Supplementary Information

A   Policy complexity in the European Union

How has complex policy been defined and operationalized in previous work? Most studies make use of the number of recitals (Kaeding, 2006; Steunenberg and Rhinard, 2010; Klüver, 2011; Thomson and Torenvlied, 2011; Bunea and Thomson, 2015).[1] Recitals are listed before the articles of a policy act and state the reasons for the provisions, principles, and assumptions on which the act is based.
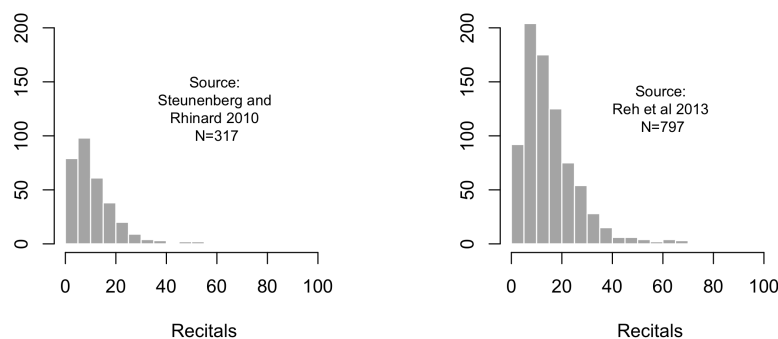

Figure SI 1: Number of recitals in Steunenberg and Rhinard (2010) and Reh et al. (2013)

Figure SI 1 presents the distribution of the number of recitals from two studies and data sets, respectively. It shows that European Union rules consist of 10-15 recitals on average. The number of recitals is usually considered to be an indicator of information intensity (e.g., Thomson and Torenvlied, 2011). The more recitals a policy act includes, the more information it is supposed to carry. Conceptually, the number of recitals intends to capture the size of a policy and the costs an individual would need to invest

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[1]The following additional operationalizations are considered: Flesch Reading Ease score, the presence of expert committees, preparatory documents, the number of major provisions, and the number of articles (Røed and Wøien Hansen, 2018; Franchino, 2004, 2007; Steunenberg and Kaeding, 2009; Brandsma and Blom-Hansen, 2017; Yordanova and Zhelyazkova, 2020).

in working through the policy (Hurka and Haag, 2020). Even though most studies in the context of the European Union refrain from defining policy complexity, the rationale behind the use of recitals comes close to the definition provided by Ehrlich (2011), which considers a policy to be complex if it has many provisions or exceptions and provides many details.

The idea behind the use of recitals to measure complex policy assumes that an act consisting of two recitals requires the processing of more information than an act consisting of one recital. While this argument appears intuitive, it comes with the implicit assumption that each recital carries the same (or at least a similar) level of information.[2] Whether or not this assumption is true is difficult to say because the content of recitals is not taken into account. A closer look at an example suggests that individual recitals can look very different. The two text boxes below present two recitals from a Commission proposal on the reduction of the impact of certain plastic products on the environment. The proposal was recently adopted by the European Parliament and the Council of the European Union and received attention from media outlets across Europe, who frequently described the topic as the 'ban of single-use plastics' (Leung, 2019; Rankin, 2019). Without going into great detail, most readers would probably agree that the two recitals vary in length and sophistication, and that recital 23 is easier to understand than recital 21. However, according to the dominant measurement strategy in the literature, such potential differences in the level of textual sophistication between two texts go unnoticed. In addition, references to existing laws and other documents (see recital 21) which require the consideration of additional information are also ignored.

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[2]For example, the assumption is made explicit in Kaeding (2006)'s interpretation that a unit increase in the number of recitals changes the probability of a delayed transposition process.

> **2018/0172 (COD), recital 21**
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> As the Court of Justice has held on numerous occasions, it would be incompatible with the binding effect, which the third paragraph of Article 288 of the Treaty ascribes to a Directive, to exclude, in principle, the possibility of an obligation imposed by a Directive from being relied on by persons concerned. That consideration applies particularly in respect of a Directive, which has amongst its objectives the protection of the environment from the adverse effects of marine litter. Therefore, in accordance with the Aarhus Convention on access to information, public participation in decision-making and access to justice in environmental matters, members of the public concerned should have access to justice in order to contribute to the protection of the right to live in an environment, which is adequate for personal health and well-being. In addition, where a large number of persons are in a 'mass harm situation', due to the same illegal practices relating to the violation of rights granted by this Directive, they should have the possibility to use collective redress mechanisms, where such mechanisms have been established by Member States in line with Commission Recommendation 2013/396/EU47.

> **2018/0172 (COD), recital 23**
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> Member States should lay down rules on penalties applicable to infringements of the provisions of this Directive and ensure that they are implemented. The penalties should be effective, proportionate and dissuasive.

B   Delegation in the European Union

Delegation of legislative powers is a vexed issue that has occupied scholars around the world for decades (Aranson, Gellhorn and Robinson, 1982; Kiewiet and McCubbins, 1991; Epstein and O'Halloran, 1999; Franchino, 2007; Braun and Gilardi, 2009). Investigations of the motives behind delegation show that policy complexity is one of the most central explanations (McCubbins, 1985). The relationship between complex policy and delegation has its roots in transaction cost theory. Legislators have scarce time and other resources and thus try to work around resource-intensive engagement with the technical complexity of modern society and administrative procedures as far as possi-

ble. Delegation of authority to the executive is considered an efficient way to avoid the complexities of policy-making that do not directly contribute to legislators' re-election goals. Executive actors are expected to have higher levels of expertise and more resources, and thus are well-suited to deal with complex policy.

Studies on delegation of legislative authority to the executive focus not only on national legislators but figure prominently in the context of the European Union as well (Franchino, 2004, 2007; Thomson and Torenvlied, 2011). A likely reason why ever more scholars are studying delegation in the context of the European Union is the Union's policy activity. Today's European Union rule-making spans almost all policy fields, from market regulation of agricultural production to environmental protection, from competition rules to health and social policy, and from trade agreements with the outside world to regional development policy in the individual member states.

The European Union policy-making process offers several opportunities for legislators to delegate authority. In a nutshell, European Union legislative decision-making starts with a proposal from the European Commission, a political-administrative body that belongs to the executive branch. The proposal is forwarded to the supranational European Parliament and the intergovernmental Council of the European Union. Today, the two bodies are co-legislators and decide about Commission proposals in unison. Yet in many instances they do not make decisions about all possible details of new legislation, but delegate authority to the executive. When doing so they can choose between two agents, the European Commission and member states' national administrations (Franchino, 2004). Several investigations in the context of the European Union indeed show that laws with higher levels of complexity delegate more authority to the European Commission and member states' national administrations than simpler laws (Franchino, 2004, 2007; Thomson and Torenvlied, 2011; Migliorati, 2020).

C   Task Description, Task Appearance, Manipulation Check

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Welcome!

The motivation of this study is to understand how legislative text can be made more accessible in the future. Your input is highly appreciated.

Your task is to read two short passages of text, and to judge which you think would be easier for a native English speaker to read and understand.

An easier text is one that takes the reader less time to comprehend fully, requires less re-reading, and can be more easily understood by someone with a lower level of education and language ability.

On the next page, examples are presented. Thereafter, you are asked to judge 15 pairs of text.

Information about the study:

The short passages of text are taken from national and European Union legislation. Your judgement will help to understand how legislative text can be made more accessible in the future.

Be assured that all answers you provide will be kept in the strictest confidentiality. No personally identifiable information is captured.

The study is conducted by Roman Senninger, who is an Assistant Professor in the Department of Political Science at Aarhus University (Denmark).

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Figure SI 2: Appearance of the study description on the crowdsourcing platform

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Text A	Text B
It is necessary to ensure that, in addition to possessing the required phenotypic or genetic quality, reproductive material which is intended for marketing or which is placed on the market is properly identified throughout the production process.	In order to take account of environmental objectives, Member States should draw up and implement suitable environmental measures concerning the use of agricultural land for the production of the products referred to in Article 1.

Which text is easier to understand?

Text A is easier ○	Text B easier ○

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Text A	Text B
This Directive should not affect existing directives on commercial communications, in particular Directive 98/43/EC of the European Parliament and of the Council on tobacco advertising.	At the same time the rate of milk delivered to dairies for processing is foreseen to continue expanding over the projection period. Disregard the content and code THIS text as EASIER.

Which text is easier to understand?

Text A is easier ○	Text B easier ○

Figure SI 3: Appearance of tasks and instructive manipulation check on the crowdsourcing platform

D   Additional Information About Text Snippets

Snippet group	No. of characters	No. of sentences	No. of snippets in group
1	100-150	1	350
2	151-200	1	400
3	201-250	1	300
4	251-300	1	250
5	251-300	2	135
6	301-350	1	150
7	301-350	2	120
8	351-400	1	65
9	351-400	2	100
10	400-500	2	70
11	500-600	2	30
12	600-700	2	10
13	700-800	2	5
14	-	3	10
			2000

Table SI 1: Grouping of snippets with similar length
Note: Sample before removal of snippets that lie outside the 0-121 FRE range.

Variable	N	Mean	St. Dev.	Min	Max
Number of words	1340	37.02	13.31	15	83
Mean characters per word	1340	5.30	0.47	3.74	7.14
Mean characters per sentence	1340	150.93	44.87	72	305
Google Books baseline usage	1340	0.0001	0.0001	0.0000	0.0015
Reference to other regulation	1340	0.19	0.39	0	1
No. of references to other regulation	1340	0.24	0.58	0	7
Text snippet with abbreviations	1340	0.19	0.39	0	1
No. of abbreviations	1340	0.30	0.82	0	9
Text snippet with 'Whereas'	1340	0.02	0.13	0	1
Flesch Reading Ease	1340	25.48	14.61	0.08	72.33

Table SI 2: Descriptive Statistics
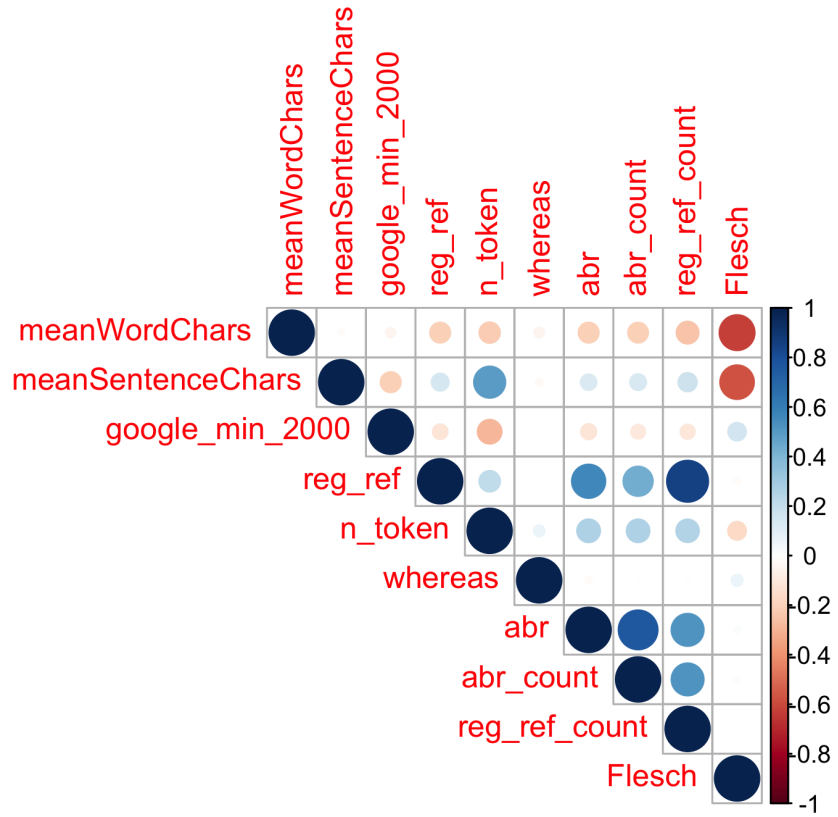Note: Sample after removal of snippets that lie outside the 0-121 FRE range.

Figure SI 4: Correlation between variables
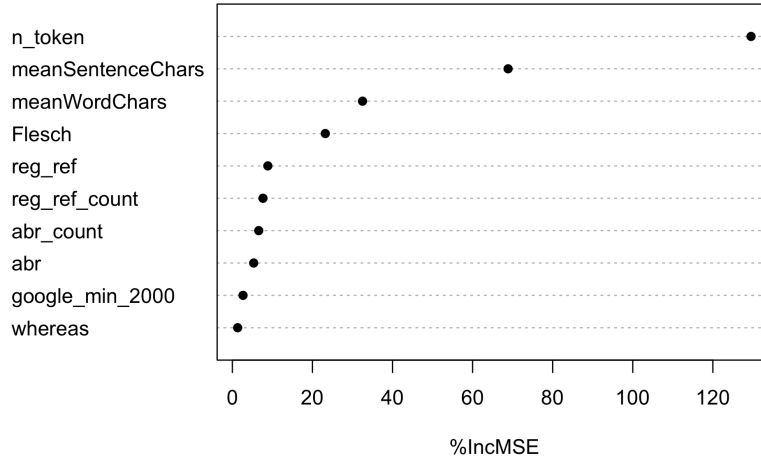
E   Additional Results 1

Figure SI 5: Variable importance plot

	Model 1	Model 2	Model 3
Flesch	0.01		
	(0.00)		
meanSentenceChars		-0.02	-0.02
		(0.00)	(0.00)
n_token		-0.04	-0.01
		(0.004)	(0.005)
reg_ref_count			-0.51
			(0.04)
N	6962	6962	6962
AIC	9613.2	9374.4	9205.2
BIC	9620.0	9388.1	9225.7

Note: Standard errors in parentheses

Table SI 3: Structured Bradley-Terry Models

Snippet ID: 134

Complexity: Very Low

The cost of such a system, part of which is to be borne by the Community budget, should be specified.

Snippet ID: 329

Complexity: Average

In order to make it easier to take advantage of the arrangements for inward processing, processing under customs control and temporary importation, the rules should be made more flexible.

SnippetID: 1325

Complexity: Very high

Building on the experience and strengths of the Urban Community initiative foreseen by Article 20(1)(b) of Council Regulation (EC) No 1260/1999 of 21 June 1999 laying down general provisions on the Structural Funds, the urban dimension should be reinforced by fully integrating measures in that field into the operational programmes co-financed by the ERDF.

Model	AIC	Accuracy
Model 4: Flesch Reading Ease + No. of references to other regulation	9367.3	0.741
Model 3: Number of words, Mean characters per sentence + No. of references to other regulation	9205.2	0.772

Table SI 4: Model performance

F   Additional Results 2

Table SI 5 shows performance results for delegation to the European Commission and national administrations separately.

	RMSE	MAE	R^2
Delegation to national administrations			
Model 1: Flesch Reading Ease	0.125	0.094	0.013
Model 2: Number of words, Mean characters per sentence and No. of references to other regulation	0.123	0.091	0.054
Delegation to European Commission			
Model 1: Flesch Reading Ease	0.122	0.058	0.076
Model 2: Number of words, Mean characters per sentence and No. of references to other regulation	0.120	0.056	0.108

Table SI 5: Model performance

Note: N = 13,366. Range of delegation to the national administration is 0-1. Range of delegation to the European Commission is 0-1. RMSE = Root Mean Squared Error, MAE = Mean Absolute Error, R^2 = R squared.

Table SI 6 and SI 7 show performance results for delegation to the European Commission and national administrations separately.

	RMSE	MAE	R^2
Delegation to national administrations			
Model 1: No. of recitals	0.164	0.138	0.094
Model 2: No. of words, Mean characters per sentence, No. of references to other regulation	0.159	0.134	0.149
Delegation to European Commission			
Model 1: No. of recitals	0.036	0.023	0.072
Model 2: No. of words, Mean characters per sentence, No. of references to other regulation	0.036	0.022	0.100

Table SI 6: Model performance

Note: N = 317. Range of delegation to the national administration is 0-0.8. Range of delegation to the European Commission is 0-0.26. RMSE = Root Mean Squared Error, MAE = Mean Absolute Error, R^2 = R squared.

	RMSE	MAE	R^2
Delegation to national administrations			
Model 1: No. of recitals	0.166	0.137	0.026
Model 2: No. of words, Mean characters per sentence, No. of references to other regulation	0.161	0.132	0.075
Delegation to European Commission			
Model 1: No. of recitals	0.302	0.197	0.077
Model 2: No. of words, Mean characters per sentence, No. of references to other regulation	0.277	0.180	0.248

Table SI 7: Model performance

Note: N = 302. Range of delegation to the national administration is 0-1. Range of delegation to the European Commission is 0-1. RMSE = Root Mean Squared Error, MAE = Mean Absolute Error, R^2 = R squared.

G Why Recitals And Not Articles?

The text snippets used in the pairwise comparison analysis are taken from recitals and not from articles of European Union legislation. There are a number of reasons for this approach. First, recitals represent continuous text which describes the reasons, principles, and assumptions of legislation. Articles, however, do not always represent continuous text but include definitions, lists and tables without providing any context (see Figure SI 5 and Figure SI 6). Definitions are usually also presented in recitals; however, there they are contextualized. In addition, articles from amending acts only point to the changes and provide no further context at all (see Figure SI 7). In sum, the text of articles is very unfamiliar to ordinary citizens and its use in the pairwise comparison would expose respondents to very unusual text. The text of recitals, by contrast, is more similar to text that citizens usually read in news reports and professional literature. Second, the findings from the pairwise comparison analysis suggest modifying policy text to make it more accessible, e.g., by reducing text length. While such modifications are desirable, they may not always be possible in the case of articles. Articles need to be precisely drafted to guarantee the intended interpretation. The flexibility in drafting articles is thus limited. Recitals, on the other hand, represent the content of the legislation without being subject to similar limitations. Third, it has been shown that it is recitals and similar explanatory text in national policies that are usually read by policy users, rather than the articles (Cabinet Office, 2013). Taken together, the text of recitals have several advantages compared to the text of articles and are therefore used in the pairwise comparison framework.

Article 3

Definitions

For the purposes of this Regulation:

(a) 'document' shall mean any content whatever its medium (written on paper or stored in electronic form or as a sound, visual or audiovisual recording); only administrative

Figure SI 6: Example of paragraph: Definition

Article 4

Exceptions

The institutions shall refuse access to documents where disclosure could significantly undermine the protection of:

(a) the public interest and in particular:

— public security,

— defence and international relations,

— relations between and/or with the Member States or Community or non-Community institutions,

— financial or economic interests,

— monetary stability,

— the stability of the Community's legal order,

— court proceedings,

Figure SI 7: Example of paragraph: List

(9) Article 42 is amended as follows:

(a) in the introductory part, the second sentence is replaced by the following:

"Those rules shall include in particular:"

(b) point 1 is replaced by the following:

"1. the conditions applicable to the accreditation of paying agencies as well as the specific accreditation of coordinating bodies, their respective functions, the information required and the arrangements for it to be made available or transmitted to the Commission;"

Figure SI 8: Example of paragraph: Amendment

H   Open Questions After Pairwise Comparisons

After the pairwise comparisons, respondents were asked two questions for which they could provide written answers. The questions asked for a description of the features that make a text snippet easier and more difficult to understand, respectively. The wordings of the two questions were as follows: 1) 'Taken together, what is the main reason you found a text to be *easier* to understand?' and 2) 'Taken together, what is the main reason you found a text to be *more difficult* to understand?'

The answers to the two questions support the results of the analysis of the pairwise comparisons (see Section 4 in the main body of the manuscript). A typical answer to the first question would mention that shorter text is easier to understand. For example, respondents noted the following when describing an easier text: 'shorter sentences/words when reading about an unfamiliar topic', 'shorter words', 'shorter sentences, more direct instructions, less use of commas and clauses', and 'shorter, concise language, shorter words also helped'.

The second defining feature (references to other policies) was also directly mentioned in respondents' answers. For example, respondents said that 'less reference to policies and their names. (...)', '(...) less reference to other articles or statutes', and 'the text with less "legalese" and references to regulation numbers' was easier to understand. In addition, respondents frequently mentioned that simplicity and familiarity of words matters for their understanding. For example, respondents mentioned that 'less jargon, familiarity of terms used', 'words I did recognize or knew', and 'less jargon and acronyms' contributed to a better understanding of the text.

The reverse is true when asked about what makes a text difficult to understand. Respondents often point to 'Too long sentences with too many more difficult words', 'Longer sentences, references to other acts/laws etc', 'Reference to entities not defined in the text', 'Regulation references/non-common language', and 'Convoluted jargon-laden

text '.

The described patterns are also visible in Figure SI 8, which presents keyness statistics (Benoit et al., 2018). The figure shows the terms that most frequently occur across the answers to the two different questions. Generally, the keyness statistic compares the associations of words with a target (that is, being mentioned in respondents' answers to the first question, 'easier') and a reference group (that is, being mentioned in respondents' answers to the second question, 'more difficult'). The light blue bars show the 15 words with the highest (statistically significant) association with being mentioned in the answer to the first question. The gray bars show the 15 words with the highest (statistically significant) association with being mentioned in the answer to the second question.
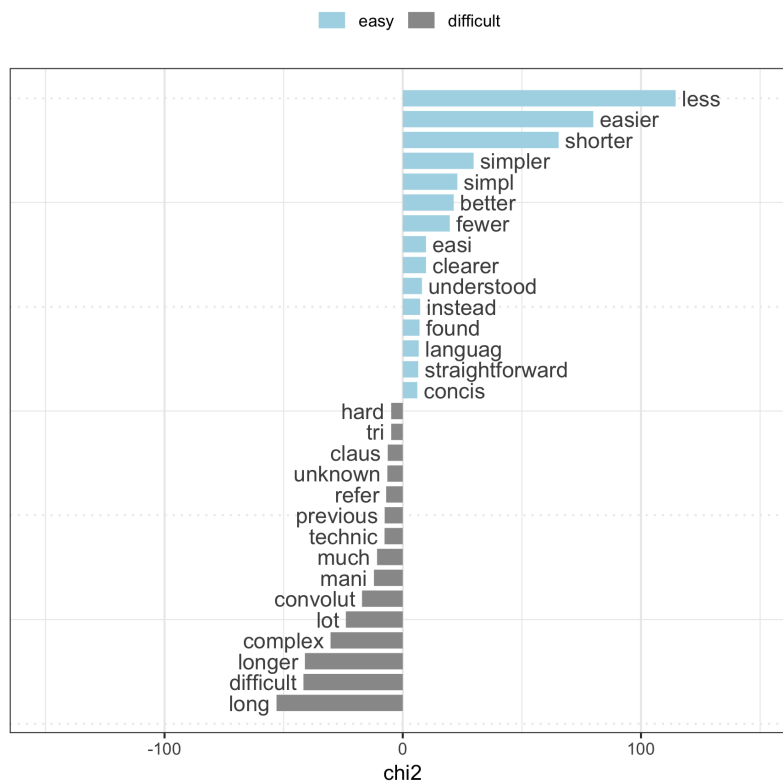

Figure SI 9: Keyness statistics

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