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The Dynamics of Cooperation and
Competition in Coalition Governance

Thomas König, Xiao Lu,
and Thiago N. Silva

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Learning to Govern Together in Representative Democracy

*The Dynamics of Cooperation and
Competition in Coalition Governance*

THOMAS KÖNIG
XIAO LU
THIAGO N. SILVA



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Introduction

This book introduces a novel perspective, a new paradigm on coalition governance, which acknowledges the *pro tempore* nature of policy-making in representative democracies. In these democracies, voters periodically hold incumbent parties accountable by rewarding or sanctioning their policy-making performance in elections. After elections, the parties typically form coalitions in parliamentary democracies by agreeing on a common policy agenda and allocating ministerial portfolios, in which the office-holders are responsible for the implementation of the common policy agenda in joint policy-making. We distinguish between a coalition dilemma of policy- and office-seeking coalition parties on the spatial dimension and an agenda timing dilemma of vote-seeking coalition parties on the temporal dimension of joint policy-making. From the formation of the coalition to the end of its term, coalition parties pursue divergent policy positions, and have incentives to either cooperate or compete in joint policy-making under a shadow of the future, which is temporarily constrained and may alter these incentives over the term. This periodicity of cooperation and competition has important implications for the analysis of joint policy-making in coalition governance. It calls for a new theoretical foundation that considers the learning process experienced by those governing together over time and a methodological approach tailored to the cyclical nature of the data. This book offers a dynamic theoretical perspective on the process by which coalition parties learn the type of their partners—cooperative or competitive—during joint policy-making over time. To cope with the periodic nature of the data generation process that has received scant attention in the literature on coalition governance, we will also develop and introduce a circular regression analysis applied to coalition politics, complemented by a series of visual analytical tools and practical guidance for drawing inferences.

In [Chapter 1](#), we introduce our dynamic perspective on coalition governance by distinguishing between two learning models of vote-seeking coalition parties, a portfolio- and a partisan-learning model. We recognize that coalition governance is subject to both spatial and temporal constraints in representative democracy. In addition to the predominant spatial dimension in analyses of joint policy-making, which emphasizes the coalition dilemma of policy- and office-seeking coalition parties, we also consider the temporal

dimension of joint policy-making. We examine whether and how ministerial office-holders, who are responsible for the implementation of the common policy agenda in their portfolio and have expertise and power to initiate government bills, learn about the cooperative or competitive type of partnership over time. Although coalition parties may have signed a coalition agreement on a common policy agenda and given approval in cabinet for its implementation, the ministerial office-holders are ultimately responsible for drafting bill proposals, which need parliamentary approval for their enactment. We hypothesize that ministerial office-holders, after initiating their bill proposal, infer and update their beliefs about the type of partnership from their experienced interactions in joint policy-making and adapt their further decisions on the timing of government bills initiation. While delayed initiation of government bills can reduce reputation costs of ministerial office-holders due to parliamentary scrutiny, it also creates an agenda timing dilemma by risking implementation failure of the common policy agenda. Our dynamic perspective considers the cyclical nature of joint policy-making in representative democracy, which sets temporal limits for vote-seeking coalition parties in the implementation of a common policy agenda. Within these temporal limits, the learning of the type of partnership is decisive for the timing of the common policy agenda through early or late initiation of government bills, which determines coalition effectiveness, coalition stability, and satisfaction with coalition governance.

Chapter 2 presents our theoretical foundation on learning the type of partnership and agenda timing by early or late bill initiation. Our two-stage game-theoretical setup focuses on ministerial office-holders, who are responsible for the implementation of the common policy agenda in their portfolio. At the beginning of coalition governance, which we consider as the first stage of joint governance, they have only a prior belief about the type of partner they will encounter in joint policy-making. From their experienced interactions after bill initiation, they can update their beliefs about the type of partnership—either cooperative or competitive—and adapt their bill initiation timing behaviour, which we consider as the mid stage of joint governance. We emphasize the vote-seeking incentives of coalition parties and examine the conditions under which vote-seeking ministerial office-holders deviate from previously agreed compromise on a common policy agenda. Additionally, we explore how they learn about the type of partnership from experienced parliamentary scrutiny of their bills, which is costly for the responsible office-holder. We assume that scrutiny corresponds to committee hearings, invitations of experts, delay of voting, and other legislative mechanisms, which call into question the ability and competence of the ministerial office-holder. To

understand the dynamics of coalition governance, we differentiate between distinct periods in a term: the initial period, characterized by uncertainty and prior belief about the type of partnership; the mid-term period, marked by coalition squabbles as parties navigate cooperative and competitive dynamics in their vote-seeking strategies; and the final period, where competition intensifies as the term nears its end, diminishing the influence of long-term joint policy-making due to the looming elections. Our game-theoretical foundation allows us to derive testable hypotheses about experienced scrutiny, coalition divergence, ministerial power, and the changes in agenda timing over time.

In [Chapter 3](#), we present our estimation method for the analysis of periodic data on the timing of bill initiation in representative democracy. Since representative democracy establishes not only spatial but also temporal constraints on coalition governance, the timing for the implementation of the common policy agenda is essential for vote-seeking coalition parties in joint policy-making. Following our learning theory, we expect that ministerial office-holders update their prior beliefs about the type of partnership from experienced scrutiny in joint policy-making, which in turn influences their decisions on the timing of further bill initiation. This dynamic perspective, in which the policy payoffs of vote-seeking coalition parties change over time through experienced scrutiny, necessitates transforming the timing data to capture the cyclical nature of policy-making within the periods of a term. Within a term, we distinguish between an initial period of uncertainty with a prior belief about the type of partnership, followed by a mid-term period of belief updating from experienced scrutiny which may lead to coalition squabbles, and a final period when upcoming Election Day finally censors joint policy-making. Empirically, because the cooperative and competitive incentives for vote-seeking coalition parties may change within these periods, our periodic data differ from data measured on a linear scale. More specifically, periodic data do not have distinct minimum or maximum time points but contain directional observations that lie on the circumference of a unit circle like a clock. For the analysis, we provide visual depictions of circular regression and visual analytics of circular estimations, which we use to explore our data before testing our hypotheses.

[Chapter 4](#) begins with the exploration of the organization of the common policy agenda before examining the explanatory power of our learning hypotheses. According to our learning theory, the organization of the common policy agenda is determined by the early or late timing of bill initiation. Although cooperative partnership fosters early timing, which promises the implementation of the common policy agenda, the competitive incentives

come from coalition parties' separate electoral benefits, which delay bill initiation and may threaten the implementation of the common policy agenda. To examine our hypotheses on learning the type of partnership, our first task is to clarify whether ministerial office-holders learn from experiences within a single term or across multiple terms. While our initial example from Germany suggests that coalition parties consider their experiences from the previous term, we find that, overall, once ministers are in office, they primarily base their decisions on bill initiation timing on their experiences within the current term. Second, we test the explanatory power of our three hypotheses concerning learning from experienced scrutiny, its interaction with coalition policy divergence, and the powers of the ministerial office-holder. In most specifications, partisan learning has greater explanatory power, particularly when we consider the ministerial power to constrain parliamentary scrutiny. Third, upon closer inspection of the power dynamics in portfolio and partisan learning, we demonstrate that the timing of bill initiation varies across different periods of the term. Finally, we further explore the power relationships between coalition parties by examining the influence of committee chairmanship on the timing of bill initiation.

In the concluding [Chapter 5](#), we argue that the study of coalition governance cannot be fully understood without considering the interplay between spatial and temporal factors. The spatial factors concern the coalition dilemma among policy- and office-seeking coalition parties with divergent policy positions, which motivate ministerial office-holders to drift from previously agreed compromise and the partner to challenge such drift in parliament. The temporal factors establish an agenda timing dilemma among vote-seeking coalition parties when their separate electoral incentives foster delayed initiation of government bills, which reduces reputation costs and coalition tensions but risks failure in the implementation of the common policy agenda. The timing of the implementation of the common policy agenda, shaped by the learning of the type of partnership in an institutional environment, fosters principal-agent problems and dynamics in coalition governance with a cyclical nature of joint policy-making. This cyclical nature, which divides a term into distinct periods of joint policy-making, is central to understanding coalition effectiveness, coalition stability, and satisfaction with coalition governance. By providing a dynamic perspective on joint policy-making, this book contributes to a deeper understanding of the mechanisms that drive coalition governance, offering insights that are essential for scholars and practitioners alike in navigating the challenges and complexities of coalition governance in representative democracies.

Dynamics of Coalition Governance

1.1 Learning from Joint Policy-Making

On 24 November 2021, the German welfare state-focused (red) Social Democratic Party (SPD) formed a new coalition—so called ‘traffic light coalition’—with the business-oriented (yellow) Free Democratic Party (FDP) and the environment-focused (green) Alliance 90/the Greens. Under the chancellorship of Olaf Scholz (SPD), this traffic-light coalition brought together parties with contrasting policy positions for joint policy-making. Although the former coalition of the SPD with the Union of the Christian Democratic Party (CDU) and the Christian Social Union (CSU) had more aligned policy positions—implementing about 80% of the pledges from the coalition agreement in joint policy-making under Angela Merkel’s chancellorship—the SPD was disheartened by numerous policy-making controversies with its coalition partners from the Union.¹ In particular towards the end of the term of Angela Merkel’s fourth cabinet, the Union consistently challenged bills proposed by SPD-led ministers, especially those pertaining to important welfare state portfolios such as labour, social affairs, and finance.

Disappointed by these experiences and despite having the option of forming again a coalition with a comfortable joint seat share of 56% with the Union—which had lost nearly 9% of its previous vote share and fallen to second place behind the SPD in the 2021 election—the SPD chose to form the new traffic light coalition with the Liberals and the Greens, both holding together the relative majority of seats in the new cabinet. The new chancellor, the former SPD-finance minister Olaf Scholz, campaigned on the promise to preserve the legacy of Angela Merkel’s chancellorship,² but the parties of the traffic light coalition declared their commitment to establishing a new progressive common policy agenda for future joint governance.³

¹ See <https://www.ft.com/content/6d9e1814-8108-11e7-a4ce-15b2513cb3ff>, <https://www.reuters.com/article/uk-europe-migrants-germany-spd-idUKKBN1JE1QY>.

² See <https://www.nytimes.com/2021/09/09/world/europe/olaf-scholz-merkel-germany-election.html>.

³ See <https://www.reuters.com/world/europe/germanys-spd-greens-fdp-present-coalition-deal-wednesday-2021-11-24/>.

The German example deviates from the conventional wisdom of spatial theories on the formation of coalition government. These theories, which concentrate on the policy positions and seat shares of parties, predict that coalitions are formed with partners that share similar policy positions and their seat shares provide advantages in the allocation of ministerial portfolios, which endorse the office-holders with expertise and power to implement a common policy agenda in future joint policy-making (see e.g., [Baron and Ferejohn 1989](#); [Laver and Schofield 1990](#); [Laver and Shepsle 1990](#); [Schofield 1993](#); [Sened 1996](#); [Morelli 1999](#); [Bassi 2013](#); [De Marchi and Laver 2020](#)).

Compared to this focus on the spatial dimension, which emphasizes the policy- and office-seeking motives of coalition parties, the German scenario provides additional valuable insights by highlighting the temporal dimensions of joint policy-making in coalition governance. This temporal dimension is a basic feature of representative democracy, which restricts government activities to distinct terms defined by elections. In parliamentary democracies, where parties must often form coalitions due to proportional electoral rules and the multiparty nature of their party systems, these terms set limited time frames to execute a common policy agenda.⁴ This leads to several implications, which draw the attention to the vote-seeking motives of coalition parties:

- First, coalition parties that pursue divergent policy positions may agree on compromise and define a road map for the implementation of a common policy agenda in future joint policy-making when they form coalition government. While documenting coalition compromise in a formal agreement might be necessary for coalition formation (e.g., [Müller and Strøm 1999, 2008](#); [Moury 2013](#); [Indridason and Kristinsson 2013](#); [Klüver and Bäck 2019](#)), it is not sufficient to ensure satisfaction with coalition governance until the end of the term. Coalition parties task ministerial office-holders with implementing the common policy agenda within their portfolios ([Martin 2004](#)), but their parties may feel their vote-seeking interests endangered when the bill proposals of their office-holders are challenged by their partners through intense scrutiny in parliament, as such challenges call into question the competence and capability of the parties' office-holders.
- Second, after coalition parties formed government and delegated representatives to ministerial offices, they are confronted with the dilemma

⁴ In parliamentary democracies where the electoral system is based on plurality rules, single party government is rather the rule than an exception.

that they can only approve government bills jointly, but compete in elections separately. Under these conditions, vote-seeking ministerial office-holders can use their bureaucratic expertise (Epstein and O'Halloran 1994) and power to propose bills (Laver and Shepsle 1996) that respond to the distinct demands of their constituencies at the expense of previously agreed compromise (Martin 2004). However, the more their bill proposals drift from compromise, the more likely will their coalition partner challenge their proposals (Martin and Vanberg 2011). This may raise coalition tensions with respective electoral costs.

- Third, at the beginning of coalition governance, ministerial office-holders do not know how many bills they will propose and whether their bill proposals will be challenged by an uncooperative coalition partner or immediately approved by a cooperative coalition partner. Neither is the partner aware of the extent of ministerial drift nor can ministerial office-holders predict if and to what extent their initial bill proposals will be challenged. They may have a prior belief about the type of their partner, which they can update over time from their experienced interactions in either cooperative or uncooperative joint policy-making. This leads to coalition squabbles with ministerial drift and challenges of government bills in joint policy-making during the term.
- Fourth, after learning the type of partnership from experienced interactions in joint policy-making, ministerial office-holders can, with their expertise and power to initiate government bills, optimize their vote-seeking interests by early or late initiation of further bills (König et al. 2022). When ministerial office-holders infer a cooperative partnership from their experiences without challenges to their initial bills, this will foster early initiation of further bills to generate electoral benefits from position-taking responsiveness to the distinct demands of their constituencies. While early bill initiation will also facilitate the implementation of the common policy agenda, ministerial office-holders may delay further bill initiation after facing uncooperative behaviour from partners. This delay reduces coalition effectiveness in the implementation of the common policy agenda and may call coalition stability into question.
- Fifth, as the term approaches its end, the dynamics of joint policy-making, the type of partnership, and the importance of vote-seeking interests may shift once more due to the upcoming election, where parties compete separately (Lu 2025). Throughout the term, coalition parties may have experienced different incentives for cooperation and competition in joint policy-making, which influenced the timing of further bill

initiation for the implementation of the common policy agenda. If ministerial office-holders delay bill initiation, they do not only fail to generate electoral benefits from position-taking responsiveness but this may also risk failure in the implementation of the common policy agenda and reduce satisfaction with coalition governance (König et al. 2022).

- Sixth, coalition parties not only pursue different policy positions, delegate their representatives to ministerial offices, and compete in elections separately, but they may also coordinate their policy-making activities across portfolios (Bäck, Bergman, and Müller 2024; De Marchi and Laver 2020, 2023; Carrubba and Volden 2000). Instead of independently updating their beliefs about the type of partnership based solely on their experiences within their own portfolios, ministerial office-holders can also consider the experiences of their co-partisan office-holders to infer the cooperative or uncooperative type of partners they have within the coalition. Compared to a more autonomous *portfolio-learning* process (König et al. 2022), this suggests a *partisan-learning* process from co-partisan experiences, which underscores the key organizational role and vote-seeking interests of political parties in joint policy-making of parliamentary democracies.

These implications suggest the need for a more dynamic understanding of joint policy-making in coalition governance, which some scholars have called for in response to criticisms on the conventional static perspective in coalition studies (e.g., Laver 1974; Budge and Laver 1986; Laver 2008; Druckman 2008). Ideally, this dynamic perspective should establish a general theory that encompasses the different stages of a coalition's life cycle, including elections, (coalition) government formation, joint policy-making in (coalition) governance, and (coalition) government termination (Strøm, Müller, and Bergman 2008; Müller and Strøm 2008). For instance, Müller, Bäck, and Hellström (2023, p. 1) posit that a 'dynamic approach implies that what happens at the electoral stage influences the government formation stage, which in turn shapes what happens during the government's tenure, which may influence the cabinet's durability'. To introduce a more dynamic perspective on joint policy-making in coalition governance, in this book we use and expand the learning theory developed by König et al. (2022), which focuses, on the learning processes vote-seeking coalition parties undergo through both cooperative and competitive policy-making experiences with their partners within a term. This theory emphasizes the temporal dimension of joint policy-making, establishing the potential for learning the type of partnership over

time in order to optimize vote-seeking interests by the timing of the common policy agenda implementation.

1.1.1 Coalition Governance: Cooperative or Competitive Partnership?

To present a more dynamic perspective of joint policy-making within coalition governments—where shifts in the vote-seeking priorities of coalition parties over time are considered—one of the central questions is how these parties update their beliefs about their partnership's nature. For both theoretical and empirical exploration of this question, we differentiate between two models of learning processes: *portfolio-learning*, wherein ministerial office-holders gain insights independently based on their specific portfolio interactions, and *partisan-learning*, wherein ministers also absorb knowledge from the experiences of their co-partisan colleagues across various portfolios. Unlike the prevalent portfolio-learning perspective, which researchers often adopt when exclusively examining policy-making within isolated portfolios, our partisan-learning model underscores the critical organizational role that political parties play in joint policy-making within coalitions.

Both models apply a dynamic perspective to predict the timing of a common policy agenda implementation, based on experiences with challenges to government bills through scrutiny in parliament, from which ministerial office-holders infer the type of partnership. In addition to a dynamic perspective on the updating of beliefs about the type of partnership from experienced scrutiny, these models also consider the policy divergence of coalition parties and their power relationship, which we expect to affect the timing of the common policy agenda implementation. The less the policy positions of coalition parties diverge and the greater the power of the ministerial office-holder, the less likely are their governmental bills challenged and scrutinized in parliament. Theoretically, we use the learning theory of König et al. (2022) to derive propositions and hypotheses on their specific effects. The empirical challenge, however, lies in determining whether their learning process relies solely on their portfolio-learning experience, on a partisan-learning experience across portfolios, or both.

Aligned with recent research on joint policy-making, which highlights coalition policy divergence and the asymmetric distribution of power, we acknowledge the policy- and office-seeking interests of coalition parties, as well as the principal-agent challenges they encounter in joint decision-making. In the

spatial dimension of coalition governance, the joint policy-making process of these parties is inherently constrained by a coalition dilemma. While coalition parties must collectively approve bill proposals, they also need to strategically delegate representatives to powerful ministerial offices, keeping in mind their separate competition in future elections. Endorsed with expertise and proposal power, the office-holders can drift from previously agreed compromise and pursue their own policy positions at the expense of their partners, which will raise coalition tensions with respective electoral costs that can exceed the benefits from joint policy-making (Müller and Strøm 2008; Martin and Vanberg 2011). To limit ministerial drift, several empirical studies highlight, for example, the importance of junior ministers (Thies 2001; Lipsmeyer and Pierce 2011) and coalition agreements (e.g., Strøm and Müller 2000; Müller and Strøm 2008; Indridason and Kristinsson 2013; Timmermans 2017; Klüver and Bäck 2019) as an *ex ante* control mechanism, focusing on their content and impact (Bergman et al. 2023).

From our dynamic perspective on coalition governance, we view a coalition agreement on a common policy agenda as a road map of vote-seeking coalition parties for future joint policy-making, documenting an initial compromise on the common policy agenda before the start of a term. Yet, once in office, ministerial office-holders retain the expertise and power to propose bills for the implementation of the common policy agenda that may favour their own constituencies rather than adhere to the coalition agreement. Despite *ex ante* control and eventually necessary approval by cabinet, Martin and Vanberg (2011) argue that the discretion of ministerial office-holders to derive electoral benefits from position-taking responsiveness to the distinct demands of their constituencies depends on the policy-making environment, as coalition partners will scrutinize and amend bills only in an unconstrained environment. In a constrained environment, ministerial office-holders can not only deviate from coalition compromise and implement their party's policy position, but they also possess gatekeeping power to avoid the implementation of a bill that would benefit coalition partners (König and Luig 2014).

Instead of differentiating between constrained and unconstrained environments, which classifies representative democracy along the strength of their parliamentary institutions (Martin and Vanberg 2011), our dynamic perspective emphasizes the temporal dimension of joint policy-making. We posit that ministerial office-holders know neither the number of future bills nor the type of coalition partner they will encounter at the beginning of coalition governance—whether of a cooperative type that will immediately approve their bill proposals, or of a non-cooperative type that will subject their bill

proposals to intense parliamentary scrutiny. Over time, we expect that ministerial office-holders learn the type of their partnership from the experienced scrutiny of their initial bills and adjust their behaviour accordingly. With this experience, they still need to navigate a trade-off between agenda timing by early bill initiation, which may generate electoral benefits from position-taking responsiveness, and potential coalition tensions. This vote-seeking navigation may result in an agenda timing dilemma of coalition parties, i.e., when delayed initiation results in incomplete or failed implementation of the common policy agenda with respective electoral costs.

When office-holders face uncooperative partners who significantly increase the reputation costs by subjecting their bill proposals to intense scrutiny in parliament, potentially outweighing the benefits of gaining electoral points through responsive decision-making, the effectiveness of coalitions in joint policy-making diminishes due to delays in introducing government bills (König et al. 2022). This agenda delay, however, can project an image of inaction to voters, leading to electoral costs for coalition parties by the end of the term (Duch and Stevenson 2008; Fortunato 2021). When the vote-seeking incentives dominate in coalition governance, coalition parties will compete rather than cooperate in joint policy-making, which will delay agenda timing and the implementation of the common policy agenda risks to fail, which reduces coalition stability and satisfaction with coalition governance. By the end of the term, the time for joint policy-making is censored, which may again change the conditions of agenda timing in coalition governance.

With this temporal framework in mind, which introduces an agenda-timing dilemma (a temporal dimension) alongside the coalition dilemma (a spatial dimension), our book offers a dynamic understanding of joint policy-making by examining how ministerial office-holders in coalition governance adapt through learning processes, adjusting their vote-seeking interests, and updating their beliefs about the nature of their partnership over time. Moving beyond a static approach, it introduces a novel dynamic perspective built on the learning theory of König et al. (2022), emphasizing the importance of learning and understanding partnership types and the role of party organizations through experienced interactions. Following Druckman (2008, 479), our dynamic analysis examines agenda timing in coalition governance through ‘interactive processes’ (e.g., with feedback) over time. Therefore, compared to the existing literature which emphasizes either the dominance of the government vis-à-vis the parliament (e.g., Döring 1995; Laver and Shepsle 1996; Döring and Hallerberg 2004; Gallagher, Laver, and Mair 2011) or the spatial dimension of coalition governance with respect to their institutional

prerogatives with a fixed distribution of power and policy positions of coalition parties (e.g., [Powell and Vanberg 2000](#); [Carroll and Cox 2012](#); [Kim and Loewenberg 2005](#); [Martin and Vanberg 2011](#)), the study of these interactive processes provides a more nuanced understanding of the classical relationship between the government and the parliament in coalition governance.

The empirical analysis of our learning theory, which combines the spatial with the temporal dimension of coalition governance, examines the dynamics of beliefs of ministerial office-holders under changes induced by inferring the type of partnership from scrutiny experiences of their bills over time. Although institutional prerogatives allow the parties of the ministerial office-holders to generate electoral benefits from position-taking responsiveness, we posit that the realization of these benefits is not only constrained by the fixed policy positions of coalition partners and their (parliamentary) power, which can impose costs on ministerial office-holders through intense scrutiny of their bills ([König, Lin, and Silva 2023](#)). We argue that they are also influenced by the (uncertain) type of coalition partnership. Following [Martin and Vanberg \(2011, p. 5\)](#), this suggests that the importance of parliamentary institutions arises from the impact ‘on the relationships between, and the relative power of parties within the government.’ However, a central thrust of our argument is that these relationships are learned over time by the coalition parties within terms.

The approach presented in this book translates the temporal constraints of representative democracy—where government activities are limited by fixed terms—into a cyclical analysis of joint policy-making. The ‘*pro tempore*’ nature of government, a defining feature of representative democracy, imposes temporal limits on office-seeking and policy-seeking parties. However, there is a notable lack of comprehensive empirical insights into the cyclical dynamics of joint policy-making. This study empirically investigates the temporal dimension of this cycle, focusing on how fixed terms constrain the implementation of a shared policy agenda.

Coalition parties, operating under uncertainty about the nature of their partnership at the start of a term and anticipating the upcoming election towards its end, face unique challenges. To address these dynamics, we examine the explanatory power of our learning models by analyzing the timing of agenda-setting through bill initiation across the term.

For both learning models, we examine the mechanisms through which learning from experienced scrutiny occurs, focusing on their interaction with policy divergence among coalition parties and the power dynamics in joint policy-making. Unlike linear scale measurements, we argue that representative

democracy inherently generates periodicity in its data generation process, reflecting temporal patterns, seasonality, and cyclical points. In this context, our book not only contributes theoretically to the existing literature on coalition governance and joint policy-making but also introduces a novel empirical approach that explicitly accounts for its cyclical nature.

1.1.2 Towards a More Dynamic Perspective on Coalition Governance

The prolific literature on coalition politics distinguishes among the different stages of coalition governance: formation, joint policy-making, and termination (Müller and Ström 2008; Müller, Bäck, and Hellström 2023). Although these stages are interrelated, scholars often focus on a single stage at a specific point in time, overlooking the dynamics across stages and over time (Druckman 2008). For instance, when examining the joint policy-making stage, conventional studies derive hypotheses on coalition conflict from the distance of coalition parties' policy positions and their relative power by secured seat shares. These factors—policy positions and relative power—are kept fixed in the empirical analysis. Although the seat share is not expected to change between elections, it is a strong assumption to assert that the data generation process on joint policy-making does not change over time. Studies on government termination also often examine its correlation with the fixed divergence in coalition parties' policy positions from the beginning to the end of the term, once again assuming that the conditions of the data generation process remain constant.

We challenge this paradigmatic assumption by considering the dynamic nature of agenda timing in joint policy-making. This means that the activities of coalition parties can evolve due to various external and internal factors, including the period of a term and the interactions and experiences they accumulate during the joint policy-making processes of these periods. At the start of the term, coalition parties may prioritize showcasing their coalition agreement and securing key ministerial offices, resulting in strong signals about their policy positions to implement their electoral pledges. On average, however, representative democracies limit terms to four to five years. Throughout these terms, various events—whether internal or external—can arise at different stages, potentially influencing joint policy-making in coalition governance. Accordingly, we do not assume that coalition partners will always be cooperative or uncooperative in their policy-making interactions, nor that their policy

positions will remain constant over time, or that their vote-maximizing strategies will be uniform at the beginning and end of the term. Moreover, coalition parties do not know *ex ante* the number or type of bills —whether aligned with coalition compromises or deviating from them—that their partners will propose throughout the term. Our assumption is that coalition parties operate with incomplete and imperfect information in an uncertain environment at the start of the term and gradually acquire and learn about their environment as the term progresses.

Once they begin to implement the common policy agenda and joint policy-making progresses, coalition parties gain experience working together, renegotiating compromises, managing conflicts, and responding to emerging issues. This process often results in adjustments to the timing and prioritization of the common policy agenda as parties adapt to new information and the practical realities of coalition governance. Towards the end of the term, coalition partners may once again shift their focus, this time towards the upcoming election. They may adjust their policy priorities and messaging to differentiate themselves and appeal to their respective voter bases, even if it means loosening their adherence to coalition agreements. These shifts highlight the inherently dynamic nature of coalition governance, where policy-making is influenced by evolving intra-coalition dynamics, external pressures, and electoral considerations. By taking these temporal and contextual changes into account, we gain a more nuanced understanding of how joint policy-making in coalition governance operates. It allows for a deeper appreciation of how agenda-setting and implementation evolve over time, challenging the conventional assumption that the conditions underlying policy-making remain static throughout the term.

This does not imply that our dynamic perspective ignores the insights from the existing literature on joint policy-making in coalition governance. This literature, which suggests that ministerial office-holders have significant discretion within their portfolios (e.g., Müller and Strøm 2003; Lupia and Strøm 2008; Strøm, Müller, and Bergman 2008; Martin and Vanberg 2011, 2014; Fortunato 2021), offers a useful starting point for identifying the policy pay-offs for both ministerial office-holders and coalition partners involved in joint policy-making. Regardless of the specific areas of a portfolio—such as energy, environment, finance—or sectors like tax and welfare, industry, and markets, previous studies have identified a policy-making dilemma inherent to coalition governance: coalition parties can only implement the common policy agenda jointly while being held separately accountable for fulfilling electoral pledges on election day (e.g., Müller and Strøm 1999; Strøm and Müller 2000;

Strøm, Müller, and Bergman 2003; Martin and Vanberg 2005, 2011). This coalition dilemma—balancing the need for collective action in joint policy-making with individual electoral competition—is exacerbated by inherent principal-agent problems. Coalition parties pursue different policy positions (i.e., coalition policy divergence) and commit to a common policy agenda to govern together (i.e., coalition compromise) but must delegate representatives to powerful offices for implementing the common policy agenda in joint policy-making (i.e., the delegation of ministerial portfolios).

These three components—coalition policy divergence, coalition compromise, and delegation to ministerial offices—define the starting point for the analysis of joint policy-making in coalition governance. When ministerial office-holders have an informational advantage and the power to propose bills in their portfolio, they can initiate bills that favour their own party at the expense of the coalition compromise. Such ministerial drift through proposing non-cooperative bills is also the incentive for other coalition partners to challenge those bills, leading to parliamentary scrutiny and coalition tensions with respective electoral costs and undermining coalition effectiveness and satisfaction with coalition governance. Consequently, the likelihood of initiating non-cooperative bills, which promise benefits from position-taking responsiveness for the distinct demands of the constituencies of the parties' ministerial office-holders, increases with greater coalition policy divergence.

This principal-agent problem, which arises from the need to delegate representatives of coalition parties with divergent policy positions into powerful ministerial offices, has prompted significant scholarly interest in understanding how coalition partners can minimize ministerial drift and implement policies aligned with the coalition compromise (e.g., Thies 2001; Müller and Strøm 2008; Indridason and Kristinsson 2013; Bowler et al. 2016). The research agenda conducted by Martin and Vanberg (2005, 2011, 2014) highlights the essential role of strong parliamentary institutions for this principal-agent problem on the spatial dimension: strong parliamentary institutions allow coalition partners to scrutinize and challenge bills that deviate from coalition compromise previously agreed by coalition parties, ultimately realigning the common policy agenda to the coalition compromise.

When representative democracy coexists with strong parliamentary institutions, the theoretical expectation of this literature is that coalition parties can overcome their principal-agent problems. Compared to this focus on the spatial dimension of coalition governance, the temporal dimension—specifically, the timing to implement the common policy agenda and the learning from the interaction between coalition parties in joint policy-making—have only

sporadically received scholarly attention. The study by [Martin \(2004\)](#) reveals that bills addressing salient issues for coalition parties tend to be prioritized on the agenda, while those dealing with less appealing matters are often postponed. In accordance with the focus of the spatial dimension, the expectation is that coalition parties pursue an accommodative common policy agenda according to their divergent policy positions, and adjust the timing of bill initiation accordingly. Alternatively, [König et al. \(2022\)](#) demonstrated theoretically and empirically that ministerial office-holders can learn the type of their coalition partners (i.e., cooperative or non-cooperative) over time by considering the experienced scrutiny of their bills. In case of inferring a non-cooperative partnership, the authors find a higher likelihood of agenda delay within specific policy areas of the respective portfolios.

When joint policy-making is studied solely through the spatial dimension, it is often assumed that coalition parties are fully aware of their partnership type and that their cooperative and competitive incentives remain constant over time. However, this perspective risks overlooking the temporal dimension of coalition governance. We argue that these incentives can vary not only across different portfolios but also over time, necessitating a more dynamic analysis of joint policy-making and agenda timing to fully understand the role of coalition parties in this process. In this temporal framework, the incentives for coalition parties to cooperate or compete in joint policy-making may shift within the course of a term.

In addition to this dynamic perspective on joint policy-making, we investigate whether coalition parties perform an organizational role in coordinating co-partisan experiences with coalition partnership. In other words, in addition to allocating ministerial offices and implementing the common policy agenda in each portfolio for office- and policy-seeking purposes ([Bäck, Debus, and Dumont 2011](#)), we examine whether coalition parties coordinate both cooperative and competitive incentives in joint policy-making across portfolios from the experiences of their ministerial office-holders with coalition partnership over time. This organizational role of parties involves integrating experiences from different portfolios and developing a vote-maximizing strategy of agenda timing for election day. We examine how coalition parties develop and refine their learning experiences within and across the policy areas of their portfolios over time by integrating key features of coalition governance.

In our view, three key features are crucial for understanding dynamic coalition governance: policy-making effectiveness of coalition parties, coalition stability in the implementation of the common policy agenda, and satisfaction with coalition governance. In addition to a positive policy payoff, with benefits

outweighing the associated costs in joint policy-making (cost-benefit relationship), coalition parties are likely to be satisfied with coalition governance when the experiences derived from partnership allow for effective implementation of the common policy agenda within their portfolios, reducing electoral costs (timing of joint policy-making), and their coordination fosters more cooperative than competitive incentives across portfolios over time (coordination for effective timing).

From the outset of forming a coalition government, achieving these goals by approving a coalition agreement that defines a road map for the implementation of a common policy agenda is already challenging when coalition parties have divergent policy positions. This challenge is reinforced by the delegation to ministerial offices, which provides the office-holder with proposal power and bureaucratic expertise to initiate government bills that may deviate from the previously agreed coalition compromise. Once they submit their bill proposals, ministerial office-holders experience cooperative and competitive interactions in joint policy-making and infer the type of coalition partnership. As we argue and demonstrate in this book, these experiences reveal the temporal dimension of agenda timing in joint policy-making and compel ministerial office-holders to modify their implementation behaviour of the common policy agenda over time.

1.1.3 The Shadow of the Future and Agenda Timing

Two institutional provisions theoretically account for the coalition dilemma in parliamentary democracies. First, *proportional electoral rules* foster multi-party systems, necessitating the formation of coalitions to govern effectively. Second, the *temporal limitation of governance* in representative democracies means that coalition parties must compete separately in periodic elections. As a result, coalition parties face a dual challenge: they must cooperate in joint policymaking to implement a common policy agenda while simultaneously competing against each other on Election Day. This dynamic creates a classic prisoner's dilemma in coalition governance. Competitive electoral incentives drive coalition parties to defect from joint policymaking, even though cooperation is more likely to ensure the successful implementation of their shared agenda.

Due to principal-agent problems, this dilemma is reinforced by information (Epstein and O'Halloran 1994) and power asymmetries (Gallagher, Laver and Mair 2011) that ministerial office-holders can exploit to pursue the policy

positions of their own party at the expense of coalition partners. Already at the beginning of the term, they can generate benefits from position-taking responsiveness through initiating bill proposals that implement their own parties' electoral pledges. When coalition governance blurs responsibilities of coalition parties (e.g., [Angelova, König, and Proksch 2016](#); [Klüver and Spoon 2020](#); [Fisher and Hobolt 2010](#)), their constituents may discount this kind of responsiveness over time, and while the likelihood of ministerial drift increases with coalition policy divergence, this also increases the likelihood of parliamentary scrutiny of bill proposals from ministerial office-holders.

In such cases, the existing literature draws the attention to political institutions, which can play a crucial role in the promotion of cooperation among coalition parties ([Thies 2001](#); [Müller and Strøm 2008](#); [Martin and Vanberg 2011](#); [Bowler et al. 2016](#)). These institutions, whether defined as rules and procedures ([Shepsle 1979](#)), norms and cultures ([March and Olsen 1983](#)), or historical continuities of organizational patterns ([Pierson and Skocpol 2002](#)), are generally believed to promote cooperation among actors with divergent policy positions by guiding and constraining their options, activities, and decisions ([North 1990](#)). For [Müller and Strøm \(2003\)](#), it is impossible to understand the formation, performance, or termination of coalition governments without paying attention to their institutional environment, i.e., to the rules under which the coalition game is played. These institutions distribute information and power, but are also considered to facilitate repeated interaction between political parties by establishing a 'shadow of the future' that can lead to cooperation under uncertainty ([Axelrod 1984](#); [Fearon 1998](#)). Compared to uncertainty about the type of partnership in the initial period of the term, coalition parties can reduce this uncertainty over time by learning this type through repeated interactions.

Yet, these interactions in joint policy-making are not indefinite. Although coalition parties cannot exactly foresee the number of their interactions in joint policy-making, term limits, sessions, or election calls impose a temporal constraint for joint policy-making by restricting the emergence of a shadow of the future sustaining cooperation between coalition parties at the end of the term. Moreover, exogenous changes and crises in the context can also impose challenges, potentially altering the incentives of coalition parties for cooperation and competition. Particularly around election day, the time constraint imposed by representative democracy limits the shadow of the future, changing the competitive and cooperative incentives for vote-seeking coalition parties. While the likelihood of benefits from position-taking responsiveness may decrease over time, the electoral costs of coalition tensions

are likely to increase towards the end of the term. This suggests that the temporal dimension engenders distinct periods of competition and cooperation among coalition parties within a term, in which vote-seeking coalition parties may change their behaviour from experiences with coalition partnership. Therefore, the dynamic perspective advocated in this book aims to understand the temporal fluctuations in agenda timing, considering spatial and temporal constraints.

Our dynamic perspective is consistent with prior findings in the literature, and also generates several new propositions and testable hypotheses on agenda timing, which can greatly enhance our understanding of multiparty governance, joint policy-making processes, and the effectiveness and limitations of representative democracy. Overall, there are several novel contributions made in this book.

First, we use a dynamic perspective to distinguish between two learning models that take into account the temporal and spatial dimensions for agenda timing in joint policy-making processes together. Our main argument is that both dimensions...compel coalition parties to engage in a continuous process of learning about the type of their partnership and adapting their policy-making behaviour to changing conditions. In addition to policy- and office-seeking behaviour in coalition governance with cooperative and competitive partnership, we highlight the vote-maximizing strategies of coalition parties and their organizational role in joint policy-making by distinguishing between two learning models for the timing of the agenda. Following the prominent model of [Laver and Shepsle \(1996\)](#), we use a portfolio-specific type of learning from experienced scrutiny of government bills within the distinct policy areas of their portfolios, which we compare with a partisan type of learning that also considers the scrutiny experiences of co-partisan ministerial office-holders *across* the policy areas of their portfolios. We investigate whether and how coalition parties adapt their policy-making behaviour according to the cooperative or competitive type of their coalition partners, learned through their joint policy-making experiences.

Second, we provide an innovative statistical estimation strategy that accounts for the periodic nature of the data generation process. This strategy enables us to accurately analyse the effect of learning processes under spatial and temporal constraints imposed by representative democracy for agenda timing in joint policy-making in general, and in particular in the timing decision of ministerial office-holders to initiate government bills within a term. We use circular regression analysis to account for data generation of an inherent

periodicity absent from measurements made on a linear scale, such as measurements over time, seasonality, and points in a cycle. By developing and introducing a series of visual analytical tools, we offer practical guidance to address substantive interpretation of the findings of the circular regression. In particular, our estimation strategy allows us to examine basic assumptions of our dynamic perspective on joint policy-making in representative democracy, i.e., whether coalition parties learn within or across terms, and whether their learning changes the timing of the policy agenda implementation.

Third, we have compiled one of the most comprehensive cross-national datasets to date on the timing of government bills from eleven European democracies, covering a variety of characteristics of representative democracy. The countries in our dataset vary in size, wealth, culture, history, and democratic foundations, yet they are all governed by coalition parties. Our sample includes both newer and established democracies from Eastern and Western Europe, as well as liberal, social-democratic, and conservative welfare states from Northern, Central, and Southern Europe. Furthermore, we have integrated data on government bills with estimates of area-specific policy positions, median positions, and seat shares of political parties to explore the dynamics of cooperative and uncooperative behaviour among coalition parties within and across portfolios over time. We also combine this dataset with data on committee chairmanship to investigate the power relationship of coalition parties in three countries, in which committee chairmanship is proportionally assigned to ministerial, partner, and opposition parties.

We hope that our theoretical contribution and empirical findings advance the literature on coalition governance, opening up crucial avenues for future research. Although we focus on the cyclical nature of joint policy-making in representative democracy, our theory and methodology allow for the examination of various types of social science phenomena and data that are often cyclical in nature. In contrast to autocracy, representative democracy sets temporal limits and usually requires collective action among two or more actors, which suggests that our theory and methodology can also be applied for a more dynamic analysis of other political phenomena.

1.2 The Cyclical Nature of Dynamic Coalition Governance

Do coalition parties steadily implement the common policy agenda to which they have agreed at the outset of coalition formation, or do they alter their assessment of the costs and benefits from joint policy-making in coalition

governance over time? Do they distinguish between cooperative and competitive partnership types among coalition parties, and adjust their policy-making behaviour for the implementation of the common policy agenda accordingly? If so, do coalition parties shift their approach from learning about the type of partnership within specific or across different portfolios to coordinating their responses based on their cooperative or competitive experiences? Finally, do their learning processes from these experiences continuously evolve or change over the course of a term? These are fundamental questions that are addressed in this book. They describe a dynamic perspective on agenda timing in joint policy-making, which draws attention to the temporal dimension of representative democracy.

1.2.1 Agenda Timing in Joint Policy-making

Contrary to a static view of coalition policy-making that is based on a fixed distribution of policy positions and power among coalition partners, the motivations for cooperation and competition in joint policy-making can evolve over the entire course of a term. In our analyses of agenda timing in joint policy-making of parliamentary democracies, in which coalition governance is rather the rule than the exception, we define a term as the period between two consecutive parliamentary elections. There are situations where our definition of a term differs from that of a legislative term as the administrative body terminates its tenure prematurely due to unforeseen consequences such as cabinet changes or motions of no confidence. For instance, [Woldendorp, Keman, and Budge \(2000\)](#) define a new term by any change in the composition of a coalition government, which can happen by either a change in the composition of the government or a shift of the prime minister (see also [Seki and Williams 2014](#)). In these situations, a caretaker government or a new cabinet may be formed to replace the existing coalition government despite the continuity of the joint policy-making process.

The dynamics of government bill activities for the implementation of a common policy agenda may also be reflected across terms, or in different sessions within a term. For example, the principle of legislative discontinuity does not apply to the Netherlands where a bill proposal does not automatically elapse with the end of a term. In countries like Denmark, by contrast, the pace of government bills is set by legislative sessions within a term, which determine the maximum amount of time each bill proposal can be amended and enacted. However, even in countries like the Netherlands, the existing empirical evidence shows that electoral cycles influence the policy-making

activities regardless of the absence of the discontinuity principle (König 2007). Thus, while we will mainly investigate the dynamics of coalition governance in the periods in-between parliamentary elections, we will also examine the explanatory power of our learning models across terms.

At the start of the term, the dynamics of the partnership in joint policy-making are relatively uncertain even if coalition parties have prior beliefs. Neither partner is aware of the amount of ministerial drift of bill proposals, nor can the ministerial office-holder predict whether her bill proposals will be subject to parliamentary scrutiny. In this early period of a term, a ministerial office-holder may try to generate benefits from position-taking responsiveness to the distinct demands of her constituency by initiating bill proposals with high saliency that signal her willingness to implement the electoral pledges of her party. However, when the coalition partner also attributes high saliency to these bill proposals, the likelihood of scrutiny and coalition tensions is high. In this vein, Martin (2004) shows that compared to contentious proposals, proposals with lower coalition policy divergence are more likely to be introduced earlier in term. Over time, a ministerial office-holder can optimize the timing of bill initiation in relation to her experiences from interactions in joint policy-making. In particular, we expect that the timing decision is determined by the risk of scrutiny of her bill proposals, which the coalition partner may conduct to keep tabs on ministerial drift from previously agreed coalition compromise (Thies 2001; Martin and Vanberg 2011).

The theory of König et al. (2022) suggests that coalition parties may learn the type of their partnership through either cooperative or competitive experiences in joint policy-making within portfolios, prompting ministerial office-holders to adjust their agenda timing behaviour accordingly. Specifically, ministerial office-holders possess the power and expertise to delay their bill initiation timing behaviour within their portfolios when they expect either lower benefits from position-taking responsiveness or higher challenging costs for scrutiny of their bill proposals. As parliamentary institutions provide only an imperfect mechanism to rain in drifting proposals (Goodhart 2013), ministerial office-holders can utilize the timing of bill initiation and coordinate effective agenda timing through considering co-partisan experiences to optimize their cost/benefit-relationship from joint policy-making. Because coalition parties may become less cooperative with upcoming elections, in which coalition parties compete separately, the conditions for partnership may again change with the approaching expiration of the term that limits further joint policy-making activities (Lu 2025). In particular, at the very end of the term, the necessary time for joint policy-making is usually censored.

The dynamics of joint policy-making in coalition governance across different periods of a term and the timing of bill proposals for the implementation of a common policy agenda can also be influenced by a number of additional factors. First, coalition parties may have established a coalition committee, where bill proposals from ministerial office-holders require approval by all coalition parties before they can formally be initiated (Bäck, Bergman, and Müller 2024). This process is likely to delay the implementation of the common policy agenda. Second, as a result of logrolling among coalition parties (Bäck, Bergman, and Müller 2024; Carrubba and Volden 2000; De Marchi and Laver 2023), package deals across portfolios may delay the timing of bill initiation. Third, bill proposals may vary in levels of expertise and complexity. In some cases, they require to invite external experts and to hold additional meetings, which extends the time needed to prepare proposals. Finally, external shocks and crises may alter the common policy agenda, affecting the timing of bill proposals and disrupting the original road map of coalition governance. While these factors may affect the timing of bill initiation, they also provide additional opportunities to learn about coalition partnership over time.

1.2.2 Learning about Partnership Over Time

After a coalition is formed, a common policy agenda is established, portfolios are allocated, and mechanisms to monitor coalition partners are put in place. Still, the inherent principal-agent problems in joint policy-making processes do not cease to exist.

- First, there is the issue of information and power asymmetry arising from the delegation of representatives to ministerial office-holders, who possess the expertise and power to propose bills for the implementation of the common policy agenda in portfolios they are responsible for (Laver and Schofield 1990; Huber 1996). The more pronounced the asymmetries in information and power between ministerial office-holders and coalition partners, the more likely it is that principal-agent problems will occur, i.e., non-cooperative bill proposals of ministerial office-holders will drift from previously agreed coalition compromise of the common policy agenda.
- Second, coalition policy divergence creates a dilemma: coalition parties commit to implement a common policy agenda that originates from a

compromise formed to build a coalition, while also having to satisfy the distinct demands of their individual constituencies, which expect to see their party's pledges implemented (Martin and Vanberg 2011). Fortunato (2019), for example, finds that voters punish parties they view as compromising, which suggests that coalition parties have electoral incentives to pursue an individual vote-seeking strategy. The higher the distance to compromise, the more likely are ministerial drift and coalition tensions through challenges of bill proposals.

- Third, as we will explore thoroughly in this book, coalition parties are often unaware of all future challenges at the beginning of a term and how their partnership will develop and change over time. When coalition governance starts, they have a prior belief about partnership, which they, however, update over time from experienced interactions in joint policy-making. Broadly speaking, the cyclical nature of joint policy-making within a term introduces different levels of knowledge about partnership types, which can be categorized into different periods: an initial period of uncertainty about the type of partnership, a mid-period of inferring the partner type from experiences in joint policy-making within and across portfolios, and a final period of preparing a vote-seeking strategy for the upcoming election.

Building on the recent literature on coalition governance, strong parliamentary institutions are understood to mitigate principal-agent problems in joint policy-making (Thies 2001; Müller and Strøm 2003, 2008; Strøm, Müller, and Smith 2010), allowing coalition parties to benefit from a coalition compromise by exercising oversight and amending non-cooperative bills (Martin and Vanberg 2005, 2011, 2014). This perspective categorizes principal-agent problems in joint policy-making within coalition governance relative to the strength of parliamentary institutions, which are generally stable over time. For instance, countries like Denmark, Germany, and the Netherlands, with their strong parliamentary systems, are considered more capable of mitigating ministerial drift, whereas France and Ireland, with weaker parliamentary institutions, may find it more challenging to scrutinize and amend non-cooperative bills (Martin and Vanberg 2011). However, as we demonstrate in this book, through the examination of bill proposals, the existence of strong or weak parliamentary institutions does not uniformly influence coalition parties' tendencies towards cooperation or competition.

In comparative research on parliamentary democracies, variations in government bill activities are often attributed to different levels of a fixed

distribution of policy positions and power among parties (Tsebelis 1999; Bräuninger and König 1999; Brunner 2012). Upon further examination of this static perspective on the spatial dimension, we observe that these variations also manifest across different portfolios (Martin 2004; König et al. 2022). To understand the spatial impact on the variance of bill activities, our analysis begins by considering the specific policy divergence in areas and the delegation of responsibility to ministerial offices. Aligning with Laver and Shepsle (1996), we propose that coalition parties assign ministerial offices based on their area-specific policy positions to optimize the benefits of position-taking responsiveness (Bäck, Debus and Dumont 2011).

Moving forward, from a dynamic perspective, our first inquiry is whether ministerial office-holders adapt the timing of bill initiation within their portfolios in response to the scrutiny they have faced in joint policy-making. We theorize that more extensive scrutiny, indicative of a non-cooperative coalition partnership, leads to delayed bill initiation. Our second line of inquiry examines whether this delay is exacerbated by greater policy divergence within the coalition partnership, which we expect to foster a non-cooperative partnership dynamic. We juxtapose this portfolio-specific view with a partisan learning model that involves coordination across portfolios (Martin and Vanberg 2011). We complement the model of König et al. (2022), which suggests that ministerial office-holders learn their partners' cooperative or competitive type from their experiences within their own portfolios, by learning from the experiences of their co-partisan ministerial office-holders across different portfolios. Again, we predict that the effects are more pronounced with higher policy divergence of coalition parties.

In both learning models, we also consider whether ministerial office-holders respond to scrutiny, as scrutiny raises reputation costs for the office-holders. Since ministerial office-holders are responsible for the implementation of the common policy agenda within their portfolios, scrutiny of their bills is likely to raise questions about their abilities and capabilities to propose bills accordingly. These results could improve our understanding of the logic behind portfolio allocation, often discussed in terms of party size alone (Gamson 1961; Browne and Franklin 1973; Schofield and Laver 1985; Baron and Ferejohn 1989; Warwick and Druckman 2001, 2006; Carroll and Cox 2007; Falcó-Gimeno and Indridason 2013; Cox 2021).⁵ In addition to considering the size of the ministerial party, we examine the influence of the

⁵ Beyond party size, Silva (2023) analysed how the legislative powers of head of governments influence the proportionality in the allocation of ministerial portfolios relative to legislative composition. However, his empirical analysis is limited to presidential democracies.

parliamentary median position on the timing of bill initiation, potentially offering fresh perspectives on the role of the legislative median model (Black 1948; Laver and Shepsle 1990, 1996; Cox and McCubbins 2007; Powell and Vanberg 2000; McDonald, Mendes, and Budge 2004; Powell 2006; Martin and Vanberg 2014). Both party size and median position may help ministerial office-holders to reduce the likelihood of scrutiny as they also relate to the committee power of ministerial parties in parliament. We also take a closer look at the power relationship between ministerial office-holders and coalition partners by investigating the role of committee chairmanship, which provides coalition partners with additional power in a subset of our sampled countries.

In our conceptual framework, we view coalition parties as the primary units of analysis because they aggregate specific demands to policy positions and delegate their representatives to ministerial offices, which provide the office-holders with expertise and authority to propose government bills. Similarly, the parties of the coalition partners can organise the responses by either immediately approving or subjecting bill proposals to scrutiny in parliament. These responses inform the office-holders about the type of partnership, which they can take into account for their timing of further bill proposals.

This dynamic perspective on the timing of bill initiation integrates the spatial and temporal dimension of joint policy-making in coalition governance. It suggests that ministerial office-holders update their beliefs about the competitive or cooperative type of their partners through policy-making experiences from previous government bills. Building on König et al. (2022), we explore how ministerial office-holders time bill initiation for the implementation of the common policy agenda in relation to their benefits and costs within their portfolio. We aim to extend this portfolio-learning model and compare it with a partisan-learning model, which posits that coalition parties coordinate the experiences of their co-partisan ministerial office-holders to time the initiation of government bills in their portfolios.

While these models suggest that coalition parties learn from the scrutiny they experience, we follow the view from Laver and Schofield (1990), Epstein and O'Halloran (1994), and Huber and Shipan (2002) that ministerial office-holders possess an informational advantage through bureaucratic expertise, which they employ to mitigate the costs associated with competitive partnerships. Accordingly, we assess learning from the viewpoint of ministerial office-holders rather than coalition partners. To emphasize our dynamic perspective, we further assess whether the learning processes of ministerial office-holders change over time. At the onset of a term, ministerial office-holders face the uncertainty of unforeseen challenges and can neither predict

the trajectory of their coalition partnership nor how their constituents will perceive it over time. Even if coalition parties compromised on a common policy agenda and have good reasons to trust their peers at the beginning of the term (e.g., following the bargaining phase of the coalition formation process), credible commitment problems and incentives to generate benefits from position-taking responsiveness to the distinct demands of the own constituency can still impede the office-holders' adherence to the coalition compromise (Bäck and Lindvall 2015; Klüver and Spoon 2020; Zubek and Klüver 2013).

Although ministerial office-holders may not accurately discern the partner 'types' at the start of a term, we expect that they update their beliefs based on their joint policy-making experiences over time. The models proposed in this book suggest that over time, ministerial office-holders can more precisely infer the type of partner—either cooperative or competitive—and adjust their timing of bill initiation in response to their learning experience. Beyond the portfolio-learning process, they can also infer the partner's type from experiences of co-partisan office-holders in other portfolios to improve their timing of bill initiation.

While we expect that learning increases with the amount of experiences over time, we acknowledge that the incentives of coalition parties for joint policy-making may change at the end of a term. Compared to the very beginning, when uncertainty exists about the type of partnership, ministerial office-holders can optimize the timing of bill initiation through learning the type of partnership over time. While the benefits of a competitive type of partner outweigh the challenging costs for scrutiny of bills, a more cooperative type will pursue a mixed strategy for scrutiny of government bills. Until this point, ministerial office-holders may decide to delay the timing of bill initiation when coalition tensions are likely to increase the reputation costs of the parties of the office-holder from scrutiny of their bills. However, the censoring of joint policy-making may again change the conditions for coalition governance at the very end of the term. Theoretically, the finite nature of a term not only discourages sustained cooperation by limiting the 'shadow of the future' for coalition governance, but it also censors the necessary time for joint policy-making.

The potential for changes in stakes implies that coalitions are formed under uncertainty about the type of partnership in future policy-making, which they can learn throughout the term. Understanding how coalition parties discern their partners' cooperative or competitive type is vital to understand the cyclical and dynamic qualities of coalition governance in a representative

democracy. Yet, we do not predict uniform patterns over time; unforeseen critical events can disrupt the foresight of coalition parties, potentially overturning the initial coalition compromise. Indeed, critical events may take place within a term outside the foresight of coalition parties already at the beginning of coalition governance. While coalition parties may agree on a common policy agenda in the coalition formation process, these critical events—external changes or internal crises (Browne, Frendreis, and Gleiber 1984)—can call into question the initial coalition compromise and the coalition’s stability in the implementation of the common policy agenda.

Furthermore, it is also possible that some specific ministerial office-holders, such as of finance, justice, and foreign affairs, pursue a different strategy from the beginning by considering the interactions of their co-partisan ministerial office-holders, while others take more into account their portfolio-specific experiences (Lu 2023). This variation suggests that coalition parties have reasonable information about policy divergence and legislative power when they form coalition government. They know the policy positions of other political parties and their divergence in each policy area. However, once coalition government is formed and representatives are delegated to ministerial offices, the context of joint policy-making may change, decreasing or increasing coalition tensions within a term. In our view, whether they consider experiences within or across portfolios is an empirical question, which we aim to answer in this book.

1.2.3 Dimensions and Patterns of Coalition Dynamics

Briefly summarized, the main argument of the book is the following: in order to govern jointly, policy- and office-seeking coalition parties not only need to form government at the beginning of the term by agreeing on compromise and allocating portfolios for the implementation of a common policy agenda, they must also learn the type of partnership in joint policy-making for vote-seeking purposes until the end of the term. Formally, we distinguish between two types of partnership—a cooperative and a competitive coalition partner type, which differ by their evaluation of the relationship between their party’s policy losses from bill proposals of ministerial office-holders and challenging costs for parliamentary scrutiny of those bill proposals. Empirically, mixed types of cooperative and competitive partnership may exist and their patterns may change over time. At the beginning of a term, which imposes a temporal restriction to joint policy-making for the implementation of a common policy

agenda, the type of partnership is uncertain. Although representative democracy usually limits the duration of a term to four or five years, the time for the implementation of the common policy agenda might be further constrained by sessions or continue after the expiration of a term.

For policy- and office-seeking coalition parties, the allocation of portfolios is important because ministerial office-holders have the power and expertise to initiate bill proposals that implement the common policy agenda within the policy areas of their portfolios. However, the higher the asymmetry in the distribution of power and divergence in policy positions of coalition parties, the greater are the principal-agent problems in joint policy-making of coalition parties. The simple reason is that the relative distribution of power and policy positions among coalition parties determine the spatial incentives to propose bills that deviate from previously agreed compromise. In turn, these incentives also motivate the coalition partner to open the gate for scrutiny of those bill proposals in parliament. Accordingly, the more powerful the ministerial office-holder and the larger her distance to coalition compromise, the more likely it is that bill proposals will drift from previously agreed compromise in favour of the ministerial party at the expense of the coalition compromise. As a result, the more bill proposals drift in favour of the ministerial party and the more the coalition partner is able to subject those proposals to parliamentary scrutiny, the more likely those bill proposals are to be challenged.

In addition to these spatial incentives of coalition parties, which determine the likelihood of ministerial drift and parliamentary scrutiny, the temporal limitation to implement the common policy agenda within a term unfolds coalition dynamics, in which vote-seeking coalition parties need to learn the type of partnership over time. At the beginning of a term, neither coalition partners nor ministerial office-holders know whether and to what extent bill proposals will drift from previously agreed compromise and whether and to what extent these bill proposals will be scrutinized in parliament. Because coalition parties compete separately in elections, ministerial office-holders aim to generate benefits for their party from showing their policy-making responsiveness to the distinct demands of their own constituency. At the same time, the coalition partner has electoral incentives to avoid a deviation from previously agreed compromises of bill proposals which favour the distinct demands of the constituency of the ministerial party at the expense of their own constituency. These electoral incentives continue to exist for vote-seeking coalition parties throughout a term despite their initial agreement on compromise and the allocation of portfolios for the implementation of the common policy agenda.

To avoid coalition tensions with electoral costs, the ministerial office-holders ideally propose bills that implement the common policy agenda without drifting away from previously agreed compromise, so that the partner does not challenge those bill proposals by opening the gate for parliamentary scrutiny. As ministerial office-holders are responsible for the implementation of the common policy agenda within the policy areas of their portfolios, scrutiny of their bills is likely to raise questions about their abilities and capabilities to draft bills accordingly. Because such questions raise reputation costs for the responsible office-holder, which risks coalition tensions, the partner bears challenging costs when he opens the gate for parliamentary scrutiny of bill proposals of the ministerial office-holder. Both reputation and challenging costs are important vote-seeking factors for the policy-making effectiveness of coalition parties, coalition stability in the implementation of the common policy agenda, and satisfaction with coalition governance.

If we assume that coalition parties know the extent of bill proposals that will drift from previously agreed compromise and whether and to what extent these proposals will be scrutinized in parliament throughout the term, coalition parties would effectively implement their common policy agenda without coalition tensions, which would increase the stability of coalition government and satisfaction with coalition governance. A perfectly informed ministerial office-holder would only propose bills that drift from previously agreed compromise when the benefits of her party exceed her reputation costs, and the coalition partner would only challenge bill proposals when the benefits of his party from scrutiny exceed his challenging costs. This evaluation depends on the type of partnership, where a cooperative type immediately approves bill proposals because his challenging costs exceed the policy losses from ministerial drift. By contrast, a competitive partner evaluates the policy losses higher, which can reduce policy-making effectiveness of coalition parties, coalition stability in the implementation of the common policy agenda, and satisfaction with coalition governance. The more competitive the partnership, the more likely will a ministerial office-holder experience scrutiny of her bill proposals.

The type of coalition partnership has a series of implications, such as coalition effectiveness in the implementation of the common policy agenda, which also affects the coalition stability and satisfaction with coalition governance. These implications also exist if we assume that coalition parties do not know the extent of bill proposals that will drift from previously agreed compromise and whether and to what extent these proposals will be scrutinized in parliament throughout the term. Under uncertainty, the question is whether ministerial office-holders learn the type of partnership over time and adapt

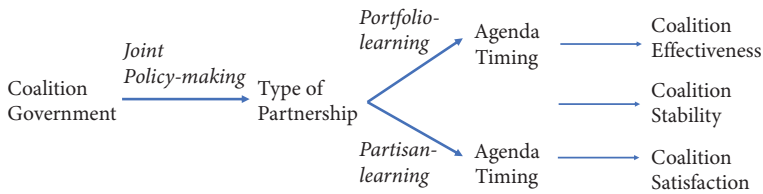


Figure 1 Learning the type of partnership from experiences in joint policy-making with implications for agenda timing that affects coalition effectiveness, coalition stability, and satisfaction with coalition governance.

the timing for the implementation of a common policy agenda accordingly. While an early initiation of bill proposals can show immediate responsiveness to the distinct demands of the own constituency, which is likely to generate position-taking benefits for the party of the responsible office-holder, coalition governance blurs responsibilities over time, which suggests that late initiation is less likely to generate such benefits. At the same time, the evaluation of the partner's challenging costs may change over time, in particular with approaching elections, in which coalition parties compete separately. Both changes of benefits and costs may affect the timing for the implementation of the common policy agenda with implications for coalition effectiveness, coalition stability in the implementation of the common policy agenda, and satisfaction with coalition governance. [Figure 1](#) provides a visual description of the causal links in our argument.

Coalition governance is characterised by a joint policy-making process in which coalition partners must implement a shared policy agenda despite potentially diverging policy interests. At the start of the term, there is uncertainty about whether partners will adhere to the agreed-upon agenda or deviate from it. Our first proposition is that coalition partners can learn about the type of their partnership in joint governance—cooperative or competitive partners—through the legislative scrutiny their bill proposals experience. In learning the type of the partnership, we differentiate between two learning processes: first, a portfolio-learning process. To learn the type of partnership, we distinguish two types of learning processes: first, a portfolio-learning process, in which ministerial office-holders learn the type of partnership through the scrutiny their bill proposals experience within their specific portfolio during joint policy-making. The more their bill proposals are scrutinized within their portfolio, the more they infer a competitive type of partner. Second, we alternatively introduce a partisan-learning model, according to which ministerial office-holders also take into account the scrutiny experiences of their

co-partisan ministerial office-holders in joint policy-making. From these experiences ministerial office-holders can infer the type of partnership, which has crucial implications for their timing of the implementation of the common policy agenda. When they infer a cooperative partner who immediately approves their bill proposals, they will initiate further bill proposals early, which will enhance coalition effectiveness in implementing their common policy agenda. The less ministerial office-holders experience scrutiny of their bill proposals, the more satisfied they will be, and the more stable the coalition government. Vice versa, when ministerial office-holders infer a competitive partner, who opens the gate for intense scrutiny of their bill proposals in parliament, the later they will initiate further bill proposals. This will decrease coalition effectiveness, coalition stability in the implementation of the common policy agenda, and satisfaction with coalition governance.

Our argument differs from the prevalent static perspective on the spatial dimension of coalition governance, which ignores the learning of the partnership type over time. While the policy-making activities of coalition parties do not vary under the assumption that the conditions of the data generation process in joint policy-making do not change, we acknowledge that ministerial office-holders are uncertain at the start of coalition governance, but can learn the cooperative or competitive type of partnership over time and adapt their timing activities for the implementation of the common policy agenda. Compared to the prevalent assumption on a fixed distribution of policy positions of coalition parties and power from parliamentary institutions, learning the cooperative or competitive type of partnership can optimize the vote-seeking benefits and costs of coalition parties, which initially agreed on compromise and the allocation of portfolios for the implementation of a common policy agenda but compete separately in elections at the end of a term. This learning process can follow a more autonomous portfolio- or partisan-learning model, which also considers the experiences of co-partisan office-holders. [Figure 2](#) shows the three dimensions of our proposed dynamic coalition governance.

Figure 2 represents the three dimensions of our proposed dynamic coalition governance: learning process, partner type, and agenda timing. These dimensions illustrate how coalition governance operates within both spatial and temporal constraints, emphasising the interplay between ministerial learning, partnership dynamics, and the timing of policy implementation. The learning process dimension captures how ministerial office-holders acquire information and adapt their strategies through two primary channels: portfolio-specific experiences, where ministers gain insights from the scrutiny their bill proposals face within their area of responsibility, and

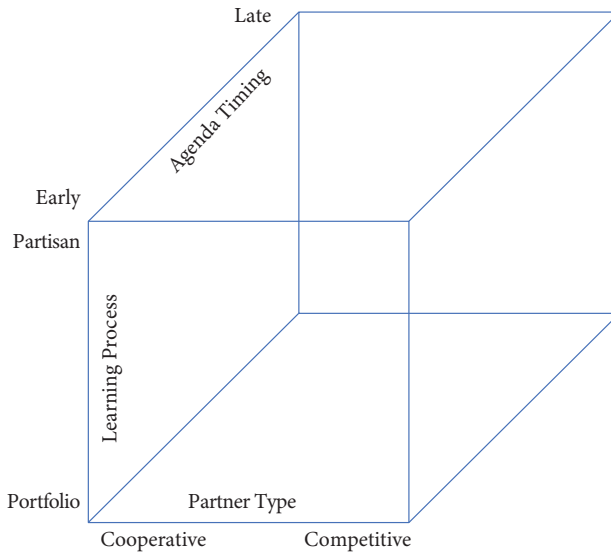


Figure 2 Three dimensions of dynamic coalition governance.

partisan experiences, where they learn from the scrutiny encountered by their co-partisan colleagues in joint policy-making. The partner type dimension reflects whether ministers infer a cooperative or competitive partnership based on their experiences. Cooperative partnerships, where bill proposals are approved with minimal scrutiny, encourage earlier initiation of subsequent legislative initiatives, fostering coalition effectiveness and stability. Conversely, competitive partnerships, characterized by intense scrutiny, delay further proposals and can undermine coalition stability. The agenda timing dimension spans the temporal scope of coalition governance, ranging from the start to the end of the policy implementation process. Ministers' interpretation of their partners' behaviour—cooperative or competitive—shapes the timing of their actions, with cooperative inferences enabling early policy initiatives and competitive inferences promoting delay in the initiation of further bill proposals.

In the following chapters, we develop the theoretical and empirical foundations of our argument on dynamic coalition governance. Expanding König et al. (2022), our theoretical framework is built within a game-theoretical setup, which postulates a learning process through which actors infer partnership types over time, along with its empirical implications. For the empirical analyses, we introduce a novel estimation strategy using circular regression, which effectively captures the cyclical nature of joint policy-making in representative democracies.

Partnership Learning and Agenda Timing

2.1 Theoretical Foundations of Partnership Learning

Government *pro tempore* is a fundamental characteristic of representative democracy, which establishes temporal limits on office-holding and policy-making (Linz 1998). This temporal limitation also constrains coalition governance, in which two or more parties compromise on a common policy agenda (Müller and Strøm 1999, 2008), allocate power across portfolios (Laver and Shepsle 1996), and delegate representatives into ministerial offices to implement the common policy agenda in each portfolio (Thies 2001). For doing so, coalition parties need to approve government bills jointly over the term, but at the end of the term, the constituencies evaluate the policy performance of each party separately (Huber 1996; Martin and Vanberg 2011). In combination with the asymmetric distribution of expertise and power through the holding of ministerial offices, this separate electoral evaluation creates an inherent coalition dilemma for the implementation of the common policy agenda: ministerial office-holders may use their power and expertise to generate benefits from position-taking responsiveness by proposing government bills in favour of their own party at the expense of the coalition compromise. In turn, coalition partners are more likely to challenge bill proposals, which deviate from the previously agreed coalition compromise of the common policy agenda (Strøm 1990; Martin and Vanberg 2011).

Although this coalition dilemma risks producing suboptimal joint policy-making, coalition governance is not only the most common form of governance in representative democracy, but incumbent coalition parties are also often rewarded in elections (Powell 2000; Martin and Stevenson 2001). One answer for this success of coalition governance is that strong parliamentary institutions may help to overcome the coalition dilemma by providing coalition partners with the power to scrutinize government bills, which drift from previously agreed compromise (Martin and Vanberg 2004). However, parliamentary scrutiny is costly for coalition parties, raising reputation costs for the ministerial office-holder and challenging costs for the partner. The theory of Martin and Vanberg (2011) distinguishes a constrained environment

from an unconstrained environment to demonstrate the implications of weak or strong parliamentary institutions for the costs of parliamentary scrutiny of government bills. In the constrained environment, the ministerial office-holder can draft government bills with drift from compromise without the risk of parliamentary scrutiny, while the likelihood for scrutiny of government bills increases with the policy divergence of coalition parties in the unconstrained environment that reduces challenging costs by the provision of strong parliamentary institutions. In both environments, it is commonly assumed that coalition parties do not learn and adapt their behaviour over time despite experiencing scrutiny of government bills.

An alternative answer—which we examine in this book—is that coalition parties learn about partnership and adapt their behaviour over time. For example, when ministerial office-holders want to show responsiveness to their constituencies by implementing their parties' pledges, they initiate government bills that a cooperative type of coalition partner will approve immediately. However, with increasing coalition policy divergence, ministerial office-holders will postpone the initiation of government bills, which are likely to be challenged by a more competitive coalition partner. For the theoretical foundation of our argument, we use a game-theoretical set-up, which posits that ministerial office-holders can benefit when they propose government bills that drift from previously agreed compromise, while challenges of their bills raises reputation costs for the responsible office-holder (König et al. 2022). This theory also accounts for policy divergence of coalition parties, which motivates ministerial office-holders to deviate from the coalition compromise and coalition partners to challenge their bills. It further considers the power distribution between the party of the ministerial office-holder and the coalition partner, proxied by party size and the median position in parliament. The size of the party usually translates into control of committee chairs, which leads to powers to schedule public hearings and to consult policy experts and societal groups, as well as a privileged position in terms of extracting policy information (Mattson and Strøm 1995; Kim and Loewenberg 2005; König, Lin, and Silva 2023). According to spatial analysis, the median position is decisive in joint policy-making (Baron 1991; Laver and Shepsle 1990; Morelli 1999). When the party of the ministerial office-holders has a larger seat share and controls the median position in parliament, this should decrease the likelihood for intra-coalition challenges by scrutiny of ministerial bills.

The novel part of this game-theoretical set-up is that it postulates dynamic learning about partnership over time. In contrast to a static view this dynamic perspective assumes that ministerial office-holders have the power

and expertise not only to propose government bills for the implementation of the common policy agenda, but also to decide about the timing of bill proposals where early bill initiation promises benefits from position-taking responsiveness to the constituencies of their party (Martin 2004). This timing of bill initiation depends on learning about the type of coalition partnership over time, for which two types are distinguished: a competitive and a cooperative type. A cooperative type immediately approves their bills and a competitive type opens the parliamentary gate for challenges by scrutiny of bills, which raises reputation costs for the ministerial office-holder. At the beginning of the term, ministerial office-holders have only a prior belief about the type of their partner and, depending on experienced scrutiny, they learn about the type of partnership and adapt the timing of bill initiation accordingly. When the reputation costs of being scrutinized are expected to exceed the benefits from position-taking responsiveness, it is predicted that ministerial office-holders will delay bill initiation, because they feel confronted with a competitive partnership type that can benefit from the scrutiny, both in policy and electoral terms. In case of a cooperative partnership type, ministerial office-holders will continue with early bill initiation, which ensures the timely implementation of the common policy agenda. Only when the ministerial office-holders can expect high benefits from position-taking responsiveness, the static and the dynamic perspective predict early initiation (König et al. 2022).

Although this set-up provides a theoretical foundation for the learning of ministerial office-holders about the type of partnership from experienced scrutiny, few insights exist into the empirical foundation of their learning processes. In the following, we compare the explanatory power of two types of learning processes, which refer to existing models on coalition governance. The first follows the idea of the prominent portfolio allocation-model of Laver and Shepsle (1996) with similar implications for ministerial autonomy to the constrained environment-model of Martin and Vanberg (2011), which excludes scrutiny of a bill proposal that drifts from previously agreed compromise. Our portfolio-learning model posits that ministerial office-holders only learn the type of coalition partner from experienced scrutiny within their portfolio (König et al. 2022). The second type of learning process postulates partisan coordination similar to the unconstrained environment-model of Martin and Vanberg (2011), which predicts compromise across portfolios. Our partisan-learning model posits that ministerial office-holders also consider the scrutiny experiences of their co-partisan office-holders in other portfolios for the timing of their bills. Our empirical analyses will compare the explanatory

power of these two types of learning processes for the timing of government bills initiation.

Our dynamic perspective also accounts for changes in the timing of bill initiation over time. Although coalition parties may consider their partnership experiences across terms, we will explore whether the type of learning process and the bill initiation activities change within a term. At the beginning of the term, uncertainty exists and ministerial office-holders only have a prior belief about the partnership type, while ministerial office-holders can credibly demonstrate their willingness to implement the pledges of their parties by early bill initiation. However, when coalition parties pursue diverging policy positions and the partner learns about ministerial drift to generate benefits from position-taking responsiveness by early bill initiation, the partner will intensify scrutiny, which enables the ministerial office-holder to update her prior belief about the type of partnership. This suggests that ministerial office-holders will adjust their timing behaviour of bill initiation once they collected enough scrutiny experiences over time. Because scrutiny of government bills raises reputation costs for the responsible ministerial office-holder, she may change her agenda timing and postpone bill initiation to avoid costly scrutiny. Finally, when election day approaches, the finite nature of a term not only limits the 'shadow of the future' for joint policy-making, but it also censors the time to implement the common policy agenda.

2.2 Agenda Timing: A Two-stage Learning Model

Before presenting the full set-up of the game-theoretical model, we first outline its main conclusion. The game theory framework on ministerial learning in coalition governments predicts how experienced scrutiny shapes the timing of the common policy agenda. It suggests that (1) ministerial office-holders initiate their bills later in the term the greater the scrutiny they have experienced and (2) this effect of experienced scrutiny on the timing of bill initiation is stronger the greater the policy divergence between coalition parties and (3) the weaker the powers ministerial office-holders have to constrain scrutiny activities in parliament, which (4) varies with the different incentives for cooperation and competition within a term. A typical example for such variation is provided by the new traffic light coalition, which German chancellor Olaf Scholz (SPD) formed with the business-oriented Liberals and the environment-focused Greens. A few months after the formation of the new coalition in December 2021, the Greens gained public support for their

flexibility in managing the cancellation of the Russian gas imports, whereas the support for the SPD and the Liberals drastically declined. However, when the Greens' popular minister of economic affairs and climate action, Robert Habeck, proposed an energy bill on the optimization of heating, the coalition partners publicly announced to challenge and allow for scrutiny of the bill in parliament. Over weeks, ongoing scrutiny of the bill provoked coalition tensions, and the popularity score of the responsible minister, Robert Habeck, dropped from 2.0 to -0.06 (on a scale from -5 to 5) and the Greens lost almost 10% of public support (Politbarometer from 2.2.2024). In response, the minister slowed down the timing of the common policy agenda in economic affairs and climate action.

For readers interested in game theory, we provide a detailed description of König et al. (2022)'s two-stage learning model. We outline a sequence for the agenda timing game involving two bills, and formalise the policy pay-offs for both the ministerial office-holder and the coalition partner, considering their respective benefits and costs. We also define the strategy set available to the ministerial office-holder for determining when to initiate a bill. Following this, we present propositions on learning from scrutiny during periods of uncertainty, which mirrors the early phase of the term. After this introduction of the basic components of agenda timing, we derive propositions on learning from scrutiny under uncertainty, which resembles the initial period of the term. At this period, the relation of the office-holder's benefits from position-taking responsiveness to the policy losses of the partner is decisive for early or late bill initiation. Our following propositions refer to learning from scrutiny in the mid-periods of a term, first with a proposition on learning from experienced scrutiny, where the challenging costs are not large enough and the partner may switch between scrutiny and approval of bills. Compared to this situation of coalition squabbles, we also present a proposition on timing of bill initiation, in which the challenging costs of the coalition partner are sufficiently high. Although we expect coalition squabbles to dominate joint policy-making in this period, a temporal variation of agenda timing behaviour support our dynamic perspective on coalition governance.

2.2.1 The Sequence of Agenda Timing

The sequence of the agenda timing game, which posits learning from scrutiny of the first bill for the timing of a second bill, develops as follows:

1. The partner's type (*competitive* or *cooperative*) is randomly determined by nature. To capture the information asymmetry of coalition parties, it is assumed that the partner knows his own type, while the ministerial office-holder has only prior knowledge that the partner is competitive with probability q .
2. The ministerial office-holder introduces her first bill, which the partner either immediately approves or allows for scrutiny. If the partner approves, then the bill passes and the bill implements the policy position of the party of the ministerial office-holder.¹ If the partner does not approve the bill immediately, then the bill undergoes a scrutiny process in parliament and is passed in the interests of the partner's party.
3. The ministerial office-holder observes whether her first bill has been immediately approved or scrutinized, and updates her beliefs about the partner's type. She decides then whether to initiate the second bill early or late in the term.
4. Once the second bill is introduced, the partner either immediately approves or allows for scrutiny. If the partner approves, then the bill passes and implements the policy position of the party of the ministerial office-holder. If the partner does not approve the bill immediately, then the outcome depends on whether the ministerial office-holder has initiated the second bill early or late in the term. An early-initiated scrutinized bill is passed in the interests of the partner's party. Scrutiny of a late-initiated bill is less likely to advance the policy position of the partner's party but rather results in the passage of a compromise bill or, due to time constraints, will not be completed by the end of the term. [Table 1](#) lists the parties' choices and outcomes for the second ministerial bill.

2.2.2 Policy Pay-offs of Office-holders and Partners

Our formalisation of the policy pay-offs of the coalition parties accounts for their coalition dilemma, which results from their cooperative needs to approve government bills jointly, while the voters' separate evaluation of each party's policy-making performance fosters their competitive incentives. Following the literature on coalition governance, we assume that coalition parties agree

¹ Following the literature on party discipline in parliamentary democracies ([Diermeier and Feddersen 1998](#); [Bowler, Farrell, and Katz 1999](#); [Depauw and Martin 2009](#); [Kam 2009, 2014](#)), coalition parties control their members and so can pass bills whenever the ministerial office-holder and the partner have agreed on them.

Table 1 Coalition parties' choices and outcomes for second bill

Player	Timing	Partner	
		Approval	Scrutiny
Office-holder	Early initiation	Bill implements office-holder's position	Bill implements partner's position
	Late initiation	Bill implements office-holder's position	Bill implements coalition compromise

on compromise about a common policy agenda when they form a coalition government, eventually by signing a coalition agreement (Müller and Strøm 2008; Martin and Vanberg 2011). We accordingly set the value of coalition compromise to 0 for each coalition party, which changes the policy pay-off toward $+X$ for the office-holding party and $-X$ for the partner party respectively when an early-initiated government bill is approved without scrutiny.² From a principal-agent perspective, we posit that the commitment to the common policy agenda with a previously agreed coalition compromise is not enforceable and so the ministerial office-holder may use her power and expertise to propose a bill that changes the policy pay-off toward $+X$ in favour of her own party.

Following the set-up of our agenda timing game, the partner has the choice to immediately approve the bill or to scrutinize and amend it. If an early-initiated bill gets scrutinized and advances the partner's policy position, then the policy pay-off to the ministerial office-holder is $-\frac{X}{\alpha}$ while the policy pay-off to the partner is $\frac{X}{\alpha}$, where $\alpha \geq 1$ denotes the power of the ministerial party to constrain scrutiny activities (e.g., by holding the median position in the policy area or having a large seat share in parliament). In turn, if a bill proposal is initiated late, subsequently scrutinized or amended to reflect the coalition compromise, then the parties' policy payoffs amount to 0.³

2.2.3 Benefits and Costs of Office-holders and Partners

According to Martin and Vanberg (2011), early bill initiation allows the ministerial office-holder to demonstrate responsiveness to the distinct demands of her party's constituency, that she is working hard on their behalf

² This assumes a one-dimensional policy space with equidistantly located policy positions of coalition parties around a compromise policy 0.
³ The key results also hold for a setting in which the partner prefers the status quo policy to a bill proposal and late-initiated scrutinized bills remain pending at the end of the term.

and willing to implement her party's pledges; thus, she generates benefits from position-taking responsiveness $B > 0$ for her party. Late initiation, in turn, is associated with temporary inaction and so generates no position-taking benefits. One can interpret these position-taking benefits as electoral pay-offs from the party of the office-holder's constituency as a reward for her responsiveness.

As for the partner, the process of scrutinizing government bills imposes challenging costs. Compared to the distinction of [Martin and Vanberg \(2011\)](#) between weak and strong parliamentary institutions, we draw attention to the type of partnership with a *competitive* partner who mainly focuses on the voters' separate evaluation of each party's policy-making performance. For simplicity, it is assumed that the benefits from the voters' separate evaluation of his party compensate the challenging costs of the competitive partner. In other words, for the *competitive* partner, the costs are offset by the individual vote-maximizing benefits that he receives as a result of scrutinized bills. The *cooperative* partner type does not expect additional benefits for his party from scrutiny but incurs the challenging costs of scrutinized bills, which are denoted by C .

The agenda timing game is played under uncertainty about the type of partner at the beginning of the term. The office-holder only has a prior belief about the partner's type, but she can update it by learning from experienced scrutiny of her bills over time. We determine the pay-offs of the office-holder and the partner, which depend on the trade-off between their policy payoffs and the amount of challenging costs.

2.2.4 Strategy Set for Agenda Timing

In the original dynamic learning model, [König et al. \(2022\)](#) solved for the perfect Bayesian equilibrium, which includes the partner's reactions to the first and second bill, the ministerial office-holder's beliefs about the partner's type, and the officeholder's subsequent decision on the timing of the second bill's initiation—whether early or late. Specifically, the partner's decision to approve the bill immediately or allow it for scrutiny in parliament is optimal given his type, incentives, and expectations about early or late initiation of the second bill. In turn, the office-holder uses the partner's reaction to her first bill to draw inferences about the partner's (*competitive* or *cooperative*) type. Given these inferences and her incentives, the ministerial office-holder optimally decides whether to initiate the second bill early or late. According to the full pay-offs of the agenda timing game depicted in [Table 2](#), the ministerial office-holder's strategy set is given by

Table 2 Full payoffs of the agenda timing game

Partner type (Nature)	Partner choice (First bill)	Minister choice (Second bill)	Partner choice (second bill)	
			Approval	Scrutiny
Competitive	Approval	Late initiation	$(2X + B, -2X)$	$(X + B, -X)$
Competitive	Approval	Early initiation	$(2X + 2B, -2X)$	$(X - X/\alpha + 2B, -X + X/\alpha)$
Competitive	Scrutiny	Late initiation	$(X - X/\alpha + B, -X + X/\alpha)$	$(-X/\alpha + B, X/\alpha)$
Competitive	Scrutiny	Early initiation	$(X - X/\alpha + 2B, -X + X/\alpha)$	$(-2X/\alpha + 2B, 2X/\alpha)$
Cooperative	Approval	Late initiation	$(2X + B, -2X)$	$(X + B, -X - C)$
Cooperative	Approval	Early initiation	$(2X + 2B, -2X)$	$(X - X/\alpha + 2B, -X + X/\alpha - C)$
Cooperative	Scrutiny	Late initiation	$(X - X/\alpha + B, -X + X/\alpha - C)$	$(-X/\alpha + B, X/\alpha - 2C)$
Cooperative	Scrutiny	Early initiation	$(X - X/\alpha + 2B, -X + X/\alpha - C)$	$(-2X/\alpha + 2B, 2X/\alpha - 2C)$

$$\{(E|A_1, E|S_1), (E|A_1, L|S_1), (L|A_1, E|S_1), (L|A_1, L|S_1)\}, \quad (1)$$

where $(i|A_1, j|S_1)$ denotes a strategy of the office-holder to choose action $i \in \{E, L\}$ when the partner has approved the first bill (i.e., in the information set A_1) and action $j \in \{E, L\}$ when the partner has allowed for scrutinizing it (i.e., in the information set S_1). The strategy set of each partner type is given by $\{A_1A_2, A_1S_2, S_1A_2, S_1S_2\}$, where each strategy indicates his actions with regard to the first (A_1 or S_1) and second bill (A_2 or S_2).

2.3 Cooperative and Competitive Partnership Under Uncertainty

To illustrate the situation of uncertainty about the type of partner without learning over time, we start with a pooling equilibrium where the partner, regardless of her type, will always react in the same way to the first bill. As a result, the ministerial office-holder holds only a prior belief about the partner's type and has not enough information to update it over the probability distribution of the two different types. This also resembles the typical single-shot game of the static perspective on joint policy-making in coalition governance where the ministerial office-holder always initiates and the partner scrutinizes or not, but the ministerial office-holder continues to initiate regardless of her experience.

In the following, we show that there exists such an equilibrium in which the partner, regardless of his type, will always scrutinize the first bill and, depending on prior beliefs and the trade-off between position-taking benefits, challenging costs, and policy pay-offs, the ministerial office-holder may initiate the second bill early or late, and the partner may approve or scrutinize it. Interestingly, it turns out that in one of this kind of pooling equilibrium, the partner is going to approve immediately the second bill initiated by the ministerial office-holder even if he scrutinized the first bill. In response, the ministerial office-holder is going to initiate late the second bill.

However, this does not suggest that the reaction of different partner types is necessarily linear or repeats itself across stages. When learning is possible, the relation between experienced scrutiny and timing of bill initiation in the early period of a term may already change depending on the amount of interactions and how the ministerial office-holder and her constituency discount the policy pay-offs of bill initiation over time (Lu forthcoming). In other words, there is a trade-off between benefits from position-taking responsiveness and policy pay-offs over time, and the optimal timing and scrutiny behaviour of coalition parties may differ within a term. For example, when the ministerial office-holder and her constituency evaluate position-taking responsiveness at time T significantly higher than at a later stage $T + 1$ because coalition governance blurs responsibilities, it is likely that early initiation at the beginning of the term promises higher benefits to the ministerial office-holder and her party than late initiation even if it implies scrutiny of early initiated bills.

For simplicity, we first focus on the pooling equilibrium, which exists when the partner's challenging costs are not large enough. We begin with the pay-offs of the competitive and the cooperative partners. Compared to the cooperative partner, the competitive partner has a dominant strategy to subject the first and the second bill to parliamentary scrutiny. In contrast to the pooling equilibrium, in which the cooperative partner pursues the same strategy as the competitive partner, the cooperative partner responds—depending on sufficiently large challenging costs—differently in the separating equilibrium.

2.3.1 Pay-off of Competitive Partner

We first demonstrate that for the competitive partner, scrutinizing both the first and second bill is the dominant strategy. As for the first bill, the *competitive* type's overall pay-off from approving it (and then subsequently allowing for scrutiny of the second bill) is given either by $-X + \frac{X}{\alpha}$ (in case the ministerial

office-holder initiates the second bill early) or by $-X$ (in case the ministerial office-holder initiates it late). If the *competitive* type, instead, allows for scrutiny of the first bill (and then subsequently allows for scrutiny of the second) then his pay-off amounts either to $\frac{2X}{\alpha}$ (in case of early initiation) or to $\frac{X}{\alpha}$ (in case of late initiation). It follows that the *competitive* partner type's pay-off from allowing for scrutiny of the first bill (i.e., either $\frac{2X}{\alpha}$ or $\frac{X}{\alpha}$) is higher than from approving it (i.e., either $-X + \frac{X}{\alpha}$ or $-X$). The *competitive* type has thus a dominant strategy of allowing for scrutiny of the first bill, S_1 . As for the second bill, the partner's pay-off from scrutiny is given either by $\frac{2X}{\alpha}$ (in case of early initiation by the ministerial office-holder) or by $\frac{X}{\alpha}$ (in case of late initiation by the ministerial office-holder), both of which are larger than the pay-offs from immediate approval, i.e., $-X + \frac{X}{\alpha}$.

2.3.2 Pay-off of Cooperative Partner

Having established that the dominant strategy of the competitive type is scrutinizing both the first and second bill, we proceed to analyse the strategies adopted by the cooperative partner type. Because the competitive partner will always scrutinize the first bill, the cooperative partner will do the same in the pooling equilibrium, which resembles the typical single-shot game of the static perspective on joint policy-making in coalition governance. Compared to the competitive partner, the strategies of the cooperative partner in the later stage are more complicated due to the presence of challenging costs. As demonstrated later, when the challenging costs are sufficiently high, a pooling equilibrium no longer exists and the ministerial office-holder starts to learn about the partner's type. We begin with considering a situation where the challenging costs are not high enough compared to the policy pay-offs, i.e., when $C \leq X + \frac{X}{\alpha}$, and the ministerial office-holder is unable to learn the partner type.

The cooperative partner's pay-offs from immediate approval or scrutiny of the second bill differ due to the trade-off between challenging costs and policy pay-offs. In case of early initiation, the partner's pay-offs from immediate approval and scrutiny are $-X + X/\alpha - C$ respectively $2X/\alpha - 2C$. It follows that the pay-off from scrutiny is always larger than that from immediate approval. Therefore, when the ministerial office-holder initiates the second bill early, the dominant strategy for the partner is to always scrutinize the bill. However, when the ministerial office-holder initiates the second bill late,

the best response by the partner depends on the trade-off between challenging costs and policy pay-off from scrutiny. Therefore, it follows that when the challenging costs are larger than the policy payoff, i.e., when $C > X$, the best response by the partner is to approve the second bill immediately, and scrutinize the bill otherwise.

2.3.3 Pay-off of Office-holder

From the above discussion of the policy pay-offs of the competitive and cooperative partner type, we can calculate the pay-off of the ministerial office-holder from early initiation as a weighted average of the payoffs associated with having a competitive or a cooperative partner:

$$\begin{aligned} U_M^E &= Pr(\text{Competitive})U_M^E(S_2|\text{Competitive}) + Pr(\text{Cooperative})U_M^E \\ &\quad (S_2|\text{Cooperative}) \\ &= q\left(-\frac{2X}{\alpha} + 2B\right) + (1-q)\left(-\frac{2X}{\alpha} + 2B\right) \\ &= -\frac{2X}{\alpha} + 2B \end{aligned}$$

Similarly, conditioned by the relative values of challenging costs C and policy pay-offs X , the pay-off of the ministerial office-holder from late initiation is

$$U_M^L = \begin{cases} -\frac{X}{\alpha} + B + q(B - \frac{X}{\alpha}) & \text{if } C < X, \\ X - \frac{X}{\alpha} + B + q(B - X - \frac{X}{\alpha}) & \text{if } X \leq C < X + \frac{X}{\alpha}. \end{cases}$$

Therefore, the ministerial office-holder initiates the second bill early if and only if the early initiation pay-off from position-taking benefits B is larger than the policy payoff from late initiation, which implies

$$B > X + \frac{X}{\alpha}. \quad (2)$$

Otherwise, late initiation is a better strategy for the ministerial office-holder. In this case, if $B < \frac{X}{\alpha}$ and $C < X$, the partner will scrutinize the second bill; if $B < X + \frac{X}{\alpha}$ and $X < C < X + \frac{X}{\alpha}$, the partner will approve the bill immediately.

2.3.4 Equilibrium Under Uncertainty Without Learning

When the challenging costs are not large enough, i.e., when $C \leq X + \frac{X}{\alpha}$, there exists a pooling equilibrium in which both types of the partner will scrutinize the first bill and the competitive type will also scrutinize the second bill. This decision to scrutinize the second bill by the cooperative partner depends on the trade-off between challenging costs and policy pay-offs. The following proposition summarizes the results from the pooling equilibrium:

Proposition 1. *For challenging costs that are not large enough (i.e., for $C \leq X + \frac{X}{\alpha}$), there exists a perfect Bayesian equilibrium with pooling strategies by the partner such that:*

- *both the competitive and cooperative partner allows for scrutiny of the first bill, S_1 , while the competitive partner will always scrutinize the second bill;*
- *the ministerial office-holder is unable to infer the partner's type and therefore has to rely on the prior belief over the type of the partner;*
- *after scrutiny, the ministerial office-holder initiates the second bill early, $E|S_1$, if $B > X + \frac{X}{\alpha}$ and, accordingly, the partner will scrutinize the second bill S_2 regardless of her type;*
- *otherwise, if $B < \frac{X}{\alpha}$ and $C < X$, the ministerial office-holder will initiate the second bill late $L|S_1$ and the cooperative partner will scrutinize the second bill S_2 ; if $B < X + \frac{X}{\alpha}$ and $X < C < X + \frac{X}{\alpha}$, the cooperative partner will approve the second bill A_2 .*

2.3.5 Equilibrium Under Uncertainty with Learning

In the pooling equilibrium, when the challenging costs are not large enough, the ministerial office-holder is unable to infer the type of partner and has to rely on her prior belief about partnership, because the partner reacts in the same ways regardless of her type. She will pursue an early timing of bill initiation for the second bill when the benefits from position-taking responsiveness outweigh the policy losses from further scrutiny. Given Proposition 1, the ministerial office-holder's expected pay-off from early initiation of the first bill depends on the scrutiny probability q when the timing decision depends on the prior belief of the ministerial office-holder about partnership. Under uncertainty, this scrutiny probability q may already affect the timing of the first bill initiation, which we define by

$$\begin{cases} q\left(-\frac{2X}{\alpha} + 2B\right) + (1-q)(2X + 2B) & \text{if } B > \frac{X}{\alpha}, \\ q\left(-\frac{X}{\alpha} + B\right) + (1-q)(2X + 2B) & \text{if } B \leq \frac{X}{\alpha}. \end{cases} \quad (3)$$

If the ministerial office-holder initiates the first bill late in the term, then neither the ministerial office-holder's nor the partner's pay-offs from the second bill change, while their pay-offs from the first bill change as follows: first, in case the initial bill gets scrutinized, both of them will receive no additional policy pay-off because the late bill will reflect the coalition compromise. Second, the ministerial office-holder will receive no benefit from position-taking responsiveness since she introduces the first bill late in the term as coalition governance is blurring responsibilities. Intuitively, late initiation of the first bill implies losses in terms of forgone position-taking benefits B but also hinders the scrutiny process and therefore saves policy losses $\frac{X}{\alpha}$.

Even if the ministerial office-holder initiates the first bill late, the *competitive* partner type has a dominant strategy of allowing for scrutiny of both bills, S_1S_2 , while the *cooperative* partner type has a dominant strategy of approving both bills, A_1A_2 . The ministerial office-holder therefore learns the partner's type despite late initiation of the first bill. She will then early initiate the second bill after endorsement of the first bill, $E|A_1$. In turn, after scrutiny of the first bill, she will initiate her second bill early, $E|S_1$, whenever $B > \frac{X}{\alpha}$, and late, $L|S_1$, whenever $B \leq \frac{X}{\alpha}$.

This implies that timing of the first bill initiation has no impact on the ministerial office-holder's and partner's subsequent incentives. In other words, the ministerial office-holder and partner follow the same equilibrium strategies independently of whether the first bill has been introduced early or late in the term. However, given that their pay-offs from the first bill depend on its early or late timing, the ministerial office-holder's expected pay-off from late initiation differs from her payoff from early initiation and is given by

$$\begin{cases} q\left(-\frac{X}{\alpha} + B\right) + (1-q)(2X + B) & \text{if } B > \frac{X}{\alpha}, \\ (1-q)(2X + B) & \text{if } B \leq \frac{X}{\alpha}. \end{cases} \quad (4)$$

Comparing the ministerial office-holder's expected payoffs, (2.3) and (2.4) shows that she will introduce the first bill early whenever $B > q \cdot \frac{X}{\alpha}$ and late otherwise. She initiates the first bill early whenever the position-taking benefits B exceed her expected policy loss $q \cdot \frac{X}{\alpha}$. The following proposition summarizes these findings in the case of learning from timing of the first bill initiation.

Proposition 2. *For sufficiently large challenging costs (i.e., for $C > X + \frac{X}{\alpha}$), there exists a perfect Bayesian equilibrium such that:*

- *the competitive partner allows for scrutiny of both bills while the cooperative partner approves both bills;*
- *the ministerial office-holder initiates the first bill early if $B > q \cdot \frac{X}{\alpha}$ and late if $B \leq q \cdot \frac{X}{\alpha}$;*
- *the ministerial office-holder learns the partner's type after having observed his actions with respect to the first bill, i.e., she learns that she faces a competitive (cooperative) partner after her first bill has been scrutinized (approved);*
- *after the approval of the first bill, the ministerial office-holder initiates the second bill early, and;*
- *after the scrutiny of the first bill, the ministerial office-holder initiates the second bill early if $B > \frac{X}{\alpha}$ and late if $B \leq \frac{X}{\alpha}$.*

At the beginning of the term, the amount of position-taking benefits is decisive for the timing of bill initiation. If ministerial office-holders believe that showing immediate responsiveness to the distinct demands of their constituency provides for high position-taking benefits, which exceed the policy losses from scrutiny, they will initiate early. However, under uncertainty, ministerial office-holders can only rely on their prior belief about the type of partner because they have either no or limited opportunities to learn about their type from experienced scrutiny.

2.4 Coalition Squabbles Through Learning

In the equilibrium analyses of the initial period, the ministerial office-holder is either unable or has limited opportunity to learn the partner's type under uncertainty. We further consider situations in which the ministerial office-holder is able to learn about the partner's type by variation of experienced scrutiny over time, i.e., the competitive type always scrutinizes the first and second bill while the cooperative type shows mixed reactions. To outline this situation of coalition squabbles, which we expect to dominate in the mid-periods of joint policy-making in coalition governance, we discuss two situations where the challenging costs are either not large enough ($C \leq X + \frac{X}{\alpha}$), so that the partner switches between scrutiny and immediate approval across stages, or where sufficiently large challenging costs for scrutiny exist (i.e., for $C > X + \frac{X}{\alpha}$).

2.4.1 Pay-off of Partner

Again, we start with the partner's pay-offs after observing the ministerial office-holder's action of early or late initiation. We focus on the pay-offs of the cooperative type and omit the discussion of the pay-offs of the competitive partner type, because they are the same as in the pooling equilibrium. If the partner immediately approves the first bill (and then subsequently approves the second one), then his pay-off is equal to $-2X$ (independently of whether the ministerial office-holder initiates the second bill early or late). In turn, his pay-off from allowing for scrutiny of the first bill (and then subsequently approving the second one) amounts to $-X + \frac{X}{\alpha} - C$ (again independently of the ministerial office-holder's decision about the second bill).

For the pay-off of the cooperative partner, we distinguish the level of challenging costs C for scrutiny. First, when challenging costs C are large enough, it follows that the *cooperative* type's pay-off from approving the first bill (i.e., $-2X$) exceeds that from allowing for its scrutiny (i.e., $-X + \frac{X}{\alpha} - C$). Therefore, the *cooperative* type has a dominant strategy of immediately approving the first bill, A_1 . Hence, the *competitive* type will allow for scrutiny of both bills, S_1S_2 , while the *cooperative* type will immediately approve both bills, A_1A_2 . The ministerial office-holder realizes this and knows that she faces a *competitive* (or *cooperative*) partner when her first bill has been scrutinized (or approved). The ministerial office-holder therefore can thus anticipate the partner's reaction to her second bill.

Second, when challenging costs C are not large enough $C \leq X + \frac{X}{\alpha}$, the pay-off from scrutiny is always larger than that from immediate approval. It follows that scrutiny is the dominant strategy for the cooperative partner when the ministerial office-holder initiated the second bill early. By contrast, if the ministerial office-holder initiated the second bill late, the pay-offs of the cooperative partner from immediate approval and scrutiny are $-2X$ respectively $-X - C$. Thus, the partner will scrutinize the second bill if $X > C$, and immediately approve it otherwise.

2.4.2 Pay-off of Office-holder

Knowing the best response of the partner, we are able to calculate the expected pay-offs of the ministerial office-holder from early or late initiation. First, we consider the case in which the ministerial office-holder observed that her first bill has been scrutinized and so knows that she faces a *competitive* partner,

who will also allow for scrutiny of her second bill. If the partner ministerial office-holder initiates the second bill early, then her pay-off is given by $-\frac{2X}{\alpha} + 2B$. When the ministerial office-holder initiates the bill late, her policy pay-off depends on the relative challenging costs of the partner. When the challenging costs of the partner are larger than the policy pay-off $X < C$, the partner will not scrutinize the second bill and thus the pay-off for the ministerial office-holder from late initiation is $X + B$. However, if she initiates the second bill late, it is also possible that the scrutiny process cannot be completed by the end of the term and she will get $-\frac{X}{\alpha} + B$. The ministerial office-holder therefore faces a trade-off between gaining position-taking benefits B and hindering the scrutiny process (and thus avoiding policy loss $\frac{X}{\alpha}$).

Second, we discuss the case when the ministerial office-holder observed that her first bill has been immediately approved and so knows that her partner is *cooperative*, who will also immediately approve her second bill. The ministerial office-holder's pay-off from early initiating of the second bill amounts to $2X + 2B$ in this case. In turn, her pay-off from late initiation of the second bill is equal to $2X + B$. It follows that after endorsement of the first bill, the ministerial office-holder will initiate the second bill early, $E|A_1$.

2.4.3 Equilibrium for Cooperative Partnership

In this period of coalition governance, the ministerial office-holder knows that she faces a *cooperative* partner after her first bill had been immediately approved. Only for $B \leq \frac{X}{\alpha}$, the ministerial office-holder opts for late initiation after her first bill has been scrutinized, while the ministerial office-holder initiates the second bill early in the term for $B > \frac{X}{\alpha}$. In this case, the ministerial office-holder's benefit from position-taking responsiveness B outweigh pay-off losses $\frac{X}{\alpha}$. As a result, the ministerial office-holder initiates early after she learned that her partner is a *cooperative* type. It follows that the equilibrium probability amounts to

$$\begin{cases} 0 & \text{if } B > \frac{X}{\alpha}, \\ q & \text{if } B \leq \frac{X}{\alpha}, \end{cases}$$

i.e., for $B \leq \frac{X}{\alpha}$, it is initiated late when the partner is a *competitive* type (recall that the partner is *competitive* with probability q), while the second bill is initiated early for $B > \frac{X}{\alpha}$. It follows that after scrutiny of the first bill, the ministerial office-holder will initiate her second bill early, $E|S_1$, whenever $B > \frac{X}{\alpha}$, and late, $L|S_1$, whenever $B \leq \frac{X}{\alpha}$. This analysis results in the following proposition:

Proposition 3. *For sufficiently large challenging costs (i.e., for $C > X + \frac{X}{\alpha}$), there exists a perfect Bayesian equilibrium such that:*

- *the competitive partner allows for scrutiny of both bills, S_1S_2 , while the cooperative partner approves immediately both bills, A_1A_2 ;*
- *the ministerial office-holder learns the partner's type, i.e., she learns that she faces a cooperative (competitive) partner after her first bill has been immediately approved (scrutinized);*
- *after the partner's immediate approval of the first bill, the ministerial office-holder initiates the second bill early, $E|A_1$;*
- *after scrutiny of the first bill, the ministerial office-holder initiates the second bill early, $E|S_1$, if $B > \frac{X}{\alpha}$ and late, $L|S_1$, if $B \leq \frac{X}{\alpha}$.*

For sufficiently large challenging costs (i.e., for $C > X + \frac{X}{\alpha}$), the ministerial office-holder may not only choose the timing of the second bill initiation (early or late in the term) but also adjust the content of the second bill. We formalize this by assuming that the ministerial office-holder's and partner's policy pay-offs from the passage of the adjusted bill amount to λX and $-\lambda X$, respectively, where $0 < \lambda < 1$, i.e., the ministerial office-holder moderates the bill content in favour of the partner's policy interests at the expense of her own policy positions (but still not to the point that reflects the coalition compromise). Similar to above, the *competitive* partner type will allow for scrutiny of the adjusted bill (if $-\lambda X < \frac{\lambda X}{\alpha}$), while the *cooperative* type will approve the adjusted bill (if $-\lambda X > \frac{\lambda X}{\alpha} - C$). It follows that independently of the content and timing initiation of the second bill, the *competitive* partner type has a dominant strategy of allowing for scrutiny of both bills, S_1S_2 , while the *cooperative* partner type has a dominant strategy of approving both bills, A_1A_2 . The ministerial office-holder thus learns the partner's type after having observed his reaction to the first bill and, therefore, realizes that her second bill will encounter the same reaction from the partner.

When the partner immediately approves the first bill, the ministerial office-holder decides between early initiation of the second bill (with the corresponding pay-off of $X + B$), a content adjustment of the second bill and subsequent early initiation of the adjusted bill (with the corresponding pay-off of $\lambda X + B$), or late initiation of the second bill (with the corresponding pay-off of X). The ministerial office-holder will opt for early initiation of the second bill in this case, $E|A_1$. After scrutiny of the first bill, the ministerial office-holder realizes that her second bill will also be scrutinized and decides between the same three options (which, however, imply lower pay-offs): the early initiation of

the second bill (with the corresponding pay-off of $-\frac{X}{\alpha} + B$), the content adjustment of the second bill and subsequent early initiation of the adjusted bill (with the corresponding pay-off of $-\frac{\lambda X}{\alpha} + B$), or the late initiation of the second bill (with the corresponding pay-off of 0). The ministerial office-holder will adjust the bill content and initiate it early whenever $B > \frac{\lambda X}{\alpha}$, and keep the bill content but initiate it late whenever $B \leq \frac{\lambda X}{\alpha}$. This complements Proposition 3 where the ministerial office-holder adjusts the content of the second bill after scrutiny of the first bill and initiates it early if $B > \frac{\lambda X}{\alpha}$, and does not adjust the bill content and initiates it late if $B \leq \frac{\lambda X}{\alpha}$.

2.4.4 Equilibrium for Competitive Partnership

Our dynamic perspective suggests that the cooperative and competitive incentives for joint policy-making may change over time. To capture these dynamics, we also investigate situations in which the challenging costs are not sufficiently large, which means that cooperation becomes more difficult. In such situations, the ministerial office-holder already knows that the partner will scrutinize the second bill to gain additional policy pay-offs even if a cooperative type had immediately approved the first bill ($E|A_2$). If this is an equilibrium strategy, alternative choices should not yield higher pay-offs and thus both players have no incentives to deviate. Thus, we consider the off-equilibrium path where the ministerial office-holder may deviate from early to late initiation. To avoid shifting, the position-taking benefits must be large enough, i.e., $B > X + \frac{X}{\alpha}$.

When the ministerial office-holder initiates the bill late $L|A_2$, there are two possible equilibrium choices for the partner: to approve immediately or to allow for scrutiny. Consider first the case of approval. The pay-off of the ministerial office-holder is $2X + B$, while the pay-off from shifting the choice to early initiation will yield a higher pay-off of $2X + 2B$. Thus, the ministerial office-holder has the incentive to deviate from the original choice, which eliminates the possibility of this equilibrium. Consider the second choice of scrutiny, which yields a pay-off of $X + B$ for the ministerial office-holder. In order to avoid deviation, an off-equilibrium constraint has to be imposed, i.e., $X + B > X - \frac{X}{\alpha} + 2B$, which results in $B < \frac{X}{\alpha}$, meaning when the position-taking benefits are small enough, the ministerial office-holder will initiate the second bill late and has no incentives to deviate from the choice. Overall, we have the following proposition:

Proposition 4. *For challenging costs that are not large enough (i.e., for $C \leq X + \frac{X}{\alpha}$), there exists a perfect Bayesian equilibrium with separating strategies by the partner such that:*

- *the competitive partner allows for scrutiny of the first bill, S_1 , while the cooperative partner approves immediately the first bill, A_1 ;*
- *the competitive partner will always scrutinize the second bill;*
- *the ministerial office-holder learns the partner's type from the scrutiny behaviour of the partner on the first bill and updates her beliefs;*
- *after immediate approval, the ministerial office-holder initiates the second bill early, $E|A_1$, if $B > X + \frac{X}{\alpha}$ and, accordingly, the partner will scrutinize the second bill S_2 regardless of her type;*
- *otherwise, if $B < \frac{X}{\alpha}$ and $C < X$, the ministerial office-holder will initiate the second bill late $L|A_1$ and the cooperative partner will scrutinize the second bill S_2 .*

While the competitive partner always scrutinizes her bill proposals, the office-holder's bill initiation timing decision depends on the amount of position-taking benefits in relation to the level of challenging costs. In the mid-period toward the end of the term, the ministerial office-holder faces a trade-off between gaining position-taking benefits B and hindering the scrutiny process (and so avoiding policy loss $\frac{X}{\alpha}$), while the challenging costs C may change with upcoming elections. These findings reinforce that for $B \leq \frac{\lambda X}{\alpha}$, experiencing scrutiny still gives the ministerial office-holder incentives to initiate the second bill late in the term even if she has the option to adjust the bill content. Furthermore, our predictions about the impacts of coalition policy divergence and the ministerial office-holder's power on the relationship between experienced scrutiny and late initiation of bills hold independently on whether the ministerial office-holder can adjust the bill content or not.

In the above equilibrium analyses, we presented general expectations about bill initiation timing in face of potential scrutiny by coalition partners. Distinguishing between pooling and separating equilibria, our analysis also implies that the incentives of bill initiation and scrutiny may vary depending on the trade-off between benefits from position-taking responsiveness and challenging costs (and consequently reputation and policy loss) across different periods of a term. This variation can be further elaborated by considering the potential discounting effect of benefits from position-taking responsiveness from early to late initiation within a term. While ministerial office-holders can

demonstrate commitment to the distinct demands of their constituencies by introducing salient and uncontested bills at the beginning of a term, this benefit is likely to decrease as coalition governance blurs responsibilities over time. Thus, it indicates that not only a pooling equilibrium may shift to a separating equilibrium, but also the kind of separating equilibrium can shift with changing challenging costs over time. At the very end of a term, the temporal challenge for joint policy-making in representative democracy may not only imply reputational costs to a scrutinized ministerial office-holder, but also induce the risk for coalition parties that the implementation of the common policy agenda fails. With this in mind, we present our hypotheses in the following section.

2.5 Hypotheses on Learning Partnership Type

Our theory suggests that ministerial office-holders learn about their partners' type after observing whether their previous bills have been scrutinized or immediately approved. Compared to a static view on coalition governance, which assumes that coalition parties do not learn and adapt their behaviour over time, our dynamic perspective makes predictions for different levels of position-taking benefits and challenging costs in joint policy-making, which can vary over time. At the beginning of the term, showing responsiveness may enhance a party's credibility in the eyes of its constituency, which usually decreases when coalition governance blurs responsibilities over time. Only when ministerial office-holders can expect high position-taking benefits for their party, the static and dynamic perspectives predict early initiation. A further predictor for early or late timing of bill initiation concerns the amount of challenging costs, which can also vary over time. At the end of the term, the challenging costs are likely to change with upcoming elections, and the time is limited for joint policy-making that may constrain the implementation of the common policy agenda. Our theoretical analysis provides four propositions, from which we derive our hypotheses on experienced scrutiny, the interaction with coalition policy divergence, the power of the ministerial party, and the dynamics of learning within a term.

2.5.1 Learning from Experienced Scrutiny

The first proposition concerns the challenging costs for the partner to scrutinize government bills. If these costs are not large enough, e.g., when

parliamentary institutions are strong, ministerial office-holders cannot learn about their partners' type because a cooperative and a competitive partner will always scrutinize the first government bill. Compared to this static perspective on strong or weak parliamentary institutions, the temporal dimension on coalition governance suggests that benefits from position-taking responsiveness and challenging costs for scrutiny of government bills can vary over time. Ministerial office-holders still initiate the second bill early when the benefits from position-taking responsiveness amount the costs from experienced scrutiny, while they will initiate late when the costs from experienced scrutiny are higher than their benefits from position-taking responsiveness. This draws attention to the implications of experienced scrutiny for the timing of bill initiation.

Specifically, greater experienced scrutiny reveals to ministerial office-holders that they face a competitive partner and that they will be constrained in their immediate attempt to respond to the distinct demands of their constituency, giving incentives for late initiation of subsequent government bills. Immediate approval of bills, in turn, indicates to ministerial office-holders that their partner is a cooperative type, which provides incentives to generate benefits from position-taking responsiveness through early bill initiation. This implies the following hypothesis: *the more scrutiny government bills have experienced, the later in the term ministerial office-holders initiate subsequent bills.*

2.5.2 Interaction with Coalition Policy Divergence

While our first proposition examines situations in which challenging costs are not large enough and the ministerial office-holders cannot learn about their partner's type, which resembles the static perspective on coalition governance, our second proposition considers sufficiently large challenging costs and the possibility that the competitive partner always scrutinizes while the cooperative type always approves the first bill. For sufficiently large challenging costs, only competitive partners scrutinize the first bill and ministerial office-holders can update their beliefs and initiate the second bill early when they learn about the cooperative partner type after the first bill has immediately been approved; otherwise, they will initiate late and the cooperative partner will scrutinize the second bill to gain additional policy pay-off.

In response of having learned about a competitive partner type, ministerial office-holders have more incentives for late initiation of bills to hinder further scrutiny. For learning about cooperative partnership, the relationship

between experienced scrutiny and partner type is affected by the policy pay-off, the size of which depends on the policy divergence of coalition parties. As the policy divergence increases, the policy pay-off of the office-holder from ministerial drift also increases. The more divergent the policy positions of coalition parties, the higher the motivation of both types of partners to gain additional policy payoff from scrutiny of government bills. This leads to our second hypothesis: *the higher the policy divergence between the coalition parties, the stronger the positive effect of experienced scrutiny on late initiation of bills.*

2.5.3 Interaction with Ministerial Power

Our second proposition considers mixed partner strategies, in which the competitive partner always scrutinizes, and the cooperative partner always immediately approves the first government bill. On the one hand, benefits from position-taking responsiveness and additional policy pay-off from scrutiny are decisive for the timing of bill initiation, which increase with higher coalition policy divergence. In this scenario of mixed strategies with sufficiently large challenging costs, our second proposition also suggests that the relationship between experienced scrutiny and timing of bill initiation is affected by the power of the ministerial office-holder's party α to constrain scrutiny activities of the coalition partner on the second bill. The more powerful the party of the ministerial office-holder, the less likely are additional scrutiny activities of her partner.

In addition to the relative power of coalition parties, often measured by their relative seat shares in government (Gamson 1961), the median voter theorem of Black (1948) and Laver and Schofield (1990) predicts that government bills will approximate this policy position. Consequently, the ministerial office-holder incurs fewer policy losses, reducing her incentives to hinder further scrutiny by late initiation. This implies our third hypothesis: *the more powerful the party of the ministerial office holder, the weaker the positive effect of experienced scrutiny on the late initiation of bills.*

2.5.4 Dynamics of Learning Over Time

The three hypotheses on experienced scrutiny, coalition policy divergence, and ministerial power address the general learning effects about the partnership type, which may also vary within a term. At the beginning of a

term, ministerial office-holders have only a prior belief over their partner's type. However, after successful coalition formation with agreement on a common policy agenda and allocation of portfolios, ministerial office-holders may not necessarily assume to be confronted with a competitive partner type in joint policy-making. Furthermore, the likelihood of generating benefits from position-taking responsiveness is high when coalition governance do not yet blur responsibilities and the voters still remember the electoral pledges of coalition parties. Under these circumstances, ministerial office-holders can benefit from early timing of bill initiation, especially for salient bills that are less important for their partner. According to our first and second proposition, (uncertain) ministerial office-holders will early on initiate the second bill even if their first bill experienced scrutiny when the benefits from position-taking responsiveness promise a higher policy pay-off and the partner will receive a policy pay-off in relation to the office-holder's power. This leads us to the fourth hypothesis: *at the beginning of the term, ministerial office-holders are more likely to initiate salient uncontested bills.*

2.5.5 Coalition Squabbles After Learning

At the beginning of the term, both the ministerial office-holders and their partners have little experiences from joint policy-making about their type of partnership and must rely on their prior beliefs. After several interactions in joint policy-making, they are more likely to know about the partner's type because the competitive partner always scrutinized their bills while the cooperative partner pursued a mixed strategy. Over time, ministerial office-holders can thus more accurately infer a cooperative or competitive partner type, the latter revealing a less supportive policy-making environment for further bill initiation. Similarly, ministerial office-holders can learn that they face a cooperative partner type after immediate approval of their bills, while their subsequent bills still risk scrutiny. In this period of coalition squabbles, ministerial office-holders may opt for early or late initiation of subsequent bills depending on the level of experienced scrutiny, coalition divergence, and the power to avoid scrutiny. Following our third proposition, ministerial office-holders can infer the type of partner but will, however, initiate bills early after having experienced scrutiny when the benefits from position-taking responsiveness still outweigh their policy losses. This implies our fifth hypothesis: *in periods of coalition squabbles, ministerial office-holders perform a mixed timing strategy of early and late initiation.*

2.5.6 Declining Shadow of the Future

With upcoming elections, the (mixed) motivations for generating benefits from position-taking responsiveness and losses from scrutiny may change again. Since coalition parties are temporally limited to implement their common policy agenda within a term, the conditions for partnership change with upcoming elections, in which coalition parties compete separately. When the time constraint imposed by representative democracy is likely to limit the shadow of the future, the competitive incentives increase, which means that the partner—regardless of his type—is more likely to allow for scrutiny of government bills in parliament. The ministerial office-holder thus faces a trade-off when the policy-making process cannot be completed by the end of the term, so that she will delay initiation when the benefits from position-taking responsiveness do not outweigh losses from scrutiny. This leads us to our sixth hypothesis: *with upcoming elections, the environment for joint policy-making becomes more competitive, which delays the initiation of government bills.*

This variation in agenda timing strategies highlights our dynamic perspective on joint policy-making of coalition governance. In addition to learning through experienced scrutiny, coalition divergence, and power, we expect that ministerial office-holders will adapt their bill initiation timing behaviour within a term to the conditions of partnership, which change over time due to the temporal limitation of governmental activities in representative democracy. Therefore, the dynamic perspective on joint policy-making advocated in this book aims to understand the temporal fluctuations in coalition governance over time, considering spatial and temporal challenges and external contextual influences for agenda timing in joint policy-making of coalition governance.

The Cyclical Nature of Joint Policy-making

3.1 Analysing Spatial and Temporal Challenges

Our dynamic perspective on learning the type of partnership provides a theoretical foundation for understanding the spatial and temporal challenges faced by coalition parties in implementing a common policy agenda within representative democracy. While the spatial challenges are defined by the diverse distribution of policy positions and power among coalition parties, the time to implement a common policy agenda and learn about the partner's type is limited by the duration of a term. During the term, ministerial office-holders are responsible for the implementation of the common policy agenda within their respective portfolios. They can initiate government bills early to demonstrate responsiveness to the distinct demands of their constituency, seeking benefits from position-taking that cannot be achieved through late initiation. Similarly, coalition partners face temporal constraints when deciding whether to challenge government bills that deviate from the common policy agenda with previously agreed compromise.

Expanding on previous research on the spatial challenges of coalition governance, we draw attention to the temporal challenges in joint policy-making of coalition parties within a term. What sets our research apart is its focus on how ministerial office-holders use their experience of parliamentary scrutiny of their bills to infer the type of their partnership in joint policy-making. In our analysis, we examine how the scrutiny exposure of bills influences ministerial office-holders' timing of their bill initiation within the constrained period of a term. Our theoretical consideration of coalition governance, which combines the spatial and temporal challenges of joint policy-making in representative democracy, has important implications for our research design and estimation strategy on the timing of bill initiation. The timing data are periodic and contain directional observations that lie on the circumference of a unit circle like a clock. Therefore, unlike measurements on a linear scale, the analysis of the timing of bill initiation within a distinct period demands a method that captures the periodicity inherent in the data generation process.

Analysing the timing of bill initiation requires consideration of this cyclical nature, defined by periods in the beginning, middle, and end of a term. Terms typically commence with a preparatory period, progress into a mid-term period, and conclude with a final period leading up to election day. Term limitations prevent discontinuity in policy-making in most representative democracies, i.e., the possibility that a government of today can exert power for policy-making of tomorrow (König 2007). We expect that these periods create dynamics of coalition governance within a term, where the balance between cooperative and competitive incentives for coalition governance may change over time. Consequently, to estimate the timing of bill initiation accurately, we need an estimation strategy that goes beyond conventional linear representations, so that we can capture the periodicity inherent in the data generation process. Statistically, periodic data of timing of bill initiation do not have distinct minimum or maximum time points. Instead, the timing of bills is recorded iteratively within a fixed term. More precisely, the periodic data contain directional observations that lie on the circumference of a unit circle, a sphere, a torus, or, when considering multiple dimensions, a unit hypersphere (Ley and Verdebout 2017).

Outside political science, the estimation of periodic data is common in disciplines like meteorology, geography, climatology, biology, oceanography, astronomy, ecology, and recently also in other disciplines of the social sciences (Mardia and Jupp 2000; Pewsey and García-Portugués 2021). The key features of periodic data are non-linear and non-Euclidean in nature, complicated by curvature of sample space around cycles or other non-linear manifolds (Ley and Verdebout 2017). Compared to representations in Euclidean space, a circular observation is typically represented by an angle θ and bounded by an interval of length 2π . The exact measure depends on the choice of the origin and the direction of rotation, i.e., whether the angle increases clockwise or anti-clockwise. Although much data in political science are cyclical in nature—especially those under the temporal constraints of representative democracy—they are usually not considered this way. Thus, for an initial exploration of the data, we begin by presenting visual representations of circular regression and descriptions of our dataset before examining our primary hypotheses regarding how ministerial office-holders gradually learn the partnership type of their counterparts over time.

3.2 Estimating Periodic Data: Generalized Circular Regression

A common strategy for estimating periodic data is circular regression (see e.g., Gill and Hangartner 2010; Mardia 1972; Mulder and Klugkist 2017). Circular regression belongs to the toolbox of direction statistics, where a circular observation corresponds to a point on a circle of unit radius (Mardia 1972; Mardia and Jupp 2000). On a circle of unit radius, any distribution used to estimate periodic data must satisfy the condition

$$\begin{cases} f(z + 2\pi) = f(z) \\ \int_{-\pi}^{\pi} f(z) dz = 1 \end{cases}, \quad (5)$$

where the angle $z \in [-\pi, \pi]$.¹ The von Mises distribution satisfies these conditions with the probability density function

$$f(z) = [2\pi I_0(\kappa)]^{-1} \exp\{\kappa \cos(z - \mu)\}, \quad (6)$$

where $I_0(\kappa)$ is the modified Bessel function of the first kind with order 0, μ is the location parameter and κ is the scale parameter.

For circular regression analysis, it is necessary to reparameterize the distribution to incorporate a set of independent variables. A common practice is to reparameterize the mean parameter μ in terms of a linear combination of the feature vector \mathbf{x}_i and the associated coefficients $\boldsymbol{\beta}$ (see, e.g., Gill and Hangartner 2010 and Fisher and Lee 1992) so that

$$\mu_i = \mu_0 + g^{-1}(\mathbf{x}_i^T \boldsymbol{\beta}) \quad (7)$$

where μ_0 is the circular intercept and $g^{-1}(\cdot)$ is a link function with $2\arctan(\cdot)$. The scale parameter κ is assumed to be the same across observations. Mulder and Klugkist (2017) show that when \mathbf{x}_i is discrete, the above parameterization shifts not only location but also the shape of the prediction line, which leaves the shape to be an arbitrary choice of the reference group. Hence, to make the shape invariant of the discrete reference group, we separate the continuous and discrete variables (namely $\mathbf{x}_{i,c}$ and $\mathbf{x}_{i,d}$), and take the linear combination

¹ Alternatively, z can also take on values between 0 and 2π (e.g., Gill and Hangartner 2010). This depends on how researchers define the starting angle but has no consequences on the analysis as long as the length of the interval equals 2π .

of the discrete variables out of the link function. Consequently, our generalized circular regression takes the following form:

$$\mu_i = \mu_0 + \mathbf{x}_{i,d}^T \boldsymbol{\beta}_d + g^{-1}(\mathbf{x}_{i,c}^T \boldsymbol{\beta}_c). \quad (8)$$

As a result, the likelihood function given the set of parameters $\boldsymbol{\theta} = \{\mu_0, \kappa, \boldsymbol{\beta}_c, \boldsymbol{\beta}_d\}$ is

$$f(z|\boldsymbol{\theta}) = [2\pi I_0(\kappa)]^{-n} \times \exp \left\{ \kappa \sum_{i=1}^n \cos[z_i - (\mu_0 + \mathbf{x}_{i,d}^T \boldsymbol{\beta}_d + g^{-1}(\mathbf{x}_{i,c}^T \boldsymbol{\beta}_c))] \right\}.$$

The model can be estimated with a maximum likelihood estimator or Markov chain Monte Carlo solutions by imposing priors (for more details, see [Gill and Hangartner 2010](#) and [Mulder and Klugkist 2017](#)). Independent from parametrization, the visual analytical approaches are generally applicable.

To illustrate the advantages of this estimation strategy to predict the timing of bill initiation, consider the following synthetic case where a variable X , e.g., experienced scrutiny, influences the timing of bill initiation Y by a factor of 2, i.e., $Y = g^{-1}(2 * X)$.² In [Figure 3](#) the dashed grey line shows the prediction of a linear regression model, which extrapolates the estimation beyond the bounds of the timing outcome within a range of 2π , or, substantively a term in our analysis. As a result, the linear model predicts that an increase of experienced scrutiny X may imply either later or earlier bill timing depending on the values of X . In contrast, the solid black line shows the prediction of the circular regression, which bounds the dependent variable: it correctly estimates delayed initiation by a quarter with one unit increase of X .³

3.3 Visual Analytics of Circular Estimations

As the non-linear transformation of the periodic data complicates the interpretation of the circular estimates, most scholars focus on the sign and significance of the coefficients, with little efforts made for substantive interpretation.⁴ To overcome this shortcoming, we present a series of visual analytical tools for substantive interpretation of circular estimations, i.e., circular

² We simulate 100 observations assuming $X \sim N(0, 1)$.

³ This is due to $g^{-1}(2)/2\pi = 1/4$ derived by the link function $g^{-1}(\cdot) = 2\arctan(\cdot)$.

⁴ A notable exception is the work by [Cremers, Mulder, and Klugkist \(2018\)](#) who distinguish between average slope and slope at mean to assess marginal effects of predictors with projected normal distributions.

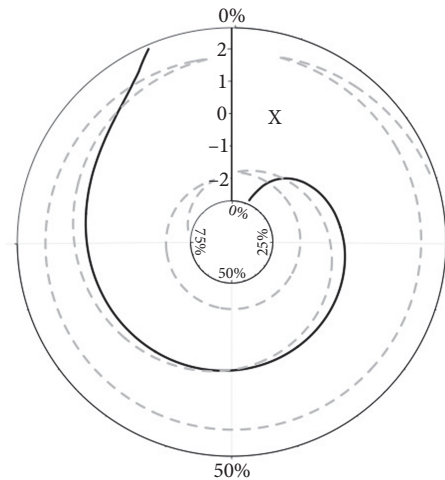


Figure 3 Effects of independent variable X on timing outcome.

Note: The solid black line represents the predictions by circular regression which correspond to the changes of true timing with increasing values of X and the grey dashed lines represent the predictions by a linear regression model.

description, circular prediction, and circular counterfactuals. First, beyond descriptive statistics of our dependent variable on the timing of bill initiation, we plot diagrams to explore the correlation structure between the dependent and independent variables, such as coalition policy divergence, opposition policy divergence, and power of the ministerial party. Second, we use circular graphs to identify and locate circular predictions, which offer an intuitive way to examine the fitness of our estimations on portfolio and partisan learning. Finally, we graphically visualise our substantive interpretations by simulated counterfactual scenarios that illustrate how changes of a certain variable impact the timing of bill initiation holding everything else constant.

To introduce our visual analytical tools, we generate two synthetic datasets of bill initiation timing with and without a dummy variable. Specifically, the first synthetic dataset considers the application of the discontinuity principle without wraparound effects at the resetting points at the beginning of the term, while the second dataset has strong wraparound effects. Unlike conventional linear regression, visualization of circular estimations demands one to project the measures onto polar coordinates. Specifically, the x-axis, which conventionally represents the values of an independent variable in a Cartesian coordinate system, is used to represent radii in a polar coordinate system, while the y-axis of the dependent variable is represented by the circumference

of a circle.⁵ We denote a circle from the starting point to the end point as a *term*. To facilitate substantive interpretation, we transform the angular measures from zero to 2π of circular outcomes to percentage measures from 0% to 100%, i.e., the closer a bill is initiated to the end of the term, the larger the percentage measure.

3.3.1 Circular Description of Bill Initiation Timing

The circular description plots illustrate common trends in our periodic data regarding the timing of bill initiation. They include both the unconditional distribution of circular outcomes and how bill initiation timing relates to key explanatory variables. Rose diagrams or circular histograms are frequently utilized to visualize these circular distributions (Mardia and Jupp 2000). Although these visual tools can be shown individually, we have integrated them into a single visualization in Figure 4. The circumferential points depict the timing of bill initiations, marked from 0% to 100% of a term. The x-axis corresponds to the radii, which remain constant as long as the distance to the centre is unchanged. To interpret these plots, one must identify the x value from the auxiliary concentric circles and locate the corresponding circular outcome on the y-axis at the circumference. For instance, the triangular point in Panel (a) of Figure 4 represents a bill initiation at $x = 0$ situated at the midpoint (50%) of a term.

Specifically, the first layer of the circular descriptive scatter plot illustrates the timing dispersion of all bill initiations throughout different periods of the term. In Panel (a), the majority of bill initiations occur in mid-term, while in Panel (b), more initiations are noted at the start of the term. The second layer presents a rose diagram of bars indicating the distribution of bill initiation timing densities across the term. The taller the bar at a specific interval, the more bills are initiated during that interval. Therefore, the diagram in the second layer presents the local timing dispersion by the height of each bar. The third layer goes beyond a simple description of the dependent variable (bill initiation timing) and incorporates independent variables of interest.

To examine the relationship between the independent variables and bill timing, a locally weighted linear regression line, along with a 95% confidence interval, is plotted on the scatter plot of the dependent and independent variables. It demonstrates that the performance of the locally weighted linear

⁵ Compared to the Cartesian coordinate system, the polar coordinate system allows for continuous visualization of observations and predictions across the resetting point. Such kind of polar coordinate transformation is done through an R package *circlize* (Gu et al. 2014).

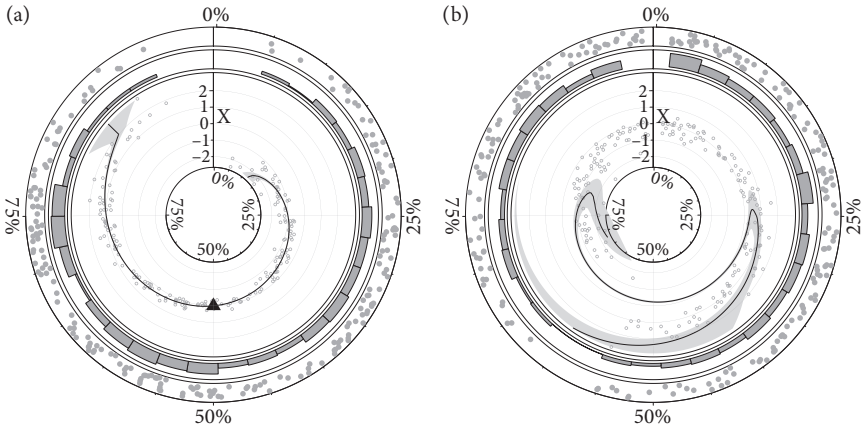


Figure 4 Circular description of bill initiation timing without (a) and with (b) wraparound effects.

regression differs between the two datasets. In the first dataset, with no wraparound effects and following the discontinuity principle, the locally weighted linear regression depicted in Panel (a) accurately shows the relationship between the independent variable x and the timing of bill initiation: as x increases, the initiation of the bill occurs later. Conversely, the prediction in Panel (b) is challenging to interpret due to wraparound effects at the reset point, indicating the necessity to additionally control for confounding variables.

3.3.2 Circular Prediction of Bill Initiation Timing

Given estimated parameters, circular predictions map covariates to predicted bill timing outcomes in a circular space. This mapping allows us to examine the explanatory power of our hypotheses on bill initiation timing and the validity of our results, for which we employ posterior predictions to capture uncertainty. In the equation, the posterior predictive distribution of bill initiation timing z^* is a function of the covariates \mathbf{x} by integrating circular parameters $\boldsymbol{\theta} = \{\mu_0, \kappa, \beta_c, \beta_d\}$:

$$f(z^*|\mathbf{x}) = \int_{\boldsymbol{\theta}} f(z^*|\boldsymbol{\theta}, \mathbf{x}) p(\boldsymbol{\theta}|\mathbf{x}) d\boldsymbol{\theta}, \quad (10)$$

where $f(\cdot)$ correspond to Equation (3.9), and $p(\boldsymbol{\theta}|\mathbf{x})$ is the posterior distribution of $\boldsymbol{\theta}$. Equation (3.10) incorporates the uncertainty of the predicted values given covariates. The above probability measure can be easily

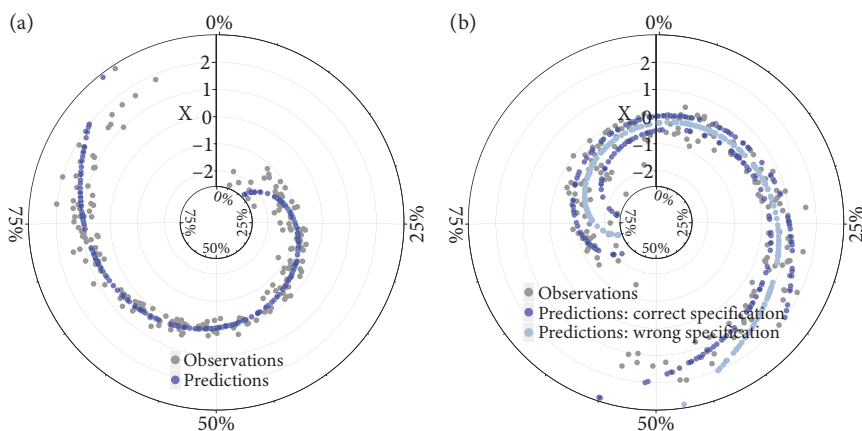


Figure 5 Circular prediction of bill initiation timing without (a) and with (b) wraparound effects.

transformed to get the predicted values of z^* that can be visualized on circular predictive plots.

Figure 5 shows circular predictive plots for our two synthetic datasets (the grey dots represent the true observations). The first synthetic dataset has no wraparound effects, and the timing of bill initiation does not vary by types controlled by a dummy variable. In Panel (a) of Figure 4, the dark blue point predictions by circular regression closely correspond to the locally weighted linear regression.

This is not the case for the predictions from the second dataset where the discontinuity principle does not apply. When the data contains wraparound effects and the timing of the bill initiation varies by type, as shown in Panel (b) of Figure 4, the light blue point predictions of circular regression differs from those of the locally weighted linear regression, and the dummy variable for the type of bills matters. When we do not control for the type of bills in circular regression, the predictions underestimate the variance of the temporal location of bills, which can under- or overestimate the effects of x on the timing of bill initiations. Only when a dummy is included in the estimation, the dark blue point predictions by the circular regression correctly follow the true data-generation process.

3.3.3 Circular Counterfactuals of Bill Initiation Timing

While circular predictions generate fitted values based on covariates, the counterfactuals ask for the impact of changes of a variable on bill initiation

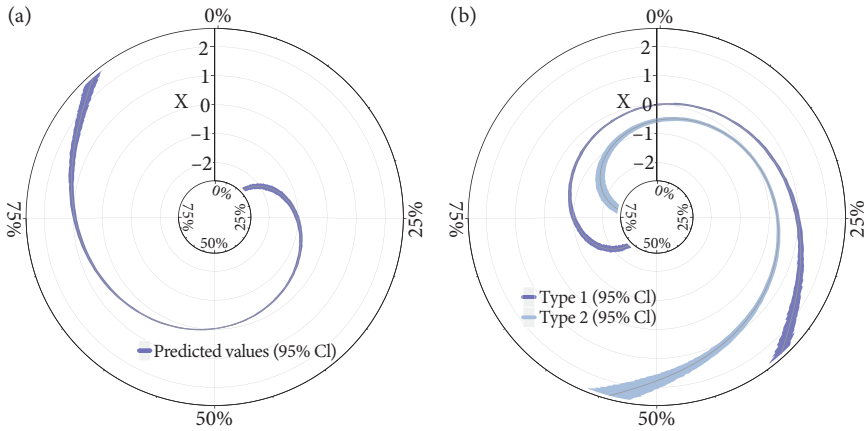


Figure 6 Circular counterfactuals of bill initiation timing without (a) and with (b) wraparound effects.

timing. For illustration, we fix the covariate values of our two synthetic datasets except for the independent variable of interest. Let \mathbf{x}^* denote a matrix of counterfactual covariate values and insert \mathbf{x}^* into Equation (3.10) so that the posterior predictive distribution of z^* is also a function of \mathbf{x}^* :

$$f(z^*|\mathbf{x}^*, \mathbf{x}) = \int_{\Theta} f(z^*|\boldsymbol{\theta}, \mathbf{x}^*, \mathbf{x})p(\boldsymbol{\theta}|\mathbf{x})d\boldsymbol{\theta}. \quad (11)$$

Thereby, we are able to extract the predicted values of z^* given \mathbf{x}^* with uncertainty quantified by the posterior distribution of $\boldsymbol{\theta}$. This allows us to examine both the substantive magnitude of the estimated effects and the confidence we have on the estimation outputs. Figure 6 shows circular counterfactuals applied to the two synthetic datasets of bill initiation timing.

Panel (a) shows that when x is low ($x < -1$), bills are likely to be initiated early in the term (before the first quarter of the term), and when x is high ($x > 1$), bills are likely to be initiated later (later than the third quarter of the term). Overall, the uncertainty (95% posterior confidence interval) is very low. When the timing effects vary by type in the second synthetic dataset as shown by Panel (b), two counterfactual scenarios exist based on the type of bills (Type 1 and Type 2 depending on whether the discontinuity principle applies). For both types, when x is low ($x < -1$), the bills are expected to be initiated in the last half of the term, but when x is high ($x > 0$), they are more likely to be initiated in the first half of the term. Given the same value of x , however, bills in dark blue tend to be initiated earlier than those in light blue. Compared to discrete predictions of each bill initiation, circular counterfactual

plots show more flexibility in generating the quantities of interest. In the following empirical analysis, we will apply the estimation strategy and visual analytical tools for substantive interpretation of our findings.

3.4 Scope and Scale of Bill Initiation Within Terms

To empirically examine our hypotheses on learning the partnership type in coalition governance using circular regression, we utilise a recently assembled dataset on government bills of coalition governments across eleven European parliamentary democracies (König et al. 2022). Our unit of analysis is individual government bills introduced in the lower houses of parliament in the following countries during the specified years: Belgium (1988–2010), Czech Republic (1993–2013), Denmark (1985–2011), Estonia (2007–2011), Finland (1989–2010), Germany (1981–2012), Hungary (1998–2014), Latvia (2002–2011), the Netherlands (1998–2012), Norway (1989–2013), and Poland (1997–2011). In total, the data contain more than 25,000 government bills over thirty years, representing one of the most comprehensive datasets of this kind assembled to date. This systematic data collection effort also provides us with ample evidence and sufficient variation for examining our hypotheses in varying political, cultural, and institutional settings.

Before introducing the variables used in circular regression to test our hypotheses on learning partnership types through experienced scrutiny, policy divergence, ministerial power, and within-term dynamics, we first explore the distribution of the government bills across countries and policy areas over time. Following our introduction to visual analytical tools, we present circular descriptions to illustrate the timing patterns of bill initiation. In particular, our circular density plots show the concentration of bill initiation timing within a term. This presentation allows us to compare the amount and distribution of bill initiation timing across countries and policy areas. Finally, we explore our transformation of these data and the independent variables, which we use in the circular regression analysis to predict early or late initiation of government bills.

3.4.1 Circular Exploration of Bill Initiation Timing

To empirically examine the hypotheses derived from our theoretical model, we need to capture the relative temporal location of bill initiation timing within

a term. For this purpose, we transform the timing dates of bill proposals into a circular measure, which indicates their relative temporal location within a term. More specifically, we divide the number of days from the beginning of the data of government formation to the date of bill initiation by the overall duration of the term (measured by days). For example, for a term starting on 1 January 2010, and ending on 31 December, 2013, the duration is 1,460 days. Thus, a government bill initiated on 1 January 2011 (365 days after the date of term's start) is located at the 25th percentile (365/1,460) of the term. Technically, we map percentile measures into radius measures applying the formula:

$$r = 2 \times \pi, \quad (12)$$

which ranges from 0 to 2π on a circle. We re-centre the variable by subtracting π from the original values, which centre the value of zero in the mid of the term. Thus, the values of our dependent variable theoretically vary from $-\pi$ to π . Below, we present circular histograms of our dependent variable, offering valuable insights into the distribution and variations of bill initiation timing across different countries and policy areas.

3.4.2 Exploring Bill Initiation Timing by Country

We first use the previously introduced rose diagrams to explore the distribution of bill initiation timing by country. As depicted in Figure 7, the circular distribution of bill initiation timing by country within our data reveals notable patterns across different parliamentary democracies. The pooled data show a general trend where bill initiation is more concentrated toward the second half of the term, indicating, as intuitively expected, that governments are, on average, more likely to propose bills as the term progresses, with a noticeable peak around the third quarter in many countries.

While there are similarities between country-specific patterns and the general trend, distinct differences also emerge. For instance, Denmark, Latvia, and the Netherlands exhibit a pattern resembling the general trend of bill initiation during the third quarter, suggesting agenda timing after the midpoint but before the final quarter. In contrast, Belgium has a significant concentration of bill proposals in the final quarter, indicating a tendency to delay bill initiation until the later periods. Meanwhile, countries such as the Czech Republic, Germany, and Poland show a balanced distribution around the midpoint of the term, between the second and third quarters.

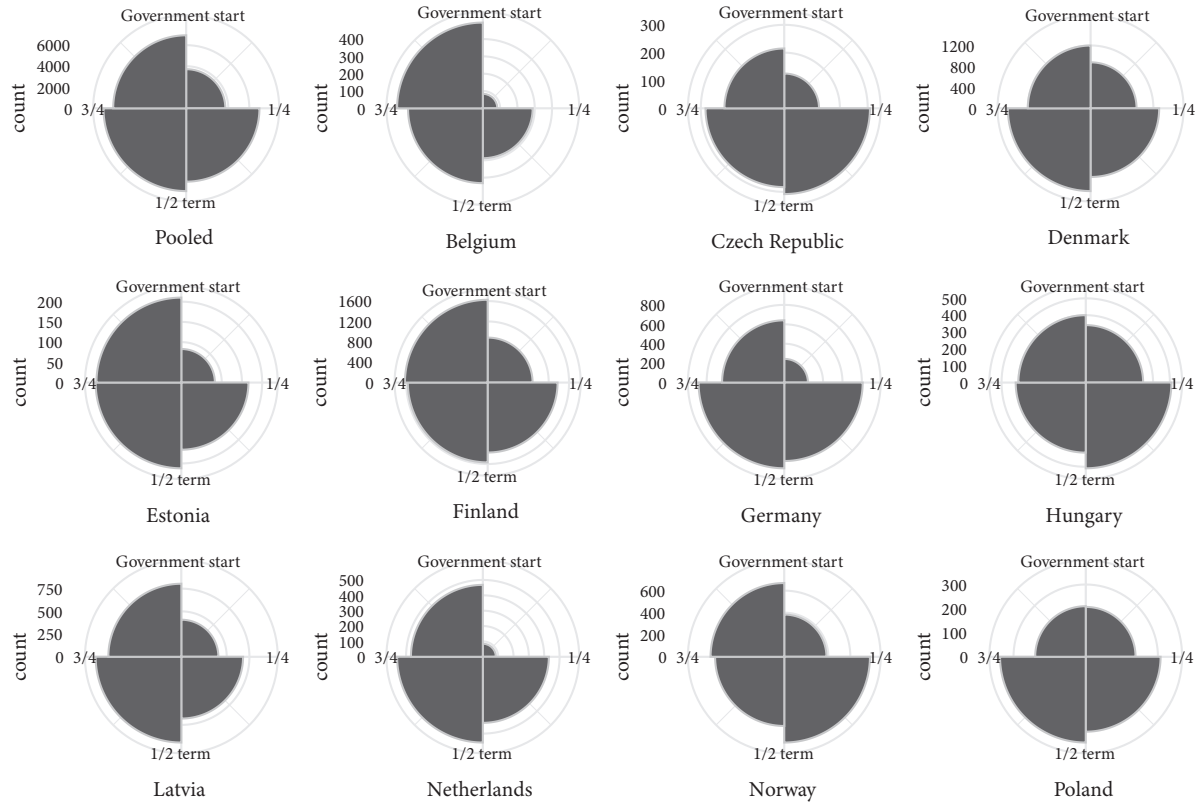


Figure 7 Circular distribution of bill initiation timing by country.

To provide a clearer representation of these distribution patterns, in [Figure 8](#), we utilize a single continuous curve resembling a density plot to illustrate the shapes or patterns in the distribution of bill initiation timing across countries. We have identified three primary shapes or patterns: the G shape, the heart shape, and the butterfly shape.

The G shape indicates minimal government bill initiations at the beginning of a term, with greater government bill activity occurring around and after the midpoint of the term. Examples of countries exhibiting this pattern include Belgium, Estonia, Latvia, and the Netherlands. The heart shape indicates a concentration of bill initiations around the midpoint of the term, with few initiatives introduced at the beginning and the end of the term. This pattern is observed in countries such as the Czech Republic, Denmark, Germany, Hungary, and Poland. The butterfly shape suggests a high degree of timing variability in bill proposals throughout all periods of the term. Finland and Norway are notable examples of countries displaying this pattern.

3.4.3 Exploring Bill Initiation Timing by Policy Area

In [Figure 9](#), we again use the rose diagrams to depict the distribution of bill initiation across policy areas, which is crucial for revealing unique policy-making dynamics and agenda priorities, offering valuable insights for agenda timing from a comparative perspective. Our dataset encompasses a total of thirteen policy areas, including agriculture, defense, economy, education, environment, finance, foreign affairs, health, industry, interior affairs, justice, labour, and social affairs.

Similar to the previous depiction of pooled data, there is a general trend where bill initiation is more concentrated towards the third quarter of the term, with significant activity also in the second and final quarters. However, this overarching pattern diverges across specific policy areas. Unsurprisingly, the lowest number of bill proposals is submitted in the first quarter of a term, as ministerial office-holders focus on preparing the implementation of the common policy agenda. In the areas of education and defence, there is a relatively balanced distribution of bill initiations throughout the second and third quarters, with a clear decrease in the final quarter. Economy and finance, which typically experience a lag between the implementation of new policies and the realization of their effects, show a notable concentration of bills initiated in the third quarter of the term. Foreign policy also exhibits a tendency for bill initiation during the later stages of the term, with the highest number of bills

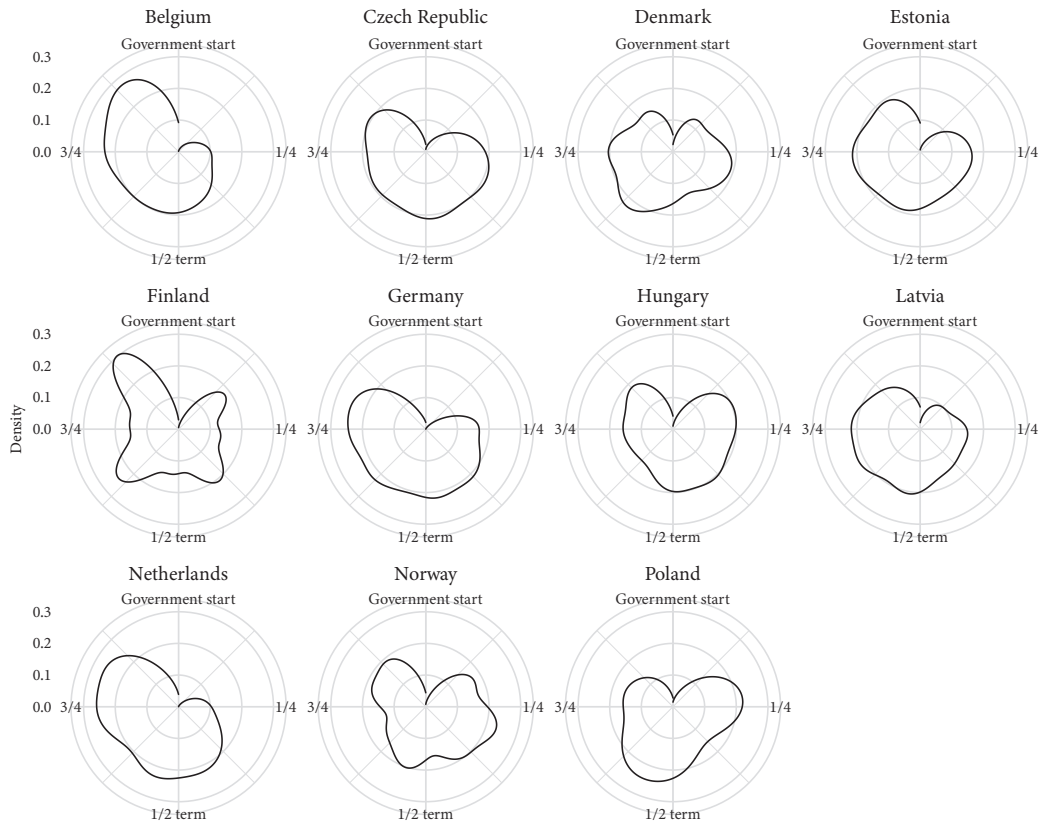


Figure 8 Circular density distribution of bill initiation timing across countries.

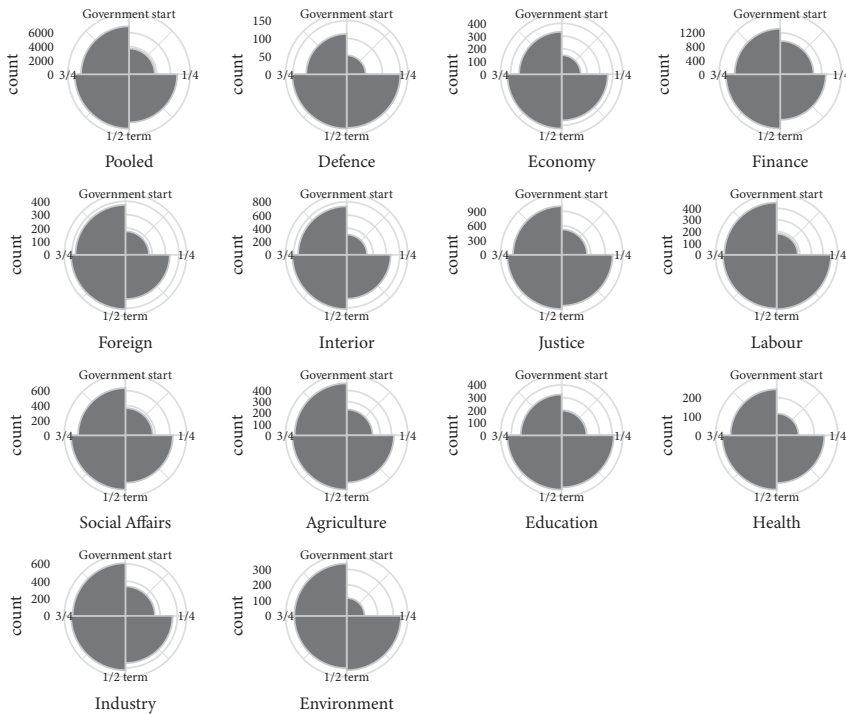


Figure 9 Circular distribution of bill initiation timing by policy area.

proposed in the third and fourth quarters. Interestingly, bills related to labour and environmental policies are evenly distributed around the midpoint of the term, with environmental bills having a slightly higher concentration in the second quarter.

When examining the shapes and patterns in the distribution of bill initiation timing across policy areas, in [Figure 10](#) we reveal that most policy areas display the heart shape, suggesting that the majority of policy-making activity in the areas is centred around the middle of the term, tapering off towards both ends. Nevertheless, although not as clear as the variation observed across countries, distinctions among different policy areas are also present. For instance, the G shape—indicating minimal government bill initiations at the beginning of a term, with greater activity occurring around and after the midpoint—depicts the patterns in areas such as economy, environment, health, and labour, with relatively little activity at the start and a significant increase in bill initiation around the midpoint of the term, continuing into the latter half. The finance and social affairs areas depict a clear butterfly shape, indicating a more evenly distribution of policy-making activity across the term.

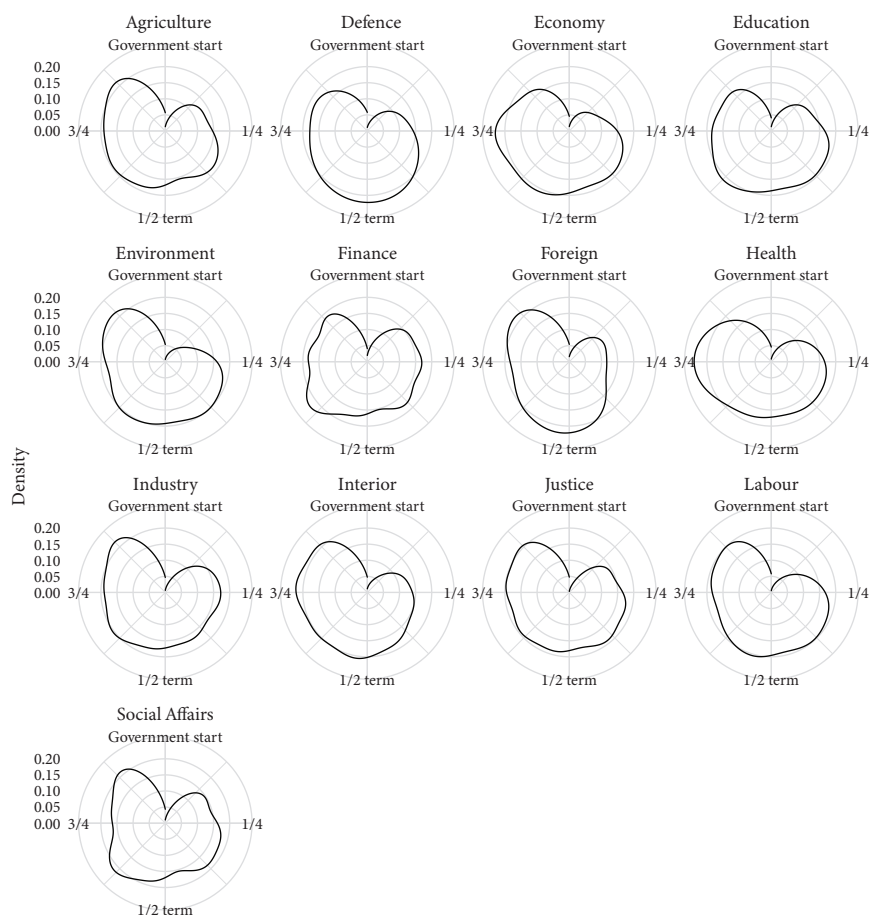


Figure 10 Circular density distribution of bill initiation timing across policy areas.

3.5 Circular Predictions: Independent Variables and Measurement

Having established the measurement and distribution of the dependent variable, we now turn to a detailed description of the independent variables. Ideally, we would like to use panel data from ministerial office-holders' perceptions of the type of coalition partner, their perceptions of the benefits from position-taking responsiveness and costs from scrutiny of their bills. Unfortunately, such data does not exist, and it is unlikely that ministerial office-holders will have the time and willingness to indicate their perceptions for the analysis of coalition governance. Accordingly, we can only approximate

their perceptions using observational data that we collected from different data sources. Specifically, we describe the measurement and distribution of our three main explanatory variables: *experienced scrutiny* by data extracted from full-text legislative databases (König et al. 2022), *policy divergence* by data from coded party manifestos (Volkens et al. 2019; Bäck, Debus and Dumont 2011), and *ministerial power* by data of Seki and Williams (2014).

3.5.1 Experienced Scrutiny: Portfolio- and Partisan-specific Learning

Our first hypothesis posits that greater experienced scrutiny of previous bills leads to later initiation of subsequent bills within a term. To examine this hypothesis, it is necessary to provide evidence on the experienced scrutiny of previous bills for each bill initiation. Following Martin and Vanberg (2004), who demonstrate the association between the level of scrutiny and the duration of the policy-making process, we measure *duration* by the time lag (in days) between the date of bill initiation and its approval (Schulz and König 2000). For each bill initiation, we calculate the past experienced scrutiny by averaging the duration of all approved bills within a term up to the time of the new bill initiation. In other words, the *experienced scrutiny* of ministerial office-holders is measured by the average duration of past bills until the date of a new bill's initiation. As ministerial office-holders may learn from experienced scrutiny within their portfolio or from experienced scrutiny of their co-partisan ministerial office-holders across portfolios within a term, we distinguish two learning models:

Model 1 (Portfolio-learning). For bill i initiated at time T in term A in policy area K , $\text{duration}_i = \text{mean}(\text{duration of passed bills initiated in } A, \text{ concluded before } T, \text{ in } K \text{ of the ministerial office-holder})$.

Model 2 (Partisan-learning). For bill i initiated at time T in term A , $\text{duration}_i = \text{mean}(\text{duration of passed bills initiated in } A, \text{ concluded before } T, \text{ in policy areas of all co-partisan office-holders})$.

In our empirical analysis, we will compare the explanatory power of the two learning models concerning our hypotheses on the timing of bill initiation. According to our first hypothesis, the variation in bill initiation timing can be explained by the experienced scrutiny of ministerial office-holders. Secondly, we expect that this experience is more pronounced when the policy divergence among coalition parties increases. Thirdly, we hypothesize

that powerful ministerial office-holders can decrease the level of experienced scrutiny. Finally, our subsequent empirical analyses evaluate how the learning process influences the timing of bill initiation, taking into account the role of legislative committee chairmanship.

3.5.2 Policy Divergence: Coalition and Opposition Parties

In addition to the two learning models derived from experience scrutiny, an important variable in our analysis is policy divergence. It is important to note that spatial measurements of policy divergence vary not only based on their sources, such as expert surveys or party manifesto documents, and the methods of their calculation, but also on the level of abstraction employed. This level of abstraction is particularly pronounced when using a single dimension, such as left versus right or conservative versus liberal, compared to a categorization based on specific sectors such as energy, environment, finance, or areas like tax and welfare, industry and markets. As previously mentioned, we assign policy divergence to portfolios held by ministerial office-holders to reflect the area-specific allocation of responsibilities to implement the common policy agenda (Austen-Smith and Banks 1990).

Following Bäck, Debus, and Dumont (2011), we calculate partisan policy positions in thirteen ministerial portfolios, and measure policy divergence using the Comparative Manifesto Project (CMP) data, which cover party manifestos of parliamentary parties since 1945 (Volkens et al. 2019).⁶ For each term and each portfolio, we measure coalition policy divergence as the sum of portfolio-specific differences between either the ministerial party and its coalition partners. The higher the value, the greater the divergence in policy positions among coalition parties. Figure 11 shows the variation of coalition policy divergence for our pooled sample and across countries.

The pooled sample in Figure 11 suggests a wide range of coalition policy divergence values, with most values falling between 0 and approximately 5, but with notable outliers reaching up to around 15. This indicates that while most coalition partnerships have moderate divergence in policy positions, some exhibit very high levels of divergence. The country-specific analyses further illustrate this variation. For instance, governments in countries such as Estonia, Germany, and the Netherlands stand out with

⁶ The CMP splits raw data of party manifestos into quasi-sentences categorized into fifty-six categories that are used to construct party positions in those categories. Because not all categories are informative and distinct, Lowe et al. (2011) developed a scaling method based on log odds ratios of quantities of quasi-sentences.

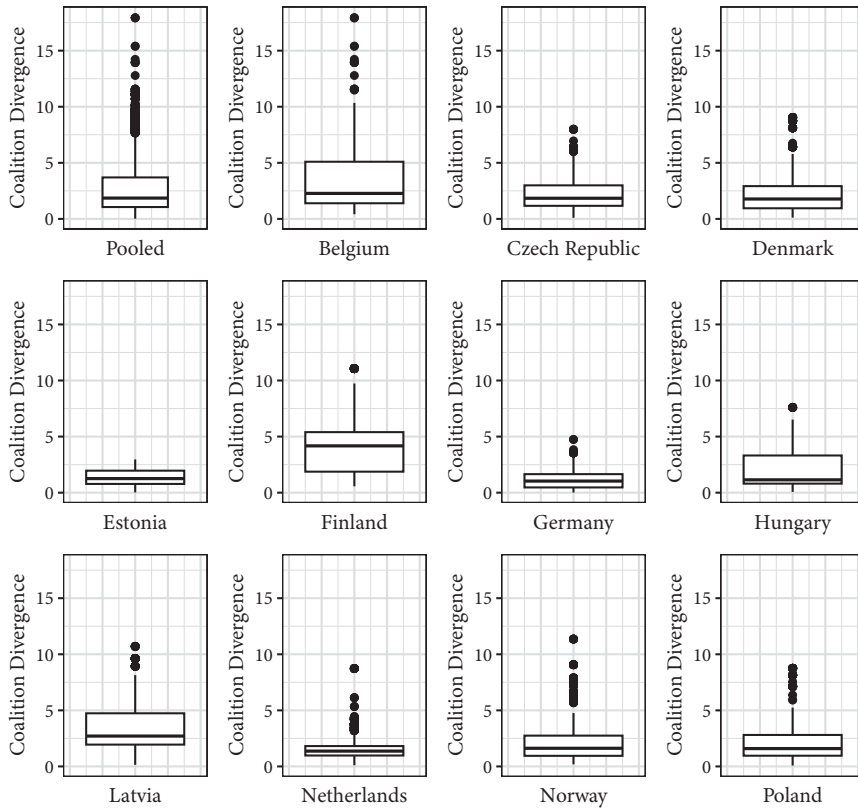


Figure 11 Coalition policy divergence pooled and by country.

consistently low divergence among coalition partners. In contrast, Belgium, Finland, and Latvia display a greater range of divergence, with Belgium having significant outliers. This variation underscores the diverse coalition dynamics and the differing challenges in policy coordination across different political contexts.

Given that opposition parties may vary in their incentives to scrutinize government bills, thereby affecting the duration of bills in the policy-making process when they collaborate in parliament, we control for the cohesiveness of their policy positions. Specifically, we calculate the *opposition policy divergence* by summing the differences in policy positions of all opposition parties in parliament, accounting for their party size and policy saliency. We weight the policy positions of opposition parties by their seat shares and the saliency they attach to different policy areas. Our measure of opposition policy divergence ranges from 0 to 1.08, with a mean value of 0.18 and a standard deviation of 0.16. The higher the value, the greater the divergence in policy positions

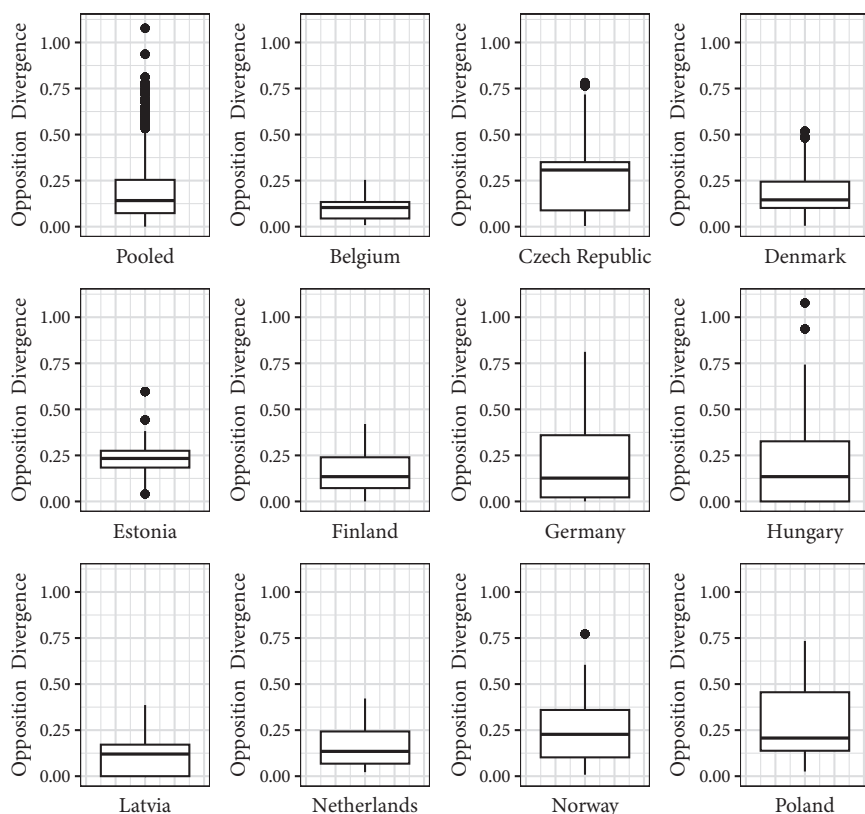


Figure 12 Opposition policy divergence pooled and by country.

among opposition parties. Figure 12 illustrates the distribution and variation of opposition policy divergence.

The pooled sample in Figure 12 shows that opposition policy divergence values are concentrated primarily between 0.1 and 0.25, but with several significant outliers reaching up to 1. This suggests that while most opposition groups maintain low levels of divergence in their policy positions, some cases exhibit very high divergence. When examining country-specific data, Belgium consistently displays low levels of opposition policy divergence, with values clustered near 0.15. This indicates strong policy alignment among Belgian opposition parties. The Czech Republic, Germany, Hungary, Norway, and Poland show broader ranges of policy divergence values among their opposition parties, with occasional outliers, revealing uncommon but significant instances of policy disagreement, particularly in the Czech Republic and Norway. Estonia presents a relatively narrow range of values, generally around

0.5, with few outliers, indicating moderate divergence with rare instances of high disagreement.

However, comparing policy divergence within coalition partners and among opposition parties is only one part of the story. Important for the theoretical framework developed in [Chapter 2](#), further exploration of the data can reveal another aspect: the ranges in policy divergence can also vary across policy areas, specifically across portfolios held by ministerial office-holders. This variation indicates potential differences in incentives for ministerial drift in joint policy-making. [Figure 13](#) illustrates the variation in coalition policy divergence within different policy areas.⁷

The pooled sample in [Figure 13](#) reveals that policy divergence typically ranges from 2 to 4, with notable outliers reaching as high as 15. This indicates that while most policy-making within coalitions tends to feature relatively low divergence, there are exceptional circumstances where disagreements are markedly more pronounced.

Examining specific policy areas not only reveals patterns that align with the general trend observed in the pooled data, such as in education, foreign affairs, and labour, but also highlights important differences. For instance, areas such as the economy and the environment exhibit a more concentrated range of divergence, typically clustering around the median of 3. The low divergence observed in these policy areas could be attributed to several factors. One potential reason is that there may be more consensus among coalition partners on how these policies should be managed by the government. For instance, in the realm of economy, coalition partners might agree on fundamental principles such as fiscal responsibility and economic stability. These principles can often transcend party lines, leading to more cohesive policy positions within coalitions. Additionally, the low divergence in these areas might also reflect the high saliency of these policies for parties and their constituents. When a policy area is highly salient, parties are more likely to prioritize it, making it less contentious in the enactment of the common policy agenda.

3.5.3 Ministerial Power: Party Size and Median Position

To examine our third hypothesis, which posits that the positive relationship between experienced scrutiny and the timing of bill initiation is diminished by the minister's power to constrain scrutiny activities, we combine two new

⁷ While the box plots in [Figure 13](#) do not distinguish variations in policy areas across countries, it is important to note that these variations may differ between countries and change over time.

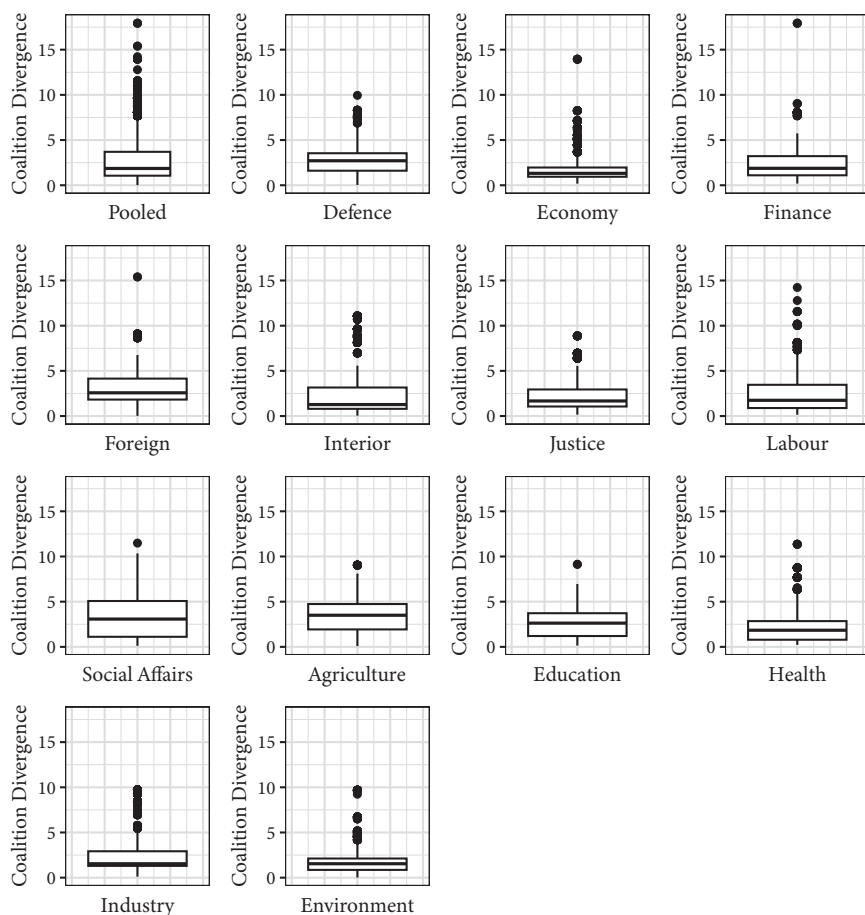


Figure 13 Coalition policy divergence pooled and by policy area.

variables: the relative seat share size of the ministerial parties and whether they occupy the median policy position in parliament. Compared to smaller parties, larger parties usually hold a privileged position to scrutinize bills and have more time to speak on the floor in parliament (Martin and Vanberg 2008). Moreover, in representative democracies, a higher share of seats typically translates into control of more chairs of legislative committees, granting parties the power to schedule hearings, consult policy experts and societal groups, and extract policy information from a privileged position (Kim and Loewenberg 2005; Mattson and Strøm 1995). Figure 14 depicts the country-specific variation in the relative size of the minister parties.

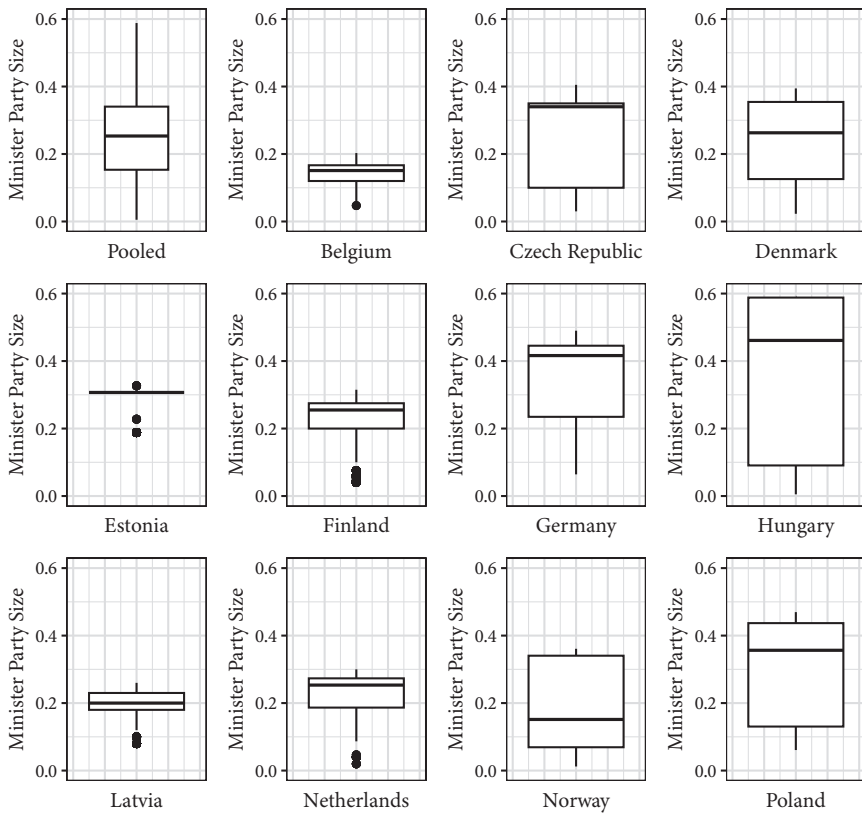


Figure 14 Ministerial power pooled and by country

In the pooled data, the median ministerial party size holds 25% of the seats available in parliament, with the interquartile range (IQR) spanning from approximately 15% to 35%. This distribution suggests that, on average, ministerial parties control about a quarter of the seats, with some variation. Examining the country-specific data, we observe notable differences in ministerial party sizes, indicating varying levels of power held by these parties in parliament across countries. In Belgium, the distribution is relatively narrow, with a median around 20%, suggesting that ministerial parties typically hold about one-fifth of the seats. Some outliers at the lower end suggest occasional weaker parties in Belgium. In contrast, Germany and Hungary display higher medians around 40%, indicating stronger ministerial parties compared to Belgium, with a much wider interquartile range (IQR) that indicates greater

variability. Similar to the Czech Republic and Poland, Estonia has a median of around 35%. However, its distinct IQR shows that the data points between the 25th percentile (Q1) and the 75th percentile (Q3) are nearly the same, suggesting almost no variation among the central data points. Yet, the presence of outliers below the median reveal occasional weaker ministerial parties in Estonia. Latvia, the Netherlands, and Norway exhibit lower median values around 20%. However, the distribution in Norway shows greater variability compared to Latvia and the Netherlands, which present more outliers on the lower end.

In Figure 15, we present the distribution of ministerial power in terms of ministerial party size for the pooled data and across the thirteen policy areas.

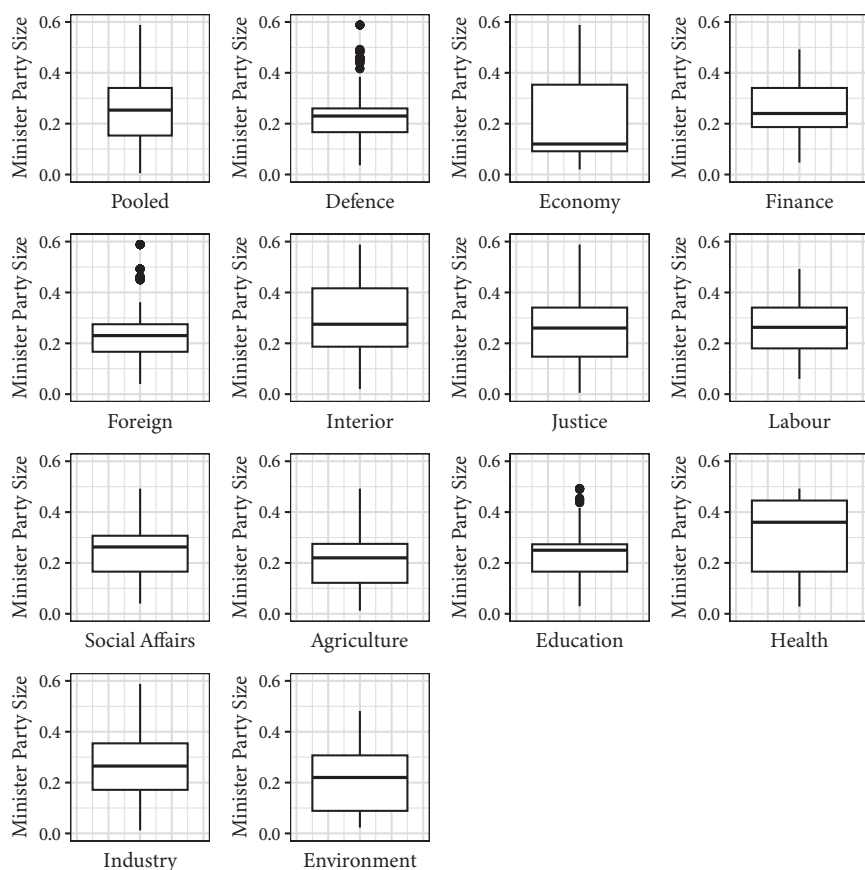


Figure 15 Ministerial power pooled and by policy area.

The overall distribution shows that most medians, including the value for the pooled data, are around 25%, suggesting that, on average, ministerial parties control about a quarter of the seats. However, the portfolio for health is a notable exception, with the median party size closer to 40%. This indicates that this policy area is often controlled by larger parties. The presence of outliers in the education, defence, and foreign policy areas suggests occasional instances where significantly larger parties control these ministries, highlighting variability in ministerial power distribution. Additionally, in contrast to the narrow range in these three policy areas, some portfolios present a wider range, suggesting greater variability in the distribution of ministerial power. This is particularly evident in the areas of economy, environment, health, and interior.

Beyond the size of the ministers' parties, spatial literature suggests that the position of the median party in parliament is decisive for policy outcomes, especially when the median party aligns closely with the median voter's stance (Baron 1991; Laver and Schofield 1990; Morelli 1999). In such cases, a ministerial office-holder should have a greater ability to avoid amendments and bring the government bill closer to their party's ideal policy position compared to an off-median partner (Laver and Shepsle 1996). To capture whether the party of the ministerial office-holder occupies the median position in parliament, we consider the ordered area-specific positions and code 'minister median party' as 1 if the party of the ministerial office-holder takes the area-specific median position in parliament. Table 3 displays the percentage of instances where the party of the minister holding a specific portfolio was also the party holding the median position in parliament, by country and policy area. This metric provides insight into how often the ministerial party is centrally positioned within the legislative body, potentially facilitating influence over policy-making processes.

A key pattern that emerges across the countries is the significant variation in alignment between the party holding the ministerial portfolio and the party occupying the median position in parliament, with this alignment differing notably across policy areas. In countries like Estonia and Hungary, alignment is more concentrated in just a few areas—such as social affairs, defence, and justice—whereas in Belgium, Poland, Latvia, Germany, and Denmark, alignment is more widely distributed across various portfolios. For instance, Denmark exhibits alignment greater than 10% across at least five portfolios, with Belgium, Hungary, and Poland following closely behind.

Table 3 Percentage of times a minister held the median position by country and area

	Belgium	Czech Republic	Denmark	Estonia	Finland	Germany
Agriculture	1.02	7.69	2.17	0.00	4.39	4.26
Defence	4.57	2.10	0.66	0.00	2.07	0.41
Economy	24.37	2.10	0.71	0.00	0.00	9.07
Finance	1.02	27.97	20.72	1.90	36.22	13.05
Foreign	1.52	6.99	0.50	0.00	4.45	2.06
Health	2.54	4.20	1.56	0.00	0.00	29.95
Industry	6.09	0.00	4.28	0.00	2.84	12.09
Interior	19.80	0.00	10.79	24.76	3.16	9.48
Labour	25.38	0.00	16.18	0.00	5.75	6.04
Social Affairs	13.71	19.58	24.70	73.33	16.27	4.67
Education	0.00	2.80	13.81	0.00	8.72	0.69
Environment	0.00	3.50	1.16	0.00	0.00	2.06
Justice	0.00	23.08	2.77	0.00	16.14	6.18
	Hungary	Latvia	Netherlands	Norway	Poland	
Agriculture	10.51	3.44	7.66	3.40	0.00	
Defence	0.60	27.53	0.00	1.87	5.53	
Economy	0.30	0.00	9.09	0.00	13.04	
Finance	0.00	0.00	10.05	0.00	4.35	
Foreign	0.60	26.77	4.31	0.00	0.00	
Health	4.20	0.00	2.39	6.29	3.16	
Industry	0.90	0.00	0.00	24.49	25.30	
Interior	24.62	4.59	31.10	7.65	0.00	
Labour	7.81	19.50	0.00	0.00	26.88	
Social Affairs	14.71	5.16	5.26	32.82	0.00	
Education	2.70	3.25	11.96	7.14	0.40	
Environment	0.00	0.00	18.18	4.25	1.58	
Justice	33.03	9.75	0.00	12.07	19.76	

In the policy area of finance there is substantial alignment in countries such as Finland (36.22%), the Czech Republic (27.97%), and Denmark (20.72%). This high alignment suggests that in these countries, the parties managing finance portfolios may be better positioned to influence decision-making and potentially secure the necessary support for complex economic policies. In contrast, in countries like Estonia, Hungary, Latvia, and Norway the alignment in the finance portfolio is very low, indicating that the party holding the finance portfolio is less likely to be the median party in parliament. Social affairs is another area where alignment varies significantly. Estonia exhibits an exceptionally high alignment (73.33%) in this policy area, suggesting that the party holding the social affairs portfolio is almost always the median party in

parliament. On the other hand, countries like Germany, Hungary, and Poland show much lower alignment in social affairs.

3.5.4 Further Controls: Saliency and Government Duration

We have also included policy saliency as a control variable in our models. Different coalition parties may assign varying levels of saliency to portfolios, which can aid in coalition formation, portfolio allocation, and reaching compromises on a shared policy agenda (Bäck, Debus, and Dumont 2011; Klüver and Spoon 2020; Klüver and Sagarzazu 2016). We employ saliency as an approximation for the motivation to derive position-taking benefits from the early initiation of a bill. If a governmental bill addresses a policy area that holds higher saliency for the party of the ministerial office-holder, we anticipate early bill initiation. Conversely, if the ministerial office-holder delays bill initiation until later in the term, they risk missing out on significant position-taking advantages. Thus, we account for area-specific saliency by tallying the relative mentions of a particular policy category in a party's manifesto that corresponds to the portfolio to which the bill pertains. In line with Lowe et al. (2011), we apply a logarithmic transformation to these counts, ensuring our measure remains resilient to extreme values.

Because the length of terms differs across elections and countries, we also control for observed government duration, measured in days. Government duration can impose constraints on ministerial office-holders due to the electoral calendar and voter demands. Ministers cannot delay their bills indefinitely, as doing so risks not having enough time to approve the common policy agenda before the next election, potentially leading to electoral penalties from their constituency. Consequently, as the term progresses, the likelihood of ministers initiating government bills increases. Additionally, we must consider that the observed effect of government duration may be influenced by very short-lived coalition governments, which inherently had less time to initiate bills.

As shown in the summary statistics of Table 4, within a sample of more than 25,000 government bills, the empirical range of our dependent variable, *Bill Temporal Location*, is between -3.01 and 3.13, with negative values indicating earlier bill initiations and positive values later initiations. The values of our central explanatory variable, *experienced scrutiny*, range from 1 to 488 days for portfolio-learning and from 1 to 339 days for partisan-learning.

Table 4 Variables and descriptive statistics

Statistics	Mean	St. Dev.	Min	Max	N
Bill Temporal Location	0.32	1.57	-3.01	3.13	25,477
Portfolio-learning	96.95	70.49	1	488	25,477
Partisan-learning	96.56	62.21	1	339.09	25,477
Coalition Policy Divergence	2.58	2.11	0.02	17.93	25,477
Opposition Policy Divergence	0.18	0.16	0.00	1.08	25,477
Minister's Party Size	0.25	0.13	0.01	0.59	25,477
Minister Median Party	0.26	0.44	0	1	25,477
Policy Saliency	-1.27	1.70	-7.08	0.91	25,477
Government Duration	1,043.14	413.81	68	1,623	25,477

Cyclical Analysis of Dynamic Learning Processes

4.1 The Organization of the Common Policy Agenda

According to [Martin and Vanberg \(2011\)](#), coalition parties reach compromises to implement a shared policy agenda during joint policy-making. The timing of this implementation, however, reveals differing strategies among coalition partners. Early bill initiation, for instance, allows ministerial office-holders to demonstrate responsiveness to their constituencies by actively working on their behalf (see also [Huber 1996](#); [Powell 2004](#)). From a principal-agent perspective, ministers enjoy a first-mover advantage when proposing government bills within their portfolio. However, coalition partners may subject these bills to parliamentary scrutiny, potentially lengthening the policy-making process ([Becher 2010](#); [Carroll and Cox 2012](#)). Furthermore, ministerial office-holders seek to gain position-taking benefits from early bill initiation. These benefits, however, tend to decline over time as coalition governance increasingly makes the distinct roles and responsibilities of coalition parties and their ministers blurry, making differentiation more difficult.

While early bill initiation may generate benefits from position-taking responsiveness, late bill initiation might help ministerial office-holders avoid the reputation costs associated with non-cooperative partnerships. These costs often arise from the scrutiny their bills face. The likelihood of scrutiny increases when there is greater policy divergence among coalition parties. This divergence motivates ministerial office-holders to propose bills that deviate from previously agreed compromises, prompting coalition partners to open the parliamentary gate for closer scrutiny of those bills. When competitive incentives for separate electoral benefits dominate, this dynamic not only delays the initiation of government bills but also threatens the implementation of the common policy agenda. However, ministerial office-holders from powerful positions—such as those in large parties or parties occupying the median position in parliament—may reduce the likelihood of scrutiny if their party has

sufficient influence to constrain parliamentary oversight. From a dynamic perspective, we argue that the incentives to propose policy-divergent bills and to facilitate parliamentary scrutiny evolve over time, impacting the organization of the common policy agenda. At the start of the term, uncertainty about the type of coalition partnership is the norm, shaping these incentives as parties navigate the dynamics of joint governance. As coalition partners develop a clearer understanding of their relationship during the midterm, these incentives may shift toward coalition squabbles. By the end of the term, as coalition parties prepare for the election day, these incentives become increasingly driven by electoral competition.

In a previous analysis of the organization of the common policy agenda in coalition governments, [Martin \(2004\)](#) sampled data on over 800 governmental bills from four countries: Belgium (1979–1992), Germany (1983–1994), Luxembourg (1979–1994), and the Netherlands (1979–1994). His findings suggest that governmental bills dealing with issues that are more attractive to all coalition parties, i.e., bills that do not divide coalition partners from the party holding the relevant ministerial office, are likely to be given priority on the policy agenda, while those dealing with relatively unattractive issues are likely to be postponed. To explore the dynamics in the organization of the policy agenda, we illustrate the temporal dimension of government bill initiation in our dataset of eleven European representative democracies over a period of more than thirty years ([König et al. 2022](#)). Instead of merging policy divergence with saliency and seat shares, [Figure 16](#) classifies separately the organization of the common policy agenda over time by coalition policy divergence and saliency.

Given the periodic nature of the data, where the continuous variable for bill initiation is measured on a unit circle the values on the x-axis of [Figure 16](#) (from $-\pi$ to $+\pi$) represent a transformed or standardized version of this circular measure. This standardized scale allows us to analyse the timing of bill initiation in a more intuitive way, particularly when visualizing data across different terms. In the very beginning and at the very end of a term, there are few bill initiation activities aimed at implementing the common policy agenda. This observation aligns with our dynamic perspective on the timing of government bill initiation, indicating that during these early and late periods, ministerial office-holders are either preparing to implement the common policy agenda or are constrained in their time for joint policy-making.

In the top left plot of [Figure 16](#), where both coalition divergence and saliency are high, we observe a clear delay in bill initiation. This pattern suggests that high coalition divergence, when combined with high saliency, might create

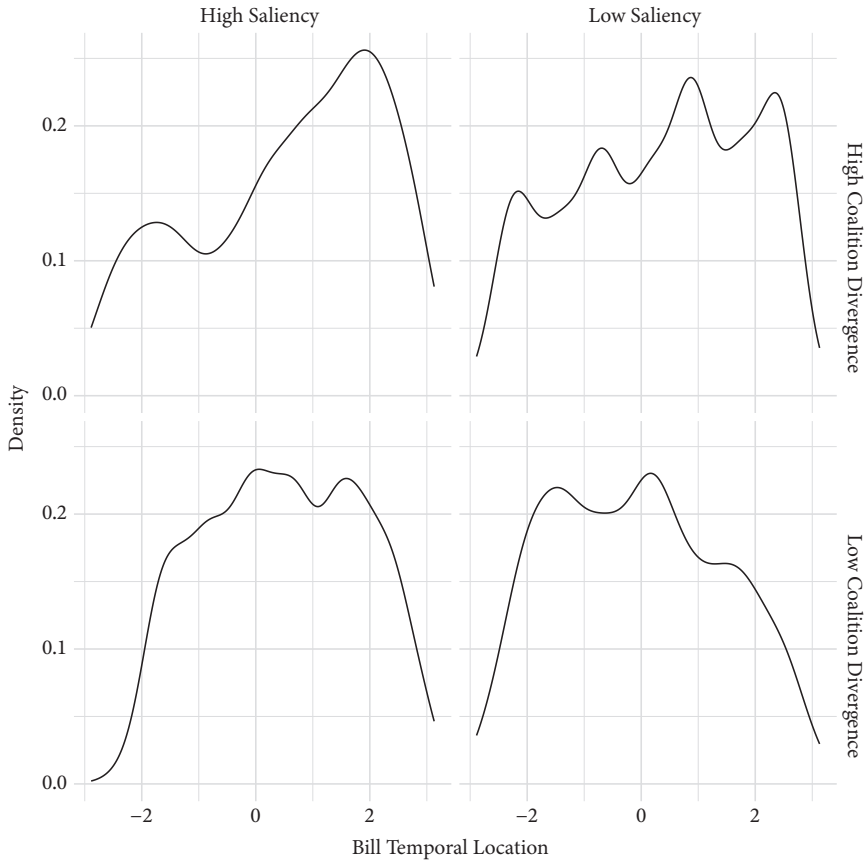


Figure 16 Bill initiation activities under low/high coalition divergence and low/high saliency.

Note: The x-axis represents the temporal location of bill initiation within a term that ranges from π (beginning of a term) to π (end of a term); the y-axis shows the density of bill activities within a term.

significant contestation and tension among coalition partners. As a result, most bill initiation activities for these contested salient bills are concentrated around the third quarter of the term. By contrast, the top right plot illustrates bill initiation activities under conditions of high coalition divergence but low saliency. Here, the activities are distributed more evenly across the term, with some clustering towards the middle. The lower saliency might be reducing the level of contentiousness, though the persistence of high coalition divergence continues to correspond with delays in bill initiation.

In the bottom left plot, where coalition divergence is low but saliency is high, we observe an interesting pattern. Bill initiation activities start relatively earlier

compared to the plots under high divergence and saliency and continue at a high density through the middle of the term. This pattern indicates that lower coalition divergence reduces barriers to advancing bills, even on salient issues. Ministers appear to move forward with implementing the common policy agenda without significant delays. However, the high saliency might still concentrate some activity around the term's midpoint, where bills could require additional scrutiny.

Finally, the bottom right plot, representing conditions of low coalition divergence and low saliency, shows a more uniform distribution of bill initiation activities across the beginning and middle of the term. Bills in this category seem to be the least contentious, which might allow for their initiation throughout the term without significant delays. The distribution appears nearly normal, suggesting that these bills are initiated without the timing constraints that might arise from either high saliency or significant coalition disagreements. As in the previous cases, however, bill initiation significantly declines toward the end of the term, potentially reflecting the competitive strategies associated with election day.

Following our hypotheses, we aim to explain these distributions by examining the potential role of learning by ministerial officeholders from experienced scrutiny over time. Accordingly, our analyses begin by exploring the possible implications of experienced scrutiny for the timing of bill initiation. We then proceed to examine the interaction between experienced scrutiny and coalition policy divergence, along with their substantive interpretation, which we anticipate might intensify learning from experienced scrutiny. We further investigate a triple interaction involving experienced scrutiny and the different sources of ministerial power, which may have the potential to limit parliamentary scrutiny. Finally, we explore the dynamics of learning over time. Alongside presenting the findings from our pooled sample, we also assess robustness at the country- and area-level to ensure the reliability of our results.

4.2 Ministerial Learning from Experienced Scrutiny

According to our learning theory, ministerial office-holders initially know neither the number of bills that they will initiate nor the type of partner they will have at the beginning of the term. However, they may have a prior belief about the type of partnership, which they can update through their inferences about experienced scrutiny. To explore this, we start by comparing two

models of learning processes from experienced scrutiny. In addition to our existing analysis on portfolio-learning (König et al. 2022), we also examine a partisan-learning model to compare the explanatory power of both models of learning processes. We are particularly interested in the relative explanatory power of both models of learning processes for the timing of bill initiation. As described above, our dependent variable bill initiation timing is a continuous variable on a unit circle with an interval of 2π , which indicates the relative temporal location of a bill on the circle of a term. Our statistical estimation takes the following form for the two learning models:

$$\text{Bill timing} = \mu_0 + g^{-1}(\beta_1 \text{ Experienced scrutiny} + X\phi + \epsilon) \quad (13)$$

where μ_0 on the right-hand side of the equation measures circular intercepts, and $g^{-1}(\cdot)$ is a transformation function mapping values to the circular space.¹ The portfolio-learning model predicts that ministerial office-holders initiate early or late government bills following experienced scrutiny of their previous bills within their portfolio. Our partisan-learning model predicts that ministerial office-holders initiate early or late government bills following experienced scrutiny of their previous bills within their portfolio and those of their co-partisan ministerial office-holders. In addition to policy divergence of coalition parties, policy saliency, and power of the ministerial party, we also control for opposition policy divergence and government duration.

4.2.1 Learning from Experienced Scrutiny Within or Across Terms?

Although representative democracy constrains coalition governance by terms, our initial example suggests that the SPD took into account their partnership experiences from previous terms when they formed the new traffic light coalition with the climate change-focused Greens and the business-focused Liberals. Following our learning models, the SPD had a strong prior belief about the Union as a competitive partner type from their experiences in the previous term. To examine whether ministerial office-holders learn from experienced scrutiny about the type of partnership within or across terms, we

¹ Although there are multiple choices available for $g^{-1}(\cdot)$ (see e.g., Fisher and Lee 1992), we follow the most common practice and assume that $g^{-1}(\cdot)$ takes the form of $2\arctan(\cdot)$ with β s as the coefficients to be estimated (Gill and Hangartner 2010). X is a matrix of observations on our control variables with parameter estimates vector ϕ , and ϵ is the error term.

distinguish between four models of learning processes. While Model 1 and Model 2, as introduced in [Chapter 3](#), focus on learning within a term, Model 3 and Model 4 consider learning across terms. More specifically, the four models adopt the following specifications:

Model 1 (Portfolio-learning within a term). For bill i initiated at time T in term A in policy area K , $\text{duration}_i = \text{mean}(\text{duration of passed bills initiated in } A, \text{ concluded before } T, \text{ in } K \text{ of the ministerial office-holder})$.

Model 2 (Partisan-learning within a term). For bill i initiated at time T in term A , $\text{duration}_i = \text{mean}(\text{duration of passed bills initiated in } A, \text{ concluded before } T, \text{ in policy areas of all co-partisan office-holders})$.

Model 3 (Portfolio-learning across terms). For bill i initiated at time T in policy area K , $\text{duration}_i = \text{mean}(\text{duration of passed bills, concluded before } T, \text{ in } K \text{ of the ministerial office-holder})$.

Model 4 (Partisan-learning across terms). For bill i initiated at time T , $\text{duration}_i = \text{mean}(\text{duration of passed bills initiated, concluded before } T, \text{ in policy areas of all co-partisan office-holders})$.

The distinction between these models lies in how ministerial office-holders incorporate experiences of scrutiny into their decision-making. Model 1 represents a portfolio-learning model within a term, where ministerial office-holders learn from scrutiny specific to their own portfolios. Model 2 represents a partisan-learning model within a term, where ministerial office-holders also take into account scrutiny of their co-partisan office-holders. Both models assume a weak prior belief about the type of partner, which will be updated from learning within a term.

To explore the potential for learning over a longer time horizon, we expand the time frame of experienced scrutiny in Model 3, predicting whether ministerial office-holders initiate early or late government bills based on their portfolio specific experiences across terms. We control for the party in office and assume that ministerial office-holders only update their beliefs about the type of partner across terms when their parties were previously in office. Model 4 further extends this analysis by considering the scrutiny experiences of ministerial office-holders and their co-partisan colleagues across terms. Again, we control for the party of the office-holders, which only update their beliefs from their co-partisan colleagues, which were previously in office. [Table 5](#) shows the results.

The table highlights the varying impacts of *Experienced Scrutiny* across these models. In the within-term models, the effects are most pronounced. Model 1 shows that, on average and holding all other variables constant,

Table 5 Different models of ministerial learning over time

	Model 1	Model 2	Model 3	Model 4
Intercept	0.21 [0.18,0.25]	0.20 [0.17,0.24]	0.59 [0.55,0.64]	0.6 [0.54,0.64]
Experienced Scrutiny	0.49 [0.46,0.52]	0.53 [0.50,0.56]	0.1 [-0.1,0.03]	0.09 [0.07,0.12]
Coalition Policy Divergence	0.19 [0.17,0.21]	0.21 [0.19,0.24]	0.11 [0.08,0.14]	0.12 [0.09,0.15]
Policy Saliency	-0.19 [-0.21,-0.16]	-0.24 [-0.26,-0.21]	0.02 [-0.01,0.05]	-0.01 [-0.04,0.02]
Minister Party Size	-0.03 [-0.05,-0.01]	-0.05 [-0.07,-0.02]	0.01 [-0.02,0.03]	-0.01 [-0.04,0.02]
Opposition Policy Divergence	-0.07 [-0.09,-0.08]	-0.08 [-0.1,-0.06]	-0.1 [-0.1,-0.06]	-0.11 [-0.13,-0.09]
Government Duration	-0.26 [-0.29,-0.24]	-0.32 [-0.34,-0.29]	-0.15 [-0.17,-0.12]	-0.15 [-0.17,-0.12]
DIC	90414.82	89945.46	91896.05	91823.13
WAIC	90416.85	89947.50	91896.78	91824.16

Dependent Variable: Temporal location of bill initiations within a term.

ministerial office-holders are significantly influenced by scrutiny within their own portfolios during the term (coefficient 0.49), while Model 2 demonstrates that partisan learning—considering experienced scrutiny of their co-partisan colleagues—has a similar average effect (coefficient 0.53). However, when the analysis shifts to learning across terms, as in Models 3 and 4, on average and holding all other variables constant, the influence of scrutiny diminishes substantially, with the coefficients dropping to 0.10 and 0.09, respectively. These findings suggest that the immediate, term-specific experiences of scrutiny have a higher impact on learning than those accumulated over multiple terms, potentially due to discounting over time.

This conclusion is further supported by the information criteria DIC and WAIC, which measure the overall estimation performance by calculating the prediction accuracy of each model. Lower values indicate higher model performance. According to these criteria, partisan learning within a term (Model 2) provides the highest performance, followed by portfolio learning within a term (Model 1). Both within-term models outperform the models that consider a longer time horizon (Models 3 and 4). This suggests that when ministerial office-holders decide about the timing of

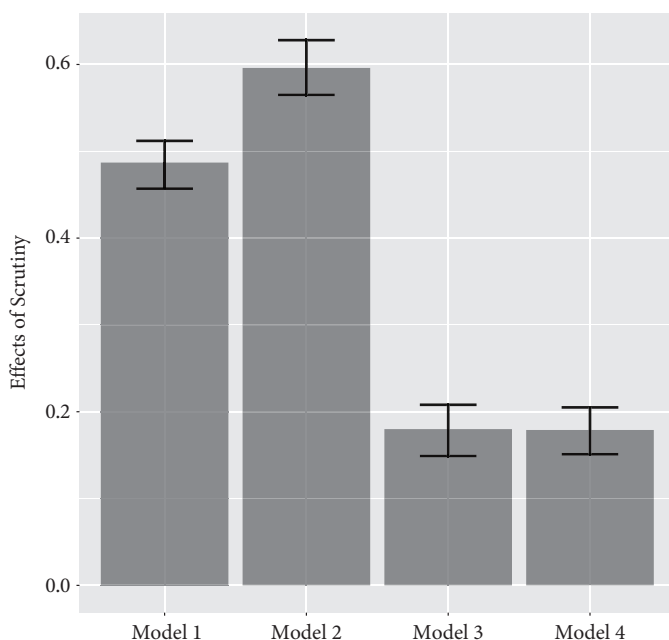


Figure 17 Comparing the Effects of Experienced Scrutiny on Bill Initiation Timing Across Four Scenarios.

Note: Model 1 represents portfolio-learning within a term. Model 2 represents partisan-learning within a term. Model 3 represents portfolio-learning across terms. Model 4 represents partisan-learning across terms.

bill initiation, they are primarily guided by the aggregated pay-offs within the current term, rendering past scrutiny experiences from other terms less relevant.

Figure 17 visually illustrates these differences, showing that the effects of *experienced scrutiny* are strongest in the within-term models (Models 1 and 2), while the across-term models (Models 3 and 4), exhibit much weaker effects, which are statistically indistinguishable. Returning to our introductory example, where the SPD decided not to continue coalition governance with the Union, the findings support our first hypothesis (H1): once ministers are in office, they primarily reflect on their experiences within the current term when deciding on the timing of bill initiation. Consequently, our further analyses will focus on timing activities within a term, as this is where ministerial learning appears to have the most significant impact for drawing inferences on the type of partnership.

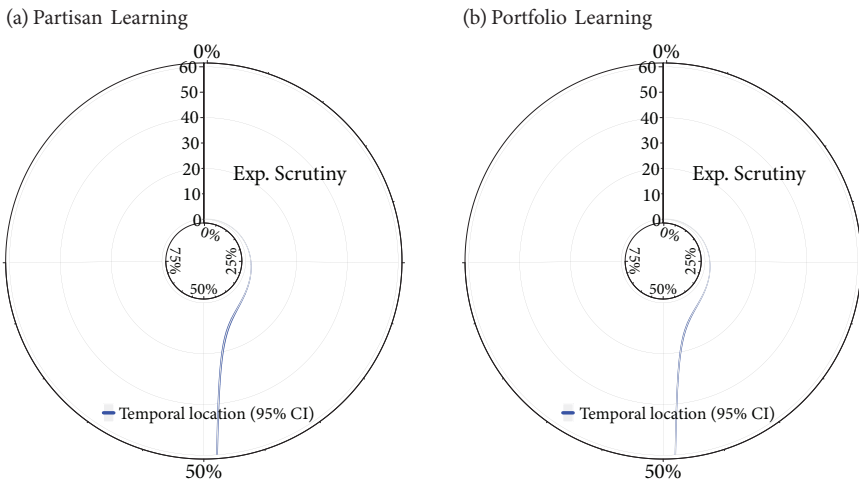


Figure 18 Predicting Circular Timing of Bill Initiation from Counterfactual Scenarios: Partisan Learning Model (a) and Portfolio Learning Model (b)

4.2.2 Portfolio- or Partisan-learning from Experienced Scrutiny Within Terms

The above results support our first hypothesis on the empirical implications of experienced scrutiny for the timing of bill initiation: The greater the experienced scrutiny, the later in the term the ministerial office-holder initiates subsequent bills. The effect of experienced scrutiny is highest (and similar in size) for both models of learning processes. Figure 18 shows the counterfactual on portfolio- and partisan-learning from experienced scrutiny within a term (Models 1 and 2). It depicts the substantive effect of experienced scrutiny on the timing of bill initiation by varying the values of experienced scrutiny from zero to sixty days, which is the range from the minimum to approximately the median value of experienced scrutiny.

Within the circle of Figure 18, the periods of the term are represented as percentages (from 0% at the beginning to 100% at the end of the term). The blue curve inside the circle shows the predicted value (with a 95% confidence interval) of the effect of experienced scrutiny on the timing of bill initiation, holding all other variables constant. From the fitted blue curve of portfolio- and partisan-learning within a term, we can observe that, on average, an increase in experienced scrutiny from one day to sixty days (median value) leads to later initiation of new bills by about 50% within a term.

The results presented in Table 5 also indicate, as expected, that while higher policy saliency promotes earlier initiation of government bills, greater coalition policy divergence delays the timing of bill initiation. Additionally, party size has a similar effect to policy saliency: the larger the size of the ministerial party, or the more salient the policy area, the earlier the bills are initiated. This early initiation strategy highlights the focus on generating electoral benefits through position-taking responsiveness. Furthermore, we infer from the results that when the opposition is less cohesive (see coefficient for *opposition policy divergence*), ministerial office-holders initiate bills earlier. Lower opposition cohesiveness reduces the risk of scrutiny in parliament, thus enabling ministerial office-holders to generate benefits from early position-taking responsiveness.²

Lastly, the sharp decline in bill initiation towards the end of the term suggests that ministerial office-holders are constrained by the electoral calendar. They cannot delay the timing of their bills indefinitely without risking failure in the implementation of the common policy agenda. Additionally, as the election approaches, ministerial office-holders may be reluctant to initiate bills that reflect the common policy agenda they agreed upon at the beginning of coalition governance, as they need to differentiate themselves in electoral competition (Fortunato 2019a).

4.2.3 Robustness

To ensure the robustness of our findings related to the first hypothesis, we conduct country- and area-specific analyses. The main objective is to examine the variation in the effect of experienced scrutiny on the timing of bill initiation across different contexts. Figure 19 illustrates the scrutiny effects across various countries.

The country-specific analyses reveal that, with the exception of Hungary, the effect of experienced scrutiny is relatively consistent in size across countries. In most cases, the effect of partisan learning is stronger than the effect of portfolio learning within the term, suggesting that ministerial office-holders are more influenced by scrutiny faced by their party as a whole rather than scrutiny within their specific portfolios.

² For instance, see König, Lin, and Silva (2023), who suggest that a unified opposition not only makes challenges to the government's agenda more likely but also conditions how coalition partners manage joint governance.

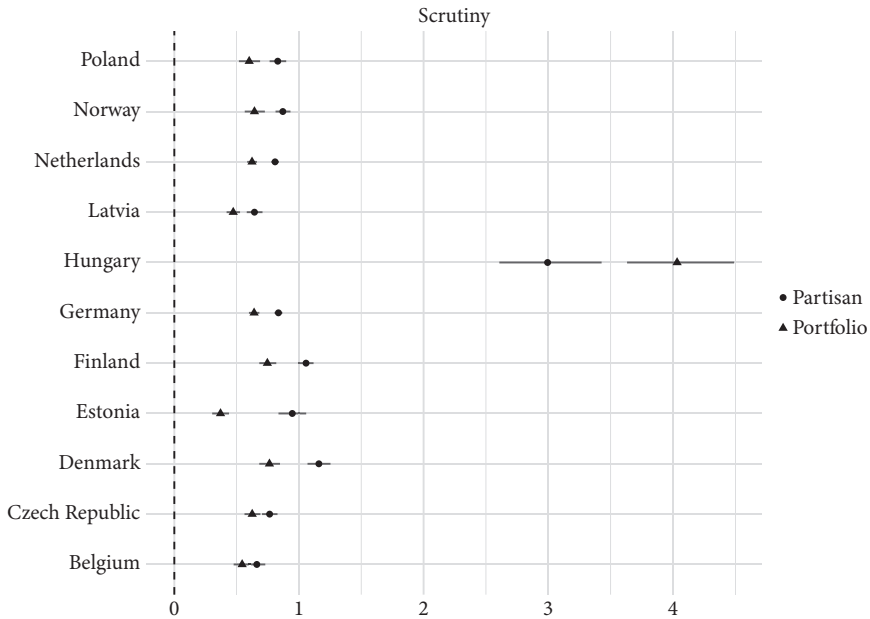


Figure 19 Country-specific effects of experienced scrutiny on bill initiation timing.

Hungary presents an interesting contrasting case where the effect of portfolio learning is stronger than that of partisan learning. A potential explanation lies in the composition of the country's coalitions during the period of study (1998–2014). During this time, Hungary was predominantly governed by a coalition of Socialists and Free Democrats. This coalition structure may have heightened the significance of portfolio-specific experiences, encouraging ministerial office-holders to focus more intensely on scrutiny related to their own portfolios. The stronger focus on portfolio learning could be due to the unique internal dynamics of the coalition, where ministerial office-holders may have felt compelled to assert their authority more prominently within their specific portfolios to safeguard their positions and influence within the coalition government.

Figure 20 presents the area-specific effects of experienced scrutiny on the timing of bill initiation, comparing the impacts of partisan and portfolio learning across different policy areas. The analysis provides insights into how scrutiny within specific portfolios influences the timing of government bills, and whether the effects differ significantly between the partisan and portfolio learning models.

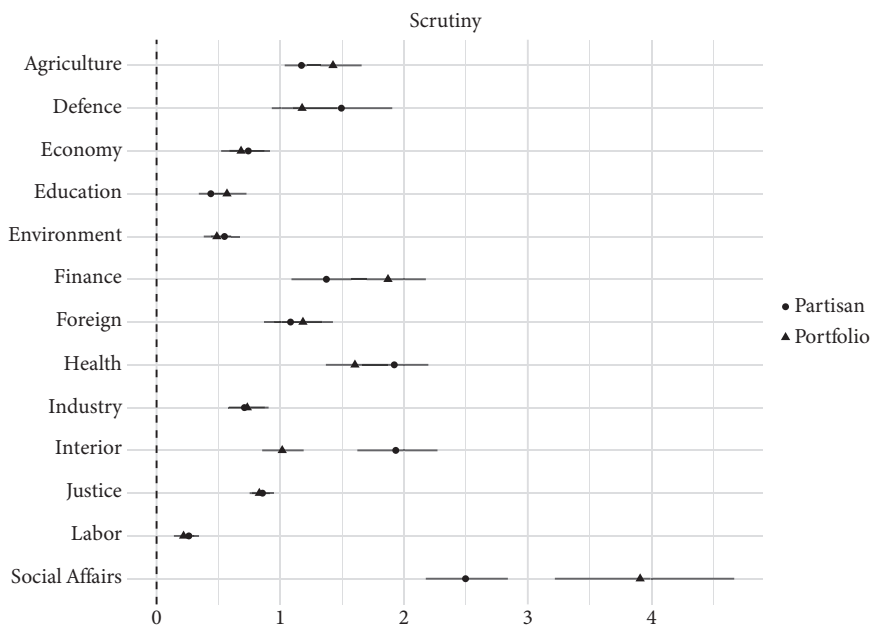


Figure 20 Area-specific effects of experienced scrutiny on bill initiation timing.

In most policy areas, the confidence intervals for the effects of partisan and portfolio learning models overlap. This overlap suggests that while experienced scrutiny has a generally positive and statistically significant effect on delaying government bill initiation across these areas, there is no statistically significant difference between the effects of the two models. In other words, the decisions of ministerial office-holders to delay bill initiation in response to scrutiny are similarly influenced by both partisan considerations and their specific portfolio responsibilities.

However, two policy areas—social affairs and interior—stand out as exceptions. In social affairs, the effect of experienced scrutiny is particularly strong, with the confidence intervals between the partisan and portfolio models not overlapping. Here, the effect of portfolio-learning is more pronounced, suggesting that ministerial office-holders rely more heavily on portfolio-specific experiences when determining the timing of bill initiation in social affairs. In contrast, in the interior portfolio, the non-overlapping confidence intervals indicate that the partisan effect is more pronounced. This implies that in the interior domain, broader partisan dynamics play a more decisive role in influencing ministerial office-holders' decisions on when to initiate bills. While a theoretical framework for these specific results is not here provided,

investigating these differences in future research represents an interesting avenue for further inquiry.

4.3 Policy Payoffs of Coalition Parties

In the study of (coalition) governance, one of the major predictors influencing the dynamics of joint policy-making is the divergence in policy positions across coalition partners. This divergence creates a coalition dilemma on the spatial dimension: while coalition parties may pursue divergent policy positions for electoral purposes, they can only implement one government bill jointly (Laver and Shepsle 1996; Martin and Vanberg 2005, 2014, 2020; Müller and Strøm 1999). Building on the learning theory proposed by König et al. (2022), the policy pay-offs to coalition parties from implementing a coalition compromise are normalized to 0. For instance, if a government bill is initiated late, scrutinized, and then amended to reflect the coalition compromise, the resulting policy pay-offs for the parties amount to 0. Conversely, the policy pay-off shifts to $+X$ for the office-holding party and $-X$ for the partner party when an early-initiated government bill is approved without scrutiny.

According to our second hypothesis, we expect the effect of experienced scrutiny on late bill initiation to be stronger under conditions of higher policy divergence among coalition parties. On the spatial dimension, as policy divergence increases, the potential policy pay-off for coalition parties from deviating from the coalition compromise also increases. The more divergent the policy positions of coalition parties, the greater the policy losses incurred by the ministerial office-holder if a competitive partner scrutinizes and amends their bills. Simultaneously, the greater the ministerial drift in government bills, the more policy losses the coalition partner will incur. To account for the heterogeneous impact of experienced scrutiny on late bill initiation by the level of policy divergence between coalition parties, we examine the interaction between experienced scrutiny and coalition policy divergence with the following specification of our second hypothesis (H2):

$$\begin{aligned} \text{Bill timing} = & \mu_0 + g^{-1} \\ & (\beta_1 \text{Experienced scrutiny} + \beta_2 \text{Coalition policy divergence} + \\ & \beta_3 \text{Experienced scrutiny} \times \text{Coalition policy divergence} + X\phi + \epsilon). \end{aligned} \quad (14)$$

To ensure robustness, we also examine the interaction effect between experienced scrutiny and coalition divergence at both the country and area levels.

4.3.1 Coalition and Opposition Policy Divergence

As described above, the incentives for a ministerial office-holder to initiate bills that prioritize their own party's goals, even at the expense of coalition compromise, increase with the policy distance between their party and the coalition partners. This determines the degree of deviation from the initiated policy to the coalition compromise. Similarly, the incentives for coalition partners to scrutinize and amend bills that deviate from the coalition compromise grow as their policy goals diverge from those of the ministerial party. This dynamic leads us to expect that policy divergence among coalition parties will amplify the effect of experienced scrutiny on the timing of bill initiation: Given the greater explanatory power of within-term learning models compared to across-term models, as outlined above, our subsequent analysis will focus on the portfolio and partisan *within-term* models. The greater the policy divergence, the more likely it is that coalition partners will scrutinize the bills, increasing the reputation costs for the ministerial office-holder. Consequently, the greater the scrutiny experienced by the office-holding minister and the higher the policy divergence between her party and other coalition parties, the more pronounced the impact of coalition policy divergence in delaying bill initiation.

Table 6 presents the results for the interaction between *experienced scrutiny* and *coalition divergence*, highlighting how these factors conditionally influence the timing of bill initiation. In both models—Model 1 (Portfolio) and Model 2 (Partisan)—the interaction term is positive and statistically significant, indicating that the effect of experienced scrutiny on delaying bill initiation becomes more pronounced as coalition policy divergence increases. In other words, the greater the policy distance between the ministerial party and its coalition partners, the more significant the role of experienced scrutiny in influencing the timing of bill initiation.

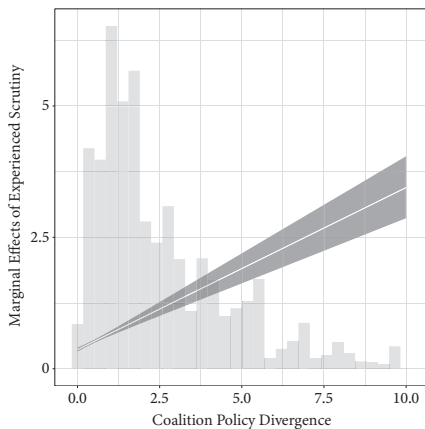
Figure 21 provides a substantive interpretation of the interaction between *experienced scrutiny* and *coalition policy divergence* by comparing the marginal effects of portfolio learning (Model 1) and partisan learning (Model 2) on the timing of bill initiation. Both plots show that as coalition policy divergence increases, the effect of experienced scrutiny on the likelihood of late bill initiation also increases. This is evidenced by the positive fitted lines with 95% confidence intervals in both models.

While both models display a positive relationship, the slope in the right panel (Model 2, partisan learning) appears slightly steeper than the slope in the left panel (Model 1, portfolio learning). This suggests that partisan dynamics

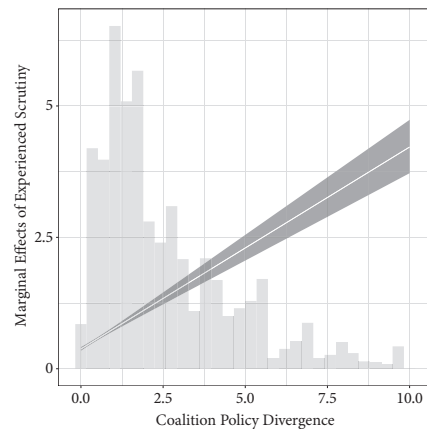
Table 6 Interaction between experienced scrutiny and coalition divergence.

	Model 1 (Portfolio)	Model 2 (Partisan)
Intercept	0.22 [0.18,0.25]	0.22 [0.19,0.25]
Experienced Scrutiny	0.36 [0.33,0.40]	0.37 [0.34,0.41]
Coalition Divergence	-0.04 [-0.09,0.01]	-0.13 [-0.17,-0.08]
Experienced Scrutiny*Coalition Divergence	0.31 [0.25,0.37]	0.39 [0.34,0.44]
Policy Saliency	-0.21 [-0.23,-0.18]	-0.28 [-0.3,-0.25]
Minister Party Size	-0.02 [-0.05,0]	-0.03 [-0.05,-0.01]
Opposition Divergence	-0.09 [-0.11,-0.07]	-0.11 [-0.13,-0.09]
Government Duration	-0.26 [-0.28,-0.23]	-0.29 [-0.31,-0.27]

(a) Model 1: Portfolio Interaction Effect



(b) Model 2: Partisan Interaction Effect

**Figure 21** Marginal Effects of Experienced Scrutiny on Bill Initiation Timing, Conditional on Coalition Policy Divergence.

may have a somewhat stronger influence on delaying bill initiation in the context of high coalition policy divergence. In other words, as the policy distance between coalition partners increases, ministerial office-holders seem more

inclined to delay bill initiation when broader partisan considerations come into play, compared to when they are focused solely on their specific portfolios.

In any case, the positive slopes in both panels indicate that in environments characterized by competitive coalition partners, late bill initiation becomes more predictable as policy divergence increases. This finding aligns with previous research on the implications of coalition divergence for both portfolio management and partisan interests, as discussed by [Laver and Schofield \(1990\)](#) and [Laver and Shepsle \(1996\)](#) regarding portfolio dynamics, and by [Martin and Vanberg \(2005\)](#), [Tavits \(2008\)](#), and [Martin and Vanberg \(2020\)](#) in the context of partisan interests. Specifically, these results support the idea that greater policy divergence among coalition partners heightens the likelihood of scrutiny and potential conflict, leading, as here demonstrated, ministerial office-holders to delay bill initiation as a response.

However, this response carries significant risks. Delays in bill initiation can lead to inaction and hinder the implementation of the common policy agenda, potentially resulting in high electoral costs for the responsible parties. When the costs associated with managing coalition dynamics and policing divergent policy interests exceed the benefits of jointly implementing government bills, as highlighted by [Duch and Stevenson \(2008\)](#) and [Fortunato \(2021\)](#), the coalition's effectiveness can be severely compromised. This underscores the delicate balance that ministerial office-holders must strike between advancing their own party's goals and maintaining coalition stability to avoid detrimental electoral consequences.

4.3.2 Robustness

In testing Hypothesis 2, we included the interaction term between *experienced scrutiny* and *coalition policy divergence* in our original learning models. The results show that the estimates for experienced scrutiny remain robust with this inclusion, and the interaction term supports our expectation of an amplified effect, indicating that coalition policy divergence indeed strengthens the impact of experienced scrutiny on the timing of bill initiation. For a robustness check, we examine how this interaction effect varies across different countries, as illustrated in [Figure 22](#). The figure shows considerable country variation in the interaction effects of scrutiny and coalition policy divergence across countries and between the partisan- and portfolio-learning models.

Hungary stands out, again, as an outlier, exhibiting large negative interaction effects in both models. Contrary to our initial expectations, these results suggest that in Hungary, the combination of high scrutiny and policy divergence does not delay bill initiation but instead appears to expedite it. This outcome may reflect unique political dynamics in Hungary during the period studied, where ministerial office-holders possibly prioritize swift action in the face of scrutiny and divergence, perhaps to pre-empt coalition tensions or reduce the risks associated with prolonged policy-making processes.

In several other countries, however, the interaction effects are close to zero, with overlapping confidence intervals between the two learning models, indicating no significant difference between the partisan and portfolio learning models in these contexts. This suggests that in countries such as the Netherlands, Germany and Finland, the combined influence of coalition policy divergence and scrutiny on the timing of bill initiation is minimal or context-specific. Notably, Poland exhibits positive interaction effects in both models, while Latvia, and Belgium show positive interaction effects primarily in the partisan model. This suggests that in these countries, increased policy divergence combined with scrutiny tends to delay bill initiation, particularly

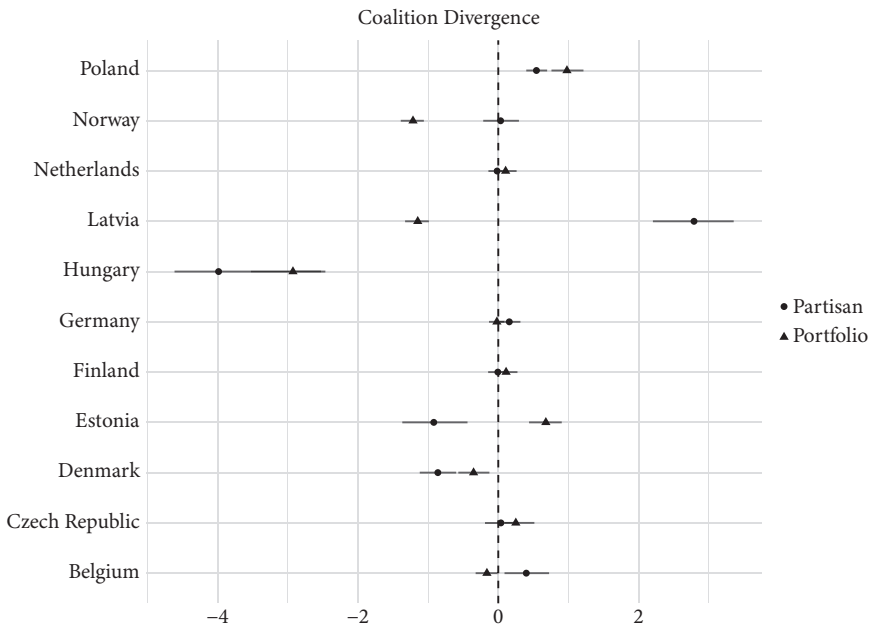


Figure 22 Country-specific effects of interaction between experienced scrutiny and coalition policy divergence on bill initiation timing.

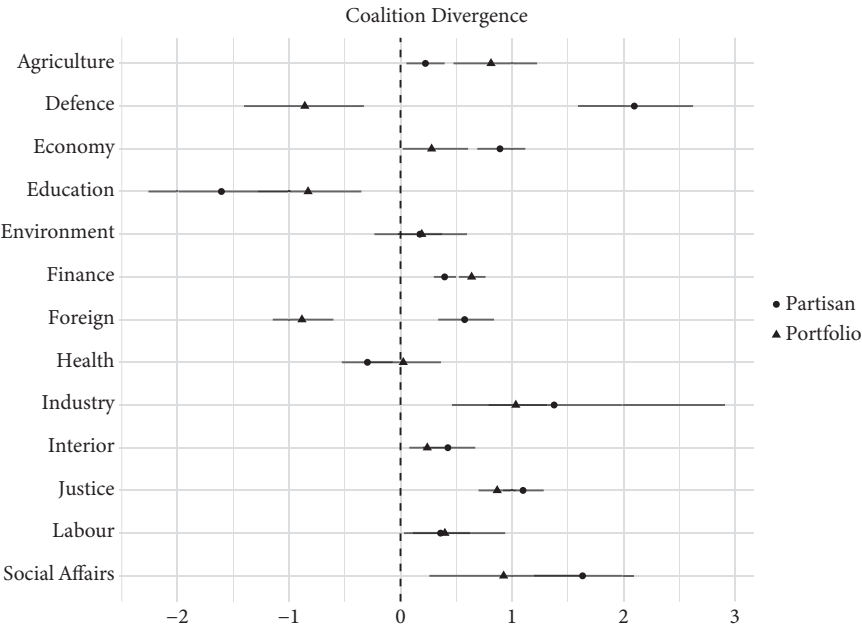


Figure 23 Area-specific effects of interaction between experienced scrutiny and coalition policy divergence on bill initiation timing.

through the lens of partisan learning. In contrast, the portfolio model shows positive interaction effects in Finland, Estonia, and the Czech Republic, indicating that in these contexts, portfolio-specific considerations play a more significant role in delaying bill initiation when policy divergence is high. These results suggest that the conditional effect of parliamentary scrutiny on bill initiation timing, when mediated by coalition policy divergence, is both complex and context-dependent, varying not only across countries but also between the learning models applied.

Figure 23 illustrates the interaction effect of scrutiny and coalition policy divergence across various policy areas. Overall, in most areas the interaction effects are positive and statistically significant, suggesting that policy divergence and scrutiny generally lead to delays in bill initiation. Yet, as evident from the large confidence intervals, the effects of both models—partisan and portfolio—often overlap across many areas, leading to greater uncertainty in differentiating between the two models.

Despite the uncertainty, the interaction effects are generally positive across most policy areas, as expected. This suggests that, in most cases, increased coalition policy divergence combined with experienced scrutiny tends to delay

bill initiation. However, there is an exception in the area of education, where both models exhibit negative interaction effects. This negative interaction indicates that in the education portfolio, higher coalition policy divergence, when paired with scrutiny, might actually expedite bill initiation rather than delay it, contrary to the general trend observed in other areas.

4.4 Power of Ministerial Office-holders

A major insight from existing research on coalition governance is that, depending on the distribution of power, coalition parties can overcome the coalition dilemma and constrain ministerial office-holders from pursuing a maximal position-taking strategy (Martin and Vanberg 2014; Becher 2010; Goodhart 2013). As a result, we expect that powerful ministerial office-holders have fewer incentives to respond to scrutiny regarding the timing of bill initiation. If an early-initiated bill is scrutinized and subsequently amended to advance the coalition partner's policy position, the policy pay-off to the ministerial office-holder is $-\frac{x}{\alpha}$, while the pay-off to the partner is $\frac{x}{\alpha}$, where $\alpha \geq 1$ represents the ministerial party's power to constrain scrutiny activities.

Depending on the level of challenging costs, which can foster either a cooperative or competitive partnership, ministerial office-holders will time strategically the initiation of government bills. For instance, a larger ministerial party size should increase the difficulty of garnering sufficient support for scrutinizing government bills. Similarly, when the ministerial party holds the median position in parliament, the challenging costs for a competitive partner are high. More precisely, we expect a weaker effect of experienced scrutiny on late bill initiation when powerful ministers are involved.

To capture this, we include two new variables to our models: whether the minister's party holds the median policy position in parliament (*minister median party*) and the relative size of the minister's party in parliament (*minister's party size*). From the perspective of other parties, these variables approximate the challenges and costs associated with scrutinizing government bills. When the minister's party holds the median position in parliament, it is better positioned to avoid scrutiny of the government bill from its own ministerial office-holder compared to an off-median ministerial party (Laver and Shepsle 1996). Similarly, a larger seat share typically results in greater control over committee powers, such as committee chairs, which have the authority to schedule public hearings and consult policy experts and societal groups, as well as a privileged position to extract policy information (Kim and

Loewenberg 2005; Martin and Vanberg 2004, 2005; Mattson and Strøm 1995). Consequently, larger ministerial parties should be more capable of avoiding scrutiny of their bills. This leads to the following specification to test our third hypothesis (H3):

$$\begin{aligned} \text{Bill timing} = & \mu_0 + g^{-1}(\beta_1 \text{Experienced scrutiny} + \\ & \beta_2 \text{Minister's party size} + \beta_3 \text{Minister median party} + \\ & \beta_4 \text{Experienced scrutiny} \times \text{Minister's party size} + \\ & \beta_5 \text{Experienced scrutiny} \times \text{Minister median party} + \\ & \beta_6 \text{Minister's party size} \times \text{Minister median party} + \\ & \beta_7 \text{Experienced scrutiny} \times \text{Minister's party size} \\ & \times \text{Minister median party} + X\phi + \epsilon). \end{aligned} \quad (15)$$

For checking robustness, we investigate the triple interaction effect between experienced scrutiny and the measures of ministerial power at the country- and policy area-level.

4.4.1 Party Size and Median Position of Ministerial Office-holders

The results from the pooled triple interaction models presented in Table 7 support our third hypothesis. The coefficient for the interaction term between experienced scrutiny, the minister's party size, and the minister median party is negative and statistically significant in both models. This indicates that as the minister's party size increases and the party holds the median position, the ability of other parties to scrutinize and the resulting delay of bill initiation is reduced, resulting in a weaker impact of experienced scrutiny on late bill initiation.

In more specific terms, the main effect of experienced scrutiny remains positive and significant across both models, suggesting that increased scrutiny tends to delay bill initiation, even when the ministerial party is small in size or does not hold the median position in parliament. However, the negative coefficients on the triple interaction term (*Experienced Scrutiny* \times *Minister Size* \times *Median Minister*) in both models—particularly in Model 2, where the effect is more pronounced—suggest that this delay is lessened when the ministerial party is both large and holds the median position in parliament. This outcome suggests that partisan considerations may amplify the strategic advantages held by median and large ministerial parties, further reducing the effectiveness of scrutiny in delaying bill initiation.

Table 7 Pooled triple interaction models.

	Model 1 (Portfolio)	Model 2 (Partisan)
Intercept	0.40 [0.25,0.51]	0.56 [0.47,0.65]
Experienced Scrutiny	0.58 [0.53,0.63]	0.57 [0.53,0.62]
Coalition Divergence	0.23 [0.2,0.25]	0.29 [0.26,0.31]
Policy Saliency	-0.16 [-0.18,-0.13]	-0.17 [-0.2,-0.14]
Minister Party Size	0.07 [0.03,0.12]	0.07 [0.02,0.12]
Median Minister	-0.61 [-0.97 -0.13]	-1.2 [-1.4 -0.99]
Opposition Divergence	-0.08 [-0.1,-0.06]	-0.06 [-0.08,-0.05]
Government Duration	-0.27 [-0.29,-0.24]	-0.33 [-0.35,-0.3]
Experienced Scrutiny*Minister Size	-0.15 [-0.21,-0.1]	-0.09 [-0.14,-0.04]
Experienced Scrutiny*Median Minister	0.46 [0.23,0.65]	0.93 [0.79,1.11]
Minister Party Size*Median Minister	0.17 [0.10,0.22]	0.22 [0.18,0.27]
Experienced Scrutiny*Minister Size*Median Minister	-0.35 [-0.47,-0.2]	-0.65 [-0.74,-0.57]

For a substantive interpretation of the triple interaction between experienced scrutiny, the median position, and the size of the ministerial party, [Figure 24](#) illustrates the marginal effects of portfolio-based (Model 1) and partisan-based (Model 2) learning processes. The figures indicate that the interaction effect is more clearly defined in the partisan-learning model, as evidenced by the steeper slope, reduced overlap between the predicted lines, and narrower confidence intervals. The solid lines in the plots represent the marginal effects of experienced scrutiny on the timing of bill initiation (with a 95% confidence interval) when the ministerial party does not occupy the median policy position in parliament, conditional on the size of the minister's party. Conversely, the dashed lines depict the marginal

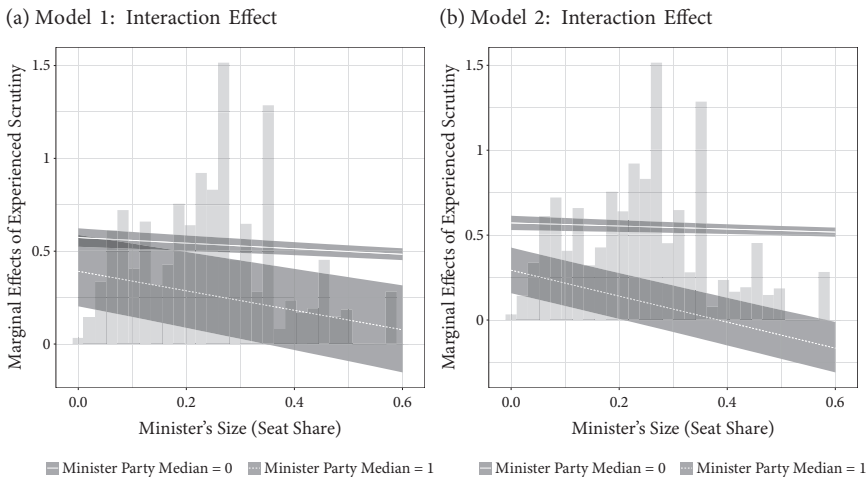


Figure 24 Marginal Effects of Experienced Scrutiny on Bill Initiation Timing, Conditional on Minister's Party Size and Median Position

effects under the condition that the ministerial party holds the median policy position in parliament (i.e., ministerial party median equals 1), again conditional on the size of the minister's party. As illustrated in both plots, the positive effect of experienced scrutiny on delaying bill initiation diminishes as the size of the ministerial party increases. This effect is further attenuated when the ministerial party holds the median policy position in parliament.

In the portfolio-learning model (Model 1), when the ministerial party holds the median policy position in parliament, the magnitude of the effect is largely indistinguishable among smaller ministerial parties (evidenced by the overlapping predicted lines for ministerial parties holding less than 20% of the seats). However, as the ministerial party with the median position grows (i.e., controls more than 20% of the seats), the positive effect of experienced scrutiny on delaying bill initiation diminishes. In contrast, in the partisan-learning model (Model 2), the positive effect of experienced scrutiny on delaying bill initiation consistently decreases with the size of the ministerial party and the median position. The reduced overlap between the lines and the narrower confidence intervals in Model 2 suggest a more robust interaction effect in this model. This result supports our theoretical expectation and underscores the importance of accounting for the legislative power of the minister's party when evaluating the impact of previous scrutiny on subsequent bill initiation timing, as outlined by our learning models.

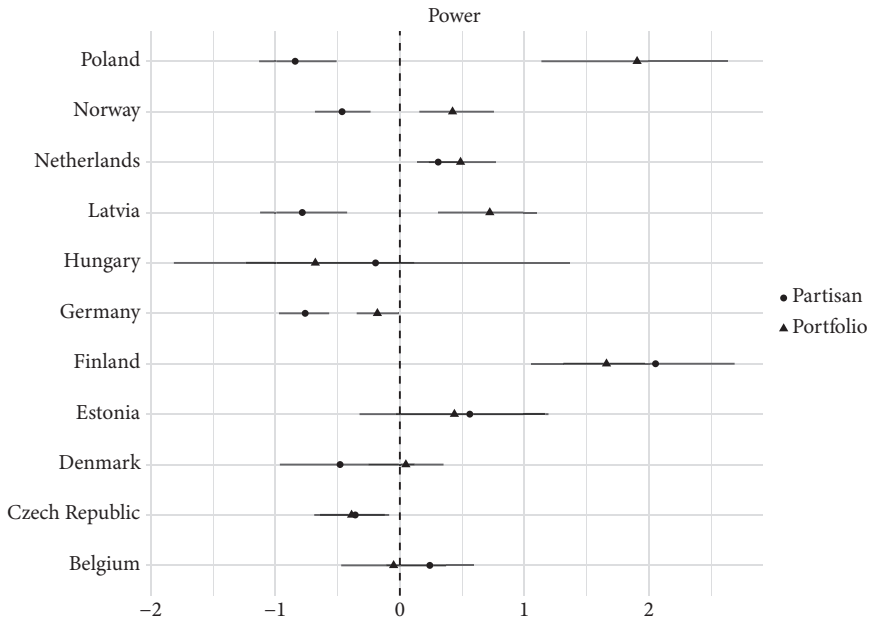


Figure 25 Country-specific effects of ministerial power on bill initiation timing.

4.4.2 Robustness

To assess the robustness of our triple interaction effects, we examine variation at the country-specific and policy-area levels. In [Figure 25](#), we present the country-specific effects of the triple interaction, revealing significant variability across countries and models. Notably, Hungary emerges as an outlier, with much larger confidence intervals compared to those of other countries, indicating greater uncertainty in the estimates for Hungary.

Overall, the triple interaction appears to be negative, aligning with our expectations that larger ministerial parties, holding the median position, would face less scrutiny and therefore be less likely to delay bill initiation. However, this overall trend is nuanced by country-specific variations. In some countries, such as the Netherlands and Finland, the interaction effects are positive and statistically significant. In such cases, it is difficult to distinguish between the magnitude of effects produced by the partisan- and portfolio-learning models, as the confidence intervals overlap.

In contrast, other countries display interaction effects that change direction depending on the learning model applied. For instance, in Poland, Norway, and Latvia, the partisan and portfolio models produce opposite effects. In

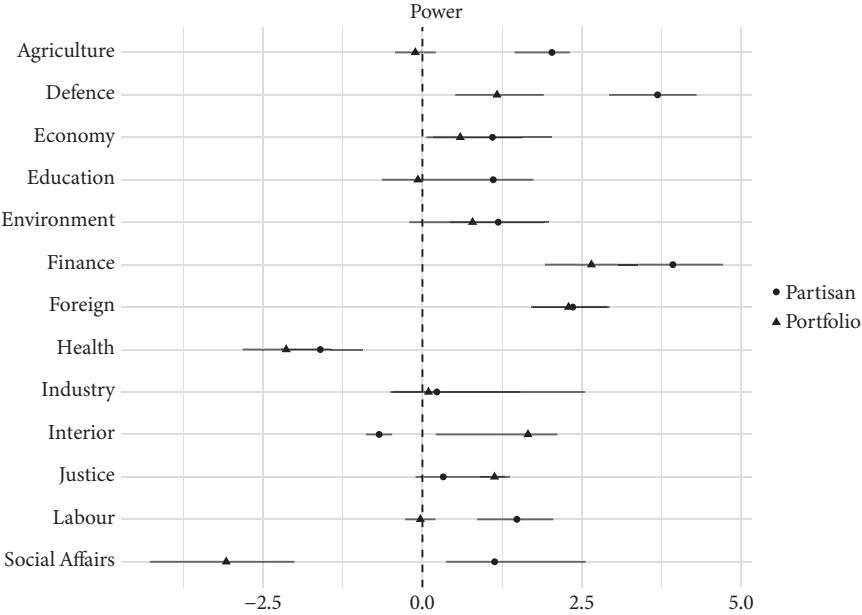


Figure 26 Area-specific effects of ministerial Power on bill initiation timing.

Poland and Latvia, the partisan model suggests a positive effect, while the portfolio model indicates a negative one. This divergence points to a more complex interaction between scrutiny, party size, and median position. In Norway, while the effects are generally smaller, a similar pattern of direction change is observed, further underscoring the model-dependent nature of the interaction effects in these countries. These findings illustrate the nuanced nature of the interaction effects across different national contexts.

The robustness test for the triple interaction effects across different policy areas, as illustrated in Figure 26, presents a more complex picture compared to the country-specific analysis. While the overall findings from our results (see Table 7) and country-specific analyses indicate a negative effect for the triple interaction—consistent with our expectation that larger ministerial parties, holding the median position, face less scrutiny and delay bill initiation less—the policy-area analysis tells a different story.

While some few policy areas, such as health and social affairs (and interior for the partisan model), exhibit negative interaction effects, which align more closely with the overall trend observed in our broader analysis, in certain policy areas, such as defence, finance, and foreign affairs, the interaction effects are positive and statistically significant across both the partisan and portfolio

models. Notably, in the defence policy area, the effect is more pronounced in the partisan model, suggesting that party size and median position interact more strongly with scrutiny when ministerial office-holders take into account the experiences of co-partisans within a term.

Overall, the policy-area-specific results highlight substantial variability in the interaction effects, depending on the area of policy being examined. This variability suggests that the theoretical model explaining the interaction between scrutiny, party size, and median position may not apply uniformly across all policy areas. Instead, some areas, particularly those where the partisan model shows stronger positive effects calls for more detailed, area-specific studies to better understand the underlying dynamics.

4.5 Dynamics of Portfolio and Partisan Learning

After examining our three hypotheses on scrutiny (H1) and its interaction with coalition policy divergence (H2) and ministerial power (H3)—which address the general learning effects of ministerial office-holders regarding the type of partnership—we now take a closer look at the learning dynamics by focusing on specific periods within a term.

4.5.1 Periodic Learning Within Term Quarters

Methodologically, identifying periodic changes within a term poses a significant challenge, as estimating timing on a period-specific basis could introduce bias into our findings. To address this, we report the model performance of our six specifications—experienced scrutiny (H1), experienced scrutiny interacted with coalition divergence (H2), and power-related experienced scrutiny (H3) for both our portfolio- and partisan-learning models—across distinct periods within a term. Figure 27 presents the model performance as the sum of squared errors, allowing us to compare the models' prediction accuracy for the first, second, third, and fourth quarters of a term.

The results reveal that predicting bill initiation timing is particularly challenging in the first and fourth quarters, as indicated by the relatively high sum of squared errors across all models and hypotheses. This suggests that, in the first quarter, ministerial office-holders are still in the process of forming their understanding of the type of coalition partnership, which could contribute to less accurate predictions during this early stage. The increase in

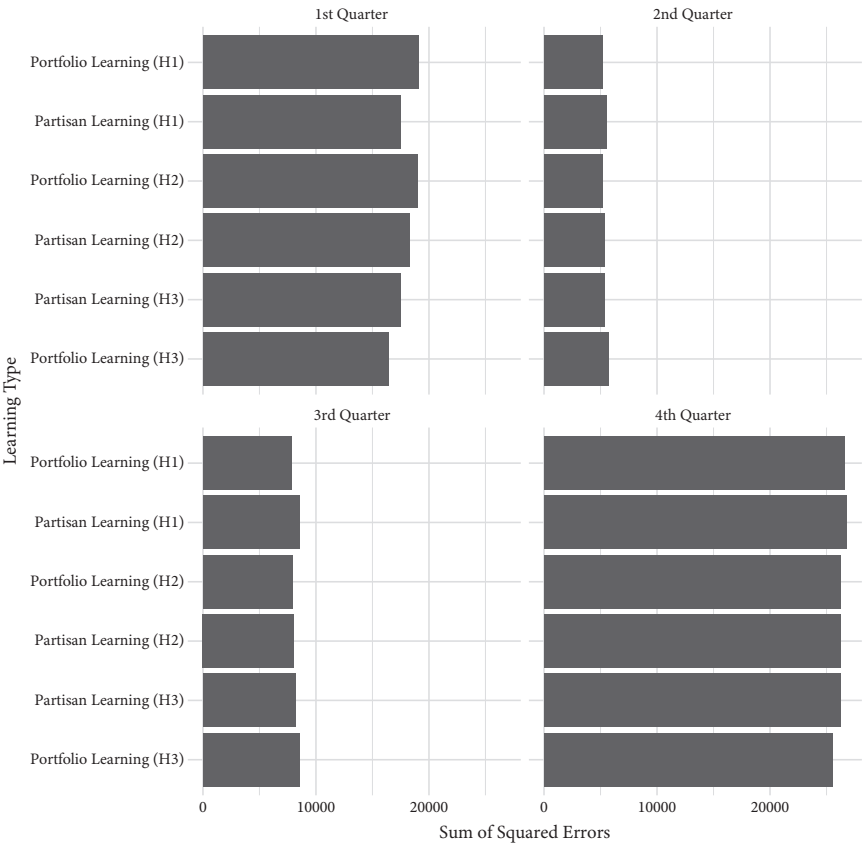


Figure 27 Prediction accuracy of learning models for different term quarters
Note: The size of the bars show the amount of squared errors for the first, second, third, fourth term quarter. The larger the bar, the higher a model's sum of squared errors.

errors observed in the fourth quarter, in turn, might reflect the complexities and uncertainties that often arise as the end of the term approaches, possibly due to strategic manoeuvring or the anticipation of upcoming elections. These patterns hint at the possibility that the timing of bill initiation is particularly challenging to predict during these periods, potentially due to the uncertainty inherent at the beginning of the term and the shifting electoral dynamics of coalition governance toward its end.

As the term progresses into the second and third quarters, the sum of squared errors decreases, indicating improved prediction accuracy. This improvement suggests that ministerial office-holders are gaining valuable experience and insights into the type of coalition partnership from experienced scrutiny, allowing them to make more informed decisions about

bill initiation timing. The second and third quarters are characterized by more stable and predictable learning dynamics, leading to lower errors across all models and hypotheses.

When comparing the portfolio and partisan learning models, partisan learning tends to perform slightly better in the first quarter, particularly for the hypotheses related to experienced scrutiny and its interaction with coalition policy divergence. This suggests that the partisan learning approach, which considers co-partisan experiences across portfolios, is more effective during the early stages of the term when ministerial office-holders rely heavily on prior beliefs. However, as the term progresses, the differences between the portfolio- and partisan-learning models diminish, and both models perform similarly in the middle quarters. In the third quarter, the partisan model for power-related experienced scrutiny shows a marginally better fit, reflecting a more accurate prediction of bill initiation timing when considering ministerial power.

Based on the results discussed, it appears that at the beginning of a term, ministerial office-holders rely heavily on their prior beliefs about the type of coalition partnership, leading to less accurate predictions in the early stages. As the term progresses, the interactions in joint policy-making allow ministerial office-holders to gradually infer the type of partnership. This ongoing learning process seems to improve prediction accuracy during the mid-term periods, where ministerial office-holders adopt a mixed strategy in bill initiation, reflecting a balance between early and late introductions. However, as the term advances and the possibility of elections looms, this shifts again, contributing to the increased prediction errors observed towards the end of the term. These patterns suggest that by analysing the distinct periods within a term, we gain further insights into how ministerial office-holders adapt their behaviour in response to cooperative and competitive experiences with partnership, thereby providing support for a dynamic learning perspective on coalition governance.

4.5.2 Prior Belief and Initial Uncertainty About Partnership

The results discussed above are consistent with the learning theory proposed by König et al. (2022), which suggests that ministerial office-holders initially have only a prior belief about the type of partnership and are largely unable to discern this type at the beginning of a term. Building on this theory, our subsequent analysis further accounts for the learning capabilities of ministerial

Table 8 Power-related portfolio and partisans models (M3) with number of previous bills.

	Model 1 (Portfolio)	Model 2 (Partisan)
Intercept	0.17 [0.15,0.20]	0.11 [0.08,0.14]
Experienced Scrutiny	0.75 [0.72,0.77]	0.65 [0.61,0.69]
Coalition Divergence	0.03 [0.02,0.04]	0.04 [0.03,0.05]
Policy Saliency	-0.07 [-0.08,-0.05]	0.11 [0.1,0.12]
Minister Party Size	0.11 [0.09,0.12]	-0.33 [-0.35,-0.29]
Median Minister	0.24 [0.14,0.32]	0.3 [-0.7 0.11]
Opposition Divergence	0.03 [0.2,0.04]	-0.04 [-0.05,-0.03]
Government Duration	0.12 [0.11,0.14]	0.16 [0.14,0.17]
Experienced Scrutiny*Minister Size	-0.28 [-0.30,-0.25]	-0.09 [-0.13,-0.05]
Experienced Scrutiny*Median Minister	0.05 [0.01,0.01]	0.17 [0.14,0.2]
Minister Party Size*Median Minister	0.05 [0.02,0.08]	0.03 [-0.01,0.08]
Experienced Scrutiny*Minister Size*Median Minister	-0.09 [-0.13,-0.05]	-0.14 [-0.18,-0.10]
Number of Previous Bills	1.05 [1.02,1.07]	1.0 [0.98,1.02]

office-holders by including the number of previous bills as a control variable. We expect that a higher number of previous bills, which provides ministerial office-holders with more information about the type of coalition partner, will enhance the accuracy of our predictions, particularly in the first quarter of a term. Table 8 incorporates the number of previous bills into our ministerial power-related portfolio- and partisan-learning models (H3).

The inclusion of the number of previous bills as a control variable in our power-related portfolio and partisan-learning models (H3) proves to be not

only statistically significant but also instrumental in enhancing the overall predictive power of these models. Specifically, the introduction of this variable leads to an increase in the magnitude of the coefficient for experience scrutiny alone. This increase in the coefficient suggests that the learning effect captured by the number of previous bills is important in understanding how ministerial office-holders adapt to scrutiny over time. By accounting for this learning process, the models become more refined, providing a better fit for the periodic data. Additionally, the inclusion of this variable helps to maintain the robustness and consistency of the other tests in our initial models. The significance and direction of other key variables, such as coalition divergence and policy saliency, remain stable, reinforcing the validity of our theoretical assumptions. Figure 28 illustrates the prediction accuracy of the power-related learning models (H3) across different quarters of a term, now incorporating the number of previous bills as a control variable. By comparing the sum of squared errors before and after including this variable, we can observe how the model's predictive performance changes.

The most notable improvement is seen in the first quarter, where the inclusion of the number of previous bills substantially reduces the sum of squared errors for both the portfolio- and partisan-learning models. This suggests that the learning gained from initiating previous bills significantly enhances the models' performance to predict bill initiation timing during the early stages of the term. Initially, without accounting for previous bills, the models particularly struggled to predict accurately bill initiation in the first quarter, likely due to the ministerial office-holders' limited knowledge and reliance on prior beliefs about the type of their coalition partners. However, once the experience from previous bills is factored in, the models become much more reliable, indicating that this learning process is crucial for improving early-term initiation predictions. In the fourth quarter, we also see an improvement in prediction accuracy, though it is less pronounced than in the first quarter. While prediction remains challenging as the term concludes, the models with the previous bills variable still outperform those without it. For the second and third quarters, where the models already perform relatively well, the inclusion of previous bills continues to contribute positively, though the impact is more modest. The prediction errors remain low, and the consistency across these middle quarters suggests that the models are robust with and without the incorporation of previous bills to the models.

Theoretically, the variation in the performance of our different learning model specifications reflects shifts in the timing strategies employed by ministerial office-holders as they seek to maximize the electoral benefits of

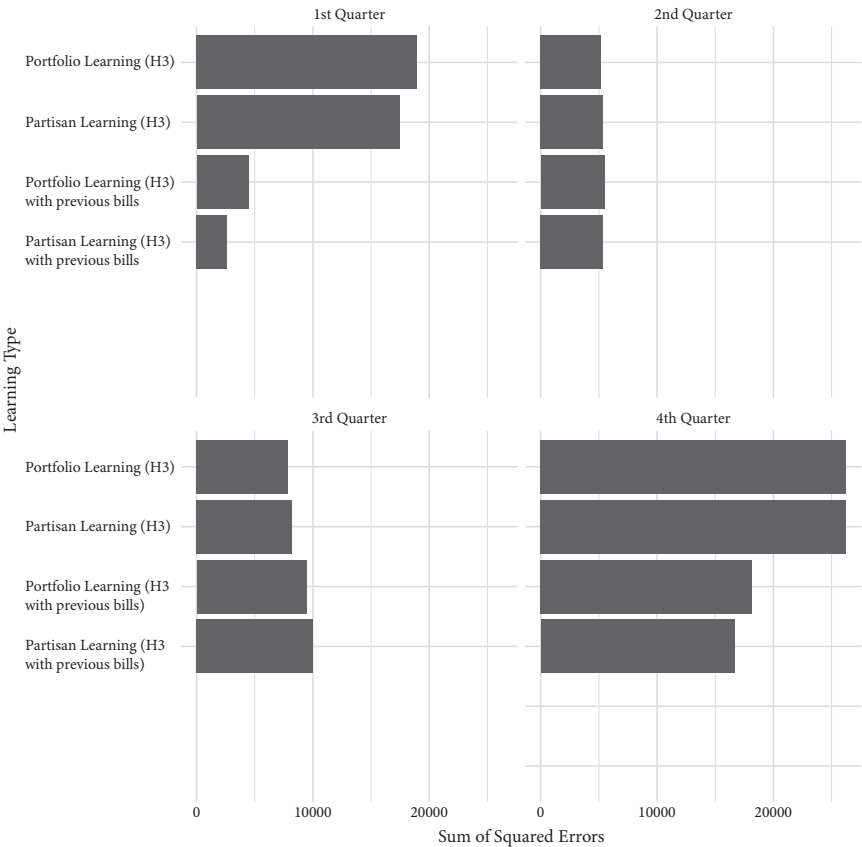


Figure 28 Prediction accuracy of power-related learning models for different quarters of term with number of previous bills.

Note: The size of the bars show the amount of squared errors for the first, second, third, fourth quarter of a term. The larger the bar, the higher a model's sum of squared errors.

their parties while mitigating potential losses from bill challenges over the course of a term. Initially, during the first three quarters, our findings suggest that ministerial office-holders are engaged in a process of learning about the type of their coalition partners. This learning occurs in the context of coalition dilemmas, arising from principal-agent problems between the ministerial office-holders' parties and their coalition partners. As this learning process unfolds, it influences how ministerial office-holders balance the cooperative and competitive incentives that characterize joint policy-making in coalition governance over time.

However, as elections approach in the final quarter, the strategic calculus appears to shift once again. The most accurate power-related specifications in

both our portfolio- and partisan-learning models tend to predict late bill initiation too early, indicating a possible overestimation of the electoral benefits associated with position-taking responsiveness or an underestimation of the costs imposed by scrutiny of their bills. These miscalculations are not necessarily mutually exclusive; coalition governance over time may blur the lines of responsibility (Silva and Whitten 2017), making it harder for constituencies to accurately assess each coalition party's responsiveness and recall their policy pledges (Stephen and Hobolt 2010). As the election nears, the dynamics within the coalition may become more competitive in joint policy-making, with parties shifting from a cooperative to a more competitive stance for vote-seeking purposes.

The performance of the models across different quarters provides further insight into these periodical dynamics in coalition governance. The portfolio-learning model shows a slight advantage in predicting bill timing during the third quarter, a period when ministerial office-holders have presumably gathered substantial information about the type of their partners and can make more informed decisions about bill timing. In contrast, the partisan-learning model outperforms the portfolio-learning model in the first and fourth quarters. In the first quarter, this superiority is theoretically grounded in the model's incorporation of additional information from co-partisan experiences, which aids learning under conditions of uncertainty. By the fourth quarter, the stronger performance of the partisan-learning model likely reflects a shift towards heightened partisan coordination, aligning with a vote-seeking strategy as elections approach. This finding underscores the dynamic nature of coalition governance as outlined in our theoretical framework, where the timing strategies of ministerial office-holders evolve in response to both the accumulation of experience and the shifting political landscape as a term progresses.

4.6 Power Relationship of Coalition Parties

So far, our findings indicate that the predictive power of our partisan-learning model is superior in most periods of the term, particularly because it incorporates the scrutiny experiences of co-partisan ministerial office-holders in other portfolios. Additionally, the power-related specifications consistently outperform those related only to scrutiny and coalition policy divergence. To deepen our understanding of these findings, we aim to explore the power dynamics

among coalition parties more closely by examining the timing of government bills in parliamentary democracies with strong institutions that grant committee power to coalition partners (Fortunato, Martin, and Vanberg 2019; König et al. 2022).

Building on the proposition that parliamentary committees empower parties in the policy-making process (Strøm 1990; Powell and Vanberg 2000; Martin and Vanberg 2011), we conceptualize the role of the committee chair as a powerful mediator who can either facilitate or hinder the scrutiny of government bills. Committee chairs, whether through formal or informal privileges, possess the authority to set the committee agenda and influence deliberations. By scheduling public hearings, consulting policy experts and societal groups, and subpoenaing relevant documents on government bills, committee chairs can reduce information asymmetries between themselves and the ministerial office-holders (Kim and Loewenberg 2005; Mattson and Strøm 1995; Mezey 1993). Although Sieberer and Höhmann (2017) do not find a strong relationship between committee chair power—measured by a thirteen-point additive index—and the share of governing parties, and report a negative relationship with Martin and Vanberg’s (2011) policing index in Western Europe, the question remains whether and under what conditions committee chairs empower coalition partners to monitor and scrutinize government bills effectively, particularly when there is a high risk of ministerial drift and disagreement over the bill (Kim and Loewenberg 2005; Carroll and Cox 2012; Fortunato, Martin, and Vanberg 2019; Krauss, Praprotnik, and Thürk 2021).

4.6.1 Learning from Powerful Partnership

Following our dynamic perspective, ministerial office-holders do not initially know the type of partner they are dealing with at the beginning of the term, but they can learn about it over time through experienced scrutiny. Our findings support our theoretical expectation that ministerial office-holders infer the type of coalition partners from experienced scrutiny—a learning process that is enhanced by higher coalition policy divergence and reduced through greater ministerial power. Accordingly, this learning process is expected to be more pronounced when partners have committee power, which increases their ability to subject bills to intense scrutiny in parliament. On closer inspection of the index of Sieberer and Höhmann (2017), the committee chairs of our covered countries vary in their agenda setting power, their right to interrupt

meetings and call for voting. In some of the countries in our sample, committee chairmanship is allocated among ministerial, coalition partner, and opposition parties, allowing us to exploit variation in chairmanship to investigate its implications for the timing of bill initiation.

Existing research on the impact of committee chairmanship for joint policy-making yields mixed findings. For instance, [Fortunato, Martin, and Vanberg \(2019, 785\)](#) argue that committee chairs provide opposition and partner parties with greater scrutiny power over government bills. However, their study on joint policy-making of 1,100 government bills in three parliamentary democracies—Denmark, Germany, and the Netherlands—reveals that control of committee chairs significantly strengthens the scrutiny power of opposition parties only, while the ability of coalition partners to monitor ministerial office-holders does not depend on their control of committee chairs. [König et al. \(2022\)](#), in turn, find that a coalition partner's ability to effectively scrutinize ministerial office-holders depends on support from the opposition, which can exacerbate coalition tensions when the coalition partner challenges government bills with opposition backing. This finding corroborates our vote-seeking argument, as the electoral costs of coalition tensions may outweigh the electoral benefits from position-taking responsiveness.

In the context of coalition party power dynamics, our findings already indicate that ministerial office-holders are less likely to delay bill initiation when they hold more power than their coalition partners. Conversely, we expect early bill initiation to be more likely when committee chairmanship reduces the scrutiny power of the coalition partner, and delayed initiation to be more likely when it increases. When the coalition partner controls the committee chairmanship, the ministerial office-holder is likely aware of the heightened scrutiny power this entails, which could impose significant reputation costs on the ministerial office-holder's party. Therefore, if the partner party chairs the committee, the likelihood of delayed bill initiation should increase, particularly when there is greater policy divergence between the party of the ministerial office-holder and the chairing partner party. Opposition parties, by contrast, generally have an incentive to undermine the image of coalition effectiveness and stability, and present themselves as a credible alternative ([Andeweg 2013](#); [Blondel 1997](#); [Hohendorf, Saalfeld, and Sieberer 2020](#); [Whitaker and Martin 2022](#)). This suggests that the learning effects regarding the type of coalition partner may differ depending on whether the committee chairmanship is held by a partner party or the opposition.

To investigate our expectation about learning based on the type of chairmanship, we constructed a new dataset by combining the data from our previous analysis with that of König et al. (2022), who studied the role of chairmanship for amendment proposals in Denmark, Germany, and the Netherlands. In Denmark, the committee chair can request testimony by ministerial office-holders and can request documents from extra-parliamentary sources. German committee chairs set the agenda of committee meetings, which they can also alter, and can interrupt or postpone meetings. This power is also held by Dutch committee chairs, which can also select amendment proposals (Sieberer and Höhmann 2017). This combined dataset allows us to examine the implications of chairmanship power for the timing of bill initiation in these three countries. In addition to considering the type of committee chairmanship, we also specify the key variable of bill divergence, defined as the policy divergence between the government bill initiated by the party of the ministerial office-holder and the party chairing the committee reviewing the bill.

We expect that the likelihood of early or delayed bill initiation will decrease or increase with the level of bill divergence between the ministerial office-holder's party and the party chairing the committee.³ Unlike our area-specific measure of coalition policy divergence derived from party manifestos, we use a sector-specific log-transformed measure of bill divergence from the study by König et al. (2022), which follows Martin and Vanberg (2011, 2014) in using expert surveys to measure both the ideological position and saliency of each party's preferences in a given policy sector (Benoit and Laver 2006; Laver and Hunt 1992). Government bills are categorized into five policy sectors—decentralisation, economic affairs, environment, foreign affairs, and social affairs—to approximate the policy positions and saliency of political parties, using data from Laver and Hunt (1992) for the years 1980 to 1995 and from Benoit and Laver (2006) for the years after 1996 (with Denmark as a reference).

4.6.2 Chairmanship and Timing of Bill Initiation

We transform our original dependent variable on the timing of bill initiation into a binary variable that takes a value of '1' for delayed bill initiation and '0' otherwise. Our combined dataset comprises 4,917 government bills from Denmark (2004–2011), Germany (1981–2012), and the Netherlands

³ Note that bill divergence is always 0 when the ministerial office-holder's party chairs the committee.

(1998–2012). In these countries, committee chairs are proportionally allocated based on the seat shares controlled by ministerial, coalition partner, and opposition parties.⁴ To investigate the effects of committee chairmanship, we categorize parliamentary committees into two groups: 1) *Opposition chair*, a binary variable coded as ‘1’ when the committee chair is held by an opposition party and ‘0’ when the chair is held by a coalition party; 2) *Partner chair*, a binary variable coded as ‘1’ when the committee chair is held by a coalition partner party and ‘0’ when the chair is either held by an opposition party or by the same party as the ministerial office-holder who initiated the bill. Our set of logistic regressions focuses on the binary variable for delayed timing, allowing us to distinguish between the effects of partner and opposition chairmanship.

In addition to the variables of interest described above, we control for several factors that might influence the relation between our response variable and main explanatory variables, as identified in previous research (e.g., Bräuninger, Debus, and Wüst 2017; Fortunato 2021; Martin and Vanberg 2011, 2014). Bill divergence measures the log-transformed difference between the ministerial office-holder’s party and the position of the party chairing the committee that reviews the proposed bill. The seat share of the committee chair accounts for the resources available to the chair for managing, whether by blocking or fostering, challenges to the implementation of the common policy agenda. Furthermore, in addition to considering bill complexity, a government bill is more likely to be scrutinized if it is examined by multiple committees. In this regard, the number of reviewing committees counts the number of committees to which a government bill is referred. Minority government is a binary variable that takes the value of ‘1’ if the seat share of the governing party (or parties) is less than or equal to 50% of the total seats in the lower chamber, and ‘0’ otherwise. We also control for country-fixed effects by introducing two binary variables for Germany and the Netherlands. Table 9 reports our results for both types of chairmanship.

The positive coefficient for the opposition chair (0.27, significant at the 0.1 level) suggests that the presence of an opposition chair is associated with an increased likelihood of delayed bill initiation when bill divergence is zero.

⁴ Information about committee chairs was collected from committee reports of each bill in Denmark. German committee chair data were obtained from *Datenhandbuch zur Geschichte des Deutschen Bundestages, 1949 bis 1999* for the years 1949 to 1998. For the years after 1998, the relevant information was extracted from the *Bundestag website*. Dutch committee chair data were mostly gathered through the websites of the *Tweede Kamer and Parlement & Politiek*.

However, this effect must be interpreted cautiously because it is contingent on the absence of bill divergence (since the opposition chair is involved in the interactive term). This indicates that when the opposition party chairs a committee, the bill initiation process for the implementation of the common policy agenda tends to slow down, likely due to the opposition's strategic use of procedural mechanisms, such as proposing amendments or raising objections, which can lengthen the policy-making process.

Similarly, the negative coefficient for the partner chair (-0.30 , significant at the 0.05 level) suggests that, in the absence of bill divergence, a committee chaired by a coalition partner tends to experience fewer delays in bill initiation. However, this effect must also be interpreted cautiously because it is contingent on the absence of bill divergence (since the partner chair is also involved in an interactive term). This aligns with the expectation that a cooperative type of coalition partner, which generally supports the implementation of the common policy agenda, is less likely to open the gate for scrutiny. However, when there is significant bill divergence, the positive interaction term (0.28 , significant at the 0.01 level) shows that the presence of a coalition partner chair actually increases the likelihood of delayed bill initiation. This can be interpreted as the coalition partner using the delay as a bargaining tool within the coalition, seeking to adjust the bill to better align with its own policy positions before allowing it to proceed.

The interaction term between opposition chair and bill divergence (-0.28 , significant at the 0.01 level) reveals that as divergence increases, the effect of an opposition chair on delaying bill initiation diminishes, holding all other variables constant. This suggests that when there is significant disagreement between the government's bill respectively the ministerial office-holder's party and the opposition's policy stance, the opposition chair may not necessarily prolong the process further. In fact, the process might even accelerate, possibly because the opposition wants to bring the bill to a vote quickly to expose coalition tensions or to leverage the situation for political gain.

The direct effects of bill divergence itself are also notable. With a partner chair, higher bill divergence generally reduces the likelihood of delay, unless modified by the interaction. In contrast, the bill divergence coefficient in the presence of an opposition chair is small and not statistically significant, suggesting that the effect of disagreement is more context-dependent and influenced by the interaction with the chair's party. Other significant factors include the chair seat share (0.72), which implies that chairs with more power (in terms of seat share) can more effectively influence the timing of bill initiation, likely through their greater control over committee proceedings.

Table 9 Delayed timing of bills.

	Partner Chair	Opposition Chair	
Opposition Chair	0.27* (0.16)	0.27* (0.13)	Partner Chair
Partner Chair	-0.30** (0.13)	-0.30** (0.16)	Opposition Chair
Bill Divergence	-0.19*** (0.08)	0.08 (0.06)	Bill Divergence
Partner Chair x Bill Divergence	0.28*** (0.10)	-0.28*** (0.10)	Opposition Chair x Bill Divergence
Chair Seat Share	0.72*** (0.14)	0.72*** (0.14)	Chair Seat Share
Number Reviewing Committees	-0.0004 (0.02)	-0.0004 (0.02)	Number Reviewing Committees
Minority Government	1.54*** (0.24)	1.54*** (0.24)	Minority Government
Government Duration	0.001*** (0.0002)	0.001*** (0.0002)	Government Duration
Germany	0.96*** (0.24)	0.96*** (0.24)	Germany
Netherlands	1.49*** (0.22)	1.49*** (0.22)	Netherlands
Constant	-2.77*** (0.35)	-2.77*** (0.35)	Constant
N	4,917	4,917	N
Log Likelihood	-3,229.76	-3,229.76	Log Likelihood
AIC	6,481.52	6,481.52	AIC

*p < .1; **p < .05; ***p < .01

Minority governments (1.54) also correlate with increased delays, which can be attributed to the inherent difficulties in managing policy-making processes under such conditions.

In sum, the analysis shows that the type of committee chair, whether opposition or coalition partner, and the level of bill divergence between the ministerial office-holder's party and the chair's party, are important predictors of the timing of bill initiation. Opposition chairs tend to slow down the process unless there is significant bill divergence, while coalition partner chairs

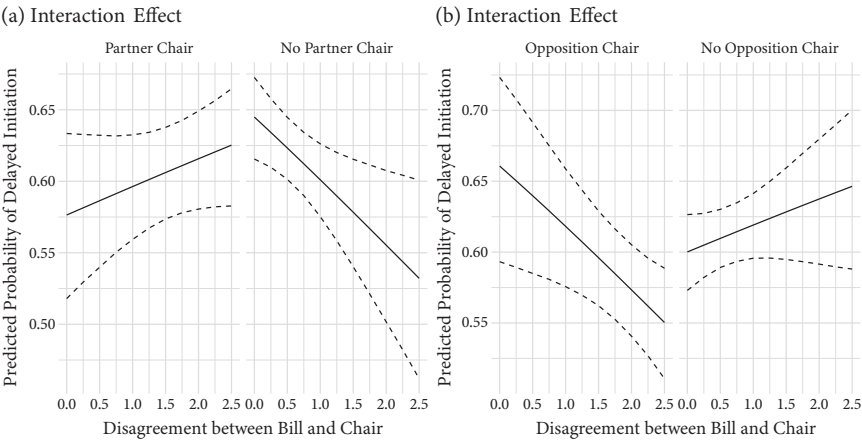


Figure 29 Predicted Probabilities of Delayed Bill Initiation, Conditional on Chair and Disagreement Between Bill and Chair

generally expedite the process unless faced with substantial policy differences. [Figure 29](#) presents the predicted probabilities of delayed bill initiation as a function of the level of disagreement between the ministerial office-holder's party and the committee chair, with separate plots for the presence or absence of a partner chair and an opposition chair.

In the left plot of panel (a), the solid line represents the predicted probability of delayed bill initiation across varying levels of disagreement between the ministerial office-holder's party and the chair when a coalition partner chairs the committee. As the level of disagreement increases, the predicted probability of delay seems to increase slightly. This aligns with the earlier interpretation that coalition partners may delay bill initiation when there is significant bill divergence. However, the wide confidence intervals around this estimate suggest considerable uncertainty. This indicates that while the model predicts a positive relationship between disagreement and delay when a partner chair is present, the data do not provide strong evidence that this relationship is significantly different from zero across the full range of disagreement levels. In the right plot of panel (a), where there is no partner chair, the predicted probability of delay decreases as disagreement increases. Here, the confidence intervals are narrower, indicating greater confidence in the negative relationship between disagreement and delay. This suggests that in the absence of a partner chair,

higher bill disagreement is more likely to result in a quicker initiation process, possibly because the absence of a coalition partner's involvement reduces internal negotiation delays.

The left plot of panel (b) shows the predicted probability of delayed initiation when an opposition chair is present. As disagreement between the ministerial office-holder's party and the chair increases, the predicted probability of delay decreases. The confidence intervals are relatively narrow, especially at higher levels of disagreement, indicating greater confidence in this negative relationship. This supports the idea that opposition chairs may expedite the policy-making process in the face of significant bill disagreement, potentially to expose coalition tensions and challenge the government bill more effectively. In the right plot of panel (b), where there is no opposition chair, the probability of delay increases with higher levels of disagreement. The confidence intervals here are also relatively wide at higher levels of disagreement, indicating some uncertainty in this positive relationship. While the model suggests that the absence of an opposition chair could lead to delays in the face of greater disagreement, this interpretation should be tempered by the recognition that the evidence is not strong across all levels of disagreement.

In general, the effects appear to be notably affected by opposition chairmanship: the larger the gap between the opposition chair's position and the bill versus the ministerial office-holder's party, the lower the likelihood of delayed government bill initiation. These findings imply that ministerial office-holders are more prone to glean insights about the coalition partnership type when the coalition partner occupies a chairmanship role in parliament. This observation aligns with our hypothesis that delayed initiation rises with greater discrepancy between the partner chair's stance and the ministerial office-holder's party, as the partner has a stronger motivation to facilitate thorough scrutiny of the bill. On the other hand, when the bill significantly diverges from an opposition chair's position, delayed initiation is less probable, suggesting that in such scenarios, the opposition may be more motivated to hasten the process, thus reducing opportunities for the ministerial office-holders to understand the nature of the coalition partnership.

These findings align with and further substantiate our previous insights into the power relationship of coalition parties, particularly in the context of learning from experienced scrutiny for bill initiation timing. The probability of delayed (or early) bill initiation is closely linked to the control of committee chairmanship by coalition partners (or opposition) and the level of policy

divergence. The heightened scrutiny afforded by the chairmanship can impose reputation costs on the ministerial office-holder's party, especially as policy divergence increases. While opposition chairs tend to expedite the process in the face of disagreement, coalition partner chairs are more likely to delay the process as policy divergence increases. This underscores the critical role of committee chairmanship in shaping the implementation of the common policy agenda within a dynamic perspective of coalition governance.

5

Conclusion

5.1 Learning the Type of Partnership

The formation of Germany's 'traffic light coalition' in 2021, marks a departure from traditional models of coalition formation, which emphasize the policy- and office-seeking incentives of coalition theories. For policy-seeking, coalition governments are formed between parties with similar policy positions to ensure future joint policy-making without coalition tensions, which promises to implement a common policy agenda. However, the welfare-focused SPD decided to align with the business-oriented FDP and environment-focused Greens despite their contrasting policy positions, largely due to dissatisfaction with their previous coalition with the Union of the Christian Democratic Party (CDU) and the Christian Social Union (CSU). Our analysis explains the SPD's choice by its prior belief about the type of partnership for future joint policy-making.

This German case also challenges approaches that take into account office-seeking interests of coalition parties. Instead of continuing the partnership with a comfortable joint seat share of 56% with the Union, which would have become the junior partner after losing almost 9% of its former vote share while the SPD won about 5% more votes, the SPD favoured a coalition with the Greens and the Liberals, which had together the majority of seats in the new cabinet. In addition to policy- and office-seeking interests, we emphasize the vote-seeking interests of coalition parties by introducing a temporal dimension to coalition governance, recognizing that coalitions must operate jointly to implement their common policy agenda within the limited time frame of a term. The formation and execution of a common policy agenda are influenced by the dynamics of joint policy-making over time, where ministerial office-holders balance the benefits of their parties from position-taking responsiveness in joint policy-making with the reputation costs from scrutiny of their bill proposals in parliament, which suggests a competitive partnership.

The German traffic light coalition provides a critical case for rethinking coalition politics. By integrating the temporal dimension, this case highlights the complex dynamics of coalition governance, where vote-seeking coalition

parties must navigate the challenges of joint policy-making within the constraints of a term after the formation of coalition government. The following experiences of the welfare-focused SPD, the business-oriented FDP, and the environment-focused Greens underline the importance of coordination and timing in achieving coalition effectiveness and satisfaction with coalition governance. Although the traffic light coalition was formed with the promise to cope with major challenges such as pandemics, climate change, and migration, it turned out that the coalition parties finally pursued quite different policy positions in joint policy-making, leading to challenges of important bill proposals of ministerial office-holders with coalition tensions. When this book was written, it was unclear whether the traffic light coalition would remain stable until the end of the term. The analyses of this book suggest that understanding coalition governance requires not only a focus on policy- and office-seeking but also an appreciation of how temporal factors shape the vote-seeking strategies and outcomes of coalition governance. Again, as highlighted in the introduction, there are a number of implications we can draw from the example:

- Coalition parties usually compromise on a road map for a common policy agenda and allocate the portfolios for ministerial office-holders for its implementation, but this alone does not guarantee coalition effectiveness in joint policy-making and satisfaction with coalition governance throughout the term.
- Ministerial office-holders may use their expertise and power to advance bills that favour their own constituencies to generate electoral benefits from position-taking responsiveness, risking challenges of their bills by intense scrutiny in parliament the more they deviate from previously agreed compromise.
- From these scrutiny experiences of their bills in joint policy-making, ministerial office-holders can infer the type of coalition partnership, i.e., a cooperative type immediately approving their bills or a competitive type opening the gate for intense scrutiny of their bills in parliament.
- The type of coalition partnership cannot only be learned from experiences in their own portfolio, but ministerial office-holders can also consider the experiences of their co-partisan colleagues, leading to a more coordinated vote-seeking approach of their party to the timing of bill initiation.
- Agenda timing by bill initiation becomes crucial for coalition effectiveness in joint policy-making. A cooperative partnership fosters early

initiation, facilitating the implementation of the common policy agenda, whereas a competitive partnership leads to delays in bill initiation.

- The type of coalition partnership may change throughout a term, shifting from cooperative to competitive partnership inferred from the experiences of bill proposals and challenges by parliamentary scrutiny. Coalition effectiveness and coalition stability in the implementation of the common policy agenda decreases with the level of competitive partnership.
- As the term approaches its end, the incentives of vote-seeking coalition parties for cooperation may decrease, leading to increased competition and potential challenges of bills in joint policy-making, which may lead to dissatisfaction with coalition governance.

Motivated by the example and thereof derived empirical implications, we have systematically explored the dynamics of coalition governance in a large sample of parliamentary democracies, providing a comprehensive analysis of how coalition parties navigate the challenges of joint policy-making within spatial and temporal constraints. By developing a dynamic framework on the learning processes of ministerial office-holders in joint policy-making, we have emphasized the importance of understanding the cyclical nature of coalition governance, moving beyond static approaches that have dominated the existing literature. Our dynamic perspective has revealed that coalition parties engage in a continuous process of learning and adaptation over time, influenced by their interactions and experiences within a term. This dynamic process significantly impacts the timing of bill initiation, the overall coalition effectiveness, coalition stability in the implementation of the common policy agenda, and satisfaction with coalition governance.

In examining the challenges of coalition governance, our analysis bridges the distinct yet interconnected spatial and temporal dimensions, the cyclical nature of joint policy-making, the kind of learning processes, and agenda timing. We illuminate how vote-seeking coalition parties navigate the evolving landscape of coalition governance across a term, in which the temporal constraints by electoral cycles shape coalition behaviour, while patterns of cooperation and competition reveal the adaptive vote-seeking strategies employed by coalition partners. The kind of learning processes, both within autonomous portfolios and across partisan lines, further refine these strategies, influencing the nature and timing of bill initiation. Together, these insights deepen our understanding of the vote-seeking considerations that underpin coalition governance and move the literature further.

Our analysis acknowledges the critical role of political institutions in creating and mitigating the risks associated with principal-agent issues inherent to coalition governance. While strong asymmetries in office-holding power and expertise between coalition parties pursuing divergent policy positions create incentives for ministerial drift, strong parliamentary institutions, by fostering repeated interactions and facilitating scrutiny, help realign bill proposals with the coalition compromise, thereby promoting cooperation among coalition partners. However, as this book has demonstrated, the timing of the implementation of a common policy agenda is not just a matter of institutional design; it is also deeply influenced by the learning processes that occur within coalition governance over time.

The introduction of the portfolio- and partisan-learning models provides a framework for understanding how ministerial office-holders adapt their timing of the common policy agenda based on their inferences about coalition partnership from experienced interactions in joint policy-making. These models underscore the dynamic nature of coalition governance, where the timing of bill proposals is continuously adjusted in response to the experiences with cooperative and competitive coalition partnership. As ministerial office-holders learn about the type of partnership they are engaged in—whether cooperative or competitive—they refine their vote-seeking strategy for agenda timing, balancing the need to implement bills with the desire to maximize position-taking benefits and to minimize coalition tensions and electoral costs.

Moreover, this book has argued that the temporal dimension is crucial for understanding the cyclical nature of agenda timing in coalition governance. From the formation of a government to the next election day, the cooperative and competitive incentives for coalition parties shift, influenced by both internal dynamics and external contextual factors. These shifts lead to distinct periods of cooperation and competition in joint policy-making, where coalition parties must continuously recalibrate their vote-seeking objectives. Considering this temporal dimension reflects the basic *pro tempore* feature of representative democracy—imposing temporal limits on office- and policy-seeking parties.

5.2 Principal-agent Problems and Learning Processes

Because ministerial office-holders are responsible for the implementation of the common policy agenda within their portfolios, they have the discretion to time the initiation of bills according to the benefits and costs from

drift of their proposals. Instead of assuming a fixed distribution of power and policy positions, we argued and demonstrated empirically that ministerial office-holders can estimate their cost-benefit relationship from drift by drawing inferences about the type of partnership from their experiences in joint policy-making over time, i.e., a cooperative type from experienced immediate approval and a competitive type from experienced parliamentary scrutiny of their bills. Drawing on the learning theory of König *et al.* (2022), we distinguish between two learning models, which ministerial office-holders may utilize to optimize their agenda timing throughout the term, namely the portfolio-learning model and the partisan-learning model.

The portfolio-learning model focuses on how ministerial office-holders learn from their experienced interactions in joint policy-making within their specific portfolios. This model assumes that each ministerial office-holder, acting relatively autonomously, navigates the challenges of coalition governance by adapting to the experienced scrutiny their bills face in parliament. When ministerial office-holders propose bills aligned with their party's policy positions, they risk straining relations with coalition partners, particularly when their proposals deviate significantly from the agreed-upon coalition compromise. Over time, as ministerial office-holders encounter either cooperation with immediate approval or competition by scrutiny of their bills, they adjust the timing for the implementation of the common policy agenda, learning to either persist with or modify the timing of their bill proposals to avoid coalition tensions.¹

In the portfolio-learning model, the principal-agent problems are managed within the confines of autonomous portfolios. Ministerial office-holders engage in a dynamic process of adjusting their behaviour in response to experienced interactions with coalition partners within their specific areas of responsibility. As office-holders initiate bills and encounter varying degrees of cooperation or competition from their partners, they learn the type of their coalition partners. This learning is critical as it enables office-holders to fine-tune their agenda timing for optimizing the vote-seeking cost-benefit relationship of their proposals. Ministerial office-holders must balance their party's goals with the coalition's common policy agenda, navigating the fine line between advancing their party's interests in generating benefits from position-taking responsiveness to the distinct demands of their constituencies

¹ Instead of adjusting the timing of bill initiation, ministerial office-holders may also adapt by modifying the content or policy position of their proposals. While this possibility is suggested here, it is not fully developed in this book and warrants further exploration in future research.

and maintaining coalition effectiveness by complying with the previously agreed coalition compromise. The repeated interactions within portfolios allow office-holders to explore the likelihood of partner support or opposition, leading to more informed decisions regarding the timing of their bill initiatives.

The partisan-learning model expands the learning process beyond autonomous portfolios to consider the experiences of co-partisan ministerial office-holders across different portfolios. This model emphasizes the organizational role of political parties in coordinating the experiences and strategies of their office-holders. Instead of learning in isolation, ministerial office-holders share insights and experiences with their co-partisan colleagues, allowing the party as a whole to develop a more cohesive vote-seeking strategy to coalition governance. This coordination is particularly important in multiparty coalitions, where the success of one bill proposal can be influenced by multiple partners. It is also important at the beginning of the term when ministerial office-holders have yet little experiences from joint policy-making in their own portfolio.

From a partisan-learning perspective, the principal-agent problem is not merely about managing individual ministerial office-holders but also about how the party coordinates its overall vote-seeking strategy to coalition governance for election day. The party leverages the collective experiences of its ministerial office-holders to anticipate coalition partners' responses, optimize the timing of bill proposals, and reduce the likelihood of coalition tensions. This coordinated approach helps the party adapt the behaviour of its representatives, aligning their actions across different portfolios to maximize both policy success and electoral benefits. It can foster coalition effectiveness, coalition stability in the implementation of the common policy agenda, and satisfaction with coalition governance.

While both models recognize the inherent challenges of the principal-agent problems in coalition governance, they offer different solutions. The portfolio-learning model emphasizes autonomous ministerial adaptation within the constraints of their portfolios, focusing on how each ministerial office-holder learns to navigate coalition dynamics. In contrast, the partisan-learning model stresses the importance of party-level coordination, where experiences are shared across portfolios to optimize the party's overall vote-seeking strategy. The portfolio-learning model may be more applicable in scenarios where ministerial office-holders operate with a high degree of autonomy, and where the coalition partners closely monitor and scrutinize each other's actions within specific portfolios.

The partisan-learning model, on the other hand, is particularly relevant in contexts where parties play a strong organizational role in shaping the behaviour of their office-holders. By fostering communication and coordination among ministerial office-holders, the party can more effectively manage the principal-agent problems across portfolios, ensuring that their representatives' actions are aligned with both the party's goals and the coalition's common policy agenda. This approach is better suited for managing the complexities of coalition governance over time, as it allows for a more dynamic and adaptive strategy that can respond to changing coalition dynamics.

The distinction between these models also points to the varying degrees of autonomy and coordination required in different periods of the coalition's life cycle. Early in the term, when uncertainty about the type of partnership is high, portfolio-learning seems to dominate as ministerial office-holders focus on establishing credibility within their specific domains. As the term progresses and experiences accumulate, partisan-learning becomes more pronounced, with office-holders leveraging the broader party network to refine their strategies and enhance the party's overall standing within the coalition.

5.3 Temporal Dynamics and Agenda Timing in Coalition Governance

Issues arising from the principal-agent dilemma, such as ministerial drift, are more likely to occur when there is significant policy divergence and power asymmetries among coalition parties, exacerbating tensions within the coalition and increasing the likelihood of parliamentary scrutiny of bill proposals.

At the beginning of a coalition's term, after the coalition government has been successfully formed by the agreement on a common policy agenda and the allocation of ministerial portfolios, ministerial office-holders might seek to immediately implement their party's electoral pledges by initiating bills that align closely with their own party platform and the distinct demands of their constituencies. This responsiveness to their constituencies can generate short-term electoral benefits, but it also risks undermining the coalition compromise and triggering conflict with coalition partners. The likelihood of such ministerial drift is heightened when power asymmetries exist and coalition policy divergence is pronounced, making it essential for coalition partners to engage in mechanisms that can mitigate the risks of ministerial drift.

Political institutions play a critical role in addressing these principal-agent problems. Coalition agreements may document the initially agreed coalition

compromise on the implementation of a common policy agenda and serve as an *ex ante* control mechanism for future joint policy-making. Furthermore, junior ministers and strong parliamentary institutions, as emphasized by scholars such as Thies, Mueller and colleagues, Martin and Vanberg, can help coalition partners to overcome information and power asymmetries vis-à-vis ministerial office-holders. These institutions provide an *ex post* control mechanism by distributing information, power, and establishing parliamentary rules that guide interactions among coalition parties. Through repeated interactions in joint policy-making, a 'shadow of the future' is created, where the expectation of continued collaboration incentivizes coalition parties to cooperate despite their policy differences.

However, the ability of the coalition partner to rein in drifting ministerial office-holders is bound by temporal dynamics, defined largely by political institutions, which define electoral rules to limit the duration of terms in representative democracy. This temporal dimension creates distinct periods within a term, each characterized by varying incentives for cooperation and competition among coalition parties. The influence of time on coalition governance is not merely a backdrop but a driving force that shapes the behaviour of coalition parties as they navigate through different periods of the joint policy-making process. The temporal dimension of coalition governance introduces additional challenges. The dynamics of cooperation and competition among coalition parties are thus not static; they dynamically evolve over the course of a term. In the early period, when coalition partners are still learning about each other's type of partnership, ministerial office-holders may be more inclined to push forward their own agendas, testing the boundaries of cooperation. As time progresses and they accumulate experience, they can better assess the cooperative or competitive type of their partners, adjusting their timing of bill proposals accordingly.

More specifically, at the onset of a term, coalition parties are primarily focused on establishing their credibility and fulfilling high-saliency policy commitments that were central to their electoral platforms but are unlikely to raise coalition tensions. This initial period is often marked by a concerted effort to implement bills that enjoy broad consensus within the coalition, aiming to build trust among partners and present a united front to the electorate. The early period is, therefore, one of relative coalition effectiveness, where the coalition's common policy agenda is pursued with minimal internal conflict. Coalition parties prioritize these uncontested, high-saliency policies as they are critical for demonstrating the coalition's effectiveness and

ensuring satisfaction with coalition governance and continued support of their respective constituencies.

As the term progresses into its mid-period, the dynamics begin to shift. The experiences of governing together start to reveal the type of partnership—whether it is cooperative or competitive. This is a period of learning and adaptation, where coalition partners adjust their strategies based on the experienced interactions and challenges encountered in joint policy-making. The mid-term is often characterized by an increased awareness of policy divergence within the coalition. As these divergences become more pronounced, the timing of bill proposals becomes a strategic tool. Bills that are highly contested and expected to face significant scrutiny tend to be delayed, particularly if they carry high saliency. As our results highlight, the postponement of the implementation of the common policy agenda reflects a strategic response by ministerial office-holders to manage the potential costs associated with coalition tensions, especially when coalition policy divergence is high.

The latter period of the term is dominated by the looming prospect of the next election, which significantly alters coalition behaviour. As the electoral cycle nears its end, the incentives within the coalition shift from policy implementation to electoral considerations. Coalition parties, now more concerned with their individual electoral prospects, may prioritize vote-maximizing strategies over the implementation of the common policy agenda. This period often sees a reorientation of the coalition's focus, with ministerial office-holders becoming more defensive, seeking to minimize any potential liabilities that could arise from challenges of their bill proposals. The impending election exacerbates competitive tendencies within the coalition, as parties begin to differentiate themselves from their partners to appeal to their core constituencies.

In this final phase, the temporal constraints of the electoral cycle exert a profound influence on the joint policy-making process. The urgency to maximize electoral gains can lead to a slowdown in the initiation of new bills. The focus shifts from governance to campaigning, with coalition parties weighing the electoral costs and benefits of their remaining time in office. Consequently, the implementation of the common policy agenda may become more selective, with ministerial office-holders opting to advance only those initiatives that trade off the electoral benefits of their parties and the reputation costs from experiencing scrutiny. At the very end of the term, the necessary time for joint policy-making is censored. When the initiation of bill proposals is significantly delayed due to learning about competitive partnership, it is unlikely that coalition parties implement their common policy agenda within the term.

Overall, the temporal dynamics of coalition governance highlight the importance of understanding how the timing within a term influences coalition behaviour. From the early period of establishing credibility and implementing the common policy agenda, through the mid-term period of learning and adaptation, to the late-term shift toward electoral considerations, coalition governance is a cyclical process shaped by the interplay between policy-making process and the electoral cycle.

5.4 The Cyclical Nature of Coalition Governance

Our dynamic theoretical framework on coalition governance uncovers the cyclical nature of joint policy-making, characterized by a fluctuating rhythm of cooperation and competition throughout a term. This cyclical pattern emerges as coalition parties navigate the challenges of coalition governance, beginning with initial uncertainty about the type of their partnership. At the start of a term, coalition partners are largely unfamiliar with each other's type, leading to a period of learning and adjustment. Early interactions are tentative, with ministerial office-holders testing the waters of collaboration, often through the implementation of high-saliency, low-contention policies designed to establish credibility and build trust.

As the term progresses, the learning process deepens. Coalition parties gather insights from their experiences, gradually uncovering the cooperative or competitive type of their partnership. As our results reveal, this learning shapes the timing and content of the common policy agenda, influencing how and when bills are introduced and challenged. The cyclical nature of governance becomes evident as coalition parties shift between cooperation and competition, adapting their strategies in response to both the successes and challenges of joint policy-making. By mid-term, as ministerial office-holders gain a clearer understanding of the type of partnership, bill initiation is more likely to be delayed in portfolios subject to high scrutiny, particularly when divergence of policy positions among coalition partners is pronounced. This delay is mitigated, however, when ministerial office-holders hold powerful positions that allow them to reduce the scrutiny of their proposed bills in parliament.

The cyclical pattern is further shaped by external factors, including the temporal constraints imposed by electoral cycles. As the end of the term approaches, the impending election exerts a profound influence on coalition behaviour. The focus often shifts from cooperative to competitive vote-maximizing strategies, with parties seeking to position themselves

advantageously for the upcoming electoral contest. This period may see a decline in cooperation as a whole, as coalition partners become more protective of their individual party brands and less willing to engage in potentially costly compromises. The ongoing learning processes, driven by the experiences of coalition parties, play a critical role in this cycle. Ministerial office-holders, who are responsible for implementing the common policy agenda, must continuously adapt their approach based on the feedback they receive from their partners. This adaptation is not just reactive but also strategic, as parties seek to optimize the timing of policy initiatives to align with both the internal dynamics of the coalition and the external pressures of the electoral calendar.

Overall, the cyclical nature of coalition governance underscores the complexity and challenges of joint policy-making in parliamentary democracies. It reveals a governance process that is far from linear, marked instead by a series of iterative cycles of learning, adaptation, and strategic recalibration. This dynamic perspective challenges the predominant static view used in coalition studies assuming the conditions of the data generation process do not change. Acknowledging changing conditions, our dynamic perspective offers a more nuanced understanding of how coalition parties navigate the intricate and evolving landscape of coalition governance over time. Through this lens, we can better appreciate the strategic considerations that underpin the timing of policy initiatives, the shifting patterns of cooperation and competition, and the ultimate success or failure of coalition governance.

As we highlight in our book, in coalition governance the timing of bill initiation by ministerial office-holders is a vote-seeking decision influenced by the intricate dynamics of cooperation and competition within the coalition. Ministerial office-holders carefully time the introduction of bills to optimize the cost-benefit relationship inherent in joint policy-making. In cooperative partnerships, where coalition partners demonstrate support for each other's initiatives, early bill initiation is favoured. This approach not only signals responsiveness to constituency demands but also facilitates the smooth implementation of the common policy agenda. However, in non-cooperative partnerships, where coalition partners are more likely to challenge or scrutinize each other's proposals, ministerial office-holders may delay bill initiation to minimize potential reputation costs. These reputation costs arise when ministerial bills are subjected to parliamentary scrutiny, which can signal a lack of unity or effectiveness within the coalition to the electorate.

The timing of bill initiation is further complicated by the extent of policy divergence among coalition parties. Higher policy divergence increases the likelihood of ministerial drift, where office-holders propose bills that

deviate from the agreed-upon coalition compromise. This drift often triggers scrutiny from coalition partners, particularly when the bills address high-saliency issues that are central to the parties' electoral platforms. Our analysis reveals a positive correlation between the level of scrutiny a bill receives and the delay in its initiation. However, this correlation is moderated by the powers held by ministerial office-holders, which are proxied by factors such as the size of their party and whether their party holds the median policy position in parliament. These factors can provide ministers with the leverage needed to prevent scrutiny or to mitigate its effects, thereby allowing for more timely bill initiation even in the face of potential opposition.

As the term nears its end, the impending election introduces additional considerations that can alter agenda timing. The shadow of the future diminishes, as the end of the term brings uncertainty about whether the current coalition will continue or if new alliances will be necessary. During this period, coalition parties may alter their behaviour, focusing more on maximizing their electoral prospects rather than maintaining the existing partnership. This can lead to a change in the timing of policy initiatives, with parties either accelerating their efforts to showcase achievements before the election or delaying contentious policies that might cause friction within the coalition.

Moreover, the electoral cycle exerts pressure on coalition parties to maximize their vote share, which may lead to a shift in focus from policy implementation to electoral positioning. Ministerial office-holders may delay or expedite bill initiation based on their calculations of how these actions will be perceived by voters. The finite nature of the term, with its inherent time constraints, further complicates these decisions, as the window for effective joint policy-making narrows.

In summary, the timing of bill initiation in coalition governance is a complex interplay of strategic considerations influenced by the level of cooperation or competition within the coalition, the extent of policy divergence, the powers of ministerial office-holders, and the electoral cycle. Understanding these dynamics provides valuable insights into the functioning of coalition governments and the challenges of joint policy-making in representative democracies.

5.5 Where to Go From Here

The theoretical and empirical contributions outlined in our analysis offer significant implications for the literature on coalition governance. By integrating a dynamic perspective that considers both temporal and spatial dimensions,

our approach challenges static views that assume fixed conditions without learning by coalition parties throughout a term. We believe that our dynamic perspective on learning the type of partnership not only enriches the understanding of the theoretical foundations of joint policy-making in coalition governance, but also introduces a new paradigm for analysing the cyclical nature of coalition interactions.

Empirically, our findings highlight the importance of timing in bill initiation as a vote-seeking strategy employed by ministerial office-holders to navigate the competing demands of coalition partners and their own constituencies. The identification of learning processes, both within and across ministerial portfolios, further underscores the evolving types of coalition partnerships and the necessity for adaptive vote-seeking strategies. The empirical insights provide a more nuanced evaluation of the factors that drive coalition behaviour, offering a novel empirical method to examine the dynamics of joint policy-making over time, and setting the stage for future research. This not only moves the literature further by challenging existing paradigms but also equips scholars and practitioners with innovative tools for analysing and predicting the dynamics in diverse political contexts of representative democracy.

In line with the implications of our theoretical framework and empirical findings, future studies on the foundations of representative democracy, which set temporal limits to governmental activities, could benefit from an increased emphasis on the temporal dimension and constraints of policy-making and other activities, particularly by advancing our learning theory and the use of circular regression as demonstrated in our analysis. Theoretically, we focused on the office-holder's learning the type of partnership, while a mutual learning through experienced interactions in joint policy-making is certainly a promising avenue. Furthermore, our novel methodology accurately estimates the periodicity in political processes, effectively capturing the non-linear and cyclical nature of political activities and events in addition to bill initiation, such as governmental declarations, parliamentary speeches, and behaviour of political parties across different periods of a term.

We encourage researchers to extend the application of circular regression to other areas of political science for the study of representative democracy, including electoral cycles, legislative sessions, and government termination. This may also help to better understand the external and internal challenges of representative democracy, which sets temporal limits to govern. This could uncover deeper insights into the temporal dynamics of political actions and the behaviour of governance in representative democracy, as compared

to technocratic or populist governance. Moreover, the identification of learning processes invites further exploration of how these processes evolve over time. Understanding how past experiences shape strategies and stability over time is crucial, particularly in different institutional contexts of representative democracy.

Building on these insights, future research may also focus on comparative studies to explore how different institutional contexts—such as parliamentary, presidential, or semi-presidential democracies—and electoral systems, like proportional or majoritarian, influence the learning processes and adaptive strategies of coalition parties.² For example, colleagues (Ohara and Hepplewhite 2024) have applied our approach to the United Kingdom, which is rarely governed by coalitions. Despite this British lack of coalition experience, the implementation of the common policy agenda is strictly constrained by parliamentary sessions, which not only limit the ministerial office-holders to draw inferences on the type of coalition partnership but also set the timing priority of bills proposals in parliament. Expanding the scope of our research to include other parliamentary democracies could provide a more comprehensive understanding of these dynamics, but it also demands to consider specific rules of each democratic regime.

Finally, investigating the role of contextual factors—such as economic crises, social movements, and international pressures—will further enhance our understanding of how external shocks shape the incentives and behaviour of coalition parties. Analysing the interaction between these factors and the cyclical nature of joint policy-making in coalition governance can provide deeper insights into the resilience and survival of coalition governments. By pursuing these lines of inquiry, we hope that future research will continue to push the boundaries of our paradigmatic understanding of coalition governance, offering more sophisticated models and empirical strategies to capture the complex realities and challenges of joint policy-making.

² A careful examination of the differences between presidential and parliamentary systems, along with the development of a potential unified framework, could yield valuable insights (Silva 2023).

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