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**Dimensions of Politics: How Institutions Shape  
East Asian Legislatures**

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## ABSTRACT

Dimensions of Politics: How Institutions Shape East Asian Legislatures

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This dissertation project explores how institutions have shaped dimensional structure in East Asian legislatures, including Hong Kong, South Korea, and Taiwan in the past two decades. The major issues dividing the left and right in East Asia are not about economic in nature, but rather structured by legislators' preferences vis-à-vis democratization and the relationship with Beijing in Hong Kong, the geo-security issue in South Korea, and the Taiwanese or Chinese identity issue in Taiwan. This dissertation provides either the first or some of the very first empirical evidence of the dimensional structure of the three East Asian politics. By drawing from the literature on political parties, electoral laws, and legislative agenda dynamics, my dissertation also explains how legislators facing different institutional incentives align differently either with or against the main political cleavage.

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# Chapter 1

## Introduction

### 1.1 Motivation

We live in a complex world with diverse people. Different people have different criteria for their decision-making. Accordingly, collective decision-making is neither simple nor straightforward. Some existing agendas fade away, and new issues become salient. Forgotten topics sometimes come back up as the principal concerns in politics. In other words, the political structure is characterized by its unstable and multidimensional nature. Following this perspective, earlier scholars have explained that political elites take different policy positions from issue to issue in consideration of party, constituency, and ideology (Truman, 1951; MacRae, 1958; Miller and Stokes, 1963; Lowi, 1964; Clausen, 1973).

Counterintuitively, Poole and Rosenthal (1997) found that American politics had been mostly structured in a single economic left-right ideological dimension. Their finding has deeply influenced on the direction of discipline to be changed. Making sense of the assumption of stable and unidimensional policy space has facilitated significant studies that sheds new light on legislative organization and legislative behavior both in the fields of American politics and comparative legislatures (e.g. Weingast and Marshall, 1988; Krehbiel, 1992; Cox and McCubbins, 2007, 2005; Jones and Hwang, 2005).

In exploring this dimensional nature of politics, there has been minimal quantitative research regarding East Asian politics. How many dimensions are necessary to

explain political decision-making in East Asia? Is it almost unidimensional to apply recent theories of legislative organizations? Or is it complex that revisiting earlier theories is better to explain politics in East Asian legislatures? What is the main dimension of legislator's decision-making? What aspects compose other dimensions, if exist? Our scholarly understanding on East Asian politics is limited to answer these questions, which motivates me to launch this dissertation project.

## **1.2 Dimensionality, Institutions, and East Asian Politics**

Following Riker (1986, p.143), dimension is defined as “a standard of measurement for relevant variable properties of alternatives and tastes.” If a policy proposal is unidimensional, it provides a single criterion, while a multidimensional bill includes multiple evaluative characteristics for legislators to make a decision. This concept of dimensionality, the number of dimensions to map a policy space in legislature, is useful to explain political decision-making.

In a unidimensional map of legislature, it possible to formulate a clear expectation of the location of policy outcome (Black, 1948; Arrow, 1963). In contrast, in a multi-dimensional policy space, it is hardly expected that collective decision-making leads to a stable outcome (McKelvey, 1979). Therefore, identifying the number of dimensions in a set of issues is critical to developing theoretical expectations for legislative policy-making about a pivotal actor, a set of possible policy outcome, and hence the direction of politics.

While the unidimensionality assumption is favored in recent studies, it is still empirically controversial. Growing studies find that the dimensionality may vary across issue areas, over time, and/or in different decision-making stages (e.g. Jochim and Jones, 2012; Hurwitz et al., 2001; Talbert and Potoski, 2002). It is also noted that

overall low-dimensionality does not mean that legislators always align with the main dimension of political cleavage. Recent studies in American politics have found a systematic variance in individual legislator's dimensionality, defined as the extent of legislative behavior associated with other dimensions beyond major political cleavages (Lee, 2014; Yoshinaka and Grose, 2011). These studies are based on the electoral connection between legislators and their voters, which can be generalized and extended beyond the U.S. Congress.

Hong Kong, South Korea, and Taiwan are ideal places to extend this theory of the electoral connection on dimensionality in different institutional contexts from the U.S. Congress. In addition to other interesting political institutions, such as multi-party system, all of the East Asian legislatures elect their members using one variant or another of a mixed-member electoral system, in which representatives are elected using multiple distinct methods. These institutional settings thus allow for a comparison of the impact of different types of electoral incentives holding many other external factors constant (Moser and Scheiner, 2012; Shugart and Wattenberg, 2001).

The Legislative Council of Hong Kong Special Administrative Region (LegCo) was established in 1998 after Hong Kong's reversion from the United Kingdom to mainland China in 1997. About half of legislators are elected by a general election with universal suffrage under a closed-list proportional representation system (PR) in multi-member districts ranging from three to eight seats. The other half of the LegCo is elected from functional constituencies. Under this rule, selected individuals, or organizations in some cases, constitute an electoral college to select one or multiple deputies.<sup>1</sup>

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<sup>1</sup>Before 2004, the Election Committee of Hong Kong elected the six legislators, in addition to geographical constituency and functional constituency systems. After then, these seats were passed into geographical constituency tier.

After returning to electoral democracy in 1987, the National Assembly of the Republic of Korea (KNA) has employed a mixed-member majoritarian system (MMM) that combines the first-past-the-post rule in single-member districts (SMD) alongside the closed list PR in a single nationwide district of about fifty five members.<sup>2</sup>

The Legislative Yuan in Taiwan has employed a single ballot MMM that combines the single non-transferable voting rule (SNTV) and the closed-list PR system since her democratization in 1992. In the SNTV rule, voters cast one ballot for one candidate in multi-member districts ranging from one to seventeen legislative seats. The candidates with the most votes filled the posts. A single nationwide district of thirty members was used for the closed-list PR system<sup>3</sup>. In 2005, the LY changed its electoral system to the dual ballot MMM consisting of the SMD plurality rule and the closed-list PR tier in a single nationwide district of thirty-four seats. This new system was first used in the 2008 election<sup>4</sup>.

Using these unique institutional settings as well as rich, but less-studied roll call and cosponsorship data in the three legislatures<sup>5</sup>, I investigate institutional determinants of dimensionality in legislature.

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<sup>2</sup>In the 2004 election, the KNA experienced the institutional change from the single ballot MMM to the conventional dual ballot MMM system. During the single ballot MMM period, voters cast one ballot in the SMD tier, and the number of PR seats was allocated from seat share (1988-1996) or vote share (1996-2004) in the SMD tier

<sup>3</sup>Like Korean single-ballot MMM system, voters cast one vote in the SNTV districts, and the number of PR seats was allocated from partisan vote share in the SNTV tier.

<sup>4</sup>There are also six aboriginal representatives elected using SNTV in two three-member districts in both the old and new electoral systems.

<sup>5</sup>For example, this dissertation includes 1,637,837 roll call voting decisions made by the total of 2,361 legislators on the total of 9,649 bills in Hong Kong, South Korea, and Taiwan. While this rich information is available, it is not transformed to the conventional style of data set, and therefore I have devoted myself to do it.

### 1.3 Plan of the Thesis

In this dissertation, three independent chapters investigate various aspects of the overall theme of this thesis. Chapter 2 analyzes comprehensive roll call voting behaviors in the Korean National Assembly (2000-12) and the Legislative Yuan (Taiwan, 1992-2012). This chapter provides empirical findings that the major political cleavages in the two countries have been the most important factor in legislative decision-making. At the same time, there are differences among individual political elites regarding the dimensionality. For example, Taiwanese legislators - elected from the closed-list proportional representation in a single nationwide district - have made their roll call voting decisions more exclusively based on the major issue of political identity than other legislators elected through multi-member districts.

Regarding Hong Kong politics, Chapter 3 confirms the conventional belief that the issues of democratization and relationship with Beijing is the most prominent cleavage. In so doing, it analyzes comprehensive roll call voting behavior in the Legislative Council of Hong Kong (1998-2012). This issue has polarized Hong Kong's elite politics to absorb other prevailing issues. This chapter also reveals that the major political parties and indirectly-elected legislators are responsible for the dominance of this issue. In contrast, minor party members and independents make their roll call voting decision not only based on the major issues, but also on their own parochial issues.

Chapter 4 examines the dimensional structure of cosponsorship networks in the Legislative Yuan from 1992 through 2012. This chapter finds that the main dimension's explanatory power is limited in the cosponsorship stage compared to the roll call voting stage. While the main dimension in the cosponsorship stage clearly reflects pan-blue vs. pan-green conflicts, it is unclear that dominant second dimension

among all other dimensions exists. The other dimensions in the cosponsorship stage are mainly shaped by minor party members.

Chapter 5 summarizes the findings from individual chapters and discusses their implications.

## Chapter 2

# Dimensionality in Roll Call Voting in Taiwan and South Korea

### Chapter Abstract

Combining the conventional wisdom regarding electoral and legislative studies provides a puzzling but rarely studied question: to what extent do electoral rules matter to dimensionality in legislature? This paper applies the personal vote literature to examine the effects of electoral rules on individual legislator's roll call voting behaviors that are not explained by overall low-dimensional decision-making structure. The two East Asian mixed-member electoral systems, South Korea and Taiwan, provide unique institutional settings to compare different electoral rules' effects on legislative behavior within a single country as well as across the two countries. Through an analysis of comprehensive roll call voting behavior in the Korean National Assembly (2000-12) and in the Legislative Yuan (Taiwan, 1992-2012), this paper finds there is no significant variation in dimensionality between Korean legislators elected in single-member districts (SMD) and representatives elected from closed-list proportional representation (PR), while Taiwanese legislators elected through multi-member districts have higher dimensionality than PR members.



## 2.1 Introduction

One of the fundamental building blocks in literature is that electoral rules provide institutional incentives for legislators to behave in predictable ways (Carey and Shugart, 1995; Carey, 2012). There is also a widespread consensus that a stable roll call voting pattern exists along one or two simple dimensions in any collective decision-making body around the world (Poole and Rosenthal, 2011). Combining these two pieces of conventional wisdom yields a puzzling but rarely studied question: to what extent do electoral rules matter to the dimensionality in legislature?

While overall legislative politics is featured by its simple structure, an individual legislator does not always make his or her roll call voting decision based on major political cleavages. Recent studies in American politics have found a systematic pattern in individual legislator's dimensionality in roll call voting behavior (Lee, 2014; Yoshinaka and Grose, 2011). These studies are based on the electoral connection between legislators and their voters, which can be generalized and extended beyond the U.S. Congress. In this chapter, I make a contribution toward a generalized theory of dimensionality in legislature by focusing on the relationship between institutional incentives for cultivating personal votes and an individual legislator's dimensionality.

South Korea and Taiwan provide unique institutional settings to investigate the research question. The two countries elect their legislators using one variant or another of a mixed-member electoral system, in which representatives are elected by two distinct methods. Such legislatures thus allow researchers to compare effects of different electoral rules on legislators within a single country (Moser and Scheiner, 2012; Shugart and Wattenberg, 2001). In addition, the two East Asian cases have different theoretical expectations about the effects of electoral rules on an individual legislator's dimensionality. The two electoral rules in Taiwan provide different incen-

tive structures for legislators (Batto, 2012), while Korean mixed-member electoral systems do not (Jun and Hix, 2010).

Through an analysis of comprehensive roll call voting behavior in the Korean National Assembly (2000-12) and the Legislative Yuan (Taiwan, 1992-2012), this chapter presents empirical evidence of the effects of the electoral rules on legislator's dimensionality. In South Korea, there is no significant variation in the dimensionality between the legislators elected in the single-member districts (SMDs) and the representatives elected from the closed-list proportional representation (PR). In Taiwan, however, I find that the legislators elected in the single non-transferable vote system in the multi-member districts (SNTV-MMDs) have higher dimensionality than the PR members.

The rest of this chapter shall proceed as follows. In the next section, I briefly review previous literature on dimensionality in legislatures. Then, I extend the theory of dimensionality based on the American Congress to legislatures in other countries with an emphasis on mixed-member electoral systems. And then I describe institutional settings in South Korea and Taiwan and test the hypotheses as well as provide the descriptions of the data, measurement, and methodology. Finally, I summarize the findings and their implications and conclude with future research agenda.

## **2.2 Spatial Model of Legislative Politics and Dimensionality**

In the spatial model of roll call voting, an individual legislator is represented by an ideal point in a one- or two-dimensional issue space. This ideal point represents the individual legislator's most preferred outcome in the issue space. Each roll call vote is also represented by two possible outcomes; one corresponding to the case of the bill being passed and the other to the case of the bill not being passed. Legislators in

this model want to maximize their utilities, and they most desire outcomes closest to their ideal points. Therefore, legislators measure distance between their ideal points and the two possible outcomes, and then make their voting decision by choosing a closer outcome to their preferences (Downs, 1957; Hotelling, 1929).

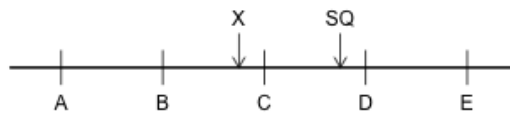
The scaling methods for preferential and choice data analyze legislator's roll call voting behavior and provide estimated ideal points in basic issue space (Clinton et al., 2004; Poole, 2005). This result, summarized as ideal point, provides a tremendous amount of information on political history, such as congressional parties, public policies, and issues in national politics (e.g. Weingast and Marshall, 1988; Krehbiel, 1992; Cox and McCubbins, 2007, 2005; Jones and Hwang, 2005).

However, ideal points estimated in the empirical spatial models explain only a certain amount of the variation in roll call voting behavior. Legislators take their position on hundreds of roll calls in each legislative session. Ideal points sometimes fail to explain legislator's position-taking activities based on the utility-maximization logic. In the empirical model of spatial voting, this failure is defined as vote misclassification or error. The common treatment regarding these errors is to add one additional dimension and check to what extent an additional dimension reduces the amount of errors. If this dimension reduces error rates significantly and is substantively meaningful for understanding legislative politics in general, then we may add this additional dimension. If not, we may focus on major dimensions by treating such errors as ignorable (Jackman, 2001; Poole, 2005).

Figure 2.1 illustrates the above descriptions. In the first figure, the five members are arrayed along a single-issue dimension. Given the distribution of the five legislators' preferences, the bill X is expected to be passed, as legislators A, B, and C may prefer the expected outcome of X over the status quo. It turns out that the bill X is not passed, as only legislator A votes for X, while the other four legislators

Figure 2.1 : The Spatial Models of Roll Call Voting

(a) One-dimensional Example



(b) Two-dimensional Example



vote against the bill X. In the unidimensional spatial model, legislators A, D, and E's behaviors are explained, while the model fails to explain B and C's cases.

In the second figure, B's voting behavior is explained well in the two dimensional model, as B finds that the status quo is closer than the expected outcome of bill X. Legislator C's behavior is still not explained even in this two-dimensional model. In the empirical model of spatial voting, one- or two-dimensional issue space is widely used, and adding additional dimension is not recommended in a variety of reasons, including theoretical concerns about the probability of generalization (Shepard, 1987) and technical difficulties<sup>1</sup>.

The focus of this chapter is to provide a systematic explanation of the cases like legislator C's voting decision. The next section discusses the systematic factors regarding these unexplained and/or unexpected observations in the spatial model of roll call voting behavior.

### 2.3 Electoral Rules and Legislator's Dimensionality

In assessing a systematic variance across individual legislators in low-dimensional roll call voting in the U.S. House, existing studies develop a theoretical argument based on electoral connection. Lauderdale (2010) describes how particular interests of constituents in various forms of agriculture, industry, and resource extraction require multidimensional issue dimensions, which are not captured in the low-dimensional model of legislatures. Yoshinaka and Grose (2011) show that a constituency change, such as redistricting and the enfranchisement of African-American voters raises a legislator's uncertainty about voters' demands that leads to more roll call voting errors. Lee (2014) finds that incumbents have an incentive to take care of other

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<sup>1</sup>The d-dimensional spatial model of roll call voting with n legislators over v votes requires  $n * d + v * (d + 1)$  parameters.

dimensions when they need to hinder a third-party candidate’s potential strength in the next election.

This literature interprets the “classical dilemma” (Pitkin, 1967, 215) between national and local representation in the language of the spatial model of politics. It is incompatible to respond to local interests and articulate national policy programs simultaneously, and therefore the balance between the two types of representation is one of the key concerns for legislators (Carey, 2012). The above stories of American politics make legislators face more incentives to cultivate personal votes, defined as the amount of votes derived from a candidate’s personal reputation based on his or her record of service to a constituency (Cain et al., 1987). These legislators are not expected to make their roll call voting decisions exclusively based on major partisan issue dimension, an economic left-right issue in American context. Instead, they should take care of their own parochial issue dimension, which is not recovered by scaling techniques that aim to recover the latent basic dimension in roll call voting data.

Electoral institutions are well known as one of the key institutional factors to balance competing types of representation by affecting the degree to which incumbents cultivate a personal vote (Carey and Shugart, 1995; Carey, 2012). The plurality voting system in single-member districts (SMDs), like the U.S. case, is one example of many candidate-centered electoral systems in which individual politicians face institutional incentives to take positions other than those that would be most beneficial for their party collectively. Other types of electoral systems have distinct features that generate a variance of the amount of institutional incentives to cultivate a personal vote.

The single non-transferable voting system in multi-member districts (SNTV-MMDs) provides strong institutional incentives for legislators to cultivate personal votes (Carey and Shugart, 1995). Each voter casts one vote for a single candidate in an M-member

district, and seats are filled by the candidates with the top  $M$  highest number of votes allocated to the district. This ballot structure allows voters to reveal their preference for individual candidates from the same party in multi-member district elections. Due to these inter- and intra-party competitions, legislators have to develop their own personal reputations not only to differentiate from other party members but also from the same party legislators elected in the same district (e.g. Cox and Thies, 1998; Fujimura, 2013; Johnson and Hoyo, 2012; McCubbins and Rosenbluth, 1995). This strong personal vote-seeking incentive let legislators make their roll call voting decision not only based on major partisan issues but also in consideration of other potential dimensions to develop their personal reputation.

In contrast, in electoral systems that promote party-based representation, such as the closed-list PR in a single nationwide district, political elites do not have serious personal vote-seeking incentives (Carey and Shugart, 1995). Voters are not able to cast their vote for a specific candidate of the party over others. Voters have to choose the list as a whole, and candidates should be expected to focus on their party's collective performance than the candidates' own reputations. Legislators in this electoral system have to be cohesive with their party's platform to enhance party label and do not have to take care of other issue dimensions to seek their personal reputation (Jones and Hwang, 2005; Jones et al., 2002). Then, roll call voting decisions are made based on the main partisan dimension.

Mixed-member electoral systems have two unique merits that can be examined in the relationship between electoral institutions and an individual legislator's dimensionality. First, in this social laboratory, different electoral rules can be studied simultaneously in isolation from contextual variables such as social cleavages, economic development, or culture (Moser and Scheiner, 2012; Shugart and Wattenberg, 2001). Second, there are two different types of institutional mechanisms among

mixed-member electoral systems that have different theoretical expectations of electoral rules' effect on legislative representation. As electoral rules are not the only variable to affect political elites' behavior, the interaction between electoral rules and other variables provides two models of mixed-member electoral systems that shape a legislator's dimensionality.

In the first model of mixed-member electoral systems, dubbed the "best of both worlds" model (Shugart and Wattenberg, 2001), the two electoral tiers are independent of one another, regardless of other interacting variables. Thus, legislators from the two electoral tiers provide all the features of representation that characterize systems (e.g. Kunicova and Remington, 2008; Lancaster and Patterson, 1990; Pekkanen et al., 2006; Sieberer, 2010; Smith and Remington, 2001; Stratmann and Baur, 2002; Thames, 2001). For this model, the previous descriptions are formulated as the following hypothesis:

*H1: In mixed-member systems of the "best of both worlds" model, legislators facing more personal vote-seeking incentives are more likely to have multidimensional issue dimensions than other incumbents.*

The other model is known as the contamination model and is defined as when "the existence of one tier prevents legislators from the other tier from behaving as if they were elected in a 'pure' system made up of their tier alone (Crisp, 2007, 1462)". In this model, electoral rules are mitigated by other factors, such as a legislator's reelection ambition, candidate selection procedure, or strong role of party leadership. Based on these institutional interacting effects, legislators elected from one electoral rule do not have strong incentives to behave differently from members elected from



the other type of electoral rule. There are also cases where these interacting effects lead to the opposite results, in which legislators elected under the electoral rules that promote personal reputation seek more party-based representation, and vice versa (e.g. Clark et al., 2008; Ferrara, 2004; Haspel et al., 1998; Kerevel, 2010; Thames, 2005).

Given that the two electoral rules in this model do not work independently, the following hypothesis is presented.

*H2: In mixed-member systems of the contamination model, legislators facing more personal vote-seeking incentives are more likely to have multidimensional issue dimensions than other incumbents.*

## **2.4 Case Studies in Taiwan and South Korea**

The following sections investigate the plausibility of Section 2.3's argument by examining roll call voting behaviors in Taiwan and South Korea, two countries with similar political systems, but that differ on the role of the principal explanatory variable, the types of elections by which legislators are elected. Taiwan is considered as an ideal test case for the best of both worlds model (Batto, 2012), whereas South Korea falls into the contamination model (Jun and Hix, 2010).

### 2.4.1 Taiwan

Taiwan has employed a mixed-member electoral system that combines the single non-transferable voting system in multi-member districts (SNTV-MMDs) and the closed-list proportional representation (PR) system in a single nationwide district from 1992 through 2007 (Batto, 2012; Nathan, 1993). In the district election, each voter casts one vote for a single candidate, while multiple seats are assigned to each district. The size of district magnitude, i.e. number of seats in a district, varies from 1 through 17<sup>2</sup>. In addition, a small number of legislators are elected by aboriginal voters in two nationwide MMDs for Pingpu tribe and Gaoshan tribe.

Regarding PR system, Taiwan has two separate closed-lists; the major list for national at-large delegates and the minor one for representing overseas Chinese. Each party provides two lists in elections, and wins a number of seats on these two lists proportional to the total vote in district election. As the lists are closed and candidates in this type of tiers are elected indirectly through a district election, candidates do not face intra-party competition and, therefore, they do not face personal-vote seeking incentive.

In 2008, Taiwan's electoral system was changed to a dual ballot mixed-member electoral system, in which voters cast two votes; one for district election and the other for closed-list PR election in a single nationwide district (Jou, 2009; Lin, 2011; Stockton, 2010). Plurality SMDs were replaced with SNTV-MMDs for district elec-

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<sup>2</sup>As Taiwan's electoral districts are matched with administrative boundaries, some rural districts in small population size elect just one legislator, which is correspond with SMD election.

tion. Regarding personal vote-seeking incentive structure, the major change is to remove intra-party personal vote-seeking incentives for district-elected legislators. Yet, district-elected legislators have still inter-party personal vote-seeking incentives to avoid challenges from other party candidates in the next election (Batto, 2009). In the electoral rules both in pre- and post-electoral reform periods, there is no institutional constraint for incumbents to run for the next election<sup>3</sup>, and most of the legislators are motivated by reelection. In addition, candidates are not allowed to run for district and PR elections at the same time (Batto, 2012).

Taiwan's political parties are rooted in society along a major social cleavage on cross-Strait relations (Chu and Lin, 2001; Fell, 2012; Rigger, 2011). If the parties matter too much, it is reasonable to expect legislators to follow partisan logic, regardless of their electoral origins. Yet, Taiwan does not fall into this category, as district-elected legislators are required to enhance personal reputation due to intra-party competition in the SNTV-MMDs rule. Candidate selection procedure, another potential compounding variable, also does not hinder the institutional effect of electoral rules on legislators. This is because party leaders exert a strong power on candidate selection procedure for PR tier, but their power is limited for district elections (Batto, 2012; Fell, 2013).

To sum up these considerations, Taiwan in the pre-reform periods (1992-2007) is an exemplary case to apply the hypothesis of electoral rules and legislator's dimen-

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<sup>3</sup>The literature in electoral connection assumes that legislators seek reelection. However, it is not always guaranteed. For example, immediate reelection is constitutionally prohibited in Mexico Kerevel (2010).

sionality for “best of both worlds” model of mixed-member electoral systems (Batto 2012). It is noted that the Legislative Yuan after-reform period may not meet some conditions discussed above, such as intra-party competition (Rich, 2014).

### **Data, Method, and Results**

Extensive roll call voting data allows for me to make a comprehensive analysis of legislator’s dimensionality in Taiwan<sup>4</sup>. For this part, I first focus on roll call voting data in the Legislative Yuan from the 2nd through the 6th legislative sessions, which covers the entire periods of legislative politics since democratization until the 2008 electoral reform. Then, I analyze the 7th legislative session’s roll call voting data. Following a conventional rule of thumb, I exclude legislators who do not have enough history of roll call voting (less than 20 times) and lop-sided roll call votes where the minority’s proportion is less than 2.5% of the total participants of the votes. The total number of legislators is 1,033 and the total number of roll call votes is 2,149. Table 2.1 provides detailed information for the number of legislators and roll call votes by sessions.

In order to test the “best of both world” model’s hypothesis in Section 2.3, I need a measure for individual legislator’s dimensionality in the spatial model of voting. For this purpose, I use the Geometric Mean Probability (GMP) score estimated

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<sup>4</sup>Roll call voting data is obtained from the website of the Center for Legislative Studies at Soochow University in Taiwan. I deeply appreciate Dr. Hawang and other members in this research center to maintain and release such comprehensive information of legislative behavior. I accessed the website using Python, one of the computer script programs, scrapped the roll call voting data, and then manipulated it as the conventional data form using R.

Table 2.1 : The Number of Legislators and Roll Call Votes by Sessions in Taiwan

Session	Legislators	Votes
2nd	165	427
3rd	170	611
4th	229	323
5th	231	456
6th	238	282

by the conventional two-dimensional W-NOMINATE model<sup>5</sup>. The W-NOMINATE technique is based on the assumptions of spatial models of voting, discussed in Section 2.2, and provide useful indicators, including the GMP score. The GMP score captures the likelihood of an observed choice is the assigned probability by the W-NOMINATE model to that choice. It varies 0 and 1, and higher values mean that the legislator's voting behavior is more explained by the simple two-dimensional spatial model. Thus, it is a useful measure to use a dependent variable for the dimensionality varied by individual legislators (Lee, 2014).

As I need a dependent variable for capturing multidimensionality, I extract 1 from this GMP score to make higher values denote legislator's multidimensionality beyond the simple two dimensions. Using this score as the dependent variable, I analyze the effects of electoral rules on legislator's dimensionality. The main explanatory variable is a binary variable of electoral rules, coded 1 for the legislators elected in

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<sup>5</sup>I also used the Correct Classification rates estimated by the Optimal Classification and the W-NOMINATE models, and the results are consistent.

the nominal districts and 0 for the PR legislators. As I expect district electoral rule increases multidimensionality, in order that this hypothesis is supported, the estimated coefficient for this dummy variable should be positive and statistically significant.

In addition to the variable of main interest, I also include a series of control variables. The two variables capture a minor variation of electoral rules including districts for aborigines, and the PR tier for abroad Chinese. I also include the two district-tier specific control variables, including the log-transformed district magnitude variable and the SMD variable. Gender variable is coded 1 for female legislators and 0 otherwise. Participation variable denotes whether the incumbent legislators run for the next election (coded as 1) or not (coded as 0). Reelected variable refers if the legislators run for the next election is reelected (coded as 1) or not (coded as 0). I also include the two ideological extremism variables, which are absolute values of the ideal points of the first and second dimensions. Several dummy variables are also included to control parties and legislative sessions.

As the dependent variable is bounded between 0 and 1, I use beta regression, which is the recommended statistical model for this type of data (Ferrari and Cribari-Neto, 2004; Paolino, 2001; Smithson and Verkuilen, 2006). The first model includes only the main explanatory variable. The second model contains electoral rules-related independent variables. The last model is a full model, including all explanatory and control variables.

The estimated results are presented in Table 2.2. Overall, the results support for the first hypothesis for the “best of both worlds” model of mixed-member electoral systems. The coefficients for the district election variable are positive and statistically significant in terms of 95% confidence interval across all the three models. This implies that legislators who have to care for their district voters, and therefore, have personal vote-seeking incentives, sometimes make a voting decision beyond the two partisan dimensions. In contrast, the PR legislators’ criteria for their roll call voting behaviors are rooted in the major dimensions.

Table 2.2 : Electoral Rules and Multidimensionality: Pre-reform Taiwan

<i>Dependent variable: Multidimensionality</i>			
	(1)	(2)	(3)
District	0.209*** (0.054)	0.293*** (0.106)	0.210** (0.086)
Aborigin		0.039 (0.112)	-0.166* (0.089)
Foreign		-0.320** (0.149)	-0.267** (0.123)
DM (logged)		-0.038 (0.047)	-0.017 (0.038)
SMD		-0.120 (0.167)	-0.133 (0.134)
Gender			-0.041 (0.044)

*Continued on next page*

Table 2.2 – *Continued from previous page*

	(1)	(2)	(3)
Participation			–0.051 (0.048)
Reelected			0.043 (0.042)
DPP			–0.172*** (0.040)
NP			–0.329*** (0.102)
NPSU			0.759*** (0.105)
PFP			0.173*** (0.067)
TIP			0.399* (0.236)
TSU			0.486*** (0.126)
Independents			0.464*** (0.073)
Extremism (1d)			–2.184*** (0.110)
Extremism (2d)			–0.262*** (0.086)
Session 3			0.293*** (0.056)
Session 4			0.002 (0.055)

*Continued on next page*



Table 2.2 – *Continued from previous page*

	(1)	(2)	(3)
Session 5			−0.674*** (0.063)
Session 6			−0.493*** (0.059)
Constant	−2.983*** (0.050)	−2.985*** (0.050)	−1.146*** (0.121)
Observations	1,013	1,013	1,010
R <sup>2</sup>	0.023	0.031	0.473
Log Likelihood	2,010.946	2,013.951	2,292.476
<i>Note:</i>	*p<0.1; **p<0.05; ***p<0.01		

*End of table*

One interesting point from the results in Table 2.2 is that the SMD variable does not make a significant difference from the closed-list PR variable. Unlike most district elections under which more than two legislators are elected, the SMD legislators do not have intra-party competition, while they still have inter-party personal vote-seeking incentives (Batto, 2009). Based on this difference between SNTV-MMDs and SMDs, legislator’s dimensionality in Taiwan seems contingent upon intra-party competition, rather than inter-party personal vote-seeking incentives. This makes an expectation that the “best of both world” model of legislative behavior no longer exists in the post-reform Taiwan. (Rich, 2014) provides an empirical support for this by examining voting cohesion in the post-reform era. In his analysis, he finds that

the different electoral rules between SMD and PR do not lead a different outcome.

To test this conjecture, I analyze the 7th legislative session's roll call voting data that includes the total of 145 legislator's roll call voting behavior on 1,030 bills. I use the same dependent variable, one minus the GMP score, as well as same independent and control variables, except for the SMD variable and a series of dummy variables that count for legislative sessions. Again, I use the beta-regression.

Table 2.3 summarizes the findings. From the Table 2.3, it turns out that Taiwan in the post-reform era does not fall onto the "best of both worlds" model of mixed-member electoral systems. There is not a significant difference between the nominal and the list legislators in the 7th session.

#### **2.4.2 South Korea**

Since the democratization in 1987, South Korea has employed a mixed-member electoral system that combines plurality SMDs and closed-list PR in a single nationwide district. While the SMD rule has been constant during this chapter's covered time period, the seat allocation rule for the closed-list PR has been changed in 2004. Previously, voters cast a single vote for a district election, and using an aggregated vote share of the party's district election, the number of PR seats for each party is assigned. After the revision of the electoral rules in 2004, voters cast the two votes; one for district election and the other for a closed-list of each party (Park, 2002; Rich, 2012).

Table 2.3 : Electoral Rules and Multidimensionality: Post-reform Taiwan

	<i>Dependent variable: Multidimensionality</i>		
	(1)	(2)	(3)
District	0.037 (0.061)	0.029 (0.062)	0.010 (0.053)
Aborigin		0.146 (0.118)	0.157 (0.104)
Foreign		-0.165 (0.323)	-0.015 (0.259)
Gender			-0.068 (0.049)
Participation			-0.015 (0.064)
Reelected			0.031 (0.057)
Extremism (1d)			-1.020*** (0.173)
Extremism (2d)			0.396*** (0.112)
DPP			-0.001 (0.049)
NPSU			0.267** (0.125)
PFP			-0.246 (0.269)
Independents			0.571*** (0.171)
Constant	-4.363*** (0.053)	-4.363*** (0.053)	-3.653*** (0.145)
Observations	125	125	125
R <sup>2</sup>	0.004	0.020	0.426
Log Likelihood	519.437	520.302	551.848

*Note:*

\*p&lt;0.1; \*\*p&lt;0.05; \*\*\*p&lt;0.01

Regardless of this change, the variances of electoral rules for PR legislators do not make any difference in personal vote-seeking incentive structure. In both cases, voters are not allowed to choose a specific PR candidate from the party's list, and therefore PR legislators do not have a reason not to follow party's positions on roll call votes. In other words, the electoral rules for PR do not have any personal vote-seeking incentives (Rich, 2013, 2014; Jun and Hix, 2010).

The Korean case falls under the category of the contamination model of mixed-member electoral systems (Rich, 2014; Jun and Hix, 2010). This is due to informal rules in the candidate selection process and the resulting career trajectory of PR legislators and party influence in SMD elections. In order to meet the condition for the best of both worlds model, legislators elected in each tier are expected to and want to be reelected in the same electoral tier. However, this condition does not hold for PR legislators. Party leaders have a strong power on candidate selection procedure in PR list, and they want to enhance party brand by recruiting new elites who are celebrated in other fields such as business, legal professions, bureaucrats, or universities (Jun and Hix, 2010). As the number of PR seats is small, there is no room for incumbent PR legislators to be re-listed in the next election.

Given this de facto term limit context, some PR members seek to be reelected in district tier in the next election, while other may take a single term in the legislature and then retire and come back to their original career (Jun and Hix, 2010). At any rate, the assumption for reelection ambition that makes specific electoral rules lead

expected legislative representation does not hold for PR legislators. Table 2.4 shows the ratio of legislators who are reelected in the same electoral tiers.

Table 2.4 : The Renominated and Reelected Legislators in the Same or Different Electoral Tiers

(a) SMD → SMD				
Session	$N_{t-1}$	Renominated	Reelected	$N_t$
16th → 17th	227	147	82	243
17th → 18th	243	174	117	245
18th → 19th	245	153	99	246

(b) SMD → PR				
Session	$N_{t-1}$	Renominated	Reelected	$N_t$
16th → 17th	227	4	1	56
17th → 18th	243	0	0	54
18th → 19th	245	11	1	54

(c) PR → PR				
Session	$N_{t-1}$	Renominated	Reelected	$N_t$
16th → 17th	46	0	0	56
17th → 18th	56	2	1	54
18th → 19th	54	2	0	54

(d) PR → SMD				
Session	$N_{t-1}$	Renominated	Reelected	$N_t$
16th → 17th	46	18	6	243
17th → 18th	56	27	10	245
18th → 19th	54	13	5	246

Political parties are rooted in society alongside the regional cleavage between Honam and Yongnam areas in South Korea (Kim et al., 2008; Moon, 2005). While

in most districts, no party holds safe seats, but due to regional cleavage, almost all districts in the two regions are dominated by particular parties. For example, the Grand Nation Party, the major conservative party, has never won in Honam area from 16th through 18th legislative elections. In these districts, dominant parties' nominations almost guarantee electoral winning. For this case, the most concern for legislators from these districts is to be re-nominated by their parties. Thus, in their roll call voting decision, they should follow their party's line, which is alongside in the main dimensions.

Given the above descriptions, South Korea can be considered as the case to apply the hypothesis for the contamination model of mixed-member electoral systems.

### **Data, Method, and Results**

For an empirical test of the theoretical expectation discussed earlier, I utilize the entire set of roll call voting information in the recent three legislative sessions in the KNA<sup>6</sup>. Following a conventional rule of thumbs, I exclude legislators who do not have enough history of roll call voting (less than 20 times) and lop-sided roll call votes where the minority's proportion is less than 2.5% of the total participants of the votes. Then, 911 legislators and 728 roll call votes are used in this section. Table 2.5 provides detailed information for the numbers of legislators and roll call votes in the Korean National Assembly.

Table 2.5 : The Number of Legislators and Roll Call Votes by Sessions in South Korea

Session	Legislators	Votes
16th	288	471
17th	323	2189
18th	329	2558

Regarding individual legislator's dimensionality, I use individual legislator's GMP score from the two-dimensional W-NOMINATE model on each legislative session. As same as the case of Taiwan, the dependent variable is measured by extracting 1 from the GMP score to make higher values denote legislator's multidimensionality beyond the simple two dimensions.

The main explanatory variable is a binary variable of electoral rules, coded 1 if legislators are elected from district competition and 0 for the PR cases. As the KNA case falls into the contamination model of mixed-member electoral system, I expect that the estimated coefficient of this variable in the statistical model would not be positive as the case of best of both worlds model.

In addition to this variable of main interest, I include several control variables, such as the two ideological extremism variables, the two series of dummy variables to control for legislative session and political parties, and the two district-specific

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<sup>6</sup>The KNA uses electronic voting system, and all roll call voting information is recorded in the KNA's official Hansard. Rare exceptions are made if legislators agree for specific votes to be secret. I obtained the Hansard pdf files, parsed them to transform such information into the conventional data format by using Python and R programs.

variables, Yeongnam and Honam, that capture electoral competitiveness.

As the dependent variable is bounded from 0 through 1, I use beta regression. The first model includes only the main explanatory variable. The second model contains control variables except for the two district-specific variables. The last model is a full model, including all explanatory and control variables.

The results are summarized in Table 2.6. First and foremost, the results support the second hypothesis for the contamination model of mixed-member electoral system. While the coefficients for district election variable are positive, the values of this coefficient are not statistically significant in terms of 95% confidence interval. This finding implies that the type of election variable, as expected, does not differentiate the KNA legislators.

## 2.5 Conclusion

Both electoral studies and the spatial model of legislative politics are highly developed fields in the discipline. Surprisingly, integrating these two fields provides a conflicting phenomenon: low-dimensionality in the legislature, regardless of electoral rules. More surprisingly, this unique feature is rarely studied. In this chapter, I investigate one piece of this puzzle by focusing on the effects of electoral rules on individual legislator's dimensionality.

The intellectual merits of mixed-member electoral systems allow for the testing of theoretical expectations of the effects of electoral rules, not only within a single



Table 2.6 : Electoral Rules and Multidimensionality: South Korea

	<i>Dependent variable: Multidimensionality</i>		
	(1)	(2)	(3)
District	0.015 (0.052)	0.039 (0.048)	0.036 (0.051)
Extremism (1d)		0.041 (0.099)	0.058 (0.101)
Extremism (2d)		-0.153* (0.078)	-0.156** (0.079)
Yeongnam			-0.017 (0.052)
Honam			0.060 (0.069)
Democratic Parties		-0.053 (0.057)	-0.067 (0.061)
Social Democratic Parties		0.360*** (0.136)	0.352*** (0.137)
Minor Conservative Parties		0.388*** (0.092)	0.387*** (0.094)
Independents		0.116 (0.086)	0.107 (0.087)
Session 17		-0.522*** (0.045)	-0.518*** (0.045)
Session 18		-0.649*** (0.047)	-0.652*** (0.047)
Constant	-1.630*** (0.047)	-1.238*** (0.084)	-1.239*** (0.085)
Observations	911	911	911
R <sup>2</sup>	0.0001	0.209	0.210
Log Likelihood	979.419	1,093.294	1,093.757

Note:

\*p<0.1; \*\*p<0.05; \*\*\*p<0.01

country but also across countries. A within-country research design considers electoral rules in isolation with other confounding variables, and the two types of mixed systems offer an opportunity to examine electoral rules independently (the best of both worlds model) as well as interactively with other institutional variables (the contamination model).

Empirical evidence from the two East Asian mixed-member electoral systems generally supports the theoretical expectations. In pre-reform Taiwan, an ideal case on which to apply the best of both worlds model of mixed systems, legislators elected from multi-member districts are more multidimensional than PR members. In South Korea as a good case on which to apply the contamination model of mixed systems, as expected, I did not find any difference between the SMD and PR tiers.

## Chapter 3

# Roll Call Voting Analysis in Hong Kong

### Chapter Abstract

This study analyzes the degree to which Hong Kong has been polarized by the issues of democracy and the relationship between Hong Kong and Mainland China. By analyzing roll call voting behavior in the Legislative Council (LegCo, 1998-2012), I present empirical findings that these competing political visions have been the single most important cleavage in Hong Kong politics. At the same time, however, there are substantial differences among the LegCo members on the salience of this Beijing/democracy issue dimension. The major political party members and the legislators elected in Functional Constituencies and Election Committee vote exclusively along the main issue dimension. In contrast, roll call voting behaviors of the minor party members and the independents are less explained by the major political issue cleavage. These findings provide an additional lens for a better understanding of the political landscape and the role of political parties in Hong Kong.

### 3.1 Introduction

Research on Hong Kong is replete with statements to the effect that the main political cleavage is based on the issues of democracy and the relationship between Hong Kong and Mainland China<sup>1</sup>. However, this conventional understanding has not yet led to the development of empirical investigation that enables the evaluation of the relative importance of this China/democracy issue in Hong Kong politics. Previous studies take it for granted or present anecdotal evidence regarding the salience of the pro-China versus pro-democracy cleavage (e.g. Baum, 2000; Ma, 2007). The purpose of this paper is to analyze the extent to which this pro-China vs. pro-democracy issue dimension explains Hong Kong politics.

Through an analysis of comprehensive roll call voting data in the Legislative Council (LegCo) from 1998 through 2012, I present quantitative evidence that the pro-China vs. pro-democracy issues have been the single most important cleavage in Hong Kong politics. At the same time, however, there are substantial differences among the LegCo members on the salience of the salience of this Beijing/democracy issue dimension. The major political party members, and the legislators elected in Functional Constituencies and Election Committee vote exclusively along the main issue dimension. In contrast, roll call voting behaviors of the independents, making up about one-third of the LegCo seats, are less explained by the major political issue

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<sup>1</sup>In this paper, I interchangeably use the issues of democracy and the relationship between Hong Kong and China, China/democracy, and pro-China vs. pro-democracy, for stylistic reasons. All of these concepts are considered complementary to capturing the main political cleavage in Hong Kong (Siu-Kai and Hsin-Chi, 2000).

cleavage. These findings provide an additional lens for a better understanding of the political landscape and the role of political parties in Hong Kong.

This chapter's structure is as follows. First, I provide a brief overview of the institutional and political features of the LegCo. Next, I discuss roll call vote data and methodology and present the results of an analysis of these data. Following that, I discuss the possibility of the existence of higher order dimensions. And then, I analyze whether the institutional incentives faced by individual legislators lead to the low-dimensional structure of the LegCo. Finally, I summarize this paper's findings with their implications.

### **3.2 Political Institutions and Party Systems in Hong Kong**

Hong Kong is one of the Special Administrative Regions (SAR) of the People's Republic of China. Since its handover from the British, which resulted in Chinese sovereignty in 1997, Hong Kong has maintained a different political system from Mainland China under the principle of "one country, two systems (OCTS)." The OCTS rule provides Hong Kong with a high degree of autonomy for in all matters except for foreign relations and military defense (Geping and Zhenmin, 2007; Wai-Man et al., 2012).<sup>2</sup>

Hong Kong has been featured as an executive-led form of government<sup>3</sup>with a

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<sup>2</sup>The OCTS principal has federalist characteristics. In other words, this rule divides the activities of government between regional governments and the central government to make final decisions on some activities by each kind of government. However, it does not mean that the People's Republic of China is a federal state. This is mainly because Mainland China maintains constitutionally unitary state status, regardless of the OCTS model (Cheung, 2007).

unicameral legislature. The executive branch has never been directly elected by universal suffrage but chosen by the Election Committee. These Election Committee members<sup>4</sup> are nominated from economic sectors, religious organizations, and previous municipal and central government officers (Lam, 2000; Loh and Exchange, 2006). As the Chief Executive of Hong Kong is not elected by universal suffrage, legislative election is the only opportunity for Hong Kong residents to reveal their political preference.

Since the handover, Hong Kong has held five legislative elections in 1998, 2000, 2004, 2008, and 2012. The total number of seats had been 60 but was increased to 70 in the 2012 election. The LegCo members are elected through multiple distinct methods. The changing size and composition of LegCo are shown in Table 3.1.

Table 3.1 : The Composition of the LegCo, 1998-2012

	GC	FC	EC	Total
1998-2000	20	30	10	60
2000-4	24	30	6	60
2004-8	30	30	0	60
2008-12	30	30	0	60

The LegCo members in geographic constituencies are elected through a general election with universal suffrage under closed-list proportional representation system

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<sup>3</sup>The executive has strong powers to control the LegCo, such as dissolution of parliament, but the LegCo does not have reciprocal powers. This executive-led principal was employed under British rule and has been continued until now (Wai-Man et al., 2012).

<sup>4</sup>The number of the Election Committee has been increasing over time. It was 400 for the 1996 election; 800 for the 2002, 2005, 2007 elections; and 1,200 for the 2012 election

(PR). There are five districts including Hong Kong Island, Kowloon West, Kowloon East, New Territories West, and New Territories East. The number of seats for these districts ranges from three to eight. The total number of seats in these geographic constituencies was 20 for the 1998 election, 24 for the 2000 election, 30 for the 2004 and 2008 elections, and then 35 for the 2012 election, respectively. These direct elections have been conducted in a free and fair manner with a seven-week campaign period similar to competitive elections in democratic countries around the world (Ma, 2005; Ma and Choy, 2003).

The other LegCo members are elected by indirect elections in functional constituencies and the Election Committee. In the first and second LegCo elections, 10 and 6 LegCo members were elected by the Election Committee, respectively. This practice was abolished since the third LegCo. Remaining LegCo seats are filled from functional constituencies (FCs). FCs were established in 1985 after the British and Chinese governments made an agreement over the transfer of sovereignty. FCs represent the interests of business and professional, social, and religious groups. LegCo members in FCs are elected by selected elites as well as other designated legal entities such as organizations and corporations (Zhang, 2011; Loh and Exchange, 2006).<sup>5</sup>

Given that more than two types of electoral rules are employed, the LegCo provides a unique institutional setting for a comparison of the electoral rules holding many other external factors constant (Moser and Scheiner, 2012; Shugart and Wattenberg,

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<sup>5</sup>This is a unique feature of political institutions in the Greater China. Macau SAR has been using this FC system in its legislative elections since the handover from the Portuguese Republic (Loh and Exchange, 2006). It was also used in Taiwan before its democratization (Winkler, 1970)

2001). The LegCo members in geographic constituencies face diverse interests from their constituencies. In contrast, the LegCo members representing functional interests have a strong incentive to focus on the narrow interests of a small group in their functional constituencies (Loh and Exchange, 2006; Zhang, 2011).

Political parties in Hong Kong have developed from being almost non-existent to becoming key actors in Hong Kong politics in the past two decades. Different studies evaluate the strength of Hong Kong's party politics differently. Studies on electoral politics point out that party systems are not well institutionalized like their counterparts in democratic countries (Lau and Kuan, 2002; Siu-Kai and Hsin-Chi, 2000; Kuan and Lau, 2002; Lam, 2010; Ma and Choy, 2003). In contrast, a study of roll call voting in the LegCo presents strong party cohesions in the legislative arena that imply institutionalized party politics (Wang and Peng, 2012).

Hong Kong has a multi-party system, and no single party won a majority status to control the LegCo. These political parties are usually divided into two camps: pro-democracy and pro-China. Historically, three political parties have been most influential in the LegCo, including the Democratic Party (DP), the Democratic Alliance for the Betterment and Progress of Hong Kong (DAB), and the Liberal Party (LP). These three parties have represented the three prominent and conflicting values in Hong Kong: democracy, relationship with the Mainland, and business (Lo, 2010; Wai-Man et al., 2012).

The DP is considered a flagship party in the pro-democracy camp, which has



adopted a more progressive attitude toward Hong Kong's democratic developments, such as universal suffrage for the chief executive election. The DP also puts more emphasis on preserving freedoms and human rights. The DAB is a counterpart flagship party in the pro-China camp. Political parties in the pro-China camp generally emphasize a better relationship between Hong Kong and the Mainland China and adopt a conservative attitude toward democratization. The LP has shared a common view regarding China/democracy issues with the DAB, but the two parties have different interests on economic issues. The DAB has stood for the interests for the middle and lower classes, but the LP has represented the interests of the business community (Baum, 2000; Lam, 2000).

While these three parties are major political actors in Hong Kong politics, their total seat share in the LegCo has been about half of the total number of seats. The minor party members and independents have filled the remaining seats. Table 3.2 summarizes the distribution of LegCo seats among political parties in the two camps.

This fragmented legislature results from two institutional constraints imposed by Mainland China to hinder the development of party politics (Lau and Kuan, 2002). First, half of LegCo seats are filled in FCs and by the Election Committee. As the number of voters for these electoral rules is very small, and these voters have narrow interests, candidates for these seats have to target their own constituencies<sup>6</sup>. In other words, they do not need a general platform of political parties. In return, many of the LegCo members elected from FCs do not have party affiliations. Second, there is

Table 3.2 : The Distribution of LegCo Seats Among Political Parties

		1998-2000		2000-4		2004-8		2008-12	
Pro-democracy	DP	13	(21.67%)	12	(20.00%)	9	(15.00%)	9	(15.00%)
	Other Parties	5	(8.33%)	6	(10.00%)	8	(13.33%)	2	(3.33%)
	Independents	2	(3.33%)	4	(6.00%)	8	(13.33%)	2	(3.33%)
Pro-China	DAB	9	(15.00%)	10	(16.67%)	10	(15.00%)	10	(15.00%)
	LP	10	(16.67%)	8	(13.33%)	10	(15.00%)	7	(11.89%)
	Other Parties	7	(8.33%)	6	(10.00%)	8	(13.33%)	2	(3.33%)
	Independents	14	(23.33%)	7	(11.89%)	3	(5.00%)	4	(6.67%)
Total		60	(100%)	60	(100%)	60	(100%)	60	(100%)

Sources: (Baum, 2000; Cheng, 2010; Loh and Exchange, 2006; Ma, 2001, 2007; Scott and Leung, 2004; Wai-Man et al., 2012)

no party law in Hong Kong, and any collection of individuals, socioeconomic groups, or minor parties can form their own list in geographic constituencies. Even a single individual is also able to form his or her own list for the election. This absence of party laws allows many small parties to run for elections with fewer costs. (Loh and Exchange, 2006; Ma and Choy, 2003).

It is generally accepted that the main political cleavage in Hong Kong reflects the relationship between Hong Kong and China. However, it is unclear to what extent this cleavage is important in comparison with other potential issues in Hong Kong. For the sake of discussing cleavage based on additional issues, some studies include an economic left-right issue dimension (Baum, 2000; Ma, 2007), while others take the

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<sup>6</sup>For example, voters in the Finance FC and the Legal FC comprise about 130 banks and related companies and about 5,000 lawyers and law-related occupations, respectively.

China/democracy issues alone (Ma and Choy, 2003). In the following sections, I will describe data and methods and provide an empirical investigation into the salience of these major political cleavages.

### 3.3 The Main Political Cleavage in the Legislative Council

In the past two decades, the analysis of roll call votes to reveal the underlying latent preferences in the major political cleavages has significantly developed (Clinton et al., 2004; Poole, 2005). This analytical technique allows for scholars to investigate quantitative evidence of the main political cleavages in legislatures (Hansen, 2008; Hix and Jun, 2009; Jones and Hwang, 2005).

The LegCo makes it a rule to keep all roll call voting records be accessible to the public. This extensive roll call voting data allows a comprehensive analysis of the LegCo politics for the four legislative sessions from 1998 through 2012. The total number of the LegCo members is 243, and the total number of roll call votes is 1,301. Table 3.3 summarizes the statistics of numbers of legislators and roll call votes in each legislative session.

In order to measure the major political cleavages in the LegCo, I use the W-NOMINATE technique, one of the standard geometric scaling techniques <sup>7</sup>in contemporary literature. The W-NOMINATE model assumes that the status quo and

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<sup>7</sup>The other popular tools include the Optimal Classification (OC) (Poole, 2005) and Bayesian ideal point estimation techniques (Clinton et al., 2004). As a robustness check of the W-NOMINATE results in this chapter, I also applied these two techniques and the results are identical.

Table 3.3 : The Number of LegCo Members and Roll Call Votes by Sessions in Hong Kong

	Members	Roll Call Votes
1st (1998-2000)	61	142
2nd (2000-4)	61	204
3rd (2004-8)	61	452
4th (2008-12)	60	503
Total	243	1301

an alternative choice can be projected on a basic issue space. Within this space, individual legislators' most preferred outcomes are represented as ideal points. As legislators in the W-NOMINATE model want to maximize their utilities<sup>8</sup>, they most desire outcomes closest their ideal points. To get the information of expected utilities, they measure the distances between their ideal points and ideal points of the status quo and an alternative choice. Individual legislators use this information and vote for/against bills for the closer outcome.

Based on these assumptions of the spatial model of voting (Enelow and Hinich, 1984), the W-NOMINATE algorithm estimates individual legislators and roll call votes in a basic issue space, based on legislators' roll call voting records. In order to apply the W-NOMINATE model to Hong Kong politics, I prepare the four matrices of binary choices on roll call votes - votes for or against the given bills - held by the LegCo members for the four legislative sessions. Then, I execute the one-dimensional

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<sup>8</sup>Individual legislators are assumed to have symmetric and single-peaked utility functions that center on their ideal points.

W-NOMINATE models four times.

The logic behind the use of a one-dimensional scaling model is the assumption that single criteria, that is, the Beijing/democracy issue, is sufficient as a basic issue space in Hong politics. If this assumption is satisfied, most of the variation in voting patterns will be explained by their estimated ideal points and the location of votes along one major criterion. In the W-NOMINATE model, several measurements of diagnostic statistics are provided for this model fitness, including Correct Classification percentages (CC), Aggregate Proportional Reduction Errors (APRE), and Geometric Mean Probabilities (GMP) (Poole, 2005).

Correct Classification (CC) percentage refers to what extent the W-NOMINATE model successfully classifies the LegCo member's voting behavior. Table 3.4 summarizes the overall roll call classification rates by sessions. For comparison, I include one- and two-dimensional W-NOMINATE models' results. The two-dimensional model assumes that Hong Kong politics should be explained by at least two issue cleavages.

When the W-NOMINATE model assumes there is only one major political issue cleavage in the LegCo, this model explains about 94% of roll call voting decisions since the first LegCo. In other words, single criteria correctly explains 43,408 of 46,109 decisions of the total of 243 legislators on the total of 1,301 votes.

In contrast, the second dimension does not have a strong explanatory power. When this additional issue dimension is added, the model is able to classify about 95% of roll call voting behaviors, which means this second criterion only explain

about additional 1% of decision-makings in the LegCo. Moreover, its impact has been decreasing. In the first session, this second dimension explained an additional 4.91% of voting behaviors. However, in the fourth session, there is no meaningful second dimension anymore.

Table 3.4 : Statistics for Model Fitness by Sessions

			1D	2D	2D-1D
1st	(1998-2000)	CC	92.3%	95.2%	2.9%
		APRE	.719	.859	.14
		GMP	.779	.875	.096
2nd	(2000-4)	CC	93.29%	96.56%	3.27%
		APRE	.805	.9	.095
		GMP	.845	.907	.062
3rd	(2004-8)	CC	94.86%	95.93%	1.07%
		APRE	.837	.871	.034
		GMP	.874	.903	.029
4th	(2008-12)	CC	95.1%	95.06%	-.04%
		APRE	.846	.845	-.001
		GMP	.86	.881	.021

Aggregate Proportional Reduction of Error (APRE) denotes the extent to which the spatial model accounts better for roll call votes than a model that simply predicts that each legislator always votes with the side in the majority on each roll call.<sup>9</sup> Geometric Mean Probability (GMP) is defined as the likelihood of an observed choice is the assigned probability by W-NOMINATE model to that choice. The two measures

vary from 0 to 1, and higher values denote voting behavior that is better explained by the W-NOMINATE model. As same as the CC rates show, adding one additional dimension does not improve the model's explanatory power, and as time goes on, its impact decreases.

Another way of determining the number of salient issue dimensions is to use eigenvalues provided by the W-NOMINATE model. In the process of the W-NOMINATE algorithm, a legislator's roll call voting matrix is transformed to a small number of dimensions, and eigenvalues are used to condense the variance in the given matrix to those dimensions. Therefore, the size of the eigenvalue for each dimension is considered as the strength of the dimension in legislative politics.

As with the CC, APRE, and GMP measures, the eigenvalue statistics supports the view that a single-issue cleavage has dominated LegCo politics. Figure 3.1 supports for this statement. The horizontal axes of these scree plots in Figure 3.1 refer to the major issue cleavages of each legislative session and the vertical axes are the size of the eigenvalues of these issues. As this plot presents from the most important dimension to the least important dimension, we can easily find how many dimensions have meaningful variance of given roll call voting data. At a glance, these figures reveal that the first dimension is the single most important dimension in the LegCo. Moreover, the strength of this major issue has been increasing over time.

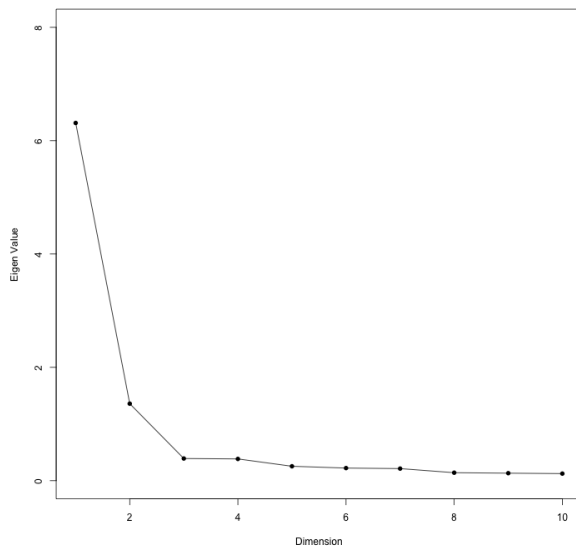
While these diagnostic statistics show that a single-issue cleavage has dominated

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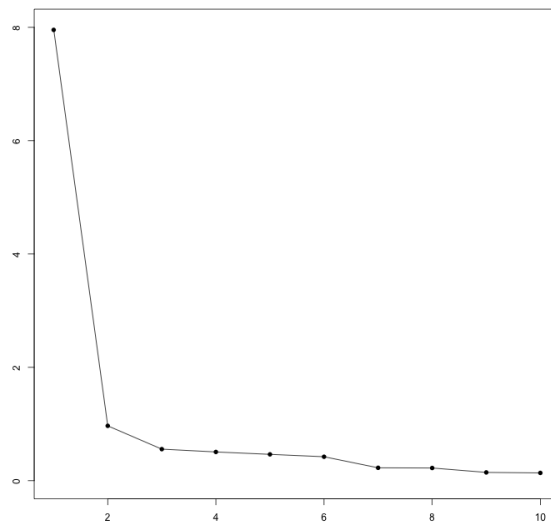
<sup>9</sup>APRE is measured by this formula:  $APRE = \frac{\sum_{j=1}^n (MinorityVote - ClassificationErrors)_j}{\sum_{j=1}^n MinorityVote_j}$ , where  $j$  is each legislator, and  $n$  is the total number of legislators

Figure 3.1 : Eigenvalue Scree Plot

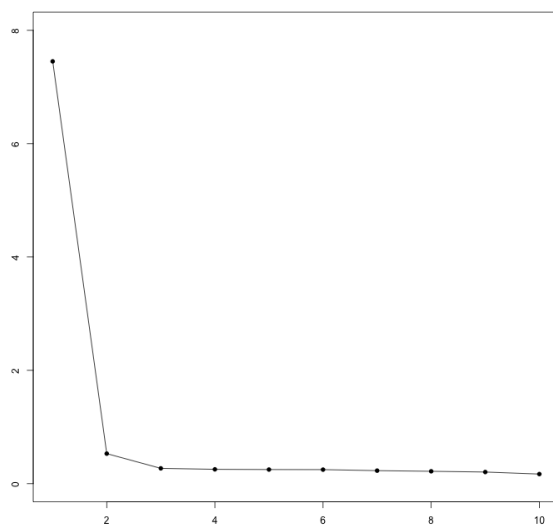
(a) 1st (1998-2000)



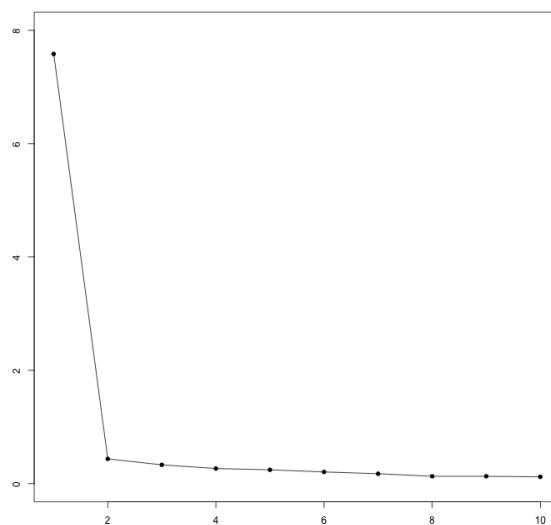
(b) 2nd (2000-4)



(c) 3rd (2004-8)



(d) 4th (2008-12)





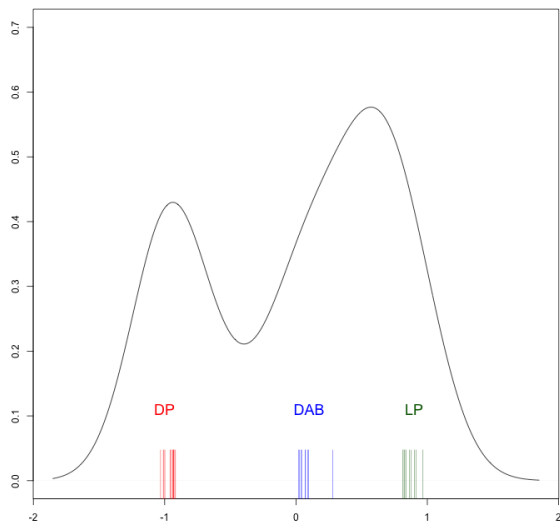
the LegCo politics, it is uncertain whether this dimension reflects the Beijing/democracy issues or not. That is, this scaling technique provides quantitative information to examine the strength of each dimension, not the meaning of it. In order to define the meaning of the main dimension, it is necessary to interpret the distribution of legislators' ideal points substantively.

In this case, if the main dimension reflects the Beijing/China issues, then the LegCo members' ideal points should be aligned along this dimension, with legislators in the pro-democracy camp, e.g. the Democratic Party, occupying the left of the continuum and the LegCo members in the pro-Beijing camp, e.g. the DAB and the Liberal Party, located on the right. Figure 3.2 provides such information. The kernel density plots in Figure 3.2 illustrate the overall distribution of the LegCo members' ideal points for each of the four legislative sessions. As discussed, the LegCo politics have been polarized by two camps. In addition, Figure 3.2 includes the rug plots, that is, plots of tick marks along the horizontal axis below the density plots, and these rug plots show the locations of the three party members' ideal points. As expected, the DP members are located in the left side of the first dimension, while members of the DAB and the LP fall on the right side. Thus, it is reasonable to state that the main dimension in the LegCo consistently reflects the conflict between pro-China and pro-democracy camps across the four LegCos.

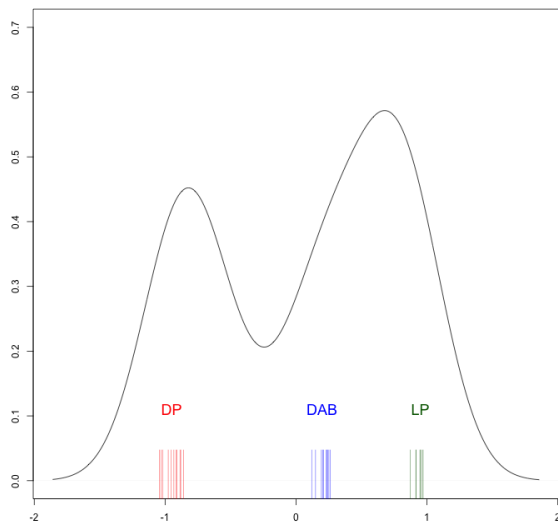
To summarize, empirical evidence supports that the dominant cleavage consistently reflects the issues of democracy and the relationship between Hong Kong and

Figure 3.2 : The Distribution of Ideal Points

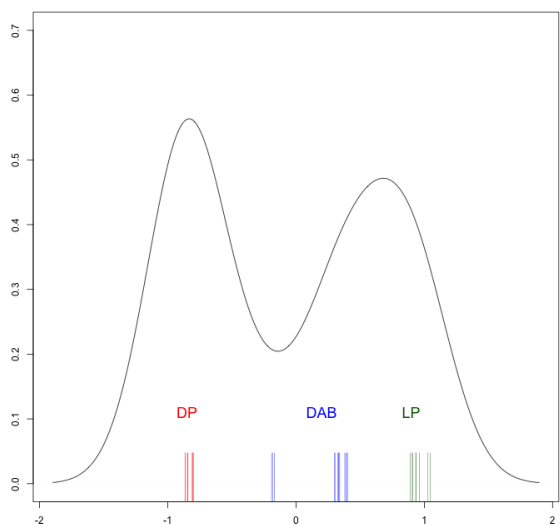
(a) 1st (1998-2000)



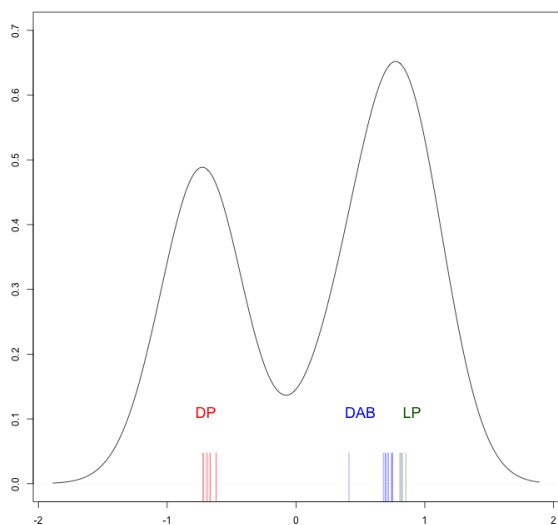
(b) 2nd (2000-4)



(c) 3rd (2004-8)



(d) 4th (2008-12)



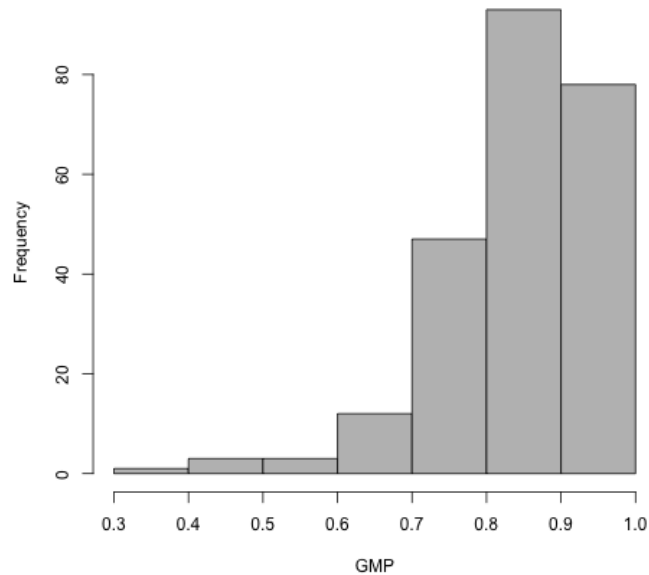
Mainland China across the four legislative sessions since the handover. Moreover, other potential political divisions, such as economic and/or social issues, are less powerful and their strength has been diminishing.

It should be noted that this overall dominance of the relationship between Hong Kong and Beijing in LegCo politics does not mean that all LegCo members make voting decisions based on the major issue cleavage. In the next section, I will investigate individual-level of variance on the major political cleavage with an emphasis on the role of electoral rules and political parties in the LegCo.

### **3.4 Electoral Rules, Party Politics, and Political Cleavage in the Legislative Council**

The number of issue dimensions is important in legislative decision-making. Low-dimensional legislature allows for researchers to formulate a clear expectation of the location of policy outcome (Arrow, 1963; Black, 1948). In contrast, fostering a stable outcome is not easy in a multi-dimensional issue cleavage structure (McKelvey, 1979). Hence, reducing the number of latent issues into a low-dimensional structure in the roll call voting stage is one of the important roles of legislative organization. Existing studies have shown various ways, such as logrolling (Shepsle, 1979), committee systems (Shepsle and Weingast, 1981), and political parties (Aldrich, 1995; Aldrich and Rohde, 2001; Rohde, 1991; Cox and McCubbins, 2005, 2007), and these theoretical backgrounds are useful for predicting an individual legislator's behavioral alignment

Figure 3.3 : Histogram of Individual Legislators' GMP Scores



on the major political cleavage.

Figure 3.3 shows a variance of individual legislators' Geometric Mean Probability scores, which measures the extent to which each legislators' roll call voting behaviors are aligned to the main issue dimension. As discussed earlier, the scores vary from 0 to 1, and higher values denote that the LegCo member votes more exclusively based on the main issue dimension. As the first dimension is the main decision criteria for the LegCo members, the overall GMP scores are high. Yet, there is still an interesting variance of the GMP scores that indicates some legislators are more likely to focus on the main issue dimension than others.

The LegCo provides a unique institutional settings of electoral rules and party

politics that influence on this variance regarding the number of observed issue dimensions that individual LegCo members use. If it matters whether LegCo members to make their voting decision based on the pro-China vs. pro-democracy issue, there will be a systematic difference on this GMP score.

First, Hong Kong's different types of electoral rules provide different institutional incentives for legislators elected in Geographical Constituencies (GCs), in Functional Constituencies (FCs), and by the Election Committee. FCs and Election Committee are strategically designed to serve pre-defined Hong Kong's pre-defined major interests for maintaining the status quo: the major issue dimension (Loh and Exchange, 2006; Zhang, 2011). Therefore, legislators elected by these electoral rules are expected to be stick with the major political cleavage. In contrast, legislators elected in Geographic Constituencies face diverse interests from their constituencies (Kwong, 2007; Ma, 2007), and these interests are not always represented by the primary issue dimension. Thus, these legislators' voting behaviors would be less explained by the main dimension. These expectations are formulated by the following hypothesis.

*H1: Legislators elected in Geographical Constituencies are less likely to be aligned on the major issue dimension than other LegCo members.*

Another expectation is that the major party members are more concerned with the main political cleavage than minor party members and independents. As the key political actors, the three major parties are expected to show strong interest

aggregation activities that lead collective decision-making under the main political cleavage (Lo, 2010; Ma, 2007). In this sense, I expect that the three major parties – the DP, the LP, and the DAB – lead LegCo politics into a low-dimensional decision-making structure (*H2a*).

At the same time, a counter-expectation exists regarding the LP. In addition to representing the conservative view on China/democracy issues, this party has incorporated the business sector’s economic concerns into party politics, which is distinguished from the main issue dimension (Baum, 2000; Lam, 2000). From this perspective, I expect that members of the DP and the DAB are more likely to be aligned to the main dimension than other LegCo members, while the LP members are likely to be aligned than others. Moreover, it is possible for the members of the LP to be less aligned to the main dimension than other legislators, as they bring the business-oriented issues beyond the major dimension (*H2b*). These two expectations are formulated as follows.

*H2a: The members of the DP, the DAB, and the LP are more likely to be aligned on the major issue dimension than other LegCo members.*

*H2b: The members of the DP and the DAB are more likely to be aligned on the major issue dimension than other LegCo members, while the LP members are likely, or less likely, to make their voting decision based on the major issue dimension than other LegCo members.*

In contrast, I expect that the independent LegCo members’ roll call voting be-

haviors are not likely to be exclusively based on the major issue dimension. Political elites have different backgrounds and preferences, and without any partisanship that works for interest aggregation, they do not have to be stick with the main political cleavage (Sing, 2009). Moreover, to be reelected, they are required to show legislative activities beyond the main issue that are differentiated from partisan legislators (Scott and Leung, 2004). This expectation is formulated as the following hypothesis.

*H3: Independent legislators are less likely to be aligned on the major issue dimension than other LegCo members.*

In order to test these expectations, I prepare a dependent variable as well as several explanatory and control variables. The dependent variable is individual LegCo members' GMP score, estimated by the one-dimensional W-NOMINATE model. The main explanatory variables are the types of election and party affiliations.

The types of election variables are two dummy variables, FC and EC, coded as 1 if the LegCo member is elected in Functional Constituencies and by Election Committee, respectively, and 0 otherwise. The baseline is legislators elected in Geographic Constituencies. If H1 holds, I expect that the coefficients of these variables will be positive and statistically significant.

Major political parties are three dummy variables that code as 1 if the LegCo member is the DP, the DAB, or the LP, respectively and 0 for otherwise. If H2a holds, the coefficients of these variables will be positive and statistically significant,

which means that these three party members' voting decisions are mainly based on the two major issue cleavages. If H2b holds, the coefficients of the DP and the DAB variables will be positive and statistically significant, while the LP's will be statistically insignificant or negative and statistically significant.

Another main explanatory variable for independent legislators is also a dummy variable that codes 1 if the LegCo member is independent and 0 for otherwise is included. The expectation is that the coefficient of this variable is negative and statistically significant, which means that independent LegCo members take a position following parochial issues representing their particular voters. The baseline is minor party members in this model.

In addition, I include several control variables, such as the two ideological extremism variables as well as the two series of dummy variables to control for legislative session and types of election. As the dependent variable is bounded between 0 and 1, I use beta regression, which is the recommended statistical model for this type of data (Ferrari and Cribari-Neto, 2004; Paolino, 2001; Smithson and Verkuilen, 2006).

Table 3.5 summarizes the results. First, it shows that the LegCo members elected in Functional Constituencies and by the Election Committee are more aligned to the major issue dimension, as expected in H1. The estimated coefficients for the FC and EC variables are positive and statistically significant, which means these two types of election variables are differentiable from the Geographic Constituencies, the baseline variable for these two categorical variables.



Table 3.5 : The Determinants of Legislators' Alignment on the Main Dimension

	<i>Dependent variable:</i>
	GMP
Functional Constituencies	0.172** (0.079)
Election Committee	0.248** (0.121)
DP	0.691*** (0.106)
LP	-0.064 (0.121)
DAB	0.854*** (0.113)
Independents	-0.182** (0.093)
Extreme	1.349*** (0.148)
Session 2	0.351*** (0.078)
Session 3	0.555*** (0.085)
Session 4	0.433*** (0.087)
Constant	0.157 (0.130)
Observations	237
R <sup>2</sup>	0.603
Log Likelihood	354.806
<i>Note:</i>	*p<0.1; **p<0.05; ***p<0.01

Second, the result also shows that the DP and the DAB members make their roll call voting decisions mainly based on the major two political cleavages, while the LP members are less aligned to the main issue dimension. This result supports for the H2b. At the same time, the coefficient of the variable for independent LegCo members is positive and statistically significant, which supports for the H3. Given that the baseline to compare the effects of partisanship is minor parties, the differences between the DP and the DAB members and independents are much stronger.

### **3.5 Conclusion**

This paper assesses the strength of the China/democracy dimension by analyzing the entire roll call voting behavior displayed by the LegCo members since the handover in 1997. In accordance with conventional wisdom, this issue is found as the most prominent cleavage in the LegCo politics. Moreover, this pro-China vs. pro-democracy cleavage has polarized Hong Kong's political elites, superseding other prevailing issues. This paper also reveals that the two of the major political parties, including the DP and the DAB, and legislators elected in the Functional Constituencies and the Election Committee are responsible for the dominance of the pro-China vs. pro-democracy issue, while independents consider their own parochial issues as well as the major issues in the process of their decision-making.

These findings provide nuanced implications for the political development of Hong Kong. On one hand, the strength of political parties is more significant than previ-

ously represented in existing studies. The three major parties, the DP, the DAB, and the LP, have played an important role in transforming a complex political situation to a low-dimensional collective decision-making structure. In the past two decades, political parties have grown from being non-existent to acquiring the recognition as key actors in Hong Kong politics. Given the importance of political parties in representative politics, party influence in the LegCo provides optimistic evidence for future political developments in Hong Kong.

On the other hand, however, the degree of polarization on the China/democracy issue in the LegCo suggests a gloomy outlook for Hong Kong's political future. Due to Mainland China's influential role on Hong Kong since its handover, Hong Kong politics has been constrained by this pro-China vs. pro-democracy cleavage. Unfortunately, this type of polarization hinders the LegCo members in incorporating other potential issues, such as a socio-economic agenda, in their decision-making in the LegCo. This is not a desirable characteristic for political development, and therefore it is highly recommended for political actors in Hong Kong to prioritize the deterrence of polarization as one of the key topics for ongoing electoral reform debates.

## Chapter 4

# Dimensional Analysis of Cosponsorship Networks in Taiwan

### Chapter Abstract

This chapter analyzes the dimensional structure of cosponsorship networks in the Legislative Yuan from 1992 through 2012. The main dimension in the cosponsorship stage reflects the Pan-blue vs. Pan-green conflicts, which explains about one-fifth of legislators' cosponsorship activities. The minor party members make extensive use of other potential issue dimensions to differentiate themselves from the members of the two major parties, including the Kuomintang and the Democratic Progressive Party. Comparing individual legislators' dimensionality in the cosponsorship and the roll call voting stages in Taiwan shows that these minor party members lose their opportunities to reveal their preferences for multiple issue dimensions in the roll call voting stage.

## 4.1 Introduction

Over the years, roll call voting has received much attention in legislative studies. New statistical techniques and the greater availability of data in these days allow scholars to draw a map of legislative politics in one or two simple dimensions (Clinton et al., 2004; Poole, 2005). In return, a variety of important research questions, such as party discipline, agenda control, and policy outcome, have been studied extensively during the past decades based on this simple dimensional structure (e.g. Cameron, 2000; Cox and McCubbins, 1993, 2005; Krehbiel, 1992; McCarty et al., 2006). Alternative studies questioning the assumption of low-dimensionality provide a different view of multidimensional politics in the legislature and enrich to our understanding of legislative politics (e.g. Clausen, 1973; Koford, 1989; Smith and Maltzman, 1994; Jackman, 2001; Aldrich et al., 2014).

While the analysis of roll call voting data provides a tremendous amount of useful information in legislative politics, it is only one of the many different types of legislative behaviors that provide important theoretical and practical implications for studies of politics. In addition to express their position in roll call votes, legislators introduce bills (e.g. Koger, 2003; Krehbiel, 1995; Wilson and Young, 1997), participate in committee activities (e.g. Hall, 1996; Jones et al., 2002), speak on the floor (e.g. Proksch and Slapin, 2009; Quinn et al., 2010), and bring localized policy-outcome to voters (e.g. Carroll and Kim, 2010; Stein, 1997). However, dimensional structures in these other types of activities are much neglected, with rare exceptions (Talbert and

Potoski, 2002; Potoski and Talbert, 2000; Alemán et al., 2009).

In order to develop our understanding of dimensional structures in different stages of the legislature, this chapter analyzes cosponsorship behavior in the Legislative Yuan from 1992 through 2012, which covers the entire six sessions since democratization. Section 2 provides a theoretical framework for dimensionality in the bill cosponsorship stage. Section 3 overviews the dimensional structure of bill introduction stage in the Legislative Yuan with a comparison with the roll call voting stage. Section 4 analyzes the institutional determinants of individual legislator's dimensionality. Section 5 concludes.

## **4.2 Dynamic Agenda Structure and Dimensionality in the Bill Cosponsorship Stage**

Studies of agenda-setting in the legislature describe that policy proposals are dynamic through the legislative process (Baumgartner and Jones, 1993; Hall, 1996; King, 1994). From this perspective, legislative proposals are introduced as multidimensional ideas, reshaped through a number of legislative stages, and then reached the low-dimensional roll call voting stage. In comparison with the roll call voting stage, this first stage of legislative decision-making is affected by fewer institutional constraints and greater uncertainty, which results in a multi-dimensional structure in bill cosponsorship behavior (Talbert and Potoski, 2002). This multi-dimensionality in the bill cosponsorship stage allows for researchers to analyze various cleavages in

politics beyond the main one or two simple dimensions (Alemán et al., 2009; Alemán, 2008; Talbert and Potoski, 2002).

Ideally, in this bill cosponsorship stage, legislators are allowed to use all dimensions to set their legislative agenda. However, we do not have a clear theory to explain how legislators actually make use of this multidimensional issue space. Talbert and Potoski (2002) find that the little scholarly attention given to this topic is based on the separation of legislative studies and agenda-setting studies. Legislative scholars tend to focus on the roll call voting stage, which produces policy-outcomes. Agenda-setting scholars are likely to analyze how a single specific issue is developed and manipulated in the legislative process. It is desirable to integrate these two research streams to develop both fields of theories as well as to enhance a deeper understanding of legislative politics. For this purpose, this section extends existing literature in legislative representation to the dimensionality in the cosponsorship stage.

First, it is noted that the electoral rules provide incentives for legislators to balance competing types of representation between enhancing their personal reputations and developing the brand of their parties (Carey and Shugart, 1995; Carey, 2012; Mayhew, 1974). Legislators facing personal vote-seeking incentives will engage in particularistic activities that promote their own credits to their constituents and therefore distinguish themselves from their copartisans. In contrast, party-oriented representation promotes a collective reputation by taking positions on broad programmatic policies. This institutional incentive structure shapes a pattern of legislative behavior in terms

of the type of bills that they introduce (Crisp, 2007; Schiller, 1995; Sulkin, 2005).

Legislators who need to enhance their party label might introduce bills that are clearly placed in a major partisan dimension. Such bills would show a party position on national policy issues, and once these bills are passed, all citizens would publicly share the benefits from the bills. This is not the case for legislators who are required to develop their own reputation for their own constituents. These politicians use bill sponsorship as an opportunity to bring particularistic benefits to their voters. This kind of bill proposal would be placed in multidimensional issue space beyond a single partisan dimension (Crisp et al., 2004).

Second, minor parties in multi-party systems are considered as actors who make use of multidimensional issue space. Under a strong two-party system, such as in the United States, legislative decision-making is mostly explained by a single partisan dimension (Poole and Rosenthal, 1997). This unidimensionality is undermined when a minor party raises a new issue beyond the existing partisan conflict. In the history of American politics, the surges of dimensionality due to third-party effects have appeared in the middle of the 19th century over the slavery issue by the Republican Party, in the 1968 presidential election by George Wallace, and in the 1950s and 1960s on racial and civil rights issues<sup>1</sup>(Lee, 2014).

In the literature of comparative politics, scholars have found that the number of dimensions in elections is strongly related to the number of parties (e.g. Lijphart,

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<sup>1</sup>Strictly speaking, this example refers to the intra-party conflict in the Democratic Party. However, it is also a conventional way to treat the Southern Democrats in this period as a third party (Bullock and Rozell, 2012).



1984; Taagepera and Shugart, 1989; Taagepera and Grofman, 1985; Taagepera, 1999). These studies are based on the common empirical ground that there are several dimensions of political conflicts in most societies. Based on this multidimensionality, scholars have theorized that multi-party systems are made to represent multidimensional political conflicts in society. Given that the two major parties are responsible for the major issue dimension, other minor political parties in multi-party systems play a role in moving politics beyond the existing dominant dimension of two-party politics.

### **4.3 Dimensional Structure of Cosponsorship Behavior in Taiwan**

This section compares the overall dimensional structure of cosponsorship activities with the roll call voting structure in the Legislative Yuan. While cosponsorship data provides useful information, it is not easy to estimate the preferences of legislators and the dimensionality of the legislature from cosponsorship data using the conventional scaling techniques, such as W-NOMINATE and OC. This is because cosponsorship data do not contain the information about who are against the bill, which is critical when applying standard analytical methods of roll call votes.

To determine the number of dimensions in the cosponsorship stage, I follow social network analytic perspective proposed by (Alemán et al., 2009). To deal with the methodological problem, they transform a matrix of individual legislators' cosponsor-

ship behaviors on each bill into a network matrix of legislators' affiliations with other members of the Legislative Yuan. In this affiliation matrix, the diagonal elements refer to the total number of bills cosponsored by each legislator, and the off-diagonal elements describe the number of affiliations of each pair of legislators cosponsoring bills together. Then, this affiliation matrix is transformed into the agreement matrix to reflect that the numbers of bill cosponsorship activities of each legislator are different. This agreement matrix is made by dividing each cell of the affiliation matrix by the total number of bills cosponsored by individual legislators.

In order to scale the agreement matrix, Alemán et al. (2009) ran the principal component analysis (PCA). The PCA returns several useful statistics, among which the standard deviations of the principal components and the matrix of variable loadings are essential for this chapter's purpose. The standard deviations of the principal components are the square roots of the eigenvalues of the agreement matrix. In the PCA process, eigenvalues are used to condense the variance in a given matrix. The factor with the largest eigenvalue has the most variance of data and is considered as the main dimension of the matrix, and down to dimensions with smaller eigenvalues. In this sense, the eigenvalues provide an information on the relative weights of the estimated dimensions. In the matrix of variable loadings, each row includes information on the extent to which each bill is loaded in all dimensions, while each column includes individual legislator's alignment on all dimensions (Borg and Groenen, 2005).

Table 4.1 summarizes dimensionality in the Legislative Yuan estimated by PCA on

Table 4.1 : Dimensionality of the Cosponsorship Stage in the Legislative Yuan

Session	# MPs	# Bills	Dimension						
			1st	(%)	2nd	3rd	4th	5th	All
2th	165	757	1.91	(17.48)	0.41	0.36	0.28	0.25	10.91
3th	170	934	1.33	(11.72)	0.73	0.67	0.24	0.21	11.34
4th	228	1,393	1.68	(12.94)	0.40	0.37	0.28	0.24	13.00
5th	231	1,875	1.91	(14.19)	0.78	0.54	0.33	0.29	13.49
6th	238	1,648	2.05	(15.31)	0.45	0.40	0.33	0.31	13.41
7th	127	2,929	1.85	(19.62)	0.39	0.34	0.27	0.19	9.43

the agreement matrix of cosponsorship networks<sup>2</sup>. This table describes the standard deviations in the top five the principal components as well as the total of the standard deviations in cosponsorship networks. As the impact of the first dimension is the most significant, I also include the percentage of the standard deviation of the first dimension over the total dimensions. The result suggests that the first dimension in the cosponsorship network is not so salient. The first dimensions explain less than 20% of the information of cosponsorship networks. At the same time, Table 4.1 shows that there is no dominant second dimension in cosponsorship networks. The explanatory powers of other dimensions are almost evenly scattered along the other dimensions.

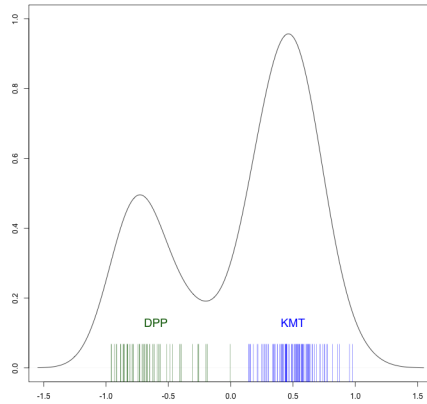
It is well known that the major cleavage in Taiwan reflects the political status of Taiwan itself, which divides Taiwanese politics into the two camps (Fell, 2012; Rigger,

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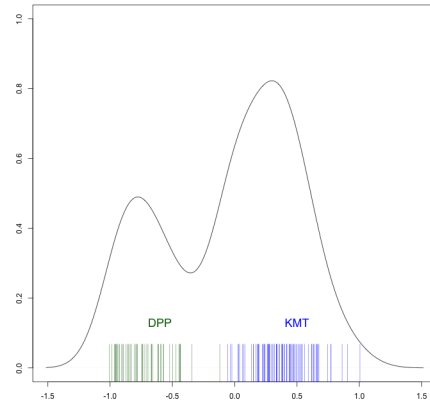
<sup>2</sup>I gathered the comprehensive information of the bill introduction activities by individual legislators from the official Legislative Yuan website, by using Python and R programs. To my best knowledge, this chapter is the first paper analyzing the Taiwanese legislators' bill cosponsorship behaviors.

Figure 4.1 : The Distribution of Cosponsorship Ideal Points

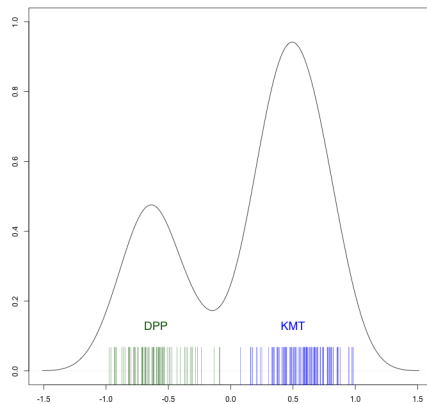
(a) 2nd Session



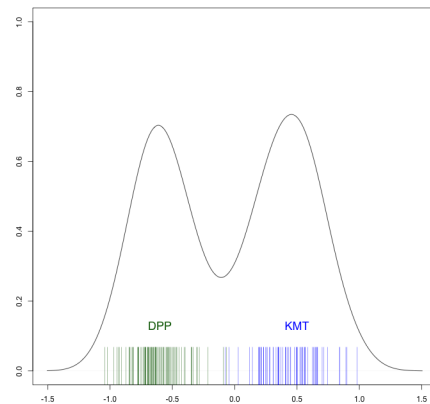
(b) 3rd Session



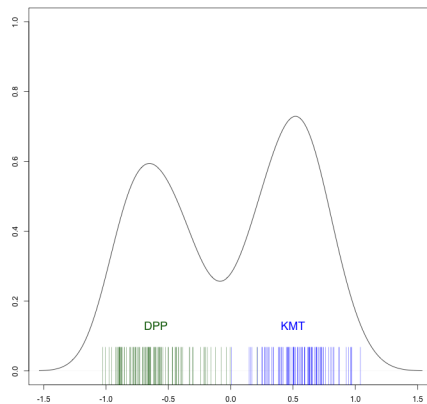
(c) 4th Session



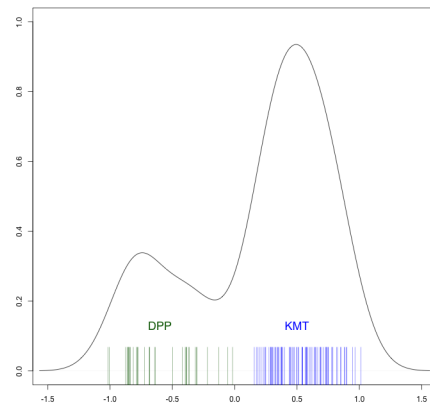
(d) 5rd Session



(e) 6nd Session



(f) 7rd Session



2011). The Pan-blue camp, which has been led by the Kuomintang (KMT), has supported the view that Taiwan should embrace the Chinese identity and maintain a closer relationship with China, both economically and culturally. In contrast, the Pan-green camp, led by the Democratic Progressive Party (DPP), has favored Taiwan's independence over Chinese reunification.

Figure 4.1 shows that the first dimensions from the 2nd through the 7th legislative session reflect this conflict between Pan-blue and Pan-green coalitions. Overall, in the six figures, Taiwanese politics has been polarized into the two camps, and the DPP and the KMT members KMT legislators are located in the left and right side of the first dimension, respectively. Other parties in the two major alliances are also located close to the major parties in their camps, while, for efficient visualization, their locations are not shown.

Table 4.2 : Comparing Cosponsorship and Roll Call Ideal Points

Session	Correlation Coefficient
2th	0.910
3th	0.905
4th	0.934
5th	0.899
6th	0.927
7th	0.858

Table 4.2 describes the correlation coefficients between the first dimension of ideal

points estimated from cosponsorship activity and roll call votes. The one-dimensional W-NOMINATE model is used for scaling roll call votes, and PCA is applied for cosponsorship networks. Even if different scaling techniques are used for different stages of the legislative decision-making structure, the two ideal point estimates are highly correlated each other in each legislative session.<sup>3</sup>

To sum up the statistical analysis of this section, cosponsorship activities have multidimensional feature of decision-making structure, while roll call voting cases are always unidimensional, as expected by theories of dynamic legislative agenda.

#### 4.4 Political Institutions and Legislator's Dimensionality

This section analyzes the determinants of multidimensionality in the cosponsorship stage. More specifically, this section focuses on other potential dimensions beyond the Pan-blue vs. Pan-green dimension, and explains how institutional incentives faced by individual legislators shape these other dimensions. Using theoretical discussions in the previous section 4.2, I first generate testable hypotheses for Taiwan, and discuss the measurement of the individual legislators' usage of other potential dimensions in

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<sup>3</sup>Desposato et al. (2011) find that cosponsorship ideal point estimates are sensitive to the assumption of the data generating process. They suggest that scholars should be cautious when estimating ideal points using cosponsorship data, while the W-NOMINATE and other methods using roll call votes perform well, regardless of the details of the data. In Taiwan's case, the high correlations of cosponsorship and roll call voting ideal points in Table 4.2 show a reliability of using the PCA for estimating ideal points of legislators' preference in the cosponsorship stage. The PCA on cosponsorship networks is one way of relieving the methodological problem mentioned in this Section. Other applications include the Bayesian ideal point estimation incorporating participation cost (Kellermann, 2012), the hybrid of NOMINATE and Bayesian approaches (Peress, 2013), and the random utility model with a threshold (Woon, 2008). Applying and/or advancing these other techniques to Taiwan would be desirable, but it is beyond the range of this dissertation.

cosponsorship stage, and then analyze the effects of political institutions on legislators' dimensionality.

Taiwan's pre-reform electoral rules include the single non-transferable voting system (SNTV) in multi-member districts (MMDs) and the closed-list proportional representation (PR) system in a nationwide district. The size of district magnitude, i.e., the number of seats in a district, ranges from 1 through 17. Post-reform electoral rules combine the plurality voting system in single-member districts (SMDs) and the closed-list proportional representation (PR) system in the nationwide district. Conventionally, the closed-list PR is categorized as the list tier, and the other types of electoral rules are considered as the nominal tier (Shugart and Wattenberg, 2001).

These electoral institutions allow us to generate two expectations. First, the comparative legislative literature on the mixed-member electoral systems has debated whether the presence of legislators elected by different electoral rules leads to different legislative behavior<sup>4</sup>. The two nominal tiers in the pre- and post-reform periods are more individual candidate-centered electoral systems than the list tier (Carey and Shugart, 1995), and as discussed in section 4.2, these two rules will provide institutional incentives for incumbent legislators to use other potential dimensions beyond the major partisan cleavage. This expectation is formulated as following.

*H1: Nominal tier legislators are more likely than list tier legislators to be aligned on the multidimensional issue dimensions.*

Second, the variance of the number of seats across districts in the pre-reform period provides different amounts of personal vote-seeking incentives for legislators elected in the nominal tier. As the district magnitude (DM) increases, legislators face more intra-party competitions, which generate the incentive to nurture a personal reputation to differentiate themselves from other legislators (Carey and Shugart, 1995). As multiple candidates of the same party run for the election, voters need more information than the party reputation. As a result, incumbent legislators are required to use other potential dimensions beyond the major partisan cleavage to enhance their personal reputation (Yu, 2005; Grofman, 1999; Tsai, 2005; Fell, 2013). This expectation is formulated as follows:

*H2: As district magnitude increases, nominal tier legislators are more likely to be aligned on the multidimensional issue dimensions.*

Taiwan's multi-party system provides ideal institutional setting to examine the role of the minor parties on the dimensional structure in the bill introduction stage. The Kuomintang (KMT) is the major party in the Pan-blue camp and has dominated Taiwanese politics. The Democratic Progressive Party (DPP) is its counterpart in the Pan-green camp. While these two are the flagship parties in Taiwan, many minor parties, including the People First Party (PFP), the New Party (NP), the Taiwan Solidarity Union (TSU), the Non-Partisan Solidarity Union (NPSU), and Taiwan In-

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<sup>4</sup>Batto (2012) provides a detailed literature review on this debate.



dependence Party (TIP), have played non-negligible roles in politics (Fell, 2005; Rigger, 2001; Hsieh and Niou, 2002; Niou and Paolino, 2003; Mattlin, 2004; Yu, 2005). As these minor party members have to compete for the same set of voters with the major party members, they are required to differentiate themselves from the major parties. As Section 4.2 discussed, this political dynamic has led minor party members to engage in the multidimensional issue dimension, which is formulated as the following hypothesis:

*H3: Legislators of the minor parties more likely than legislators of the major parties to be aligned on the multidimensional issue dimensions.*

In order to test these hypotheses, a measure for capturing multidimensionality in cosponsorship networks is required. Most studies dealing with multidimensionality in the legislature specifically focus on the second dimension (Poole and Rosenthal, 2011; Jackman, 2001; Aldrich et al., 2007; Jeong, 2007). However, in the Legislative Yuan, there are no dominant second dimensions, as Table 4.1 shows, and therefore, it is not recommended to take the conventional approach. Alternatively, I have developed a measure that summarizes all other dimensions except for the first one. This dependent variable allows an analysis of the complex structure of cosponsorship networks in classical linear models.

The dependent variable, called *multidim<sub>j</sub>*, is measured by manipulating two indicators, which were used in the previous sections. One is the standard deviations

of the principal components from the PCA results of cosponsorship networks, which can be used as an indicator of weighting on dimension<sub>*i*</sub> (*weight<sub>i</sub>*).<sup>5</sup> The other is the matrix of variable loadings (*loading<sub>ij</sub>*) in which columns reveal how much legislator<sub>*j*</sub> uses dimension<sub>*i*</sub>.<sup>6</sup>

I multiply *weight<sub>i</sub>* by *loading<sub>ij</sub>* to get the weighted raw data to which presents the degree to how legislator<sub>*j*</sub> makes use of dimension<sub>*i*</sub> (*weight<sub>i</sub> \* loading<sub>ij</sub>*). Then I divided *weight<sub>i</sub> \* loading<sub>ij</sub>* by its sum to get a standardized quantity (*dim<sub>ij</sub>*) as in the equation bellow.

$$dim_{ij} = \frac{weight_i}{weight_i * loading_j},$$

where *i* refers dimension *i* and *j* indicates legislator *j*

The dependent variable (*multidim<sub>j</sub>*) is measured by the sum of all *dim<sub>ij</sub>* except for the first dimension *dim<sub>1j</sub>*. Alternatively, it can be measured by one minus *dim<sub>1j</sub>*, as the sum of all *dim<sub>ij</sub>* is one. The range of the dependent variable is from zero to one. A zero score means that the legislator exclusively focuses on the first dimension. A higher score denotes that an individual legislator's cosponsorship decision is based on other criteria beyond the major Pan-blue vs. Pan-green issue. The below equations describe the measure of dependent variable by using *dim<sub>ij</sub>*.

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<sup>5</sup>These standard deviations were used to present dimensionality in the cosponsorship stage in the Legislative Yuan (see Table 4.1).

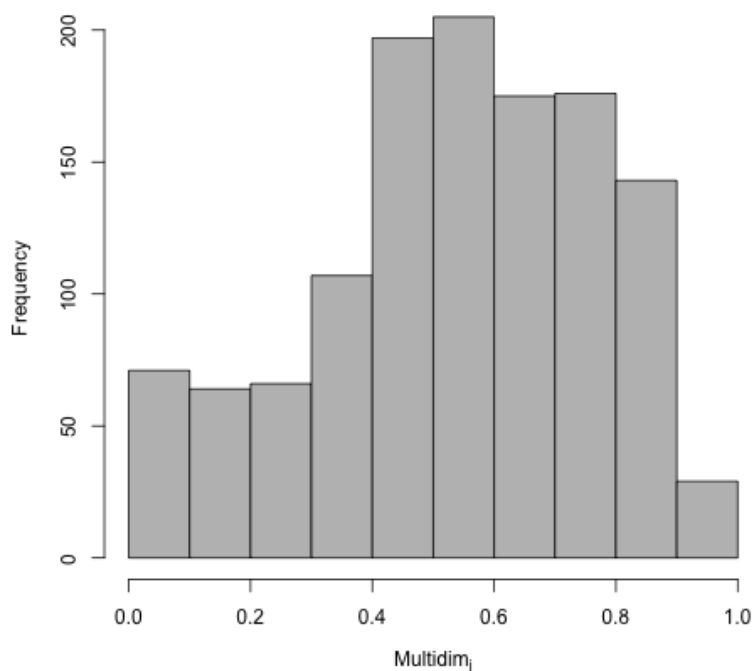
<sup>6</sup>The first column was standardized and then used as the first dimensional cosponsorship ideal points, which were compared with roll call voting ideal points (see Table 4.2).

$$\begin{aligned}
 multidim_j &= \sum_{i=2}^n dim_{ij} \\
 &= 1 - dim_{1j}
 \end{aligned}$$

Figure 4.2 presents the distribution of multidimensionality of cosponsorship networks in the Legislative Yuan. It provides a decent variation. Some legislators' cosponsorship behaviors are mostly explained by the major issue cleavage, as their scores are relatively low. Yet, most of the legislators make use of other potential issues beyond the major Pan-blue vs. Pan-green issue.

The PR variable is coded as 1 if legislators are elected in closed-list PR in a nationwide district, and as 0 otherwise. This variable is included to test H1, and I expect that the estimated coefficient of this PR variable will be negative and statistically significant, which means that the party-centered electoral institution provides institutional incentives for individual legislators to focus on the major issue dimension. The district magnitude is a continuous variable that is a log of the number of seats in the districts where the legislator is elected. For this variable, my expectation is that the estimated coefficient of this variable will be positive and statistically significant. For H3, I prepare a binary variable that code 0 for the two flagship parties - the KMT and the DPP - and 1 otherwise. Theoretically, minor party members are required to use other issue dimensions in order to differentiate them from the major

Figure 4.2 : The Distribution of Individual Legislators' Dimensionality



party members, I expect the estimated coefficient for the minor party variable will be positive and statistically significant.

I also include several control variables, such as gender, seniority, participation and reelection in the next election, legislators representing aborigines and overseas Chinese, and the number of cosponsorship activities. As the dependent variable,  $multidim_j$ , is bounded between 0 and 1, I use the beta-linear model, which is the recommended statistical model for this type of dependent variable (Ferrari and Cribari-Neto, 2004; Paolino, 2001; Smithson and Verkuilen, 2006). The six beta-linear regression models are used to test the above expectations in each legislative session.

Table 4.3 : The Determinants of Legislators' Dimensionality

	<i>Dependent variable: Multidimensionality</i>					
	2nd	3rd	4th	5th	6th	7th
PR	-0.123 (0.104)	-0.046 (0.185)	-0.114 (0.126)	0.082 (0.118)	0.109 (0.114)	-0.315** (0.123)
DM (logged)	-0.003 (0.044)	0.112 (0.082)	-0.040 (0.056)	0.054 (0.051)	0.017 (0.049)	
Minor Parties	0.857*** (0.088)	1.756*** (0.167)	0.847*** (0.071)	0.398*** (0.051)	0.631*** (0.059)	0.429* (0.239)
Aborigin	-0.085 (0.132)	0.086 (0.255)	-0.030 (0.145)	0.321** (0.133)	0.079 (0.135)	0.210 (0.261)
Foreign	-0.343** (0.175)	-0.305 (0.270)	0.099 (0.147)	-0.012 (0.129)	-0.134 (0.140)	0.259 (0.569)
Gender	0.203** (0.090)	-0.052 (0.140)	-0.154** (0.067)	0.013 (0.057)	0.058 (0.060)	0.064 (0.116)
Seniority	-0.023 (0.021)	-0.042 (0.041)	-0.003 (0.021)	0.024 (0.018)	0.039** (0.018)	0.050 (0.032)
Participation	-0.093 (0.082)	-0.533*** (0.158)	0.124* (0.071)	-0.007 (0.078)	0.007 (0.061)	-0.289** (0.139)
Reelected	-0.011 (0.068)	-0.012 (0.126)	-0.147** (0.063)	-0.026 (0.062)	0.097* (0.059)	0.107 (0.128)
# Sponsorship	-0.007*** (0.0005)	-0.006*** (0.001)	-0.003*** (0.0003)	-0.002*** (0.0002)	-0.003*** (0.0002)	-0.002*** (0.0002)
Constant	-0.382** (0.156)	1.680*** (0.265)	0.727*** (0.162)	0.651*** (0.146)	-0.447*** (0.142)	-0.266 (0.183)
Observations	157	169	223	230	231	125
R <sup>2</sup>	0.762	0.428	0.566	0.501	0.605	0.514
Log Likelihood	225.051	112.838	222.210	248.378	277.912	134.159

Note:

\*p<0.1; \*\*p<0.05; \*\*\*p<0.01

Table 4.3 presents several features of individual legislator's multidimensionality in the bill introduction stage. First, the two expectations regarding the electoral rules are not supported by the results. The estimated coefficients of the PR and the district magnitude variables are mostly not statistically significant, which reject H1 and H2.

In contrast, the expectation for the membership of the minor parties is widely supported. The estimated coefficients of minor party variables are positive and statistically significant. Given that the main dimension is dominated by the two main parties, these smaller parties do not have many incentives to work on the bills that are related to the first dimension. Their possibilities for enhancing party labels by bill introduction are in the other dimensions. This incentive motivates these other party members to focus on some minor dimensions that may enhance their image as an alternative to the two major parties. This finding suggests that the minor political parties play a pivotal role in the multi-dimensional structure of the pre-floor stage in Taiwan.

In positive theories of legislative politics, however, this multi-dimensional structure is problematic, as proposals that include multiple criteria make it hard to produce a stable outcome. That is, producing the equilibrium of the majority decisions is not feasible due to the formation of counter-majority that overturn any majority coalition (McKelvey, 1979). Therefore, it is emphasized that one of the important roles of the majority parties is to reduce the number of latent dimensions into a low-dimensional structure in the roll call voting stage (Aldrich, 1995; Aldrich and Rohde, 2001; Rohde,

1991; Cox and McCubbins, 2005, 2007).

In this dimensionality-reduction process, it creates “dimensionality losers” who want to consider multiple issues for casting their roll call votes, but face limited issue space in the roll call voting stage. Based on the empirical findings in this Section, the minor party members fall into this category. These legislators want to raise different issue dimensions and differentiate themselves from the two major parties. However, in the low-dimensional roll call voting stage, there is no distinct issue space for them, except for the major Pan-blue vs. Pan-green cleavage. Hence, the minor party members vote yea or nay mostly based on the main issue dimension.

To test this dimensional inconsistency for “dimensionality losers” expectation, I prepare the dimensionality inconsistency variable, which is measured by extracting the individual legislator’s dimensionality score in the roll call voting stage from one in the cosponsorship stage. For the measure of roll call voting, I use the Geometric Mean Probability (GMP) score estimated by the one-dimensional W-NOMINATE model. The GMP is defined as the likelihood of an observed choice is the assigned probability by the W-NOMINATE model to that choice. It varies 0 and 1, and higher values mean that the legislator’s voting behavior is more explained by the simple two-dimensional spatial model. As I need to measure multi-dimensionality index, I extract 1 from the GMP score to make higher values denote legislator’s multidimensionality. For the measure of cosponsorship dimensionality, I use *multidim<sub>j</sub>*, which is used as dependent variable in the previous analysis in this Section. The new dependent variable ranges

from -.1054 through 0.9836, and the median is 0.3534.

I use the same independent variables used in the previous analysis (Table 4.3). The six OLS regression models are used to test this “dimensionality losers” hypothesis in each legislative session. As I expect that the dimensionality of the minor party members is suppressed during the legislative process, if this is supported, then the estimated coefficients for the minority party variable should be positive and statistically significant. As Table 4.4 summarize, the “dimensionality losers” hypothesis is generally supported across the legislative sessions. The estimated coefficients for the minor party variable are positive and statistically significant.

## 4.5 Conclusion

This chapter analyzes the dimensional structure in the bill cosponsorship stage with a comprehensive cosponsorship data that cover the six legislative sessions of the Legislative Yuan since democratization. It is found that the main dimension’s explanatory power is limited in the cosponsorship stage. The Pan-blue vs. Pan-green conflicts only explain about one-fifth of legislators’ cosponsorship activities. This finding is consistent with the dynamic legislative agenda theory that emphasizes multi-dimensional aspects of politics and policy-making. In contrast, this multi-dimensionality in the cosponsorship stage raises a question for students of Taiwan politics who have described Taiwan as a single-issue dominant regime.

In order to explain this multi-dimensional structure of Taiwanese politics, I ex-



Table 4.4 : The Determinants of Legislators' Reduced Dimensionality

	<i>Dependent variable: Multidimensionality</i>						
	2nd	3rd	4th	5th	6th	7th	
Minor Parties	0.131*** (0.028)	0.131*** (0.043)	0.036* (0.022)	0.037*** (0.014)	0.110*** (0.014)	0.122** (0.053)	
PR	-0.015 (0.026)	0.012 (0.038)	-0.055* (0.029)	0.012 (0.031)	0.026 (0.026)	-0.048** (0.023)	
DM (logged)	-0.009 (0.011)	0.007 (0.016)	-0.019 (0.013)	0.001 (0.013)	0.002 (0.011)	0.020 (0.044)	
Aborigin	0.001 (0.036)	-0.029 (0.051)	0.041 (0.033)	0.062* (0.034)	0.011 (0.031)		
Foreign	-0.032 (0.041)	-0.027 (0.056)	0.002 (0.034)	0.004 (0.033)	-0.020 (0.032)	-0.001 (0.107)	
Gender	0.029 (0.022)	-0.055* (0.029)	-0.037** (0.015)	0.003 (0.015)	0.018 (0.014)	0.008 (0.022)	
Seniority	-0.001 (0.006)	-0.002 (0.008)	0.0001 (0.005)	0.009* (0.005)	0.007* (0.004)	0.012* (0.006)	
Participation	0.015 (0.021)	-0.032 (0.031)	-0.004 (0.016)	-0.008 (0.020)	0.008 (0.014)	-0.057** (0.027)	
Reelected	-0.016 (0.018)	-0.015 (0.025)	-0.008 (0.015)	0.011 (0.016)	0.018 (0.014)	0.010 (0.024)	
numSpon	-0.001*** (0.0001)	-0.001*** (0.0001)	-0.001*** (0.0001)	-0.0004*** (0.00004)	-0.001*** (0.00004)	-0.0003*** (0.00003)	
Extremism	0.298*** (0.047)	-0.064 (0.066)	0.241*** (0.043)	0.035 (0.040)	0.251*** (0.042)	0.084 (0.067)	
Constant	0.090* (0.047)	0.831*** (0.081)	0.433*** (0.051)	0.569*** (0.046)	0.173*** (0.042)	0.318*** (0.059)	
Observations	157	169	223	230	231	126	
R <sup>2</sup>	0.507	0.491	0.485	0.351	0.565	0.572	
Adjusted R <sup>2</sup>	0.469	0.455	0.458	0.318	0.543	0.534	
Residual Std. Error	0.082 (df = 145)	0.124 (df = 157)	0.088 (df = 211)	0.091 (df = 218)	0.081 (df = 219)	0.102 (df = 114)	
F Statistic	13.534*** (df = 11; 145)	13.749*** (df = 11; 157)	18.035*** (df = 11; 211)	10.720*** (df = 11; 218)	25.876*** (df = 11; 219)	15.235*** (df = 10; 114)	

\*p&lt;0.1; \*\*p&lt;0.05; \*\*\*p&lt;0.01

Note:

tend existing literature on legislative representation, and find that the minor party members make extensive use of other potential issue dimensions. They introduce bills beyond the major cleavage in order to differentiate them from the members of the two major parties, including the Kuomintang and the Democratic Progressive Party. However, the dynamic legislative agenda process suppress other dimensions and lead the low-dimensional roll call voting stage. It is the minor party members who lose their possibility to consider other issues beyond the Pan-blue vs. Pan-green cleavage. The minor party members are required to make their decisions on roll call votes mostly based on the major issue, while they make use of other issue dimensions in cosponsorship stage.

These results suggest several future avenues for research, of which I will mention two in particular. First, the role of minor parties in multi-party system on dimensionality is not sufficiently studied in the comparative legislative studies. As the theoretical expectations regarding the dimensionality in the cosponsorship and the roll call voting stages as well as regarding the “dimensionality losers” hypothesis are general, it is desirable to extend these theoretical considerations to other institutional settings, such as South Korea.

Second, studying cosponsorship activities in the Legislative Yuan is in the embryonic stage and, as such, is still establishing its basic tenets. While this chapter provides a stepping stone for understanding the dimensional structure of the bill cosponsorship stage, more research is needed. For example, the cosponsorship net-

works provide interesting features, such as centrality, density, transitivity, and modularity that are from social network theory. Measuring and analyzing these unique concepts should be pursued to enhance a deeper understanding of Taiwan politics.

## Chapter 5

### Conclusion

This dissertation examined how political institutions, especially electoral rules and party politics, shape the map of politics in the East Asian Legislatures. In this brief concluding chapter, I summarize the findings from each chapter and discuss implications of these findings.

#### 5.1 Basic Findings

The overarching theme of this dissertation is to emphasize the importance of political institutions on the dimensional structure of politics. As the latent preference of legislators is not directly observed, it is necessary to use various scaling techniques to estimate unseen preference from observed legislative activities. Analyses of roll call votes, cosponsorship behaviors, or legislative speeches provide the number of salient issue dimensions and the ideal points of the legislators' preferences on each of these dimensions. The latent preference may be institution-free, but the estimated one is under the institutional constraints (Alemán et al., 2009).

Electoral institutions are central in the studies of democratic politics by providing the different amount of institutional incentives for individual legislators (Carey and Shugart, 1995; Carey, 2012). Roll call voting analysis in Taiwan provides an empirical

evidence for the effects of electoral rules on individual legislators' dimensionality. From this analysis, it is supported that legislators who face more personal vote-seeking incentives are more aligned in multi-dimensional issue space. In addition, the behaviors of political elites in Hong Kong's hybrid electoral system are also explained by the logic of institutional incentives of electoral rules. It is found that legislators of Hong Kong serve for their constituencies; if their voters are ordinary Hong Kong citizens who have multiple issues and demands, the legislators work for such multi-dimensional requests. In contrast, indirectly-elected legislators are only responsible for the narrow and pre-defined issues of their functional constituencies.

Electoral rule is not the only variable to affect legislators' behavior; it also interacts with other institutions, and this complex institutional structure constrains individual politicians. The analysis of South Korean legislators roll call voting behavior supports this view. That is, the institutional incentives provided by the electoral rules do not make a difference on legislative behavior in the Korean National Assembly, due to the career trajectory of Korean legislators that mitigates electoral rules' effects.

It is also found that minor parties in the multi-party systems are considered as pivotal actors who use multi-dimensional issue space. Given that the main issue dimension is dominated by the major parties, minor party members need to enhance their reputations in other issue dimensions. The analyses of roll call voting in Hong Kong and cosponsorship behavior in Taiwan support this expectation. Moreover, comparing individual legislators' dimensionalities in the cosponsorship and the roll

call voting stages in Taiwan shows that these minor party members lose their opportunities to reveal their preferences for multiple issue dimensions in the roll call voting stage.

## 5.2 Implications

This research contributes to a deeper understanding of the dynamic agenda process, substantive representation, and legislative policy-making in three specific ways. First, I offer new hypotheses to examine the electoral connections between legislators and their constituents. Second, I employ an innovative set of dependent variables, which makes it possible to analyze my theoretical expectations in a more optimal manner than has hitherto been the case. Third, I collect an original data set to test these hypotheses. To my knowledge, this is the most comprehensive archive of legislative activities for East Asian countries. This extensive information will open up many other research opportunities beyond this dissertation.

More broadly, this research has several substantive impacts. The first is the importance of studying legislative politics in East Asia. Hong Kong, South Korea, and Taiwan are strong economic actors in this globalizing world, and moreover they are also important for the U.S. vis-à-vis geo-security issues in Asia. Given that some of political elites in these countries might be the next pivotal partners of the U.S. government, scholarly information of parliamentary behaviors and estimated policy preferences of individual representatives from these activities would be beneficial for

not only academic purpose, but also for policy-related perspectives.

It is also important for us to understand contemporary Chinese politics. Unfortunately, due to data limitations, it is not feasible to undertake a quantitative research of legislative politics in Mainland China. Studying politics in Greater China provides an alternative way to examine how the leaders of the Communist Party of China may respond to diverse social needs and demands. The experiences of Hong Kong in particular provide a unique potential window into the future of Chinese politics, underscoring how a managed form of competitive authoritarian politics might function in other regions of China, in the medium to long term.

In addition, this dissertation provides several policy implications for encouraging better representation beyond academic research. For example, this research reveals that Taiwans electoral reform in 2008 makes it harder to achieve the ideal representation in mixed-member electoral systems. Comparing legislative behavior in pre- and post-electoral reform periods of the Legislative Yuan shows that the different incentive structures between district-elected legislators and PR representatives are due to an intra-party dimension, not an inter-party dimension. The 2008 electoral reform removed the intra-party personal vote-seeking incentives, and the result is that a partisan struggle dominates legislative politics in contemporary Taiwan. This unexpected and undesirable outcome should not be repeated in future electoral reforms around the world, and for this purpose, it is necessary to understand the intertwining nature among complex institutional settings of representation.

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