

Policy complexity and legislative duration in the European Union

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ABSTRACT

This article investigates the impact of policy complexity on the duration of legislative negotiations in the European Union employing survival analysis. We conceptualize policy complexity as a three-dimensional construct encompassing structural, linguistic and relational components. Building on this conceptual framework, we measure the complexity of 889 Commission proposals published under the ordinary legislative procedure between 2009 and 2018. Controlling for institutional and political drivers of legislative duration identified by previous studies, we show that different types of policy complexity influence the duration of the decision-making process in the European Union to varying degrees, at different points in time and partially in unexpected ways. On a general level, our study highlights that developing a better understanding of the origins and consequences of policy complexity in the European Union is a key task for scholars of European integration.

KEYWORDS Decision-making, duration, European Union, policy complexity, survival analysis

The publisher's version of the article is available at
<https://journals.sagepub.com/doi/10.1177/1465116519859431>

DOI: 10.1177/1465116519859431

I wish that the superfluous and tedious statutes were brought into one sum together, and made more plain and short.

Edward VI, King of England and Ireland, 1537–1553.

Introduction

King Edward VI can hardly be blamed for his lack of understanding of the intricacies of English law – after all, he died at age 15. But when he complained about policy complexity in 16th-century England, he certainly did not see the European Union (EU) coming. Since its inception, the EU has been proliferating enormous amounts of legislation. Today, the complexity of secondary law that permeates Europe not only implies major managerial challenges for those in power and their bureaucracies, but also involves significant cognitive burdens for the public (Adam et al., 2019). The EU has recognized these challenges and increasingly aims to simplify its legislation as reflected in its recently introduced regulatory fitness and performance program (REFIT), which is part of the Commission’s broader ‘Better Regulation’ agenda. In 2015, the responsible Commissioner Frans Timmermans sounded not that different from Edward VI when he stated: ‘It is essential that every single measure in the EU’s rulebook is fit for purpose – modern, effective, proportionate, operational and as simple as possible’ (Timmermans, 2015). Thus, policy complexity has been an issue for centuries, but the core questions surrounding it remain unanswered: what exactly is policy complexity and how does it matter for the legislative process? In this contribution, we address both questions by (a) providing a conceptualization and measurement approach that allows us to assess and compare the complexity of legislative proposals in the EU and (b) analyzing the extent to which different forms of policy complexity impact on the efficiency of the ordinary legislative procedure under the rules of Lisbon.

While the existence of policy complexity at the EU level is well recognized both by practitioners and EU scholars, we lack appropriate conceptual tools to capture the phenomenon and accordingly, we know only very little about its origins and consequences. Drawing on descriptive approaches in computer science and law, we distinguish between structural, linguistic and relational policy complexity (Bommarito II and Katz, 2010; Katz and Bommarito II, 2014). While structural policy complexity relates to the size of a certain policy proposal, linguistic policy complexity captures the conceptual variety present in a legal text and relational policy complexity addresses the interdependencies within a policy proposal and the extent to which the policy proposal relies on additional, existing EU law for interpretation and implementation. We show that incorporating these types of policy complexity is of great relevance for the explanation of the duration of the legislative process. In particular, our findings suggest that different types of policy complexity crucially influence the duration of decision-making processes in the EU to varying degrees, at different points in time and partially in unexpected ways.

Beyond these theoretical considerations related to the existing literature, we consider our contribution important for several additional reasons. First, we regard it as problematic that for the past few years, the European Commission has been equating ‘simpler’ legislation with ‘cheaper and less’ legislation. Accordingly, the Commission has repeatedly highlighted the importance of financial impact assessments and reduced the number of new legislative proposals. Yet, both the costs and the amount of EU legislation do not tell us anything about how complex the proposed legislation actually is. Second, and related to this, the concept of policy complexity allows us (and the European Commission) to compare the policy content of extremely different policy types on a common dimension. Unlike concepts like policy restrictiveness or policy intensity, which mainly pertain to regulatory policies or policy generosity, which might be more relevant in the context of distributive policies, policy complexity is a concept that transcends the boundaries of policy types and thus allows for more general statements on the dynamics of policy making. Finally, our research has important normative implications. While we do not call for a general reduction in the complexity of the European Commission’s policy proposals, we make the case that the EU needs to make sure that the complexity of these proposals matches the carrying capacity of its political institutions.

Policy complexity as a neglected concept in EU research

Research on the legislative process in the EU and its decision-making outcomes has largely been conducted through an institutional analytical lens. Most prominently, spatial approaches to decision-making have focused on the role of institutional scope conditions, the heterogeneity of actor preferences, and the interaction of the two (e.g. Tsebelis and Garrett, 2000). This strand of scholarship has produced a wealth of insights on how the EU operates and why some actors are more successful than others in the legislative process. Yet, while the political and institutional aspects of decision-making in the EU have been examined extensively, the question of *what* is actually being negotiated often only plays a secondary role. To a large extent, this neglect can be attributed to the problem that policy content is extremely hard to measure in a way that allows for systematic comparison across policy sectors and over time. Moreover, next to these conceptual challenges, it is also quite demanding to obtain the necessary data.

As an important exception to this general pattern, the project ‘Decision Making in the EU’ (DEU) has collected information on the positions of various policy stakeholders on a set of policy issues and analyzed the corresponding legislative negotiations comparatively (Thomson et al., 2006, 2012). The project can be regarded as a milestone in EU research as it delivered many important insights into the legislative process of the EU. However, it focused exclusively on salient and controversial policy topics and was mainly interested in the ideological distances between the involved political actors on a given policy issue, not in the intricacies of the underlying policy content as such. Yet, regardless of whether the complexity of policy content matters for the quality of decision-making *outcomes*, it should certainly matter

a great deal for the *efficiency* of the legislative process, as it augments the transaction costs for all involved political institutions and actors. Accordingly, the time it takes to decide may well be influenced by the complexity of what it is that must be decided upon.

The duration of the legislative process in the EU has been attributed to a variety of factors by the existing literature. Hertz and Leuffen (2011) demonstrate a procedure-prolonging effect of EU enlargement and resulting changes in group size within the EU institutions, while Toshkov (2017) contested this finding with new empirical evidence. Schulz and König (2000) find the undertaken institutional reforms of the decision-making process to have a time-reducing effect, whereas Bølstad and Cross (2016) recently demonstrated that not all treaty revisions were equally important and that only the Amsterdam Treaty had a significant impact. Other studies identify preference heterogeneity between member states (Drüner et al., 2018; Golub, 2007; König, 2007) and EU institutions (Klüver and Sagarzazu, 2013) as determinants of decision-making efficiency. Golub and Steunenberg (2007) highlight the role of qualified majority voting in the Council as a key institutional variable reducing legislative duration. Rasmussen and Toshkov (2013) show that legislative duration is affected by the extent to which policy stakeholders are consulted at the design stage.

Yet, the role of policy content is rarely considered systematically. Schulz and König (2000) and König (2007) find shorter legislative duration for EU policy areas in which member states share common goals. Moreover, several studies have confirmed that the legal instrument chosen by the Commission makes a difference and that directives are the most time-consuming (e.g. Klüver and Sagarzazu, 2013; Rasmussen and Toshkov, 2013; Sloot and Verschuren, 1990). Toshkov (2017) also showed that the EU has become more efficient in dealing with directives in recent years, which is arguably due to increasing informalization and early agreements. Focusing on the policy formulation stage, Osnabrügge (2015) demonstrated that the technical complexity of a policy proposal significantly delays its introduction by the European Commission. Thus, we know that policy complexity exerts an influence when the Commission formulates its proposal, but does this effect carry over to the legislative negotiations? In order to answer this question, we first need to conceptualize what exactly we mean by ‘policy complexity’.

Conceptualizing policy complexity

While the concept of policy complexity has not gone completely unnoticed by extant research, it has mainly been addressed descriptively and hardly considered by political science. However, policy complexity has received attention in the neighboring disciplines of computer science and law. Schuck (1992) provided the early groundwork for research on the influence of complexity in legal and legislative systems, outlining a conceptual framework as well as a variety of possible effects and dynamics. Schuck (1992: 3) considered the grade of complexity of a legal system to be comprised of its ‘density, technicality, institutional

differentiation and uncertainty or indeterminacy'. Following this initial outline, several scholars in the field have been preoccupied with refinements and empirical measurements of Schuck's definition of complexity (Bommarito II and Katz, 2010; Bourcier and Mazzega, 2007; Katz and Bommarito II, 2014; Mazzega et al., 2009; Walzl and Matthes, 2014, 2015).

Drawing on Schuck (1992) and moving from the complexity of the entire legal system to the complexity of a single legal text, Katz and Bommarito II (2014) employ an 'end-user perspective' in order to conceptualize complexity. According to the authors, an end-user is the person or body dealing with a legal text at any stage of the legislative process. The policy complexity this end-user is confronted with materializes through the *structure, language and interdependence* of the legal text (Katz and Bommarito II, 2014).

The structure of a legal text can be thought of as a network of individual parts organized in a tree-like arrangement where the nodes are pieces of text – articles, paragraphs, points – which are characterized by hierarchical 'legal influence' (Bourcier and Mazzega, 2007: 212). The individual nodes each contain a legal provision, which may further specify another legal provision, as is the case for hierarchical structures, or add an additional branch to the text. As the size of the network of legal provisions in a text is extended, its structure may become broader (additional high-level links) and deeper (additional hierarchical links). *Structural policy complexity* thus relates to the size of a policy proposal and represents the costs associated with the quantitative workload the proposal entails.

Second, in addition to structural policy complexity, which mainly captures the size of a legal text, also the text's language can make a difference for its perceived complexity. In general, texts can be formulated in more or less easily digestible language. In order to illustrate this, it helps to think of a rather trivial example: most people will find it much easier to read 100 pages of Harry Potter than 100 pages of the Ulysses. Both texts have the same structural complexity, as both are of equal length, but Ulysses is arguably much more complex in linguistic terms. Likewise, a legal text's language can serve as an indicator for more abstract properties such as the conceptual variety in the text or the text's readability (Katz and Bommarito II, 2014; Walzl and Matthes, 2014). Thus, we argue that not only the size of a legal text determines its complexity, but that also the complexity of the employed language matters. Unlike the mere size of a text, *linguistic policy complexity* provides insight as to how costly the engagement with a given policy proposal can become in cognitive terms.

Finally, next to size and language, we should also pay attention to the extent to which individual policy elements in a legal text interact. Individual elements of a legal text are not necessarily only ordered hierarchically, but can interact both within the closed environment of the legal text and with already existing provisions in different laws and regulations (Bourcier and Mazzega, 2007: 212). In legal texts, quotations of other acts add to the complexity of the quoting provision and the density of the network as a whole in

the sense that the quoting act needs to be interpreted taking the quoted provision into account. The *relational policy complexity* of a legal act therefore offers an insight into the costs that result from the interactions of individual legal provisions within the text and the embedding of the legal text into the system of existing policies.

Policy complexity, transaction costs and legislative duration

As the previous discussion suggests, all three types of policy complexity (structural, linguistic and relational) are inseparably intertwined with the notion of costs, more specifically *transaction costs* (North, 1990). Laws entail transaction costs at the implementation stage, when it comes to compliance and enforcement (Kaplow, 1996; Tullock, 1995), but transaction costs already accrue much earlier during the policy formulation and decision-making stage. Similar to firms in the economic market, political institutions in the ‘political market’ should help to reduce the transaction costs that arise when political preferences are channeled into a policy decision (North, 1990). However, the efficiency of this process should be determined critically by the complexity of the policy content these political institutions have to deal with. As policy complexity grows, the transaction costs for lawmakers to understand, process and agree upon the policy grow with it (Schuck, 1992: 20). Thus, we argue below that different types of policy complexity come with different kinds of transaction costs and that these costs entail consequences for the efficiency of the legislative process.

First, complex policy proposals multiply opportunities for inter-institutional bargaining. If the legal provisions in a given policy proposal are numerous, this invites more extensive and by implication, longer, legislative deliberations. Therefore, especially structural policy complexity should be prone to increase the opportunities for the involved political actors to negotiate and augment the quantitative workload that these negotiators have to cope with. This implies that the Commission might face strategic incentives at the formulation stage to calibrate the complexity of its proposals in a certain way. Whether this is indeed the case is a question we cannot answer in this article. However, regardless of whether the Commission’s motivation to increase or decrease the structural complexity of its policy proposals is inherently political or follows a purely functional logic: in both cases, the decision should affect the efficiency of the decision-making process by influencing the transaction costs resulting from higher workload and potentially also through the more contentious content of these policy proposals.

Second, transaction costs can also be cognitive in nature and these types of transaction costs are primarily affected by the linguistic complexity of a policy proposal. The complexity associated with the conceptual variance present in a text is crucially related to the capacity of an end user to process this text in cognitive terms (Katz and Bommarito II, 2014). The relevance of linguistic complexity for text comprehension has been demonstrated in experimental studies (e.g. Linzen and Jaeger, 2014), and it is not

far-fetched to assume that also policy makers suffer from these cognitive limitations. Linguistically complex legal texts require more effort from the involved legislative actors to grasp the policy content conveyed in these texts and thereby augment the time these actors need to process them.

Finally, relationally complex policy proposals entail significant transaction costs resulting from increased efforts for information acquisition. While the European Commission enjoys a first-mover advantage in legislative negotiations and produces its proposals with the help of a large bureaucratic body, both the European Parliament (EP) and the Council first need to engage in fact-finding missions, hearings and internal coordination when they are confronted with a policy proposal. Greater relational policy complexity makes these latter tasks more demanding, because of the increased technical knowledge and legal expertise required to evaluate the costs and benefits of a given policy proposal. While legislative committees in the EP may reduce these costs in a variety of ways, including specialization, expert consultations and informalization, we may still expect that proposals of higher complexity are more challenging to process politically.

We therefore expect legislative duration to be a function of the diverse transaction costs accruing from the complexity of the policy to be decided upon. In line with the conceptual distinction introduced above, we theorize this policy complexity to materialize through the size of the legislative proposal (*structural policy complexity*), its language (*linguistic policy complexity*) and the interdependence between the proposal's policy elements and between the proposal and other, already existing EU law (*relational policy complexity*).

Research hypothesis: Structural, linguistic and relational policy complexity increase the duration of the decision-making process in the EU.

Operationalization and measurement

How can we operationalize and measure our three different forms of policy complexity? To the extent the existing literature addresses policy complexity, it mainly relies on measures of the length of legislative proposal, for example the proposals' number of words (e.g. Kousser, 2006) or number of pages (e.g. Golub, 2006). Kaeding (2006), Toshkov (2008) and Steunenberg and Rhinard (2010) use the number of recitals in their respective studies of transposition delay and Rasmussen and Toshkov (2011) use the same indicator in their study on legislative duration. Other authors have used the number of committees consulted as a proxy for policy complexity in their analyses of early agreements (Reh et al., 2013) and legislative duration (Rasmussen and Toshkov, 2013). However, all of these measures paint an incomplete picture of policy complexity. Word and page counts could be sensitive to the language used in the text and if at all, only tap into the structural complexity of the text. The number of recitals is not sensitive to the text's language, but

also only partially reflects the structural complexity of the proposal (see below). Finally, the number of consulted committees might, if at all, be a potential consequence of policy complexity, not a direct measure of the phenomenon as such.

Accordingly, there is quite some room for improvement regarding the operationalization and measurement of policy complexity, especially in relation to its linguistic and relational aspects. In this section, we describe our measurement approach. Moreover, we present the way we conceptualize and measure the dependent variable ‘legislative duration’ and provide a short discussion of the control variables we include in the analysis.

Structural policy complexity

Katz and Bommarito II (2014) propose two ways of measuring the structure of a legal text: structural size and element depth. The structural size of a given text can be assessed by simply counting the individual legal provisions containing substantive policy content. Element depth can be captured by calculating the mean depth of a text, i.e. the mean specificity of individual legal provisions. Both ways of operationalizing structural policy complexity have their merits. In this contribution, we opt for the somewhat simpler approach of counting the individual legal provisions in the policy proposal. We think that this gives us a reasonable approximation of the transaction costs generated by the sheer size of the policy proposal and closely mirrors previous approaches of approximating policy complexity only through the number of recitals (Kaeding, 2006; Steunenberg and Rhinard, 2010; Toshkov, 2008). In order not to inflate our measure for structural policy complexity artificially, however, annexes will not be included in this analysis as they often contain a great number of short list items, not adding any legal content to a provision, and vary greatly in terms of form and structure. Accordingly, we measure structural policy complexity by counting the number of recitals, para- graphs, subparagraphs, points and indents in a Commission proposal.¹

Linguistic policy complexity

The literature on computational linguistics provides a wide variety of measures for the difficulty of natural language ranging from relatively simple to advanced measures. Simple, yet vague, measures include overall word counts, counts of words indicating legal indeterminacy (Walzl and Matthes, 2014) and the average word length (Katz and Bommarito II, 2014). The Flesch Reading Ease index measures the readability of a text taking the average sentence length and the average number of syllables per word into account (Flesch, 1948). While such measures possibly offer an insight into readability, Katz and Bommarito II (2014) point

¹ Please note that citations are not included in our measure for structural policy complexity, as they do not contain any legal provisions, but merely references. Citations are, however, included in our measure for relational policy complexity.

out that longer words are not necessarily harder to grasp or increase indeterminacy, but are simply often more precise. Instead, they propose the use of a text's word entropy, which measures the variety of words in a text, as an alternative. Stemming from the field of information theory and first proposed by Shannon (1948), entropy can be thought of as a measure for the uniformity of a given signal. A signal (text) is more uniform the more predictable its content is. In this sense, word entropy gives an indication of a text's linguistic complexity (or uncertainty) and reflects the text's conceptual variety.

In order to calculate word entropy, the text is first split into unigram tokens, i.e. strings of characters representing a single word, while removing punctuation and whitespace. The text is then considered a 'bag of words', from which the probability of each token's occurrence can be calculated and aggregated across the entire text. This approach is common for a wide variety of linguistic measures (Katz and Bommarito II, 2014; Walzl and Matthes, 2014). In formal terms, word entropy can be calculated as

$$-\sum_{w \in W} p_w \log_2(p_w)$$

where p_w is the probability p of a token's occurrence in the given text W (Katz and Bommarito II, 2014: 357). It is important to point out that we only use the English version of the Commission proposals in order to measure word entropy. Since recent research shows that the underlying logic driving word entropy is the same across all languages of the world, this choice should not bias our findings (Bentz et al., 2017).

Relational policy complexity

Finally, each connection, i.e. reference, to another element of a legal system adds to the relational policy complexity of a legal text. Specifically, we count each mention of another act as a whole or of individual parts as well as mentions of other articles of the proposal itself. We include duplicates, as each mention can be expected to require a new appraisal of the quotation in the specific context. We use the average number of cross-references per article. Accordingly, our measure for relational policy complexity reflects the extent to which an average policy element in the proposal is embedded into the existing legal landscape as well as how strongly it is connected to other elements in the proposal.

The dependent variable: Legislative duration

The dependent variable is based on data taken from the EU's Legislative Observatory. Reflecting the approach taken in previous studies, we calculate the time elapsed between the publication of the Commission proposal and the publication of the final legal act in the *Official Journal of the European Union*. The data are right-censored on 1 November 2018, which implies that all proposals that had not been

concluded on this day enter the analysis as right-censored observations.

Control variables

We employ a series of important control variables that have been identified in the existing literature. Dummy variables control for the legal instruments (directives and decisions vs. regulations), the procedure sub-type (codifications and recasts vs. regular legislation), and whether the policy proposal is new or amends existing legislation. In order to control for the amount of possible political conflict in the Council, we measure the heterogeneity of preferences of the national governments represented in the Council. Specifically, we use the standard deviation (weighted by Council voting weights) of government positions on the left–right and pro-/ anti-EU dimensions. National government positions are based on national election manifesto data by Volkens et al. (2018) and constructed, respectively, using the *rile* measure and positive (*per108*) and negative (*per110*) mentions of the EU in the most recent manifesto at a given point in time and weighted by a party’s government seat share.² We hold the decision-making procedure constant by our exclusive focus on ordinary legislative procedures. We also introduce dummy variables capturing the policy area a given proposal addresses and use the lead committee dealing with the proposal in the EP as a proxy. In order to avoid the overburdening of our model with a long list of dummy variables, we only control for the policy areas in which the most proposals were issued. This concerns the policy areas economy and monetary affairs (ECON), environment, public health and food safety (ENVI), internal market and consumer protection (IMCO), inter- national trade (INTA), industry, research and energy (ITRE), and civil liberties, justice and home affairs (LIBE). Furthermore, we include variables for the number of pending co-decision files (i.e. legislative backlog) and the days left in the Council presidency in order to control for possible scheduling and organizational pressures within the institutions.

Data and methods

We test our research hypothesis by analyzing all Commission proposals published under the ordinary legislative procedure since the coming-into-force of the Lisbon Treaty on 1 December 2009. The end point of our investigation period is 1 November 2018. We focus on directives, regulations and decisions, but do not analyze opinions and recommendations. Cases where modified or amended proposals were published by the Commission after the original proposal – and there- fore triggered the process to start anew – were excluded as it can be expected that the information acquisition process, and therefore the accumulation of costs, was considerably distorted. We also dropped all proposals the Commission withdrew at some point,

² Note that we neither control for the EP term during which a proposal was issued nor for the accession of Croatia on 1 July 2013. While including these variables does not change our conclusions, both introduce problems of multicollinearity through their correlation with political conflict in the Council on the integration dimension.

because the censoring times for withdrawals are not independent.³ In sum, the number of analyzed cases amounts to 889, while 621 of these proposals had been concluded at our cut-off date on 1 November 2018.

We web-scraped the required data from the EP’s Legislative Observatory and EUR-Lex.⁴ Subsequently, we extracted the necessary ‘technical’ information, including the (sub-)procedure, committee, and event information for all proposals as well as the texts of the proposals. Based on the extracted data, the variables relating to the text metrics, as described in the previous section, were then generated using text analysis techniques. In order to ensure the data quality of the automatically collected data, we conducted random counter-checks of the scraped as well as the parsed data. A few cases were excluded from the dataset due to unavailable data. In most of these cases, proposals were not available via EUR-Lex at all or exclusively in languages other than English.

In order to test our hypothesis, we use Cox regressions with time-varying coefficients, mirroring the methodological approach used in previous studies (e.g. Golub, 2007; Golub and Steunenberg, 2007; Hertz and Leuffen, 2011; Klüver and Sagarzazu, 2013). However, we take advantage of recent developments in the methodological literature, which allow us to estimate and plot survivor functions and thereby provide a more nuanced and appropriate interpretation of the model (Ruhe, 2016; Ruhe, 2018). Most importantly, these survivor functions allow us to compare survival times under different, empirically interesting scenarios.

Results

We find that four of our variables violate the proportional hazards assumption: structural policy complexity, linguistic policy complexity, whether the proposal is a directive, and Council heterogeneity on the pro-/anti-EU dimension.⁵ Therefore, we interact these variables with the natural logarithm of time and estimate time-varying coefficients (Box-Steffensmeier and Zorn, 2001). Moreover, since the Council composition changes over time, we followed the approach taken in previous studies and coded a time-varying covariate capturing these state changes. In addition, changes in legislative backlog and the days left in the Council presidency were coded whenever changes of Council preference heterogeneity occurred. In the Online appendix, we report an additional model which is based on a dataset in which we introduce legislative backlog as a regular time-varying covariate. Table 1 presents the estimated hazard ratios.

³ The Commission often withdraws several proposals at once at the end or the start of a term and the average survival time of the withdrawn proposals in our sample of 1186 days is considerably longer than the average survival time of non-censored proposals (589 days) and those censored on 1 November 2018 (592 days).

⁴ Legislative Observatory: www.europarl.europa.eu/oeil.

⁵ Please find the corresponding Grambsch–Therneau test in the Online appendix.

The models indicate significant relationships between all three types of policy complexity and legislative duration. Specifically, the main component of the model suggests that all three forms of policy complexity prolong the decision-making process.⁶ Since we include all complexity types in the same model and thereby control for their relative influence, we can conclude that not only the size of the proposal matters, but also the complexity introduced by the proposal's language and its legal intricacies.⁷ However, the effect is not stable over time for structural and linguistic policy complexity, as their time-varying coefficients demonstrate. Unfortunately, this information alone does not help us determine whether the effects of structural and linguistic policy complexity disappear over time, only become smaller or even reverse their direction. In order to answer this question, it is useful to analyze the corresponding survivor functions (Ruhe, 2018). Before we do this, however, we take a quick look at our control variables and put their estimated effects into context.

First, directives take significantly longer to be concluded than regulations (Hertz and Leuffen, 2011; Klüver and Sagarzazu, 2013; Schulz and König, 2000), but this effect is not stable over time. Decisions, in contrast, are decided upon much more quickly than regulations. Second, our model shows that codifications are concluded faster than regular legislation, whereas there is no significant difference for recasts. Third, we find that amending acts take somewhat less time to be concluded than new policy proposals, reflecting recent findings by Drüner et al. (2018). Fourth, we cannot find any effects of Council heterogeneity on the left–right dimension. However, our findings are as puzzling as the findings presented by Klüver and Sagarzazu (2013) as far as the integration dimension is concerned. The model suggests that higher heterogeneity leads to a faster decision-making process initially, but the effect reverses over time. Like Klüver and Sagarzazu (2013), we are unable to provide a perfect explanation. However, it might be the case that member states coordinate more if heterogeneity is high, leading to shorter negotiations initially, but that these coordination efforts are insufficient to prevent long negotiations if a file is highly controversial. Fifth, the number of days left in the Council Presidency has a prolonging effect on the duration of legislative negotiations.

⁶ We standardized the different complexity types with a mean of 0 and a standard deviation of 1 to facilitate comparisons.

⁷ Please note that the variance inflation factors for all three types of complexity are well below 2, which implies that their simultaneous inclusion in the model does not entail problems of multicollinearity (see the Online appendix). In addition, we provide alternative model specifications with different combinations of our complexity variables in the Online appendix as a robustness check.

Table 1. Cox proportional hazards regression with time-varying coefficients

Variables	Hazard ratios	
	Main component	Time-varying coefficients
Structural policy complexity (standardized)	0.005*** (0.006)	2.127*** (0.334)
Linguistic policy complexity (standardized)	0.049*** (0.022)	1.600*** (0.119)
Relational policy complexity (standardized)	0.895** (0.050)	
Directive (ref.: regulation)	0.038** (0.049)	1.662** (0.338)
Decision (ref.: regulation)	2.066*** (0.328)	
Codification (ref.: legislation)	1.567** (0.331)	
Recast (ref.: legislation)	0.851 (0.168)	
Amending proposal (ref.: new proposal)	1.211* (0.125)	
Council heterogeneity: Left/Right (weighted)	1.001 (0.030)	
Council heterogeneity: Pro-/Anti-EU (weighted)	4.996*** (2.005)	0.764*** (0.051)
Days left in Council Presidency	0.994*** (0.001)	
Legislative Backlog	0.997*** (0.001)	
Lead committee: ECON	1.178 (0.164)	
Lead committee: ENVI	0.930 (0.130)	
Lead committee: IMCO	0.869 (0.148)	
Lead committee: INTA	1.323* (0.194)	
Lead committee: ITRE	1.455** (0.252)	
Lead committee: LIBE	0.621*** (0.090)	
Log likelihood	-3399.638	
Number of subjects	889	
Number of failures (completions)	621	
Observations	22,846	22,846

Note: *** p<0.01, ** p<0.05, * p<0.1. Hazard ratios reported; standard errors of coefficients in parentheses. Time-varying coefficients are estimated for variables that violate the proportional hazards assumption through the interaction with the natural logarithm of time. Data are right-censored on 1 November 2018. Council heterogeneity is coded as a time-varying covariate.

Fifth, the number of days left in the Council Presidency has a prolonging effect on the duration of legislative negotiations. This broadly corroborates the findings presented by Klüver and Sagarzazu (2013), but we do not find that the effect reverses over time. Sixth, our model suggests that legislative backlog slows down decision-making, which contradicts earlier studies that found backlog to accelerate decision-making initially and slow it down later on (Golub and Steunenberg, 2007; Hertz and Leuffen, 2011; Klüver and Sagarzazu, 2013). We suspect that this difference might be due to the fact that unlike these studies, we only focus on the post-Lisbon period and, more importantly, only measure the backlog of co-decision procedures. Pending co-decision files might exert a different impact than overall backlog. Finally, we find that proposals in the area of civil liberties, justice and home affairs take considerably longer to conclude than proposals issued in other policy areas, whereas proposals on industry, research and energy as well as international trade are decided upon somewhat more quickly.

As indicated above, the hazard ratios presented in Table 1 hardly allow us to assess and compare the relative importance of the different forms of policy complexity. Therefore, we present a graphical analysis of our findings below. In particular, we predict survivor functions at specific values of the covariates we are interested in.⁸ Specifically, we estimated the probability that a certain proposal is still under negotiation at a certain point in time both for complex proposals (at the 95th percentile of the distribution) and simple proposals (at the 5th percentile of the distribution). We fixed the remaining variables at their means and set all dummy variables to zero. The only exception to this latter rule is that we present the survivor functions for directives in the article, while the same functions for regulations can be found in the Online appendix. Figures 1 to 3 show the resulting survivor functions.

Figure 1 shows how structural policy complexity affects legislative duration at different points in time after the publication of the Commission proposal. Structurally simple proposals have a consistently higher probability of being concluded early than structurally complex proposals. Moreover, we see that the difference of the survivor functions diminishes over time, suggesting that the reversal of the time-varying coefficient we identified in the regression does not imply that the effect of structural policy complexity reverses, but that it becomes smaller and disappears very late in the process. The longer legislative

⁸ We used Ruhe's *scurve_tvc* command for Stata (Ruhe, 2016) to estimate the survivor functions and visualized our findings using Bischof's *plotplain* scheme (Bischof, 2017).

Figure 1. Survival functions: structural policy complexity

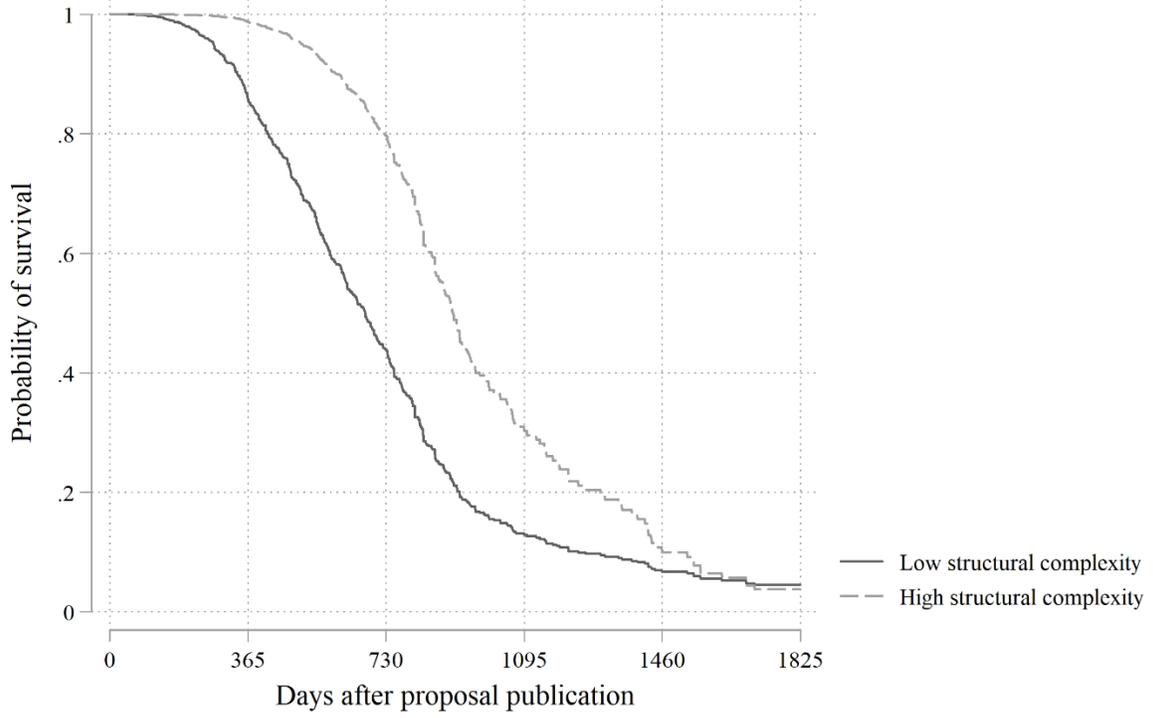
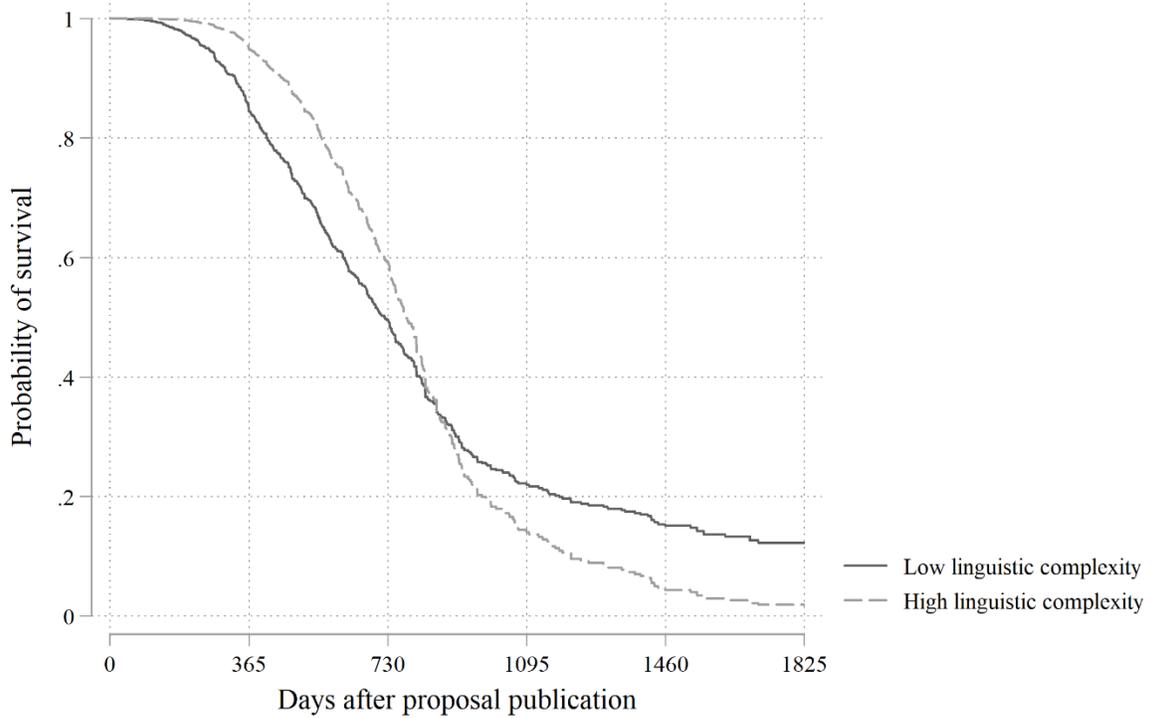
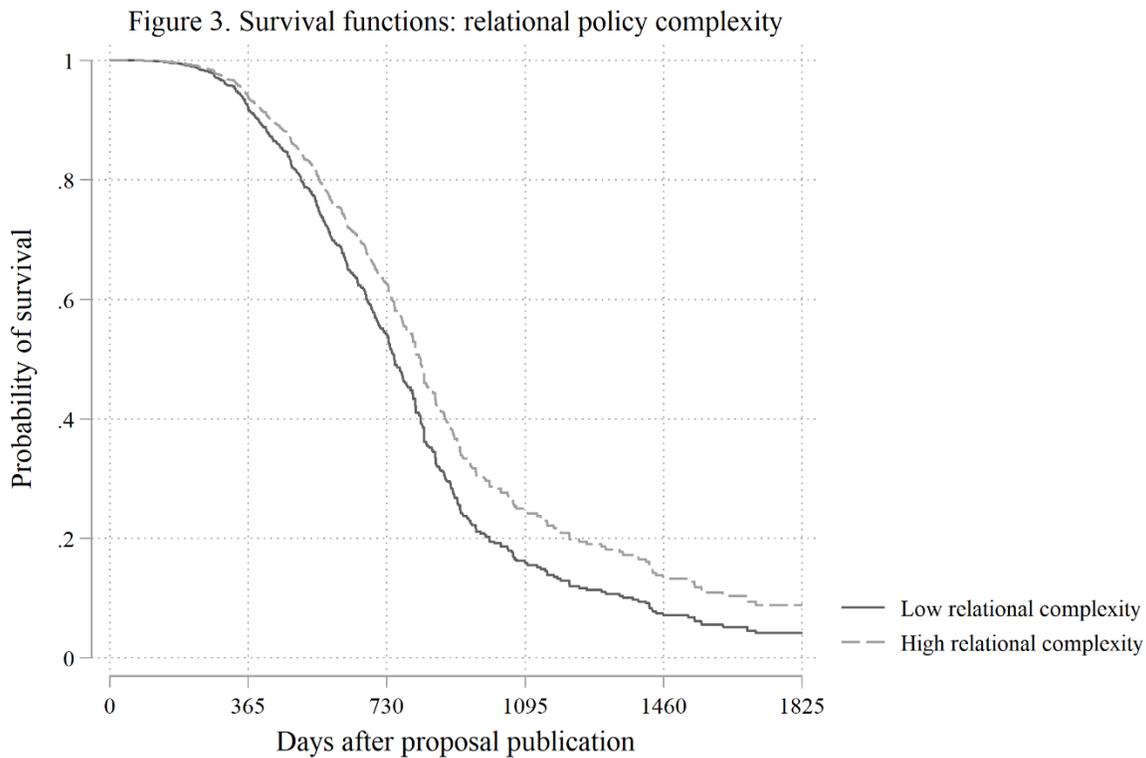


Figure 2. Survival functions: linguistic policy complexity





negotiations drag on, the lower the chance that these delays are the result of structural policy complexity. The effect of structural policy complexity peaks after roughly two years (741 days). At this point in time, the probability that a simple proposal is still under negotiation is about 36 percentage points lower than the probability for a structurally complex proposal (41 vs. 77%).

Interestingly, the effect of linguistic policy complexity evolves quite differently over time (Figure 2). Right after the publication of the Commission proposal, we observe exactly the effect we expected: the cognitive costs associated with linguistically complex proposals prolong the decision-making process. The difference between the curves is smaller than the difference we see for structural policy complexity, but as the regressions demonstrate, it is statistically significant and even more importantly, holds while we control for structural policy complexity. The effect of linguistic policy complexity is strongest after 541 days and accordingly, peaks much earlier than the effect of structural policy complexity. The difference of the survivor functions at this point in time is 15 percentage points for linguistically simple versus complex proposals (68 vs. 83%).

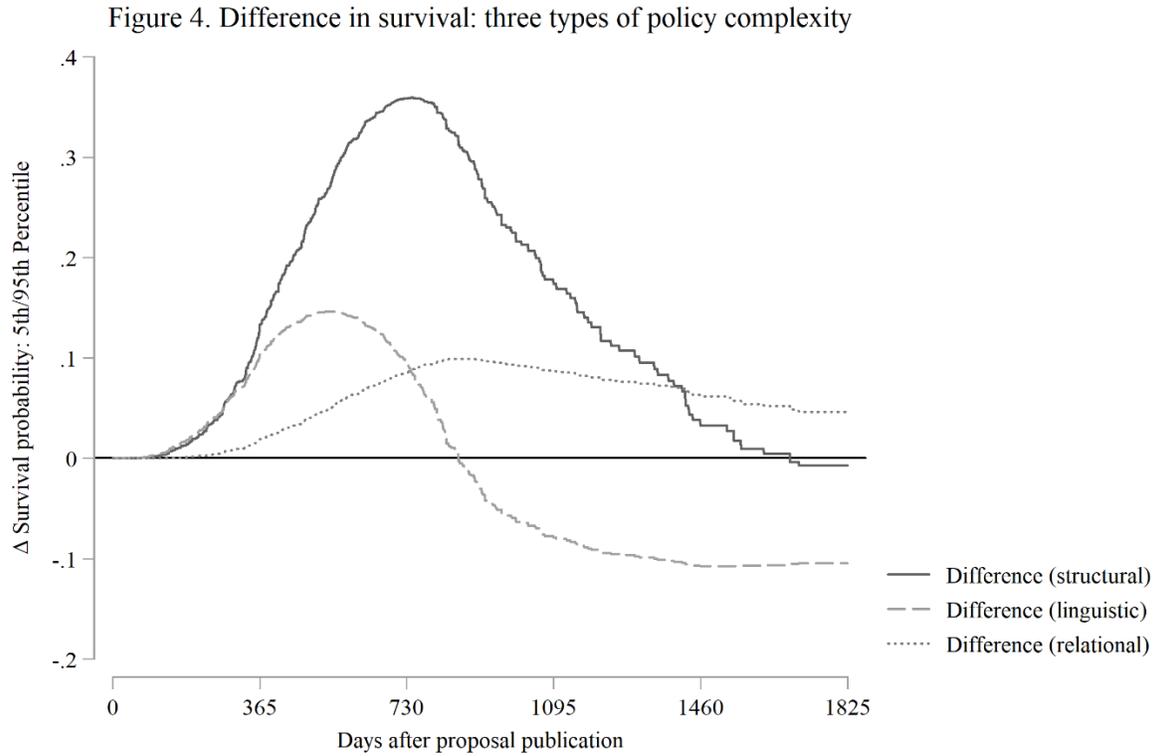
However, the crossing survivor functions demonstrate that in a scenario in which we hold other types of complexity at their respective means, the effect of linguistic policy complexity *reverses* at some point. Once negotiations take longer than 860 days, linguistically simple proposals become more difficult

to conclude than complex ones. We took a closer look at the content of these proposals and could identify the explanation for this puzzling finding. Some proposals primarily draw their linguistic simplicity from the fact that they contain many provisions that empower the European Commission to adopt delegated and implementing acts. These provisions are simple in linguistic terms as they repeat the same legal formula over large portions of the text (e.g. ‘The Commission shall be empowered to adopt delegated acts [...]’). At the same time, however, these proposals are highly contentious in political terms, because they re-distribute power in the EU and because the EP and the Council are often in disagreement over which control mechanism to use when delegating powers to the European Commission (Brandsma and Blom-Hansen, 2017). These delegations of power are extremely important, because they enable the Commission to shift its activities towards tertiary legislation, whenever legislative gridlock prevents the timely adoption of new secondary law (Junge et al., 2015). Accordingly, in order to predict whether linguistic simplicity leads to longer or shorter legislative negotiations, we need to know whether this linguistic simplicity is induced by the simplicity of the regulatory matter or by the existence of many provisions that delegate power to the European Commission.

Finally, Figure 3 shows that the effect of relational policy complexity is weaker than the effects of the other forms of policy complexity. The survivor functions are quite close to each other and only diverge rather late in the process. We estimate the most pronounced difference between relationally simple and complex proposals after 864 days, when the difference of the survival probabilities amounts to 10 percentage points (32 vs. 42%). This comparably late and weak effect suggests that the institutions of the EU are far better equipped to deal with legal complexity than with long and linguistically challenging policy proposals. To a certain degree, we interpret this finding as an expression of the (still) often technocratic character of the EU.

Figure 4 summarizes the findings by plotting the differences between the estimated survivor functions over time. We can see that all three types of policy complexity exert their effects to varying degrees, in varying forms and at different points in time. Overall, structural policy complexity has the strongest impact on legislative duration, but the other types of policy complexity also matter even if we control for the size of the proposal. Linguistic policy complexity shows the most intriguing pattern, as the effect reverses its direction over the course of time. As explained above, this reversal seems to be driven by the fact that linguistic simplicity can also be an indicator for a controversial proposal that allocates wide-ranging powers for the adoption of delegated acts to the European Commission. Crucially, these effects of different forms of policy complexity materialize even if we control for the degree of ideological heterogeneity present in the Council. This finding adds to the existing literature on decision-making duration in the EU, demonstrating that if we hold institutional scope conditions constant and control for crucial political factors, the complexity of the Commission proposal has an independent impact on

legislative duration. Most importantly, the way this effect plays out is crucially determined by how we decide to conceptualize policy complexity.



Conclusion

This article investigated the influence of policy complexity on the duration of the legislative process under the EU’s ordinary legislative procedure. As the concept of policy complexity has hardly been addressed by the existing political science literature, we constructed a conceptual framework from existing approaches in other disciplines, particularly computer science and law. The hypothesis suggesting an increasing decision-making time lag with rising policy complexity is clearly corroborated by the empirical results, although the patterns we found are not as straightforward as could be expected. While more complex Commission proposals typically take longer to decide, we find that the effects for different types of policy complexity (structural, linguistic and relational) vary in terms of their size and direction, as well as over time. While proposal size (i.e. structural policy complexity) generally exerts the strongest impact on legislative duration, also the proposal’s language (i.e. linguistic policy complexity) and its degree of legal interconnectedness (i.e. relational policy complexity) matter. Specifically, we find that the effect of structural policy complexity becomes weaker two years after the Commission published its proposal, that the effect of linguistic policy complexity reverses its direction at some point and that relational policy

complexity only has a rather weak impact that occurs comparably late in the process.

Thus, the length of the decision-making process in the EU is not only a function of political or institutional factors (Golub, 2007; Klüver and Sagarzazu, 2013; König, 2007; Schulz and König, 2000) – but also influenced by features of the policy itself. This adds to the existing literature on legislative duration in the EU by highlighting the crucial role of the European Commission as the formal agenda setter under the ordinary legislative procedure. Our results also suggest a potential causal mechanism driving the finding by Rasmussen and Toshkov (2013), that stakeholder consultations during the policy formulation phase prolong the legislative process. While we are unable to control for this factor in the present study, we suspect that these consultations could exert their impact on legislative duration by enhancing the complexity of the Commission proposal. We could hypothesize that the more external actors bring in their views on a certain regulatory matter during the policy formulation phase, the more complex the Commission proposal will eventually become, given that the Commission will aim to accommodate as many of these views as possible.

Policy complexity could also play an important role for the outcomes of legislative processes. For instance, it would be reasonable to assume that the Commission has a comparative advantage vis-à-vis the other institutions in a situation of high policy complexity, as it acts as the ‘technical agenda-setter’ (Kreppel and Oztas, 2017). If the complexity of a policy proposal is high, this potentially increases the costs to amend the proposal for the other institutions, whose costs of information acquisition are considerably higher than those of the technical agenda setter. This implies that the Commission could calibrate the complexity of its policy proposals strategically and thereby compensate for its inability to influence the decision-making process significantly after the agenda-setting stage, acting as a ‘political agenda-setter’ (Kreppel and Oztas, 2017). In other words, the Commission should be more successful in influencing the final policy output, the higher the complexity of its initial policy proposal is. Accordingly, while we suspect that the complexity of the Commission proposal is primarily driven by functional considerations at the design stage; strategic incentives might also have a role to play. However, this strategic component should rather pertain to the estimated *outcome* of the legislative process, not its *duration*. Thus, our article makes a first contribution to the question of how the complexity of a policy proposal affects the efficiency of the decision-making process, but it does not answer the important question of how and where different types of policy complexity originate at the design stage.

Our research also raises the crucial normative question of which degree of policy complexity can be considered ‘optimal’ given the EU’s existing institutional framework. Until which point must policy complexity be considered a ‘necessary evil’ and at which point does it become a significant burden for decision makers and implementers (Tullock, 1995)? If such areas of optimal policy complexity are theoretically and empirically informed, they can provide a powerful informational shortcut for EU citizens,

decision makers and implementers with regard to the feasibility and duration of the upcoming negotiations and give an indication of potential implementation challenges. Thus, a valid and reliable measure of policy complexity can serve both as an early-warning mechanism for decision makers and implementers and as a useful tool for those actors in the EU who are entrusted with the difficult task of red tape reduction. In addition, a measure that enables all policy stakeholders, the media and the public, to assess the complexity of a Commission proposal in the moment it is published would greatly enhance the transparency of EU decision-making. Such an increase in transparency on the production of EU policy content thus helps observers to make a better-informed assessment on the EU's efficiency and to nuance this assessment by policy areas, as it provides them with an empirical yardstick to compare different pieces of EU legislation. This is particularly important given the European Commission's ongoing struggle to simplify its legislative proposals in the context of the EU's 'Better Regulation' agenda. So far, the Commission lacks the appropriate tools to evaluate the success of its efforts beyond financial impact assessments and the sheer number of published proposals. However, fewer and cheaper proposals are not necessarily simpler ones.

While our study focused on the case of the EU, the question of how policy complexity affects the efficiency of legislative processes is highly relevant for all political systems and for all levels of government. In this context, the crucial question we could not answer in this article is how factors like state capacity or institutional arrangements mediate the effects of policy complexity. In order to answer this question, we need research designs that compare how different political systems process policy proposals of varying complexity. This could bring us closer to an idea of how political systems must be designed in order to cope efficiently with increasing policy complexity, while maintaining their democratic legitimacy. In this context, we find it important to emphasize that policy complexity is not inherently bad, but can also be considered an indicator of (legal, technological, social) progress (Adam et al., 2019). However, the EU needs to make sure that its institutional infrastructure can cope with this complexity efficiently and that the complexity of its policy proposals matches the carrying capacity of its political institutions. In this sense, the relationship between policy complexity and legislative efficiency touches upon fundamental aspects of the EU's democratic legitimacy.

Acknowledgements

The authors thank the editor and their three reviewers for their constructive comments and suggestions. The authors would also like to thank all their discussants, fellow panelists and panel attendants at MPSA 2018, EPSA 2018 and DVPW 2018 for their valuable feedback.

Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or

publication of this article: This research was funded by the Deutsche Forschungsgemeinschaft (DFG, German Research Foundation) – 407514878: ‘EUPLEX – Coping with Policy Complexity in the European Union’.

References

Adam C, Hurka S, Knill C, et al. (2019) *Policy Accumulation and the Democratic Responsiveness Trap*. Cambridge: Cambridge University Press.

Bentz C, Alikaniotis D, Cysouw M, et al. (2017) The entropy of words—Learnability and expressivity across more than 1000 languages. *Entropy* 19: 275.

Bischof D. (2017) New graphic schemes for Stata: Plotplain and plottig. *The Stata Journal* 17: 748–759.

Bølstad J and Cross JP (2016) Not all treaties are created equal: The effects of treaty changes on legislative efficiency in the EU. *JCMS: Journal of Common Market Studies* 54: 793–808.

Bommarito II MJ and Katz DM (2010) A mathematical approach to the study of the United States code. *Physica A: Statistical Mechanics and its Applications* 389: 4195–4200.

Bourcier D and Mazzega P (2007) Toward measures of complexity in legal systems. In: *Proceedings of the 11th international conference on artificial intelligence and law, Palo Alto, CA, 4–8 June 2007*, pp. 211–215.

Box-Steffensmeier JM and Zorn CJ (2001) Duration models and proportional hazards in political science. *American Journal of Political Science* 45: 972–988.

Brandsma GJ and Blom-Hansen J (2017) *Controlling the EU Executive?: The Politics of Delegation in the European Union*. Oxford: Oxford University Press.

Drüner D, Klüver H, Mastebroek E, et al. (2018) The core or the winset? Explaining decision-making duration and policy change in the European Union. *Comparative European Politics* 16: 271–289.

Flesch R. (1948) A new readability yardstick. *Journal of Applied Psychology* 32: 221–233.

Golub J (2006) Did the Luxembourg compromise have any consequences? In: Palayret J-M, Wallace H and

Winand P (eds) *Visions, Votes and Vetoes: The Empty Chair Crisis and the Luxembourg Compromise Forty Years On*. Brussels: P.I.E.-Peter Lang, pp. 279–300.

Golub J (2007) Survival analysis and European Union decision-making. *European Union Politics* 8: 155–179.

Golub J and Steunenberg B (2007) How time affects EU decision-making. *European Union Politics* 8: 555–566.

Hertz R and Leuffen D (2011) Too big to run? Analysing the impact of enlargement on the speed of EU decision-making. *European Union Politics* 12: 193–215.

Junge D, König T and Luig B (2015) Legislative gridlock and bureaucratic politics in the European Union. *British Journal of Political Science* 45: 777–797.

Kaeding M (2006) Determinants of transposition delay in the European Union. *Journal of Public Policy* 26: 229–253.

Kaplow L (1996) How tax complexity and enforcement affect the equity and efficiency of the income tax. *National Tax Journal* 49: 135–150.

Katz DM and Bommarito II M (2014) Measuring the complexity of the law: The United States code. *Artificial Intelligence and Law* 22: 337–374.

Klüver H and Sagarzazu I. (2013) Ideological congruency and decision-making speed: The effect of partisanship across European Union institutions. *European Union Politics* 14: 388–407.

König T (2007) Divergence or convergence? From ever-growing to ever-slowng European legislative decision making. *European Journal of Political Research* 46: 417–444.

Kousser T (2006) The limited impact of term limits: Contingent effects on the complexity and breadth of laws. *State Politics & Policy Quarterly* 6: 410–429.

Kreppel A and Oztas B (2017) Leading the band or just playing the tune? Reassessing the agenda-setting

powers of the European Commission. *Comparative Political Studies* 50: 1118–1150.

Linzen T and Jaeger F (2014) Investigating the role of entropy in sentence processing. In: *Proceedings of the 2014 ACL Workshop on Cognitive Modeling and Computational Linguistics*, Baltimore, Maryland, USA, 26 June 2014, pp. 10–18.

Mazzege P, Bourcier D and Boulet R (2009) The network of French legal codes. In: *Proceedings of the 12th international conference on artificial intelligence and law*, New York, NY, 8–12 June 2009, pp. 236–237.

North DC (1990) A transaction cost theory of politics. *Journal of Theoretical Politics* 2: 355–367.

Osnabrügge M (2015) The European Commission and the implementation of its legislative programme. *European Union Politics* 16: 241–261.

Rasmussen A and Toshkov D (2011) The inter-institutional division of power and time allocation in the European Parliament. *West European Politics* 34: 71–96.

Rasmussen A and Toshkov D (2013) The effect of stakeholder involvement on legislative duration: Consultation of external actors and legislative duration in the European Union. *European Union Politics* 14: 366–387.

Reh C, Héritier A, Bressanelli E, et al. (2013) The informal politics of legislation: Explaining secluded decision making in the European Union. *Comparative Political Studies* 46: 1112–1142.

Ruhe C (2016) Estimating survival functions after stcox with time-varying coefficients. *The Stata Journal* 16: 867–879.

Ruhe C (2018) Quantifying change over time: Interpreting time-varying effects in duration analyses. *Political Analysis* 26: 90–111.

Schuck PH (1992) Legal complexity: Some causes, consequences, and cures. *Duke Law Journal* 42: 1–52.

Schulz H and König T (2000) Institutional reform and decision-making efficiency in the European Union.

American Journal of Political Science 44: 653–666.

Shannon CE (1948) A mathematical theory of communication. *Bell System Technical Journal* 27: 379–423.

Slout T and Verschuren P (1990) Decision-making speed in the European community. *JCMS: Journal of Common Market Studies* 29: 75–85.

Steunenberg B and Rhinard M (2010) The transposition of European law in EU member states: Between process and politics. *European Political Science Review* 2: 495–520.

Thomson R, Arregui J, Leuffen D, et al. (2012) A new dataset on decision-making in the European Union before and after the 2004 and 2007 enlargements (DEUII). *Journal of European Public Policy* 19: 604–622.

Thomson R, Stokman FN, Achen CH, et al. (2006) *The European Union Decides*. Cambridge: Cambridge University Press.

Timmermans F (2015) *Refit measures will make sure EU rules bring concrete benefits*. Available at: <https://www.theparliamentmagazine.eu/articles/feature/refit-measures-will-make-sure-eu-rules-bring-concrete-benefits> (accessed 26 February 2019).

Toshkov D (2008) Embracing European law: Compliance with EU directives in Central and Eastern Europe. *European Union Politics* 9: 379–402.

Toshkov D (2017) The impact of the Eastern enlargement on the decision-making capacity of the European Union. *Journal of European Public Policy* 24: 177–196.

Tsebelis G and Garrett G (2000) Legislative politics in the European Union. *European Union Politics* 1: 9–36.

Tullock G (1995) On the desirable degree of detail in the law. *European Journal of Law and Economics* 2: 199–209.

Volkens A, Krause W, Lehmann P, et al. (2018) *The Manifesto Data Collection*. *Manifesto Project*

(MRG/CMP/MARPOR). Version 2018b. Berlin: Wissenschaftszentrum Berlin für Sozialforschung (WZB).

Waltl B and Matthes F (2014) Towards measures of complexity: Applying structural and linguistic metrics to German laws. In: *Jurix: International conference on legal knowledge and information systems*, Krakow, Poland, 2014, pp. 153–162.

Waltl B and Matthes F (2015) Comparison of law texts: An analysis of German and Austrian legislation regarding linguistic and structural metrics. In: 18. Internationales Rechtsinformatik Symposium (IRIS), Salzburg, Austria, 26–28 February 2015.