Challenges to government formation in Western European parliamentary democracies

Rieder, Gaston

M.A. Thesis:

Challenges to government formation in Western European parliamentary democracies (1980-2019)

Gaston Rieder

Email address: s2917270@vuw.leidenuniv.nl

Leiden University Student Number: s2917270

Supervisor: Dr. D.M. Oude Nijhuis

Programme of Study: European Politics and Society – Václav Havel Joint Master Programme (2019/2021).

Date of submission: 18th of June of 2021.

Word count: 15560

Table of Contents

Table of Figures

Table of Tables

Disclaimer

I, the undersigned [Gaston Rieder], candidate for the Erasmus Mundus Joint Master Degree European Politics and Society, declare herewith that the present thesis is exclusively my own work, based on my research and only such external information as properly credited in notes and bibliography. I declare that no unidentified and illegitimate use was made of works of others, and no part of the thesis infringes on any person's or institution's copyright. I also declare that no part of this thesis has been submitted in this form to any other institution of higher education for an academic degree.

Gaston Rieder

Acknowledgments

Acknowledgments are perhaps both the easiest and the hardest section to write in a thesis. On the one hand, we are for once exempt from the methodological rigour that will soon populate these pages. On the other, we are entrusted with the responsibility to remedy an injustice. Indeed, although only I get to sign this thesis, this is by no means an individual production. Rather, it is a collective enterprise. In these brief paragraphs, I seek to remedy this unfairness.

Firstly, I would like to extend my gratitude to the EPS consortium, and each and every one of its members. They have all contributed to this thesis in their own ways, be it by teaching in class, providing feedback during seminars, or providing us all with crucial administrative information. Particular gratitude is extended to my supervisor, who has managed to give structure to all the nonsense I came up with, and has readily made himself available whenever I have needed guidance. Moreover, this thesis would not have been possible without the support of the European Commision, whose generous grant has allowed me to fully devote myself to this endeavour. If anything, I hope this research manages to persuade them that I know what I am talking about. I, for one, am not convinced about that. In short, I am profoundly grateful for the chance I have had to experience the diversity of Europe under such enriching circumstances. I am fortunate in

that I have had the opportunity to learn enormously both inside and outside the classroom, and at four prestigious universities in four very different countries no less. I could not have wished for more.

Numerous theses are written out of the necessity to fulfil the requirements of an academic degree. I am not an exception to this rule, but I would be lying if I said I did not choose this topic in the hope it would prove useful for society at large. Indeed, the interrogations that have guided this work are not exclusively academic. They are rooted in the day-to-day reality of the political phenomena around us. If I have been able to look past the classroom and appreciate how intimately intertwined our research should be with the wider world, it is in no small part thanks to all my professional experiences. I am thankful to superiors and peers alike for teaching me that we should always keep this in mind.

Moving on, a comparative politics professor once quoted that “wherever people interact, it is because institutions were present”. I beg to differ. In order to get here, I have had to jump several administrative hurdles that can only be imputed to institutional absence. People, however, have always been there to try and make up for it. Therefore, special thanks go to those at the University of Buenos Aires and beyond, who have been undoubtedly kind and helped me navigate the intricacies of a failing bureaucracy. Likewise, I would like to thank all those at UBA who contributed to my academic development in general, and to my EPS application, in particular. I would simply not be here without them.

Last but not least, uncountable thank-yous go to my friends and family, whether in Europe, Argentina, or further afield. Writing a thesis is in many respects an exercise of sheer solitude: only us and the blank pages before our eyes. The circumstances that have plagued -pun intended- most of my time as a student have intensified this condition, as we were mostly confined to our grandiose mansions, or in my case, modest university housing. My friends and family, in short, my beloved ones, have always been there to encourage me and, when necessary, laugh at my frankly ridiculous attempts at being serious. If I have been able to make it through somehow, I can only but attribute it to them. Thank you, I love you.

Abstract

This thesis aims to understand the reasons behind the increase in the duration of government formation negotiations in Western Europe. It argues that there is a gap in the existing scholarship on this issue. On the one hand, scholars have noted that party systems in the region have undergone profound changes over the last decades, and particularly since the 2008 financial crisis. On the other, the effect this has had on the duration of government formation has not been as thoroughly researched. In order to explain this phenomenon, this thesis expands upon the survival analysis literature, by means of applying recent innovations to the Cox proportional hazards model, such as the Cox with Expected Durations package (Kropko & Harden, 2017, 2020). All in all, the results show that longer government formation processes can be attributed to two main phenomena: the rise in parliamentary fragmentation, and the rise in less stable legislative types as per the typology outlined by Laver and Benoit (2015). The findings of this thesis thus contribute to a better understanding of this crucial development in the Western European political landscape, which has wider implications for the stability of Western European democracies as a whole.

Key words: *government formation duration - Western Europe - party system change - Cox proportional hazards model*

Challenges to government formation in Western European parliamentary democracies (1980-2019)

"There can be no doubt at all that the government formation process [...] is one of the most fundamental processes of European parliamentary democracy. Understanding how a given electoral result leads to a given government is, when all is said and done, simply one of the most important substantive projects in political science"

(Laver & Schofield, 1990: 89)

Introduction

Over the past decades, and particularly since the 2008 financial crisis, Western European democracies have witnessed considerable change in their party systems. Several party system variables, including but not limited to fragmentation, polarisation and volatility, have increased considerably, to the point where it has been noted that "symptoms of an ongoing process of deinstitutionalization are spreading across many countries in Western Europe" (Chiaramonte & Emanuele, 2017: 384).

These developments have not escaped the attention of political scientists, who have problematised and sought to explain recent party system change in the region (Drummond, 2006; Bellucci, Lobo, & Lewis-Beck, 2012; Casal Bértoa, 2014; Powell & Tucker, 2014; Hernández & Kriesi, 2016; Dassonneville & Hooghe, 2017; Emanuele & Chiaramonte, 2018; Poguntke & Schmitt, 2018). Less comprehensive, however, has been academic literature on another phenomenon that has likewise become growingly common across Western Europe: the increasingly longer duration of government formation negotiations.

Indeed, while there exists a corpus of literature that has attempted to identify which variables delay government formation in a comparative perspective, this scholarship has relied primarily on datasets ranging from 1945 to the first decade of the 21st century (Diermeier & van Roozendaal, 1998; Martin & Vanberg, 2003; Conrad & Golder, 2010; Golder, 2010; Ecker & Meyer, 2015; Laver & Benoit, 2015; Savage, 2018). There is thus a need to reexamine the impact of recent developments in Western European politics on government formation negotiations. The importance of this phenomenon should not be underestimated. Indeed, difficulties in government formation can have lasting consequences for democracy as a whole. They can negatively impact democratic accountability (Martin & Vanberg, 2003; Conrad & Golder, 2010), as well as severely disrupt regular patterns in

coalition-making behaviour (Martin & Vanberg, 2003; De Winter & Dumont, 2008). They can also condition government duration to a considerable extent (King *et al.*, 1990; Grofman & van Roozendaal, 1994, Warwick, 1994). More at large, delays in government formation can increase uncertainty and thus influence macroeconomic variables, namely investment risks and volatility in stock markets (Leblang & Mukherjee, 2005; Bernhard & Leblang, 2006; Bechtel, 2009) as well as foreign exchange markets (Bernhard & Leblang, 2002).

In this spirit, this thesis aims to understand the ways in which contemporary changes in party systems across Western Europe have impacted on the duration of government formation. Taking this into account, this thesis puts forward the following research question:

> *Research question: has recent party system change in Western European parliamentary democracies increased the duration of government formation processes in Western European parliamentary democracies?*

As has been prefaced, one of the central claims that justifies this research is that I find a gap in the existing comparative politics literature linking party system change, on the one hand, and government formation duration, on the other. Additionally, there are two other dimensions where I believe the current scholarship could be improved.

Firstly, I find that researchers have relied on several metrics to capture the complexity of the bargaining environment and its impact on the duration of the government formation process, such as fragmentation and polarisation rates. However, I consider that these metrics do not capture the impact of recent party system change on *formateur* parties. *Formateur* parties are tasked with leading government negotiations, and as such a decreasing share of votes will commensurately influence their position as key negotiators amongst parties. I thus propose that bargaining complexity analysis should be methodologically refined in order to account for the impact of growing bargaining complexity in *formateur* parties' bargaining power and, ultimately, on government formation as a whole. In this vein, the classification system of legislative party systems outlined by Laver and Benoit (2015) is a welcome theoretical innovation to the field that I propose to build upon.

Secondly, the dependent variable in this thesis is a concept related to time. As such, statistical duration models constitute an intrinsic component of the methodology herein outlined. There is a considerable corpus of scholarship on this issue: in both this field and several other sub-disciplines in political science, the Cox proportional hazards model (hereinafter Cox model; Cox, 1972, Cox & Oakes, 1984) has become by far the most

employed survival analysis tool. I will seek to expand upon this methodology by applying the recently developed Cox proportional hazards model with expected durations (Kropko & Harden, 2020), which aims to overcome the shortcomings of the Cox proportional hazards model.

Ultimately, this thesis aims to fulfil a relevant gap in the literature. It aspires to point to several issues that I find should be addressed more extensively in comparative politics, chief amongst them the impact of recent party system change on government formation in Western Europe. It also seeks to do so by testing new methodological tools that require thorough empirical application to prove their robustness.

This thesis is structured as follows: firstly, I will conduct a review of the existing literature, with the aim of identifying the gaps in the literature that underpin this piece of research. Secondly, a chapter outlining the methodology of this thesis will be presented, followed by an ensuing empirical analysis chapter where the hypotheses will be tested. Subsequently, I will engage with the results of the analysis in order to answer the research question at hand and further discuss the contributions of this thesis to the current scholarship. A final conclusion will thereupon follow.

Literature Review

Why reexamine Western Europe? Recent developments in the political landscape

As the birthplace of some of the oldest political parties in the world, Western Europe has long been an object of study for political scientists. Particularly influential has been Lipset and Rokkan's (1967) contribution to understanding Western European party systems. By means of the term "cleavage", both authors account for the divisions and forces that shaped European party systems from their inception in the second half of the nineteenth century to the interwar period. Succinctly, cleavages can be described as the political differences that structure society (Bartolini & Mair, 1990). Lipset and Rokkan's main conclusion is that, once consolidated, party systems in Europe remained "frozen" in spite of profound societal change; in their words, "the party systems of the 1960s reflect, with few but significant exceptions, the cleavage structures of the 1920s" (Lipset & Rokkan, 1967: 44).

However, starting mainly from the 1980s onwards, Western European citizens seem to have changed their voting preferences to a considerable extent (Inglehart, 1971, 1990; Kriesi *et al.*, 2006). Indeed, there exist several accounts of the diminishing weight of religion and class identity in voting behaviour (Broughton & ten Napel, 2000; Dogan, 2004; Crouch, 2008). This claim has long been disputed, with several academics arguing that traditional cleavages are no longer influential (Dalton, 1984; Clark & Lipset, 1991; Franklin, 1992; Clark *et al.*, 1993; Nieuwbeerta, 1996; Nieuwbeerta & Ultee, 1999; De Graaf *et al.*, 2001; Knutsen, 2007), and numerous others claiming the opposite (Andersen, 1984; Evans, 1993, 1999; Brooks *et al.*, 2006; Elff, 2007). This debate could possibly be resolved by noting that "the voting behaviour of traditional social cleavage groups is likely to vary cross-nationally, even if there is a tendency for this behaviour to be on the decline" (Best, 2011: 279).

Parallel to the weakening of traditional political cleavages, the addition of two new party families to the political landscape of Europe has also impacted on party systems significantly. Firstly, the so-called "Green challenge" exerted pressure on the established political forces in Europe (Richardson & Rootes, 2006). Over time, however, Green parties began to be conceived of as acceptable parties in government (Poguntke, 2002), or *koalitionsfähig* (Prinz, 2010) to phrase it in Sartorian terms (Sartori, 1976). Secondly, the Populist Radical Right Party family, which mainly rose to prominence from the 1980s onwards (Mudde, 2004, 2013; Kriesi, 2014). These parties have been mainly described as

anti-establishment parties (Schedler, 1996), opposing the current political establishment but not questioning the democratic regime itself (Abedi & Lundberg, 2009; Smith, 2009). As a result, in numerous Western European countries, mainstream parties have decided to erect a *cordon sanitaire* (Kestel & Godmer, 2003; van der Brug & van Spanje, 2004), ruling out cooperation with these parties.

These developments have been further deepened due to the 2008 financial crisis, which triggered conflicts within the member states of the European Union (EU). In short, the era of "permissive consensus on European integration" (Taggart, 1998; Taggart & Szczerbiak, 2004) came to an end: both European integration and immigration emerged as clear wedge issues, ie., issues "that cannot easily be subsumed by the dominant dimension of contestation in a party system" (Van de Wardt *et al.*, 2014: 3). As such, wedge issues are analytically useful because they account for the rise of multi-spatial polarisation in Western European party systems (Schmitt, 2016; Kam, Indridason, & Blanco, 2017). Indeed, European integration in particular can be thought of as an issue that cannot easily fit in the left-right spectrum. This has led academics to speak of the appearance of a new cleavage shaping Western European politics, based on parties' position *vis-à-vis* the prospect of further European integration (Taggart, 1998; Marks & Wilson, 2000; Art, 2011; Meguid, 2005; Kriesi *et al.*, 2006; Green-Pedersen, 2007). Since then, other works have framed this division within a larger cleavage, which is cultural and post-material in nature (Hobolt & Tilley, 2016; Jennings & Stoker, 2017) and divides "winners" and "losers" of globalisation (Kriesi *et al.*, 2006; Bornschier, 2010).

As can be observed, the rise of alternative electorally competitive parties has promoted considerable change in Western European party systems. On the one hand, an electorate less inclined to vote for traditional parties coupled with new growingly successful parties has resulted in overall more fragmented party systems across the region (Golosov, 2017). On the other hand, several of the aforementioned parties are structured around new cleavages, based on post-material values and European integration, and also possess anti-establishment features. This contrasts with mainstream parties, which have traditionally differentiated themselves based on their position on the left-right spectrum. As a consequence, polarisation has increased in Western European party systems. In turn, this paves the way for the legislative co-existence of parties whose policy preferences are largely incompatible (Bornschier, 2010; Steiner & Martin, 2012).

Additionally, West European party systems have also seen a sharp rise in electoral volatility in the recent past and particularly as a result of the 2008 financial crisis

(Drummond, 2006; Dassonneville & Hooghe, 2017). Poguntke and Schmitt (2018) show an increase in volatility in all Western party systems in "post-crisis elections" (Hernández & Kriesi, 2016: 209)[1], an increase that is even more notorious when looking exclusively at type A volatility (Powell & Tucker, 2014)[2]. As Poguntke and Schmitt (2018) put it, "except for the 1994 Italian election, all elections with a type A volatility above 10 are clearly associated with the Euro crisis" (Poguntke & Schmitt, 2018: 4). This leads them to the conclusion that "a high degree of party system change is primarily a Western European phenomenon" (Poguntke & Schmitt, 2018: 9). This could potentially lead to instability and unpredictability in interparty competition (Casal Bértoa, 2014), a key factor in de-institutionalisation (Mainwaring & Zoco, 2007) and potential institutional paralysis (Diermeier & Roozendaal, 1998). Indeed, ruling coalitions have been regularly defeated in the last decade due to these radical changes in electoral outcomes (Bellucci, Lobo, & Lewis-Beck, 2012).

In sum, there exists an extensive body of literature that has analysed recent party system change in Western Europe. Whilst conclusions are logically bound to vary in scope and nature to a certain degree, academics generally agree that Western European party systems have been witnessing growing rates of polarisation, fragmentation, and volatility over the last decades, and especially after the 2008 financial crisis. What is more, these developments take all the more meaning in a region such as Western Europe: most countries are parliamentary democracies[3] (Sartori, 1997) and several thereof count with proportional electoral systems or are otherwise described as consensus democracies (Lijphart, 1984, 1999). As such, it could be argued that voters technically "do not choose governments" but "they alter the power relations between the parties" (Bogdanor, 1983: 272). This indirect link between the electorate and the government means it is up to parties themselves to engage in negotiations to "artificially construct [...] a majority" (Bogdanor, 1983: 272) in light of the electoral results produced. As party dynamics across Western Europe become more unpredictable and unconciliatory, these negotiations are increasingly taking longer.

What delays government formation? A review of the existing scholarship

[1] The authors define these as national elections held since December 2008 (Hernández & Kriesi, 2016).
[2] Type A volatility refers to the entry of new parties and the decreasing vote share for existing parties specifically (Powell & Tucker, 2014).
[3] France and Portugal are two notable exceptions.

In spite of the wealth of literature on recent party system change in Western Europe, the link between this phenomenon and government formation remains largely unexplored by the existing literature, particularly in a comparative perspective. On the one hand, the scholarship which has engaged with recent party system change has not explored the effect this has had on government formation length beyond general assertions that these developments will render "government formation difficult" (Poguntke & Schmitt, 2018: 1). On the other hand, the literature on the duration of government formation has as of yet failed to produce a comprehensive account of the effects of party system change in a comparative perspective. This second point will be elaborated upon below.

Political scientists have long tried to understand what brings political parties together, attempting to identify the most crucial factors for coalition formation (Gamson, 1961; Riker, 1962; Rae, 1967; Groennings, 1970). However, it could be argued that scholarship on what accounts for the duration of government formation specifically is still in its early stages and has not been elaborated upon as much as other aspects of the government formation process (Golder, 2010; Blockmans et al., 2016). Rasch, Martin and Cheibub note that "relatively little attention has focused on the duration of government formation processes" (Rasch, Martin & Cheibub, 2015: 15). As a specialist on the topic herself, Golder (2010) likewise notes that "it is somewhat surprising that there have been only two published cross-national studies focusing on bargaining delays in the government formation process" (Golder, 2010: 5). This remark remains valid to this day: the list of cross-national studies on the topic has been expanded only marginally since her remarks (Diermeier & van Roozendaal, 1998; Martin & Vanberg, 2003; Conrad & Golder, 2010; Golder, 2010; Ecker & Meyer, 2015; Laver & Benoit, 2015; Savage, 2018).

For the most part, these studies have attempted to account for delays in government formation negotiations by referring to two key concepts, ie., bargaining complexity and uncertainty (Strøm, Budge, & Laver, 1994). Golder (2010) provides definitions to both terms. She states that bargaining complexity describes dimensions such as "the number of different potential government proposals, both in terms of the allocation of ministerial portfolios and in terms of future government policy, as well as the number of politically relevant actors who have to agree on the proposed government" (Golder, 2010: 9). As for uncertainty, this phenomenon refers to "not knowing the preferences over policy and office of all the political actors whose agreement might be necessary to form a government" (Golder, 2010: 9). In other words, "political actors may face uncertainty about their competitors' policy

preferences, outside options, and objectives" (Ecker & Meyer, 2015: 2; see also Strøm, 1996; De Winter & Dumont, 2008).

Diermeier and van Roozendaal (1998) provide a preliminary theoretical framework for this issue. Their main premise is that political parties are rational actors which would normally be able to secure coalition arrangements without delay under conditions of complete information. Given the fact that government formation negotiations never constitute scenarios of complete information, delays are regularly incurred; political parties simply cannot and do not know "what government policy and ministerial portfolios would constitute an acceptable offer to all other actors whose agreement is necessary to form the new government" (Golder, 2010: 10). In short, uncertainty is the explanatory variable for these authors: the higher the uncertainty, the longer government formation negotiations are likely to take before a government proposal is announced. Correspondingly, dimensions where complete information is readily available do not incur additional delays. The authors conclude by stating that the key to accounting for the duration of government formation processes lies thus in identifying the dimensions of party politics which generate uncertainty amongst political actors. They note that the bargaining environment in and of itself is not one of these dimensions, and therefore any factors relating to bargaining complexity can be discarded as analytically irrelevant.

The findings reached by Diermeier and Van Roozendaal (1998) have been challenged by Martin and Vanberg (2003), who arrive at the opposite conclusion: bargaining complexity is the better predictor of delays in government formation negotiations, whilst uncertainty is not statistically significant in this domain. The authors consider two key components of bargaining complexity, ie., the ideological distance between political actors -polarisation- as well as the total number of parties present in the legislature. At core, they argue that an increase in the complexity of the bargaining environment would entail that party leaders have more difficulty negotiating an acceptable government proposal with fellow political parties, thus increasing the time that these negotiations will take. In their own words, "once we control for the number of parties and ideology, variables that favour the DvR[4] approach become statistically insignificant [...] thus, our analysis strongly suggests additional theoretical and empirical research on the duration of coalition negotiations" (Martin & Vanberg, 2003: 325).

Finally, Golder (2010) criticises both approaches due to their propensity to "frame the debate in terms of uncertainty versus bargaining complexity", which she finds to be

[4] This is how Martin and Vanberg (2003) refer to Diermeier and van Rozedaal (1998)

"theoretically misleading" (Golder, 2010: 9). She aims to reconcile both concepts by claiming that uncertainty is always relevant to the duration of government formation processes, whilst bargaining complexity only has an impact when uncertainty is sufficiently high. Golder states that under circumstances of full certainty, *formateurs* are expected to form government immediately. As such, the complexity of the bargaining environment should not contribute to delays in these scenarios. In contrast, when uncertainty is high, "it should take longer for political actors engaged in the government formation process to obtain the information that they are uncertain about when the bargaining environment is complex than when it is not" (Golder, 2010: 12). Additionally, Golder refines the methodological contributions of Martin and Vanberg (2003), by employing the effective number of parties index (ENP; Laakso & Taagepera, 1979) in lieu of the total number of parties to account for bargaining complexity.

These existing studies have been criticised for dealing primarily with national elections in Western democracies across similar periods of time, which generally stretch from 1945 to the early 21st century (Ecker & Meyer, 2015; Blockmans *et al.*, 2016). This incurs the methodological risk of overusing data "which has by now been very thoroughly picked over" (Laver & Schofield, 1998: 8). As a result, further scholarship on this topic has since sought to expand the scope of analysis of this phenomenon. Two noteworthy contributions are Ecker and Meyer (2015) and Blockmans *et al.* (2016). The former extends the number of countries under study through an updated dataset that includes information for both Western European, and Central and Eastern European countries. The latter aims to "provide the first analysis of the duration of government formation processes at the local government level" (Blockmans *et al.*, 2016: 131) by means of researching this phenomenon in Flemish municipalities.

This thesis agrees with the claim that there exist numerous potential avenues for future research on this topic. In this spirit, I put forward the argument that the changes witnessed in Western European party systems particularly since the 2008 financial crisis demand and justify a reexamination of the literature as well as a more updated dataset. Echoing Chiaramonte and Emanuele's (2017) concerns that "the presence of stable and predictable patterns of interactions among political actors has been generally taken for granted for a long time" (Chiaramonte & Emanuele, 2017: 376) in Western Europe, this thesis aims to contribute to this gap in the literature not only by providing theoretical innovations to the existing scholarship -to be elaborated upon in the methodology chapter- but also by delving into how government formation length has changed over time (Morlino, 2018), with a specific focus on the recent decade in particular. As has been explained above,

Western European party systems have undergone considerable change following the 2008 crisis, to the point that, "in terms of the perspective of party systems' theory, the Great Recession may constitute a 'critical juncture'" (Hernández & Kriesi, 2016: 204). A similar conclusion is reached by Emanuele & Chiaramonte (2018), who claim that "elections with high innovation are not randomly distributed across time but occur more frequently in the last decades, with a specific concentration in the last few years" (Emanuele & Chiaramonte, 2018: 478). This suggests that there is value in assessing what the recent development of party politics in Western Europe has meant for the length of government formation.

This assertion is recognised by several case studies which have sought to explore the recent challenges to government formation in Western European countries, namely in Germany, Spain, Portugal, Sweden, Greece, and the Netherlands[5]. For example, Thomas Bräuniger *et al.* (2018) have looked into the reasons behind Germany's first failed coalition negotiations in the aftermath of the 2017 general election. They largely conclude that a *große Koalition*[6] was still the most likely outcome, but stress that "established parties face tough choices" (Bräuniger *et al.*, 2018: 93), particularly if they continue to rule out cooperation with more radical parties. Dealing with the same topic, Hornung *et al.* (2020) assert that intraparty dynamics are the key to understanding why it took German parties considerably longer than expected to form a government. In the case of the Netherlands, Pellikaan, de Lange and van der Meer (2016) analyse the recent changes in the Dutch party system and how they have conditioned subsequent government formation negotiations. They establish that the Dutch party system no longer has either a "core" or a "heart" that can structure political behaviour in the legislature (Schofield, 1993, 2008; Schofield & Sened, 2006), and that this has resulted in a complex environment for parties to negotiate, leading to an unprecedented 225 days to announce a cabinet in 2017. As for Sweden, Aylott and Bolin (2015, 2019) note the transformation of the party system and its impact on the ensuing coalition negotiations. In their words, recent elections have "left the array of parliamentary forces fragmented and finely balanced", to the point that "only after months of negotiations could a government be formed" (Aylott & Bolin, 2019: 1504). In a similar vein, Bonnie Field has drawn upon her work *Why Minority Governments Work: Multilevel Territorial Politics in Spain* (Field, 2016a) and argued that the recent addition of *Podemos* and *Ciudadanos*

[5] This list aims only to demonstrate that case studies on this topic have been sufficiently undertaken in the existing scholarship. It is by no means an exhaustive list.

[6] A *große Koalition* (grand coalition) describes a coalition arrangement between Germany's traditionally largest parties, the centre-right *Christlich Demokratische Union Deutschlands* (CDU), and the centre-left *Sozialdemokratische Partei Deutschlands* (SPD) (Strohmeier, 2009).

coupled with radicalisation amongst regional parties has weakened the ability to find consensus to form and maintain Spanish governments (Field, 2016b). For their part, Bosco and Verney (2016) analyse the cases of Spain, Portugal, and Greece, although they do not delve into the reasons that make these countries' situations similar and/or different. Tentatively, they suggest that it remains to be seen whether Southern Europe's recent governmental gridlock "will prove a case of regional exceptionalism or become a manifestation of a more standard European pattern" (Bosco & Verney, 2016: 404). Indeed, in my thesis, I aim to show that this has become a primarily Western European phenomenon, not an exclusively Southern European one.

Case studies are undoubtedly a valuable contribution to our understanding of the intricacies of government formation in Western Europe. Case studies are generally helpful in that they enable researchers to trace the causal connections between variables scrupulously (Ragin, 2004). However, this literature review propounds the idea that a comparative approach is also required for extending our understanding of these developments, especially as the literature recognises that most if not all Western European countries are undergoing similar trends. As a matter of fact, several of the aforementioned authors explicitly mention the need for research of this nature, by noting that "across Western Europe mainstream parties face growing electoral challenges" (Pellikaan, de Lange & van der Meer, 2016: 248), and that this topic is "of general interest not only for future coalition negotiations in Germany but also for other European parliamentary democracies facing increasing party fragmentation" (Hornung *et al.*, 2020: 332). Comparative politics can thus help us identify and clarify similarities and differences between Western European countries (Rose & MacKenzie, 1991; Mair, 1996).

Unfortunately, however, comparative approaches on the neoteric challenges to the duration of government formation are scarce. Indeed, there is to date only one academic contribution to the topic. In a recently published paper, Morini and Cilento (2020) propose to fill this gap in the literature by "measuring the current government bargaining duration in the EU member states and highlighting its increase throughout the years" (Morini & Cilento, 2020: 1204). More specifically, the authors focus on one particular independent variable for this study: the entry of new parties into Western European party systems. Through the deployment of various bivariate and multivariate regression models, the authors conclude that this independent variable actually appears "not to have a direct influence on the length of government formation" (Morini & Cilento, 2020: 1204). Instead, a statistically significant

correlation is found between the length of government formation processes and the ENP score of Western European party systems.

Whilst this contribution is certainly welcome, its set purpose is to exclusively cover a precise aspect of party system change and its commensurate impact on government formation duration. Therefore, it also serves to highlight the gap this thesis aims to fill, ie., the need for a more comprehensive comparative study of the impact of recent party system change on the length of government formation processes in Western Europe.

The case for new metrics

Most studies mentioned above rely on a number of variables to operationalise bargaining complexity and uncertainty. Authors usually treat post-electoral bargaining rounds (as opposed to cabinet formation in an inter-electoral scenario) as indicative of uncertainty. Bargaining complexity, for its part, is generally operationalised by means of fragmentation and polarisation rates, or, succinctly put, the "quantity and quality of party systems" (Dalton, 2008: 899). In order to account for parliamentary fragmentation, the literature has mostly relied on the concept of the ENP (Laakso & Taagepera, 1979), generally described as "the purest measure of the number of parties" (Lijphart, 1994: 70). As for polarisation, there exist several indexes that measure the ideological heterogeneity of political parties (Esteban & Ray, 1994; Dalton, 2008; Indridason, 2011).

However, I consider that these variables do not on their own properly capture the impact of bargaining complexity on government formation. This is primarily due to the fact that these variables do not distinguish *formateur* parties from other parties. In parliamentary systems, the Head of State selects a *formateur* party, or in other words, a party that is assigned the task of forming the government after an election. The rules for this selection are "fixed in the constitution, the product of enduring unwritten norms, which the Head of State obeys, or the product of other calculations" (Tsebelis & Ha, 2014: 333). As virtually all Western European countries are parliamentary democracies, *formateur* parties are a key player in government negotiations. It is thus safe to assume that a decreasing share of seats -coupled with growing polarisation- will commensurately impact on *formateur* parties and, ultimately, on the government formation process as a whole.

This problem is noted by Laver and Benoit (2015), whose typology of party systems aims to show how various legislative seat distributions shape political negotiations to different extents. Indeed, as they note, "despite the huge number of possible seat

distributions following a general election in a multiparty parliamentary democracy, there are far fewer classes of seat distribution sharing important strategic features" (Laver & Benoit, 2015: 275). As such, they define a typology which accurately represents an exclusive and exhaustive division of possible legislative party systems: 5 basic types are significant in terms of how they condition subsequent government formation negotiations and, in turn, government type and stability. In their own words, "different classes of legislature are associated with different political outcomes in real parliamentary democracies", including outcomes such as "duration of government formation negotiations, type of coalition cabinet that forms, and stability of the resulting government" (Laver & Benoit, 2015: 275-276). According to the authors, this typology relies on the number of seats (S_1, S_2, S_3) of the three largest parties in a legislature (P_1, P_2, P_3), both in relation to one another and to the number of seats necessary to achieve a legislative majority, which is symbolised by W. Figure 1 describes how these rules give shape to each legislative type. A more detailed breakdown is conducted below.

Figure 1: Partitioning the Universe of Legislative Party Systems

<table>
<tr><td colspan="5">Universe of possible legislative party systems</td></tr>
<tr><td>Single winning party</td><td colspan="4">No single winning party</td></tr>
<tr><td rowspan="4">$S_1 \geq W$</td><td colspan="4">$S_1 < W$</td></tr>
<tr><td colspan="3">$S_1 + S_2 \geq W$</td><td rowspan="3">$S_1 + S_2 < W$</td></tr>
<tr><td colspan="2">$S_1 + S_3 \geq W$</td><td rowspan="2">$S_1 + S_3 < W$</td></tr>
<tr><td>$S_2 + S_3 < W$</td><td>$S_2 + S_3 \geq W$</td></tr>
<tr><td>A: Single winning party</td><td>B: Strongly dominant party</td><td>C: Top-three</td><td>D: Top-two</td><td>E: Open</td></tr>
</table>

Source: Laver and Benoit (2015).

Type A, also known as a Winning Party System, represents a scenario where a single party can control all legislative decisions due to it holding a legislative majority by itself. In other words, S_1 >= W.

Type B, or Strongly Dominant Party System indicates that "P_1 has too few seats to control decisions (S_1 < W) but can form a winning coalition with either P_2 or P_3 ($S_1 + S_2$ >= W and $S_1 + S_3$ >= W), whereas P_2 and P_3 together cannot form a winning coalition ($S_2 + S_3$ < W)" (Laver & Benoit, 2015: 278). In practical terms, this means that P_1 is in a particularly powerful position. It can propose offers to either P_2 or P_3, as well as other potential parties too, whereas any winning coalition that does not include P_1 must forcefully then include both P_2 and P_3 at least. This limits the scope of action of all parties except for P_1, making it the dominant actor in the legislature (Peleg, 1981; Einy, 1985; van Deemen, 1989). Additionally, there is a subtype to Type B, ie., Type B* or System-Dominant Party System. This is referred to as a special situation where P_1 is not a single majority party but is free to choose its coalition partner; it can reach W with any other party present in the legislature ($S_1 + S_n$ > W). As the authors note, this results in an apex game situation, ie., "a bargaining situation in which there is one major (apex) player and n 'minor' players" (Bennett & van Damme, 1991: 118). This essentially makes it virtually impossible for P_1 to be excluded from the ensuing government. All other parties in the legislature would have to coalesce into a coalition for this to be the case. This is a highly unlikely scenario once other dimensions intrinsic to political negotiations are factored in.

For its part, Type C indicates a Top-Three Party System. This means that any two parties within the three largest ones can achieve W and obtain a legislative majority by forming a two-party coalition: $S_1 + S_2$ >= W, $S_1 + S_3$ >= W, and $S_2 + S_3$ >= W. However, it should be noted that Laver and Benoit (2015) consider C types to be the least empirically relevant legislative type in their typology. This is due to the fact that they are not as common in practice as the other party systems listed, at least in the dataset used by the authors.

Type D refers to a Top-Two Party System, in which P_1 and P_2 can form a majority coalition but the S_3 of P_3 is not enough to achieve W. In practice, this means that the only two-party way of achieving W is if P_1 and P_2 sum up their seat shares, S_1 and S_2: $S_1 + S_2$ >= W; the next possible two-party coalition, P_1 and P_3, would not command enough seats to form a majority ($S_1 + S_3$ < W). P_1 and P_2 are thus in the situation where "one or the other must be part of every winning coalition, whereas they and only they can form a winning coalition between themselves that excludes all others" (Laver & Benoit: 279).

Finally, Type E depicts an Open Party System. The main feature of this legislative type is as follows: $S_1 + S_2$ < W. In other words, there is no arithmetically possible way for two parties to form a winning coalition. Succinctly put, what sets E types apart is the fact that in all other legislative types, the largest party can always manage to secure a two-party winning

coalition with another party. By extension, an E type also implies that both P_1 and P_2 command fewer seats than half of W each ($S_1 < W/2$ and $S_2 < W/2$). This has the additional consequence that it is then necessary to consider five-party systems in order to account for all potential coalition scenarios in light of the arithmetic constraints outlined. In practical terms, this entails that even the largest party in parliament -usually the *formateur* party- is forced to consider a multi-party coalition in order to achieve a legislative majority. It must also face the prospect of other parties potentially arranging their own sets of multi-party coalitions that can mathematically exclude P_1. Foreshadowing one of the hypotheses of this thesis, the authors note that "the empirical significance of open legislative party systems arises [...] because they are associated with significantly longer government formation negotiations" (Laver & Benoit, 2015: 280).

Laver and Benoit (2015) provide an empirical application of their typology by means of the January and September 2015 Greek elections, where the slight changes in the seat shares of the largest parties produced a change in legislative types, from D to B. This, in turn, translated to two completely different dynamics in the government formation process. The electoral events surrounding Brexit, ie., the scheduled withdrawal of the United Kingdom (UK) from the EU, provide another clear case in point. Indeed, following the result of the referendum on the UK's status as a member state of the EU in 2016, then Prime Minister Theresa May decided to call a new general election in 2017. The result was unexpected, as it led to the resurgence of the traditionally strong bipartite system in the UK in a context of hitherto increasing electoral fragmentation (Prosser, 2018). However, in spite of the corresponding decrease in fragmentation and volatility, the Conservative Party -the ruling party- could not secure a majority, leading to a delayed opening of Parliament until it finally signed a Confidence and Supply Agreement with the Democratic Unionist Party. Subsequently, both Parliament and Government remained "deeply divided over Britain's future in the EU and in the world" (Hobolt, 2018: 2) and were not able to secure a Withdrawal Agreement, leading to an eventual leadership replacement and, subsequently, a new general election set for the 12th of December of 2019. Crucially, while the results of the 2015 general elections yielded a type A scenario, where the Conservative Party was the single winning majority party, the 2017 general elections produced a more fragmented B type. The Conservative Party still remained by far the largest party in parliament, to the point where it could form a winning coalition with most other parties with representation in the House of Commons. However, the fact that it had to consider the necessity of a coalition partner

delayed the announcement of a viable government considerably more than it had in the election two years prior.

As can be seen, the theoretical framework put forward by Laver and Benoit (2015) serves several purposes. Firstly, it is a typology that is built around the concepts of coalition-building and the parties' necessity of obtaining a parliamentary majority. As a result, their model paves the way for a better understanding of how party dynamics will play out in practice; their classification is based on how various seat distributions arithmetically condition the possibility of obtaining a legislative majority, capturing thus both bargaining complexity and uncertainty in parliamentary negotiations. In this vein, Laver and Benoit (2015) go on to show that there are strong statistical correlations between their typology and the length of the government formation process. Secondly, precisely by focusing on the arithmetic conditions imposed by legislature compositions, the authors build a typology of model-free legislative types, "in the sense that they are accounting identities arising from binding arithmetical constraints and hold regardless of utility functions of key agents or local institutional structure" (Laver & Benoit, 2015: 276). Contrary to coalition formation models which assume political parties' intentions in order to understand their behaviour during coalition bargaining rounds, this typology is based on the arithmetic limits placed by the allocation of parliamentary seats following an electoral round. As such, these limits apply regardless of the reasons pushing political parties to participate in government. Furthermore, this typology allows researchers to go beyond models which stipulate *ex-ante* the kind of coalition type that parties will tend towards, be it minority governments, minimum winning coalitions or oversized coalitions (Strøm, 1984, 1986, 1990; Strøm & Müller, 1999; Volden & Carrubba, 2004; Lenine, 2019). Finally, the authors note that the arithmetic constraints they describe "apply no matter what detailed institutional structures exist to circumscribe legislation or structure government formation", adding that these factors can further constrain but not "transcend" their model (Laver & Benoit, 2015: 290).

Hypotheses

Taking into account this theoretical discussion, this thesis generates the following hypotheses to account for the rise in the duration of government formation negotiations in Western European parliamentary democracies. These are listed as follows:

Hypothesis 1: the duration of government formation processes has increased over time due to the rise of fragmentation.

Hypothesis 2: the duration of government formation processes has increased over time due to the rise of polarisation.

Hypothesis 3: the duration of government formation processes has increased over time due to the rise of volatility.

Hypothesis 4: the duration of government formation processes has increased over time due to the rise of less stable legislative types.

Methodology

This chapter outlines the methodology employed in this thesis. The structure of this thesis is informed both by its research question and the properties of the dependent variable under study, ie., the duration of government formation negotiations. This variable is measured in the number of days that it takes for a government to be formally accepted after a general election has been held. In other words, it is an expression of duration. An analysis of how duration has been examined in the existing scholarship will thus be conducted, succeeded by a justification of the specific methods that will be utilised in this research as well as an operationalisation of the independent variables.

Durations models in political science: the case for the Cox model

In itself, the use of survival analysis methods has always been a feature of political science literature (Box-Steffenmeister & Jones, 1997; Box-Steffenmeister & Zorn, 2001, 2002; Hays & Kachi, 2009). In this spirit, political scientists have built upon and developed a myriad of duration models, with the purpose of producing empirically-contrastable estimates of the probability that an event occurs/will occur (or not) over time (Box-Steffensmeier & Jones, 2004). Understanding why events occur (or fail to occur) can prove to be crucial to analysing political phenomena, as "there is often a strong case to be made for shifting from snapshots to moving pictures" (Pierson, 2000: 72). Indeed, the issues of duration and timing at large have been significantly influential on and feature in several foundational pieces of research in political science, which range from works on political party systems (Lipset & Rokkan, 1967) to state-society relations (Skocpol & Theda, 1979; Katzenstein, 1985) and political economy (Gerschenkron, 1962). Indeed, as Pierson (2000) notes, a key dimension of comparative politics has its origins precisely in identifying how timing impacts on the differences between various national political landscapes. A substantial element of this development has thus been the question of why certain phenomena last the time they do as well as how said durations can vary across cases and why.

Taking this into account, duration models are based on -and ultimately try to accurately measure- the concept of hazard (Singer & Willett, 1993; Clark *et al.*, 2003). The hazard can be defined as the risk (or probability) that an event will occur[7] at a particular point

[7] Event occurrence is alternatively referred to as "failure" in the duration model literature (Singer & Willett, 1993; Clark *et al.*, 2003).

in time, in light of the fact that it has not occurred up to that point. In general, duration models are classified as either parametric and semi-parametric, depending on their assumptions regarding the hazard or, more accurately, the baseline hazard function. The baseline hazard function can be described as the potential risk of failure (or event occurrence) given that all model covariates equal zero.

The parametric category is characterised by the fact that it makes an explicit assumption about the shape that the baseline hazard function will take, although the assumption itself varies according to the model. Indeed, several models coexist that assume different relations between risk and time (Miller, 2011). By way of example, the exponential model assumes a constantly flat hazard, the Weibull model assumes a monotonic hazard, and the log-normal and log-logistic models are based on the opposite principle: they assume non-monotonic hazards.

For its part, the Cox model belongs to the latter category; it is a semi-parametric model. Cox (1972) argued that it is not necessary to assume the shape of the baseline hazard function insofar as it is methodologically valid to assume that hazards remain proportional. As a result, the hazard function in the Cox model is defined as follows:

$$h(t|\,X) \;=\; h_0(t)\,exp(X\,\beta),$$

where X stands for the model covariates, β designates the corresponding regression coefficients, and $h_0(t)$ represents the baseline hazard, ie., the hazard when the model covariates equal zero. For its part, the cumulative baseline hazard function stands as follows:

$$H_0(t) \;=\; \int_0^t h_0(s)ds,$$

while the cumulative distribution function of event occurrence is expressed as:

$$F_0(t|\,X) \;=\; 1 \;-\; exp\Big[-\,H_o(t)\,exp(X\,\beta)\Big],$$

and the baseline survivor function is expressed thus:

$$S_0(t|\,X) \;=\; exp\Big[-\,H_0(t)\,exp\,(X\,\beta)\Big].$$

The need to go beyond Cox: the case for Cox ED

The flexibility provided by the Cox model has paved the way for its increased popularity in political science scholarship. Indeed, the nature of political phenomena usually implies that the duration and the evolution thereof cannot easily be assumed from the outset. As a result, examples of the uses of the Cox model are not limited to the objective of this thesis. As a matter of fact, the Cox model enjoys a large trajectory in the discipline, and has been applied to account for several phenomena, including regime change (Gates *et al*., 2006; Švolík, 2008), the ratification of international treaties (McKibben & Western, 2020), position-taking in legislatures (Box-Steffensmeier, Arnold & Zorn, 1997; Boehmke, 2006; Maltzman & Shipan, 2008; Darmofal, 2009; Kropko & Harden, 2020), the tenure of political leaders (Omgba, 2009; Licht, 2017), the length of both civil and international armed conflicts (Bennett & Stam, 1996; Balch-Lindsay & Enterline, 2000; Krustev, 2006; Meernik & Brown, 2007; Cunningham, 2011), the impact of international peacekeeping missions (Fortna, 2004, 2008; Werner & Yuen, 2005; Mattes & Savun, 2010), campaign strategy by challengers to incumbent American congresspeople (Box-Steffensmeier, 1996), delays in the appointment of federal judges in the United States (Binder & Maltzman, 2002; Shipan & Shannon, 2003), and the timing of labour reforms (Murillo & Schrank, 2005). Even with such an array of diverse topics that make use of the Cox model, this list is by no means exhaustive. To the contrary, “these examples only scratch the surface” (Hays & Kachi, 2009: 1).

Notwithstanding its flexibility and widespread use, the Cox model has also been subject to criticism both amongst political scientists and elsewhere in academia (Kalbfleisch & Prentice, 2002; Collett, 2003; Bender, Agustin, & Blettner, 2005; Hernán, 2010). Namely, the assumption that hazards will remain proportional entails that the model effectively ignores the time magnitudes of the series of events observed. Instead, the Cox model yields its results by means of ordering the relative rankings of the observations at hand. Succinctly put, this allows the model to estimate coefficients without defining the baseline hazard function at all, thereby avoiding but ultimately not resolving how to express the baseline hazard function. As a result, academics rely on the relative changes in the hazard function for their analysis, even at the risk of statistical overinterpretation (Braconnier, 2010).

Correspondingly, several academics have sought to address the shortcomings of the Cox model in the political science literature (Chastang, Byar & Piantadosi, 1988; Keele,

2010; Desmarais & Harden, 2012; Box-Steffensmeier, Linn & Smidt, 2014; Benaglia, Jackson & Sharples, 2015). However, a large share of this literature has resorted to parametric distributions -such as the ones mentioned above in this chapter- in order to express the baseline hazard function and thus generate expected durations. The problem arising with this approach is that it invalidates the flexibility of the Cox model in the first place. In other words, "by restricting the simulated data to a known (usually parametric) form, these studies impose an assumption that is not required in applications of the Cox model" (Harden & Kropko, 2019: 921). This takes all the more meaning as academics have already proven that baseline hazards usually prove to be considerably heterogenous in practice (Cox *et al.*, 2007). Ultimately, this outlines the academic need for methods that can transcend the limitations of the Cox model whilst still taking full advantage of the flexibility afforded by it. It is worth noting that additional alternatives have been explored in other fields of research (see Royston & Parmar, 2002; Hernán, 2010; Uno *et al.*, 2014). Having said that, these models have been for the most part formulated to treat datasets which are different to those in comparative politics (eg., clinical trial data). Their use to date remains thus limited in the political science scholarship. Therefore, these alternatives are considered to be analytically ineffectual for –and ultimately beyond the scope of– this thesis.

More at large, a further criticism that has been levied against the Cox model concerns the way in which its results are expressed. This, in turn, conditions the type of interpretations that can be subsequently derived from the results generated. In order to produce an output, the Cox model relies on the ordering of the observed durations, which means that the results yielded are expressed in terms of the model's hazard function. In other words, the results of the Cox model are indicated in terms of hazard ratios and/or percentage changes in the hazard rate. This has two consequences for Cox model-based research. Firstly, as Kropko and Harden (2017) argue, this results in difficulties for researchers to meaningfully convey what the implications of an increase or a decrease in the hazard actually translate to in practice. In short, the Cox model does not provide "a meaningful scale or a way to map hazard to expectations for the duration of the event" (Kropko & Harden, 2017: 306). Secondly, as a direct consequence of the first issue, Cox model-based research is generally considered to be difficult for audiences beyond statistics specialists to understand (Lupia & Aldrich, 2015). This represents a particular challenge in light of the need to "bridge the relevance gap" (Wood, 2014a: 276) between political science, on the one hand, and policymakers and civil society, on the other. As has been mentioned before, this thesis deals with a topic whose consequences can have an overarching impact

on Western European democracies[8]. It therefore follows that the methodological choices guiding this work are to a considerable degree informed by a conscious choice to both contribute to the existing political science scholarship and enhance the "accessibility of research" dimension of this thesis (Wood, 2014a: 281; see also Peters, 2014; Wood, 2014b; Markwica, 2020).

In this spirit, I will be making use of the recently developed Cox proportional hazards with expected durations method (hereinafter Cox ED; Kropko & Harden, 2017, 2020). Cox ED is a package which provides a set of tools that build upon the Cox model and aim to make its results both more robust and intuitively interpretable. This is achieved by virtue of generating duration-based quantities based on the Cox model, thus allowing researchers to concentrate not on the relative changes of the hazard functions but on the expected durations of the events under study. Furthermore, the fact that results are expressed in duration-based quantities –eg., number of days, months, etc.– has the advantage that results "match better with researchers' substantive interests and are easily understood by most readers" (Kropko & Harden, 2020: 1).

At base, Cox ED translates the results provided by Cox model into duration-based quantities, by means of three specific computations, as outlined below:

> *(1) the expected duration for each observation used to fit the Cox model, given the covariates, (2) the expected duration for a 'new' observation with an independent variable profile set by the analyst or (3) the first difference, or change, in expected duration given two new observations.* (Kropko & Harden, 2017: 308).

More specifically, Cox ED introduces two methods. On the one hand, Cox ED proposes a generalised additive model (GAM). On the other hand, it provides researchers with a nonparametric step-function approach (NPSF). Both methods constitute novel approaches to calculating duration-based quantities based on the Cox model. I will proceed to explain both approaches in detail, and then justify why this thesis will opt for one of these methods in particular.

The GAM method is built upon the standard Cox model, and first requires the results yielded by the latter to properly work. Once the results have been generated, the GAM model proceeds to matrix-multiply the covariates X by β, ie., the estimated coefficients, and

[8] For further details, see chapter 1 "Introduction".

then exponentiates the results. This is executed in order to create the exponentiated linear predictor (ELP; also exp [Xβ]), which is necessary for the model to gauge the risk values for every observation. All observations are then sorted in ascending order based on the values generated by the ELP. This sorted ranking expresses the expected order of failure of each observation. Once this ranking is in place, the GAM model proceeds to link the ELP to the actual observed durations for the events. Succinctly put, "the method utilizes a cubic regression spline to draw a 'smoothed' line summarizing the bivariate relationship between the observed durations and the ranks" (Kropko & Harden, 2017: 308-309). It should also be noted that the use of locally estimated polynomial splines is methodologically crucial in that it contemplates the chance that variables will display nonlinear relationships between them (Beck & Jackman, 1998).

For its part, the NPSF method is based on the approach first established by Cox and Oakes (1984) in order to evaluate the cumulative baseline hazard function. It builds upon it with the aim of producing expected durations once the results of the Cox and Oakes model have been yielded. The cumulative baseline hazard function according to this approach can be defined as follows:

$$\widehat{H_0}(t) \;=\; \sum_{\tau_j < t} \frac{d_j}{\sum_{l \in \Re(t_j)} \widehat{\Psi}(l)}.$$

In this equation, t_j denotes time recorded earlier than t, whilst d_j stands for the number of failures at t_j. For its part, $\Re(t_j)$ stands for the leftover risk at t_j, whereas ψ^(l) represents the ELP at the risk set at t_j. The NPSF method then attempts to produce expected durations (as well as marginal changes in these) by means of extracting the baseline survivor function via the function:

$$\widehat{S_0}(t) \;=\; exp\left[-\widehat{H_0}(t)\right].$$

The baseline survivor function is then linked to the survivor function of each individual observation using the following equation:

$$\widehat{S_i}(t) \;=\; \widehat{S_0}(t)^{\;\widehat{\Psi}(i)},$$

where ψ^(i) represents the ELP for an individual observation (i). For their part, non-negative random variables can also yield an expected value via the function:

$$E(X) = \int_0^{\infty} (1 - F(t))dt,$$

where F(.) represents the cumulative distribution function of X. Concerning duration variables, their expected duration can be extracted by use of the following function:

$$E(t_i) = \int_0^{T} S_i(t)dt,$$

where $S_i(t)$ represents an individual survivor function and T depicts the maximum duration that can be obtained. The NPSF method relies on a right Riemann-sum in order to approximate this generated integral and yield expected durations for the whole dataset. It conducts this analysis "by calculating the survivor functions at every discrete time point from the minimum to the maximum observed durations, and multiplying these values by the length of the interval between time points with observed failures" (Kropko & Harden, 2017: 312-313):

$$E(t_i) \approx \sum_{t_j \in [0,T]} (t_j - t_{j-1}) S_i(t_j).$$

Finally, in order to compute marginal effects to expected duration after changes in the covariates, both methods rely on the same approach. At least two further covariate profiles must be created, which are set to a commensurate number of existing theoretically interesting values. Indicator variables are thus given a score of either 0 or 1, whereas continuous variables are assigned a score in a low-to-high spectrum. By default, Cox ED proposes that remaining variables rely on the method for value observation first introduced by Hanmer and Kalkan (2013), although this can be changed by the researcher. This method has the advantage of allowing variables to vary over the dataset and providing an average once all computations have been executed, thus reducing the potential bias that could arise from calculating a particular measure of central tendency from the outset. A clear exemplification of this process is provided by Kropko and Harden (2017), who elaborate on

the steps necessary to assess the impact of a scenario where covariate X_1 increases from 0 to 1:

> *(a) Set X_1 to 1 for the entire data (all N observations) and calculate the ELP for every observation, then take the average value of those computations (the median is the default).*
> *(b) Repeat step (a) while setting X_1 equal to 0.*
> *(c) Take the values obtained in steps (a) and (b) and append them to the list of ELP values from the original Cox model in which X_1 is left as exogenous data. Then compute new rankings of the linear predictor values from this list, which is length N + 2.*
> *(d) Pass the list of rankings from step (c) to the GAM as new data to generate expected values. Note that a new GAM is not estimated at this step. Rather, expected durations are generated for each observation – including the two new ones created in steps (a) and (b) – using the previously estimated GAM. This produces point estimates of the expected durations for those two new observations.*
> *(e) Compute the difference between the two estimates obtained in step (d): the expected duration for the data in which X_1 is set to 1 and the expected duration for the data in which X_1 is set to 0. This quantity is a point estimate for the marginal effect, or first difference, corresponding to the change in X_1 from 0 to 1* (310-311).

The final estimates for uncertainty are conceived by repeating this process via bootstrapping [9]. The distributions of expected durations generated by each bootstrap sample allow for the calculation of confidence intervals and standard errors. It is noteworthy that uncertainty is thus calculated for the whole of the model estimation, ie., not only for the Cox model results that the Cox ED models then proceed to build upon.

While both approaches certainly have their advantages, this thesis manifests a preference for the GAM approach over the NPSF method. The reasons behind this decision are threefold. Firstly, the GAM approach has the ability of allowing for time-varying covariates. This gives it a considerable degree of flexibility *vis-à-vis* the NPSF method, a feature that is of significant importance in light of the nature of the data under analysis in this

[9] Repeating the process 1000 times is the default configuration of Cox ED (Kropko & Harden, 2020).

thesis. Secondly, the existing analyses with both methods have shown that the GAM approach generally performs better than NPSF in regards to confidence intervals, which are closer to nominal levels when using GAM. Thirdly, my methodological choice is in line with the authors' own position on the matter, which states that "researchers use the GAM approach as a starting point and consider using the NPSF approach if they have a specific preference for the single-model estimation strategy" (Kropko & Harden, 2017: 313).

Dataset and operationalisation

In this section, I outline the dataset that I will use to conduct my analysis, and I provide explanations for the operationalisation of the independent variables contained therein.

This thesis mostly relies on data from the ParlGov database (Döring & Manow, 2020), and encompasses the following countries: Austria, Belgium, Denmark, Finland, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Spain, and Sweden. The list of post-electoral cabinets, duration of government formation negotiations, and basic information such as election dates, countries, number of parties in the legislature, in government and in opposition have all been extracted from this database. Furthermore, both fragmentation and polarisation rates have also been derived from ParlGov. The fragmentation rate is operationalised by means of the ENP (Laakso & Taagepera, 1979) or, more precisely, the ENPP (effective number of parliamentary parties), which produces a score based on the number of seats of each party in the legislature. The ENPP is calculated as follows:

$$\frac{1}{\sum_{i=1}^{n} p_i^2}$$

where n stands for the number of parties present in the legislature and p_i^2 represents the square root of each party's share of all seats. It should also be mentioned that parties' share of seats must be normalised before calculating the ENPP.

For its part, the polarisation rate is operationalised via Dalton's polarisation index (Dalton, 2008). The formula for this index can be appreciated below:

$$\sqrt{\left\{\left(party\ vote\ share\ _i\right) * \left(\left[party\ L/R\ score\ _i\ -\ party\ system\ average\ L/R\ score\right]/5\right)^2\right\}}$$

where *i* represents each individual party and the L/R score represents the position of each party on a left-right continuum. As Dalton himself notes, "this index is comparable to a measure of the standard deviation of a distribution", given that "it has a value of 0 when all parties occupy the same position on the Left–Right scale and 10 when all the parties are split between the two extremes of the scale" (Dalton, 2008: 906). There are several ways to measure parties' positions on the left-right spectrum. ParlGov utilises several sources to assign this score to each party, generating an average position of all applicable results produced by Castles and Mair (1984), Huber and Inglehart (1995), Benoit and Laver (2006) and the Capitol Hill Expert Survey (Rikker *et al.*, 2020).

I calculate the total volatility rate on my own using the formula referenced in *Comparative European Party Systems: An Analysis of Parliamentary Elections Since 1945* (Siaroff, 2019). The formula stipulates that this metric is calculated by "taking the absolute difference between the percentage of votes won in the election and the percentage won in the previous election by a particular party [...] and summing these absolute values for all parties" (Siaroff, 2019: 36). The resulting value is subsequently divided by two to obtain the total volatility rate. As such, if the rate reports a value of 0, this indicates that there have been no changes since the previous election. It is worth noting that this metric is logically dependent on comparing a given election with its previous election. There is thus no value for the first election ever held. Due to the fact that this thesis analyses data from 1980 to 2019, all countries in this dataset have already had several elections by then; volatility rates have therefore been calculated without exception.

Lastly, I assign legislative types to each cabinet by replicating and applying the formula by Laver and Benoit (2015) whose basic structure can be appreciated in Figure 1.

Measuring government formation

As has been explained above, the dependent variable is operationalised as follows: government formation refers to the number of days it takes for a government to be announced after an election. In order to deal with a dataset that is analytically useful to the research question that this thesis aims to answer, certain choices have had to be made,

chiefly in regard to the types of elections and cabinets to count. These choices are explained in this section.

The literature on government formation delays tends to agree that post-electoral government formations provide more uncertainty than inter-electoral ones (Diermeier & van Roozendaal, 1998; Martin & Vanberg, 2003; Golder, 2010; Laver & Benoit, 2015). The reasons behind this observation are multifold. At base, inter-electoral government formation processes usually occur after the incumbent government has been ousted or pressured to resign. In other words, this propounds the idea that political parties have a motive to see a new government form, with the likelihood that they will have preferred alternatives already planned. This has two consequences for this research. On the one hand, this implies that there is less value in assessing inter-electoral government formation processes, in light of the diminished uncertainty that comes after a political crisis has triggered the resignation of the ruling government. On the other, the fact that legislative politics plays a key role in triggering an inter-electoral cabinet replacement proves that the reasons behind it cannot be modeled and measured as easily as existing features of party systems. As such, my dataset will exclude inter-electoral elections and only encompass post-electoral elections.

Moreover, this thesis specifically addresses the duration of government formation processes as a whole. In practice, this means that I will not concentrate on individual bargaining rounds themselves. Instead, the focus will be placed on the number of days it takes for a cabinet to be announced since the electoral results are officialised, ie., the time it takes for political parties to come together to form a government. Accurately identifying individual bargaining rounds is methodologically challenging, as political actors regularly engage in informal negotiations in and around them (de Groot, Ramer & Schram, 2016). This carries the risk of “produc[ing] a lot of noise in the data” (Savage, 2018: 316). Ultimately, the issue of whether there is one long or several short bargaining rounds is beyond the scope of this thesis, and will thus not provide insights of added value for the research question I aim to answer.

Empirical analysis

Outline of the analysis

In this chapter, I will examine and discuss the results of the empirical analysis conducted. The structure of the chapter is hereby outlined.

Firstly, I will present a number of visualisations of the dependent and independent variables of this thesis. This graphical descriptive evidence is aimed at demonstrating the evolution of the key variables of this thesis, thus providing a frame of reference for the subsequent deployment of the statistical models.

There are several approaches at disposal in order to represent data across time (Meidinger, 1980; Wei, 2006; Kirchgässner, Wolters, & Hassler, 2012). Various political scientists have compared processes by decade (Kriesi, 2014). This is also explicitly noted in the case of the duration of government formation processes; for example, Morini and Cilento (2020) propose to “compare government formations in the decade before 2008 and decade by decade” (Morini & Cilento, 2020: 1219). However, this carries the risk of not measuring subtle changes occurring within these ten-year periods. Capturing these changes in time is of particular importance to this thesis given that one of its main arguments is the progressive difficulty in forming government in Western Europe since 2008. A possible alternative consists of extracting the mean and median values on a yearly basis. Notwithstanding the fact that this would circumvent the issues present in the decade-by-decade approach, a yearly number of elections represents “a small sample size, and so would produce a high degree of measurement error” (Hix, 2004: 296).

As a solution, I have chosen to represent these metrics by means of the rolling five-year mean and median numbers. Five-year periods seem an adequate temporary cut in light of the fact that this thesis deals with a four-decade dataset, allowing me to visualise the changes in duration registered across time with a focus on the post-2008 period. Additionally, the inclusion of rolling measures of distribution, in lieu of their general counterparts, is due to the fact that “a rolling analysis of a time series model is often used to assess the model's stability over time” (Zivot & Wang, 2003: 299). This contributes to ensuring that short-term spikes and/or outliers do not skew the results (Finch, 2009).

I then proceed to interpreting the findings of my analysis. Firstly, the scores of the Cox model will be presented. This will help in assessing the statistical significance of the independent and control variables under study; besides the coefficients, the standard errors

and confidence levels will be included. For cases where ties in the time data are registered, I rely on Efron's method (Efron, 1977). This is because Efron's method is generally the default setting in survival analysis software[10], and presents advantages *vis-à-vis* other alternatives: it performs far better than the Breslow or Kalbfleisch-Prentice approximations, even with moderate or heavy ties" (Hertz-Picciotto & Rockhill, 1997: 1154)

These models are used to estimate the hazard ratios of the independent variables on the duration of government formation. Binary variables for the legislative types have been created in order to assess their impact on delays. This is a procedure known as one-hot encoding, and it is needed for categorical data to be processed properly (Jason, 2017). Additionally, I control for two key dimensions, ie., the presence of type A types, which represent a parliamentary composition where there is a single majority party in place, and the number of legislative parties present in parliament. This serves two purposes. On the one hand, the number of legislative parties is treated as an indicator of uncertainty for parties after an election. This is in line with previous studies on the topic (Golder, 2010; Laver & Benoit, 2015). On the other, holding the number of parties constant is necessary to a proper estimation of the effects of legislative types on the dependent variables. Crucially, it helps prevent a skewed analysis due to the fact that legislative types themselves are strongly dependent on the number of parties at a given legislature.

Once this has been executed, the final step is identifying the extent to which the independent variables have impacted on the dependent one. In other words, I will conduct an assessment of the marginal changes in expected time when the covariates are modified. However, the results that the Cox model yields by itself are expressed in hazard ratios. This entails that they are difficult to link to expected durations. This occurs in spite of the fact that accounting for time variations is ultimately the main metric of interest for duration-based phenomena[11]. As a solution, building a Cox ED GAM model on top of a regular Cox model allows me to produce these quantities in terms of numbers of days. I will thus present an array of figures outlining the marginal changes in expected durations due to changes in the key variables delineated above.

Dichotomous variables will logically be calculated by adopting one of the two values possible. For its part, the presence of continuous variables represents a challenge in terms of how to decide what values will be given to the model. On this note, I draw inspiration from three recent publications that have relied on Cox ED methods (Stiansen, 2019; Adolph *et al.*,

[10] This is the case for the coxph package in the RStudio statistical software used in this thesis.
[11] For further details, see chapter 2 "Methodology".

2020; Cronert, 2020). All these analyses compute these kinds of variations by using the 25th and 75th percentiles of the variables chosen. Due to the rapid variation of the continuous independent variables under consideration in this thesis, however, I will analyse the changes in the dependent variables for two sets of 25th and 75th percentiles: the percentiles for each variable taking into account the whole dataset, and the percentiles for each variable factoring in the values since 2010 only.

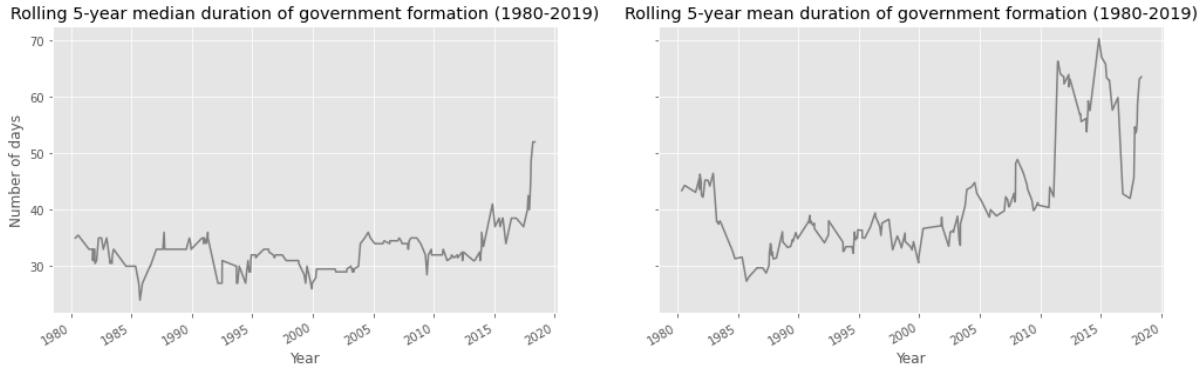
Descriptive graphical evidence

1. **Dependent variables**

The hypothesis of this thesis stipulates that the independent variables under consideration have negatively impacted on the duration of the government formation process. Succinctly put, government formation processes have become longer on average due to the rise in the values of the independent variables.

A first approximation to the duration of government formation is reflected in Figure 2. The figure shows the rolling 5 year median and mean duration of government formation negotiations across time in Western European countries.

Figure 2



As can be appreciated, government formation remains reasonably stable up until 2010, when the average delay in negotiations increases from 40 days to more than 60. This represents an increase of approximately 50%. The median, for its part, rises more gradually from over 30 days in 2010 to 53 days approximately by the end of the decade. All in all, both

graphs show a clear upwards trend: post-electoral rounds have growingly yielded considerable delays in government formations over time, particularly since the last decade.

2. Independent variables

As has been explored in the literature review, Western European party systems have recently undergone considerable change, particularly since the 2008 financial crisis. In this regard, this thesis has identified the following independent variables: fragmentation, polarisation, electoral volatility and legislative types (Laver & Benoit, 2015). Figures displaying the rolling 5 year mean and median values of the first three of these variables are displayed below.

For these variables, the values register an upwards trend. Whilst the fragmentation and polarisation rates in particular have been increasing steadily since the start of the 1980s, the last decade registers the highest rise in values thus far. In the case of electoral volatility, the effect of the 2008 financial crisis is more readily discernible. All in all, both median and average values for all variables under analysis register their peaks in the last decade and do not suggest that they will decrease to a significant extent in the short-term future.

Figure 3

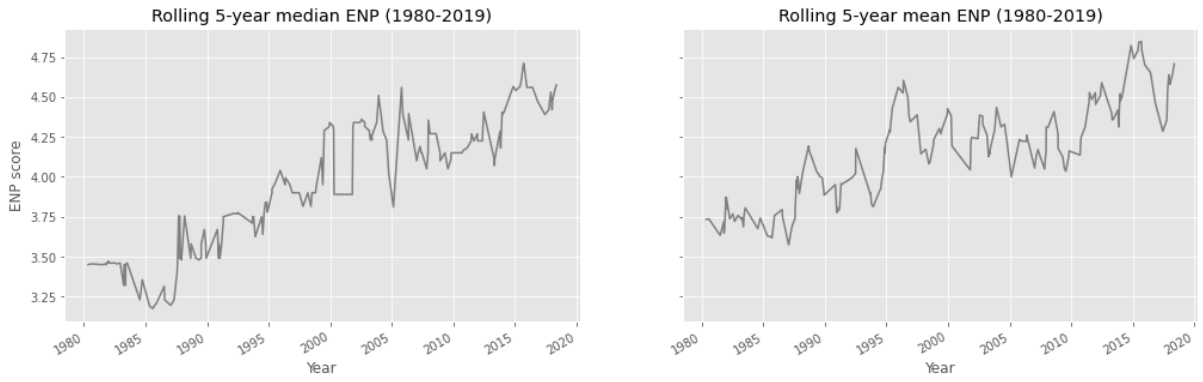


Figure 4

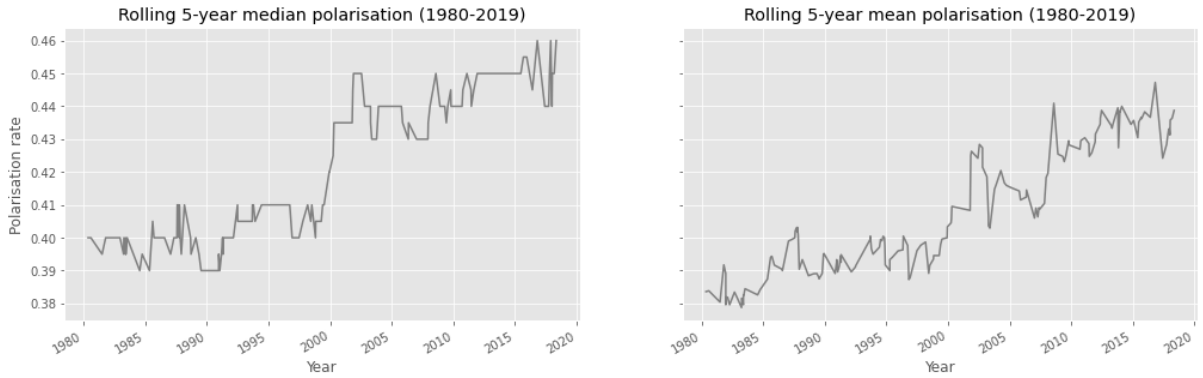
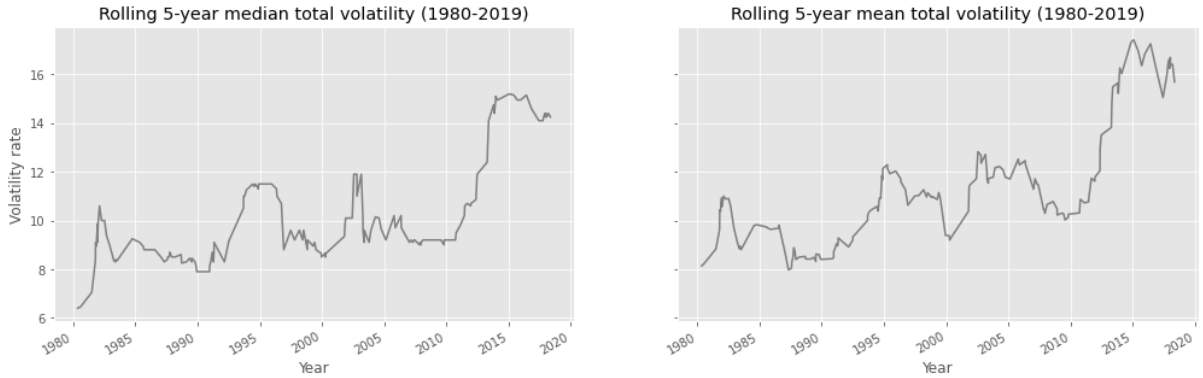


Figure 5



This thesis also makes the case that the typology of legislative types outlined by Laver and Benoit (2015) is a valuable contribution to our understanding of government duration dynamics, particularly in terms of the duration of the government formation process. This is illustrated by Tables 1 and 2, which report the mean and median durations of government formation negotiations in Western Europe.

It can be observed in Tables 1 and 2 that government formation durations vary considerably depending on the legislative type: a scenario where there is a single majority party, for instance, reports an average of 11 days and a mean of just four days in terms of government formation, compared to an E type system, where the same metrics increase to 82 and 54 days respectively. Remaining legislative types lie between these two extremes.

Table 1: Mean duration of government formation by legislative type in Western European countries (1980-2019)

Legislative type	No. of days
A	13.85 (3.85)
B	32.94 (2.83)
B*	29.08 (8.42)
C	51.71 (7.84)
D	42.53 (5.09)
E	93.47 (11)
All formations	30.37 (3.22)

Note: Standard errors in parentheses.

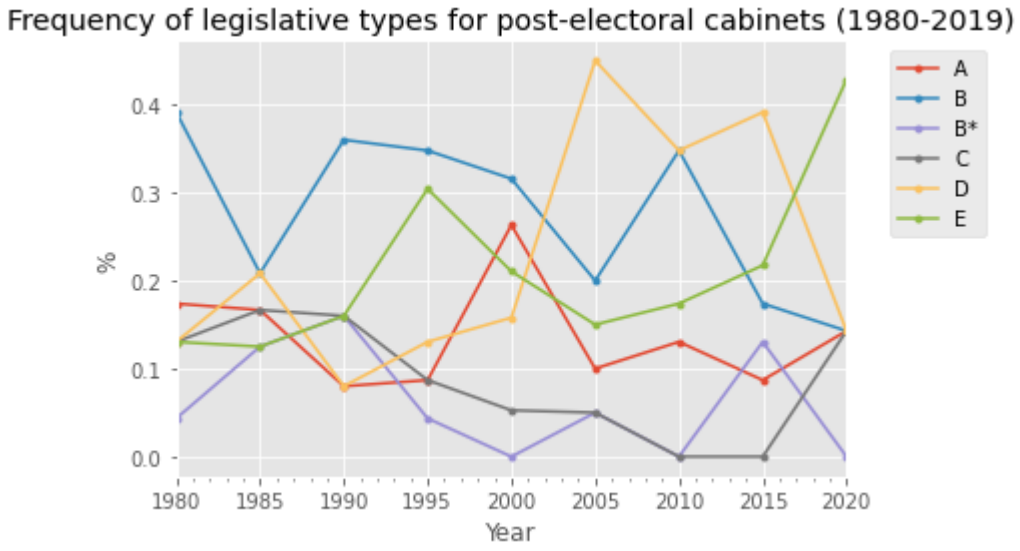
Table 2: Median duration of government formation by legislative type in Western European countries (1980-2019)

Legislative type	No. of days
A	3 (4.83)
B	30.5 (3.54)
B*	18.5 (10.55)
C	52.5 (9.82)
D	33 (6.37)
E	67 (13.79)
All formations	33 (4.03)

Note: Standard errors in parentheses.

These patterns are of no minor consequence, as certain legislative types have become increasingly more common over time compared to others. Laver and Benoit (2015) assess that only 12% of European governments are legislative type E out of all legislative elections between 1945 and 2010. However, a 5-year breakdown from 1980 to 2020 reveals a change in these numbers, with type E becoming the most common legislative type for Western European governments (Figure 6). Indeed, a sharp increase in the frequency of E type governments can be perceived particularly in the last decade, with all other legislative types except for C registering an overall decline when compared to their 1980s levels. This relation will be further examined in the following section.

Figure 6



Cox proportional hazards model

This section discusses the results of the Cox models deployed for the duration of government formation negotiations presented in Figure 7. In total, three models were produced. Model 1 constitutes a stripped-down benchmark. It works under the assumption established in previous studies that the number of parties present in a legislature is crucial to the notion of uncertainty. In other words, the higher the number of mathematically possible coalitions, the higher the uncertainty. In turn, this increases the delay in the government formation process. This is indeed the case, as reflected in the negative hazard rate recorded for this variable. Predictably, legislatures without a single party majority are more likely to take longer to form governments.

For its part, Model 2 adds three of the independent variables under consideration, ie,. fragmentation, polarisation and electoral volatility. It still accounts for the presence of a single party majority as well as the total number of parties in the legislature. Crucially, in spite of the fact that all these variables have reported growth recently, the only relevant variable is the ENP; neither polarisation nor volatility reaches a statistically significant confidence level. However, it should be noted that the hazard ratio of the ENP is low at -0.326, suggesting that the actual effect of political fragmentation on the length of the government formation process is marginal.

Finally, Model 3 adds a layer of complexity, by means of introducing the list of legislative types outlined by Laver and Benoit (2015) whilst keeping the number of legislative

parties constant. The only type excluded is Type A, given that it is used as the baseline. As can be appreciated, most metrics are statistically significant at the 0.05 confidence level, with a number of metrics even reaching statistical significance at the 0.01 confidence level. The results show that legislative types with system-dominant parties, ie., B and B*, regularly have shorter government formation negotiations than C, D, and E types. Indeed, these latter types, and particularly the E type, have a statistically significant impact on delays in government formation. This is in line with Tables 1 and 2. It also conforms to the findings reported by Laver and Benoit (2015).

All in all, the results indicate that legislative types are the most statistically significant variables to predict the duration of government formation processes. Additionally, the results are concordant with expectations: type E presents the most difference with Type A, followed by type C and D. In contrast, types B and B* are the closest. Moreover, apart from legislative types, only the ENP yielded an appreciable score in this analysis, although the hazard ratio still remains considerably lower than for all legislative types. This indicates relatively little influence on the outcome of government formation negotiations. Polarisation and volatility, for their part, are essentially inconsequential to this process.

Figure 7: Cox Proportional Hazards Models of Durations of Government Formation Negotiations in Western European countries (1980–2019)

	Model 1	Model 2	Model 3
Absence of a one party majority	-1.293***	-0.595*	
	(0.305)	(0.335)	
Total number of parties	-0.065***	0.010	-0.019
	(0.025)	(0.027)	(0.028)
Polarisation rate		0.385	
		(1.412)	
Total volatility rate		-0.008	
		(0.013)	
ENP		-0.326***	
		(0.075)	
B			-0.887***
			(0.320)
B*			-0.845**
			(0.427)
C			-1.436***
			(0.413)
D			-1.236***
			(0.334)
E			-2.039***
			(0.362)
Observations	161	161	161
Log Likelihood	-650.796	-639.373	-639.666
Wald Test	23.010*** (df = 2)	39.910*** (df = 5)	40.500*** (df = 6)
Significance levels			*p<0.1; **p<0.05; ***p<0.01

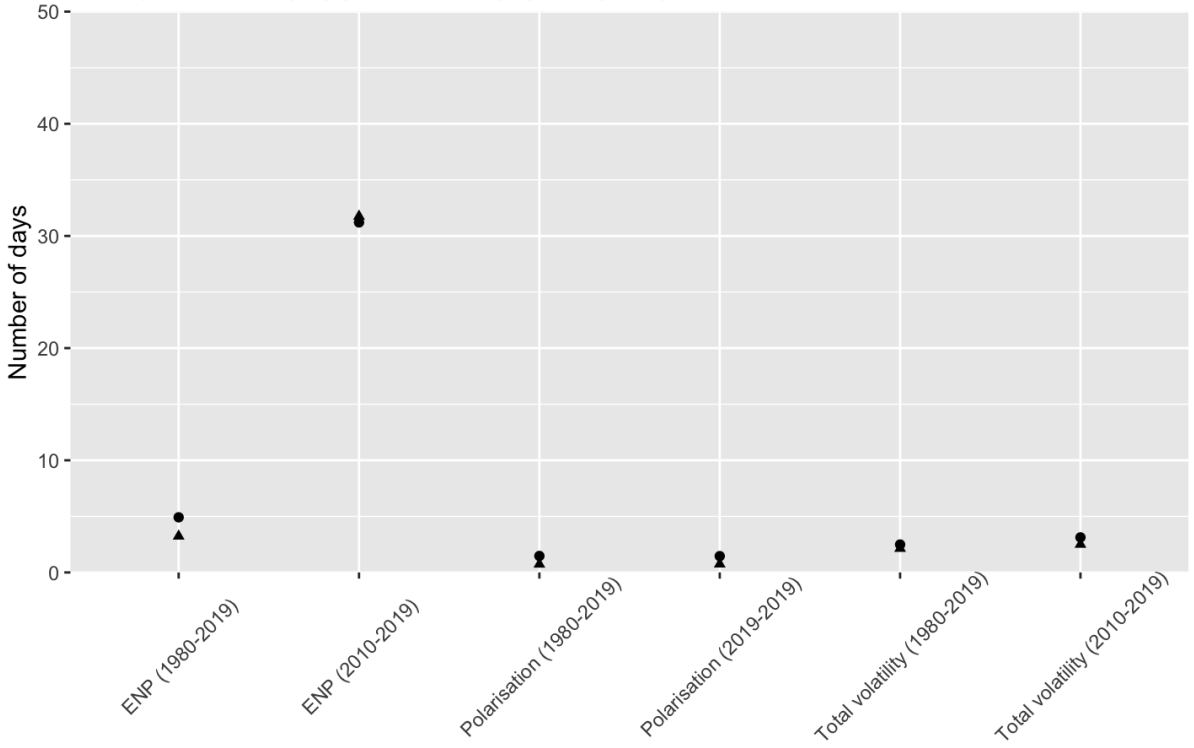
Cox ED model

This section concerns itself with the results of the Cox ED models, which were built on top of the results of the Cox model shown above. The figures herein displayed show the

average and median marginal changes in number of days due to the variations of a given variable.

First, Figure 8 shows how many days are added to the government formation process when there is a change from the 25th percentile to the 75th percentile in the ENP score and the polarisation and volatility rates. This encompasses percentiles obtained from the whole dataset as well as from data since 2010 only. For both the ENP score and the volatility rate, the change in percentiles from the overall dataset to those of the last decade translates into a higher delay in government formation. This is particularly acute in the case of the ENP score, where both the median and the average jump from approximately 5 days to over 30 days. The same effect is not reported for the polarisation rate; both results derived from this variable indicate that it plays virtually no role in the duration of government formation processes.

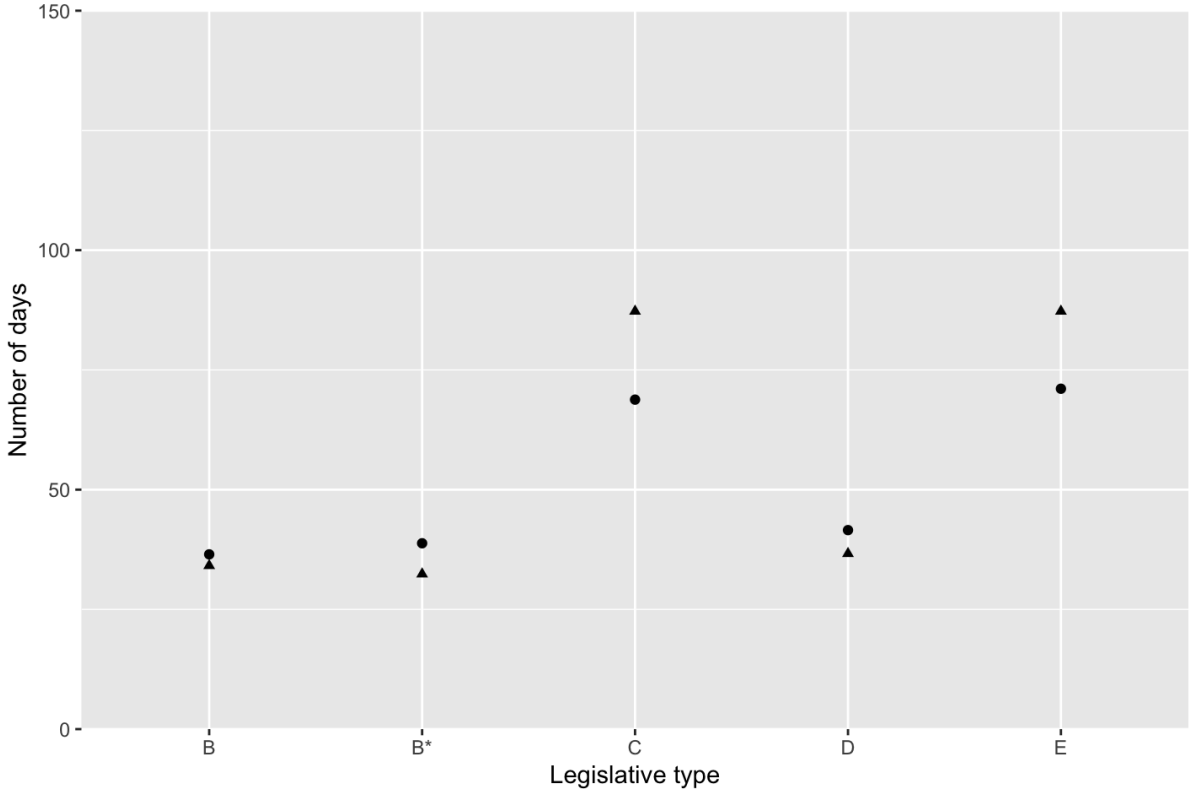
Figure 8: Average (●) and median (▲) change in government duration by party system variables



Secondly, the average and median marginal changes due to a change in legislative type are scrutinised. Figure 9 shows the number of days that each legislative type adds to the baseline type A. Predictably, type E adds the most number of days: the mean sits at 72 days whilst the median affixes 87 days. Also within expectations, types B and B* add the

lowest amounts of days to type A durations, closely followed by type D. More unexpectedly, type C generates roughly the same delays in the dependent variable as type E.

Figure 9: Average (●) and median (▲) change in government formation duration by legislative type



All in all, the outcomes of the Cox ED models deployed above are in line with those produced by the Cox models presented in Figure 7. Indeed, the results indicate that all legislative types have a significant impact on the dependent variable. These durations are not inconsequential, with both types C and E adding the approximate equivalent of three months to government formation negotiations. For their part, the only other significant independent variable is the ENP score. More specifically, the ENP score only becomes relevant to the formation of government in the last decade, or, in other words, against the backdrop of a dramatic increase in its value (Figure 3). On the contrary, neither volatility nor polarisation report the same effect; instead, they remain consistently unimportant for the dependent variable.

Discussion

Key findings

In this chapter, I will discuss the results of the analysis conducted in the previous chapter. I will assess how they answer the research question of this thesis and, in turn, contribute to the existing scholarship on the issue. The first section of the empirical analysis chapter showed how the duration of government formation has increased over time, particularly since the last decade. The subsequent analyses show that this can be primarily attributed to two main factors: firstly, the growth in E and, to a lesser extent, C type systems. These legislative types now account for more than 40% and 15% of all post-electoral cabinets in Western European parliamentary democracies respectively. Secondly, the rise in parliamentary fragmentation (ENP). In short, hypotheses 1 and 4 are confirmed.

Indeed, as can be appreciated, legislative types are by far the best predictors for the duration of government formation. This assertion is underpinned by the results of both the Cox models and the Cox ED models built on top. In all cases legislative types proved to be statistically more significant than all other independent variables tested. Most results were according to expectations. Compared to the usually immediate government formation process ensured by the presence of a single majority party, E legislative types delay government formation the most. B and B* types, for their part, add considerably less time to this process. Unexpectedly, C type systems were also significantly more likely to incur delays in government formation negotiations than all other types except E. In this sense, it should be mentioned that in both types C and E “there is no clear majority” (Crosson & Tsebelis, 2021: 11). Indeed, E types are characterised by the mathematical impossibility of forming a two-party coalition, whereas in C types all three biggest parties can reach a legislative majority by negotiating with one another. The results yielded help thus elucidate the consequences that are brought about by the presence or absence of a clear *formateur* party, a condition which “determines whether party competition is centripetal or centrifugal, and whether coalitions will be formed through the centre or along the outskirts of the political space” (Pellikaan, de Lange & van der Meer, 2016: 233).

The increase in fragmentation across Western Europe has likewise been associated with longer delays in government formation. This metric reports a weak yet statistically significant hazard ratio in the Cox model deployed. This is in line with most research produced on the topic of government formation duration, which also stresses that

fragmentation is amongst the key aspects driving bargaining complexity for political parties[12]. Crucially, the deployment of two different Cox ED models for the ENP variable proved pivotal to properly grasp the effect of *recent* fragmentation in particular on government formation negotiations. Indeed, the effect of fragmentation was only palpable once the rise in the last decade was accounted for. This effect is backed by research which covers recent elections too. This research finds that "there is a strong correlation between fractionalization (meant as "effective number of parliamentary parties" index) and times for government formation", and that "fractionalization keeps explaining the increase in government bargaining duration in the EU member states" (Morini & Cilento, 2020: 1224). However, it is worth mentioning that, by concentrating on the arithmetic constraints of various seat distributions, legislative types do on the whole manage to capture the effects of increasingly fragmented party systems more effectively than the ENP.

Hypotheses 2 and 3, for their part, have to be rejected. Polarisation was found not to have any statistically significant impact on the dependent variable under study. If anything, thus, the conclusions reached on this front are closer to Warwick's (1994), who stated that polarisation at the legislature level is not as crucial to cabinet formation as polarisation within the governing coalition itself. In other words, under growing polarisation "coalitions must form around the political centre, uniting often amorphous and diverse collections of parties and ideologies to amass majority support" (Warwick, 1994: 65). Given that types E deem it "necessary to model at least five-party systems to cover the full range of logical possibilities arising from the legislative arithmetic" (Laver & Benoit, 2015: 279), it would appear that polarisation is conditional to long government formation negotiations insofar as coalitions in type E systems forcefully involve multiple, potentially heterogeneous parties. Succinctly, hypothesis 2 is rejected.

Electoral volatility reported similar results. This indicates that the instability induced by a rise in this metric does not translate necessarily to delays in government formation. Equivalent conclusions are reached by Morini and Cilento (2020), who fail to find statistically significant correlations between both phenomena. They observe that "record-length times for government formation negotiations happened after elections that were not characterized by substantial successes of new parties" (Morini & Cilento, 2020: 1224). This thesis arrives at commensurate findings. Briefly put, hypothesis 3 is rejected.

All in all, the results of this research contribute to better comprehending the causes behind longer government formation processes across Western Europe. The consequences

[12] For further details, see Chapter 2 "Literature Review".

of these developments are of paramount importance to our understanding of the current Western European political landscape. As Laver and Benoit rightly point out, “the empirical significance of open legislative party systems arises [...] because they are associated with significantly longer government formation negotiations” (Laver & Benoit, 2015: 280). This thesis has hence shown the value of this typology as an explanation of this phenomenon. Moreover, by relying on a more updated dataset, I was able to extract further insights as regards this typology. Indeed, I was able to demonstrate that C types have become more common than in previous decades. What is more, C types are now associated with increasingly longer government formation negotiations, similarly to the level registered for E types. This propounds the idea that the complications arising from an open legislative system also extend to a legislative scenario where there is no clear pivotal party, like in C types. In turn, this further suggests that the complexity of the bargaining environment is not only affected by party system variables such as fragmentation, but also by the absence of a clear structuring party, ie., a *formateur* party.

In terms of methodology, this research contributes to a nascent corpus of scholarship which relies on the Cox ED package to convey more significant and clearer data for duration-based variables (Stiansen, 2019; Adolph *et al.*, 2020; Cronert, 2020). By means of example, the difference between the average government duration for E types and B types is difficult to assess in and of itself. The results yielded by the Cox Model 3 (Figure 7) show that their hazard ratios are -2.039 and -0.887 respectively (both metrics are significant at the 0.01 confidence level). It therefore follows that E types are associated with a lower risk that government formation negotiations will conclude. In other words, government formation negotiations will take longer in E types than in B types. However, there is no scale to translate hazard ratios back into duration-based quantities. It is thus impossible to know the empirical impact of the rise in E types in the recent decade. Employing Cox ED models solved this shortcoming, and showed that the difference between both types is approximately two months; E types add almost 90 days to Type A durations, whereas B types add about 30 days. The significance of this methodology is not to be underestimated. Indeed, increasingly longer government formation negotiations have profound consequences for a myriad of other political and economic phenomena[13]. Being able to generate expected durations expressed in numbers of days thus helps scholars produce results that are more directly related to the issues they intend to address.

[13] For further details, see Chapters 1 “Introduction” and 2 “Literature Review”.

Furthermore, this thesis has introduced a new approach to take into account radical shifts in the value of independent variables across time. For the deployment of Cox ED models, it not only relied on the 25th and 75th percentiles derived from the whole dataset but also calculated additional ones based on the data of the last decade only. The fact that different values were reported depending on what percentiles were used highlights the value of this approach. It served the purpose of expliciting that fragmentation does indeed play a role in incurring delays in government formation negotiations, and that this role has become especially important over the course of the last decade.

Future avenues of research

This thesis paves the way for future research on the topic, both in terms of the independent variables and the dependent variables that can be employed. Additionally, further extending the scope of analysis to countries outside those examined as well as to polities at the supra- and sub-national levels would prove beneficial to test the robustness of the approaches taken herein.

Regarding independent variables, I have relied on the polarisation index as outlined by Dalton (2008). This is in line with the vast majority of the existing scholarship, which tends to measure polarisation along a single dimension, the left-right spectrum (Saalfeld, 2008). It also responds to the limitations of the dataset I have used; in general, obtaining consistent polarisation data across a "sufficiently long period of time" (Bergmann, Bäck & Saalfeld, 2021: 9) and spanning multiple countries represents a methodological challenge. However, it should be mentioned that recent scholarship emphasises that polarisation is increasingly a multi-dimensional phenomenon (Kitschelt & McGann, 1997; Hooghe *et al.*, 2002; Mudde, 2007). As the literature progresses and manages to capture different aspects of polarisation, scholars will accordingly benefit from testing the effect of its various dimensions separately.

Additionally, political science has long established that "institutions matter" (North, 1994: 1) for political outcomes. The institutional features of different countries, such as various investiture rules, the presence of a constructive vote of no confidence, the role of a stronger executive than is the norm in parliamentary settings, amongst others, can all contribute to expediting or delaying government formations. Moreover, the interaction between party system variables and institutional constraints may shed further light on the ways both sets of variables play a role in shaping this crucial aspect of parties' political behaviour. Dealing primarily with the issue of early cabinet termination, Bergmann, Back and

Saalfeld (2021) analyse several dimensions of positive parliamentarism and how these mitigate (or not) polarisation levels in various European democracies. This is a clear example of how variables of diverging nature can complement each other to arrive at more nuanced and precise conclusions.

Academics might also be interested in testing the effects of these variables -particularly the rise of E legislative types- on other dependent variables. Logical examples are variables which also relate to time and are intrinsic to the dynamics of political behaviour, such as the duration of government itself and the time it takes for pieces of legislation to be passed into law. There is already a substantial body of literature detailing the significance of these phenomena (Box-Steffensmeier, Arnold, & Zorn, 1997; Boehmke, 2006; Maltzman & Shipan, 2008; Darmofal, 2009; Laver & Benoit, 2015; Kropko & Harden, 2020; Bergmann, Back, & Saalfeld, 2021).

Lastly, a categorical variable of potential interest is the resulting government type after an election. Laver and Benoit (2015) already test the correlation between legislative types and government types, concluding that “notwithstanding many theoretical models, MWCs[14] are not the norm in real parliamentary settings, and our classification of legislative party systems throws light on why this might be” (Laver & Benoit, 2015: 288). In fact, aforementioned case studies on the difficulties of government formation processes have likewise taken note that this might impact resulting government types. For example, following a record 171 days to form a government, Bräuniger *et al*. (2018) speculate that “German parties have to adapt to the new situation, either by embracing ideologically more heterogeneous coalitions such as in the Netherlands or by considering alternative forms of governing such as Scandinavian-style minority governments" (Bräuniger *et al.*, 2018: 94). In another reference to the tendency of Scandinavian countries to form minority governments, Pellikaan, de Lange, and van der Meer comment that “it is not unlikely that party competition in Belgium, Finland and the Netherlands will start to resemble this ‘Scandinavian model’ more closely, if only out of the necessity to cope with the electoral volatility and shifting parliamentary majorities” (Pellikaan, de Lange, & van der Meer, 2016: 250). More at large, several authors have decried that the existing scholarship tends to assume coalitions -and mainly MWCs- as the default outcome of government formation negotiations, to the point that it has been claimed that “the study of cabinet formation [...] has become virtually synonymous with coalition studies” (Schleiter, 2010: 4; see also Schleiter & Morgan-Jones,

[14] MWC stands for minimal winning coalition (Riker, 1962).

2009). The scholarship could thus benefit from studies that scrutinise the patterns of government types emerging from recent post-electoral cabinets.

Conclusion

Over the last decades and particularly since the events surrounding the 2008 financial crisis, government formation negotiations have become increasingly longer in Western Europe. This thesis has attempted to understand why. In order to do so, it has built upon a rich corpus of scholarship on two topics: firstly, on the neoteric changes that party systems across the region have undergone (Drummond, 2006; Bellucci, Lobo, & Lewis-Beck, 2012; Casal Bértoa, 2014; Powell & Tucker, 2014; Hernández & Kriesi, 2016; Dassonneville & Hooghe, 2017; Emanuele & Chiaramonte, 2018; Poguntke & Schmitt, 2018). Secondly, on the reasons behind delays in government formation processes (Diermeier & van Roozendaal, 1998; Martin & Vanberg, 2003; Conrad & Golder, 2010; Golder, 2010; Ecker & Meyer, 2015; Laver & Benoit, 2015; Savage, 2018). Additionally, it has sought to expand upon the survival analysis literature and its application to political phenomena, chiefly by employing the recently introduced Cox ED package on top of the regular Cox Proportional Hazards model (Cox, 1972; Cox & Oakes, 1984).

The results of this thesis point to a clear pattern as regards what drives government formation duration in Western European parliamentary democracies. Two main variables were identified as statistically significant. The most relevant variable is to be found in the typology of legislative types outlined by Laver and Benoit (2015). In particular, open legislative systems, also referred to as E types, regularly delay government formation negotiations by approximately three months when compared to a scenario where there is a single majority party. Similar values are reported for top-three systems (or C types). The second variable is political fragmentation. Indeed, fragmented party systems were found to result in longer negotiations, particularly in the last decade. The remaining two independent variables under consideration, polarisation and total volatility, are rejected; no statistically significant correlation between them and government formation duration was found.

This research contributes to the literature twofold. Firstly, it fills a clear gap in the literature, which had hitherto not produced a comprehensive account of the recent challenges to government duration processes in Western Europe. Secondly, it provides further robustness to two recent innovations in the literature, ie., the typology of legislative types of Laver and Benoit (2015) and the Cox ED package (Kropko & Harden, 2017, 2020). On this note, it also introduces a novel way of measuring the impact of independent variables which have seen their values change radically in short periods of time.

More importantly, this thesis serves as a stark reminder that even established party systems are not to be taken for granted, and that a growing inability to produce majorities to govern has consequences for democracy as a whole. In the words of the European Commision, it makes it increasingly more difficult to “aggregate citizens’ demands and interests and translate them in political debates and policy decisions” (European Commision, 2019: 5). The implications of this phenomenon are thus crucial to the political landscape of the continent. This takes all the more significance in light of the fact that both open legislative systems and highly fragmented party systems are fast becoming the norm in the region. Historical experiences, both in Western Europe itself (Berg-Schlosser & Mitchell, 2002) and further afield[15] provide insightful guidance in this regard. It is my conviction that we should heed these lessons.

[15] For Latin America see Mainwaring & Scully, 1995. For Central and Eastern Europe see Birch, 2003; Powell & Tucker, 2014; and Sikk, 2005. This list is by no means exhaustive.

References

- Abedi, A., & Lundberg, T. C. (2009). Doomed to failure? UKIP and the organisational challenges facing right-wing populist anti-political establishment parties. Parliamentary Affairs, 62(1), 72-87.
- Adolph, C., Amano, K., Bang-Jensen, B., Fullman, N., & Wilkerson, J. (2021). Pandemic politics: Timing state-level social distancing responses to COVID-19. Journal of Health Politics, Policy and Law, 46(2), 211-233.
- Andersen, J. G. (1984). Decline of class voting or change in class voting? Social classes and party choice in Denmark in the 1970s. European Journal of Political Research, 12(3), 243-259.
- Art, D. (2011). *Inside the radical right: The development of anti-immigrant parties in Western Europe.* Cambridge University Press.
- Aylott, N., & Bolin, N. (2015). Polarising pluralism: The Swedish parliamentary election of September 2014. West European Politics, 38(3), 730-740.
- Aylott, N., & Bolin, N. (2019). A party system in flux: the Swedish parliamentary election of September 2018. West European Politics, 42(7), 1504-1515.
- Balch-Lindsay, D., & Enterline, A. J. (2000). Killing time: The world politics of civil war duration, 1820–1992. International Studies Quarterly, 44(4), 615-642.
- Bartolini, S., & Mair, P. (1990). Policy competition, spatial distance and electoral instability. West European Politics, 13(4), 1-16.
- Bechtel, M. M. (2009). The political sources of systematic investment risk: lessons from a consensus democracy. The Journal of Politics, 71(2), 661-677.
- Beck, N., & Jackman, S. (1998). Beyond linearity by default: Generalized additive models. American Journal of Political Science, 596-627.
- Bellucci, P., Lobo, M. C., & Lewis-Beck, M. S. (2012). Economic crisis and elections: The European periphery. Electoral Studies, 31(3), 469-471.
- Benaglia, T., Jackson, C. H., & Sharples, L. D. (2015). Survival extrapolation in the presence of cause specific hazards. Statistics in Medicine, 34(5), 796-811.
- Bender, R., Augustin, T., & Blettner, M. (2005). Generating survival times to simulate Cox proportional hazards models. Statistics in medicine, 24(11), 1713-1723.
- Bennett, D. S., & Stam III, A. C. (1996). The duration of interstate wars, 1816-1985. American Political Science Review, 239-257.

- Bennett, E., & Van Damme, E. (1991). Demand Commitment Bargaining:-The Case Of Apex Games. In Game equilibrium models III (pp. 118-140). Springer, Berlin, Heidelberg.
- Benoit, K., & Laver, M. (2006). Party policy in modern democracies. Routledge.
- Berg-Schlosser, D., & Mitchell, J. (Eds.). (2002). Authoritarianism and democracy in Europe, 1919-39: comparative analyses. Springer.
- Bergman, T., Ersson, S., & Hellström, J. (2015). Government formation and breakdown in Western and Central Eastern Europe. *Comparative European Politics*, *13*(3), 345-375.
- Bergmann, H., Bäck, H., & Saalfeld, T. (2021). Party-system polarisation, legislative institutions and cabinet survival in 28 parliamentary democracies, 1945–2019. West European Politics, 1-19.
- Bernhard, W., & Leblang, D. (2002). Democratic processes, political risk, and foreign exchange markets. American Journal of Political Science, 316-333.
- Bernhard, W., & Leblang, D. (2006). Democratic processes and financial markets: Pricing politics. Cambridge University Press.
- Bértoa, F. C. (2014). Party systems and cleavage structures revisited: A sociological explanation of party system institutionalization in East Central Europe. Party Politics, 20(1), 16-36.
- Best, R. E. (2011). The declining electoral relevance of traditional cleavage groups. European Political Science Review: EPSR, 3(2), 279.
- Binder, S. A., & Maltzman, F. (2002). Senatorial delay in confirming federal judges, 1947-1998. American Journal of Political Science, 190-199.
- Birch, S (2003) *Electoral Systems and Political Transformation in Post-Communist Europe.* Basingstoke: Palgrave Macmillan.
- Blockmans, T., Geys, B., Heyndels, B., & Mahieu, B. (2016). Bargaining complexity and the duration of government formation: evidence from Flemish municipalities. Public Choice, 167(1), 131-143.
- Boehmke, F. J. (2006). The influence of unobserved factors on position timing and content in the NAFTA vote. Political Analysis, 421-438.
- Bogdanor, V., & Butler, D. (Eds.). (1983). Democracy and elections: electoral systems and their political consequences. CUP Archive.
- Bornschier, S. (2010). *Cleavage politics and the populist right*. Temple University Press.

- Bornschier, S. (2010). The new cultural divide and the two-dimensional political space in Western Europe. West European Politics, 33(3), 419-444.
- Bosco, A., & Verney, S. (2016). From electoral epidemic to government epidemic: the next level of the crisis in Southern Europe. *South European Society and Politics*, *21*(4), 383-406.
- Box-Steffensmeier, J. M., & Jones, B. S. (1997). Time is of the essence: Event history models in political science. American Journal of Political Science, 1414-1461.
- Box-Steffensmeier, J. M., & Jones, B. S. (2004). Event history modeling: A guide for social scientists. Cambridge University Press.
- Box–Steffensmeier, J. M., & Zorn, C. (2002). Duration models for repeated events. Journal of Politics, 64(4), 1069-1094.
- Box-Steffensmeier, J. M., & Zorn, C. J. (2001). Duration models and proportional hazards in political science. American Journal of Political Science, 972-988.
- Box-Steffensmeier, J. M., Arnold, L. W., & Zorn, C. J. (1997). The strategic timing of position taking in Congress: A study of the North American Free Trade Agreement. American Political Science Review, 324-338.
- Box-Steffensmeier, J. M., Linn, S., & Smidt, C. D. (2014). Analyzing the robustness of semi-parametric duration models for the study of repeated events. Political Analysis, 183-204.
- Box-Steffensmeier, J. M. (1996). Challengers, Competition, and Reelection: Comparing Senate and House Elections.
- Braconnier, C. (2010). Une autre sociologie du vote: les électeurs dans leurs contextes: bilan critique et perspectives. Université de Cergy-Pontoise, Laboratoire d'études juridiques et politiques; Lextenso éd..
- Brooks, C., Nieuwbeerta, P., & Manza, J. (2006). Cleavage-based voting behavior in cross-national perspective: Evidence from six postwar democracies. Social Science Research, 35(1), 88-128.
- Broughton, D., & ten Napel, H. M. (Eds.). (2000). Religion and mass electoral behaviour in Europe (Vol. 19). Routledge.
- Brownlee, J. (2017). Why one-hot encode data in machine learning. Machine Learning Mastery.
- Castles, F. G., & Mair, P. (1984). Left–right political scales: Some ‘expert’ judgments. European Journal of Political Research, 12(1), 73-88.

- Chastang, C., Byar, D., & Piantadosi, S. (1988). A quantitative study of the bias in estimating the treatment effect caused by omitting a balanced covariate in survival models. Statistics in Medicine, 7(12), 1243-1255.
- Cheibub, J. A., Martin, S., & Rasch, B. E. (2015). Government selection and executive powers: Constitutional design in parliamentary democracies. West European Politics, 38(5), 969-996.
- Chiaramonte, A., & Emanuele, V. (2017). Party system volatility, regeneration and de-institutionalization in Western Europe (1945–2015). *Party Politics*, *23*(4), 376-388.
- Clark, T. G., Bradburn, M. J., Love, S. B., & Altman, D. G. (2003). Survival analysis part I: basic concepts and first analyses. British journal of cancer, 89(2), 232-238.
- Clark, T. N., & Lipset, S. M. (Eds.). (2001). The breakdown of class politics: A debate on post-industrial stratification. Woodrow Wilson Center Press.
- Clark, T. N., Lipset, S. M., & Rempel, M. (1993). The declining political significance of social class. International Sociology, 8(3), 293-316.
- Collett, D. (2003). Modelling survival data in medical research. CRC press.
- Conrad, C. R., & Golder, S. N. (2010). Measuring government duration and stability in Central Eastern European democracies. European Journal of Political Research, 49(1), 119-150.
- Cox, C., Chu, H., Schneider, M. F., & Munoz, A. (2007). Parametric survival analysis and taxonomy of hazard functions for the generalized gamma distribution. Statistics in medicine, 26(23), 4352-4374.
- Cox, D. R., & Oakes, D. (1984). Analysis of Survival Data.. Monographs of Statistics and Applied Probability. Chapman & Hall/CRC.
- Cox, D. R. (1972). Regression models and life-tables. Journal of the Royal Statistical Society: Series B (Methodological), 34(2), 187-202.
- Cronert, A. (2020). Democracy, state capacity, and COVID-19 related school closures.
- Crosson, J. M., & Tsebelis, G. (2021). Multiple vote electoral systems: a remedy for political polarization. Journal of European Public Policy, 1-21.
- Crouch, C. (2008). Change in European Societies since the 1970s. West European Politics, 31(1-2), 14-39.
- Cunningham, D. E. (2011). Barriers to peace in civil war. Cambridge University Press.
- Dalton, R. J. (1984). Cognitive mobilization and partisan dealignment in advanced industrial democracies. The Journal of Politics, 46(1), 264-284.

- Dalton, R. J. (2008). The quantity and the quality of party systems: Party system polarization, its measurement, and its consequences. Comparative Political Studies, 41(7), 899-920.
- Darmofal, D. (2009). Bayesian spatial survival models for political event processes. American Journal of Political Science, 53(1), 241-257.
- Dassonneville, R., & Hooghe, M. (2017). Economic indicators and electoral volatility: economic effects on electoral volatility in Western Europe, 1950–2013. Comparative European Politics, 15(6), 919-943.
- Dassonneville, R. (2015). Net Volatility in Western Europe: 1950–2014. *Dataset. Leuven: Centre for Citizenship and Democracy*.
- De Graaf, N. D., Heath, A., & Need, A. (2001). Declining cleavages and political choices: the interplay of social and political factors in the Netherlands. Electoral Studies, 20(1), 1-15.
- de Groot Ruiz, A., Ramer, R., & Schram, A. (2016). Formal versus informal legislative bargaining. Games and economic behavior, 96, 1-17.
- Desmarais, B. A., & Harden, J. J. (2012). Comparing partial likelihood and robust estimation methods for the Cox regression model. Political Analysis, 113-135.
- De Winter, L., & Dumont, P. (2008). Bargaining complexity, formation duration, and bargaining rounds. Cabinet Governance: Bargaining and the Cycle of Democratic Politics. Oxford: Oxford University Press (forthcoming).
- Diermeier, D., & Van Roozendaal, P. (1998). The duration of cabinet formation processes in western multi-party democracies. British Journal of Political Science, 609-626.
- Dogan, M. (2004). From social class and religious identity to status incongruence in post-industrial societies. Comparative Sociology, 3(2), 163-197.
- Döring, H., & Manow, P. (2020). Parliament and government composition database (ParlGov). An infrastructure for empirical information on parties, elections and governments in modern democracies. Version, 12(10).
- Drummond, A. J. (2006). Electoral volatility and party decline in Western democracies: 1970–1995. Political Studies, 54(3), 628-647.
- Ecker, A., & Meyer, T. M. (2015). The duration of government formation processes in Europe. *Research & Politics*, *2*(4), 2053168015622796.
- Efron, B. (1977). The efficiency of Cox's likelihood function for censored data. Journal of the American statistical Association, 72(359), 557-565.

- Einy, E. (1985). On connected coalitions in dominated simple games. International Journal of Game Theory, 14(2), 103-125.
- Elff, M. (2007). Social structure and electoral behavior in comparative perspective: The decline of social cleavages in Western Europe revisited. Perspectives on Politics, 277-294.
- Emanuele, V., & Chiaramonte, A. (2018). A growing impact of new parties: Myth or reality? Party system innovation in Western Europe after 1945. *Party Politics*, *24*(5), 475-487.
- Esteban, J.-M. & Ray, D. (1994). On the measurement of polarization. Econometrica 62(4): 819–851.
- European Political Strategy Centre (European Commission). (2019). *10 trends shaping democracy in a volatile world*. https://doi.org/10.2872/2142
- Evans, G. (1993). Class, prospects and the life-cycle: explaining the association between class position and political preferences. Acta Sociologica, 36(3), 263-276.
- Evans, G. (Ed.). (1999). The end of class politics?: class voting in comparative context. Oxford University Press.
- Field, B. N. (2016a). *Why Minority Governments Work: Multilevel Territorial Politics in Spain*. Springer.
- Field, B. N. (2016b). How the next Spanish government might be formed after Spain's election. LSE European Politics and Policy (EUROPP) Blog.
- Finch, T. (2009). Incremental calculation of weighted mean and variance. University of Cambridge, 4(11-5), 41-42.
- Fortna, V. P. (2004). Does peacekeeping keep peace? International intervention and the duration of peace after civil war. International studies quarterly, 48(2), 269-292.
- Fortna, V. P. (2008). Does peacekeeping work?: shaping belligerents' choices after civil war. Princeton University Press.
- Franklin, M. N. (1992). The decline of cleavage politics. Electoral change: Responses to evolving social and attitudinal structures in Western countries, 383-405.
- Gamson, W. A. (1961). A theory of coalition formation. American sociological review, 373-382.
- Gates, Scott, Håvard Hegre, Mark P. Jones, and Håvard Strand. "Institutional inconsistency and political instability: Polity duration, 1800–2000." American Journal of Political Science 50, no. 4 (2006): 893-908.

- Gerschenkron, A. (1962). Economic Backwardness in Historical Perspective (1962). The Political Economy Reader: Markets as Institutions, 211-228.
- Golder, S. N. (2010). Bargaining delays in the government formation process. Comparative Political Studies, 43(1), 3-32.
- Golosov, G. V. (2017). Party systems, electoral systems, and legislative fragmentation: A cross-national empirical study. *Party politics*, *23*(5), 487-497.
- Green-Pedersen, C. (2007). The growing importance of issue competition: The changing nature of party competition in Western Europe. Political studies, 55(3), 607-628.
- Groennings, S. (1970). Notes toward theories of coalition behavior in multiparty systems: Formation and maintenance. The study of coalition behavior: Theoretical perspectives and cases from four continents, 445-65.
- Grofman, B., & Van Roozendaal, P. (1994). Toward a theoretical explanation of premature cabinet termination: With application to post‐war cabinets in the Netherlands. European Journal of Political Research, 26(2), 155-170.
- Hanmer, M. J., & Ozan Kalkan, K. (2013). Behind the curve: Clarifying the best approach to calculating predicted probabilities and marginal effects from limited dependent variable models. American Journal of Political Science, 57(1), 263-277.
- Harden, J. J., & Kropko, J. (2019). Simulating duration data for the Cox model. Political Science Research and Methods, 7(4), 921-928.
- Hays, J. C., & Kachi, A. (2009). Interdependent duration models in political science. In APSA 2009 Toronto Meeting Paper.
- Hays, J. C., & Kachi, A. (2009). Interdependent duration models in political science. In APSA 2009 Toronto Meeting Paper.
- Hernán, M. A. (2010). The hazards of hazard ratios. Epidemiology (Cambridge, Mass.), 21(1), 13.
- Hernández, E., & Kriesi, H. (2016). The electoral consequences of the financial and economic crisis in Europe. *European Journal of Political Research*, *55*(2), 203-224.
- Hertz-Picciotto, I., & Rockhill, B. (1997). Validity and efficiency of approximation methods for tied survival times in Cox regression. Biometrics, 1151-1156.
- Hix, S. (2004). A global ranking of political science departments. Political studies review, 2(3), 293-313.
- Hobolt, S. B., & Tilley, J. (2016). Fleeing the centre: the rise of challenger parties in the aftermath of the euro crisis. West European Politics, 39(5), 971-991.

- Hobolt, S. B. (2018). Brexit and the 2017 UK general election. Journal of Common Market Studies, 56(S1), 39-50.
- Hooghe, L., Marks, G., & Wilson, C. J. (2002). Does left/right structure party positions on European integration?. Comparative political studies, 35(8), 965-989.
- Hornung, J., Rüsenberg, R., Eckert, F., & Bandelow, N. C. (2020). New Insights into Coalition Negotiations—The Case of German Government Formation. Negotiation Journal, 36(3), 331-352.
- Huber, J., & Inglehart, R. (1995). Expert interpretations of party space and party locations in 42 societies. Party politics, 1(1), 73-111.
- Indridason, I. H. (2011). Coalition formation and polarisation. European Journal of Political Research, 50(5), 689-718.
- Inglehart, R. (1971). The silent revolution in Europe: Intergenerational change in post-industrial societies. The American political science review, 991-1017.
- Inglehart, R. (1990). Culture Shift in Advanced Industrial Society. Princeton University Press.
- Jennings, W., & Stoker, G. (2017). Tilting towards the cosmopolitan axis? Political change in England and the 2017 general election. *The Political Quarterly*, 88(3), 359-369.
- Kalbfleisch, J. D., & Prentice, R. L. (2002). Relative risk (Cox) regression models. The Statistical Analysis of Failure Time Data. Hoboken, NJ: John Wiley & Sons, Inc, 95-147.
- Kam, C., Indridason, I., & Bianco, W. (2017). Polarization in multiparty systems.
- Katzenstein, P. J. (1985). Small States in World Markets: Industrial Policy in Europe. In Small States in World Markets. Cornell University Press.
- Keele, L. (2010). Proportionally difficult: testing for nonproportional hazards in Cox models. Political Analysis, 189-205.
- Kestel, L., & Godmer, L. (2003). Institutional inclusion and exclusion of extreme right parties. Western democracies and the new extreme right challenge, 133, 49.
- King, G., Alt, J. E., Burns, N. E., & Laver, M. (1990). A unified model of cabinet dissolution in parliamentary democracies. American Journal of Political Science, 846-871.
- Kirchgässner, G., Wolters, J., & Hassler, U. (2012). Introduction to modern time series analysis. Springer Science & Business Media.

- Kitschelt, H., & McGann, A. J. (1997). The radical right in Western Europe: A comparative analysis. University of Michigan Press.
- Knutsen, O. (2007). The decline of social class?. In The Oxford handbook of political behavior.
- Kriesi, H., Grande, E., Lachat, R., Dolezal, M., Bornschier, S., & Frey, T. (2006). Globalization and the transformation of the national political space: Six European countries compared. *European Journal of Political Research*, 45(6), 921-956.
- Kriesi, H. (2006). The mobilization of the political potentials linked to European integration by national political parties. *Euroscepticism, Amsterdam.*
- Kriesi, H. (2014). The populist challenge. *West European Politics*, 37(2), 361-378.
- Kropko, J., & Harden, J. J. (2017). Beyond the hazard ratio: Generating expected durations from the cox proportional hazards model. British Journal of Political Science, 50(1), 303-320.
- Kropko, J., & Harden, J. J. (2020). coxed: Duration-Based Quantities of Interest for the Cox Proportional Hazards Model. R package version 0.3. 2. https://CRAN. R-project. org/package= coxed.
- Krustev, V. L. (2006). Interdependence and the duration of militarized conflict. Journal of Peace Research, 43(3), 243-260.
- 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., & Benoit, K. (2015). The basic arithmetic of legislative decisions. American Journal of Political Science, 59(2), 275-291.
- Laver, M., & Schofield, N. (1990). Multiparty Government: the Politics of Coalition in Europe.
- Leblang, D., & Mukherjee, B. (2005). Government partisanship, elections, and the stock market: Examining American and British stock returns, 1930–2000. American Journal of Political Science, 49(4), 780-802.
- Lenine, E. (2019). Explaining coalitions: A taxonomy of formal models of Government formation and breakdown. Revista Española de Ciencia Política, 49(49), 43-62.
- Licht, A. A. (2017). Hazards or hassles the effect of sanctions on leader survival. Political Science Research and Methods, 5(1), 143-161.
- Lijphart, A. (1984). Democracies: Patterns of majoritarian & consensus government in twenty-one countries. Yale University Press.

- Lijphart, A. (1994). Electoral Systems and Party Systems. Oxford: Oxford University Press.
- Lijphart, A. (1999). Patterns of Democracy: Government Forms and Performance in Thirty-six Countries. Yale University Press.
- Lipset, S. M., & Rokkan, S. (1967). Cleavage structures, party systems, and voter alignments: an introduction. Free Press.
- Lupia, A., & Aldrich, J. H. (2015). How political science can better communicate its value: 12 recommendations from the APSA Task Force. PS: Political Science & Politics, 48(S1), 1-19.
- Mainwaring, S, Scully, TR (1995) *Building Democratic Institutions: Party Systems in Latin America.* Stanford: Stanford University Press.
- Mainwaring, S., & Zoco, E. (2007). Political sequences and the stabilization of interparty competition: electoral volatility in old and new democracies. Party politics, 13(2), 155-178.
- Mair, P. (1996). Comparative politics: an overview. *A new handbook of political science*, 309-335.
- Maltzman, F., & Shipan, C. R. (2008). Change, Continuity, and the Evolution of the Law. American Journal of Political Science, 52(2), 252-267.
- Marks, G., & Wilson, C. J. (2000). The past in the present: A cleavage theory of party response to European integration. *British Journal of Political Science*, 30(3), 433-459.
- Markwica, R. (2020). Wie relevant ist die Politikwissenschaft? Wissenstransfer und gesellschaftliche Wirkung von Forschung und Lehre. Bericht über eine Thementagung der Deutschen Vereinigung für Politikwissenschaft (DVPW), 12.–14. Dezember 2019, Goethe-Universität Frankfurt am Main. Zeitschrift für Außen-und Sicherheitspolitik, 13(3), 287-307.
- Martin, L. W., & Vanberg, G. (2003). Wasting time? The impact of ideology and size on delay in coalition formation. British Journal of Political Science, 33(2), 323-332.
- Mattes, M., & Savun, B. (2010). Information, agreement design, and the durability of civil war settlements. American Journal of Political Science, 54(2), 511-524.
- Meernik, J., & Brown, C. (2007). The short path and the long road: Explaining the duration of US military operations. Journal of peace research, 44(1), 65-80.
- Meguid, B. M. (2005). Competition between unequals: The role of mainstream party strategy in niche party success. *American Political Science Review*, 99(3), 347-359.

- Meidinger, E. E. (1980). Applied time series analysis for the social sciences. Sage Publications.
- Miller Jr, R. G. (2011). Survival analysis (Vol. 66). John Wiley & Sons.
- Morini, M., & Cilento, M. (2020). New Parties, Fractionalization, and the Increasing Duration of Government Formation Processes in the EU Member States. Politics & Policy.
- Morlino, L. (2018). Comparison: A Methodological Introduction for the Social Sciences. Verlag Barbara Budrich.
- Mudde, C. (2004). The populist zeitgeist. *Government and opposition*, 39(4), 541-563.
- Mudde, C. (2007). Populist Radical Right Parties in Europe. 10.1017/CBO9780511492037.
- Mudde, C. (2013). Three decades of populist radical right parties in Western Europe: So what?. *European Journal of Political Research*, 52(1), 1-19.
- Müller-Rommel, F. (2002). The lifespan and the political performance of Green parties in Western Europe. *Environmental Politics*, 11(1), 1-16.
- Murillo, M. V., & Schrank, A. (2005). With a little help from my friends: Partisan politics, transnational alliances, and labor rights in Latin America. Comparative Political Studies, 38(8), 971-999.
- Nieuwbeerta, P., & Ultee, W. (1999). Class voting in Western industrialized countries, 1945–1990: Systematizing and testing explanations. European Journal of Political Research, 35(1), 123-160.
- Nieuwbeerta, P. (1996). The democratic class struggle in postwar societies: Class voting in twenty countries, 1945-1990. Acta Sociologica, 39(4), 345-383.
- North, D. C. (1994). Institutions matter. Economic History, 9411004.
- Omgba, L. D. (2009). On the duration of political power in Africa: the role of oil rents. Comparative Political Studies, 42(3), 416-436.
- Peleg, B. (1981). Coalition formation in simple games with dominant players. International Journal of Game Theory, 10(1), 11-33.
- Pellikaan, H., de Lange, S. L., & van der Meer, T. W. (2016). The centre does not hold: Coalition politics and party system change in the Netherlands, 2002–12. Government and Opposition, 53(2), 231-255.
- Peters, B. G. (2014). Further thoughts on the relevance of political science–A response to Matthew Wood. Politics, 34(3), 287-290.

- Pierson, P. (2000). Not just what, but when: Timing and sequence in political processes. Studies in american political development, 14(1), 72-92.
- Poguntke, T., & Schmitt, J. (2018). The Crisis, Party System Change, and the Growth of Populism. *European University Institute (EUI) Via dei Roccettini 9, I-50014 San Domenico di Fiesole (FI) Italy First Published 2018 ISBN: 978-92-9084-715-1*, 1.
- Poguntke, T. (2002). Green parties in national governments: From protest to acquiescence?. *Environmental Politics*, 11(1), 133-145.
- Powell, EN, Tucker, JA (2014) Revisiting electoral volatility in post-communist countries: new data, new results and new approaches. *British Journal of Political Science,* 44(1): 123–147.
- Prinz, S. (2010). Verhältnis zu anderen Parteien und Organisationen. In Die programmatische Entwicklung der PDS (pp. 303-313). VS Verlag für Sozialwissenschaften.
- Prosser, C. (2018). The strange death of multi-party Britain: the UK general election of 2017. West European Politics, 41(5), 1226-1236.
- Rae, D. W. (1967). The political consequences of electoral laws. New Haven: Yale University Press.
- Ragin, Charles C. 2004. “Turning the Tables: How Case-Oriented Research Challenges Variable-Oriented Research.” In *Rethinking Social Inquiry: Diverse Tools, Shared Standards*, ed. Henry E. Brady and David Collier. New York: Rowman & Littlefield. 123–138.
- Richardson, D., & Rootes, C. (Eds.). (2006). *The Green challenge: the development of Green parties in Europe*. Routledge.
- Riker, W. H. (1962). The theory of political coalitions (Vol. 173). Yale University Press.
- Rose, R., & Mackenzie, W. J. M. (1991). Comparing forms of comparative analysis. *Political Studies*, *39*(3), 446-462.
- Royston, P., & Parmar, M. K. (2002). Flexible parametric proportional‐hazards and proportional‐odds models for censored survival data, with application to prognostic modelling and estimation of treatment effects. Statistics in medicine, 21(15), 2175-2197.
- Ryan Bakker, Liesbet Hooghe, Seth Jolly, Gary Marks, Jonathan Polk, Jan Rovny, Marco Steen- bergen, and Milada Vachudova. (2020). “2019 Chapel Hill Expert Survey.” Version 2019.3. Available on chesdata.eu. Chapel Hill, NC: University of North Carolina, Chapel Hill

- Saalfeld, T. (2008). Institutions, chance and choices: The dynamics of cabinet survival in the parliamentary democracies of Western Europe (1945-99).
- Sartori, G. (1976). Parties and Party Systems: Volume 1: A Framework for Analysis (Vol. 1). CUP Archive.
- Sartori, G. (1997). Comparative constitutional engineering: an inquiry into structures, incentives, and outcomes. NYU Press.
- Savage, L. (2018). How and when do presidents influence the duration of coalition bargaining in semi‐presidential systems?. European Journal of Political Research, 57(2), 308-332.
- Schedler, A. (1996). Anti-political-establishment parties. Party politics, 2(3), 291-312.
- Schleiter, P., & Morgan‐Jones, E. (2009). Party government in Europe? Parliamentary and semi‐presidential democracies compared. European journal of political research, 48(5), 665-693.
- Schleiter, P. (2010). Non-partisan ministers in cabinets: who gets in and what do they stand for? An approach and an application to Russia. In Artículo presentado en el Congreso IPSA.
- Schmitt, J. (2016). How to measure ideological polarization in party systems. In ECPR Graduate Student Conference.
- Schofield, N., & Sened, I. (2006). Multiparty democracy: elections and legislative politics. Cambridge University Press.
- Schofield, N. (1993). Political competition and multiparty coalition governments. European Journal of Political Research, 23(1), 1-33.
- Schofield, N. (2008), The Spatial Model of Politics (London: Routledge).
- Shipan, C. R., & Shannon, M. L. (2003). Delaying justice (s): A duration analysis of Supreme Court confirmations. American Journal of Political Science, 47(4), 654-668.
- Siaroff, A. (2019). Comparative European party systems: An analysis of parliamentary elections since 1945. Routledge.
- Sikk, A (2005) How unstable? Volatility and the genuinely new parties in Eastern Europe. *European Journal of Political Research,* 44: 391–412.
- Singer, J. D., & Willett, J. B. (1993). It's about time: Using discrete-time survival analysis to study duration and the timing of events. Journal of educational statistics, 18(2), 155-195.
- Skocpol, T., & Theda, S. (1979). States and social revolutions: A comparative analysis of France, Russia and China. Cambridge University Press.

- Smith, J. M. (2009). Challenging the status quo: The rise and consequences of anti-establishment parties in western Europe. Texas A&M University.
- Steiner, N. D., & Martin, C. W. (2012). Economic integration, party polarisation and electoral turnout. *West European Politics*, *35*(2), 238-265.
- Stiansen, Ø. (2021). Directing Compliance? Remedial Approach and Compliance with European Court of Human Rights Judgments. British Journal of Political Science, 51(2), 899-907.
- Strohmeier, G. (2009). Große Koalitionen in Deutschland und Österreich. *ZPol Zeitschrift für Politikwissenschaft*, *19*(1), 5-37.
- Strøm, K., & Müller, W. C. (1999). The keys to togetherness: Coalition agreements in parliamentary democracies. The Journal of Legislative Studies, 5(3-4), 255-282.
- Strøm, K., Budge, I., & Laver, M. J. (1994). Constraints on cabinet formation in parliamentary democracies. American journal of political science, 303-335.
- Strøm, K. (1984). Minority governments in parliamentary democracies: The rationality of non-winning cabinet solutions. Comparative Political Studies, 17(2), 199-227.
- Strøm, K. (1986). Deferred gratification and minority governments in Scandinavia. Legislative Studies Quarterly, 583-605.
- Strøm, K. (1990). Minority government and majority rule. Cambridge University Press.
- Strøm, K. (1996). Government Survival in Parliamentary Democracies. The American Political Science Review, 90(3), 689.
- Svolik, M. (2008). Authoritarian reversals and democratic consolidation. American Political Science Review, 153-168.
- Taggart, P., & Szczerbiak, A. (2004). Contemporary Euroscepticism in the party systems of the European Union candidate states of Central and Eastern Europe. European Journal of Political Research, 43(1), 1-27.
- Taggart, P. (1998). A touchstone of dissent: Euroscepticism in contemporary Western European party systems. *European Journal of Political Research*, 33(3), 363-388.
- Thomas Bräuninger, Marc Debus, Jochen Müller & Christian Stecker (2019) Party Competition and Government Formation in Germany: Business as Usual or New Patterns?, *German Politics*, 28:1, 80-100, DOI: 10.1080/09644008.2018.1538362
- Tsebelis, G., & Ha, E. (2014). Coalition theory: a veto players' approach. *European Political Science Review*, *6*(3), 331-357.

- Uno, H., Claggett, B., Tian, L., Inoue, E., Gallo, P., Miyata, T., ... & Wei, L. J. (2014). Moving beyond the hazard ratio in quantifying the between-group difference in survival analysis. Journal of clinical Oncology, 32(22), 2380.
- van Deemen, A. M. (1989). Dominant players and minimum size coalitions. European Journal of Political Research, 17(3), 313-332.
- Van der Brug, W., & Van Spanje, J. (2004, April). Consequences of the strategy of a 'Cordon Sanitaire' Against anti-immigrant parties. In ECPR joint sessions of workshops, workshop (Vol. 17).
- Van de Wardt, M., De Vries, C. E., & Hobolt, S. B. (2014). Exploiting the cracks: Wedge issues in multiparty competition. *The Journal of Politics*, *76*(4), 986-999.
- Volden, C., & Carrubba, C. J. (2004). The formation of oversized coalitions in parliamentary democracies. American Journal of Political Science, 48(3), 521-537.
- Warwick, P. (1994). Government survival in parliamentary democracies. Cambridge University Press.
- Wei, W. W. (2006). Time series analysis. In The Oxford Handbook of Quantitative Methods in Psychology: Vol. 2.
- Werner, S., & Yuen, A. (2005). Making and keeping peace. International Organization, 261-292.
- Wood, M. (2014). Building bridges: What do policymakers really want from academics? A reply. Politics, 34(3), 306-308.
- Wood, M. (2014a). Bridging the relevance gap in political science. Politics, 34(3), 275-286.
- Zivot, E., & Wang, J. (2003). Rolling analysis of time series. In Modeling Financial Time Series with S-Plus® (pp. 299-346). Springer, New York, NY.