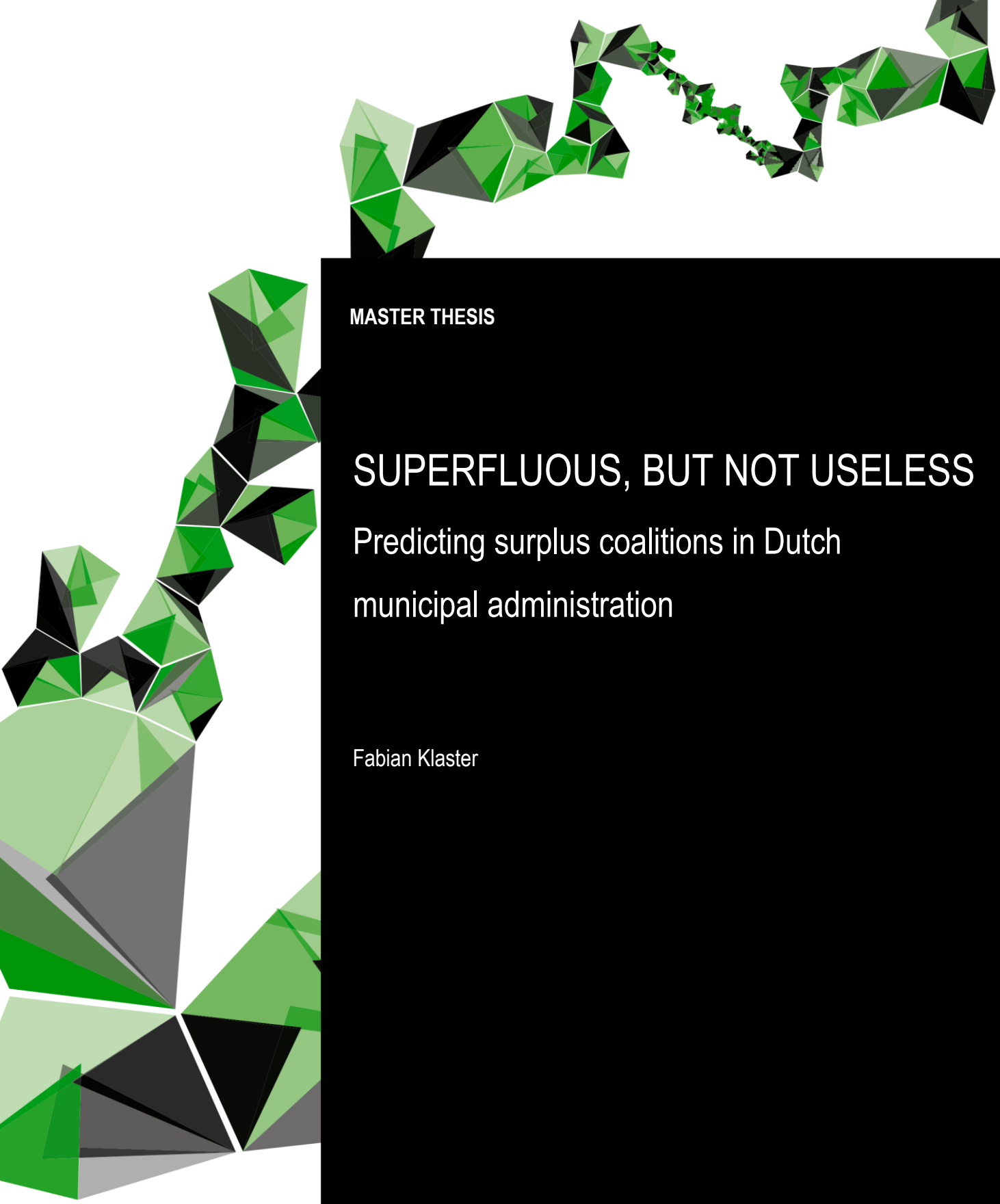

MASTER THESIS

SUPERFLUOUS, BUT NOT USELESS

Predicting surplus coalitions in Dutch municipal administration

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Superfluous, but not useless: predicting surplus coalitions in Dutch municipal administration

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Supervision:
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Abstract

Classical game theory generally predicts coalitions that are not minimal winning. As opposed to surplus coalitions, minimal winning coalitions lose the parliamentary majority if the smallest coalition member leaves the coalition. However, having studied 304 cases ensuing the 2018 Dutch municipal elections, only 54% of the coalitions that formed were minimal winning. This study therefore aimed to find the conditions under which surplus coalitions emerge.

The study was quantitative and used a multivariate logistic regression model to predict surplus coalitions. The model shows a positive relationship between electoral localisation (Denters, 1985; Van der Kolk, 2000; Bäck, 2003) and the presence of surplus coalitions. In municipalities where there was no legal constraint on full-time surplus coalitions (Tops, 1990), 3.8 times as much surplus coalitions were formed as in municipalities where there was such a constraint. No significant direct effects of electoral volatility, political fragmentation, financial solvability or population size were found.

As this study did not take into consideration ideological positions and interpersonal relationships, further research should be directed at qualitative studies, so that these concepts can be measured adequately.

Keywords: coalition-making, electoral control, Dutch local administration

Preface

I would like to thank my primary supervisor, prof. dr. Bas Denters. It was his 1985 article in the *European Journal of Political Research* that introduced me to the field of coalition formation. Without his feedback, critical thoughts, ideas and encouragement, this study would not have been the same.

Thanks is also due to prof. dr. René Torenvlied. His enthusiasm for the field of public administration as a lecturer has always been very contagious. It was his bachelor course that sparked my interest in public choice theory in the first place. I was delighted when he suggested to become my secondary supervisor and thank him for his guidance.

I thank the wonderful people of the Public Administration department. In particular prof. dr. Ariana Need and secretary Annette van der Tuuk have been very supportive.

And so my time as a student ends. I owe a debt of gratitude to my sister Iris, and to my parents, who always support my decisions in life. I wish to thank my roommates for mocking me on off-days and Max Julian Nab for distracting me on on-days. Above all, I would like to thank my girlfriend Shannon for her endless support.

Fabian Klaster
Enschede, August 2019

Contents

Chapter 1

Introduction

This study is an enquiry into coalition formation in local public administration. As the Netherlands is a representative multiparty democracy, most Dutch elections result in legislatures without a single party holding a majority of seats. This typically brings about one or multiple bargaining rounds of coalition negotiations, striving to constitute a government that is supported by a parliamentary majority. Scholars of coalition-making study this process to understand the dynamics of the democratic system.

What determines what coalition emerges from the high number of coalitions that are mathematically possible? Assuming that parties can maximise the pay-offs of being in office (i.e. income, power, and prestige) by minimising the number of coalition partners, Von Neumann & Morgenstern (1944) expected only *minimal winning* coalitions to form. A coalition is minimal winning if holds a majority of government seats, but looses the majority if any of its members quits the coalition. Adding additional parties to a minimal winning coalition does not contribute to achieving a majority, but does require some of the pay-offs to be shared with that party. The minimal winning paradigm has been dominant in coalition theory for many years and evolved into a number of variations. Gamson (1961) and Riker (1962) believe parties prefer minimal winning coalitions with the smallest legislative weight to maximise their own weight in the coalition. Leiserson (1968) argues that the minimal winning coalition with the smallest number of parties is favoured in order to reduce bargaining costs. Axelrod (1970) and De Swaan (1973) prefer minimal winning coalitions that are ideologically alike.

Even though the minimal winning theory is both simple and logical, its predictive power is lower than one would expect. Laver & Schofield (1990) report that only 35% of the 1945-1987 European national cabinets are minimal winning. On the Dutch local level, Wieldraaijer (2015) shows that only 48% to 61% of the municipal boards was supported by a minimal winning coalition between 1986 and 2010, as is shown in Figure 1.1.

Given that only about half of the Dutch coalitions are minimal winning, the blindness of classical game theory towards coalitions that are not minimal winning is problematic. It shows that two main assumptions of classical game theory are inaccurate: cabinet parties do not have to hold a majority in the council to form, and under some conditions parties do not minimise the number of coalition partners. This anomaly can only be resolved by introducing theories

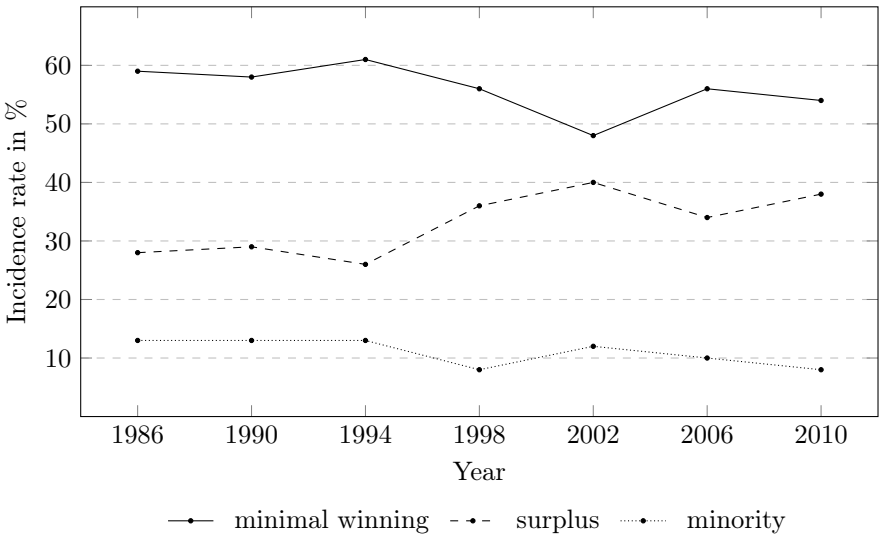

Figure 1.1: Distribution of municipal board types 1986-2010, adapted from Wieldraaijer (2015)

that are able to predict coalitions that are not minimal winning.

And so we arrive at the main topic of this study: *surplus* coalitions. A surplus coalition is a coalition that includes parties that are not necessary to hold a majority in parliament[1]. Figure 1.1 shows that 28% to 40% of the Dutch municipalities was headed by such a surplus board in the 1986-2010 period (Wieldraaijer, 2015). This study aims to explain why such coalitions do emerge, contrary to what the minimal winning theory expects. The research question central to this study is: *Under what conditions do surplus coalitions emerge in Dutch municipal administration?*

An often echoed remark about studies related to coalition-making was made by Laver (1989), who described the field as 'incestuous'. After all, the number of cases on the national level is limited and researchers are therefore using the same data over and over again in order to shape theory. Recently, scholars have therefore shifted towards the local level (e.g. Skjæveland et al., 2007; Debus & Gross, 2016). Besides the benefit of adding new cases next to the overused national cases, this context is interesting because of the larger number of cases. It allows to maintain contextual factors like time and institution constant. However, a comparable shift towards the local level has not happened in Dutch public administration research, the most recent quantitative research on local coalition formation being published by Denters (1985), Tops (1990), and Steunenberg (1992). In the meantime, Dutch local administration has been far from stable due to a number of developments, including the 2002 introduction of dualism, increasingly fragmented municipal councils, the rise of local parties (Boogers & Voerman, 2010), increased

[1]Although minority governments bear many similarities to surplus coalitions (Lijphart, 2012), these coalitions are not within the scope of this study due to sample size issues. Only fifteen minority coalitions were formed after the March 2018 elections. For an introduction in the topic, see the work of Kaare Strøm (1984).

political volatility (Mair, 2008), and over 300 municipal amalgamations (Allers & Geertsema, 2016). It is for these reasons this study focuses on local administration and specifically the Dutch local level.

The societal relevance of this study must mainly be derived from its contribution to the understanding of democracy. Downs (1998) discusses what studies into coalition formation dynamics teach us about democracy. They reveal the basic motivations of politicians and parties. For example, do politicians aim to maximise offices, policies or votes? Coalition studies indicate if the political system allows for a diversity of parties to rule. They can also contribute to understanding of political responsiveness towards electoral verdicts.

This study allows the legislator to understand to what extent nationalisation of local elections and political fragmentation influence the type of coalition that will be formed. Both predictors can be regulated through policy[2]. While this study does not evaluate the desirability of coalitions that consists of more parties than the bare minimum, the literature suggests that some coalitions may in fact be more desirable than others[3].

In the next chapter, the theoretical framework, existing knowledge on the formation of surplus coalitions will be presented and hypotheses will be formulated. A research design to test these hypotheses will be presented in the third chapter. The subsequent results of this study can be found in the fourth chapter. In the fifth and final chapter, the implications of the study on theory and society, the limitations of this study and directions for future research will be discussed.

[2]For example, by organising local elections all throughout the year to avoid a national campaign and by setting a voting threshold to reduce fragmentation artificially.

[3]Broad coalitions may look democratic as they are supported by a substantial majority of the council. However, assuming that due to party discipline only opposition parties will truly challenge the municipal board, such broad coalitions also harm the scrutinising function of the council. Moreover, having more parties in government generally raises public spending (Roubini & Sachs, 1989; Bawn & Rosenbluth, 2006).

Chapter 2

Theoretical framework

In classical coalition theory, the coalition formation is considered a n-player constant-sum game where the pay-off is maximised by forming the smallest possible majority, i.e. a minimal winning coalition. In this theoretical framework, several theories that could explain the formation of non-minimal winning coalitions will be presented. Hypotheses will be formulated based on these theories.

As this study focuses on coalition formation in Dutch municipalities, some variables related to the legal framework offer no variance to analyse and will therefore not be presented in this report[1]. Those concepts could however be relevant in a future cross-national study.

2.1 Electoral control: volatility and localisation

In his widely-cited economic theory of political action in democracy, Downs (1957) argues that politicians seek office in order to gratify desired income, prestige and power. He perceives policies as a means to seek votes and not as a goal in itself. As a result, policies are a function of the expected electoral reaction and the strategy of the opposition. The opposition has a strategic advantage because contrary to government it does not have to commit on controversial issues nor do they have to proof the effectiveness of their policies in practice (Downs, 1957).

These principles contribute to explaining surplus cabinets. As Downs (1957) shows that the opposition has a strategic advantage in vote-seeking, being in government is likely to hurt the prospect of being in a future government. Such an incumbency effect is empirically widely supported[2] (Strøm, 1985; Paldam & Skott, 1995; Mattila & Raunio, 2004; Narud & Valen,

[1] An example of such a variable is the constitutional power of the municipal council vis-à-vis the municipal board (see e.g. Jungar, 2002). If a council is powerful, council parties can influence policy from the opposition. This decreases the utility gained from being in government and increases the utility gained by opposition parties. As a result, non-minimal winning governments could become more prevalent. Because all municipal councils in the Netherlands act under the same legal framework, such a variable is irrelevant in the current study.

[2] Some positive incumbency effects can be hypothesised. For example, current executives may more easily attract media attention. However, most studies on the incumbency effect find a net negative effect.

2008; Norpoth & Gschwend, 2010; Dassonneville et al., 2017). Therefore, the future electoral prospects that parties associate with being in office might somewhat reduce the value parties attribute to entering government (Mitchell & Nyblade, 2008).

By assuming that, contrary to what classical theorists did, coalition formation is part of a repeated game, one can look beyond the current term. Abstaining from government can then serve as an optimal long term vote-seeking strategy against the incumbency effect and thus result in holding more offices over a longer (Strøm, 1990). Alternatively, the incumbency cost can be minimised by adding more coalition partners, thus spreading the incumbency cost across more coalition parties. By considering the repeated game, strategies that hurt office-seeking and policy-seeking goals suddenly become perfectly reasonable on the grounds that these pursue a greater reward in future. Question is: under what conditions do politicians expect such strategies to be fruitful?

Denters' (1985) answer, in line with Downs' (1957) vote-seeking paradigm, is that such strategies are employed under the condition of high electoral control, when the need for consistency and reliability is the highest. Under low electoral control, politicians can safely maximise their ultimate desires with only limited risk of electoral punishment. Denters (1985) and Downs (1998) regard electoral control as a combination of volatility and localisation.

Electoral volatility refers to the variance of parties' share of seats over time (Pedersen, 1979). Low volatility suggests stable party alignments. If party alignments are stable, politicians are likely to diminish the cost of government: after all, they are unlikely to be punished by the electorate. On the contrary, if electoral volatility is high, parties may be incentivised to include surplus parties (Jungar, 2000; Bäck, 2003; Mitchell & Nyblade, 2008). This way, incumbency costs will be borne by more parties, thus limiting the risk of electoral punishment during the next election.

Hypothesis 1. *Electoral volatility has a positive effect on the likelihood of surplus governments to be present in a Dutch municipality.*

In localised party systems, the electorate bases its vote on local issues. Contrary to localised party systems are nationalised party systems, which are overshadowed by national politics (Boogers & Voerman, 2010). According to Denters (1985), parties are more likely to feel controlled by the electorate in localised party systems. The risk of losing seats as a punishment for being in government will therefore be perceived as higher than in nationalised systems. Hence, the aforementioned strategy of including surplus coalition members to share incumbency costs will therefore be perceived to be more rewarding strategy when localisation is high.

Hypothesis 2. *The localisation of the election has a positive effect on the likelihood of surplus governments to be present in a Dutch municipality.*

2.2 Political fragmentation

In this study, political fragmentation is considered to be diametric to political concentration. The latter is often measured using the formula developed by

Laakso & Taagepera (1979): the sum of all parties' squared seat share. Political fragmentation therefore encompasses the number of parties and the distribution of seats. Highly fragmented party systems are characterised by a high number of parties and a relatively uniform distribution of seats over those parties.

Most studies of coalition-making that consider political fragmentation recognise that it can impact the type of coalition through various mechanisms (Warwick, 1996; Gravdahl, 1998; Geys et al., 2006). As a result, the direction of its effect on the likelihood of surplus coalitions is ambiguous and depends on the mechanism. The two mechanisms that are central in the existing literature are fragmentation as a source of political instability and fragmentation as a moderator of the minimal winning criterion.

Fragmentation and political instability

The first of these mechanisms predicts a positive effect of political fragmentation on surplus coalition-making based on logrolling. Logrolling theory revolves around the notion that faced with a series of dichotomous choices on policies, political parties form coalitions to pass one another's core policies. The crux of the theory is that these arrangements are informal and as a result, a political party is incentivised to defect from the coalition as soon as its core issues are passed, leaving its former partners empty-handed (Mueller, 2003).

In order to protect themselves against defectors, coalition partners can opt to include surplus members to reduce the risk of defection (Luebbert, 1986). The majority is not necessarily lost when a coalition partner defects from a surplus coalition, contrary to minimal winning coalitions. Surplus coalition partners that contemplate defection need at least one other coalition partner to constitute a new majority. Consequently, surplus coalition partners are far less likely to gain anything from defecting or blackmailing to do so.

Carrubba & Volden (2000) and Volden & Carrubba (2004) show that surplus coalitions are more prevalent in highly fragmented systems and argue that this effect should be attributed to the high perceived risk of defection. To see why, consider that the number of unfavourable policies a party has to support in order to pass their own core policies positively scales with the number of coalition partners. Under high fragmentation, the number of coalition parties is generally higher. The costs of passing a favourable bill are therefore higher under high fragmentation, making defection more appealing.

Fragmentation and the minimal winning criterion

The second mechanism related to political fragmentation considers its implication on the office-seeking and policy-seeking theories. Office-seeking theorists like Von Neumann & Morgenstern (1944), Gamson (1961) and Riker (1962) all believe that coalition-making politicians are strongly incentivised to reduce the size of the coalition as much as possible for their own benefit. As the political fragmentation increases, the number of parties that are needed to form a winning coalition increases. This suggests that the rewards of being in

office are generally lower in such systems[3], while the bargaining costs only increase. As a result, the costs of being in office might exceed its benefits. In such cases, it is both more difficult and less desirable to convince surplus parties to join the coalition.

On the policy-seeking side of things, Gravdahl (1998) finding a common denominator among possible coalition partners is more difficult in politically fragmented systems due to the higher number of interests that need to be satisfied. Since policy-seeking theorists like Leiserson (1968) and Axelrod (1970) cite ideological incentives as a reason to form surplus coalitions, Gravdahl's observation suggests that surplus coalitions are less likely to form in highly fragmented systems as a result of policy-seeking incentives. Of course, this assumes that the average ideological distance between parties is unrelated to political fragmentation[4].

Taking into account the contradicting nature of these two mechanisms, the impact of political fragmentation using is tested a two-tailed hypothesis:

Hypothesis 3. *Fragmentation of the municipal council has an effect on the likelihood of surplus coalitions to be present in a Dutch municipality.*

2.3 Financial position of the municipality

The Dutch Act on Local Government prescribes municipal budgets to be balanced. However, the municipal equity can be used to compensate in case of a budgetary deficit. Municipalities with a relatively low solvability are therefore restricted when policy-making as opposed to financially thriving municipalities.

Let us first consider the implications of solvability on vote-seeking strategies. Under the condition of low solvability, the budget to enact policies that serve interest groups within society is lower. The incumbency costs of a coalition then increase. As surplus coalitions could be formed to protect oneself against incumbency costs, there is a vote-seeking incentive to form surplus coalitions under low-solvability conditions.

Besides the implications on vote-seeking strategies, Volden & Carrubba (2004) expect a relation based on the logrolling theory. As explained before, logrolling theory is based on a framework where councilmen are faced with repeated dichotomous choices and help pass each others pet policies. Surplus coalitions are then formed to prevent that a single party can defect once its own favourable bills are passed (Mueller, 2003). Volden & Carrubba (2004) argue that the incentive to defect is weaker if the benefits of the policies that are passed are high, which is the case under high-solvability conditions. As the risk of defection decreases, the benefit of insuring oneself against such a risk decreases. Surplus coalitions can therefore be hypothesised to be less likely to form under in such situations.

[3]However, Geys et al. (2006) note that the cost of including an extra coalition partner is lower in highly fragmented systems due to the lower average size of political parties (cf. Leiserson, 1968), which somewhat negates the described effect.

[4]If the average ideological distance is lower in politically fragmented systems, Gravdahl's argument does not hold as finding a common denominator would be easier, thus increasing the likelihood of surplus coalitions.

Hypothesis 4. *The solvability of a Dutch municipality has a negative effect on the likelihood of surplus governments to be present in that municipality.*

2.4 Population size

Wieldraaijer (2015) hypothesises a negative effect between the prevalence of surplus coalitions and the size of the municipality (measured as the number of eligible voters). In the Netherlands, the number of aldermen is related to the size of the municipality. Also, being alderman in a bigger municipality is arguably more prestigious, yields more power, offers better career perspectives and rewards more income. Therefore, being in government offers more utility the bigger the municipality, thus bolstering office-seeking incentives.

Gravdahl (1998) observes a direct positive effect between population size and the prevalence of surplus coalitions. Surprised by this outcome, he tries to interpret it by arguing that the level of conflict is generally higher in bigger municipalities[5] and that surplus coalitions are consequently formed to reduce conflict. There are two problems with this statement. First, Gravdahl (1998) does not explain why parties are incentivised to reduce conflict. More important, his model already controls for the impact of political conflict by including the political fragmentation variable. Hence, he cannot attribute the positive effect of size on coalition type to an indirect effect through fragmentation.

Hypothesis 5. *Population size has a negative effect on the likelihood of surplus coalitions to be present in a Dutch municipality.*

2.5 Legal constraint on full-time surplus boards

The Dutch Local Government Act limits the number of aldermen to twenty percent of the number of council seats or twenty-five percent of the number of council seats if the aldermen work part-time. Tops (1990) shows that some seat distributions can cause the formation of full-time surplus board or even any surplus board to be mathematically impossible[6]. Based on office-seeking principles, a full-time alderman position could be considered more rewarding in terms of income, power and prestige compared to a part-time position. Therefore, coalition parties are discouraged to form surplus boards if that means the aldermen have to work part-time. Hence, hypothesis 6 is formulated:

Hypothesis 6. *If there is a legal constraint on full-time surplus municipal boards, surplus governments are less likely to be present compared to when such a constraint is absent.*

[5]Local politics tends to be less politicised than national politics because of its limited scope and a culture of consensus (Boogers & Voerman, 2010). For example, major issues like immigration and tax policies are often nationalised. On the contrary, local issues are often practical and therefore difficult to politicise. The culture of consensus is a result of the small communities local politicians operate in, because the need to peacefully cooperate in other social contexts discourages politicians to escalate. The strength of these mechanisms is arguably related to population size. Hence, Gravdahl's assumption on the relationship between size and conflict seems accurate.

[6]For example, consider a thirteen seat council where the two largest parties together do not hold seven or more seats. Given the maximum number of aldermen of three, it is impossible to form a surplus coalition in this municipality.

Chapter 3

Methodology

Based on the theoretical framework, six hypotheses have been formulated regarding predictors of coalition type. This chapter will show how these hypotheses have been tested.

3.1 Research design

The population researched in this study consisted of the Dutch municipalities that organised municipal elections in March 2018. These municipalities use the party-list proportional representation political system. Ultimately, the sample size was 304, because a number of cases could not be used for reasons that will be explained later in this chapter. The six hypotheses were tested using multivariate logistic regression analysis, which can be used to model the probability of dichotomous events. In this case, the surplus coalition was regarded as the event. The model estimates parameters for each of the five concepts. The parameters indicate the effect size of each concept, allowing to reject the hypotheses as appropriate.

3.2 Operationalisation and data collection

A predictive model of the coalition type of the municipality was developed using properties of the seat distribution in the council, municipal demographics and the financial position of the municipality. The operationalisation and data collection of all variables will be discussed in this section.

3.2.1 Coalition type

Coalition type was considered a dichotomous variable that can be 'minimal winning' or 'surplus'. All parties that are represented in the municipal board were considered coalition parties. This does not take into account confidence-and-supply agreements with non-government parties. Such a

operationalisation of coalition type would require extensive content analysis[1]. Only coalitions that hold a majority of seats in the municipal council were considered[2]. Coalitions that would still hold a majority if the smallest party left the coalition are considered surplus (coded 1). All other majority coalitions are minimal winning (coded 0).

Data on what parties are in the municipal boards was acquired from the website of the Dutch Association for Aldermen (Wethoudersvereniging) using a dedicated web-scraper. The data was freely available. The validity of this data was verified by comparing a random sample of it with the information supplied by the websites of the municipalities.

3.2.2 Electoral volatility

In order to measure electoral volatility, the index developed by Pedersen (1979) was used. This index shows the net change in votes between parties during elections. The index can be calculated using the following formula:

$$V = \frac{1}{2} \sum_{q \in Q_t^c} \mid S_t^c(q) - S_{t-1}^c(q) \mid \tag{3.1}$$

where $S_t^c(q)$ refers to party q's share of vote during election t in municipality c, which is compared to the share of votes at the previous election $t-1$. In this case, $t = 2018$ and $t - 1 = 2014$. The set of all parties is denoted by Q.

The data was obtained from the Dutch Electoral Council, which offers data on all election results since 1848 through their online public data bank.

3.2.3 Localisation

The simplest way of measuring localisation of the election is by calculating the local parties' share of seats, as was done by e.g. Wieldraaijer (2015). This operationalisation is problematic for multiple reasons. It does not acknowledge that the electorate can exercise control by voting a party that is not local and that voting for a local party does not necessarily increase electoral control. It is unable to differentiate between two municipalities where both show an equal share of local party seats, but one perfectly reflects the national elections due to being completely overshadowed by national politics while the other ignores national trends altogether.

Denters (1985) and Bäck (2003) solve this problem by considering the absolute difference between the local election result and the national trend.

[1] The result of the vote on the appointment of the aldermen may seem an appropriate and convenient operationalisation at first sight. However, as part of a ceremony, Dutch aldermen are traditionally elected either unanimously or by a grand majority, even though only a majority is required by law.

[2] Only fifteen minority coalitions were formed after the March 2018 elections. An multinomial analysis could therefore not be conducted without a high risk of type II errors. Lijphart (2012) argues that minority coalitions are most similar to surplus coalitions, while Crombez (1996) believes that minority coalitions resemble MWCs more closely. Two additional analyses were conducted where minority coalitions were considered either MWCs or surplus coalitions. The conclusions of this study would not have been different if either model was preferred over the reported model. This is not very noteworthy given the low leverage these fifteen cases have over the 305 other cases. So, even though there might be theoretical reasons to classify minority governments one way or another, statistically speaking there is no complication.

While this measure is a lot more sophisticated already, the operationalisation could be improved upon due to a pair of problems. First, it can expect a party to lose more seats than is possible. To see how, consider a national branch that loses a quarter of its 40% seat share. Based on the absolute difference, the local branch that only held 4% of seats in the first place is expected to hold -6% of the seats after the elections. Second, regardless of predicting negative values, expecting a local branch to win or lose the absolute national seat change might be misplaced on a more fundamental level. A relative change, resulting in a 3% seat share in the aforementioned example, might be a more accurate expectation. The Index of Minimal Electoral Control (IMEC[4]) developed by Van der Kolk (2000) considers the relative seat change and therefore solves these complications.

The set of parties that participate in municipality C during election t is denoted by Q_t^c. A single element from this set, the party, is denoted by q. The fraction of votes gained by party q in a specific local election is denoted by $S_t^c(q)$. Obviously, $S_t^c(q) \in [0,1]$ and $\Sigma_{q \in Q_t^c} S_t^c(q) = 1$. $Q_t^\Sigma(q)$ denotes the fraction of the national electorate electing party q, calculated by dividing the total sum of voters for party q by the number of eligible voters.

The expected value E of the seat share S of party q in municipality C at election t can be calculated using equation 3.4 calculating the relative change of seats on the national level and multiplying that with the seat share of party q at the previous election. The second part normalises the fractions so that $\Sigma E[S_t^c(q)] = 1$. An adaption of the equation was necessary for the index to be compatible with the 2018 context[3][4].

$$E[S_t^c(q)] = \begin{cases} 0, \text{if } q \notin Q_t^c \\ \\ \frac{S_t^\Sigma(q)_{adj.}}{S_{t-1}^\Sigma(q)_{adj.}} S_{t-1}^c(q)_{adj.} / \sum_{q \in Q_t^c} \frac{S_t^\Sigma(q)_{adj.}}{S_{t-1}^\Sigma(q)_{adj.}} S_{t-1}^c(q)_{adj.}, \text{if } q \in Q_t^c \end{cases} \tag{3.4}$$

Next, $\delta_t^c(q)$, the deviation between the expected seat share S of party q

[3]Some combined lists (e.g. VVD-D66) participate in a low number of municipalities, forcing individual municipalities to have high leverage over the nationalised trend. This would consequently cause these municipalities to show deflated electoral control scores. This is prevented by using the sum of the combined lists and all its individual members in order to calculate the national trend:

$$S_t^\Sigma(q)_{adj.} = \sum_{q \in F_t^\Sigma(q)} S_t^\Sigma(q) \tag{3.2}$$

where $F_t^\Sigma(q)$ refers to the family of lists in Q_t^Σ that participate in the combination list q. For example, $F_t^\Sigma(\text{VVD/D66}) = \{\text{VVD, D66, VVD/D66}\}$. As a result, $\Sigma_{q \in Q_t^\Sigma} S_t^\Sigma(q)_{adj.} \geq 1$.

[4]In some municipalities, parties combined or split in between elections. Van der Kolk's model cannot handle party mergers: it assumes that the combined list is unrelated to the former lists. In order to retain a decent sample size and avoid selection bias, such municipalities were evaluated as if the parties participated as combined lists in both elections:

$$S_t^c(q)_{adj.} = \begin{cases} 0, \text{ if } q \notin Q_t^c \text{ or } q \in F_{t_i}^c(p) \\ \\ \sum_{q \in F_{t_i}^c(q)} S_t^c(q), \text{ if } q \in Q_t^c \text{ and } |F_{t_i}^c(q)| > 1 \\ \\ S_t^c(q), \text{ if } q \in Q_t^c,\ q \notin F_{t_i}^c(p) \text{ and } |F_{t_i}^c(q)| = 1 \end{cases} \tag{3.3}$$

where $t_i = 2014, 2018$, $p \in Q_{t_i}^c$ and $p \neq q$.

during election t and its actual seat share is calculated. Here, we assume that $S_t^c(q)_{adj.} = 0$ if $q \notin Q_t^c$.

$$\delta_t^c(q) =\mid E[S_t^c(q)] - S_t^c(q)_{adj.} \mid \tag{3.5}$$

Finally, the sum of the deviations across all parties is taken and multiplied by 50 in order to create a scale of electoral control ranging from 0 to 100.

$$E(C) = \sum_{q \in Q_t^c} \delta_t^c(q) \times 50 \tag{3.6}$$

Van der Kolk (2000) calls $E(C)$ a measure of *minimal* electoral control, because the electorate can also exercise control over decision-makers in other ways. However, this focus on electoral results is not necessarily a limitation to this study, because the line of reasoning of the related hypothesis is specifically focused on the electoral punishment of the governing parties.

The data was obtained from the Dutch Electoral Council, which offers data on all election results since 1848 through their public data bank. In eleven municipalities that organised elections in March 2018, the previous elections did not take place in March 2014 due to mergers[5]. Instead, those elections were held in November 2012, November 2013 and November 2014. This raises issues when calculating the localisation of these municipalities, because there is no way of knowing if deviations from the observed national trend should be attributed to location (which is ought to be measured) or changes in the national trend over time. These municipalities were therefore excluded from further analysis.

3.2.4 Political fragmentation

Political concentration can be measured using the index that was developed by Hirschman (1980)[6]. In order to use it as a measure of political fragmentation, the scale is reversed:

$$C_0 = 100 - \sum_{q \in Q_t^c} S_t^c(q)^2 \times 100 \tag{3.7}$$

where $t = 2018$.

Compared to measures like *seat share of the largest party* (Carrubba & Volden, 2000), this measure is able to look beyond that party and take into account the size of parties that are not the largest. On the other hand, operationalizations like *number of parties in parliament* fail to take into account the seat share of the parties. The index combines both measures into one and therefore has neither weakness.

Just like the volatility and localisation measures, political fragmentation was measured using data that was provided by the Dutch Electoral Council.

[5]Specifically, Alkmaar, Alphen aan den Rijn, Berg en Dal, De Fryske Marren, Goeree-Overflakkee, Gooise Meren, Heerenveen, Krimpenerwaard, Nissewaard, Oss, Schagen and 's-Hertogenbosch.

[6]Laakso & Taagepera (1979) should be credited for introducing the Herfindahl–Hirschman Index in the field of political science.

3.2.5 Financial position of the municipality

The financial position of the municipality was be measured through its solvability which is the balance equity (the liability side of the balance minus the debts) divided by the balance assets multiplied by 100%. This operationalization is favourable compared to e.g. the profits reported over 2017, because solvability takes into account the available financial reserves and is based on various years.

The data is by law publicly available in the year reports of the municipalities and was obtained from the Association of Dutch Municipalities, who used collected the data from the reports of 2017.

3.2.6 Population size

The population size of municipalities was calculated by transforming the number of inhabitants with the natural logarithm. The natural logarithm was used to avoid that big municipalities have tremendous leverage on the estimated parameter in the regression model.

The data was obtained from the Association of Dutch Municipalities, who collected the data from the Central Bureau of Statistics report 'Kerncijfers wijken en buurten 2018'. The census records of January 2018 were used.

3.2.7 Legal constraint on full-time surplus boards

According on the Local Government Act, the number of aldermen equals 20% of the number of council seats or 25% if the aldermen work part-time. Under some conditions, it is impossible to form a surplus coalition that works full-time. This dummy variable has value 1 if the seat share of the $n-1$ largest parties was smaller than 50%[7], where n is the maximum number of full-time aldermen.

The data needed to calculate this dummy variable was retrieved from the Electoral Council.

3.3 Analysis of the data

All data was imported into Microsoft Excel documents in order to process it using a script developed in the programming language Python 3.6.5. This script was used for all non-statistical operations. This includes detecting the coalition type by comparing aldermen distributions to seat distribution. The program was also used to calculate the Pedersen Index for electoral volatility, Van der Kolk's localisation index, the Hirfindahl-Hirschman index for political fragmentation, and the presence of a legal constraint on full-time surplus boards. The script reduced the risk of manual errors, increases academic transparency as it can easily be fully reviewed, and made an otherwise tedious job rather convenient.

The data was consequently analysed in the IBM SPSS Statistics 23.0 program. Given the dichotomous outcome variable, it was opted to study the relationships between variables using multivariate logistic regression. Hence,

[7]Note that it is impossible for a coalition to hold exactly 50% of the seats as all municipal councils have an odd number of seats.

the following six-predictor model was fitted to the data to test the hypotheses formulated in the theoretical framework:

$$\pi = \frac{1}{1 + e^{-(\alpha+\beta_1 V+\beta_2 L+\beta_3 F+\beta_4 P+\beta_5 S+\beta_6 C)}} \tag{3.8}$$

where π is the probability of a coalition being surplus, and V, L, F, P, S and C refer to the independent variables electoral volatility, localisation, political fragmentation, population size, financial solvability and legal restraint on full-time surplus coalitions, respectively.

Multivariate logistic regression assumes a linear relationship between continuous independent variables and the logit transformation of the dependent variable. This assumption has been tested using the significance of the interaction effect between each predictor and its natural log (Box & Tidwell, 1962). The test detected that none of the variables violates the assumption.

During the outlier analysis, one case (Vlissingen) was excluded from the reported model. The average solvability in the dataset, excluding Vlissingen, was 36.55 (SD = 18.13). Vlissingen's solvability was -80.20. Removal had no effect on the direction of the log odds, but influenced the significance levels. In order to avoid Type II errors among all other cases, the case was dropped. All remaining 305 cases had studentized residuals less than -2 or greater than 2 and were therefore no potential outliers (Sarkar et al., 2011).

Some overall model test were also conducted in IBM SPSS Statistics 23.0, including the likelihood ratio test and the Lagrange multiplier test to evaluate if the model is an improvement over the null-model, the Hosmer-Lemeshow test to analyse the goodness-of-fit, and the c-statistic and Goodman-Kruskal's γ to assess the predictive performance of the model.

Finally, a plot was produced to show the relationship between the predicted probability and the squared studentized residual. This plot was used to select cases to recommend for further qualitative research in the final chapter of this thesis.

3.4 Ethical considerations

At the Faculty of Behavioural, Management and Social Science of the University of Twente, only studies that involve human suspects or sensitive data need to be approved by the Ethical Committee. Since no new data has been gained from human suspects and the data that has been used was already part of the public domain, no ethical complications were expected and therefore no approval from the committee needed to be sought.

Chapter 4

Results

The results of the analysis that was conducted are presented in this chapter. The first section will discuss the descriptive statistics. Next, the multivariate logistic regression model will be evaluated and used to test the hypotheses. Finally, a number of general model statistics will be presented to discuss the quality of the model.

4.1 Descriptive statistics

The descriptive statistics of the variables used in this study are presented in Table 4.1. The final sample size was 304, which is 90,7% of the municipalities that organised elections in March 2018. 139 of these municipalities had a coalition that was surplus. The other 165 coalitions were minimal winning coalitions.

Among all municipalities, an average volatility score of 17.49 (SD = 10.00) was observed. The volatility in municipalities with an MWC is over 1.29 percentage point higher compared to surplus coalition municipalities. The average IMEC4 score for localisation is 6.219 (SD = 2.789), where the average score in municipalities with surplus coalitions is about half a percentage point higher than in municipalities with an MWC. The index for political fragmentation shows a mean score of 80.98% (SD = 5.81%). The surplus coalitions are generally found in relatively politically fragmented municipalities, although the difference is rather small. The financial solvability of municipalities with an surplus coalition is observed to be over three percentage points higher than MWC municipalities, with an average standard

Table 4.1: Descriptive statistics of variables in this study

Type	N	Volatility		Localisation		Fragmentation		Solvability		Population size		Legal constraint	
		M	SD	M	SD	M	SD	M	SD	M	SD	Yes	No
MWC	165	17.63	9.70	5.983	2.365	80.94	5.87	35.16	18.42	10.26	.898	27	138
Surplus	139	16.34	10.37	6.492	3.204	81.03	5.75	38.27	17.74	10.35	1.129	8	131
Total	304	17.49	10.00	6.219	2.789	80.98	5.81	36.58	18.15	10.30	1.009	35	269

deviation of 18.15. The population size, shows a mean of 10.30 (SD=1.0099). The mean population size of municipalities with an surplus board is generally higher. The final variable is a dummy that is coded 1 if an full-time surplus municipal board cannot be formed due to the Local Government Act. It can be observed that if this is the case, the odds of an surplus board forming are $8/27 = 0.296$ compared to $131/269 = 0.487$ in municipalities where full-time surplus are possible.

4.2 Evaluation of the model

The model will now be evaluated statistically. First, the estimates of individual predictors will be studied. Subsequently, the overall model will be evaluated. Finally, the predicted probabilities will be regarded.

4.2.1 Statistical tests of hypotheses

Table 4.2 shows estimates and the related statistical tests of the coefficients of the predictors in the model. The statistical significance of the individual predictors was examined using the Wald χ^2 test. In Table 4.2, the $e^{\beta}[95\%CI]$ column of a variable refers to the estimated odds ratio and corresponding 95% confidence intervals when the values of the other prediction variables in the model are fixed. The odds ratio is the increment of odds if the unit of analysis increases by one. In this study, the odds are calculated by the probability of a surplus coalition to form divided by the probability of a minimal winning coalition to form. Thus, an $e^{\beta} > 1$ indicates that the probability of a surplus coalition increases as the variable increases, while $e^{\beta} < 1$ shows the opposite.

The first hypothesis concerns electoral volatility and expects a one-tailed positive relationship with the presence of surplus coalitions. The analysis shows an insignificant effect in the wrong direction. The hypothesis is therefore rejected.

The second hypothesis expects a one-tailed positive effect between the presence of a surplus government and localisation of the election. The model shows a significant effect of electoral control on coalition type. The e^{β} shows that if the electoral control increases by one percentage point, the probability

Table 4.2: Results of the multivariate logistic regression analysis to predict the presence of a surplus coalition in Dutch municipalities

Predictor	$\beta(SE)$	p	e^{β} [95%CI]
Electoral volatility	-.004 (.013)	.776	0.996 [0.971, 1.022]
Localisation	.106 (.049)	.030	1.111 [1.010, 1.223]
Political fragmentation	.026 (.025)	.297	1.027 [0.977, 1.078]
Financial solvability	.013 (.007)	.065	1.013 [0.999, 1.027]
Population size	.006 (.143)	.964	1.006 [0.760, 1.333]
Legal constraint on full-time coalition	-1.326 (.457)	.004	0.266 [0.108, 0.651]
Constant	-3.288 (2.168)	.129	-

Note. All tests statistics are reported two-sided.

of a surplus coalition increases by 11.1% ($p = .015$)[1], all other variables fixed. The data therefore supports the hypothesis.

The third hypothesis is two-tailed and concerns the relationship between political fragmentation and the presence of surplus coalitions. The model shows an insignificant positive effect on the probability of a surplus coalition to form ($p = .297$). The hypothesis is therefore rejected.

The fourth hypothesis is one-tailed and expects a negative relationship between the financial solvability and the presence of a surplus coalitions. The analysis shows a beta coefficient that is in the opposite direction. The corresponding p-value therefore becomes .935. The hypothesis is therefore refuted.

The fifth hypothesis is one-tailed and expects a negative effect of population size on the presence of a surplus coalitions. Table 4.2 shows a positive insignificant effect with an e^{β} of 1.006 ($p = .482$). Given the insignificant effect, the hypothesis is rejected.

The sixth and final hypothesis expects that the presence of a legal constraint on full-time surplus municipal boards has a negative effect on the presence of surplus governments. Finally, the legal constraint on full-time coalitions shows a significant negative effect with log odds of .266 ($p = .002$). This means that, keeping all other variables fixed, the formation of a surplus government in a municipality with a legal constraint on full-time surplus governments was $1/.266 = 3.759$ times as likely as in municipalities where there was a legal constraint. The hypothesis is therefore supported.

4.2.2 Overall model evaluation

Is the model an improvement over the null-model which only includes the intercept and assigns all cases to the largest outcome category? Two inferential statistical tests were used to evaluate this. The likelihood ratio test shows that the model is 16.98 times more likely to predict the sample than the null-model. The hypothesis that the data is equally likely under the null-model was therefore rejected with $p = .009$. The Lagrange multiplier test was used to test the same hypothesis using the slope of the log-likelihood function. The test also shows that we can conclude that the model is an improvement over the intercept-only model, with $\lambda = 16.00$ and $p = .014$.

4.2.3 Goodness of fit statistics

The goodness of fit of a statistical model is described by the discrepancy between the values predicted by the model and the values observed in reality. In order to measure the goodness-of-fit of the models, the inferential Hosmer-Lemeshow test evaluates whether or not the probability rates predicted by the models correspond with the occurrence rate observed in reality in subgroups of the population. The test resulted in $\chi^2_8 = 5.800$, which corresponds to $p = .670$. This means that the null-hypothesis that the model fits the data well was not

[1]When interpreting Table 4.2, one must take into account that the reported p-values are reported two-tailed. The in-text p-values are corrected for the direction of the hypothesis in the case of a one-tailed test.

rejected, which of course is the desired result[2].

4.2.4 Validations of predicted probabilities

The model can also be evaluated in terms of the quality of its predictions. Goodman-Kruskal's γ was calculated and shows the model made 37.7% fewer errors in predicting which of municipalities has a surplus government by using the estimated probabilities than by chance alone. The effect is statistically significant at $p = .001$.

The c-statistic is used to study if the model is better at predicting an outcome than random chance. In the current model, the c-statistic = .610 ($p = .001$). This means that for 61.0% of all possible pairs of municipalities, one with a MWC coalition and one with a surplus government, the model correctly assigned the higher probability of a surplus coalition to form to the right municipality.

Overall, the model made a correct prediction in 60.2% of the cases. The model is a lot better at correctly classifying an observed minimal winning coalition (72.7%) than a surplus coalition (45.3%). This bias might be explained by the higher number of MWC cases.

Likewise, Figure 4.1 shows the relation between the predicted probabilities and the residuals. It illustrates that the model predictions of minimal winning coalitions tends to be more extreme, because of the higher number of cases that have a probability lower than 0.25 compared to higher than 0.75. The cases where the squared studentized residuals are high are cases the model finds hard to predict. Likewise, if the square studentized residuals are low, the model is accurate in its predictions.

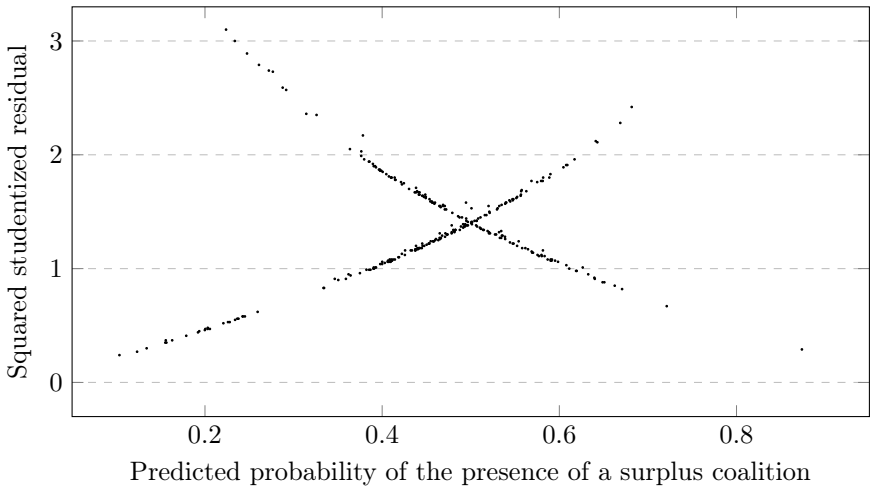

Figure 4.1: Change in deviance versus predicted probabilities

[2]Those who are familiar with testing goodness of fit in linear regression models might expect R^2 to be reported here. Hosmer et al. (1989) explain that although pseudo-measures of R^2 (e.g. those by Cox & Snell, 1989 or Nagelkerke, 1991) are available, those are not intuitively easy to explain, especially to those who expect large R^2 scores, which are uncommon in multivariate logistic regression. They therefore recommend against reporting these values.

Chapter 5

Discussion

The reseach question of this study was: *Under what conditions do surplus coalitions emerge?* This quantitative study suggests that electoral localisation and the legal constraint of full-time surplus coalitions have an effect on surplus coalitions.

As was discussed in the theoretical framework, electoral localisation refers to the notion that the local electorate bases its vote on local issues. Under such conditions, politicians may perceive a higher risk of being punished for being in government. This is in line with Downs' (1957) suggestion that the opposition may have an advantage in seeking votes, as was empirically tested by e.g. Mattila & Raunio (2004) and Narud & Valen (2008). As a consequence, local politicians may prefer surplus coalitions over minimal winning coalitions because this spreads the risk of being punished and removes the oppositional advantage of direct competitors by putting them in government as well.

The observation by Tops (1990), who found that in some municipalities it is impossible to form a full-time surplus government due to an institutional constraint, was supported by this study. The data suggests that politicians prefer to form a full-time minimal winning coalition over a part-time surplus coalition: minimal winning coalitions were over 3.8 times as likely to form in municipalities where there was such a constraint, even after controlling for political fragmentation and population size.

Electoral volatility, population size, political fragmentation and financial solvability showed no direct effect.

The remainder of this chapter will discuss the theoretical and practical implications of these findings, the limitations of this study, and directions for further research.

5.1 Theoretical implications

The main objective of this study was to gain a better understanding how an election results leads to the formation of a government. A gap in classical coalition theory was identified: its inability predict non-minimal winning coalitions. In order to fill that gap, six hypotheses were formulated in order to explain the conditions that cause surplus coalitions to emerge.

In line with earlier studies by Denters (1985) and Bäck (2003), it was

expected that electoral volatility and localisation would have impact on the coalition type. Only the latter theory was supported by the data. Given the trend of Dutch politics becoming increasingly volatile (Mair, 2008), electoral volatility may no longer be an accurate predictor because at least a minimum level of volatility can be expected in most municipalities (Bäck, 2003).

Two hypotheses were formulated based on the logrolling theory following Carrubba & Volden (2000). The first of those expected an effect of political fragmentation on coalition type based on the risk of defection. The second concerned a negative effect between solvability and the formation of surplus coalitions, because defection is less likely if the spoils of government are higher. Both hypotheses were rejected, suggesting that logrolling theory might not be as applicable in Dutch local governance compared to other contexts. Due the relatively weak position of the council vis-à-vis the board and the lack of new elections being prompted when a local coalition falls, defecting from a coalition may be less fruitful compared to other states.

Regarding population size, Wieldraaijer's (2015) suggested that being in government offers more utility in bigger municipalities due to the higher number of aldermen, and the increased prestige, power, career perspectives, and income associated with the position. The theory was not supported by the data.

5.2 Practical implications

Since this study primarily aims to predict coalition type, the practical implications are somewhat dependent on the desirability of one type over the other. Before any practical recommendations are made, one should consider if there are reasons to prefer minimal winning or surplus coalitions. A few of these were already touched upon. For example, Roubini & Sachs (1989) and Bawn & Rosenbluth (2006) show that public spending is positively related to the number of coalition members. In this light, surplus coalitions might be regarded as a cause of rising public spending. However, the desirability of public spending remains a normative and political question, as one could also argue that public spending is higher because it is distributed more equally over the population. Another aspect of the desirability of either coalition type is the power of the municipal council vis-à-vis the municipal board. Surplus coalitions might be more inclusive on the board level, but weaken the scrutinising function of the municipal council. Whether this is desirable is also a normative question[1]. Both the aspects of public spending and the power of the municipal council can be turned into instrumental questions if these are studied in relation to political legitimacy.

Now that it was established that there are instrumental, normative and political reasons to prefer one coalition type over the other, some practical recommendations can be presented.

Given the positive effect of electoral localisation on the formation of surplus coalitions, actors that would like to reduce public spending have reasons to denationalise local elections. One way to do this, is by organising the local

[1]To see why this is a political question, consider that a dominant party is better off in systems where MWCs are prevailing, because they are likely to be in power anyway. Smaller parties have probably more to gain from inclusive systems, as these decrease the likelihood of them watching from the sidelines.

elections all throughout the year to avoid interference on the national level.

This study also shows that if the Local Government Act sometimes forces politicians to choose between full-time minimal winning coalitions and part-time surplus coalitions, the former is often preferred over the latter, even though MWCs and surplus coalitions are almost equally likely to form if there is no constraint. This shows that coalition formation is shaped by the institutional framework. Proponents of an inclusive local board can therefore propose to increase the maximum number of full-time aldermen, causing surplus coalitions to be more likely to emerge.

5.3 Limitations

This study was limited in various ways. First, there is room for improvement in the way coalition type was operationalised. By the current definition, a party is part of the coalition if it holds an alderman seat. This does not take into account confidence-and-supply agreements or council agreements with independent aldermen. This leads to an underestimation of the number of surplus coalitions. As a result, the estimation of the parameters within the model may be erroneous.

Second, the Pedersen volatility and Van der Kolk localisation indices were based on the 2014 and 2018 elections. The measurement of these variables may have been more accurate if earlier elections had been used in addition to these two elections.

Third, the hypothesis with regards with political fragmentation is two-tailed due to two contrary mechanisms. In retrospect, it may have been preferable to dedicate a separate hypothesis to each of these mechanisms and operational accordingly. As a result of this limitation, it is unclear if any of these mechanisms have an effect, because they might cancel one another out.

Fourth, while no direct effects of population size and political fragmentation could be found, these concepts may have an indirect effect. An indirect effect through the institutional constraint on surplus full-time coalition variable might be even mathematically provable. However, this study has not looked into the indirect effects. This was done mostly to avoid having to mix logistic and linear regression in one model or having to use structural equation modelling without solid background knowledge of the researcher.

Finally, it must be noted that the scope of this study somewhat limited the ability to answer the research question. As almost one thousand different local parties participated in the 2018 municipal elections, developing spatial models including the elected parties would have been a tedious job. Even if policy

positions could have been measured[2,3], it is difficult to make a cross-municipal comparison of political cleavage as one would have to assume that the levels of salience on the issues are equal throughout all municipalities. This study is therefore policy-blind. That is to some extent problematic, because reducing the ideological range of a coalition could be a reason to form an ideological coherent surplus coalition vis-à-vis a polarised minimal winning coalition (Leiserson, 1968; Axelrod, 1970).

Likewise, the choice for qualitative research also limited the ability to take into acount the interpersonal relationships within the local party system. Local politics are generally more intimate and interwoven with society (Bäck, 2003). Therefore it can be reasoned that interpersonal relationships could shape the coalition formation process.

5.4 Directions for further research

Bäck & Dumont (2007) describe that the way forward in coalition research is by combining large-n and small-n studies. This quantitative study is an example of such a large-n study. It is possible to build upon this study by conducting a series of small-n studies.

How should the cases for these qualitative studies be selected? Figure 4.1 could contribute to this. Cases where the residuals are low can be used to validate this model. The correct predictions where the predictive model was most confident about were Vaals, Schiermonnikoog, Terschelling (all MWC), Someren, Rucphen, and Brielle (all surplus). These municipalities are therefore most likely to confirm the theorised relations.

Cases with a high residual can be used to explore new predictors of coalition formation. The model found Heeze-Leende, Heumen[4], and Waalre highly likely to be minimal winning, but these turned out to be surplus coalitions. Vice versa, the model was wrong to predict that surplus coalitions would be formed in Oudewater[5], Leiderdorp, and Huizen. Given that this study did not take into account confidence-and supply, policy-seeking motives, and interpersonal relationships, these cases could maybe be explained with such concepts.

Further research should be qualitative because such a study would allow to take into account interpersonal relationships, policy positions and confidence-and-supply agreements. This study was highly limited with regards to these concepts that are difficult to study quantitatively.

[2]In an early research proposal, the policy positions were aimed to be measured using multidimensional scaling. It was consequently removed from the proposal because the policy positions could not be based on parliamentary voting due to government coalitions voting as a bloc. As a result, the government parties would always be closer to each other than to opposition parties. It was briefly considered to base the policy positions based on voting advise applications. However, different voting advise applications are used across Dutch municipalities and in some municipalities none is available. On a more theoretical level, the voting advise applications are designed to maximise cleavage in order to simplify reality, causing fragmentation levels to be skewed.

[3]Policy positions could have been derived from party programs using content analysis. Such an analysis is also cumbersome. It is difficult to design a code book that allows for cross-municipal comparison, because the salience of issues varies across municipalities. On a more practical note, parties do not always offer an online version of their program.

[4]In Heumen, largest party *DGH* was excluded based on interpersonal issues (Reith, 2018).

[5]Oudewater had the longest formation period. The largest party was excluded for demanding too much.

Bibliography

Allers, M. A. & Geertsema, J. B. (2016). The effects of local government amalgamation on public spending, taxation, and service levels: Evidence from 15 years of municipal consolidation. *Journal of Regional Science*, 56(4), 659–682.

Axelrod, R. M. (1970). *Conflict of Interest: A Theory of Divergent Goals with Applications to Politics.* Markham.

Bäck, H. (2003). *Explaining coalitions: evidence and lessons from studying coalition formation in Swedish local government.* PhD thesis, Uppsala University.

Bäck, H. & Dumont, P. (2007). Combining large-n and small-n strategies: The way forward in coalition research. *West European Politics*, 30(3), 467–501.

Bawn, K. & Rosenbluth, F. (2006). Short versus long coalitions: electoral accountability and the size of the public sector. *American Journal of Political Science*, 50(2), 251–265.

Boogers, M. & Voerman, G. (2010). Independent local political parties in the netherlands. *Local Government Studies*, 36(1), 75–90.

Box, G. E. & Tidwell, P. W. (1962). Transformation of the independent variables. *Technometrics*, 4(4), 531–550.

Carrubba, C. J. & Volden, C. (2000). Coalitional politics and logrolling in legislative institutions. *American Journal of Political Science*, (pp. 261–277).

Cox, D. R. & Snell, E. (1989). *Analysis of Binary Data*, volume 32. CRC Press.

Crombez, C. (1996). Minority governments, minimal winning coalitions and surplus majorities in parliamentary systems. *European Journal of Political Research*, 29(1), 1–29.

Dassonneville, R., Lewis-Beck, M. S., & Mongrain, P. (2017). Forecasting dutch elections: An initial model from the march 2017 legislative contests. *Research & Politics*, 4(3), 1–7.

De Swaan, A. (1973). *Coalition theories and cabinet formations: A study of formal theories of coalition formation applied to nine European parliaments after 1918*, volume 4. Jossey-Bass.

Debus, M. & Gross, M. (2016). Coalition formation at the local level: Institutional constraints, party policy conflict, and office-seeking political parties. *Party politics*, 22(6), 835–846.

Denters, S. A. H. (1985). Towards a conditional model of coalition behaviour. *European Journal of Political Research*, 13(3), 295–309.

Downs, A. (1957). An economic theory of political action in a democracy. *Journal of political economy*, 65(2), 135–150.

Downs, W. M. (1998). *Coalition government, subnational style: multiparty politics in Europe's regional parliaments*. The Ohio State University Press.

Gamson, W. A. (1961). A theory of coalition formation. *American sociological review*, (pp. 373–382).

Geys, B., Heyndels, B., & Vermeir, J. (2006). Explaining the formation of minimal coalitions: Anti-system parties and anti-pact rules. *European Journal of Political Research*, 45(6), 957–984.

Gravdahl, H. P. (1998). Consensual coalitions? coalition formation in norwegian municipalities. *Scandinavian Political Studies*, 21(4), 307–323.

Hirschman, A. O. (1980). *National power and the structure of foreign trade*, volume 105. University of California Press.

Hosmer, D. W., Lemeshow, S., & Sturdivant, R. X. (1989). *Applied logistic regression*. John Wiley & Sons.

Jungar, A.-C. (2000). *Surplus majority government: A comparative study of Italy and Finland*. PhD thesis, Uppsala University.

Jungar, A.-C. (2002). A case of a surplus majority government: The finnish rainbow coalition. *Scandinavian Political Studies*, 25(1), 57–83.

Laakso, M. & Taagepera, R. (1979). "effective" number of parties: a measure with application to west europe. *Comparative political studies*, 12(1), 3–27.

Laver, M. (1989). Theories of coalition formation and local government coalitions. In *Political parties and coalitions in European local government*. Routledge.

Laver, M. & Schofield, N. (1990). *Multiparty government: The politics of coalition in Europe*. Oxford University Press.

Leiserson, M. (1968). Factions and coalitions in one-party japan: An interpretation based on the theory of games. *The American Political Science Review*, 62(3), 770–787.

Lijphart, A. (2012). *Patterns of Democracy: Government forms and performance in thirty-six countries*. Yale University Press.

Luebbert, G. M. (1986). *Comparative democracy: policmaking and governing coalitions in Europe and Israel*. Columbia University Press.

Mair, P. (2008). Electoral volatility and the dutch party system: A comparative perspective. *Acta Politica*, 43(2-3), 235–253.

Mattila, M. & Raunio, T. (2004). Does winning pay? electoral success and government formation in 15 west european countries. *European Journal of Political Research*, 43(2), 263–285.

Mitchell, P. & Nyblade, B. (2008). Government formation and cabinet type in parliamentary democracies. In M. W. C. Strøm, K & T. Bergman (Eds.), *Cabinets and coalition bargaining: the democractic life cycle in Western Europe*. Oxford: Oxford University Press.

Mueller, D. C. (2003). *Public choice III*. Cambridge University Press.

Nagelkerke, N. (1991). A note on a general definition of the coefficient of determination. *Biometrika*, 78(3), 691–692.

Narud, H. M. & Valen, H. (2008). Coalition membership and electoral performance. In M. W. C. Strøm, K & T. Bergman (Eds.), *Cabinets and coalition bargaining: the democractic life cycle in Western Europe*. Oxford: Oxford University Press.

Norpoth, H. & Gschwend, T. (2010). The chancellor model: Forecasting german elections. *International Journal of Forecasting*, 26(1), 42–53.

Paldam, M. & Skott, P. (1995). A rational-voter explanation of the cost of ruling. *Public Choice*, 83(1-2), 159–172.

Pedersen, M. N. (1979). The dynamics of european party systems: changing patterns of electoral volatility. *European Journal of Political Research*, 7(1), 1–26.

Reith, M. (2018). Heumen: coalitie zonder dgh. *De Gelderlander*.

Riker, W. H. (1962). *The theory of political coalitions*. Yale University Press.

Roubini, N. & Sachs, J. D. (1989). Political and economic determinants of budget deficits in the industrial democracies. *European Economic Review*, 33(5), 903–933.

Sarkar, S. K., Midi, H., & Rana, S. (2011). Detection of outliers and influential observations in binary logistic regression: An empirical study. *Journal of Applied Sciences*, 11(1), 26–35.

Skjæveland, A., Serritzlew, S., & Blom-hansen, J. (2007). Theories of coalition formation: An empirical test using data from danish local government. *European Journal of Political Research*, 46(5), 721–745.

Steunenberg, B. (1992). Coalition theories: Empirical evidence for dutch municipalities. *European Journal of Political Research*, 22(3), 245–278.

Strøm, K. (1984). Minority governments in parliamentary democracies: The rationality of nonwinning cabinet solutions. *Comparative Political Studies*, 17(2), 199–227.

Strøm, K. (1990). *Minority government and majority rule.* Cambridge: Cambridge University Press.

Strøm, K. (1985). Party goals and government performance in parliamentary democracies. *American Political Science Review*, 79(3), 738–754.

Tops, P. (1990). *Afspiegeling en afspraak: Coalitietheorie en collegevorming in Nederlandse gemeenten (1946-1986).* PhD thesis, Leiden University.

Van der Kolk, H. (2000). Measuring electoral control. *Quality and quantity*, 34(4), 367–378.

Volden, C. & Carrubba, C. J. (2004). The formation of oversized coalitions in parliamentary democracies. *American Journal of Political Science*, 48(3), 521–537.

Von Neumann, J. & Morgenstern, O. (1944). *Theory of games and economic behavior.* Princeton University Press.

Warwick, P. V. (1996). Coalition government membership in west european parliamentary democracies. *British Journal of Political Science*, 26(4), 471–499.

Wieldraaijer, J. (2015). Explaining coalition types: an analysis of government formation at the dutch local level. Master's thesis, Leiden University.