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Knowledge of the Electoral System and Voting: Taiwan's 2008 and 2012 Legislative Elections

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For the legislative elections in 2008, Taiwan introduced a new mixed-member majoritarian (MMM) electoral system to replace the single non-transferable vote (SNTV) system that had been in place for half a century. The new MMM system is a sharp departure from the original SNTV system in several institutional designs. Whether the Taiwanese public is ignorant or fully aware of the new electoral system has attracted the attention of many Taiwanese scholars. By taking advantage of survey data conducted between 2007 and 2011, we aim to examine in this research the level of the Taiwanese public's awareness of the new MMM electoral system in the 2008 and 2012 elections, investigating whether most voters are knowledgeable of the new electoral system. We also test whether holding legislative elections concurrently with the presidential election influences the

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effect of political campaigns on people's learning of electoral knowledge. Furthermore, the extent to which people's knowledge of electoral systems influences their voting participation is also included in our analysis. The findings of this study indicate that the majority of citizens were not fully aware of the institutional components of the new MMM system in the 2008 and 2012 elections. We also confirm that political campaigns play an important role in enriching citizens' electoral knowledge. Citizens' knowledge of the electoral system rises as the election date approaches and declines after the election is held. Moreover, concurrent presidential and legislative elections did negatively impact the relationship between political campaigns and electoral knowledge. The learning effect of electoral knowledge in the 2012 concurrent elections was not as significant as that in the 2008 legislative election. In addition, our findings also reveal a positive relationship between electoral knowledge and voting participation, suggesting that citizens who are more knowledgeable of the electoral system were more likely to vote in the 2012 legislative election.

KEYWORDS: political knowledge; electoral system; concurrent election; voting participation; item response theory.



Taiwan employed a new MMM (Mixed-Member Majoritarian) system to replace the SNTV (Single non-transferable vote) system that had been in place for half a century as its legislative electoral system in 2008. The new MMM electoral system has indeed had a huge impact on Taiwan's party politics and has attracted the attention of many political scientists. According to their studies, the majority of citizens are not fully aware of the institutional components of the new MMM

system. Moreover, citizens' knowledge of the new MMM system is a function of electoral momentum and the knowledge of electoral systems is strongly associated with people's voting behavior.

However, the research findings regarding the citizens' electoral knowledge, based on the 2008 Legislative Yuan election, are challenged by the concurrent presidential and legislative elections held in early 2012.¹ Do people become less or more aware of the institutional designs

¹Taiwan held its 13th presidential and 8th Legislative Yuan elections concurrently on January 14, 2012.

of the MMM electoral system when legislative and executive elections are held simultaneously? Moreover, does the significant relationship between people's electoral knowledge and voter turnout change when the factor of a presidential election is included in the analysis? The first concurrent presidential and legislative elections held in 2012 offer an excellent opportunity for answering these questions, and test the impact of an executive election on legislative elections. In this study, we intend to investigate whether the learning effect of political knowledge derived from the campaign process is offset when legislative and presidential elections are held simultaneously. Furthermore, we also plan to test the relationship between electoral knowledge and voting participation, investigating whether citizens with a higher level of electoral knowledge are more likely to vote than their counterparts in the 2012 legislative election.

This research is divided into five parts. The first section reviews the literature on political knowledge in general and the relationship between knowledge of the MMM system and voting behavior in particular. In the second section, we move to introduce the data source and method used in the study. The third section specifies the political cycle of electoral system knowledge from 2007 to 2012 and compares the changes in electoral knowledge in the 2008 and 2012 elections accordingly, observing how people's knowledge of the legislative electoral system is affected by the presidential election. In the fourth section, we examine the extent to which electoral knowledge influences citizens' voter turnout under concurrent presidential and legislative elections and draw a comparison with the results under non-concurrent elections. In the final concluding section, a summary of our research findings, theoretical implications, and limitations will be discussed.

The Nature and Origins of Political Knowledge

Classical democracy theory suggests that a politically informed citizenry is a pre-requisite of democracy. A citizen is more likely to make more prudent decisions if he (she) is more knowledgeable of political institutions, politicians and political events.² Nevertheless, most citizens are ignorant of public affairs and are not interested in politics either.³

According to Delli Carpini and Keeter, political knowledge refers to "the range of factual information about politics that is stored in long-term memory" and is closely related to other concepts such as political awareness, political sophistication, cognitive sophistication and political expertise. They are often interchangeable to measure citizen competency.⁴ Jennings divides political knowledge into three types: "textbook facts," "current events," and "historical facts."⁵ "Textbook facts" consist of questions about the mechanics of government and politics, are relatively stable, and often learned via the education system. Compared with textbook facts, "current events" change more frequently and are usually acquired through mass media and personal interaction. As for "historical facts," these have elements of both tuition and surveillance.

Previous studies suggest that civil ability, opportunity and motivation are three major determinants of political knowledge.⁶ Ability refers to various types of skills, talents and attributes which help individuals process and retain information. Public education, compared with other information sources such as mass media, is considered to be the main

²Chi Huang, Ching-hsin Yu, and Yi-Ching Hsiao, "Citizen's Awareness of the New MMM Electoral System in Taiwan: A Cohort Analysis," *Election Studies* 1, no. 2 (Fall 2011): 7-43.

³Angus Campbell et al., *The American Voter* (New York: Wiley 1960); Michael X. Delli Carpini and Scott Keeter, "Stability and Change in the U.S. Public's Knowledge of Politics," *Public Opinion Quarterly* 55, no. 4 (Winter 1991): 583-612.

⁴Michael X. Delli Carpini and Scott Keeter, *What Americans Know About Politics and Why It Matters* (New Haven, Conn.: Yale University Press 1996), 10.

⁵Kent M. Jennings, "Political Knowledge Over Time and Across Generations," *Public Opinion Quarterly* 60, no. 2 (Summer 1996): 229. In addition to Jennings, other scholars also propose different categories for political knowledge. For example, Delli Carpini and Keeter divide political knowledge into two domains: "taught facts" and "surveillance facts;" the former include knowledge of fact such as the president's veto power and amendments to the U.S. Constitution, which are similar to Jennings" "textbook facts." The latter include knowledge of who is the vice president and which party is the majority party in the U.S. House and Senate, which is also labeled "current events" by Jennings, see Delli Carpini and Keeter, "Stability and Change," 583-612.

⁶Delli Carpini and Keeter, *What Americans Know About Politics*, 106-16; Robert C. Luskin, "Explaining Political Sophistication," *Political Behavior* 12, no. 4 (December 1990): 334.

source offering the opportunity to obtain information and provide substantive information. Motivation is a sense of obligation which results from interest, a sense of efficacy and civic duty. Furthermore, motivation drives citizens to focus on public affairs and acquire more political information.

Among all factors which may affect citizens' political knowledge, education is believed to be the most crucial because it provides individuals with the opportunity to learn civic ability and foster motivation to acquire political knowledge. Empirical results also demonstrate that the well-educated citizens tend to be more politically knowledgeable than their counterparts.⁷ Furthermore, an empirical study indicates that the influence of education on political knowledge is conditioned by the country's degree of economic redistribution.⁸ According to Grönlund and Milner, education has a larger impact on citizens' political knowledge in countries where income is more unequally distributed or in those which adopt a majoritarian electoral system.⁹ In addition to education, age, gender, media contact, party identification, political interest and political efficacy are also confirmed to be important factors affecting the level of political knowledge.¹⁰

⁷Jeffrey A. Karp, "Political Knowledge About Electoral Rules: Comparing Mixed Member Proportional Systems in Germany and New Zealand," *Electoral Studies* 25, no. 4 (December 2006): 714-30; Delli Carpini and Keeter, *What Americans Know About Politics*; Jennings, "Political Knowledge Over Time."

⁸Kimmo Grönlund and Henry Milner, "The Determinants of Political Knowledge in Comparative Perspective," *Scandinavian Political Studies* 29, no. 4 (December 2006): 386-406.

⁹Ibid.

¹⁰Karp, "Political Knowledge About Electoral Rules"; Delli Carpini and Keeter, *What Americans Know About Politics*; Ronald D. Lambert et al., "The Social Sources of Political Knowledge," *Canadian Journal of Political Science* 21, no. 2 (June 1988): 359-74; Luskin, "Explaining Political Sophistication"; Jennings, "Political Knowledge Over Time"; Chiung-chu Lin, "Taiwan minzhong de zhengzhi zhishi: 1992-2000 nian de biandong" (Political knowledge among the electorate in Taiwan), *Xuanju yanjiu* (Journal of Electoral Studies) (Taipei) 12, no. 1 (May 2005): 147-71; and Tsong-jyi Lin and Shu-hua Wang, "Taiwan minzhong zhengzhi zhishi de bianqian yu laiyuan" (Changes and sources of political knowledge in Taiwan), *Dongwu zhengzhi xuebao* (Soochow Journal of Political Science) (Taipei) 25, no. 3 (2007): 93-129.

As for the case of Taiwan, the origins of political knowledge there are very similar to those in the United States.¹¹ Education is also the factor that has the greatest impact on the level of political knowledge in Taiwan. In addition to education, factors such as gender, age, region, occupation, ethnicity, media exposure, party identification, and political discussions are confirmed as the determinants of the Taiwanese public's political knowledge.¹² Moreover, Lin and Wang also indicate that the Taiwanese public's political knowledge may potentially grow in the coming years, based on economic development and social change, while it is conditioned by whether the Taiwanese public relies heavily on TV as its main information channel.¹³

When it comes to the impact of political knowledge on the development of democratic politics, it has been argued that political knowledge boosts political participation because it promotes an understanding of why politics is relevant.¹⁴ Lambert et al. suggest that political knowledge is an important precursor of political action, such as voting.¹⁵ In fact, accord-

¹¹Shiow-duan Hawang, "Zhengzhi zhishi zhi renzhi yu xingbie chayi" (Political knowledge and gender difference), *Dongwu zhengzhi xuebao* (Soochow Journal of Political Science) (Taipei), no. 5 (1996): 51-75.

¹²Ibid., 51-75; Shieu-chi Weng and Hsiu-hui Sun, "Xuanmin de meijie shiyong xingwei ji qi zhengzhi zhishi, zhengdang pianhao yu toupiao xingwei zhijian de guanlian: jianlun Taiwan meiti longduan dui zhengzhi renzhi yu xingwei zhi yingxiang" (How media use influences voters' political knowledge, party preferences and their voting behavior in Taiwan's 1993 general voting), Xuanju yanjiu (Journal of Electoral Studies) (Taipei) 1, no. 2 (November 1993): 1-25; Hsiu-hui Sun, "Bijiao Taiwan sheng xuanmin chuantong meiti yu xinmeiti de shiyong dui zhengzhi xingwei de yingxiang: yi minguo 83 nian Taiwan shengzhang xuanju weili" (Exploring the influence of new media on voters' political behavior during the 1994 election for Taiwan governor), Xuanju yanjiu (Journal of Electoral Studies) (Taipei) 2, no. 1 (May 1994): 93-118; Tien-lien Chuang, "Woguo 'duli' xuanmin de fazhan yu biangian (1989-1999)" (The developing and changing situation of "independent" voters in Taiwan from 1989 through 1999), *Xuanju yanjiu* (Journal of Electoral Studies) (Taipei) 8, no. 1 (May 2001): 71-115; and Hung-der Fu, "Zhengzhi zhishi, zhengzhi pingjia yu toupiao xuanze: diwujie lifa weiyuan xuanju yanjiu" (Political knowledge, political evaluation, and voting choice: a study of the legislative election of 2001), Xuanju vanjiu (Journal of Electoral Studies) (Taipei) 12, no. 1 (May 2005): 39-68.

¹³Lin and Wang, "Taiwan minzhong zhengzhi zhishi de bianqian yu laiyuan."

¹⁴Delli Carpini and Keeter, What Americans Know About Politics, 224.

¹⁵Lambert et al., "The Social Sources of Political Knowledge," 359-74.

ing to Delli Carpini and Keeter, the well-informed citizens are more likely to pay attention to politics, engage in various forms of political activities, commit to democratic principles and possess higher levels of political efficacy.¹⁶ Furthermore, Delli Carpini and Keeter note that political knowledge serves as an instrumental good which contributes to good citizenship. Political knowledge promotes civil virtues like political tolerance, active political participation and stable and consistent public opinion. Moreover, it also helps citizens identify their true interests and connect their opinion with participation to serve their interests.¹⁷ In short, political knowledge indeed has a huge impact on democracy.

Electoral Knowledge and Voting

As mentioned above, Taiwan has employed the SNTV electoral system for its legislative elections for around five decades. However, SNTV is believed to have had more of a negative impact than a positive one on Taiwan's democracy. It was blamed for encouraging intra-party competition instead of inter-party competition, candidates' parochial and radical appeals in elections, and gangster politics and money politics.¹⁸ Therefore, Taiwan began electoral reforms in 2004, adopting a new electoral system, the MMM electoral system, to replace the SNTV system in 2005. Elections for the 7th Legislative Yuan on January 12, 2008 were the first implementation of this new MMM electoral system in Taiwan.

However, as Huang, Yu, and Hsiao claim, there are many different institutional designs between the new MMM system and the SNTV system, such as assembly size, district magnitude, ballot structure and electoral formula.¹⁹ In fact, the MMM system is a compromise between a plural

¹⁶Delli Carpini and Keeter, What Americans Know About Politics, 6.

¹⁷Ibid., 219.

¹⁸Huang, Yu, and Hsiao, "Citizen's Awareness," 9.

¹⁹Ibid., 13-18.

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system and a proportional representation system.²⁰ Under the MMM electoral system, each voter has two ballots. The first ballot chooses a district representative under a single member district system and the second ballot determines the number of seats a political party can have if its vote share exceeds 5% of the total number of votes.

Since the MMM system is quite different from the SNTV system and more complicated in some key elements, it appears to require some knowledge of the new electoral rules when citizens cast their votes. In fact, citizens' knowledge of the electoral system can be seen as a subarea of political knowledge. Hence, the level of knowledge about the new electoral system may affect people's voting behavior.

However, empirical results show that most voters in Taiwan are ignorant of the new MMM electoral system that was employed in the 2008 Legislative Yuan election.²¹ By using four survey questions- regarding district magnitude, ballot structure, threshold of votes parties require to qualify for proportional representation and the new length of term of the legislators under the MMM system- Huang, Yu, and Hsiao examine the level of the respondents' knowledge of the MMM system, finding the different levels of difficulty of these four knowledge questions.²² Their research findings suggest that most respondents knew the correct answer to the four-year term question whereas the threshold of party list votes was answered incorrectly by most of them.

Most importantly, Huang and Yu find that "voters' awareness of the electoral system is a function of the legislative electoral cycle as well as the efforts of political parties and candidates' campaigns to maneuver the

²⁰Ibid., 10.

²¹Huang, Yu, and Hsiao, "Citizen's Awareness"; Chi-huang Tsai and Ching-hsin Yu, "Political Knowledge of A New Election System: A Case Study of the 2008 Taiwan Legislative Election" (paper presented at the Annual Conference of the European Association of Taiwan Studies, Prague, 2010); and Yi-ching Shiao, "Xuanzhi renzhi yu toupiao canyu: 2008 nian lifa weiyuan xuanju de duoceng fenxi" (Perception of electoral rules and voting participation: a multilevel analysis of the 2008 Legislative Yuan election), *Zhengzhi xuebao* (Chinese Political Science Review) (Taipei) 47 (June 2009): 29-58.

²²Huang, Yu, and Hsiao, "Citizen's Awareness."

electorate and take advantage of the new rule."²³ According to political learning theory, campaigns matter because they create an environment that educates voters about the candidates and policies and reduce the level of information inequality among the electorate.²⁴ Huang and Yu argue that campaign mobilization accelerated the flow of electoral information, enriching the citizens' knowledge level of the electoral system. However, this increase in the level of electoral knowledge stopped and even began to drop when the elections were over and political parties and candidates stopped offering information on the electoral system.²⁵ In addition, Karp's comparative study of the Mixed Member Proportional (MMP) systems in Germany and New Zealand also confirms that most of the learning of electoral rules takes place before the election rather than afterwards.²⁶

Huang and Yu go further to indicate that people's education level and their party identification strongly influence their awareness of the new electoral system.²⁷ Citizens with a higher education level and stronger partisan attachment tend to be more knowledgeable of the institutional design of the MMM system than their counterparts. Furthermore, education and party identification also enhance the learning effect during the campaign period, suggesting that those who are both well educated and have a strong attachment to their party absorb more electoral knowledge than those who are less educated or nonpartisan.

²⁵Huang and Yu, "Political Cycle of Voters' Understanding," 60.

²³Chi Huang and Ching-hsin Yu, "Political Cycle of Voters' Understanding of the New Electoral System: The Case of Taiwan," *Japanese Journal of Electoral Studies* 27, no. 2 (February 2011): 60.

²⁴Paul Freedman, Michael Franz, and Kenneth Goldstein, "Campaign Advertising and Democratic Citizenship," *American Journal of Political Science* 48, no. 4 (October 2004): 259-73; Thomas M. Holbrook, "Political Learning from Presidential Debates," *Political Behavior* 21, no. 1 (March 1999): 67-89; Thomas M. Holbrook, "Presidential Campaigns and the Knowledge Gap," *Political Communication* 19, no. 4 (October 2002): 437-54; Heather L. Ondercin, James C. Garand, and Lauren E. Crapanzano, "Political Learning during the 2000 U.S. Presidential Election: The Impact of the Campaign on the Gender Gap in Political Knowledge," *Electoral Studies* 30, no. 4 (December 2011): 727-37.

²⁶Karp, "Political Knowledge About Electoral Rules."

²⁷Huang and Yu, "Political Cycle of Voters' Understanding."

Furthermore, Huang, Yu, and Hsiao investigate the cohort effect of people's knowledge level of electoral systems by dividing Taiwanese voters into three electoral system cohorts: the prior to 1972 authoritarian SNTV cohort; the 1972-84 competitive SNTV cohort; and the 1985-87 pure-MMM cohort.²⁸ They then find that the most senior first cohorts were more knowledgeable of the new MMM system. However, their further examination of the interaction between period and cohort reveals that the youngest third cohort with a relatively pure political experience under the new electoral system tended to be less confounded by the old SNTV system with its multi-member district and single-ballot features.

As for the impact of electoral knowledge, previous empirical studies suggest that political knowledge significantly contributes to political participation. Citizens who possess more political knowledge are more likely to turn out to vote.²⁹ On the other hand, the confusion of electoral systems has a significant impact on participation, discouraging people from voting and resulting in lower voter turnout.³⁰

Moreover, Tsai and Yu and Shiao analyze the results of the 7th Legislative Yuan election in 2008 and claim that the impact of electoral knowledge on voting participation can also be found in the case of Taiwan.³¹ The knowledge of the new MMM electoral system markedly influenced an individual's electoral participation in the 2008 election. The more

²⁸Different from the age effect and period effect, Huang, Yu, and Hsiao define the cohort effect as "changes across groups of people who experience a particular type of event at the same age." See Huang, Yu, and Hsiao, "Citizen's Awareness," 24.

²⁹Valentino Larcinese, "Does Political Knowledge Increase Turnout? Evidence from the 1997 British General Election," *Public Choice* 131, no. 3-4 (June 2007): 387-411; Martin Wattenberg, Ian McAllister, and Anthony Salvanto, "How Voting Is Like Taking an SAT Test: An Analysis of American Voter Rolloff," *American Politics Research* 28, no. 2 (April 2000): 234-50.

³⁰Karen E. Cox and Leonard J. Schoppa, "Interaction Effects in Mixed-member Election Systems: Theory and Evidence from Germany, Japan, and Italy," *Comparative Political Studies* 35, no. 9 (November 2002): 1027-35; Haruhiro Fukui and Shigeko N. Fukai, "Japan in 1996: Between Hope and Uncertainty," *Asian Survey* 37, no. 1 (January-February 1997): 20-28; and Masaru Kohno, "Voter Turnout and Strategic Ticket-Splitting under Japan's New Electoral Rules," *Asian Survey* 37, no. 5 (May 1997): 429-40.

³¹Tsai and Yu, "Political Knowledge of a New Election System"; and Shiao, "Xuanzhi renzhi yu toupiao canyu."

electoral knowledge an individual possesses, the more likely he (she) would be to turn out and vote.

As for the relationship between the knowledge of the electoral system and voting choice, according to Schoen, how a majority of voters in the German electorate cast their votes is in fact an accident rather than a tactical consideration.³² That is, a lot of German voters do not know much about the electoral system and cannot make their voting choices according to their preferences.

However, Karp's findings demonstrate that a misunderstanding of electoral knowledge does not necessarily influence people's voting behavior, suggesting that most voters cast their votes in the ways that are consistent with their preferences even if they lack knowledge about the electoral system.³³ Moreover, Karp also argues that confusion with electoral systems is not significantly associated with split voting. Instead, split voting is the product of people's rational strategy. Those who are well educated are more likely to split their votes because they are sophisticated.³⁴ Scholars, apparently, have not reached a consensus on this issue yet.

The Effect of Concurrent Elections

As noted above, 2012 marked the first year for Taiwan in which the presidential and legislative elections were held concurrently. Concurrent elections are considered to have an impact on people's voting behavior. The relationship between the knowledge of electoral systems and voting behavior may be "contaminated" by the effect of such concurrent elections. Therefore, the effect of concurrent elections needs to be addressed before we start our analysis of the influence of electoral knowledge on voting behavior.

 ³²Harald Schoen, "Split-ticket Voting in German Federal Elections, 1953-90: An Example of Sophisticated Balloting?" *Electoral Studies* 18, no. 4 (December 1999): 473-96.
 ³³Karp, "Political Knowledge About Electoral Rules."

²⁴Karp, Political Knowledge About Electora

³⁴Ibid., 727.

The conventional wisdom in electoral studies suggests that election timing matters, particularly for voter turnout. Voter turnout is considered to be the one aspect which is influenced by concurrent elections the most. Non-concurrent elections are more likely to result in lower electoral participation.³⁵ Electoral timing affects participation because concurrent elections increase the importance of the vote with regard to the distribution of power and policy-making authority, thus encouraging parties to mobilize and citizens to vote.³⁶ Fornos, Power, and Carand also suggest that "concurrent elections are more likely to be high-intensity, high-information political events and this serves to reduce the costs (particular information costs) of voting and create an attentive, motivated electorate."³⁷

By analyzing the relationship between participation and the election timing of local elections in the U.S. state of California, Hajnal, Lewis and Louch indicate that election timing is the most crucial factor influencing voter turnout in local elections and a move to concurrent elections has the greatest potential to raise turnout rates in California's local elections.³⁸ That is, local contests that coincide with higher-level elections, such as gubernatorial and presidential polls, draw more citizens to turn out to vote. Nikolenyi focuses on India's Parliamentary elections, also confirming the importance of election timing on electoral participation.³⁹ Holding separate elections for different branches and levels of government weakens Indian citizens' incentives to participate in the democratic electoral process.

³⁵Gary W. Cox, "Electoral Rules and the Calculus of Mobilization," *Legislative Studies Quarterly* 24, no. 3 (August 1999): 387-419; Carolina A. Fornos, Timothy J. Power, and James C. Carand, "Explaining Voter Turnout in Latin America, 1980 to 2000," *Comparative Political Studies* 37, no. 8 (October 2004): 909-40.

³⁶Csaba Nikolenyi, "Concurrent Elections and Voter Turnout: The Effect of the De-Linking of State Elections on Electoral Participation in India's Parliamentary Polls, 1971-2004," *Political Studies* 58, no. 1 (February 2010): 214-15.

³⁷Fornos, Power, and Carand, "Explaining Voter Turnout," 932.

³⁸Zoltan L. Hajnal, Paul G. Lewis, and Hugh Louch, "Municipal Elections in California: Turnout, Timing, and Competition," March 20, 2002, http://www.ppic.org/content/pubs/ report/R_302ZHR.pdf.

³⁹Nikolenyi, "Concurrent Elections and Voter Turnout."

Moreover, previous studies also suggest that election type matters to voter turnout. Electoral participation tends to be lower in elections in which executive power is not at stake.⁴⁰ In the United States, concurrent presidential and congressional elections, compared with midterm elections, lead to a higher turnout.⁴¹ A comparative study also suggests that concurrent legislative and executive elections significantly influence voter turnout in Latin American countries.⁴² In short, concurrent elections do have a positive impact on electoral participation. The higher the level of election, the more likely citizens are to turn out to vote on election day.

Not only do concurrent elections affect participation, but they may also influence electoral results. Concurrent elections are considered to benefit incumbents, especially in local elections. It is argued that a local election held together with a national election tends to attract both informed and uninformed citizens to vote. Incumbents thus take advantage of better name recognition than their challengers. On the contrary, nonconcurrent elections create a situation in which better-informed voters are more likely to vote than their counterparts, making incumbents less secure.⁴³ Moreover, according to Shugart, opposition parties are less likely to win a majority of seats in the legislative elections held concurrently with presidential elections.⁴⁴ In other words, non-concurrent elections tend to be advantageous to opposition parties, often resulting in divided government.

According to the preceding discussion, both electoral knowledge and concurrent elections markedly influence people's political behavior. However, previous studies have not addressed the issue of whether concurrent elections have any impact on political learning. In other words,

⁴⁰Mark N. Franklin, "Electoral Participation," in *Comparing Democracies: Elections and Voting in Global Perspective*, ed. Lawrence LeDuc, Richard G. Niemi, and Pippa Norris (Thousand Oaks, Calif.: Sage, 1996), 216-35.

 ⁴¹Gary C. Jacobson, *The Politics of Congressional Elections* (New York: Longman, 2000).
 ⁴²Fornos, Power, and Carand, "Explaining Voter Turnout."

⁴³Hajnal, Lewis, and Louch, "Municipal Elections in California."

⁴⁴Matthew S. Shugart, "The Electoral Cycle and Institutional Sources of Divided Presidential Government," *American Political Science Review* 89, no. 2 (June 1995): 327-43.

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they do not analyze whether the pattern of people's acquisition of electoral knowledge changes when a higher-level or more important election is held simultaneously with a lower-level poll. This research is the first to address this issue, which it does by examining the difference between the effect of concurrent elections and that of non-concurrent elections on electoral knowledge. By making a comparison between Taiwan's 2008 legislative elections and the 2012 concurrent presidential and legislative elections, we will analyze to what extent the presidential election affected people's obtainment of knowledge of the legislative election, and investigate whether the electoral cycle of electoral knowledge taking place in non-concurrent elections disappeared when the Legislative Yuan elections were held concurrently with the presidential election to which the mass media and citizens pay greater attention.

Moreover, we also examine the extent to which electoral knowledge influences citizen's voting behavior in the 2012 concurrent elections. We investigate whether citizens who were more aware of the institutional designs of the MMM system were more likely to turn out to vote in 2012 compared with the results for the 2008 legislative election.

To sum up, based on previous research in the fields of political knowledge and the effect of concurrent elections, we argue that concurrent elections have a negative impact on the Taiwanese public's acquisition of electoral knowledge. Furthermore, there is a positive relationship between the citizens' knowledge of the electoral system for the Legislative Yuan election and voter turnout. The above theoretical discussion leads to the following hypotheses:

- **H1:** Concurrent presidential and legislative elections influence the learning effect of electoral knowledge, confounding citizens' understanding of the electoral system for the legislative election.
- **H2:** Electoral knowledge has a significant impact on voting participation. However, the impact tends to be weaker under concurrent elections.

However, a fundamental problem needs to be addressed before

we begin to analyze the relationship between electoral knowledge and people's voting behavior. In fact, previous studies have failed to solve a methodological problem before they start their analyses. Scholars, in general, are used to establishing an index, which is a summation of survey questions about the electoral system. They use this index to measure the level of respondents' electoral knowledge and whether electoral knowledge affects voting intention. However, this simple sum of the survey questions that the respondent answers correctly may not be an appropriate index of electoral knowledge because the probabilities of electoral knowledge questions being answered correctly are different. A simple index may not effectively measure the citizens' level of electoral knowledge if it does not take this into account. Hence, before analyzing the relationship between electoral knowledge and voting behavior, we have to create a more appropriate measure of citizens' electoral knowledge. A further discussion of this issue is presented in the following sections.

Data and Methodology

As introduced in the above discussion, we hypothesize that the electoral cycle of the learning of electoral knowledge is contaminated by the effect of concurrent elections. If our hypothesis is correct, we expect to see that the surge of citizens' electoral knowledge during the 2012 campaign period is not as significant as that in the 2008 campaign.

Moreover, we also hypothesize that there is a positive relationship between electoral knowledge and voting participation. That is, the more electoral knowledge that an individual possesses, the more likely he (she) would be to turn out to vote in the 2012 legislative election.

In this study, we adopt a repeated cross-section design by comparing several waves of telephone interviews conducted from mid-December 2007 to early January 2012 by the Election Study Center of National Chengchi University. These survey data have overlapped both the 2008 and 2012 elections, allowing researchers to compare the dynamics of political knowledge between these two elections. The first data set is a five-wave pre-election rolling cross-section. Its first wave began on December 13, 2007, 30 days before the 2008 election. Then the second, third, fourth and fifth waves of the survey followed, until January 11, 2008, the day immediately before the election day. Each wave successfully collected around 700 cases.⁴⁵

The second data set is a cross-sectional survey conducted from March 19 to 23, 2010. The survey comprises 1,629 cases, completed roughly two years after the 2008 election. The third data set is also a cross-sectional survey. It comprises 1,616 cases and was completed from March 2 to 7, 2011. Both data sets serve to examine the dynamics in voters' electoral knowledge two years after the 2008 election.⁴⁶

The fourth data set is a fifteen-wave pre-election rolling cross-section survey composed of three sub-data sets. The first wave began on October 1, 2011, 105 days before the 2012 election. Each wave successfully collected around 1,000 cases.⁴⁷ All waves of telephone interviews shared

⁴⁵The first data set was from Yun-han Chu, 2005 nian zhi 2008 nian "xuanju yu minzhuhua diaocha" sinianqi yanjiu guihua (III): 2008 nian lifa weiyuan xuanju mianfang'an (Taiwan's Election and Democratization Study, 2008: Legislative Election, TEDS 2008L) (NSC96-2420-H004-002-025) (Taipei: National Science Council, 2007). The coordinator of the multi-year project TEDS is Professor Chi Huang. The principal investigator of TEDS2008L is Professor Yun-han Chu. More information is available on the TEDS website: http://www.tedsnet.org.

⁴⁶The second data set was from Chi Huang, *Tai Ri Han bijiao diaocha zhi yanjiu* (Core questionnaire for comparative surveys of Taiwan, Japan, and Korea: Taiwan, March 2010) (Taipei: National Chengchi University, 2010). The principal investigator is Professor Chi Huang. The third data set was from Chi Huang, *Liwei xuanzhi renzhi diaocha zhi yanjiu* (Political knowledge of electoral systems) (Taipei: National Chengchi University, 2010). The principal investigator is Professor Chi Huang. The principal investigator is Professor Chi Huang. Both the second and the third surveys were supported by National Chengchi University's Top University Project "Asia Election Studies" (99H-4-2-3).

⁴⁷The fourth data sets which were composed of pre-2012 election rolling cross-section surveys included: (1) Chi Huang, *Yinguo tuilun: fenxi fangfa zhi tantao ji qi dui hunhe xuanzhi zhong "wuran xiaoguo" zhi yingyong yanjiu (2/3)* (Causal inference: methodology and application to the study of the contamination effect in mixed-member electoral systems [2/3]) (NSC99-2410-H-004-036-MY3) (Taipei: National Science Council, 2010). The principal investigator is Professor Chi Huang; (2) Ching-hsin Yu, *Taiwan minzhong lifa weiyuan xin xuanju zhidu zhishi zhi yanjiu* (Citizen's knowledge of the new legislative electoral system in Taiwan) (NSC100-2410-H-004-090-MY2). (Taipei: National Science Council, 2011). The principal investigator is Professor Ching-hsin Yu; (3) Chi Huang; *2009 nian zhi 2012 nian "xuanju yu minzhuhua diaocha" sannianqi yanjiu guihua (3/3): 2012 nian zongtong yu lifa weiyuan xuanju dianfang diaocha* (Taiwan election and de-

four questions on electoral knowledge regarding the new MMM system, including the single member district, two-ballot structure, five percent PR threshold formula, and four-year term. This set of four questions is listed below.

The pre-election rolling surveys were designed not only to collect data on the overall understanding of voters' knowledge before elections, but also to provide a dynamic picture of changes in voters' knowledge during the campaign period. The two data sets conducted in March 2010 and 2011 represent voters' electoral knowledge during the non-campaign period, when less information was supplied by political parties and candidates. These surveys' data sets serve to investigate the change and continuity of the Taiwanese public's electoral knowledge during the campaign and non-campaign periods and compare the differences in peoples' awareness of the new MMM system in the 2008 and the 2012 elections.

1. [Single Member District]

- (2008) Do you know how many legislators will be elected in your district? (請問這一次的立委選舉,您的選區會選出幾個立法 委員?)
- (2012) Do you know how many legislators will be elected in your district? (請問這次的立委選舉,您的選區會選出幾個立法委員?)

2. [Two-Ballot Structure]

- (2008) Do you know, besides referendum ballots, how many ballots you can cast in this Legislative Election? (在這次立法委員選 舉中,除了公投票以外,請問,一個人可以投幾票?)
- (2012) Do you know how many ballots you can cast in this Legislative Election? (Reminder: besides presidential ballot) (請問在這次 的選舉中,立法委員的部份,一個人可以投幾票? [提示: 除總統的選票之外])

mocratization study: telephone interview of the presidential and legislative elections, TEDS 2012-T) (NSC100-2420-H-002-030) (Taipei: National Science Council, 2012). The principal investigator is Professor Chi Huang.

3. [Five Percent PR Threshold Formula]

- (2008) Do you know the threshold of the list vote that a party must reach in order to participate in the allocation of seats by party lists?
 (請問您,政黨需要得到百分之多少的政黨票,才能分配不 分區的席次?)
- (2012) Do you know the threshold of the list vote that a party must reach in order to participate in the allocation of seats by party lists?
 (請問您,政黨需要得到百分之多少的政黨票,才能分配不 分區的立委?)

4. [Four-Year Term]

- (2008) Do you know how long the term of office is for the new legislators? (請問您這次選出的立法委員,一任可以做幾年?)
- (2012) Do you know how long the term of office is for the new legislators? (Assuming there is no premature dissolution of the legislature.) (請問您這次選出的立法委員,一任可以做幾年[在 沒有中途解散立法院的情況下]?)

These four survey questions were coded as binary indicators with each correct answer to an item coded as 1 and an incorrect answer (or "don't know") answer coded as 0. Based on the data collected, in the following analysis, this study presents a trend analysis of respondents' awareness of the institutional design of the new MMM system from 2007 to 2012. We investigate whether concurrent presidential and legislative elections contaminate citizens' political learning of the electoral information of the legislative election. Meanwhile, voters' knowledge of the new MMM electoral system and voting participation are provided to examine whether more electorally knowledgeable citizens have higher levels of voting participation than those who are not aware of the new electoral system.

The Political Cycle of Electoral System Knowledge: 2007-2012

Figure 1 presents an overall distribution of citizens' knowledge of the new MMM system from 2007 to 2012. Each citizen's knowledge





varies in each of the four components of the new electoral system. According to figure 1, except for the term length, most Taiwanese voters apparently were not fully aware of the institutional designs of the new MMM system before the 2008 and 2012 elections. However, the survey results also confirm the political cycle of electoral knowledge in both the 2008 and 2012 elections. That is, voters became more and more aware of the new electoral rules before the legislative election and then tended to forget about them during the mid-term period until the next election. In short, abundant electoral information offered by political parties and candidates during the campaign period greatly helped to enrich the citizens' awareness of the new electoral system. Nevertheless, this effect waned rapidly when the campaign activities ended.

Among these four questions, the four-year term length was the easiest institutional design of the new MMM system for respondents to answer correctly. The survey results show that the majority of the Taiwanese public

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recognized the term length for legislators. More than 50% of respondents before the 2008 election knew the correct answer to this question and 70% of respondents before the 2012 election understood that the new term length for legislators was 4 years. Respondents in the 2011 surveys were more aware of the term length for legislators than their counterparts in the 2007 surveys, suggesting that increasingly more citizens knew how long the term of office for the new legislators was. Moreover, a stable increasing trend can be found in figure 1, demonstrating that respondents became more aware of the term length for legislators from 2007 to 2012.

Only around 30% of respondents knew how many legislators would be elected in each district at the beginning of the 2008 campaign period. Respondents' knowledge of district magnitude then markedly increased when the election day approached, showing that more than 50% of respondents correctly answered the question of district magnitude. However, people's awareness of district magnitude waned quickly after the campaign ended. Only around 20% of respondents were able to understand the district magnitude during the non-campaign period in 2010 and 2011.

The dynamics of people's awareness of the ballot structure shows a very similar surge and declining pattern with the question of district magnitude during the 2008 campaign and non-campaign periods. Around 30% of respondents knew that they had two ballots to cast at the beginning of the 2008 campaign period. It then surged to 52.4% when the election day approached. However, citizens' knowledge of the ballot structure declined more than that of the district magnitude in the non-campaign season, showing that only about 10% of respondents could correctly answer the question regarding the ballot structure during the non-campaign period. Most importantly, the people's lack of awareness of the ballot structure did not rebound when a new election approached. Apparently, there was not an electoral cycle of knowledge of the ballot structure during the 2012 campaign period.

According to figure 1, the threshold question was much more difficult to answer than the questions regarding the term length, district magnitude and ballot structure for the majority of respondents. Fewer than 5% of respondents knew the correct answer to this question. Moreover, the surge in the citizens' knowledge of the 5% threshold induced by the campaign effects during the 2008 election period was not as significant as those for other questions, indicating that people were confused by the institutional design of the new MMM system.

After looking at an overall trend of the Taiwanese public's knowledge level of the new MMM system, a further question we would like to answer is whether the electoral type influences people's political learning of electoral knowledge. As noted, 2012 marked the first year for Taiwan in which the presidential and legislative elections were held concurrently on the same day. We wonder whether holding legislative elections with an executive election concurrently would have a negative impact on the citizens' reception of electoral information since presidential elections always elicit more mass media and citizen attention, thus contaminating the learning effect of electoral knowledge which has already been confirmed in figure 1. Therefore, figure 2 compares the dynamics of citizens' electoral knowledge in the 2008 and 2012 elections, by examining the impact of concurrent elections on electoral knowledge. In figure 2, we focus on an identical starting point, observing the dynamics of citizens' electoral knowledge within the last 5 waves (weeks) of surveys before the election days.

The findings revealed in figure 2 show that campaign activities had a larger impact on the 2008 election than on the 2012 election. First, according to figure 2-1, citizens' awareness of term length increased by 2.0% (from 55.9% to 57.9%) during the campaign period in 2008, while it only increased by 0.2% (from 72.9% to 73.1%) in 2012. Moreover, respondents who were interviewed during the 2012 campaign period tended to be more aware of this institutional component than those interviewed in 2008. In addition to already having experienced legislative elections once in 2008, respondents in 2012 were more knowledgeable of the term length of legislators due to the fact that the 2012 Legislative Yuan elections were held concurrently with the presidential election, which is well known to be a quadrennial election. Therefore, since the two elections were held concurrently, some respondents may have answered this question based on their understanding of presidential term length.













4. PR Threshold

Figure 2-2 demonstrates that a rapidly increasing trend in people's awareness of district magnitude can be found in both the 2008 and 2012 elections. Nevertheless, the surge in the respondents' understanding of district magnitude in the 2012 election was not as significant as that of the 2008 election. The citizens' understanding of the district magnitude increased by 13.2% (from 35.8% to 49.0%) in the 2012 election, whereas a 19.5% increase could be observed during the 2008 campaign period.

Furthermore, according to figure 2-3, respondents in 2008 tended to be more aware of how many ballots they needed to cast in the legislative election. On the contrary, there were even fewer respondents who did not know that they had two ballots to cast after they experienced the 2012 campaign period. A potential explanation of this phenomenon may be that respondents were confused by concurrent presidential and legislative elections, thus responding incorrectly during the interview.

As for the 5% threshold, this question was the most difficult among the four cited questions. Most respondents in both the 2008 and 2012 elections did not know the correct answer to this question. Nevertheless, we still witnessed a 6% increase of citizens' awareness of the threshold question in the 2012 election (from 10.9% to 16.9%), although this surge was less significant than the 8.9% increase in the 2008 election (from 4.5% to 13.4%).

In conclusion, according to our analysis, the learning effect of electoral knowledge in the 2008 election was more significant than that in the 2012 election. That is, more respondents tended to be knowledgeable of the new MMM electoral system after they went through the 2008 campaign period. Evidently, concurrent presidential and legislative elections did have a negative impact on the political cycle of electoral knowledge.

In fact, the Taiwanese public were supposed to become more aware of the institutional design of the new MMM system since they had already experienced how this system functions once in the 2008 legislative elections. However, the findings of figure 2 suggest that respondents in the 2012 election were not more knowledgeable than were those in the 2008 election. Moreover, the learning effect of the electoral system during the 2012 campaign period was not as significant as that in the 2008 election. A reasonable explanation for this phenomenon is that the overwhelming media coverage of the presidential campaigns resulted in citizens' ignorance of the Legislative Yuan elections, which thus led to the result that the electoral cycle of political knowledge in the 2012 election was not as evident as that of the 2008 election. In a nutshell, holding legislative and executive elections concurrently did have a negative impact on people's acquiring electoral knowledge of the legislative election.

Electoral Knowledge and Voter Turnout

The primary focus of this study is the effect of voters' knowledge of the MMM electoral system on turnout. Our model is illustrated by a path diagram in figure 3. We hypothesize that voters' knowledge of the MMM electoral system y_2 has a positive effect on turnout. Knowledge and turnout, in turn, are affected by vectors of exogenous variables \mathbf{x}_2 and \mathbf{x}_3 , respectively.

However, we do not have a direct measure of voters' knowledge. Instead, we only have four binary indicators or "items" (a 4×1 vector of \mathbf{x}_3) discussed in the last section for probing voters' awareness of the MMM electoral system. We therefore adopt a sophisticated measurement model of latent traits, i.e., the logistic item response model based on the item response theory (IRT) for categorical responses,⁴⁸ to construct a continuous measure of knowledge y_2 . Furthermore, knowledge involves cost and may thus be an endogenous explanatory variable even after controlling for other exogenous variables such as sex, age and education and political attitudes in \mathbf{x}_1 . That is, there is always the possibility that some unobserved or even unobservable variables may affect both knowledge and voting. We tackle this challenge by specifying a probit model with a continuous endogenous regressor in order to confront the endogeneity problem.

⁴⁸Susan E. Embretson and Steven P. Reise, *Item Response Theory for Psychologists* (Mahwah, N.J.: L. Erlbaum Associates, 2000); R. J. de Ayala, *The Theory and Practice of Item Response Theory* (New York: Guilford, 2009).

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Source: Rex B. Kline, *Principles and Practice of Structural Equation Modeling*, 3rd edition (New York: Guilford, 2011), 95.

Note: Circles \bigcirc denote latent variables, while rectangles \square represent observed variables.

Logistic Item Response Models

In the classic Rasch model, the probability of a correct response for a dichotomous item x_{3i} (i = 1, ..., I) by person p (p = 1, ..., P) is a function of the distance between a person's latent trait ("knowledge level" in this study) y_{2p} and an item's difficulty parameter δ_i :

$$\Pr(x_{3ip} = 1 | y_{2p}) = \frac{\exp(y_{2p} - \delta_i)}{1 + \exp(y_{2p} - \delta_i)} = \frac{1}{1 + \exp[-(y_{2p} - \delta_i)]}$$
(1)

Since the Rasch model uses one parameter δ_i to characterize each item, it is often referred to as a one-parameter logistic (1PL) model in the IRT literature.

Birnbaum extended the 1PL to a two-parameter logistic (2PL) model by including a slope parameter λ_i which determines how well an item discriminates between different trait levels.⁴⁹ This λ_i is sometimes referred to as an "item discrimination parameter".⁵⁰ The 2PL item response model is specified as:

$$\Pr(x_{3ip} = 1 \mid y_{2p}) = \frac{1}{1 + \exp\left[-\lambda_i(y_{2p} - \delta_i)\right]} = \frac{1}{1 + \exp\left[-(\lambda_i y_{2p} - \delta_i)\right]}$$
(2)

where $\alpha_i = \lambda_i \delta_i$, and the item difficulty is represented by $\delta_i = \alpha_i / \lambda_i$.⁵¹ λ_i can also be interpreted as factor loadings of items on the unidimensional latent knowledge score y_{2p} .⁵² If we constrain these factor loadings to be equal to 1 by assuming that the weights of all items are the same, the 2PL model collapses into the 1PL model. Since the 2PL model is nested within 1PL, we can test 2PL against 1PL for goodness-of-fit by conducting a likelihood ratio test.⁵³

⁴⁹Allan Birnbaum, "Some Latent Trait Models," in *Statistical Theories of Mental Test Scores*, ed. Frederic M. Lord and Melvin R. Novick (Reading: Addison-Wesley 1968), 397-424.

⁵⁰Simon Jackman, "Measurement," in *The Oxford Handbook of Political Methodology*, ed. Janet Box-Steffensmeier, Henry E. Brady, and David Collier (Oxford: Oxford University Press 2008), 135.

⁵¹de Ayala, *The Theory and Practice of Item Response Theory*, 17-19; Akihito Kamata and Brandon K. Vaughn, "Multilevel IRT Modeling," in *Handbook of Advanced Multilevel Analysis*, ed. Joop J. Hox and J. Kyle Roberts (New York: Routledge 2011), 42.

⁵²Anders Skrondal and Sophia Rabe-Hesketh, Generalized Latent Variable Modeling: Multilevel, Longitudinal, and Structural Equation Models (Boca Raton, Fla.: Chapman & Hall/CRC, 2004), 293.

⁵³Admittedly, four items may not be ideal for two-parameter IRT analysis. However, in our rolling cross-sectional telephone interviews design with limited room for a total of thirty-or-so survey questions, we do not have the luxury of including long items and therefore have to rely heavily on the theories of electoral systems to capture the four key dimensions of the MMM system, namely, district magnitude, ballot structure, electoral formula, and term length. See Douglas Rae, *The Political Consequences of Electoral Laws* (New Haven, New H

We first estimate a 1PL item response model; parameter estimates are given in the first column of table 1. The estimated item difficulties $\hat{\delta}_i$ indicate that item 4 (4-year term) is the easiest, item 1 (SMD) is the second easiest, and item 2 (two-ballot structure) is slightly harder than item 3 (5% PR threshold). The variance of respondents' knowledge y_{2p} is estimated as 1.815 with a standard error of 0.117. As mentioned earlier, however, the 1PL model assumes that the effect of increased knowledge of the electoral system is the same for all four items. This assumption can be relaxed using the 2PL model.

In the 2PL item response model there are four item loadings and we set the first item loading $\lambda_1 = 1$ for identification. Parameter estimates of the 2PL model are given in the second column of table 1. Although the estimated item difficulties confirm that item 4 is the easiest while item 3 is the hardest, the 2PL model's estimated discrimination parameters (or item loadings) $\hat{\lambda}_3$ and $\hat{\lambda}_4$ are quite different from 1, as assumed by the 1PL. The likelihoodratio test of $G^2 = 147.2$ with df = 3 is highly significant (p < 0.001), confirming that the 2PL model fits much better than the 1PL model. Perhaps the best way to report parameter estimates of the 2PL model is to draw item characteristic curves (ICC). Figure 4 shows ICCs describing the relationship between latent knowledge levels, the discriminatory power of the four items and the probabilities of answering each item correctly.

Conn.: Yale University Press, 1967); and Arend Lijphart, Electoral Systems and Party Systems: A Study of Twenty-Seven Democracies, 1945-1990 (Oxford: Oxford University Press, 1994). To our knowledge, this set of four items-related questions is the most comprehensive measurement of citizens' electoral system knowledge available so far. Moreover, the accuracy of IRT parameter estimation depends jointly on several conditions such as sample size, item length, and estimation method. In a study of marginal maximum likelihood estimation (MMLE) which is what we have used in our study, Drasgow found that as few as 200 persons and five items were required for essentially unbiased parameter estimates and reasonably small standard errors. See Fritz Drasgow, "An Evaluation of Marginal Maximum Likelihood Estimation for the Two-Parameter Logistic Model," Applied Psychological Measurement 13, no. 1 (March 1989): 77-90. Our sample sizes in the 2008 and 2012 elections are 1,530 and 4,369, respectively. Such sample sizes are more than moderate and should improve the IRT estimation. We further introduce a prior distribution to obtain empirical Bayes predicted mean values of the latent knowledge score. Also see Christine DeMars, Item Response Theory (Oxford: Oxford University Press, 2010).

| | 1PL Model | | 2PL Model | |
|---|-----------------------------------|---------|--------------------|----------------|
| Parameters | estimates | (s.e.) | estimates | (s.e.) |
| Intercepts/Difficulty Parameters [†] | | | | |
| α_1 [Item1: SMD] | 0.702*** | (0.043) | 0.791*** | (0.059)/0.791 |
| α_2 [Item2: 2 Ballots] | 2.621*** | (0.064) | 2.533*** | (0.085)/3.503 |
| α_3 [Item3: 5% PR Threshold] | 2.418*** | (0.061) | 3.640*** | (0.339)/2.226 |
| α_4 [Item4: 4 Year Term] | -1.397*** | (0.048) | -1.138*** | (0.040)/-3.092 |
| Discrimination Parameters | | | | |
| λ_1 [Item1: SMD] | 1 | - | 1 | _ |
| λ_2 [Item2: 2 Ballots] | 1 | - | 0.723*** | (0.086) |
| λ_3 [Item3: 5% PR Threshold] | 1 | - | 1.635*** | (0.309) |
| λ_4 [Item4: 4 Year Term] | 1 | - | 0.368*** | (0.047) |
| Variance of Knowledge | | | | |
| Ψ | 1.815*** | (0.117) | 2.905*** | (0.503) |
| Model information | 42(0 × 4 - | | 42 <u>(0</u> × 4 – | |
| Number of persons × number of | $4309 \times 4 =$ | | 4509 × 4 - | |
| items Log-likelihood | 1/4/0 - 8550.040 1/4/0 - 8250.440 | | - 0250.440 | |

Table 1Estimates for 1PL and 2PL Item Response Models: 2012 Election

Data Source: Chi Huang, *Yinguo tuilun: fenxi fangfa zhi tantao ji qi dui hunhe xuanzhi zhong* "wuran xiaoguo" zhi yingyong yanjiu (2/3) (Causal inference: methodology and application to the study of the contamination effect in mixed-member electoral systems [2/3]) (NSC99-2410-H-004-036-MY3) (Taipei: National Science Council, 2010); Chi Huang, 2009 nian zhi 2012 nian "xuanju yu minzhuhua diaocha" sannianqi yanjiu guihua (3/3): 2012 nian zongtong yu lifa weiyuan xuanju dianfang diaocha (Taiwan elections, TEDS 2012-T) (NSC100-2420-H-002-030) (Taipei: National Science Council, 2012); Ching-hsin Yu, *Taiwan minzhong lifa weiyuan xuanju zhidu zhishi zhi yanjiu* (Citizen's knowledge of new legislative electoral system in Taiwan) (NSC100-2410-H-004-090-MY2). (Taipei: National Science Council, 2011).

Note: ***: p < 0.001; **: p < 0.01; *: p < 0.05[†]For 1PL, item difficulties $\delta_i = \alpha_i$. For 2PL, item difficulties $\delta_i = \alpha_i / \lambda_i$.

In the following analysis, we adopt the better fitting 2PL model and obtain its empirical Bayes predicted mean values⁵⁴ as our measure of the latent knowledge score y_{2p} for each individual p in the sample.

⁵⁴Xiaohui Zheng and Sophia Rabe-Hesketh, "Estimating Parameters of Dichotomous and Ordinal Item Response Models with Gllamm," *Stata Journal* 7, no. 3 (2007): 331; de Ayala, *The Theory and Practice of Item Response Theory*, 77-78.





Simultaneous Probit Model with Endogenous Knowledge Variable

Equipped with a continuous measure of knowledge of the electoral system, we now turn to our structural equation model as illustrated in figure 3. We start by specifying the following linear latent-variable model where y_1^* is the dependent variable, the propensity to vote of the structural equation, and y_2 is a continuous endogenous regressor, i.e., knowledge of the new MMM electoral system.

Structural Equation:
$$y_{1p}^* = \mathbf{x}'_{1p} \mathbf{\gamma} + \beta y_{2p} + \varepsilon_p$$
 (3)

Reduced-form Equation:
$$y_{2p} = \mathbf{x}'_{1p} \boldsymbol{\pi}_1 + \mathbf{x}'_{2p} \boldsymbol{\pi}_2 + u_p$$
 (4)

 \mathbf{x}_1 is a vector of a constant plus seven exogenous variables, including four demographic variables (sex, age, education and ethnicity) and three variables of political attitudes (party identification, stand on the independence/unification issue and national identity). \mathbf{x}_2 is a vector of two additional instrumental variables (IV), including media attention and the specific wave (timing) of the interview which affects y_2 but does not directly affect $y_1^{*,55}$

Structural equation (3) is of primary interest in this study and we would like to estimate coefficients γ and β consistently. If y_1^* is continuously observed, then we can overcome the endogeneity of y_2 by applying the two-stage least squares (2SLS) method, i.e., employing the least squares regression of Equation (3) with the endogenous y_2 replaced by its fitted values from Equation (4). However, the dependent variable y_1^* is not directly observed. Instead the binary outcome y_1 is observed with $y_1 = 1[y_1^* > 0]$ and thus a nonlinear probit/logit model is more appropriate than a linear probability model. Unfortunately, the 2SLS interpretation of linear IV does not extend to nonlinear models, so we cannot simply run a probit regression with the endogenous regressor replaced by fitted values from a reduced-form Equation (4).⁵⁶

In order to handle the potential endogeneity of y_2 as well as nonlinearity of Equation (3) in our model, we adopt an instrumental variable (IV) probit approach.⁵⁷ This approach specifies joint distributions of y_1^* and y_2 in Equations (3) and (4) as bivariate normal (BVN)

$$\begin{bmatrix} \varepsilon_p \\ u_p \end{bmatrix} \sim \text{BVN}\left(\begin{bmatrix} 0 \\ 0 \end{bmatrix}, \begin{bmatrix} 1 & \sigma_{\varepsilon u} = \rho \cdot 1 \cdot \sigma_u \\ \sigma_{u\varepsilon} = \rho \cdot \sigma_u \cdot 1 & \sigma_u^2 \end{bmatrix}\right).$$

⁵⁵Since we use a set of dummy variables for all the independent variables except age, the dimensions of \mathbf{x}_1 and \mathbf{x}_2 are 19 × 1 and 17 × 1, respectively.

⁵⁶Jeffrey M. Wooldridge, *Econometric Analysis of Cross Section and Panel Data*, 2nd edition (Cambridge, Mass.: MIT Press 2010), 585-94.

⁵⁷Ibid., 590-91.

From this setting, the endogeneity of y_2 arises if and only if ε_p and u_p are correlated. A test of the null hypothesis of exogeneity of y_2 is equivalent to the test of H_0 : $\rho = 0$. If, $\rho = 0$, ε_p and u_p are independent, there is no endogeneity problem. Maximum likelihood (ML) estimation of this IV probit model is more efficient and allows consistent estimation of the structural coefficients γ and β .

Empirical Findings

The results of the ML estimates of both SMD and PR voter turnout are reported in table 2. Wald tests of the exogeneity of $y_2 H_0 = \rho = 0$ in both the SMD and PR equations are rejected at p < .001. This finding confirms our conjecture that voters' knowledge of the MMM electoral system is indeed endogenous, i.e., both knowledge and turnout are affected by some unobserved factors. Our specification of the instrumental variable probit model takes into account such endogeneity and renders consistent estimates of the structural coefficients γ and β .

A glance at the first-stage reduced-form Equation (4) results in table 2 indicates that males, older citizens, those with higher education and those who pay more attention to the news media are more aware of the new electoral system. Furthermore, as Huang, Yu and Hsiao find, the closer to the election day that respondents were interviewed, the more knowledgeable about the electoral system they tended to be.⁵⁸ In other words, campaign dynamics indeed create the momentum for understanding the electoral system. It is also interesting to note that, in terms of party identification, those who identified themselves with smaller parties including the New Party (NP), People First Party (PFP), and Taiwan Solidarity Union (TSU) were more aware of the electoral rules. Those identifying with small parties were either more sensitive to the constraints that the new MMM system posed to their preferred parties or were more likely to receive campaign messages from their party leaders.

⁵⁸Huang, Yu, and Hsiao, "Citizen's Awareness."

| | SMD ballot | | PR ballot | |
|--|------------|---------------|-----------|--------------------|
| | estimates | (Robust s.e.) | estimates | (Robust s.e.) |
| First-stage reduced form Equation (4): Knowledge | | | | |
| Gender (Male = 0) | | | | |
| Female | -0.709*** | (0.035) | -0.700*** | (0.034) |
| Age | 0.015*** | (0.002) | 0.015*** | (0.002) |
| Education (elementary school or illiterate = 0) | | | | |
| Junior high school | 0.285*** | (0.082) | 0.291*** | (0.081) |
| Senior high school | 0.403*** | (0.085) | 0.431*** | (0.082) |
| College | 0.467*** | (0.088) | 0.503*** | (0.082) |
| University (or above) | 0.617*** | (0.082) | 0.633*** | (0.077) |
| Ethnicity (Hakka = 0) | | | | |
| Minnan | 0.089 | (0.059) | 0.093† | (0.056) |
| Mainlander | -0.038 | (0.064) | -0.046 | (0.061) |
| Aboriginal | 0.002 | (0.209) | 0.042 | (0.189) |
| Party Identification (KMT = 0) | | | | |
| DPP | 0.085* | (0.041) | 0.074† | (0.040) |
| NP | 0.301* | (0.131) | 0.291* | (0.127) |
| PFP | 0.219** | (0.080) | 0.231** | (0.074) |
| TSU | 0.382** | (0.121) | 0.367** | (0.117) |
| Independents | 0.012 | (0.056) | -0.016 | (0.051) |
| Independence/Unification (prefer unification = 0) | | | | |
| prefer status quo | 0.065 | (0.056) | 0.069 | (0.052) |
| prefer independence | 0.058 | (0.073) | 0.063 | (0.070) |
| Identification as Taiwanese/Chinese (Taiwanese = 0) | | | | |
| Both | 0.008 | (0.039) | 0.002 | (0.037) |
| Chinese | -0.174† | (0.094) | -0.160† | (0.093) |
| Media Exposure (Very close attention = 0) | | | | |
| Moderately close attention | 0.337*** | (0.064) | 0.332*** | (0.062) |
| Not very close attention | 0.652*** | (0.071) | 0.650*** | (0.067) |
| No attention at all | 0.992*** | (0.077) | 0.983*** | (0.074) |
| Wave of Interview $(1^{st} wave = 0)$ | | | | |
| 2 nd wave (11/10/08-11/10/14) | -0.015 | (0.101) | -0.107 | (0.097) |
| 3 rd wave (11/10/15-11/10/21) | -0.016 | (0.096) | -0.019 | (0.095) |
| 4 th wave (11/10/22-11/10/28) | -0.047 | (0.089) | -0.034 | (0.087) |
| 5 th wave (11/10/29-11/11/04) | -0.155† | (0.085) | -0.132† | (0.078) |
| 6^{th} wave $(11/11/05-11/11/11)$ | 0 195* | (0.087) | 0.208* | (0.084) |
| 7^{th} wave $(11/11/12 - 11/11/18)$ | -0.029 | (0.007) | -0.026 | (0.089) |
| 8^{th} wave (11/11/19-11/11/25) | -0.076 | (0.095) | -0.078 | (0.089) |
| 0^{th} wave $(11/11/26, 11/12/02)$ | 0.025 | (0.095) | 0.0/0 | (0.00) |
| 10^{th} wave $(11/11/20-11/12/02)$ | 0.025 | (0.000) | 0.130 | (0.0)1) |
| $11^{\text{th}} \text{ wave} (11/12/10, 11/12/16)$ | 0.091 | (0.103) | 0.100 | (0.101) (0.077) |
| 11 th wave (11/12/10-11/12/10) | 0.004 | (0.083) | 0.102 | (0.077) |
| $12^{}$ wave $(11/12/1/-11/12/23)$ | 0.242.** | (0.062) | 0.150+ | (0.000) |
| 15^{m} wave $(11/12/24-11/12/30)$ | 0.148 | (0.088) | 0.1587 | (0.087) |
| 14^{cm} wave $(11/12/51-12/01/06)$ | 0.241* | (0.096) | 0.262** | (0.090) |
| 15 th wave (12/01/07-12/01/13) | 0.267** | (0.089) | 0.291** | (0.090) |
| Constant | -1.585*** | (0.170) | -1.632*** | (0.165) |

Table 2IV Probit Model of Voter Turnout (with Endogenous Regressor)

Table 2 (Continued)

| | | SMI | SMD ballot | | PR ballot | |
|-----------------|---|---|-------------------------|---------------|------------------|--|
| | | estimates | (Robust s.e.) | estimates | (Robust s.e.) | |
| Structural Eq | uation (3): Voting | | | | | |
| Knowledge of | the MMM Electoral System | 0.681*** | (0.043) | 0.665*** | (0.046) | |
| Gender (Male | = 0) | | | | | |
| Female | | 0.554*** | (0.062) | 0.547*** | (0.062) | |
| Age | | 0.001 | (0.003) | 0.002 | (0.003) | |
| Education (ele | ementary school or illiterate $= 0$) | | | | | |
| Junior high | school | 0.035 | (0.149) | 0.060 | (0.156) | |
| Senior high | n school | -0.152 [†] | (0.123) | -0.154 | (0.123) | |
| College | | -0.264* | (0.125) | -0.276* | (0.124) | |
| University | (or above) | -0.335** | (0.119) | -0.319** | (0.121) | |
| Ethnicity (Hak | ka = 0 | | | | | |
| Minnan | | -0.113 | (0.085) | -0.128 | (0.084) | |
| Mainlander | r | -0.017 | (0.102) | -0.016 | (0.102) | |
| Aboriginal | | -0.475 ⁺ | (0.244) | -0.366 | (0.262) | |
| Party Identifie | cation $(KMT = 0)$ | | | | | |
| DPP | | -0.195* | (0.076) | -0.182* | (0.077) | |
| NP | | -0.171 | (0.208) | -0.169 | (0.208) | |
| PFP | | -0.323* | (0.126) | -0.321* | (0.126) | |
| TSU | | -0.162 | (0.247) | -0.139 | (0.250) | |
| Independents | | -0.650*** | (0.089) | -0.611*** | (0.085) | |
| Independence | /Unification (prefer unification = 0) | | | | | |
| prefer statu | is quo | 0.093 | (0.084) | 0.088 | (0.083) | |
| prefer inde | pendence | 0.214* | (0.107) | 0.204† | (0.104) | |
| Identification | as Taiwanese/Chinese (Taiwanese = 0) |) | | | | |
| Both | | 0.053 | (0.065) | 0.058 | (0.065) | |
| Chinese | | 0.313 | (0.205) | 0.298 | (0.203) | |
| Constant | | 0.993*** | (0.203) | 1.012*** | (0.208) | |
| Model | SMD ballot: | PR ballot: | | | | |
| information | n = 3574; Log Likelihood = -6209.97 | 09.9788 n = 3727; Log Likelihood = -6448.3361 | | | | |
| | Wald test $X^2 = 1004.22$; df = 19; $p < 0$ | .001 Wal | d test $X^2 = 858$ | .06, df = 19, | p < 0.001 | |
| | $\hat{\rho} = -0.678$, Wald test of exogeneity | $\hat{\rho} =$ | -0.662, Wald t | est of exoger | neity | |
| | $H_0: \rho = 0, X^2 = 90.97; df = 1; p < 0.0$ | 01 . H ₀ : | $\rho = 0$, $X^2 = 84$ | 4.11; df = 1; | <i>p</i> < 0.001 | |

Data Source: Huang, *Yinguo tuilun*; Huang, 2012 nian zongtong yu lifa weiyuan xuanju; and Yu, Taiwan minzhong.

Notes: 1. ***: p < 0.001; **: p < 0.01; *: p < 0.05; †: p < 0.1 s.e. adjusted for clusters in districts. 2. Dependent variable: y₁, 1 = "Vote"; 0 = "Not vote".

Structural Equation (3) is of primary interest in this study. We first notice that in both SMD and PR, a higher knowledge level of the new MMM electoral system indeed stimulates a higher probability of voting after taking into account the endogeneity of knowledge. As shown in table 2, the β coefficient estimates of the knowledge level, 0.681 and

0.665 in SMD and PR, respectively, are highly significant at the p < .001 level. Since the probit regression is a nonlinear model, we interpret the estimates in terms of average marginal effects (or partial effects) on the probability of voting. A calculation of partial effects indicates that a one standard deviation increase in electoral system knowledge leads to average increases of 0.152 and 0.145 in the probability of the voter turning out to vote for SMD and the party list, respectively. In other words, an increase in the knowledge of electoral rules indeed contributes to a higher probability of voting, as hypothesized.

Although this finding, i.e., awareness of the MMM system encourages voter turnout, is consistent with a previous study of Taiwan's first implementation of the mixed-member system in January 2008,⁵⁹ it also reveals some subtle differences. First of all, the ranking of difficulty among the four items differs in the 2008 and 2012 elections. According to table 3, the 5% PR threshold is clearly the hardest item followed by the two-ballot item in the 2008 legislative election. In the 2012 concurrent elections, the rank order reverses with the 2-ballot item having a difficulty measure of (2.533/0.723) = 3.503 while the 5% PR threshold is (3.640/1.635) = 2.226. We believe that this reflects the dominance of the presidential campaign prior to the election day, which not only distracts voters' attention from legislative election rules but even misleads some voters into thinking that "two-ballots" simply means one for the presidential candidate and one for the legislative candidate.

Furthermore, concurrent presidential and legislative elections in 2012 led to an almost 16% jump in the voter turnout rate compared with the January 2008 legislative elections. Clearly, this record high voter turnout in Taiwan's legislative elections since 1992 is only a byproduct of the concurrent executive and legislative elections. This explains why coefficient estimates of the knowledge level in this study of the 2012 elections, albeit still statistically significant, are almost thirty percent lower

⁵⁹Chi Huang, Hung-chung Wang, and Chang-chih Lin, "Knowledge of the Electoral System and Voting Behavior," *Taiwan zhengzhi xuekan* (Taiwan Political Science Review) (Taipei) 16, no. 1 (June 2012): 239-79.

| | 1PL Model | | 2PL Model | | |
|---|---------------------------------|---------|-------------------------------------|----------------|--|
| Parameters | Estimates | (s.e.) | Estimates | (s.e.) | |
| Intercepts/Difficulty Parameters [†] | | | | | |
| α_1 [Item1: SMD] | -0.024 | (0.062) | -0.024 | (0.067)/-0.024 | |
| α_2 [Item2: 2 Ballots] | 0.251*** | (0.062) | 0.263*** | (0.065)/0.299 | |
| α_3 [Item3: 5% PR Threshold] | 2.445*** | (0.097) | 4.125*** | (0.741)/1.847 | |
| α_4 [Item4: 4 Year Term] | -0.521*** | (0.063) | -0.444*** | (0.054)/-1.734 | |
| Discrimination Parameters | | | | | |
| λ_1 [Item1: SMD] | 1 | _ | 1 | - | |
| λ_2 [Item2: 2 Ballots] | 1 | _ | 0.881*** | (0.185) | |
| λ_3 [Item3: 5% PR Threshold] | 1 | _ | 2.233*** | (0.727) | |
| λ_4 [Item4: 4 Year Term] | 1 | - | 0.256*** | (0.069) | |
| Variance of Knowledge | | | | | |
| Ψ | 0.963*** | (0.116) | 1.619*** | (0.454) | |
| Model information | 1520 × 4 - | | 1520 × 4 - | | |
| Number of persons × number of | $1330 \times 4 =$ | | $1330 \land 4 =$ 6120 = 3547 865 | | |
| items Log-likelihood | 0120 - 5500.515 0120 - 5547.005 | | | 5547.005 | |

Table 3Estimates for 1PL and 2PL Item Response Models: 2008 Election

Data Source: Yun-han Chu, 2005 nian zhi 2008 nian "xuanju yu minzhuhua diaocha" sinianqi yanjiu guihua (III): 2008 nian lifa weiyuan xuanju mianfang'an (Taiwan's Election and Democratization Study, 2008: Legislative Election, TEDS 2008L) (NSC96-2420-H004-002-025) (Taipei: National Science Council, 2007).

Note: ***: *p* < 0.001; **: *p* < 0.01; *: *p* < 0.05.

[†]As explained in the text, $\alpha_i = \lambda_i \delta_i$. Thus, for 1PL, item difficulties $\delta_i = \alpha_i$. For 2PL, item $\delta_i = \alpha_i / \lambda_i$.

in magnitude than those in our analysis of the 2008 election presented in table 4 (0.961 and 0.956, respectively). These subtle differences between the 2008 and 2012 elections echo the executive-centric theory's argument that a presidential election often plays a more significant role in voter co-ordination.

Conclusion

This research starts from an inquiry into the Taiwanese public's awareness of the new MMM electoral system, the dynamics of citizens' electoral knowledge during campaign and non-campaign periods, the

Table 4IV Probit Model of Voter Turnout: 2008 Election (with Endogenous Regressor)

| | SMD ballot | | PR | ballot |
|--|------------|---------------|-----------|---------------|
| | Estimates | (Robust s.e.) | Estimates | (Robust s.e.) |
| First-stage reduced form Equation (4): Knowledge | | | | |
| Gender (Male = 0) | | | | |
| Female | -0.564*** | (0.044) | -0.565*** | (0.042) |
| Age | 0.011*** | (0.002) | 0.012*** | (0.002) |
| Education (elementary school or illiterate $= 0$) | | · · · · | | () |
| Junior high school | 0.380*** | (0.101) | 0.386*** | (0.097) |
| Senior high school | 0.522*** | (0.087) | 0.543*** | (0.083) |
| College | 0.577*** | (0.108) | 0.611*** | (0.099) |
| University (or above) | 0.597*** | (0.117) | 0.620*** | (0.110) |
| Ethnicity (Hakka = 0) | | . , | | |
| Minnan | 0.021 | (0.062) | 0.012 | (0.060) |
| Mainlander | -0.066 | (0.088) | -0.083 | (0.086) |
| Party Identification (KMT = 0) | | · · · · | | () |
| DPP | 0.037 | (0.072) | 0.006 | (0.067) |
| NP | 0.217† | (0.119) | 0.166 | (0.117) |
| PFP | 0.394* | (0.157) | 0.364* | (0.151) |
| TSU | 0.264* | (0.132) | 0.370** | (0.138) |
| Independents | -0.137† | (0.071) | -0.138* | (0.067) |
| Independence/Unification (prefer unification = 0) | 1 | · · · · | | () |
| prefer status quo | 0.043 | (0.075) | 0.057 | (0.076) |
| prefer independence | 0.062 | (0.095) | 0.095 | (0.094) |
| Identification as Taiwanese/Chinese (Taiwanese = 0) | | · · · · | | () |
| Both | -0.070 | (0.067) | -0.075 | (0.067) |
| Chinese | -0.201† | (0.108) | -0.184† | (0.110) |
| Media Exposure (Very close attention = 0) | | | | |
| Moderately close attention | 0.162* | (0.072) | 0.136† | (0.075) |
| Not very close attention | 0.413*** | (0.062) | 0.399*** | (0.062) |
| No attention at all | 0.591*** | (0.095) | 0.548*** | (0.090) |
| Wave of Interview $(1^{st} wave = 0)$ | | · · · · | | () |
| 2^{nd} wave (07/12/19-07/12/24) | 0.098 | (0.067) | 0.088 | (0.064) |
| 3 rd wave (07/12/25-07/12/30) | 0.222*** | (0.057) | 0.208*** | (0.055) |
| 4 th wave (07/12/31-08/01/05) | 0.364*** | (0.051) | 0.351*** | (0.047) |
| 5 th wave (08/01/06-08/01/11) | 0.521*** | (0.065) | 0.509*** | (0.065) |
| Constant | -0.161*** | (0.228) | -0.071*** | (0.224) |
| Structural Equation (3): Voting | | · · · · | | () |
| Knowledge of the MMM Electoral System | 0.961*** | (0.089) | 0.956*** | (0.098) |
| Gender (Male = 0) | | · · · · | | () |
| Female | 0.499*** | (0.104) | 0.491*** | (0.104) |
| Age | 0.010* | (0.005) | 0.008 | (0.005) |
| Education (elementary school or illiterate $= 0$) | | | | . , |
| Junior high school | -0.305 | (0.229) | -0.290 | (0.222) |
| Senior high school | -0.399† | (0.211) | -0.396† | (0.209) |
| College | -0.498* | (0.217) | -0.533* | (0.214) |
| University (or above) | -0.570* | (0.226) | -0.562* | (0.218) |

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| | | SMD ballot | | PR ballot | | |
|---------------------|---|---------------------------------------|------------------------|-----------------|---------------|--|
| | | Estimates | (Robust s.e.) | Estimates | (Robust s.e.) | |
| Ethnicity (Hak | ka = 0) | | | | | |
| Minnan | | 0.299** | (0.100) | 0.307** | (0.097) | |
| Mainlander | - | 0.254† | (0.143) | 0.245† | (0.137) | |
| Party Identific | cation $(KMT = 0)$ | | | | | |
| DPP | | -0.189 | (0.130) | -0.171 | (0.123) | |
| NP | | -0.240 | (0.249) | -0.182 | (0.246) | |
| PFP | | -0.648* | (0.323) | -0.598† | (0.326) | |
| TSU | | -0.516* | (0.262) | -0.693** | (0.240) | |
| Independer | nts | -0.800*** | (0.139) | -0.807*** | (0.140) | |
| Independence | Unification (prefer unification = 0) | | | | | |
| prefer status quo | | 0.016 | (0.136) | 0.024 | (0.138) | |
| prefer independence | | 0.050 | (0.212) | 0.018 | (0.204) | |
| Identification | as Taiwanese/Chinese (Taiwanese = 0) | | | | | |
| Both | | 0.157 | (0.116) | 0.152 | (0.117) | |
| Chinese | | 0.299 | (0.215) | 0.276 | (0.219) | |
| Constant | | -0.167 | (0.344) | 0.420 | (0.352) | |
| Model | SMD ballot: | PR ballot: | | | | |
| information | n = 1139; Log Likelihood = -1744.109 | n = 1175; Log Likelihood = -1786.6024 | | | | |
| | Wald test $X^2 = 604.28$; df = 18; $p < 0.001$ Wald test $X^2 = 594.57$, df = 18, $p < 0.001$ | | | p < 0.001 | | |
| | $\hat{\rho} = -0.564$, Wald test of exogeneity | $\hat{\rho} =$ | -0.543, Wald te | est of exoger | neity | |
| | $H_0: \rho = 0, X^2 = 27.17; df = 1; p < 0.00$ | 01 H_0 : | $\rho = 0, X^2 = 23.2$ | 29; df = 1; p | < 0.001 | |

Table 4 (Continued)

Data Source: Chu, 2005 nian zhi 2008 nian "xuanju yu minzhuhua diaocha."

Notes: 1. ***: p < 0.001; **: p < 0.01; *: p < 0.05; †: p < 0.1. s.e. adjusted for clusters in districts. 2. Dependent variable: y_1 , 1 = "Vote"; 0 = "Not vote".

impact of concurrent elections on an individual's political learning of electoral knowledge, and the relationship between electoral knowledge and voting participation. The findings are exploratory but plentiful. First, we find that that the Taiwanese public was not fully aware of the components of the new electoral system both in the 2008 and 2012 legislative elections. Except for the term length of new legislators, the majority of citizens did not understand the institutional designs of the district magnitude, two-ballot structure, and 5% PR threshold for the legislative election. Among these questions, the 5% PR threshold was apparently the most difficult question for most respondents.

Secondly, our findings also confirm that a political campaign matters to citizens' learning of the institutional components of a new electoral system. Citizens' awareness of the new MMM system rose markedly during the 2008 campaign period and then declined rapidly when campaigning ended. This declining electoral knowledge rebounded as the 2012 election approached, demonstrating a political cycle of the people's electoral knowledge.

Most importantly, by making a comparison of the dynamics of people's electoral knowledge in the 2008 and 2012 elections, our study examines the extent to which concurrent elections influence the learning effect of electoral knowledge. The findings of this research indicate that the Taiwanese public in 2012 did not become more knowledgeable of the new MMM system than it was in 2008. Moreover, holding legislative and presidential elections concurrently, which attracted more attention from both the media and the public, indeed had a negative impact on the relationship between political campaigns and electoral knowledge. In other words, the learning effect in terms of electoral knowledge in the 2012 concurrent legislative elections. In addition, we also find that citizens' electoral knowledge markedly contributed to voting participation. Citizens with a higher level of electoral knowledge were more likely to turn out to vote than those without.

Although this study does contribute to people's understanding of the dynamics of citizens' electoral knowledge and its positive relationship with voter turnout, we admit that it still has a long way to go. There is a major goal that we will try to achieve in the future. Taiwan, in fact, is not the only Asian country to adopt a new electoral system for legislative elections during the past two decades. Japan, for instance, also introduced the MMM electoral system for its lower house elections in 1996. Theoretically, conducting a comparative study of the dynamics of people's electoral knowledge between Taiwan and other countries which have also adopted new electoral systems would be quite valuable. However, due to the lack of equivalent survey data in Japan, we are not able to conduct this type of comparative study at present. We expect that a comparative study will become feasible in the future by cooperating further with other academic institutes which conduct public opinion surveys in other countries.

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