

# **Why do courts craft vague decisions? Evidence from a comparative study of court rulings in Germany and France using quantitative text analysis**

SEBASTIAN STERNBERG\*  
University of Mannheim

---

Why do judges craft vague opinions if these are less likely to be implemented? In a game-theoretic model, Staton and Vanberg (2008) argue that opinion vagueness is a function of judge's policy preferences and their fear of potential non-compliance by the legislature. Yet, the court's ability to use vagueness ultimately depends on their level of public support. I empirically test the implications of their model in a comparative study of two constitutional courts in Germany and France, analyzing novel data on opinion vagueness obtained by neural networks. My findings confirm that a court's public support is indeed the key factor for explaining how courts strategically use vagueness. The German Federal Constitutional Court, a court with high public support, uses vagueness primarily to take advantage of the policy expertise of other policy makers and to strategically pressure the legislature. In contrast, the French Conseil Constitutionnel, a court with low public support, uses vagueness as a "defensive mechanism" to hide non-compliance from public view. My results therefore imply that current models of judicial behavior underestimate the full extent of strategic behavior of courts.

---

---

\*PhD Candidate, Department of Political Science, University of Mannheim, A 5, 6, D-68131, Mannheim, Germany (ssternbe@mail.uni-mannheim.de).

# Introduction

Why do judges craft vague decisions if these are less likely to be implemented than specific ones? In a landmark decision on inheritance tax in Germany in 2014, the German Federal Constitutional Court declared the existing inheritance tax law as unconstitutional<sup>1</sup>. In their ruling, the judges instructed the federal legislature to revise the law, but also stated that the specific implementation of a revised law is the legislature's task because of the issue's complexity. The Bundestag instituted a committee to study revisions of the inheritance tax code – but no legislation was initiated. After two years without legislative response, the President of the German court wrote an open letter to the German legislators, pointing out that the court feels obliged to deal with this matter again. Now, as of 2018, still no law revision has happened.

This decision illustrates two fundamental challenges of judicial policy-making. First, when reviewing legislation, judges often confront a wide range of issues and usually do not possess specialized knowledge about it. While judges may be in an excellent position to evaluate political outcomes that are constitutionally required or prohibited, they are typically in a less favorable position to design the specific policies necessary to bring about those outcomes compared to other policy makers. Second, and the inheritance tax decision illustrates this clearly, judicial decisions are not self-enforcing, and compliance cannot be taken for granted. How can judges deal with these challenges?

In a game-theoretic model, Staton and Vanberg (2008) argue that the strategic use of vague decision language allows judges to manage these challenges. Vague decision language allows judges to give discretion to the legislator, while it simultaneously raises the possibility that other policy makers will use their expanded authority to promote their own interests. Moreover, vague language makes it increasingly difficult for the public to detect when the

---

<sup>1</sup>1 BvL 21/12

government is failing to comply, hence removing one of the central sources for compliance. The model implies that how courts strategically use vague language ultimately depends on their level of public support. Popular courts will write rulings with specific instructions on how to implement their decisioning, making it easier for the public to detect governmental deviations, thus using specific language as a tool to pressure the government for compliance. In contrast, unpopular courts do not possess the power to pressure the legislator in the same way: suppose judges expect that a decision – even if highly specific — will encounter resistance. In this case, governmental evasion will highlight the relative lack of judicial enforcement power. For this reason, the model predicts unpopular courts to write vague decisions when open defiance of the government is likely.

This article empirically tests the implications of the Staton and Vanberg (2008) model in a comparative study of two constitutional courts in Germany and France, analyzing novel data on vague decision language using neural networks. My findings confirm that a court’s public support is indeed the key factor for explaining how courts strategically use vagueness. In both countries, the constitutional courts use decision vagueness to give discretion to the legislator in complex cases. However, both courts use vagueness differently when legislative defiance is likely: The German Federal Constitutional Court, a court with high public support, uses specific decision language to strategically pressure the legislature. In contrast, the French Conseil Constitutionnel, a court with low public support, uses vagueness as a “defensive mechanism” to hide noncompliance from public view. Therefore, my preliminary findings are in line with the theoretical model’s predictions.

My results have a number of implications for the study of judicial politics. If judges strategically craft vague rulings and control decision language to manage the challenges of judicial policy making, then empirical tests of common separation-of-powers (SoP) models that only use binary measures of decision outcomes (e.g. a law is declared as unconstitutional or not) are likely to underestimate the real extent of strategic judicial behavior. My

findings are therefore in line with a growing part of the judicial literature which suggests that courts and judges take active measures to prevail in the strategic interaction between court, government, and mass public (Staton, 2006; Krehbiel, 2016). Since many other non-majoritarian institutions such as central banks face the same challenges as constitutional courts, it is possible that vagueness is used in a similar way. The findings of this study have thus broader implications beyond judicial politics.

## The Challenges of Judicial Policy-Making

Besides legal factors and concerns derived from the internal dynamics of collegial courts, the external relations between courts and other policymakers generate a number of distinct challenges in judicial policy-making. The first challenge is the *limited policy expertise* of judges. Drafting public policies to achieve a given political outcome is often a complex technical problem. Consider the *inheritance tax decision* of the GFCC again. Striking down the current inheritance tax law as unconstitutional is only part of eliminating an unconstitutional public policy. Determining which specific policies will achieve a fair taxation of family-owned companies of different sizes and which side-effects this will have for other inheritance tax cases presents a technical challenge requiring specialized knowledge. Thus, a central difficulty in judicial policy-making is to solve a “means-ends” problem by structuring the implementation process in such away as to allow technical expertise to inform choices among alternative policy options.

Other policy-making institutions such as legislatures do not face the same constraints. Legislators usually have access to a committee system, including an extensive staff and bureaucratic support in drafting public policies. Therefore, relative to policy-makers with whom judges interact, they typically have only limited access to technical information which

would be necessary for evaluating alternative policies<sup>2</sup>. In other words, judges may be in an excellent position to evaluate political outcomes that are constitutionally required or prohibited. But they will typically be in a less favorable position to design the specific policies necessary to bring about those outcomes than other policy makers.

The second challenge which judges face is the *fear of legislative non-compliance*. Because judicial decisions are not self-enforcing, compliance cannot be taken for granted. Courts have no coercive means and “no influence over either the sword or the purse” (Hamilton [1788] 1987, 437). Moreover, considering support of high courts from a cross-national perspective, Gibson et al. (1998) argue that “with limited institutional resources, courts are therefore uncommonly dependent upon the goodwill of their constituents for both support and compliance” (Gibson et al., 1998, 343). When confronted with a judicial decision that makes an unwelcome policy demand, legislative majorities (or other policy makers) may be tempted to evade or defy the decision. Whether this will happen depends largely on the political costs of such an evasion attempt. Because courts often enjoy broad public support, open defiance of a judicial decision can result in a public backlash that could be electorally costly for governments (Vanberg, 2005; Staton, 2006; Krehbiel, 2016).

To sum, there are two main challenges which judges are confronted with when deciding about policy. On the one hand, many cases need specialized knowledge which judges sometimes do not possess. On the other hand, judges are afraid of legislative non-compliance, since judicial decisions are not self-enforcing. In the next section, I discuss how the strategic use of decision language can help judges to meet these challenges by discussing the main implications of a formal model developed by Staton and Vanberg (2008) which explicitly addresses this aspect.

---

<sup>2</sup>The information which plaintiffs or interest groups offer might often be biased, therefore not presenting a liable information source for judges.

# The Value of Vagueness

The formal model of Staton and Vanberg (2008) offers some general lessons about how judges can resist the judicial policy-making challenges they face<sup>3</sup>. The author's main argument is that decision language, or more precisely, vague decision language, is a tool that judges use to deal with the challenges of judicial policy-making. As outlined before, a central difficulty in judicial policy-making is the judicial policy uncertainty which judges have to face when deciding amongst alternative policy options. Staton and Vanberg (2008) argue that decision language offers judges the possibility to decide on the degree of discretion they want to give to the better informed legislator.

On the one hand, by issuing a very vague decision, judges can give other policy makers discretion to use their policy expertise. In other words, writing a vague decision without providing specific instructions concerning implementation may allow judges to hedge against their limited policymaking abilities. But of course, vagueness is not costless. Providing discretion raises the possibility that other policy makers will use their expanded authority to promote their own interests. If a decision is too vague and gives too much leeway to the policy-maker, the policy-maker might be tempted to realize its own policy preferences rather than meeting the court's demand. On the other hand, by issuing a highly specific decision that identifies the political outcome to be achieved as well as the specific policy to be employed for achieving that purpose, judges run the risk of "locking in" an inappropriate policy that does not achieve its desired purpose and may even produce a worse outcome than the initial unconstitutional law.

How can judges solve this dilemma? Following the well-established literature on delegation between legislators and bureaucrats (Bawn, 1995; Epstein and O'Halloran, 1999),

---

<sup>3</sup>For space reasons, the formal model and its central implications are only summarized here. For a detailed account of the model, including the game's setup, the utility functions of both court and government as well as the equilibrium and its interpretation see the original paper.

Staton and Vanberg (2008)'s model suggest that judges are sensitive to the divergence of preferences between them and the policy makers to whom they delegate. If both share the same policy preferences, judges are willing to provide the policy-maker with adequate discretion if they have to decide on complex technical issues and do not possess specialized knowledge in this area. Of course, this discretion comes at a price. It ensures that the policy outcome will reflect the legislature's preferences. When legislative and judicial preferences are sufficiently close, this cost is more than outweighed by the informational gain the court secures by allowing the legislature to take advantage of its policy expertise. As preferences begin to diverge, however, the legislature will make use of discretion in a way that leads to outcomes that are increasingly disliked by the court. The "price" the court must pay for the legislature's expertise increases and the court becomes more concerned with reining in legislative policymaking by issuing more specific rulings.

To sum up, like legislatures in their relations with bureaucrats, courts can make use of vague rulings to delegate policymaking authority to better informed "agents", and they will be more tempted to do so the less informed they are about the consequences of different policies, and the greater the convergence of preferences between them and other policy makers. The following observable implication summarizes these insights<sup>4</sup>:

**Trade-Off Hypothesis (H1):** *Decision vagueness is a function of judicial policy uncertainty and preference divergence. Therefore, decision vagueness will a) increase with judicial policy uncertainty, and b) decrease as judicial and policy maker preferences diverge.*

The judicial context adds an important additional twist to the usage of vague language that goes beyond the standard delegation model story. As outlined before, judicial decisions are not self-enforcing, and compliance cannot be taken for granted. The leverage of judges

---

<sup>4</sup>This is a direct implication of the first observation of Staton and Vanberg (2008)'s formal model (Staton and Vanberg, 2008, 511).

largely depends on the costs that other policy-makers face for resisting judicial decisions. Here, evading a decision of a very popular court is more costly for legislative majorities than ignoring a decision of a very unpopular court. Moreover, these costs depend on how easy it is for others – either other political elites or the mass public – to tell that a decision has not been properly implemented and on how easy it is for them to make a credible case to others that a decision has been ignored (Vanberg, 2005). Courts have some control over the extent to which others can detect non-compliance, and take active measures to increase the chance that the public becomes aware of a decision and its legislative (non)-implementation<sup>5</sup>. In the formal model of Staton and Vanberg (2008), the authors propose that decision vagueness is an additional measure which judges can use to control the extent to which observers can detect noncompliance. The more clearly the court articulates its policy demand, the higher the costs for evasion since noncompliance is easier to detect. Vagueness, on the other hand, reduces the costs of noncompliance: if a decision is sufficiently vague, it may not be obvious that a legislative majority (or other policy maker) is not complying with a decision, even if the policy that is adopted in response deviates considerably from the court’s demand. In other words, clear decisions can increase pressure for faithful compliance because policy-makers may incur considerable political costs if they are (or are perceived to be) caught in a flagrant attempt to disregard a judicial decision. The more clearly an decision states the policy implications of the decision, the easier it is to verify whether policy-makers have faithfully complied, making it more likely that the mass public becomes aware of any attempt legislative evasion attempt.

Again, the judicial context adds an important twist. While a clear ruling can generate tremendous pressure for compliance, increasing specificity in the face of opposition is not always desirable. Clear language provides judges with a tool to increase the costs of policy-

---

<sup>5</sup>Staton (2006) finds that courts strategically use press releases to increase public awareness. Krehbiel (2016) finds that judges strategically use oral hearings to draw attention to a case.



makers resulting from non-compliance, but this strategy, if unsuccessful, can also be costly. If other policy-makers are willing to resist and defy even the clearest judicial demand, a clearly written decision of a court only serve to highlight the relative lack of judicial enforcement power. Such an open defiance is costly for courts, too. This is because defiance tends to have a corrosive effect: non-compliance by a policy-maker today may begin to undermine the general perception that court decisions must be respected, and thus induce more and more noncompliance tomorrow. Once defying decisions becomes “normal”, courts are at risk of loosing their institutional reputation, the only “weapon” against hostile legislative majorities they have, in the long run (Carrubba, 2005). To prevent such an erosion of authority, judges may choose to be vague when they expect defiance in order to protect the court against open institutional challenges while still striking down a policy to which they object.

To sum, with respect to the judicial fear of non-compliance, decision language can be used for both increasing pressure for compliance, but also protecting against open resistance. So when do judges use language as a tool for pressure and when to protect themselves against open resistance in this scenario?

The model of Staton and Vanberg (2008) suggests that how judges use decision language in this scenario depends on their level of public support. A court that enjoys generally robust level of support must be less concerned about legislative non-compliance for two reasons: first, its high support imposes higher electoral costs for any attempt of legislative defiance, and second, the court must be less worried about the corrosive effect of non-compliance because of its robust “reservoir” of support. This implies that such a court has considerable leverage in confrontations with the government, and will thus write rather clear and specific decisions when it faces potential legislative non-compliance.

In contrast, other courts are newly established, and have had little opportunity to establish their institutional legitimacy and to build up a strong base of popular support. These courts have, therefore, less leverage when facing potential legislative non-compliance

because the electoral costs for legislative defiance are only small, while the erosive effect of non-compliance could jeopardize the institutional legitimacy they have built at the same time. Therefore, the benefits of using clear language are outweighed by the potential costs for appearing as a powerless institution. Judges in such circumstances may use vagueness when they expect resistance to "mask" noncompliance while asserting the court's authority.

The following hypothesis summarize these insights<sup>6</sup> and can be formulated as the following two observable implications:

**Non-Compliance Risk Hypothesis (H2):** *Given a sufficient risk of non-compliance, a) a **popular** court will write increasingly **specific** decisions to increase the pressure on the government and to force compliance, whereas b) an **unpopular** court will write increasingly **vague** decisions in an attempt to mask non-compliance, and to shield the court against negative institutional consequences of open defiance.*

In the following, I will outline a comparative research design that allows me to test these hypotheses.

## **A Comparative Application: The German and French Constitutional Courts**

### **Case selection**

The two constitutional courts in this comparative study are selected according to the most different system design (Przeworski and Teune, 1970, 34). In order to test the observable implications of Staton and Vanberg (2008)'s model, the chosen courts must meet the follow-

---

<sup>6</sup>The hypotheses are directly derived from Staton and Vanberg (2008)'s Observation 2 of the formal model (Staton and Vanberg, 2008, 513).

ing three conditions. First, both courts must possess the right of judicial review, because otherwise the game between court and legislative majority could not be played. Second, the courts' judges must be regarded as policy-seekers, because otherwise judges simply would not care about policy outcomes and policy implementations. Third, and most important, testing the hypotheses the Staton and Vanberg (2008) formal model requires two courts which considerably vary in their degree of public support.

For the comparative application, I chose the *German Federal Constitutional Court* (hereafter GFCC) and the French constitutional court, the *Conseil Constitutionnel* (hereafter CC). Both courts have the right of judicial review and its judges are regarded as policy-seekers (Hönnige, 2009). Thus, condition one and two are apparently met.

Moreover, the GFCC is a prime example of a constitutional court which enjoys high public confidence. The GFCC is a prominent institution in German politics, repeatedly finding itself at the center of controversial political conflicts. Its prominence and reputation as a “guardian of the constitution” has made it one of the most recognized and popular institutions in the German political system. Indeed, the German court enjoys extremely high support vis-à-vis other institutions, and its public support consistently exceeds that of the other major German political institutions<sup>7</sup> (Vanberg, 2005, 98).

The French CC is one of the few constitutional courts in Europe which cannot rely on broad public support as other courts can do. In the study of Gibson et al. (1998), which is the only available cross-national study of public support for national high courts, the French court is the only Western European court which ranks amongst the most unpopular high courts, together in a group with Bulgaria, Hungary and Poland (but these courts did just exist for eight years when the study of Gibson et al. (1998) was conducted, and therefore had basically no time to build up institutional legitimacy). For instance, only 26% of the

---

<sup>7</sup>The popularity of the German court is once again confirmed in a recent survey in the German Internet Panel, where 73% of the respondents state that they have trust or very big trust in the GFCC (German Internet Panel, November Wave 2016).

French respondents state to support the French court (whereas 59% of the West German respondents do so). Moreover, only 2.7 are very aware of the French court and 7.6% of the French respondents never heard of it, whereas 47.5% of the German respondents state that they are very aware of the GFCC while only 1.5% never heard of it<sup>8</sup>. Therefore, with both the GFCC and CC used as study object, condition three is met, too.

## Data and Operationalization

For the analysis of the GFCC, I use a data set originally collected by Vanberg (2005), and extended by Krehbiel (2016). The data set contains all published decisions of the GFCC between 1983 to 2010 reviewing the constitutionality of federal and state laws. Because the original data set of Krehbiel (2016) excludes decisions in which the court does not have discretion over oral hearings, I added these cases to the data set as well<sup>9</sup>. This data set includes 619 decisions. It is important to note that the logic of the formal model of Staton and Vanberg (2008) only applies to decisions where the court rejects the law under review. I therefore dropped all decisions where the court does not strike down the law. The final data set for Germany includes 242 decisions.

For the analysis of the French CC, I use self-collected data obtained from the web page of the CC on all decisions dealing with the abstract review of laws<sup>10</sup>. This data set contains 702 abstract review decisions between 1974 and 2010. Again, I dropped all decisions where

---

<sup>8</sup>One possible reason for the very low public support of the French CC is the fact that its members were more than once involved in political controversies. In a highly controversial decision (Decision 98-408 DC) related to the accusation of the sitting French President Jacques Chirac concerning the misappropriation of public funds and political party financing, the CC decided that the immunity of his presidency shields him from any criminal charges until he left office.

<sup>9</sup>Therefore, the final data set includes constitutional complaints, concrete reviews, public law disputes, election disputes involving the constitutionality of an electoral law, constitutional disputes between the national and state governments, constitutional disputes within a state, and abstract reviews. It does not include unpublished chamber decisions and cases in which the court reviews a lower court verdict, not a statute.

<sup>10</sup>These are decisions of the type "DC", so called "Contrôle de constitutionnalité des lois ordinaires, lois organiques, des traités, des règlements des Assemblées".

the CC upholds a law. The final data set for France includes 258 decisions.

## Vagueness Measurement Using Word Embeddings

Staton and Vanberg (2008) do not provide an exact definition of what makes a vague decision. All they write is that “in the context of our model, a perfectly vague opinion is an opinion that attacks the status quo policy as illegitimate, but does not impose any specific demands on the legislature for reforming that policy” (Staton and Vanberg, 2008, 508). I suggest that judges can use vague terms to achieve this purpose. I, therefore, conceptualize vagueness as the strategic use of vague word choices to modify the informative structure of court rulings in order to influence how the legislators interpret such terms. Vague terms can structure a broad interpretation range, and can be an intentional feature of word choice that modifies and scales this range. Such word choices compromises, for instance, nouns, prepositions, verbs and adjectives that structure the gradability of interpretation (Eichorst and Lin, 2018, 4)

In legal scholarship and the political science literature, vague terms are primarily identified using dictionaries containing a list of vague words. In this context, recent scholarship relies on the dictionary of vague words from the *Linguistic Inquiry and Word Count* (LIWC) platform (Tausczik and Pennebaker, 2010). LIWC is a dictionary textual-analysis software package originating from research from psychology. LIWC employs a word-count strategy that searches whatever text is under review using specific dictionaries. More specifically, LIWC assigns the words in a text to one of 70 predefined dimensions, and tallies up all of the words used in each dimensions and provides the percentage of words in a text that belong in each dimension. Vague words of this dictionary are, for instance: *possible*, *or*, *some*, *unclear*, and *perhaps*. Because of its simplicity and availability in multiple languages, LIWC and its dictionary are currently the state of the art measure for vagueness in political science (e.g. Owens and Wedeking, 2011, 2012; Crabtree et al., 2016; Eichorst and Lin, 2018)

Yet, using LIWC to identify vague statements is admittedly a crude instrument. The list of words is composed using research from psychology, business and medicine, and is originally designed to measure the cognitive writing style of individuals. For this reason, it is likely that the list of vague words in LIWC does not perform well in identifying vague statements in the context of constitutional court rulings. What is more, computer linguist research shows that general dictionaries most often under-perform compared to domain-specific dictionaries (Stajner et al., 2017; Theil et al., 2009).

To create such a domain-specific dictionary, I rely on recent advances in Natural Language Processing (NLP) to extend the existing list of vague words from the LIWC dictionary for both German and France. Specifically, I use *word-embeddings* to extend the existing list of vague terms with semantically similar words from the legal context. In NLP, the usage of word embeddings to adapt general dictionaries to a specific domain is common state of the art (Theil, Stajner, Stuckenschmidt, and Group, Theil et al.; Tsai and Wang, 2014). Word embeddings use shallow *neural networks* to learn vector representations of each word in a background corpus, such that similar words are close to each other in the word embedding space (Mikolov et al., 2013). In this geometric space, the geometric relationships between word vectors reflect the semantic relationships between these words. In a reasonable embedding space, for instance, you would expect synonyms to be embedded into similar word vectors; moreover, the geometric distance between any two word vectors should relate to the semantic distance between the associated words. Word embeddings have recently become popular as a text representation, since the vectors produced can be compared to find semantically (rather than textually) similar words using similarity metrics (e.g. cosine similarity). This makes them useful for finding semantically similar words given a list of input words. A more detailed explanation of word embeddings can be found in Appendix A.

To extend to dictionary, I proceed in three steps. First, I train a word embedding model on all German (consisting of 22.7 million words) and French (consisting of 15.6 million

words) court rulings. For this purpose, I use the *R word2vec* implementation with standard parameters<sup>11</sup>. The result is a high-dimensional vector representation, where each unique word is embedded in a word vector.

In a second step, for each word in the list of vague terms from LIWC, I consider the top 15 closest words (according to cosine similarity, a metric to measure the similarity of words in the embedding context) in the embeddings as new candidates for the dictionary. Like this, I am able to identify words which are semantically similar to the list of vague words from LIWC, but not yet in the dictionary. Since not all the top 15 candidates are a reasonable extension of the dictionary, I manually selected the most meaningful candidates. The original German LIWC dictionary contained 36 vague words, whereas the extended dictionary now contains 104. The original French LIWC dictionary contained 42 vague words, whereas the extended dictionary now contains 120. The new German dictionary now contains legal domain specific terms such as “*auslegungsfähig*” (open to interpretation, discretionary), or “*Ermessensspielraum*” (latitude of judgment, discretion), which have not been in original LIWC dictionary before. Word embeddings are also able to find semantically similar terms consisting of more than a single word. The French legal domain specific dictionary now contains words such as “*d’une façon générale*” (generally speaking), or “*interprétation large*” (wide interpretation), while the original French LIWC dictionary only includes terms consisting of one word. Therefore, the word embedding expanded dictionary is better able to capture the nuances of legal language than the LIWC dictionary.

In the third and last step, I tokenized the texts of all court rulings in the data set used for the analysis into sentences, and sentences into words. I then used the extended dictionaries to check whether a sentences contains a vague word or not. The final vagueness measurement and dependent variable is then the proportion of sentences in a decision containing at least one vague token from the extended dictionaries.

---

<sup>11</sup>N = 200, windows = 5, min count = 2, negative sampling = 2.

To illustrate how the word choice structures interpretation in communication, Table 1 shows sentences categorized as vague using the classified words from the LIWC dictionary. Vague words in each sentence are bolded and capitalized. The reader should recognize how simple word choice structures the interpretative range of a decision. Each sentence in Table 1 is sampled from decisions that reflect the effect described in the theoretical argument.

Table 1: Vague Sentences in court rulings (own English translation)

Vague Sentences
If <b>and how</b> the legislator makes use of this alternative is a matter of <b>political assessment</b> .
It is the legislator’s responsibility, <b>in which manner</b> it wants to remediate the existing discrimination.
The federal legislator has different options to define the police’s authority to intervene within a <b>sufficient</b> and <b>appropriate</b> manner.
The legislator has a considerable <b>wiggle room</b> and <b>freedom</b> in how it fulfills its duty to protect.
The new law must assure the <b>consistency</b> of economic activity.
In this question, the legislator has a <b>broad decision leeway</b> and latitude.

It is important to note that the original LIWC dictionary would not have identified all vague terms in these sentences. While *appropriate* and *sufficient* are indeed in the original LIWC dictionary, legal domain-specific vague terms such as “broad decision leeway” (German: weitreichender Entscheidungsspielraum) do not appear in the original dictionary, and would thus have been overlooked.

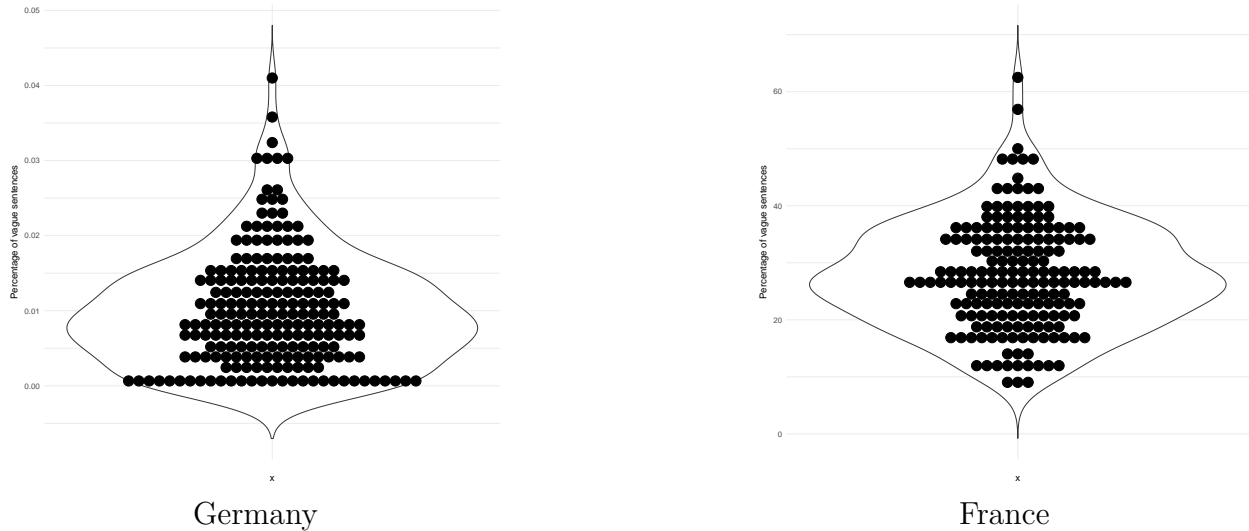
Figure 1 shows the distribution of the dependent variable for both Germany and France as a violin plot. The black dots indicate individual court rulings in the sample. Overall, the violin plot shows that there is variation in the vagueness of court rulings within and between the courts. While rulings of the GFCC only contain, on average, around 1% vague sentences<sup>12</sup>, rulings of the French Conseil contain around 26% vague sentences. The reason for this large discrepancy is that the French court rulings are written in a very technical and paragraph-structured style. These paragraphs often consist of only one or two sentences. As a consequence, even rather long decisions are structure in a rather small number of paragraphs,

<sup>12</sup>This is in line with other NLP research on vague language, where the average vague sentences percentage is usually between 1% and 5% (Liu et al., 2016, e.g.).



with very long sentences<sup>13</sup>. This makes it more likely that the rather low number of sentences in a ruling contain one or more of the vague terms of the dictionary, consequently increasing the number of vague sentences. It is clear that the French measure needs rather refinement, and results of France analysis are just preliminary and should be treated with caution.

Figure 1: Expected Decision Vagueness Depending on Judicial Uncertainty and Ideological Distance



*Note:* This figure shows the distributions of the dependent variable “Proportion of Vague Sentences” for the German and the French constitutional court.

## Measuring Judicial policy uncertainty

Judicial policy uncertainty describes a court’s uncertainty about the implications of specific policies, that is, the limited policy expertise of judges to inform choices among alternative policy options. I argue that the judicial policy uncertainty of judges can be measured by a decision’s *complexity*.

For Germany, to approximate this complexity, I employ a measure complexity following

<sup>13</sup>Although French rulings are on average shorter than German rulings (the average German decision contains 4875 words, while the average French decision is 3823 words long), the sentences contain more than the double amount of words (German decisions contain, on average, 21 words per sentence, while the French decisions contain 77. ).

the measurement strategy of Wittig (2016). She argues that “in complex cases a clear-cut solution is less likely since (too) many aspects have to be reconciled, and a solution may be less obvious than in simpler cases” (Wittig, 2016, 103). This level of complexity of a decision can be measured by the length of the section in which the decision depicts the facts of the case. In decisions of the GFCC, the case facts can be found in the top section of the opinion, or in briefer decisions in the head. Typically the case facts contain, for instance, a description of the case and its context, the plaintiff’s arguments, the respondent’s standpoint and statements of other actors if eligible. The length of the case facts is measured by the number of paragraphs written in this respective section. The judicial uncertainty variable ranges from 0 to 252, with a mean of 65 and a standard deviation of 40.

For France, I approximate the judge’s uncertainty by the number of legal doctrines the court has to consider in a decision. In the introduction of the French rulings, the court always quotes the legal rules and doctrines it has to consider in this ruling. I argue that the more legal rules and doctrines the Conseil has to consider, the more complex a ruling is. This variable ranges from 1 to 20, with a mean of 5.7 and a standard deviation of 4.2.

### **Measuring Preference Divergence**

Preference divergence describes the divergence between the policy ideal point of the court and the policy preferences of the government. I follow the common measurement approach of Hönnige (2009) by measuring preference divergence as the absolute ideological distance between the court and the government on a common left-right scale using ideology scores from the Comparative Manifesto Project (CMP) (Laver and Budge, 1992). The position of the government is calculated by weighting the CMP scores by the seats of the governing parties in parliament. The position of each Senate of the GFCC is measured by assigning each judge the CMP-RILE score of the political party nominating him or her on the given day this judge entered the court. Afterwards, the mean position of each Senate is calculated.

Finally, the absolute distance between these two position measures is calculated to obtain the ideological distance between court and government. This measure is the same for both Germany and France.

### **Measuring Risk of Non-Compliance**

The measurement of the perceived *risk of non-compliance* must approximate the assessment of the judges whether or not the government will try to evade a decision after the court has delivered a ruling.

For Germany, I measure the risk of noncompliance by examining whether or not the government whose statute is being challenged filed an amicus brief defending the constitutionality of the statute. Filing a brief requires a government to invest resources, which can indicate the level of importance politicians place on the law. Furthermore, filing a brief requires a government to take a public stance and risk its reputation on the issue. While such briefs are rarely direct threats of noncompliance, they signal to the court that the government has invested in the challenged policy and, as a result, may be willing to engage in noncompliance to continue its implementation. This variable, *Government Brief*, is coded 1 when the challenged government files a brief defending the constitutionality of the statute under review and 0 otherwise.

For France, I have to use a different ruling because the French court does not allow governments to file amicus briefs. To approximate the perceived risk of non-compliance of the Conseil’s judges, I rely on a data set of the French Comparative Agenda Project (CAP) including the weekly “communiqués du Conseil des ministres”<sup>14</sup>, i.e. the press release following each weekly government meeting. Communications are issued as statements of individual ministries on issues of legislative interest. For each decision of the Conseil in my data set, I checked whether the press releases of the government mentioned the upcoming

---

<sup>14</sup><https://www.comparativeagendas.net/france> .

decision of the Conseil at least one week in advance. I argue that if the government considers a decision to be important, it mentions this decision in the press release. The variable *Press Release* is therefore coded 1 when the government mentioned a decision and is coded zero if it did not.

## **Confounders**

A large strand of literature finds public opinion to be a predictive factor of judicial behavior. Vanberg (2005) and Krehbiel (2016) for instance find the degree of public awareness for a decision to be an influential factor for the behavior of judges of the GFCC. The court's decision to write extra vague or specific decisions might be correlated with the salience of a decision. If the public awareness for case is high, the court could use this to additionally increase the pressure on the government and write even more specific decisions, because the government's room for maneuver is smaller than in cases without public awareness. In the same way, case salience may correlate with the government's decision to file a brief. Therefore, failing to control for existing public awareness of a case could lead to biased results.

I use the fact whether the court holds a public hearing or not as a proxy variable of a case's salience and thus, as an indicator of public awareness (Vanberg, 2005). The court holds public hearings only rarely. Of 242 decisions in the data set, public hearings were held in only 62. Usually, decisions granted a hearing are cases of great significance, and thus the public interest in these cases is considerably higher than in ordinary cases. Moreover, Krehbiel (2016) shows that the expected number of media coverage covering an FCC decision is 90% greater for cases granted a hearing

I also control for the institutional structure of the GFCC. Decisions are carried out by one of two Senates. Differences in the Senates' personnel and jurisdiction may lead to different strategies both by litigants and the Court that result in systematic variation in

the usage of decision language. I address this possibility with the variable Second Senate. Decisions adjudicated by the Second Senate are assigned a value of 1 and those adjudicated by the First Senate coded as 0. For France, there are – unfortunately– no variables to control for confounding factors available.

## **Statistical Model**

Since the dependent variable is a continuous measure bounded to the interval  $[0, 1]$  (the proportion of sentences containing one or more vague term in a given text), I employ a Fractional Logit regression (Papke and Wooldridge, 1996). I model the vagueness of decisions as a function of the covariates described above. For the different model specifications, see Table 3 and Table 2 in Appendix B. The unit-of-analysis here are the individual court rulings. Positive coefficients suggest that courts are writing more vague decisions and negative coefficients suggest that courts are writing less vague (ergo, specific) decisions. Note that because of the coefficients of the fractional logit are difficult to interpret directly (they are essentially “relative proportion ratios”), I use simulations to produce quantities of interest for sensible scenarios (King et al., 2000).

## **Results Trade-Off Hypothesis**

This section shows the results of the binomial generalized linear model for the Trade-Off hypothesis (H1) in both Germany and France. The formal model predicts that decision vagueness will increase as judicial policy uncertainty increases and decrease as judicial and policy maker’s preferences diverge. This effect should be observable in both countries, independent of the level of public support a court enjoys. In line with the formal model, there is a delicate trade-off going on between the judicial policy uncertainty which judges face and the degree of preference divergence between court and legislator. Judges strategically vary

their decision vagueness depending on the complexity of the issue at hand and the ideological distance to the legislator.

Figure 2 plots the effect of effect of judicial policy uncertainty (measured by the length of case facts) on decision vagueness dependent on the ideological distance of court and government<sup>15</sup>. For both countries, we observe the same effect. If court and government are ideologically close, judges write increasingly vague decisions to provide the legislator with discretion to use its policy-expertise the higher their policy uncertainty becomes (gray-colored curve in the figure). In contrast, if court and government are ideologically distant, judicial texts become increasingly less vague the higher the policy uncertainty becomes (light-blue curve in the figure).

Focusing on Germany, looking at very complex cases where judges face maximum judicial uncertainty (the right end of the judicial uncertainty dimension), we see that there is a substantial difference in decision vagueness depending on the court and government's preference divergence: the expected decision vagueness is around 2 percentage points when both court and government are ideologically close, but the score is around 0.5 percentage points when both actors are ideologically distant. Thus, there is a (statistically significant) difference in decision vagueness of around 1.5 percentage points, which is a substantial change given a mean proportion of vague sentences of only 1% in Germany. In substantial terms, if the court shares the same ideological view as the government, the latter is not afraid that the government takes advantage of the discretion it has and implements some undesired policy. In other words, the court "trusts" the legislator by providing it with the necessary discretion to use its policy expertise. However, if court and government are ideologically distant, the court seems to worry more about the possibility that other policy makers will use their

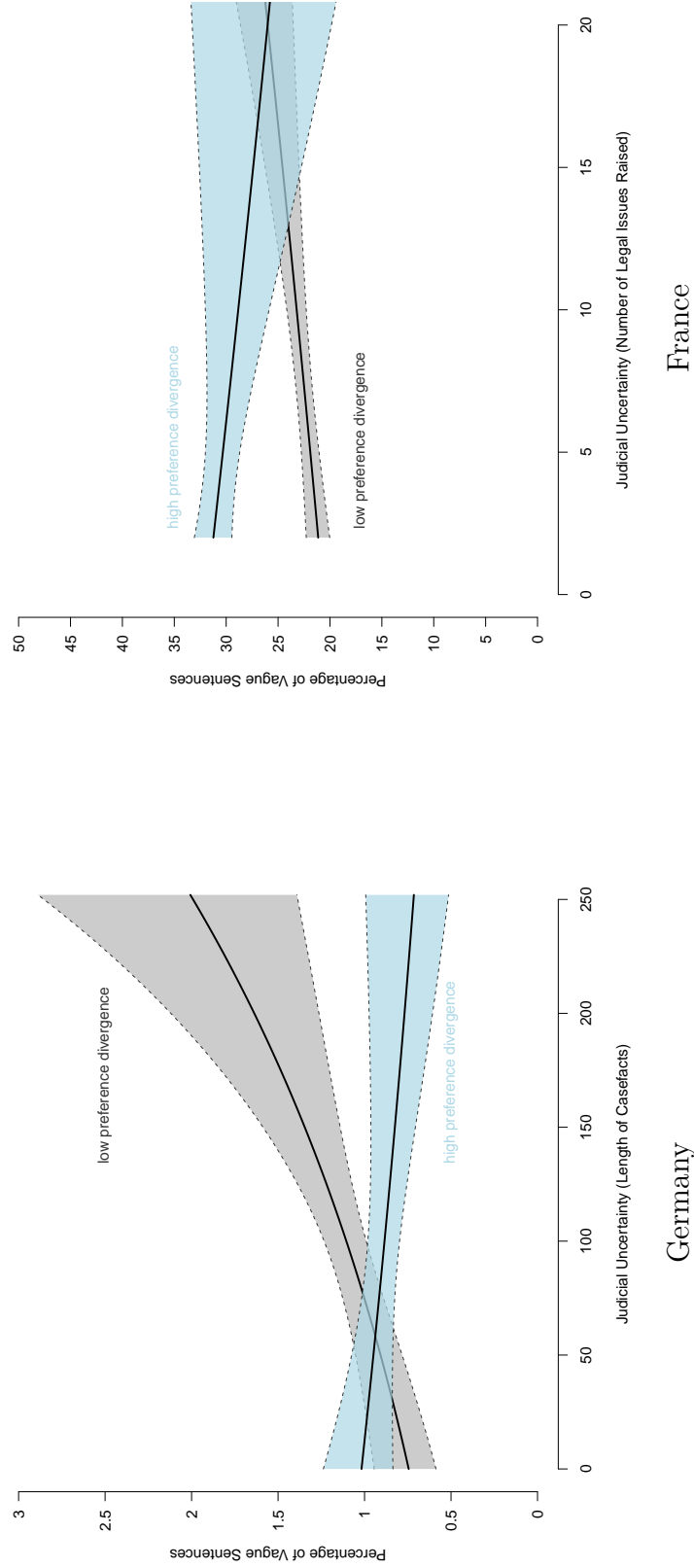
---

<sup>15</sup>Results are based on the expected values of 1000 simulations for different scenarios. In the simulations, the ideological distance variable was varied from minimum distance (gray) to maximum distance (light-blue). For the simulation for Germany, case salience and Second Senate was set to zero. Changing these variables to one does not change the results.

expanded authority to promote their own interests. In order to avoid this, the court crafts very specific rulings in cases with high judicial policy uncertainty. The court, therefore, rather runs the risk of “locking in” an inappropriate policy, but ensuring that the decisions provides specific instructions concerning implementation than giving the policy maker the chance to use their expanded authority to promote their own interests.

Looking at the same relationship in France, this trade-off is not confirmed. Although the effect of the expected decision vagueness follows the same direction than in Germany, there is no statistically significant difference between the expected decision vagueness in a high preference and low preference divergence scenario at maximum judicial policy uncertainty. One possible explanation of this null-finding is that the vagueness measurement the French decision needs some rather refinement.

Figure 2: Expected Decision Vagueness Depending on Judicial Uncertainty and Ideological Distance



Note: This figure shows the effect of judicial policy uncertainty on opinion vagueness, dependent on the ideological distance of court and government. Estimates are based on Table 2 and Table 3, Model 1 in Appendix B.



## Results Non-Compliance Risk Hypothesis

This section provides evidence for the Non-Compliance Risk Hypotheses (H2). If the formal model is correct, we should see a different usage of decision vagueness across Germany and France. For a very popular court such as the GFCC, the non-compliance risk hypothesis predicts that given a sufficient risk of non-compliance, the GFCC will craft less vague (and therefore, more specific) rulings to increase the pressure of the government and to force compliance. The proportion of vague sentences, therefore, is expected to be lower (indicating a rather specific ruling) in cases where the risk of non-compliance is high than in cases where the risk of non-compliance is low. For a rather unpopular court such as the Conseil Constitutionnel, the non-compliance risk hypothesis predicts that given a sufficient risk of non-compliance, the GFCC will craft more vague decisions in an attempt to mask potential non-compliance.

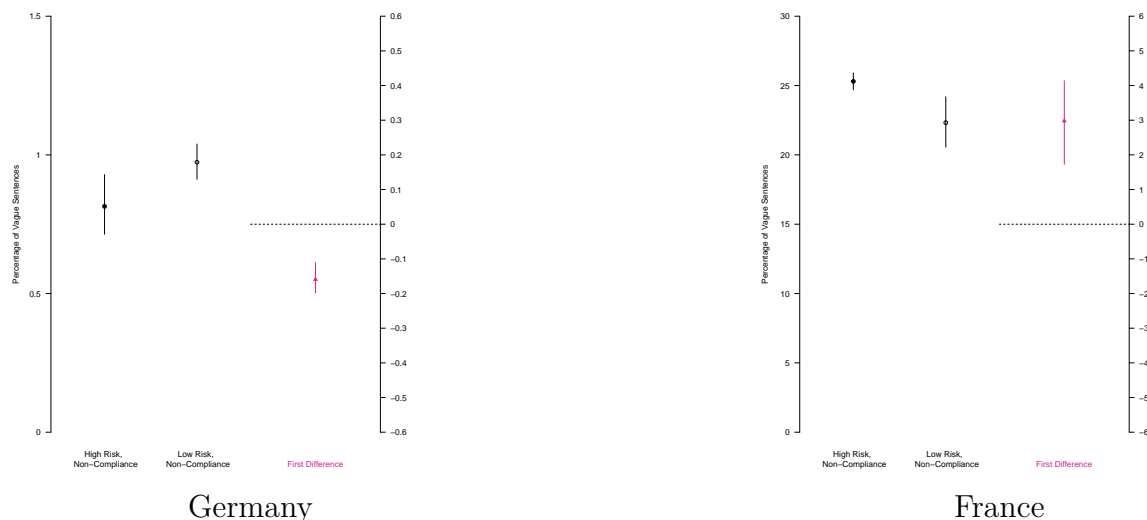
The empirical results support these prediction. Vagueness is used differently depending on the level of public support a court enjoys. Figure 3 displays the first difference between a case where the perceived risk of non-compliance is high and a case where the perceived risk of non-compliance is low <sup>16</sup>.

The German Court writes, on average, around 0.2 percentage points less vague rulings when it fears governmental non-compliance. This makes it more likely that potential attempts of non-compliance by the government are detected by the public, and therefore raises the costs to other policy makers of pursuing policies that are not consistent with the court's specific demands. In substantive terms, given a sufficient risk of legislative non-compliance, the benefits of pressuring the government outweigh the concerns of the court that an open defiance of the government could highlight the relative lack of judicial enforcement power for a popular court such as the GFCC. The margin of this effect is, however, really small.

---

<sup>16</sup>Results based on 1000 simulations. For these simulation, only the non-compliance risk variable was varied between 0 and 1, while all other variables where fixed at their mean.

Figure 3: First Difference Expected Decision Vagueness Depending on Risk of Non-Compliance



*Note:* This figure shows the effect of the risk of non-compliance on decision vagueness. The black point represents the expected complexity score for a case with a high perceived risk of non-compliance, including 95% confidence intervals. The white point represents the expected proportion of vague sentences for a case with a low perceived risk of non-compliance, including 95% confidence intervals. The first difference between these two scenario including the respective 95% confidence intervals is display on the right. Estimates are based on Table 2 and Table 3, Model 2 in Appendix B.

The French Conseil, in contrast, writes about 3 percentage points more vague rulings in cases with a high perceived risk of non-compliance. This is because the French court enjoys less public support than the German Court, and therefore also possesses less leverage in interacting with the government. Under such circumstances, the Conseil rather writes a vague decision that makes it less likely that governmental non-compliance is spotted by the public than to risk to lose reputation when the relative lack of judicial enforcement power becomes evident. Given the court’s concern for avoiding open noncompliance in this case, the benefits of “masking” outweighs the benefit of using specific language to move the legislative response towards the court’s ideal point. In other words, vagueness is used to shield the Conseil against the negative institutional consequences of open defiance, and works as a “defensive mechanism”.

To sum, the presented evidence on both courts supports the theory of Staton and

Vanberg (2008). Just as the formal model suggests, judges strategically craft vague or specific rulings depending on the amount of policy uncertainty they face and the degree of preference divergence between them and the legislator. More important, both courts anticipate the potential future legislative behavior and adapt the decision vagueness to it to either pressure the legislator to follow the court’s ruling (Germany) or to mask potential attempts of evasion (France).

## **Robustness Analyses**

The robustness of these findings is confirmed by several robustness tests. A central variable in the analysis is the measurement of the degree of policy divergence between court and legislator. For the main analysis, I used the so-called RILE scores from the Comparative Manifesto Project project. These scores are increasingly criticized with regard to their spatial and temporal comparability (Lowe et al., 2011; König et al., 2013). In order to check whether my findings are robust to the change of the ideological distance measure, I replicated the analysis using both the logged version of the CMP scores of Lowe et al. (2011) as well as the Manifesto Common Space Scores (MCSS) of König et al. (2013) instead of the original RILE scores. The findings remain robust to the usage of different ideology measures.

Moreover, I used a different measurement for judicial policy uncertainty. Instead of counting the length of the case facts at the beginning of each decision or the number of legal issues raised in a case, I used Vanberg (2005)’s and Krehbiel (2016)’s dichotomous coding scheme to construct a new variable case complexity. Cases involving taxation, budgets, economic regulation, social insurance, civil servant compensation, and party finance are coded as “complex” with a value of 1, whereas those involving institutional disputes, family law, judicial process, individual rights, asylum rights, and military conscription are coded as “simple” with a value of 0. Here, my findings remain not robust. The direction of effect remains as expected: judges write vaguer decisions when judicial policy uncertainty is high

(in complex case) and when they share the same ideological views like the government, whereas they will write clearer opinions when judicial policy uncertainty is low (in simple cases) but the court and government's preferences diverge. However, these results are not statistically significant on the 95%-level. One reason for this might be that the original coding scheme of Vanberg (2005) was developed to measure the transparency of a case, that is, how accessible is a case for the broad public. In fact, cases which might be hard to grasp for the public might be less problematic to grasp for judges, who can be assumed to possess above average public general knowledge.

## Conclusion

This study tested the empirical implications of the game-theoretic model of Staton and Vanberg (2008). It argues that opinion vagueness is a function of judge's policy preferences and their fear of potential noncompliance by the legislature. Yet, the court's ability to use vagueness ultimately depends on their level of public support. In a comparative study of two constitutional courts in Germany and France and analyzing novel data on opinion vagueness using quantitative text analysis, I find support for the central implications of the formal model. My findings confirm that a court's public support is indeed the key factor for explaining how courts strategically use vagueness. The German Federal Constitutional Court, a court with high public support, uses vagueness primarily to take advantage of the policy expertise of other policy makers and to strategically pressure the legislature. In contrast, the French Conseil Constitutionnel, a court with low public support, uses vagueness as a "defensive mechanism" to hide noncompliance from public view.

These findings have larger implications for the study of judicial politics. If judges strategically craft vague rulings and control decision language to manage the challenges of judicial policy making, then empirical tests of common separation-of-powers (SoP) models

that only use binary measures of decision outcomes (e.g. a law is declared as unconstitutional or not) are likely to underestimate the real extent of strategic judicial behavior. Therefore, the findings suggest that judicial politics must move beyond the binary coding of judicial outcomes to richer and more nuanced measures of strategic judicial behavior. My findings are also in line with a growing part of the judicial literature which suggests that courts and judges take active measures to prevail in the strategic interaction between court, government, and mass public (Staton, 2006; Krehbiel, 2016). In addition, such an approach has the potential to begin bridging the gap between traditional legal scholarship and the quantitative study of judicial politics by taking into account case specific aspects of judicial decisions that legal scholars regard as fundamentally important. Furthermore, because the implications of Staton and Vanberg (2008)'s model can be applied to many other delegation relationships, the findings of this study have implications beyond judicial politics and opens new avenues for further research. Central banks and other non-majoritarian institutions face the same delegation problems as constitutional courts, but also lack proper enforcement mechanisms. Further research could thus investigate whether central banks use vague language in a similar way as suggested by this study.

## References

- Bawn, K. (1995, mar). Political Control Versus Expertise: Congressional Choices about Administrative Procedures. *American Political Science Review* 89(01), 62–73.
- Carrubba, C. J. (2005). Courts and Compliance in International Regulatory Regimes. *Journal of Politics* 67(3), 669–689.
- Crabtree, C., M. Golder, T. Gschwend, and I. H. Indridason (2016). Campaign sentiment in European party manifestos. *Working Paper 92521*.
- Eichorst, J. and N. Lin (2018). Resist to Commit: Concrete Campaign Statements and the need to clarify a partisan reputation. *Journal of Pol* *forthcomin*.
- Epstein, D. and S. O’Halloran (1999). Delegating Powers: A Transaction Costs Politics Approach to Policy Make Under Separate Powers.
- Gibson, J. L., G. A. Caldeira, and V. A. Baird (1998, jun). On the Legitimacy of National High Courts. *The American Political Science Review* 92(2), 343–358.
- Hönnige, C. (2009, sep). The Electoral Connection: How the Pivotal Judge Affects Oppositional Success at European Constitutional Courts. *West European Politics* 32(5), 963–984.
- King, G., M. Tomz, J. Wittenberg, and M. Tomz is candidate (2000). Making the Most of Statistical Analyses: Improving Interpretation and Presentation. *Source: American Journal of Political Science* 44(2), 347–361.
- Konig, T., M. Marbach, and M. Osnabrugge (2013, may). Estimating Party Positions across Countries and Time—A Dynamic Latent Variable Model for Manifesto Data. *Political Analysis* 21(4), 468–491.
- Krehbiel, J. N. (2016, oct). The Politics of Judicial Procedures: The Role of Public Oral Hearings in the German Constitutional Court. *American Journal of Political Science* 60(4), 990–1005.
- Laver, M. and I. Budge (1992). Measuring Policy Distances and Modelling Coalition Formation. In *Party policy and government coalitions*, pp. 15–40. New York: St. Martin’s Press.
- Liu, F., N. L. Fella, and K. Liao (2016). Modeling Language Vagueness in Privacy Policies Using Deep Neural Networks. pp. 257–263.
- Lowe, W., K. Benoit, S. Mikhaylov, and M. Laver (2011, feb). Scaling Policy Preferences from Coded Political Texts. *Legislative Studies Quarterly* 36(1), 123–155.
- Mikolov, T., K. Chen, G. Corrado, and J. Dean (2013). 5021-Distributed-Representations-of-Words-and-Phrases-and-Their-Compositionality. *Proc. of HLT-NAACL*, 1–9.

- Mikolov, T., G. Corrado, K. Chen, and J. Dean (2013). Efficient Estimation of Word Representations in Vector Space. *Proceedings of the International Conference on Learning Representations (ICLR 2013)*, 1–12.
- Owens, R. J. and J. Wedeking (2012). Predicting drift on politically insulated institutions: A study of ideological drift on the United States Supreme Court. *Journal of Politics* 74(2), 487–500.
- Owens, R. J. and J. P. Wedeking (2011). Justices and legal clarity: Analyzing the complexity of U.S. Supreme Court opinions. *Law and Society Review* 45(4), 1027–1061.
- Papke, L. E. and J. M. Wooldridge (1996). Econometric methods for fractional response variables with an application to 401(k) plan participation rates. *Journal of Applied Econometrics* 11(6), 619–632.
- Przeworski, A. and H. Teune (1970). *The logic of comparative social inquiry*. Malabar, Fla: R.E. Krieger Pub. Co.
- Stajner, S., G. Glavas, S. P. Ponzetto, and H. Stuckenschmidt (2017). Domain Adaptation for Automatic Detection of Speculative Sentences. In *Proceedings - IEEE 11th International Conference on Semantic Computing, ICSC 2017*, pp. 164–171.
- Staton, J. K. (2006). Constitutional Review and the Selective Promotion of Case Results. *American Journal of Political Science* 50(1), 98–112.
- Staton, J. K. and G. Vanberg (2008). The value of vagueness: Delegation, defiance, and judicial opinions. *American Journal of Political Science* 52(3), 504–519.
- Tausczik, Y. R. and J. W. Pennebaker (2010). The psychological meaning of words: LIWC and computerized text analysis methods. *Journal of Language and Social Psychology* 29(1), 24–54.
- Theil, C. K., S. Stajner, H. Stuckenschmidt, and W. S. Group. Exploiting Word Embeddings for Industry-Specific Dictionary Expansions.
- Theil, C. K., S. Stajner, H. Stuckenschmidt, and S. P. Ponzetto (2009). Automatic Detection of Uncertain Statements in the Financial Domain. *World Wide Web Internet And Web Information Systems (C)*, 2005–2009.
- Tsai, M.-F. and C.-J. Wang (2014). Financial Keyword Expansion via Continuous Word Vector Representations. *Emnlp*, 1453–1458.
- Vanberg, G. (2005). *The Politics of Constitutional Review in Germany*. Cambridge: Cambridge University Press.
- Wittig, C. E. (2016). *The Occurrence of Separate Opinions at the Federal Constitutional Court. An Analysis with a Novel Database*. Ph. D. thesis, Berlin.

# Appendix A: Vagueness Measurement Using Word Embeddings

This section gives a brief summary of the calculation of word embeddings. For greater detail see the original paper of Mikolov et al. (2013). The following section explains the continuous Bag Of Words (CBOW) single-word model in *word2vec*. I used the standard parameter of a two-word window, which slightly complicates the calculation. I assume a certain familiarity with neural networks<sup>1</sup>.

In the CBOW model, the objective is to find a target word  $\hat{y}$ , given a context of words. In the simplest case in which the word's context is only represented by a single word (that is, the word before and after the word of interest), the neural network for the CBOW model looks like in the figure below,

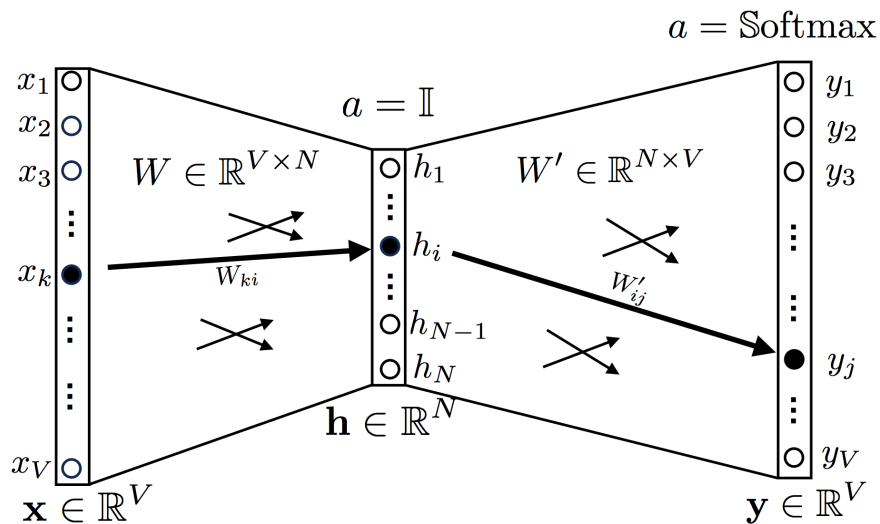


Figure 4: Topology of the one-word Continuous Bag-of-Words model

As you can see, there is one input layer, one hidden layer and finally an output layer. The activation function for the hidden layer is the identity  $a = 1$  (usually called *linear activation function*). The activation function for the output is a *softmax*,  $a = \text{Softmax}$

The input layer is represented by a one-hot encoded vector  $x$  of dimension  $V$ , where  $V$  is the size of the vocabulary. In case of the German model, for instance,  $V$  is equal to 15,687. The hidden layer is defined by a vector of dimension  $N$ . Where  $N$  is the number of dimensions we choose to represent our word in. It is arbitrary and a hyper-parameter for a neural network. Also,  $N$  is the number of neurons in the hidden layer. With the standard parameters of *word2vec*,  $N = 100$ . Finally, the output layer is a vector of dimension  $V$ .

<sup>1</sup>The explanation here is largely taken from the excellent blog of Claudio Bellei, <http://www.claudiobellei.com/2018/01/06/backprop-word2vec/>



The weights between the input and the hidden layer are represented by a matrix  $W$ , of dimension  $V \times N$ . Similarly, the weights between the hidden and the output layer are represented by a matrix  $W'$ , of dimension  $V \times N$ . For example, as in the figure, the relationship between an element  $x_k$  of the input layer and an element  $h_i$  of the hidden layer is represented by the weight  $W_{ki}$ . The connection between this node  $h_i$  and an element  $y_j$  of the output layer is represented by an element  $W'_{ij}$ . The output vector  $y$  will need to be compared against the expected targets  $\hat{y}$ . The closer  $y$  to  $\hat{y}$ , the better is the performance of the neural network.

## Appendix B: Regression Tables

Table 2: Regression Results of Fractional Logit Model, France

	<i>Dependent variable:</i>	
	Proportion of Vague Sentences	
	Model 1	Model 2
Constant	-1.347*** (0.043)	-1.282*** (0.037)
Judicial Policy Uncertainty	0.015*** (0.005)	0.007** (0.003)
Ideol. Distance Court/Government	0.014*** (0.002)	0.011*** (0.001)
Judicial Policy Uncertainty × Ideol. Distance Court/Government	-0.001** (0.0003)	
Press Release		0.287*** (0.065)
Observations	258	258

*Note:*

\*p<0.1; \*\*p<0.05; \*\*\*p<0.01  
Robust standard errors in parentheses

Table 3: Regression Results of Fractional Logit Model, Germany

	<i>Dependent variable:</i>	
	Proportion of Vague Sentences	
	Model 1	Model 2
Constant	−4.892*** (0.122)	−4.580*** (0.064)
Judicial Policy Uncertainty	0.004*** (0.001)	0.001** (0.0004)
Ideol. Distance Court/Government	0.105 (0.068)	−0.060** (0.029)
Second Senate	0.082* (0.044)	0.056 (0.043)
Government Brief		−0.180*** (0.069)
Case Salience	0.155*** (0.051)	0.168*** (0.050)
Judicial Policy Uncertainty × Ideol. Distance Court/Government	−0.002*** (0.001)	
Observations	242	242

*Note:*

\*p<0.1; \*\*p<0.05; \*\*\*p<0.01  
Robust standard errors in parentheses