

選制變遷之效應：

分析方法的探討及對我國立委選制變遷影響之研究

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**選制變遷之效應：
分析方法的探討及對我國立委選制變遷影響之研究**

摘要

2005年6月國民大會完成複決修憲，其內容最引人矚目的莫過於立委席次減半、任期改為四年，以及立委選舉由目前之「單記不可讓渡制」(SNTV)改為「單一選區兩票制」(MMM)，這不僅對我國之立委選舉制度是一大變革，而且對於政黨消長、競選策略、選民之投票行為等都勢必影響深遠。2008年1月的第七屆立委選舉將首次適用新選制，因此堪稱是台灣民主發展過程中舉足輕重的一次關鍵選舉，值得深入研究。

本計畫定位為制度之「下游」研究，亦即聚焦於評估選制之影響與效應。其成果展現於方法與實質兩方面：

- 一、從方法論的角度，針對評估型因果推論採跨時間之研究研究，並以定群資料 (longitudinal panel data) 比較制度變化前後之持續與變遷。方法上，考量新選制之單一選區兩票特性，故建構能兼顧「選票-選民-選區」之多層分析勝算對數模型 (multilevel logit model)。
- 二、研究結果發現，新MMM選制因較偏重單一選區 (SMD)，如Duverger法則所論，選前即促使各黨合縱聯盟，比較2004與2008年立委選舉之定群資料，亦發覺選票流動多發生在小黨支持者之策略投票。但在政黨比例代表 (PR) 選票上，小黨支持者卻沒有如Duverger法則預期之忠誠投票。與日本之案例比較分析後，本計畫認為：看似細微之制度差異 (如是否允許雙重提名、PR之門檻高低等)，仍可能造成相當之影響。

關鍵詞：選舉制度，選制效應，因果推論，立委選舉、分裂投票、策略投票

Consequences of Electoral System Change: Methodology and Its Application to the Study of Taiwan's Shift to the Mixed-Member Majoritarian System

Abstract

In May of 2005, an election was held to select the National Assembly delegates, who will vote on constitutional amendments proposed by the Legislative Yuan in August 2004. In the following month, the National Assembly overwhelmingly passed the constitutional amendments which, among other things, reduce the seats of the Legislative Yuan from 225 to 113, and change its electoral system from the single nontransferable vote (SNTV) into the mixed-member majoritarian (MMM) system. This change has significant effects not only on the current multi-party system, their interrelationship, and campaign strategies, but also on the electorate's voting behavior and choices. This project assesses the political consequences of Taiwan's electoral system change of the Legislative Yuan election in 2008.

By focusing on evaluating the effect of electoral system change, the research project emphasizes methodology and data analysis.

1. We adopt a longitudinal research design in order to compare the respondents in both 2004 and 2008 post-election surveys. We also argue that multilevel model is most suitable for analyzing the ballot-voter-district structure of the new MMM electoral system.
2. The main finding of this project is that Duverger's law correctly predicts the strategic voting for small party supporters in the SMD ballot. Interestingly, however, small party supporters in 2008 Legislative election deviate from Duverger's law by also strategically vote for major parties. By comparing with the case of Japan, we conclude that even seemingly minor differences in electoral system, such as no dual candidacy allowed and the relatively high 5% threshold in Taiwan, can make a difference.

Keywords: electoral systems, consequences of electoral system change, causal analysis, Legislative Yuan elections, split-ticket voting, strategic voting

Consequences of Electoral System Change: Methodology and Its Application to Taiwan's Shift from SNTV to the Mixed-Member Majoritarian System

Political scientists generally agreed that electoral systems matter. As electoral systems convert votes into seats in the legislature, and thus to a large extent determine who wins and who loses in the political arena, their changes and consequences always attract wide attention.

In January 1994, Japan abolished the SNTV system and introduced the mixed-member majoritarian (MMM) system. And in June 2005, Taiwan changed the rules of legislative elections by cutting the number of legislative seats from 225 to 113, extending legislators' terms of office from three years to four, and adopting the MMM system to replace the SNTV system. The election of the 7th Legislative Yuan held on January 12 of 2008 marked the beginning of a new era of Taiwan's legislative politics since it was the first ever election in Taiwan under the mixed-member majoritarian (MMM) electoral system¹. It is intriguing to examine what consequences on voters' vote choices this new electoral system brings about.

This research project explores the continuity and change of voting behavior in Taiwan by comparing two Legislative Yuan elections immediately before and after the electoral system shift in 2005. We call attention to strategic voting under the MMM system, and we employ panel data to examine individual-level vote choices under the previous single nontransferable vote (SNTV) system and the new MMM electoral systems. Besides assessing the influence of electoral reform on voter behavior in Taiwan, this paper also briefly discusses the major differences and consequences in electoral rules between Japan and Taiwan.

This report is organized as follows. The next section describes the differences between the SNTV and the MMM electoral systems as well as some possible impacts of the new system on Taiwan's politics. The third section reviews literature on voting behavior in general and strategic voting and the potential interactions between two tiers of MMM. The fourth section discusses our research data and hypotheses. The fifth section explores data and explains our model and the sixth presents empirical findings. The seventh section discusses the differences in the MMM System between Japan and Taiwan, and their political consequences.

¹ Here we adopt the classification of two subtypes of mixed-member systems by Shugart and Wattenberg (2001, 13-14). They call the mixed-member system "majoritarian" when there is no linkage between nominal and list tiers in the allocation of seats to parties. On the other hand, mixed-member proportional (MMP) systems prioritize the list tier, i.e., the second ballot.

Legislative Electoral Systems in Taiwan

Since the softening of the Kuomintang (KMT, or “Nationalist Party”) authoritarian regime in the late 1980s, Taiwan has experienced full-speed democratization in the 1990s with the first transfer of power in March 2000. The Democratic Progressive Party (DPP) candidate Chen Shui-bian won the 2000 presidential election, ending the KMT’s half-century rule. With the re-election of President Chen in March 2004, the DPP maintained its control over the executive branch for eight years until March 2008 when the KMT presidential candidate Ma Yin-jeou won a landslide victory against DPP’s Frank Hsieh. However, the DPP and its allied party, the Taiwan Solidarity Union (TSU), which together are often referred to as the pan-green camp, have never won a majority in the Legislature during Chen’s administration. Since the legislative election of 2001, the KMT has continued to dominate the Legislative Yuan by a narrow margin, with the help of the People First Party (PFP) and New Party (NP), which together are often referred to as the pan-blue. In December 2004’s legislative election, for example, then opposition pan-blue alliance secured 114 out of the 225 seats of the 6th Legislative Yuan, while the pan-green coalition captured 101 seats. Although the then ruling DPP remained the biggest party in the Legislature, the pan-blue camp retained its majority of the legislative seats. The frustration due to the deadlock and stalemates caused by the divided government stimulated DPP’s lead in electoral system reform. The KMT, though somewhat reluctant in the beginning, soon made use of the opportunity to gain its own end. The two major parties, KMT and DPP, thus became strange bed fellows in bringing to birth the new MMM electoral system in Taiwan.

On August 23, 2004, the Legislative Yuan in Taiwan passed constitutional amendment proposals to cut the number of legislative seats from 225 to 113, to extend legislators’ terms of office from three years to four, and to adopt a new mixed-member majoritarian electoral system to replace the previous single nontransferable vote system for legislative elections. On May 14, 2005, an election was held to select the National Assembly delegates who would vote on constitutional amendments. Three weeks later on June 7, the amendment was ratified by a resolution of 83.6 percent of the delegates present at the meeting.

Before evaluating potential effects of shifting from the SNTV to MMM system, we need to examine changes in legislative electoral rules in Taiwan. Rae (1967) identified three key elements of electoral systems: ballot structure, district magnitude, and electoral formula. Lijphart (1994) added assembly size to Rae’s list. For the purpose of comparison, Table 1 traces the changes since 1992 when all the seats in the

Legislative Yuan were first subject to re-election.

[Table 1 about here]

I. Assembly Size. According to the 2005 constitutional amendment, the total number of seats was cut into half from 225 to 113. Among them, 73 seats are elected based on the single-member districts (SMD), 34 seats based on the proportional representational (PR) in a nationwide district, and 6 seats for the aboriginals based on the SNTV constituencies.

II. Ballot Structure. Ballot remained nominal, although instead of casting one vote ($V=1$) in the former single nontransferable vote system, each voter now can cast two votes ($V=2$): one for the SMD candidate, and the other for the political party.

III. District Magnitude. In the former SNTV system, multi-member district magnitude (M) ranged from 1 to 13, with an average of 5.79, between 1998 and 2004.² Under the new mixed-member system, the SMD tier is limited to $M=1$. This of course also means that the whole nation is redistricted into 73 districts.

IV. Electoral Formula. Under the new parallel mixed-member system, the SMD tier is based on the plurality rule. The PR seats remained allocated based on the largest remainder Hare formula with a 5% legal threshold.

In sum, starting from 2008 voters in Taiwan receive two ballots on the election day of the Legislative Yuan. They can still vote for one candidate on the now single-member districts they resides in, but have the additional vote to express their preference for political parties.

Months before the 2008 Legislative election, KMT negotiated successfully with the PFP to nominate 6 former PFP legislators in 6 districts and also allowed PFP to share three seats on KMT's party list. KMT also coordinated with the Non-partisan Solidarity Union (NPSU) to stand off 3 seats in SMD, and KMT promised not nominate candidate in the first district in Pingtung to allow independent candidate Tsai Hau, also affiliated with NPSU, to compete against the DPP candidate.

² In the 1992 and 1995 Legislative Yuan elections, Taipei County as a whole was the largest SNTV district with 16 and 17 seats respectively. It was divided into three districts since 1998, so Taoyuan County with 12 seats in 1998 and then increased to 13 seats in 2001 as well as 2004 elections became the SNTV district with the highest magnitude. (see Huang 2008b, 133)

Apparently, the KMT, after losing the 2000 and 2004 presidential elections, was anxious to form a grand coalition aiming at the presidential election in the March of 2008 and thus was more willing to make compromises with its allies. In contrast to the coordination in the pan-blue camp, the DPP and the TSU squabbled with each other and eventually failed to reach any substantive agreement. The DPP seemed to believe that the TSU would simply back down and follow its lead. Yet the TSU eventually fielded 13 candidates in districts to fight its survival battle. It is interesting to note that the new electoral system facilitates the tacit merge of the KMT and PFP in the pan-blue camp and yet fuels tension between the DPP and TSU in the pan-green camp. These somewhat opposite effects on both camps are further magnified by the new system since the SMD tier tends to favor the party capturing majority of popular votes.

As mentioned earlier, the reform of legislative electoral system might be one hope for the DPP to win the absolute majority in the Legislative Yuan. However, the 2008 legislative election results fell far short from the expectation of the ruling DPP. As Table 2 shows, DPP received 38.0% of total district votes but only 13 (16.5%) out of 79 SMD/SNTV seats. For the second ballot, DPP received 36.9% of total votes and 14 (41.2%) of 34 party seats. On the other hand, the KMT garnered 53.5% of total district votes and 61 (77.2%) out of the 79 SMD/SNTV seats, as well as 51.2% of total at-large votes and 20 (58.8%) out of the 34 party seats. If we count in the 3 seats won by the NPSU, the KMT's close ally, the pan-blue indeed secured an overwhelming victory over the DPP in the 2008 legislative election. It is interesting to examine how voters in Taiwan made their choices under the single-ballot SNTV system in 2004 and the new two-ballot system in 2008.

[Table 2 about here]

Electoral Systems and Voting Choices

Researchers of strategic voting often return to Duverger's classic arguments on electoral systems and their political consequences. According to Duverger (1959, 217): "the simple-majority single ballot system favors the two-party system." He provides two factors to explain why third party can not survive in this electoral system. Duverger (1959, 224) argues that "the mechanical factor consist in the "under-representation" of the third, i.e. the weakest party, its percentage of seats being inferior to its percentage of the poll." The second factor is more ambiguous one. Because supporters of third party do not want to waste their votes, Duverger (1959,

226) argues that “their natural tendency to transfer their vote to the less evil of its two adversaries in order to prevent the success of the greater evil.”

Following the lead of Duverger (1959), many studies focus on the macro level (or systemic level) consequences, especially on the (dis)proportionality profiles of different electoral systems and on party systems (for example, Rae 1967; Taagepera and Shugart 1989; Lijphart 1994; etc.). More recent works, however, indicate a growing interest in the micro level effects of electoral systems, including both how electoral rules shape voters and elites’ incentives as well as how political parties are affected by them (for example, Cox 1997). This shift of attention should not be too surprising since most macro effects result from the micro level incentive structure shaped by the electoral rules (Grofman 2006).

The effect of the mixed-member electoral system on party system serves a good example of this trend. As we mentioned above, Duverger (1959, 205) asserted that single-member district plurality would tend to generate two-party competition, and he also proposed that PR systems would encourage multiparty competition. Mixed-member electoral system is characterized by the hybrid of both SMD and PR tiers. That is, mixed-member systems typically involve electing part of a legislature through single-member districts, and another part through PR from party lists. It is certainly interesting to speculate the effects of such mixed systems on the party system.

Since the primary feature of the MMM system adopted by Taiwan is the lack of linkage between SMD and PR tiers, “the typical majoritarian boost received by a large party in the nominal tier is not likely to be wiped away by proportional allocation from the list tier.” (Shugart and Wattenberg 2001, 13) Furthermore, the PR portion in Taiwan accounts for only 30.1% of the total 113 seats. It seems logical to argue that the gravity force of Duverger’s law will exert pressure on small parties and thus push down the number of parties (see Reed 2005 on Japan’s case; Wang 2006, 108 on Taiwan’s case).

However, a small number of studies criticized the failure of taking account the potential for interaction effect or contamination effect across the two ballots under mixed rule (Cox and Schoppa 2002; Herron and Nishikawa 2001; Moser and Scheiner 2004). “Contamination is...when the behavior of voter, a party, a candidate, or a legislator in one tier of the election is demonstrably affected by the institutional rules employed in the other tier” (Ferrara, Herron, and Nishikawa 2005, 8). That is, the contamination effects also generate what Cox (1990) called a “centripetal” force that pull up the number of electoral parties. In order to lift the PR votes, party elites may

have strong incentive to field candidates in single-member districts to give the party label a human face, regardless of the chance of winning the district seat. In other words, electoral incentives in one tier “contaminate” those in the other tier, complicating the insights from Duvergerian laws.

Both views seem to be sound on purely theoretical ground. The real test of these two competing hypotheses rests on how voters use the two ballots under the MMM system, that is, the pattern of straight- and split-ticket voting (Huang 2001; Huang, Wang, and Kuo 2005). The “mainstream” view implies that strategic voting on the SMD side will produce split-ticketing. That is, small party supporters are not likely to waste their votes on their most preferred party’s candidates and will instead vote strategically for a large party candidate they dislike least. And yet they will choose to vote sincerely for their preferred small party on the PR lists. The “interaction effects” view, on the other hand, implies that small party supporters are more likely to vote straightly and sincerely in those districts where their preferred small party also fields a candidate.

An important methodological implication of this debate is that while comparing electoral behavior across time we should conceive voters’ vote choices in a multilevel framework, as illustrated in Figure 1. Since the same voter cast a single ballot in the 2004 election and then two ballots (SMD and PR) in the 2008 election, ballots are nested within voters and thus tend to be highly correlated. This hierarchical framework constitutes the basis of our two-level logit model in the fifth section.

Panel Data and Research Hypotheses

In this study, we employ panel survey data to examine individual-level vote choices under the SNTV system in 2004 and the MMM system in 2008 Legislative elections to see whether people tend to cast strategic votes in SMD tier comparing with the previous semi-proportional SNTV system as well as the new PR tier under the MMM system. The data set used in this study consists of 1,380 valid cases in the panel data section of two nation-wide surveys: “Taiwan’s Election and Democratization Study, 2004: Legislative Election” (abbreviated as TEDS 2004L) and “Taiwan’s Election and Democratization Study, 2008: Legislative Election” (TEDS 2008L)³. We first explore

³ Data analyzed in this paper were from “Taiwan’s Election and Democratization Study, 2004: Legislative Election (TEDS 2004L) (NSC 93-2420-H004-005-SSS) and “Taiwan’s Election and

people's vote choices over two elections through cross-tabulations. Then, we construct a two-level logit model to examine if SMD ballot still favors the greater coalition, i.e., the blue-camp in the 2008 election, after taking into account other major factors that might affect people's vote choices on their SNTV ballot in 2004 as well as SMD and PR ballots in 2008.

As Abramson (1983, 71) argues, "[p]arty identification is an attitudinal variable that measures an individual's sense of attachment to a political reference group." It is one of the most important variables in the political attitude and voting behavior research. Party identification "is a psychological identification, which can persist without legal recognition or evidence of formal membership and even without a consistent record of party support" (Campbell et al. 1960, 121). Previous researches of voting behavior find that party identification has been playing an important role since the 1950s (Campbell, Converse, Stokes, and Miller 1960). It anchors people's political attitudes and predicts voting behavior well (Converse 1966). So too is party identification critical to voting behavior in Taiwan (Shyu 1991). We expect that people who identify with a given party tend to vote for its nominee.⁴

The other important factor is people's stance on "Taiwan independence" vs. "Unification with China" issue. Because KMT is a pro-unification party and DPP supports Taiwan independence, we can expect people with "pro-unification" preference are more likely to support KMT but people with "pro-independence" are more likely to support DPP.

Besides obvious demographic variables such as sex, age, level of education and ethnicity origin, we also include evaluation of President Chen's performance as controls. The reason why we add this variable to our model is not only because the previous literature indicates presidential performance affects congressional elections (Tsai 2008; Wu and Lee 2003) but also because President Chen was not a lamb duck during the 2008 election campaign period despite the fact that his second term would end in May 2008. Instead, President Chen took over the chairmanship of the DDP in October, 2007, and dominated the nomination and campaign strategies of the party.

Democratization Study, 2008: Legislative Election (TEDS 2008L) (NSC 96-2420-H004-002-025). The coordinator of the multi-year project TEDS is Professor Chi Huang (National Chengchi University). TEDS 2004L and TEDS2008L are yearly projects on the Legislative Yuan election in 2004 and 2008, respectively. The principal investigator is Professor I-Chou Liu for TEDS 2004L and is Professor Yun-han Chu for TEDS 2008L. More information is on TEDS website (<http://www.tedsnet.org>). The authors appreciate the assistance in providing data by the institute and individuals aforementioned. The authors are alone responsible for views expressed herein.

⁴ For SMD, we consider three NPSU candidates in Taichung county, Tainan county, and Penghu county as KMT nominees because KMT cooperates with NPSU in Legislative Yuan so KMT stands off from these three districts. Another independent candidate, Tsai Hau in Pengtung county, is also considered as KMT for the same reason.

And yet meanwhile he had been plagued by a series of corruption charges against him and other first family members. We therefore argue that evaluation toward President Chen's performance is important for voter choice in both the 2004 and 2008 Legislative Yuan elections.

Exploratory Data Analysis

Table 3 cross-tabulates the voting choices of voters in terms of the two ballots, SMD and PR, in 2008.⁵ It indicates that, among the two major parties and other smaller parties, not only an overwhelming majority (77.4%) of respondents adopted straight-ticket voting but almost all the straight-tickets went to the two major parties, KMT and DPP. Smaller parties such as the TSU suffers under the MMM system since only one respondent cast straight-ticket. Although the NP did not field any candidate in SMD districts it still obtained 7.4% of PR votes from those who voted for the KMT candidates on SMD ballot. This type of ticket splitting is often called "non-opportunity" (Ferrara, Herron, and Nishikawa 2005, 87) since NP supporters do not even have the option of casting straight tickets. Yet the pattern of ticket-splitting among the TSU supporters seems to worth particular attention. TSU nominated 13 candidates in a total of 73 districts, its supporters in these 13 districts did have chance to cast straight tickets. Yet in fact among the 10 respondents who voted for TSU candidates, only one voted straight-ticket for the TSU and all others swung to the DPP. Instead, 45.0% of them voted for the DPP candidates, 35.0% voted for the KMT candidates, and none voted for the TSU candidates on the SMD ballot. This seems to be a clear indication of how the gravity force of Duverger's law operated in Taiwan's new mixed electoral system. Obviously, straight-ticket voting is dominant among the two major party identifiers. For them, to vote sincerely seems to be an easy choice. If there is small proportion of ticket-splitting among party followers, it mainly occurs inside its coalition camp instead of across its camp. To a large extent the new MMM electoral systems further consolidate the blue vs. green confrontation in Taiwan.

[Table 3 about here]

Our focus is the continuity and change of voting choices before and after the

⁵ The following analyses do not include those who failed to turnout to vote and who refused to reveal their vote choices.

electoral system shift. Although Table 2 compares the vote and seat shares of parties in the 2004 legislative election under the SNTV and 2008 election under the MMM systems, it tells us only the net (or aggregate-level) changes. The most striking feature of the panel data is that it offers the possibilities to analyze gross changes at the individual level (Huang 2005). With a panel study, it is possible to identify the individuals who have changed their choices from one wave to another. Hagenaaars (1990, 148-151) points out that the turnover table, which shows clearly how an individual's score at time t_1 differs from the score at time t_2 , forms the nucleus of the panel analysis of discrete data. We therefore decompose Table 3 into four partial tables (Tables 4-1 to Table 4-4) according to respondents' vote choices in the 2004 legislative election under the SNTV system. Here again we find that major party supporters tend to be quite stable in their vote choices over time. Among those who voted for the KMT in 2004, 80.6% remained loyal to the KMT and cast straight-ticket in 2008. If we count in those ticket-splitters who either voted for the KMT on the SMD or voted for the NP on the PR ballot, the percentage of loyalists further raised to 90.3%. As to those who voted for the DPP in 2004, 63.7% remained loyal to the DPP. If we count in those who voted for the TSU on either the SMD or the PR ballot, the percentage increased to 80.6%. The most obvious difference between DPP and KMT supporters in 2004 is the relatively high swing rate of the former in 2008, especially the $51/248=20.6\%$ on the SMD tier which is almost three times as high as the KMT swing rate.

It should surprise no one that 77.2% of those PFT supporters in 2004 became the KMT straight-ticket voters. If we also count in those who voted for the NP on the party list ballot, the percentage shots up to 90.3%. On the other hand, although the TSU nominated 13 candidates in 73 districts, none of its supporters in 2004 voted straightly for TSU in 2008. In contrast, 70% of them voted strategically for the DPP candidates and 20% of them voted for the KMT candidates on the SMD tier. Furthermore, 82.5% of them voted for the DPP on the PR ballot. Indeed, although in 2008 the NP and TSU did receive 3.95% and 3.53% for the PR votes respectively nation-wide, neither of them managed to reach the 5% threshold required for parties to be allocated PR seats. We suspect that the relatively high 5% threshold of the PR tier might have induced some small party supporters also to vote "strategically" for the major party in each camp and thus make futile the minor parties' campaigns. The MMM electoral system in Taiwan seems to squeeze small parties from both ends and facilitates the process toward a two-party system on the island, as Duverger's law predicts.

[Tables 4-1 to 4-4 about here]

A Two-Level Logit Model

Huang (2008a) argues that the most promising way of studying voting behavior is to embed the micro-level motives in the macro-level institutional structures. Given that comparing the SNTV and MMM electoral systems forms a hierarchical structure with three ballots nested within voters and voters within districts, as illustrated in Figure 1, students of vote choices under this system had better adopt a model flexible enough to incorporate its key structural features while general enough to take account key players' characteristics. Recent development of the multilevel logit model (Baltagi 2008; Cameron and Trivedi 2009; Rabe-Hesketh and Skrondal 2008; Raudenbush and Bryk 2002; Train 2003) fits this research objective well. Multilevel logit's generality, despite its ostensible complexity, lies in its ability to model choices (i.e., each voter casts three ballots in two legislative elections) while accommodating possible unobserved heterogeneity due to taste variation or substitution pattern among alternatives. Indeed in our study, each voter casts two ballots in 2008 while they may face the trade-off between strategically voting for the major parties and sincerely voting for the most preferred smaller parties. We specify our model as a special case of generalized linear mixed models (GLMM) according the following steps.

[Figure 1 about here]

- I. **Random component.** The dependent variable of our study is voter's choice between pan-blue and pan-green candidates/parties. By treating the pan-green as the base category, the dependent variable is a Bernoulli distributed binary variable with the probability π_{ij} of voting for the pan-blue.

$$f(y_{ij} | \pi_{ij}) = \pi_{ij}^{y_{ij}} (1 - \pi_{ij})^{1 - y_{ij}}, \quad y_{ij} = 0, 1; \quad 0 < \pi_{ij} < 1$$

- II. **Link function.** We specify the logit link between the probability π_{ij} and the linear systematic component η_{ij} .

$$\text{logit}(\pi_{ij}) = \ln\left(\frac{\pi_{ij}}{1 - \pi_{ij}}\right) = \eta_{ij} \quad \text{or} \quad \pi_{ij} = \frac{\exp(\eta_{ij})}{1 + \exp(\eta_{ij})}$$

- III. **Systematic component.** In our panel study, three types of ballots in two

legislative elections are nested in voters. We thus specify ballots in 2004 and 2008 elections as level one i and voters as level two j . Since our target of inference is the conditional association between a set of independent variables and the dependent variable holding constant the unobserved random effect, we should use the subject-specific model (Raudenbush 2009, 171-172).

$$\begin{aligned} \text{Level 1} \quad \eta_{ij} &= \gamma_{0j} + \gamma_{1j}W_{1ij} \\ \text{Level 2} \quad \gamma_{0j} &= \beta_{00} + \sum_{s=1}^7 \beta_{0s}X_{sj} + u_{0j}, \quad u_{0j} \sim N(0, \tau_{00}) \\ \gamma_{1j} &= \beta_{10} + u_{1j}, \quad u_{1j} \sim N(0, \tau_{11}) \end{aligned}$$

As explained in the section on data and hypotheses, we include eight independent variables, one of them at level 1 and the rest at level 2. They are listed as follows.

Level 1: W_{1ij} =SMD ballot (dummy variable) in the MMM system

Level 2: voter-specific variables

A. Demographic Variables:

X_{1ij} =sex (male=1, female=0)

X_{2ij} =age

X_{3ij} =education (high, median, and low, with low=0)

X_{4ij} =ethnicity (Minnan, Hakka, Mainlander, and Aboriginal, with Minnan=0)

B. Party Identification

X_{5ij} =KMT, DPP, NP, PFP, and TSU, with independents & others=0

C. Political Attitudes

X_{6ij} =attitude toward Taiwan's independence/Unification with China, a 0-10 scale with independence=0 and unification=10

X_{7ij} =evaluation of President Chen Shui-bian's performance, a 0-10 scale with very unsatisfied=0 and very satisfied=10

In words, we specify a random coefficient logistic model with not only the subject-specific random intercept u_{0j} but also the random slope of the SMD ballot with mean effect β_{10} and variance τ_{11} . That is, we hypothesize that the effect of the new SMD ballot in 2008 tends to differ from voter to voter.

By combining both levels, we obtain the following mixed-effects model with fixed effects inside the brackets and random-effects outside the bracket:

$$\eta_{ij} = \left[\beta_{00} + \beta_{10}W_{1ij} + \sum_{s=1}^7 \beta_{0s}X_{sij} \right] + u_{0j} + u_{1j}W_{1ij}$$

The covariance matrix of the two random terms becomes $V \begin{pmatrix} u_{0j} \\ u_{1j} \end{pmatrix} = \begin{pmatrix} \tau_{00} & \tau_{01} \\ \tau_{10} & \tau_{11} \end{pmatrix}$. The

simple version of this random slope model is achieved by assuming the two random effects are independent and thus $\tau_{01} = \tau_{10} = 0$. However, this assumption is often not realistic in practice and should be tested by likelihood ratio (LR) test.

Estimation

In panel studies, it is often said that subjects serve as their controls when considering the effects of time-varying independent variables (Baltagi 2008, 6-7). However, this is not always true since we still need to worry omitted subject-level variables, say Z_j , which may correlate with random intercept u_{0j} and hence be confounded with the time-varying variables of interest, such as the two variables of political attitudes X_6 and X_7 . According to Mundlak (1978) and Neuhaus and Kalbfleisch (1998), we can avoid omitted subject-level variable bias by subject-mean centering X_6 and X_7 , that is, by subtracting the subject means from the original variables. The regression coefficient of the subject-mean centered variable β^W can be interpreted as a purely within-subject (or longitudinal effect). Rabe-Hesketh and Skrondal (2008, 115) show that the subject mean itself should also be included and its coefficient β^B can be interpreted as between-subject (or cross-sectional) effect. A test of the null hypothesis $\beta^W = \beta^B$ can be used to assess the exogeneity of X_6 and X_7 , which is equivalent to the Hausman test. A significant test result means that we should keep both the subject-mean centered and the subject mean in the equation. An insignificant test result means that $\beta^W = \beta^B$ and the original variable suffices.

We estimate our two-level random-coefficient logit model in the following steps.

1. We first estimate a simple random-coefficient logit model (assuming $\tau_{01} = \tau_{10} = 0$) by including both the subject-mean centered and the subject mean of political attitudes in the equation, as shown in Table 5, and then test the null hypothesis

$\beta^W = \beta^B$. The test on attitude toward independence/unification variable results in $z=0.70$ ($p=0.486$) and we do not reject the null hypothesis. We simply return to the original variable in the next step of analysis. In contrast, the test on the evaluation of President Chen Shui-bian's performance results in $z=-3.06$ ($p=0.002$) which is significant. We therefore keep both the subject-mean centered and the subject mean of X_7 in the equation and re-run the model. The estimates are presented at the left column (Model 1) of Table 6.

2. We then relax the independence-between-random-effects assumption and re-estimate the two-level logit model. Since Model 1 is nested in Model 2, likelihood ratio test is appropriate for model selection. A test result of LR $X^2=6.24$ with $df=1$ ($p=0.0125$) is statistically significant at 0.05 level. We therefore select the Model 2 on Table 6 as our final model.

[Tables 5 and 6 about here]

Interpretation

In terms of the central focus of this paper, the effect of the SMD ballot in the new MMM electoral system, we find that on average voters tend to be $\exp(0.555)=1.741$ times as likely to vote for the blue camp then vote for the green camp. This finding confirms our impression from reading partial turnover tables in the previous section. However, the regression estimate is more robust since it is the conditional effect holding constant all other variables and random effects. Furthermore, there is some indication that the effect of the SMD ballot varies substantially from voter to voter. The confidence interval of $\exp(\hat{\beta}_{10})$ ranges from 1.405 to 18.302 based on a 95% confidence level. Any assessment of the electoral system effect should take this substantial heterogeneity into account.

As to those subject-specific variables, three out of the seven explanatory variables play significant roles in affecting voter choices. Demographic variables such as sex and age make little difference. Citizens with middle-level education (senior high school) are less likely to vote for the pan-blue than those with lower level of education. Mainlanders are more likely to vote for the pan-blue, albeit significant

only at the 0.1 level.

Not surprisingly, partisan voting is dominant. Comparing with non-partisans, those who identify themselves with the KMT/PFP are much more likely to vote for the pan-blue camp. Likewise, those who identify with the DPP/TSU are very unlikely to vote for pan-blue candidates as well as party list. This coincides with the dominant pattern of straight-ticket voting among the two major party identifiers.

Very much like all the previous studies have found, attitude toward Taiwan-independence vs. unification with China remains to be an important factor that influences voter choices. As indicated in Table 5, this variable is relatively stable during our study period and its longitudinal and cross-sectional effects are equivalent. Our final model estimate shows that, other things being equal, on average each point increase on the independence/unification scale leads to 32.4% increase in the odds of voting for the pan-blue camp.

Finally, evaluation of President Chen Shui-bian's performance affects vote choices even after controlling for all the above-mentioned variables. As discussed earlier, a test of endogeneity rejects the null hypothesis of $\beta^W = \beta^B$. Both Model 1 and Model 2 indicate that its between-subject (or cross-sectional) effect is significant. On average for each one-point increase in the 0-10 evaluation scale favoring President Chen, the odds of voting for the pan-blue camp declined by about 38.9%. Staunch supporters of Chen are obviously also those "dark greens." However, with a series of outbreaks of financial scandals involving Chen himself, his family, and officials in his administration since 2006, Chen's popularity declined substantially. This fact alone certainly does not contribute to the overwhelming victory of the pan-blue camp in the 2008 legislative election. However, we do suspect that this negative effect of Chen's poor image might have been magnified by the single-member district component of the MMM system which is known to favor disproportionately the single party which garnered nearly half of the total votes.

Differences in the MMM System between Japan and Taiwan

Despite the apparent similarities of the MMM systems between Japan and Taiwan, there are some subtle differences whose political consequences deserve closer examination.

1. Dual candidacy and the best loser provision.

The MMM system in Japan allows lists ordered on the basis of which candidates

prove to be the “best losers” in the nominal-tier single-member districts (SMD) in which they are nominated. Best-loser lists provide candidates with the incentive to campaign hard within their districts so as to be elected in the list tier even if defeated in their districts. Japanese parties may nominate candidates to compete for a PR seat by running hard in a losing SMD. However, no dual candidacy of the kind is permitted in Taiwan and therefore it is strictly closed party list in the PR tier.

2. PR constituencies

The 180 PR list seats (37.5% of the total 480 seats since year 2000 House election) are further distributed in 11 PR constituencies in Japan. Such institutional rule may be favorable to some smaller parties whose supporters tend to concentrate within certain PR constituencies. By contrast, the 34 list seats (30.1% of the total 113 seats) in Taiwan are elected in the whole nation as a single PR constituency.

3. Electoral threshold

In Japan, there is no formal electoral threshold for political parties on the second ballot to be eligible to the allocation of list seats. In Taiwan, however, parties competing for party-list seats must attain at least 5% of the vote nation wide—a provision which discriminates against small parties. As a result, only two major parties, Kuomintang (KMT) and the Democratic Progressive Party (DPP), met this threshold requirement in the 2008 Legislative Yuan election. Although two small parties, the New Party (NP) and the Taiwan Solidarity Union (TSU), did receive 3.95% and 3.53% for the PR votes respectively, neither of them managed to reach the 5% threshold.

Similarities and Differences in the Political Consequences

The above-mentioned differences in electoral rules might have divergent political consequences in Taiwan and Japan. I believe that it takes some careful and detailed comparative analyses to answer the following research questions.

1. Party System: Toward a Two-Party System but at a Different Pace?

Duverger (1959, 205) asserted that single-member district plurality would tend to generate two-party competition, and he also proposed that PR systems would

encourage multiparty competition. Since the MMM systems in Japan and Taiwan lack linkage between SMD and PR tiers, “the typical majoritarian boost received by a large party in the nominal tier is not likely to be wiped away by proportional allocation from the list tier.” (Shugart and Wattenberg 2001, 13) The PR portion in Japan accounts for only 37.5% of the total 480 seats and in Taiwan accounts for only 30.1% of the total 113 seats. It seems logical to argue that the gravity force of Duverger’s law will exert pressure on small parties and thus push down the number of parties. Indeed macro-level data seem to confirm Duverger’s law and indicate that the impact of electoral reforms on party systems in the two countries is a movement toward two-camp competition.

Why does it take Japan almost one and a half decades to gradually evolve toward a two-party system while in Taiwan the impact of the new electoral system on the party system is immediate and obvious? To what extent does this different pace contributed by the differences in electoral rules? For example, I suspect that the relatively high 5% threshold of the PR tier might have induced some small party supporters also to vote “strategically” for the major party.

The MMM electoral system in Taiwan seems to squeeze small parties from both SMD and PR ends and thus accelerates the process toward a two-party system on the island.

2. “Contamination Effect”: Are SMD and PR Ballots “Mixed” or Not?

A small number of studies criticized the failure of the mainstream literature taking account the potential for interaction effect or contamination effect across the two ballots under mixed rule (Cox and Schoppa 2002; Herron and Nishikawa 2001; Moser and Scheiner 2004). In order to lift the PR votes, party elites may have strong incentive to field candidates in single-member districts to give the party label a human face, regardless of the chance of winning the district seat. In other words, electoral incentives in one tier “contaminate” those in the other tier, complicating the insights from Duvergerian laws. Are voters in the two countries equally motivated to react to the maneuvers of political elites to maximize their parties’ seats and votes in both SMD and PR tiers? My speculation is probably not.

Despite some negative evidence (Maeda 2008), I suspect that in Japan with best loser provision, candidates who ‘died’ gloriously in their SMD can be ‘revived’ in PR ‘zombie Diet members’ and thus have strong incentive to run hard in their SMD, the interaction mechanism is more likely to take effect. Also, in Japan with 11 PR constituencies, smaller parties with supporters concentrated in an area are more likely to trade SMD votes in exchange of PR votes. Both theories and empirical evidence indicate that the higher the district magnitude, the greater the proportionality between vote shares and seat shares among parties. So Taiwan’s new electoral system should be more proportional since the whole country is treated as a PR constituency. However, the combination of single PR constituency and 5% threshold turns out to be less favorable to small parties. In Taiwan, therefore, there is little mechanism exists for interactions between SMD and PR ballots to take effect. Small party supporters might well vote strategically for major-party candidates and sincerely for PR lists, as Duverger’s law predicts, or even turn to major party list in the PR tier due to the seemingly formidable 5% electoral threshold.

Conclusions

This research project examines the continuity and change of voting behavior in Taiwan by comparing two Legislative Yuan elections immediately before and after the electoral system shift in 2005. We pay particular attention to strategic voting under the MMM system, and we employ the TEDS panel data to examine individual-level vote choices under the previous SNTV system and the new MMM electoral systems.

Both our exploratory analyses of turnover tables and two-level logit model estimation confirm that the SMD ballot in the new MMM electoral system tends to favor the party that successfully forms a coalition, i.e., the pan-blue camp in 2008. Besides the effect of electoral system change, partisan voting remains to be dominant in both 2004 and 2008 legislative elections. Comparing with non-partisans, those who identify themselves with the KMT/PFP are much more likely to vote for the pan-blue candidates in districts as well as the pan-blue parties on the PR ballot. Likewise, those who identify with the DPP are very unlikely to vote for pan-blue candidates and parties. Supporters of the smaller parties such as PFP and TSU in 2004 election, on the other hand, tend to vote strategically for the major party candidates of their own camp in 2008. Although the NP and TSU did receive 3.95% and 3.53% for the PR votes respectively in 2008, neither of them managed to reach the 5% threshold required for parties to be allocated PR seats. We suspect that the

relatively high 5% threshold of the PR tier might have induced some small party supporters also to vote “strategically” for the major party in each camp and thus make futile the minor parties’ campaigns.

Institutions do matter. The MMM electoral system in Taiwan seems to squeeze small parties from both ends and facilitates the process toward a two-party system on the island, as Duverger’s law predicts. This may be even true for seemingly “minor” differences among apparent similarities between two electoral rules in Japan and Taiwan. Their potential divergent consequences call for careful comparative studies and causal analyses in the future.

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Table 1 Features of the Legislative Electoral System in Taiwan Since 1992

| Term | Election Year | Electoral System | Total Seats | PR Seats (%) | PR Legal Threshold | Average District Magnitude ¹ | ENPP ² |
|-----------------|---------------|------------------|-------------|--------------|--------------------|---|-------------------|
| 2 nd | 1992 | SNTV | 161 | 36(22.4%) | 5% | 4.41 | 2.28 |
| 3 rd | 1995 | SNTV | 164 | 36(22.0%) | 5% | 4.52 | 2.54 |
| 4 th | 1998 | SNTV | 225 | 49(21.8%) | 5% | 5.79 | 2.48 |
| 5 th | 2001 | SNTV | 225 | 49(21.8%) | 5% | 5.79 | 3.47 |
| 6 th | 2004 | SNTV | 225 | 49(21.8%) | 5% | 5.79 | 3.26 |
| 7 th | 2008 | MMM | 113 | 34(30.1%) | 5% | 1 | 1.75 |

Source: Huang 2008b, 132.

Notes: 1. (Total number of seats elected from districts)/(Total number of districts).

2. Effective number of parliamentary parties (ENPP) between 1992 and 2004, see Wang, (2006, 97). ENPP of 2008 is computed by the first author.

Table 2 Vote/Seat Shares of Major Parties¹ in 2004 and 2008 Legislative Elections

| | 2004 | | | 2008 | | | | | |
|------------------|-------------------|-------|--------|------------------|-------|-------|-------|------------|--------|
| | SNTV ² | | | SMD ² | | PR | | Seat Total | |
| | Vote% | Seats | Seats% | Vote% | Seats | Vote% | Seats | Seats# | Seats% |
| KMT | 32.83 | 79 | 35.11 | 53.50 | 61 | 51.23 | 20 | 81 | 71.68 |
| DPP | 35.72 | 89 | 39.56 | 38.17 | 13 | 36.91 | 14 | 27 | 23.89 |
| NP | 0.12 | 1 | 0.44 | --- | --- | 3.95 | 0 | 0 | 0.00 |
| PFP ³ | 13.90 | 34 | 15.11 | 0.29 | 1 | --- | --- | 1 | 0.89 |
| TSU | 7.79 | 12 | 5.33 | 0.95 | 0 | 3.53 | 0 | 0 | 0.00 |
| NPSU | 3.63 | 6 | 2.67 | 2.42 | 3 | 0.70 | 0 | 3 | 2.66 |
| Other | 6.00 | 4 | 1.78 | 4.68 | 1 | 3.68 | 0 | 1 | 0.89 |
| Total | 100.0 | 225 | 100.0 | 100.0 | 79 | 100.0 | 34 | 113 | 100.0 |

Sources: Huang, Chen, and Chou (2008). Data on vote/seat share for each party are from the Central Election Commission of the Ministry of the Interior, Republic of China.

Notes: 1. *Parties*: KMT, Kuomintang; DPP, Democratic Progressive Party; NP, New Party; PFP, People First Party; TSU, Taiwan Solidarity Union; NPSU, Non-Partisan Solidarity Union.

2. Vote statistics includes 2 aboriginal SNTV constituencies.

3. PFP won one seat from an aboriginal SNTV constituency in 2008 elections.

Table 3 Straight- and Split-Ticket Voting in 2008

| | | 2008's PR | | | | | |
|---------------|-------|-------------------------|-------------------------|----------------------|----------------------|----------------------|-------|
| | | KMT | DPP | NP | TSU | Other | Total |
| 2008's SMD | KMT | 420 (81.6) [49.3] | 30 (5.8) [3.5] | 38 (7.4) [4.5] | 9 (1.7) [1.1] | 18 (3.5) [2.1] | 515 |
| | DPP | 19 (6.6) [2.2] | 239 (83.3) [28.1] | 1 (0.3) [0.1] | 16 (5.6) [1.9] | 12 (4.2) [1.4] | 287 |
| | NP | 0 | 0 | 0 | 0 | 0 | 0 |
| | TSU | 0 | 9 (90.0) [1.1] | 0 | 1 (10.0) [0.1] | 0 | 10 |
| | Other | 14 (35.0) [1.6] | 16 (40.0) [1.9] | 4 (10.0) [0.5] | 2 (5.0) [0.2] | 4 (10.0) [0.5] | 40 |
| | Total | 453 | 294 | 43 | 28 | 34 | 852 |

Data resource: TEDS2008L

Notes: 1. Figures in () are row percentages.

2. Figures in [] are total percentages.

3. Pearson's $\chi^2=567.585$; $df=12$; $p<0.001$

4. Cramer's $V=0.471$

5. Test of symmetry: $\chi^2=59.50$; $df=9$; $p<0.001$

Table 4-1 Straight- and Split-Ticket Voting in 2008 among Those Who Voted for KMT in 2004

| 2004's SNTV | 2008's | | KMT | DPP | NP | TSU | Other | Total |
|----------------|---------------|----|-------------------------|-----------------------|----------------------|---------------------|---------------------|-------|
| | 2008's SMD | PR | | | | | | |
| KMT | KMT | | 208 (89.3) [80.6] | 4 (1.7) [1.6] | 13 (5.6) [5.0] | 4 (1.7) [1.6] | 4 (1.7) [1.6] | 233 |
| | DPP | | 7 (36.8) [2.7] | 10 (52.6) [3.9] | 0 | 1 (5.3) [0.4] | 1 (5.3) [0.4] | 19 |
| | Other | | 4 (66.7) [1.6] | 1 (16.7) [0.4] | 1 (16.7) [0.4] | 0 | 0 | 6 |
| | Total | | 219 | 15 | 14 | 5 | 5 | 258 |

Data sources: TEDS2004L and TEDS2008L

- Notes: 1. Figures in () are row percentages.
 2. Figures in [] are total percentages.
 3. Pearson's $X^2=90.459$; $df=8$; $p<0.001$
 Fisher's exact test: $p<0.001$
 4. Cramer's $V=0.419$

Table 4-2 Straight- and Split-Ticket Voting in 2008 among Those Who Voted for DPP in 2004

| 2004's SNTV | 2008's | | KMT | DPP | NP | TSU | Other | Total |
|----------------|---------------|----|------------------------|-------------------------|---------------------|----------------------|---------------------|-------|
| | 2008's SMD | PR | | | | | | |
| DPP | KMT | | 30 (58.8) [12.1] | 14 (27.5) [5.6] | 2 (3.9) [0.8] | 3 (5.9) [1.2] | 2 (3.9) [0.8] | 51 |
| | DPP | | 2 (1.1) [0.8] | 158 (88.8) [63.7] | 1 (0.6) [0.4] | 10 (5.6) [4.0] | 7 (3.9) [2.8] | 178 |
| | TSU | | 0 | 5 (83.3) [2.0] | 0 | 1 (16.7) [0.4] | 0 | 6 |
| | Other | | 4 (30.8) [1.6] | 8 (61.5) [3.2] | 0 | 1 (7.7) [0.4] | 0 | 13 |
| | Total | | 36 | 185 | 3 | 15 | 9 | 248 |

Data sources: TEDS2004L and TEDS2008L

Notes: 1. Figures in () are row percentages.

2. Figures in [] are total percentages.

3. Pearson's $X^2=120.474$; $df=12$; $p<0.001$

Fisher's exact test: $p<0.001$

4. Cramer's $V=0.402$

Table 4-3 Straight- and Split-Ticket Voting in 2008 among Those Who Voted for PFP in 2004

| 2004's SNTV | 2008's | | KMT | DPP | NP | TSU | Other | Total |
|----------------|---------------|----|------------------------|----------------------|------------------------|-----|---------------------|-------|
| | 2008's SMD | PR | | | | | | |
| PFP | KMT | | 71 (81.6) [77.2] | 1 (1.1) [1.1] | 11 (12.6) [12.0] | 0 | 4 (4.6) [4.3] | 87 |
| | DPP | | 1 (50.0) [1.1] | 1 (50.0) [1.1] | 0 | 0 | 0 | 2 |
| | Other | | 2 (66.7) [2.2] | 0 | 1 (33.3) [1.1] | 0 | 0 | 3 |
| | Total | | 74 | 2 | 12 | 0 | 4 | 92 |

Data sources: TEDS2004L and TEDS2008L

Notes: 1. Figures in () are row percentages.

2. Figures in [] are total percentages.

3. Pearson's $\chi^2=23.293$; $df=6$; $p=0.001$

Fisher's exact test: $p=0.116$

4. Cramer's $V=0.356$

Table 4-4 Straight- and Split-Ticket Voting in 2008 among Those Who Voted for TSU in 2004

| 2004's SNTV | 2008's | | KMT | DPP | NP | TSU | Other | Total |
|----------------|---------------|----|----------------------|------------------------|----------------------|----------------------|----------------------|-------|
| | 2008's SMD | PR | | | | | | |
| TSU | KMT | | 2 (25.0) [5.0] | 3 (37.5) [7.5] | 1 (12.5) [2.5] | 1 (12.5) [2.5] | 1 (12.5) [2.5] | 8 |
| | DPP | | 0 | 26 (92.9) [65.0] | 0 | 2 (7.1) [5.0] | 0 | 28 |
| | TSU | | 0 | 2 (100.0) [5.0] | 0 | 0 | 0 | 2 |
| | Other | | 0 | 2 (100.0) [5.0] | 0 | 0 | 0 | 2 |
| | Total | | 2 | 33 | 1 | 3 | 1 | 40 |

Data sources: TEDS2004L and TEDS2008L

Notes: 1. Figures in () are row percentages.

2. Figures in [] are total percentages.

3. Pearson's $X^2=19.048$; $df=12$; $p=0.087$

Fisher's exact test: $p=0.037$

4. Cramer's $V=0.398$

Table 5 Two-Level Random Intercept Logit Model: A Test of Equality of Within-subject and Between-subject Effects

| | | Blue vs. Green | | |
|--|-----------------------|--------------------|---------|---------------------|
| | | $\hat{\beta}$ | (s.e.) | $\exp(\hat{\beta})$ |
| SMD Ballot (SNTV and PR=0) | | 0.577 * | (0.257) | 1.781 |
| Gender (Female=0) | | | | |
| | Male | 0.361 | (0.282) | 1.435 |
| Age | | 0.011 | (0.012) | 1.011 |
| Education (Junior high school or less =0) | | | | |
| | Senior high school | -1.132 ** | (0.417) | 0.322 |
| | College or above | -0.764 | (0.493) | 0.466 |
| Ethnicity(Minnan=0) | | | | |
| | Hakka | 0.456 | (0.401) | 1.578 |
| | Mainlander | 1.077 [§] | (0.559) | 2.936 |
| | Aboriginal | -0.781 | (1.475) | 0.458 |
| Party Identification (Other Parties & Independents =0) | | | | |
| | KMT | 3.461 *** | (0.456) | 31.849 |
| | DPP | -3.608 *** | (0.486) | 0.027 |
| | NP | 1.276 | (0.943) | 3.582 |
| | PFP | 3.245 ** | (1.218) | 25.662 |
| | TSU | -2.510 ** | (0.840) | 0.081 |
| Independence / Unification (0~10) (Independence=0; Unification=10) | | | | |
| | Subject-mean centered | 0.228 * | (0.113) | 1.256 |
| | Subject mean | 0.312 *** | (0.076) | 1.366 |
| Evaluation of President Chen Shui-bian (very unsatisfied=0; very satisfied =10) | | | | |
| | Subject-mean centered | -0.144 | (0.107) | 0.866 |
| | Subject mean | -0.509 *** | (0.086) | 0.601 |
| Constant | | 0.978 | (0.943) | 2.659 |

| | | | | |
|------------------|---|------------------|------------------|---|
| | | Random intercept | SMD | |
| Random intercept | [| 2.519 (0.331) | 0 |] |
| SMD | | 0 | 2.958 (0.411) | |

Sample size = 947
Number of observations = 1,961
Whole Model:
Log Likelihood = -429.80818
Wald test $X^2 = 101.11$, $df=17$,
 $p < 0.001$

Data sources: TEDS 2004L and TEDS 2008L

Notes: ***: $p < 0.001$; **: $p < 0.01$; *: $p < 0.05$; \$: $p < 0.1$

**Table 6 Two-level Random Coefficient Logit Model with and without Correlation
Between Random Terms**

| | Blue vs. Green (Model 1) | | Blue vs. Green (Model 2) | |
|--|-----------------------------|----------------------|-----------------------------|----------------------|
| | $\hat{\beta}$ (s.e.) | exp($\hat{\beta}$) | $\hat{\beta}$ (s.e.) | exp($\hat{\beta}$) |
| SMD Ballot (SNTV and PR=0) | 0.574 * (0.256) | 1.776 | 0.555 * (0.235) | 1.741 |
| Gender (Female=0) | | | | |
| Male | 0.360 (0.282) | 1.434 | 0.351 (0.270) | 1.420 |
| Age | 0.011 (0.012) | 1.011 | 0.010 (0.012) | 1.010 |
| Education (Junior high school or less =0) | | | | |
| Senior high school | -1.123 ** (0.416) | 0.325 | -1.076 ** (0.393) | 0.341 |
| College or above | -0.755 (0.492) | 0.470 | -0.723 (0.468) | 0.485 |
| Ethnicity(Minnan=0) | | | | |
| Hakka | 0.469 (0.400) | 1.599 | 0.422 (0.382) | 1.524 |
| Mainlander | 1.058 § (0.557) | 2.880 | 0.994 § (0.534) | 2.701 |
| Aboriginal | -0.829 (1.473) | 0.437 | -0.876 (1.368) | 0.416 |
| Party Identification (Other Parties & Independents =0) | | | | |
| KMT | 3.463 *** (0.456) | 31.919 | 3.254 *** (0.391) | 25.901 |
| DPP | -3.620 *** (0.486) | 0.027 | -3.402 *** (0.407) | 0.033 |
| NP | 1.276 (0.940) | 3.582 | 1.112 (0.884) | 3.040 |
| PFP | 3.243 ** (1.219) | 25.600 | 3.001 * (1.175) | 20.101 |
| TSU | -2.499 ** (0.838) | 0.082 | -2.362 ** (0.782) | 0.094 |
| Independence / Unification (0~10) (Independence=0; Unification=10) | 0.292 *** (0.069) | 1.338 | 0.281 *** (0.064) | 1.324 |
| Evaluation of President Chen Shui-bian (very unsatisfied=0; very satisfied =10) | | | | |
| Subject-mean centered | -0.133 (0.106) | 0.876 | -0.130 (0.101) | 0.878 |
| Subject mean | -0.516 *** (0.086) | 0.597 | -0.493 *** (0.076) | 0.611 |

| | | | | | | |
|--|-------------------------|------------------|------------------|-------------------------|-------------------------|------------------|
| Constant | | | 1.089 (0.929) | 2.971 | 1.045 (0.887) | 2.843 |
| Model 1 | Random intercept | SMD | | Model 2 | Random intercept | SMD |
| Random intercept | 2.513 (1.045) | 0 | | Random intercept | 1.581 (0.708) | 1.254 (0.398) |
| SMD | 0 | 2.937 (1.409) | | SMD | 1.254 (0.398) | 0.995 (0.544) |
| <p>Sample size = 947</p> <p>Number of observations = 1,961</p> <p>Whole Model:</p> <p>Model 1: Log Likelihood = -430.05081 Wald test $X^2 = 101.51$, $df=16$, $p<0.001$</p> <p>Model 2: Log Likelihood = -426.93054 Wald test $X^2 = 159.34$, $df=16$, $p<0.001$</p> | | | | | | |

Data sources: TEDS 2004L and TEDS 2008L

Notes: ***: $p<0.001$; **: $p<0.01$; *: $p<0.05$; \$: $p<0.1$

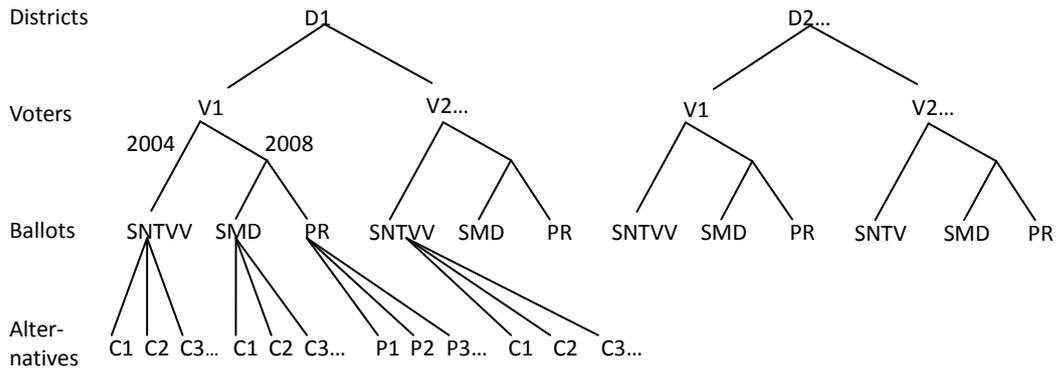


Figure 1 Hierarchical Structure of Taiwan's SNTV and MMM Electoral Systems in the 2004 and 2008 Legislative Yuan Elections

Source: revised from Huang 2008b, 139.

Notes: D= district; V= voter; SNTV= single nontransferable vote; SMD= single-member district; PR= proportional representation; C= candidate; P= party

國科會補助專題研究計畫成果報告自評表

請就研究內容與原計畫相符程度、達成預期目標情況、研究成果之學術或應用價值（簡要敘述成果所代表之意義、價值、影響或進一步發展之可能性）、是否適合在學術期刊發表或申請專利、主要發現或其他有關價值等，作一綜合評估。

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因故實驗中斷

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除四篇期刊論文外，亦發表三篇專書之專章、及一本合輯之專書（如附錄）。

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本計畫之研究成果，在方法論上針對制度效應評估之需求與選制之層級結構，建構了結合定群資料panel data與多層分析之勝算對數模型（multilevel logit model），兼顧了研究設計與資料分析的嚴謹，可供後續研究之參考。在研究發現上，亦具體評估選舉制度之變遷，對政黨菁英之合縱連橫、選民之策略投票與否的影響，均兼具學理與實用價值。

附錄

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