

# Measuring Parliamentary Influence on Policy

## A Text-Comparison Approach

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### Abstract

Legislative studies have extensively benefitted from the recent improvement of textual analysis and scholars have learned to take advantage of the large amount of text produced by legislatures. Among others, they have used text to estimate the ideological position of individual actors; they have expanded the scope of their previous analyses by automating the coding processes of textual documents and they also have improved our understanding of the strategic behaviours of legislative actors, by looking in detail at their verbal interactions.

Following those developments, this paper proposes to take advantage of the textual modifications adopted during the legislative review, to estimate the amount of influence, that a parliament exerts. In doing so, it addresses an old -but widely accepted- idea, that, in parliamentary democracies, most policies are written by the government all alone and the parliament is restricted to a mere adoption role. Despite the large consensus supporting this expectation, there is only limited empirical evidence.

Using data from the British House of Common and the German Bundestag and following an idea first proposed by Martin and Vanberg (2011), I compare the introduced and the final versions of each bill adopted during the last decade. Then, I compute the number of adopted modifications and obtain a Parliamentary Influence Score (PIS). This PIS is expected to capture the extent to which a bill is influenced by members of Parliaments. The rest of the paper is dedicated to the validation of the measure.

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# 1 Intro

Political science benefited and is still benefiting immensely from the development of measures based on text. In the last decades, the technical improvements of computational resources, combined with the increasing accessibility of political texts, enabled analyses, which were unthinkable fifty years ago. Text-as-data research in political science can pursue four different objectives (adapted from Wilkerson and Casas (2017)): scaling, supervised classification, topic modelling, text reuse. Scaling methods aim at mapping documents on a given dimension. Three main scaling models exist: Wordscore (Lowe 2008), Wordfish (Slapin and Proksch 2008) and Wordshoal (Lauderdale and Herzog 2016). They differ essentially in the way they identify the dimension, on which the document should be mapped. These models have been mostly used in the legislative context, to estimate the ideological position of speakers. Supervised classification aims at automatically attribute one or several categories to a document. They require a pre-coded sample and can learn how to classify unknown cases. Topic modelling is an unsupervised method -i.e. no need to have pre-coded sample-, which proposes to identify the topics, mentioned in a corpus of documents. This can be done with the help of different algorithms, which differ in their assumption and complexity. In the last years, political scientists mostly used Structural Topic Modelling, which includes an estimate for the uncertainty and enables hypothesis testing. Finally, text reuse technic identify the text chunks common to different documents. It can be used in different ways depending on the context: Wilkerson, Smith, and Stramp (2015) uses text reuse to trace republican policy proposals in democrat bills ; Smith, Cordell, and Dillon (2013) use text reuse to investigate the diffusion networks of newspapers in the 19. century. This brief review shows the diversity of cases, where we can use text to gain empirical leverage. The four broad objectives are only the tip of the iceberg, considering the myriad of technical ways to reach these objectives. The field is also moving very fast and new and better performing algorithms frequently emerged.

Legislatures are a particularly fertile ground for text-based measures. In terms of data accessibility, they are close to the text-as-data paradise: most actions undertaken by legislative actors are either written or transcribed. The transparency policy adopted by many parliaments made those transcripts not only public, but also accessible in the large scale. Scholars already used parliamentary speeches, amendments table, bill text, parliamentary questions and plenary transcript. As parliamentary archives turn digital, it becomes easier to access an extremely large amount of textual information. The intersection of the legislative studies and the text-as-data methodological agenda has already proven to be mutually beneficial for both fields. Legislative scholars were able to better track empirical phenomena by deploying text-as-data tools. In doing so, they gathered knowledge that helped to improve text-as-data methods. For example, Proksch

et al. (2019) uses translated speeches from the European parliament, to demonstrate that Google translate can be used to run multilingual analyses. In this sense, this paper is an attempt to contribute to both fields simultaneously.

The present study proposes to use the modifications undergone by a bill during the legislative review process as a proxy of parliamentary influence. Its contributions are twofold. On the one hand, it shall provide a better measure of parliamentary influence, which constitutes a key concept in different fields of political science. On the other hand, it is meant to discuss the conditions under which political scientists can use similarities measure for their analysis. The rest of this paper is structured as follows. After a conceptual discussion of parliamentary influence, I present the measurement strategy and extensively discuss both its advantages and potential limits. Then, using data from Germany and United Kingdom, I evaluate the validity of the measure.

## **2 Conceptual Background**

### **2.1 Parlimentaentary influence and Political Science**

Policy-making is one of the core functions of political systems. Understanding how policies are decided and specifically the role played by parliament in this process is of high relevance for a large panel of research fields, which do not necessarily relate to legislative studies. For instance, the literature on democratic processes and representation linkage is, among others, interested in the legitimacy of adopted policies. This legitimacy is in part provided by the representative nature of parliaments. Scholars willing to investigate how legitimate is a policy or which conditions lead to more legitimated decisions will be tempted to know how influential are parliaments. Policies are also an important tool for politicians to represent their constituents. To investigate who is represented in a policy or how the representation mechanisms interact with policy making, it is important to know whether a policy has been mostly written by the parliament or the government. In other words, those two examples show that policy is a central concept for political science and the benefits drawn from a better understanding of parliamentary influence overcome the mere field of legislative studies.

We know surprisingly little about the empirical reality of parliamentary influence. A large number of theoretical contributions have discussed (1) whether parliaments should be more or less influential and (2) how institutional provisions affect parliamentary influence. The internal structure of parliaments as their relationship with other policy-makers highly vary across countries. Some institutional rules are associated with expanded powers, other with restricted powers. Becher and Christiansen (2015) demonstrates for instance that dissolution power tends to favour government when they bargain with

the legislature. As acknowledged by Mezey (1979), institutional provisions can also interact with the political context and produce differentiated outcomes. We also know that members of parliament use their policy-making power to regulate the relationship between coalition members (Martin and Vanberg 2004). Put briefly, most of what we know on how much parliament influence policy is theoretical. This lack of comparative and empirical knowledge probably explains the broad acceptance of the parliamentary decline thesis. This idea states that, in parliamentary systems, it is rather the government that controls the parliament than the contrary (Russell and Cowley 2016). Following this idea, members of Government can use their parties to pressure members of Parliaments (MPs), so that they adopt any government proposal. Thus, at least in parliamentary systems, most political scientists would expect parliament not to matter for policy. This expectation is so deeply anchored that scholars preferred to focus on other aspects of policy making or parliaments. Indeed, if as stated above, parliaments do not influence policy, why should we waste our time studying an inexistent or marginal influence. But, in the absence of clear empirical evidence and most importantly of a good measure of parliamentary influence, it remains important to assess whether this idea is accurate. If parliaments exert indeed little influence on policy, scholars should legitimately concentrate their effort on other questions and if, on the contrary, parliaments influence policy more than expected, scholars will be encouraged to look more closely at the parliamentary influence and its determinants.

## **2.2 Definition**

Our difficulties to accurately and precisely measure parliamentary influence stems from both the vagueness and multidimensionality of the concept itself and from its hardly quantifiable empirical manifestations. Bargaining over policy making is usually not described through the opposition between the government and the parliament (Huber 1996b). Formal models mostly looked at cross-partisan tension within these institutional arenas. Now, even if a government is supported by a majority of the parliament, a conflict can still emerge between the two bodies. Huber (1996b) mentions the conflict between Great Britain's Prime Minister, John Major, and part of his legislative majority during the adoption of the Maastricht Treaty. Similarly, during his presidency, François Hollande frequently used constitutional provisions that allowed him to restrict parliamentary veto rights to overcome intra-party conflicts. When a parliament and a government enter bargaining, both attempt to influence policy in a game, which is often asymmetric in the powers it offers to each body. In this context, parliamentary influence can be understood as its ability to impose its preferred policy or part of it over the government preference. Since policies are constructed in the interaction between parliament and government, I consider any deviation from the Government preferred policy as the manifestation of the

influence exerted by the parliament. The larger the deviation, the more influential is the parliament. This paper proposes a strategy to quantify this deviation and the underlying parliamentary influence.

When measuring parliamentary influence, a first problem regards the multidimensionality of parliamentary powers. Parliament can influence policy in a lot of different ways. Sieberer (2011) distinguishes between three “types” of powers. Parliament can exert influence public action (1) ex-ante - by controlling key nomination -, (2) during the legislative review process - by modifying a bill - and (3) ex-post - through inquiry-. This multidimensionality makes parliamentary influence hard to measure. Any measure requires not only one or several suitable indicators for each dimension, but also a way to aggregate these indicators in one index. This implies finding which of strong nominations powers and strong policy-making powers make a parliament more influential. I doubt this question can be solved theoretically or empirically. For this reason, I choose in the rest of this paper to focus on the influence exerted through policy-making powers, i.e. through parliament’s ability to adopt and decide policies.

A second issue concerns the importance to distinguish the parliamentary influence on policy, from the influence exerted by other non-government actors. Normally, only governments and parliaments can decide policies. In fact, many other actors are involved in the policy-making process: citizens, justices, lobbyists, parties. If a lobbyist succeeds in convincing a majority of representatives to adopt an amendment, does it belong to parliamentary influence, since the parliament is itself influenced? To solve this issue, I stick with the strict institutional framework of policy making. Since only parliament and government can decide policy, I understand parliamentary influence as any stream of influence channelled by the parliament. Accordingly, if a lobbyist, a citizen or anybody influence policy by pressuring members of parliament, it falls under the roof of parliamentary influence<sup>3</sup>. Similarly, if a member of parliament influence directly the government through partisan channels, it is not channelled by parliamentary action and, therefore, it does not belong to parliamentary influence.

Last but not least, parliamentary influence needs to be thought as a dynamic phenomenon. While the rich literature on legislative institutions think parliamentary influence in static terms, it is important to acknowledge that this influence can vary within the same institutional framework. Institutional rules interact with the political context and can yield different levels of influence. For instance, the fifth French republic allows the executive to punctually prevent MPs from amending a bill.<sup>4</sup> Huber (1996a) shows that some govern-

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<sup>3</sup>Parliamentary influence should actually be called "influence channelled by the parliament". To favour the readability, I chose in this paper to simplify it and to use parliamentary influence

<sup>4</sup>This so-called package vote is provided by the article 44.3 of the French constitutions. It states that "if the Government requests it, the assembly considering a bill decides by a single vote on all or part of the text under discussion, retaining only the amendments proposed or accepted by the Government" (Huber,

ments used this instrument far more often than others, which indicates that depending on the government, the French parliament had more or less influence although the institutional rules remain constant. Accordingly, investigating parliamentary influence requires an indicator able not only to measure whether the Austrian institutional system empowers more the parliament than the German one, but also to identify the policies on which the Austrian parliament had more or less influence over time. Parliamentary influence is a moving phenomenon that varies across and within institutional frameworks.

In a nutshell, this paper defines parliamentary influence as the influence on a given policy channelled by parliamentary actions. More specifically and as explained later, it focuses on the influence exerted during the legislative review process, which is measured as the differences observed between the initial version of a bill introduced by the government and the final version adopted by the parliament. The objective is to obtain a comparable, systematic and objective measure of parliamentary influence.

### **3 Measuring Parliamentary influence**

#### **3.1 Existing strategies**

Measuring parliamentary influence is not a new task for political scientists. So far, three types of strategies have been used: institution-driven classification, aggregated empirical measures and bill-level empirical measures. Classifications certainly represent the most classical way of measuring parliamentary influence. This idea is fairly simple: based on knowledge we have of how institutions work, we can observe for a number of cases the institutional framework and either group certain cases into categories or aggregate the observation into a numerical index. Up to my knowledge, all classifications of parliament attribute a static score or a static category to each legislature. Early work by Polsby (1975) distinguished between “transformative” - American Congress - and “arena” - British House of Commons - legislatures based on their respective system of separation of powers. In his view, these two ideal types of legislatures constitute two extremes of a continuum. Even if Polsby did not consider many countries, he assumed each country could be ordered on this latent dimension. A couple of years later, Mezey (1979) acknowledges the limit to base such classification on formal power and proposes a new typology structured by two dimensions. On the first axis, legislatures are ordered following their institutional prerogatives to influence policy-making. In that point, Mezey’s typology is very similar to Polsby’s. He also claims that institutional powers can be used in different ways depending on how much citizens specifically support the legislature against the government. He defines the popular support enjoyed by the legislature as a second dimension distinguishing parliaments. In doing so, he assumes that even with strong

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1996:3)

institutional tools to influence policy making, a legislature might not be able to exert any influence. For instance, a government might restrict parliamentary influence by threatening to dissolve the parliament, but this will only be efficient if the parliament fears elections. With this typology, Mezey acknowledges that political context can interact with institutional rules and allows parliamentary power to vary even if the institution remains the same. In the following decades, research in legislative politics focused on micro-level studies and took distance with the comparative approach (Kreppel 2014). Until recently, scholars concentrated themselves on individual parliaments and reduced their effort to assert comparatively parliamentary powers. In 2009, Fish and Kroenig (2009) brought legislative studies back to the comparative game and proposed a parliamentary power index. For an impressive long list of parliaments, they asked experts to code 32 items, meant to capture parliamentary powers. The broad list of items included among others the capacity of a legislature to impeach the head of government, the number of staff members allocated to each legislator or the judiciary immunity enjoyed by MPs. Despite the huge scope of their study, they do not address the two issues mentioned above and propose a static classification, which exclusively relies on institutional provisions. Classifications are not well suited for detailed empirical analysis of the classification criteria. They mostly rely on our theoretical expectation regarding the behaviour implied by certain institutional rules. If the expectations are proven to be wrong, the result classification will be wrong as well. For instance, strong standing committees are frequently expected to increase parliamentary influence. Without a proper measure of parliamentary influence, there is no way to test this assumption, since it would be tautological and useless to look at whether strong parliaments tend to have strong committees. Classifications are therefore very useful to gain insight on the cases under study or to select cases to study. They are on the contrary not helpful for detailed analysis of a moving phenomenon, such as parliamentary influence.

A second group of measures rely on empirical proxy, which depicts the overall bargaining mood between a government and the legislature. Scholars have used the proportion of adopted bills introduced by non-government actors, the number of government defeat or the use of institutional tools meant for the government to overcome parliamentary review. Although they offer a little more variation than classification - each of these measure can be computed for a given period -, they remain aggregated measure. Since political context does not only vary across years but also across policy in the same year, the unit of analysis of such proxy is not small enough to enable detailed analysis. In addition, these quantities are contingent to many confounding factors that do not relate to parliamentary influence.

Finally, the more fine-grained strategies propose to look at how much each bill is changed during legislative reviews. They - including the strategy proposed in this paper - rely

on the same assumption: the amount of influence exerted by a parliament on a bill is proportional to the changes undergone by a bill during legislative review. The process leading to the adoption of a policy is in most countries similar. (1) A government proposed a policy draft, which is (2) investigated and eventually modified by the parliament with majoritarian rules. (3) Once the bill is adopted by the parliament, it goes back to the government, which is in charge of its implementation. Assuming governments introduce their preferred policy and keep stable preferences during the legislative review, we can logically conclude that the differences between the introduced and the adopted policy are the fruit of parliamentary influence. The biggest issue regards the quantification of these differences. Martin and Vanberg (2011) propose to count the proportion of articles - defined as policy subunits - which are changed during the legislative review process. In doing so, they assume that each article modification implies a similar amount of influence. They do not distinguish between the re-writing of a complete article and the insertion one word. It is also questionable whether articles can be considered as homogeneous policy subunits, while some articles - probably the longer ones - are likely to be more central for the policy. Finally, it is not clear how Martin and Vanberg's measure deal with the deletion, insertion or merger of articles. Acknowledging some of these issues, Pedrazzani and Zucchini (2013) propose another strategy to estimate the distance between the proposed and adopted bills. They count the words used in the two documents and sum up the differences of the absolute frequencies of each word. As explained later, the characteristics of bills decrease the performance of such term-based distances. Modifying policies is not necessarily associated with corresponding vocabulary modifications. This approach is also very language dependent and requires many pre-processing decisions, which hurts the reliability of the measure.

The strategy proposed in this paper is largely inspired by Martin and Vanberg's (2011) strategy. It aims at measuring parliamentary influence on each adopted bill, by looking at the similarity of the proposed and adopted texts. To estimate this distance, a metric closed to the editing Levenshtein distance is used. More specifically, for each bill, the parts deleted from the proposal and the parts inserted in the final bill are identified. After the identification of the deletions and insertions, two ratios are computed: a deletion ratio - how much of the proposal has been deleted - and an insertion ratio - how much of the bill has been inserted -. Finally, a so-called parliamentary influence score (PIS) is obtained by taking the average of the two ratios. The present strategy is consequently a refinement of the measure deployed by Martin and Vanberg. The next part presents the characteristics of this approach, compare the proposed text similarity measure with other measures and attempt to validate the presented measure. ## Parliamentary Influence Score



### 3.1.1 Computation

**A BILL TO** Make provision for a railway between Euston in London and a junction with the West Coast Main Line at Handsacre in Staffordshire, with a spur from Old Oak Common in the London Borough of Hammersmith and Fulham to a junction with the Channel Tunnel Rail Link at York Way in the London Borough of Islington and a spur from Water Orton in Warwickshire to Curzon Street in Birmingham; and for connected purposes.

Be it enacted by the Queen's most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same, as follows:—

Works

1 Power to construct and maintain works for Phase One of High Speed 2

(1) The nominated undertaker may construct and maintain the works specified in Schedule 1, being—

(a) 5 works for the construction of Phase One of High Speed 2, and

(b) works consequent on, or incidental to, such works.

(2) In this Act, the works specified in Schedule 1 are called the “scheduled works”.

(3) In this Act “Phase One of High Speed 2” means a railway between Euston in London and a junction with the West Coast Main Line at Handsacre in Staffordshire, with—

(a) a spur from Old Oak Common in the London Borough of Hammersmith and Fulham to a junction with the Channel Tunnel Rail Link at York Way in the London Borough of Islington, and

(b) a spur from Water Orton in Warwickshire to Curzon Street in Birmingham.

2 Further provision about works

(1) The nominated undertaker may, for the purposes of or in connection with the scheduled works or otherwise for Phase One purposes, do any of the following within the Act limits—

**An Act to** make provision for a railway between Euston in London and a junction with the West Coast Main Line at Handsacre in Staffordshire, with a spur from Water Orton in Warwickshire to Curzon Street in Birmingham; and for connected purposes.

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2 Further provision about works

(1) The nominated undertaker may, for the purposes of or in connection with the scheduled works or otherwise for Phase One purposes, do any of the following within the Act limits—

(a) carry out and maintain railway electrification and signalling works;

(b) make, provide and maintain all such approaches, bridges, subways, interchanges, roundabouts, turning places, lifts, stairs, escalators, ramps, passages, means of access, shafts, buildings, apparatus, plant and machinery as may be necessary or expedient;

(c) construct, provide and maintain all such embankments, aprons, abutments,

Figure 1: Example of the Comparison Output for a British Bill

Parliamentary Influence Score are obtained in three consecutive steps. First, using a character-based version of a greedy-string algorithm (Wise 1993), I compare pairwise final bills with their introduced version. Each character of the two texts is either common to texts, specific to the proposal - deleted character- or specific to the final bill - inserted character -. An example of output is provided in Figure 1. Once each character has been classified, I obtain a *deletion ratio* by counting the proportion of the deleted characters in the proposal and an *insertion ratio* by counting the proportion of the inserted characters in the final version. Finally, I compute the PIS of a given bill following equation. This score goes from 0% to 100%, where 0% indicates that there is no text in common and 100% that the two texts are the same.

$$PIS_i = 1 - \frac{Deletion\ Ratio_i + Insertion\ Ratio_i}{2}$$

### 3.1.2 Characteristic of this approach

Using the parliamentary influence score as a measure for parliamentary influences has four main advantages: measurement at the bill level, broad scope of application and high reproducibility.

One first important aspect of the parliamentary influence score is that it provides an estimation of the parliamentary influence for each adopted bill. Bills constitute a common unit of analysis for political scientists, which is relatively homogeneous across space and time and structures both government and parliament agendas. The PIS is accordingly well

suites to perform detailed comparative quantitative analysis and allows political scientists to gain empirical leverage for their studies. Indeed, as stated earlier, aggregated indicators of influence makes it hard to distinguish the respective effect of the institutional and the political contexts. But, at the bill level, there is enough variation of the two contexts to keep them apart and to identify their respective effect.

Another advantage of the PIS regards the number of cases, on which it can be employed. In most political systems - with some important exceptions such as the USA -, most bills are adopted according to a similar process. Government introduces, parliament adopts and government implements with the help of its administrative prerogatives. In each context, where bill introductions are dominated by the executive body, parliamentary influence during legislative review can be estimated by the PIS. This includes a very large number of legislatures at the supranational, national and regional levels. PIS is also language agnostic. The biggest hurdle regards the accessibility of the data, but as parliamentary archives turn digital and adopt international standard to archive their documents, the amount of work to gather the data and parse the text will be drastically reduced.

Finally, the PIS presents the advantage of being highly reproducible and reliable. It does not involve any subjective coding and is completely automated. The comparison of two texts will always yield the same result.

### **3.1.3 Text similarity measures**

As mentioned earlier, PIS is really close to what has been called editing distance. Before the presentation of the empirical results, it is necessary to briefly review the existing similarity measures and most importantly to dwell on the reasons that brought me to use my own metric instead of one of the well-established text similarity metrics. Consequently, in this section, I discuss the existing measures of text similarity and their respective advantages, when comparing the initial and final versions of a bill.

There is no one metric for text similarity. There are dozens of measures, which perform very differently depending on the task and the context (Pradhan, Gyanchandani, and Wadhvani 2015, @gomaa2013survey). It is common to distinguish lexical from semantic measures. Lexical similarity does not consider the meaning of the words and merely try to match sequences of terms or characters. Semantic similarity, on the other hand, infer the meanings of the words and look at whether two texts deals with similar topics or contains words with similar meanings. For instance, “cat” and “hat” are lexically similar, while “cat” and “dog” are semantically similar. Ideally, measuring parliamentary influence would require semantic similarity. Indeed, influence is in itself not about whether the same words or character sequences are used but rather on whether the political meaning of the

final version is close to its original meaning. However, to perform well semantic similarity measures require large text corpora, which deal with diverse topics. A corpus of two texts, where the second text is a future version of the first text is neither huge, nor likely to deal with differentiated topics. In addition, semantic similarity estimators usually rely on clustering methods, which again perform better with large corpora. For these reasons, even though they would conceptually be a good estimator of the similarity between a bill proposal and its adopted version, semantic similarities measure are technically not able to estimate this similarity.

Lexical measures are divided in two groups. The first type - term-based measures - looks at the similarity of the words used in the text, whereas the second type - character-based - looks at common sequences of characters between two texts. Term-based distances, such as *Euclidean*, *Cosine* or *Jaccard*, require to count the terms of the documents to compare and capture how similar are those words distributions. This bag-of-words approach is problematic in two ways when comparing two different versions of one single text. First, term-based distances work better with generic texts, which use a small vocabulary of common words. Technical texts, as bills can be, usually employ a large vocabulary with very specific words. In addition, the words used in the two versions of a bill will not only be rare words, but also the same rare words in the two text version. Cosine distance looks, for instance, at how similar are the terms used in two documents without taking into account how often are the terms used. Computing the cosine distance between a proposal and a final bill would not really inform on how close the two texts are, but rather on whether the modifications undergone by the bill implied vocabulary extension or contraction. The second issue with term-based measures is their dependence on pre-processing decision. These measures are not interested in the variation of specific types of words such as determinants or auxiliary verbs. Similarly, to accurately capture the modification of vocabulary, they often require to stemmatize or lemmatize the words. Although this reduces the dimensionality of texts and increase the information of the frequencies, it adds a transformation step, that hurt the reproducibility and reliability of such approaches. Character-based distances on the contrary to term-based measure do not require to transform the raw text. They represent text as a sequence of characters and look at the similarity between the sequences, as biologists compare DNA sequences. The most popular one is certainly the *Levenshtein* distance - also named editing distance - which counts the number of characters that need to be deleted, inserted or substituted to transform one string into another. Other metrics can estimate the editing distance. The *Jaro* distance is mostly meant to identify whether two strings are the same beyond small deviations. It does not perform well if a long string is inserted. The *longest common substring* (LCS) methods looks at length of the longest sequence common to the two texts. The *n-gram* distance split each text into subsequences of n characters and look

at the proportion of common subsequences. Editing distances are hard to interpret in a comparative perspective, since they are - with the exception of Jaro distance - absolute values, which do not take into account the length of the texts. It is obvious that an editing distance of 10 does not imply the same similarity if the compared texts have a length of 20 or 1000. In the context of bill comparison, this would overestimate the distance for long bills, which would appear very dissimilar in spite of a relative small distance compared to their length. One other issue regards the amount of computational resources required to compute editing distances. Editing distance are usually implemented with recursive algorithms. Consequently, they are long to compute and frequently hit memory limits.

To summarize, measuring the similarity between texts is a complex task. Depending on the type of texts, their length and their content, different approaches should be considered. There is no magical recipe and choosing the right metric is a hard task. The absence of comparative review of the performance of each measure in different contexts does not help. From a general point of view, similarity distances are well suited to compare one text to many texts. These metrics are very useful to assess whether text A is closer to text B or C. But, this paper requires a metric, able to assert whether text A is closer from A' than B from B'. In addition, bills are technical documents, heterogeneous across comparison pairs and homogeneous within comparison pairs. Typos are also frequent in bill proposals, which adds to the complexity of the problem. Given these constrains, the Levenshtein distance appears to be the best metric for the task of comparing the initial and final versions of a bill. In order to make this measure comparable across texts of different lengths, it can be divided by the overall length of the documents and transformed in a relative version which score from 0 to 1. It can be interpreted as the number of required editions per characters compared.

Although the Levenshtein distance would constitute the best metric for the present task, I opted for another strategy for two reasons. First, while computing the editing distance on German and British bills, I experienced stack overflow problems each time the total length of the bill and the proposal was greater than 90 000 characters. For all bills under 90 000 characters, I computed both the PIS and the relative Levenshtein distance and obtained a correlation of 95% as presented in Figure 2. In addition, the prior identification of common strings, make further analysis possible. It will be interesting for example to distinguish between deleted and inserted words and to specifically investigate which kinds of words are modified. Such analysis requires to identify the common words, which is not possible with the Levenshtein distance.

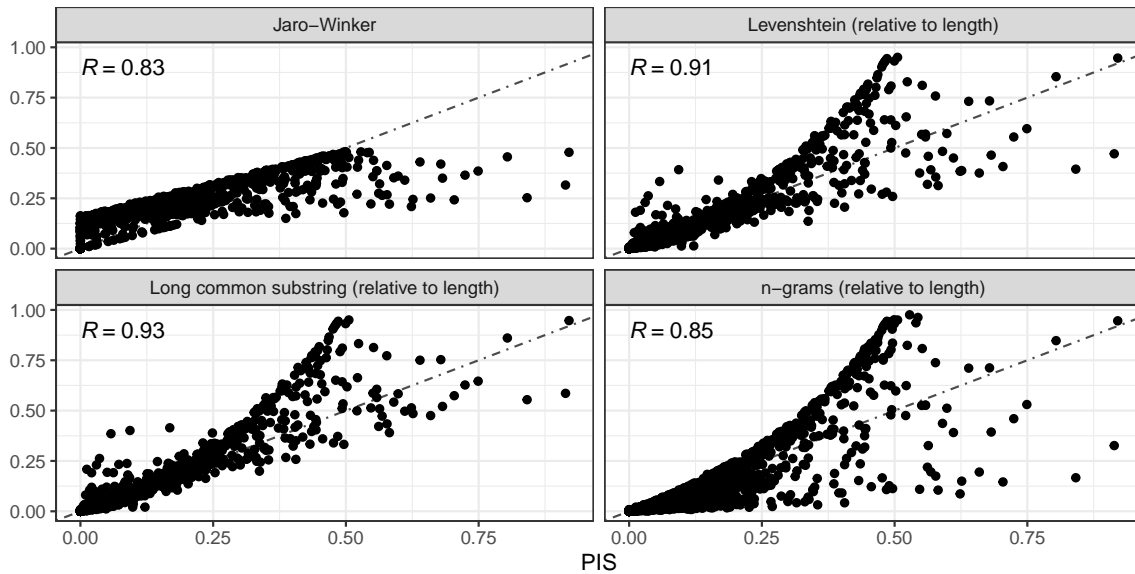


Figure 2: PIS and different text similarity measures

## 4 Empirical results

### 4.1 Data

For the empirical part of this study, I use data from the German Bundestag and British House of Commons. These two legislatures have been chosen for their dissimilarities. Although both countries are parliamentary democracies, the literature describes the role played by the parliament in these two political systems in very different terms. The British parliament, qualified by Martin and Vanberg (2011) as a “notoriously impotent parliament”, is usually seen as a weak parliament. Its election under a majoritarian system produces single-party government, who benefit from strong institutional agenda-setting power. In such a context, the pressure exerted by the party almost prevent any backbencher from rebellion and provide the government a stable majority to pass policies<sup>5</sup>. On the other hand, the German Bundestag is usually approached as a strong parliament. Elected under a proportional system, it usually produces coalition governments. This coalitional framework comes with a set of instruments at the parliament’s disposal, which allows him to efficiently control the government. As put by Paterson and Southern (1991) : an “elaborate committee structure, with most influential parliamentarians of all parties acting as chairmen of the important committees, assures to the Bundestag a degree of autonomous influence in policy-making which is not found in the classical parliamentary system based on the Westminster model”. Given the many ways in which the German and British parliaments differ from each other, they constitute two good cases to test

<sup>5</sup>This description works at least for the pre-Brexit period. As Brexit seems to have deeply transformed British politics, it is yet too early to know whether this description will last once the Brexit case will be over

the present measure. They are certainly not representative for all parliaments, but if the measure was to be validated for these two very different cases, it would strongly suggest that the proposed strategy works for most legislatures. Additionally, if the large amount of literature stating that the House of Commons is weaker than the Bundestag is right, this provides us with a validation criteria for the construct validity. We should accordingly observe on average lower PIS for the House of Commons.

Comparing the two versions of a bill requires to gather and parse the text of both the proposal and the adopted legislation. Exploiting the archives of the two parliaments, I manage to gather, parse and compare 107 British bills (2007-2016) and 1019 German bills (2005-2017). According to the official statistics, this represents respectively 57% and 73% of all bills that have been both initiated by the government and adopted by the parliament. The missing values are caused either by a gathering failure - it sometimes happened that the link between the parliamentary archives and the page hosting the document was broken - or by a parsing failure - some documents were not readable -. Since the measure is computed at a bill level, these missing values should not disturb the analysis. Additionally, they seem to be at random and should therefore not disturb any inference.

## **4.2 Validation framework**

There is nor an ideal measure of parliamentary influence, nor a clear validated proxy that could be used as a benchmark to assess the validity of the PIS. Consequently, I follow the three steps recommended by Adcock and Collier (2001) and present evidence in favour of (1) the content validation, (2) the convergent validation and (3) the construct validation.

### **4.2.1 Content validation**

Content validation focuses on the conceptual aspect and is meant to assess whether the designed indicator captures the “full content of the systematized concept” (Adcock and Collier, 2001:538). “Because content validation involves conceptual reasoning, it is imperative to maintain the distinction [...] between issues of validation and questions concerning the background concept.” (Adcock and Collier, 2001:538) Accordingly, the content validation requires to demonstrate that the PIS captures each aspect of parliamentary influence, as defined earlier in this paper. As parliamentary influence is obviously much more than just modifying text, it is worth repeating here that this paper focuses on the parliamentary influence exerted only during the legislative review process. PIS is not a measure of the whole parliamentary influence and disregards any influence happening outside the legislative process. This being said, validating the content of the PIS necessitates accepting two assertions.

First, PIS only makes sense if parliamentary influence can be measured by the differences

between a policy draft and the adopted policy. In strict terms, this implies both that each aspect of parliamentary influence results empirically in a difference between the draft and the bill and that no policy difference is induced by any other factor but parliamentary influence. The restriction to the influence exerted during the legislative review ensures that influence corresponds exactly to the modifications undergone by a bill. Although an important aspect of the influence on policy-making lies in the bargaining over the agenda, the strict definition of parliamentary influence evacuates this aspect from the measure. Concerning the second part of this assumption and as stated earlier, only two actors can modify policy during the legislative process: the government and the parliament. Accordingly, as long as a government does not modify the bill, differences between a proposal and the bill can be attributed to the mere parliament. Government amendments happen but their nature is questionable. If a government is forced by a parliament to negotiate a compromise, the textual modification - eventually adopted by the parliament - is the fruit of the parliament influence. Consequently, this first assumption becomes only problematic if a government modify a bill and if this modification is not forced by the executive-legislative bargaining. This can only happen if the policy preferred by the government changes during the process - either because of external pressure or because of internal shifts -. Such modifications are rather unlikely to happen. Government usually benefit from large agenda setting powers and can choose the introduction timing for a bill. It is also very common for a government to consult the involved actors when drafting a bill and discuss the bill within the government. In this context and in the absence of external shock, government position is likely to remain constant during the legislative review. Assuming that the policy preferred by the government remains constant during the review, I expect parliamentary influence to strictly corresponds - i.e. is no more and no less - to the differences observed between a proposal and the adopted bill.

The second assertion that need to be made to validate the content of the PIS regards the quantification of the differences between a proposal and a bill, which induces that editing distance is good metric to estimate the difference between two versions of the same policy. Editing distance is probably a poor estimate of the distance between two policies. In the specific case of two versions of the same policy, it probably performs better than other similarity measures, but the obtained value is far from being bias-free. A good example to understand the limit of the editing distance is the case of numbers. If parliament and government bargain over a specific threshold, increasing this threshold would demonstrate a high level of influence, also it does imply to change a lot of characters. This being said, the PIS and this study overall constitute an attempt to identify the best estimator of parliamentary influence, not the perfect one. Even if the PIS suffers from measurement biases, it should remain informative enough. This measurement bias would become more annoying if it was not randomly distributed across bills. Indeed, if for

a specific reason, a certain type of bill would display higher or lower measurement biases, we might wrongly and spuriously associate this type of bill with different levels of parliamentary influence. Luckily, I do not see any factor likely to systematically increase or reduce the measurement bias. Accordingly, this second assumption holds as long as the difference between the PIS and the true - unfortunately unknown - amount of parliamentary influence is randomly distributed.

To summarize, parliamentary influence as defined in this work can be measured by quantifying the differences between a bill proposal and the corresponding bill. Although there is no way to ensure the validity of quantifying strategies, editing distance seems to be the less worst distance, with significant but randomly distributed measurement errors.

#### 4.2.2 Convergent validation

Convergent validation regards the association between a new measure and previously used indicators. The relevance of convergent validation depends on how well validated are the previous indicators. In the case of parliamentary influence, there is no gold measure. As mentioned earlier, Martin and Vanberg (2011) and Pedrazzani et al. (2013) designed a measure very similar to the PIS. However, their measures have been used in an empirical study, without being properly validated. Accordingly, a poor correlation between the PIS and their indicators would not necessarily indicate a bad performance of the PIS.

I first look at the relationship between the PIS and Martin and Vanberg’s proportion of modified changed articles. The results are displayed in Figure 3. In both countries, the two measures correlate positively, but not perfectly. It is interesting to notice that as Martin and Vanberg does not account for the length of the modifications, they systematically overestimate the amount of changed text.

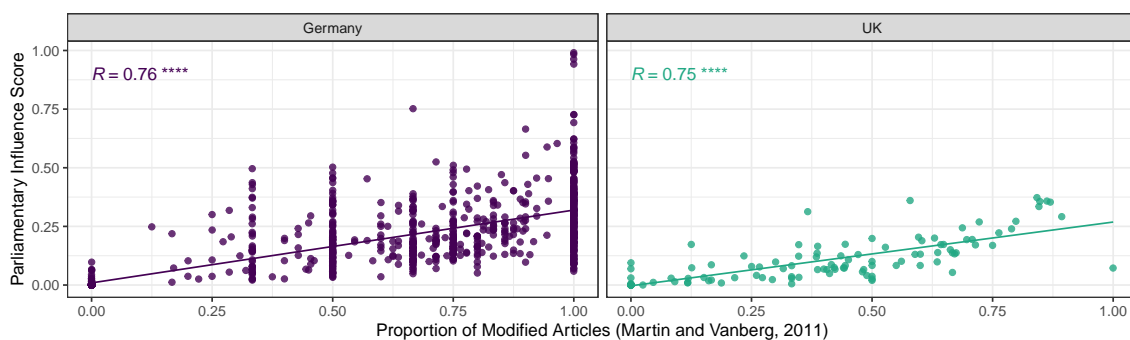


Figure 3: PIS and Proportion of Modified Articles

Then, I turn to the measure deployed by Pedrazzani and Zuchini, where they “computed for each single word appearing in either version the absolute difference between the number of times it occurs in the draft bill and the number of times it occurs in the final



law, and then summed all these absolute differences.” (Pedrazzani and Zuchini, 2013: 699) The result of this comparison is presented in Figure 4. Similarly to the first test, the two indicators correlate positively but are not equivalent. Interestingly, the coefficient is here and distribution more heterogeneous.

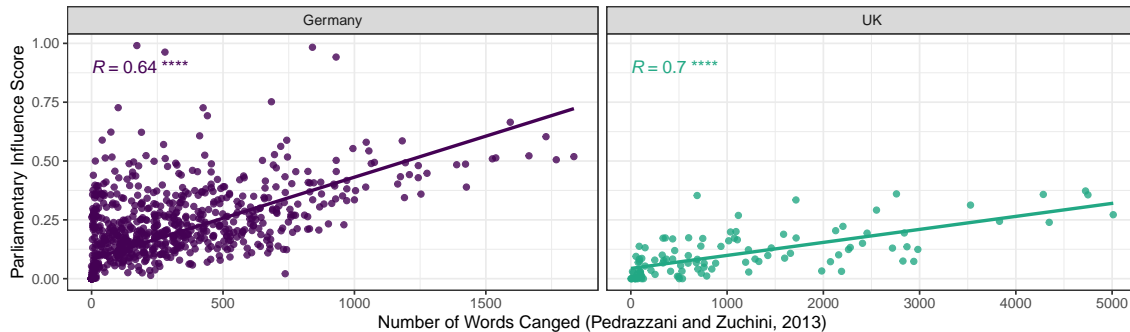


Figure 4: PIS and Number of Changed Words

Although the PIS seems to covary with previously used indicators, the correlation is as high as expected. Since the previously used indicators were not properly validated, the relatively low correlation does not automatically disqualify the PIS. It calls for further tests, to assert which indicator lies closer the true level of parliamentary influence. As explained earlier, term-based measures such as Pedrazzani et al.’s indicator, are not well designed to compare different versions of a bill. Consequently, I put the second measure aside and focus on the comparison between Martin and Vanberg’s indicator and the PIS. To assess which measure performs better, a future version of this paper will include a qualitative analysis of some cases in Germany and the UK, where the indicators display highly different scores.

#### 4.2.3 Construct validation

Finally, the construct validation build on literature knowledge. Thanks to the existing literature, we can expect parliamentary influence to be positively or negatively associated with other observable phenomena. If the measure behave as expected, this would strongly suggest that it captures the right phenomenon. Here again, the validity of the test highly depends on the credit we give to the hypothesis. To establish the construct validity of the PIS, I test four different hypotheses. First, as the German Bundestag is usually described as a stronger parliament than the British one, German bills should on average display higher level of Parliamentary Influence Score. Second, it is usually expected that longer processes imply higher levels of parliamentary influence, since modifying a bill takes time. Therefore, I test in both countries, whether longer processes imply higher PIS. Finally, I expect bills introduced by members of Parliament to be less locked by the government. Accordingly, the differences between the introduced and adopted bills should be bigger,

when it is introduced by members of Parliament. Since this test does not only look at public bills, it does not concern parliamentary influence, but is useful to test whether editing distance is a good metric for policy distance. This test will be passed if public bills display higher PIS than private bills.

Figure 5 compares the PIS in Germany and in the UK. As expected in the literature (André, Depauw, and Martin 2016), the Bundestag appears to have significantly more influence on policy than the House of Commons. The difference matches what Martin and Vanberg (2011) observed for strong and weak parliaments. When testing for the relationship between our measure and the duration of the legislative process, the measure behaves differently in Germany and in the UK. In Germany, the changed proportion of each bill is negatively correlated with the length in the process, while this correlation is positive in the UK (Figure 6). These results support the idea that the length of the legislative process is a bad proxy to catch parliamentary influence. The duration of the legislative process is indeed not only affected by the depth of the legislative scrutiny, but also by the opposition's ability to delay the process. In this second scenario, legislative review becomes longer without an increase of the influence of the parliament. The cross-national variation might be explained by the different institutional powers offered to the opposition in each country (Garritzmann 2017). The German system is, indeed, well known for the tools it provides to the opposition. Finally, when comparing government bills with MPs' bills, we observe that in both countries bills initiated by MPs tend to be more broadly changed (Figure 7). This is also in line with the expectations formulated in the literature.

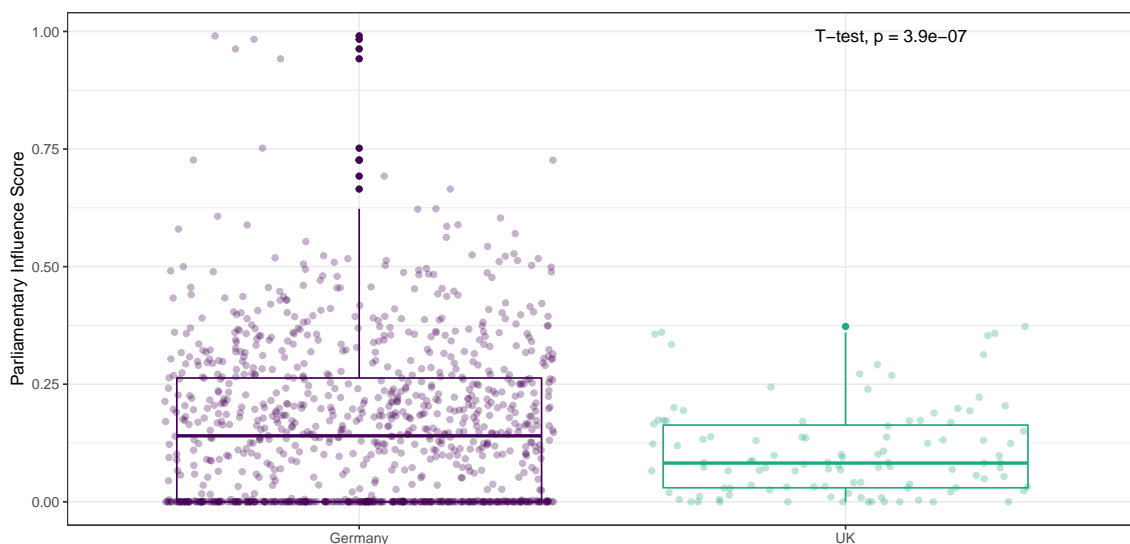


Figure 5: PIS in Germany and UK

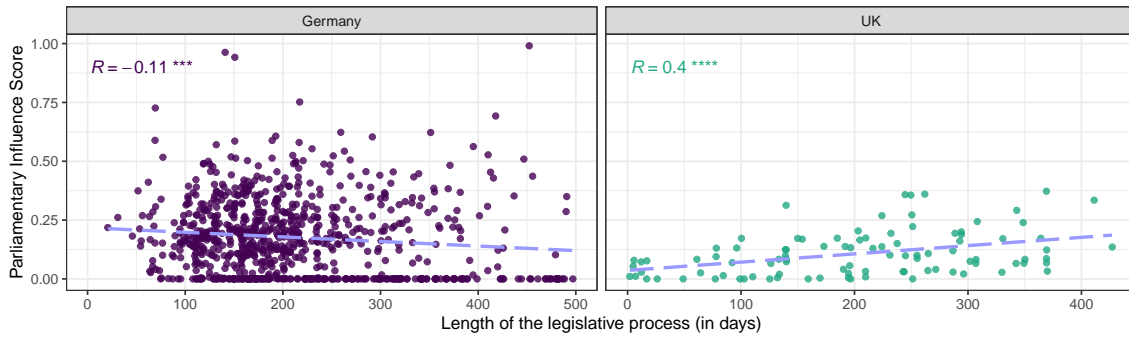


Figure 6: PIS and Duration of Legislative Review

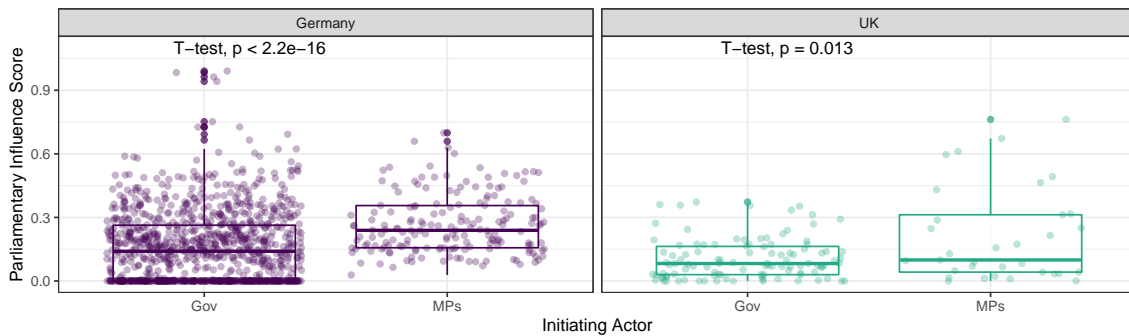


Figure 7: Parliamentary Influence Score and Actor initiating Process

## 5 Conclusion

This paper constitutes an explorative attempt to develop a systematic, comparative and reliable indicator of the parliamentary influence on policy during legislative review. It first discusses the concept of parliamentary influence and its relevance for political science. After reviewing the existing measurements, I highlight their limitation and suggest a strategy to overcome this limitation. The Parliamentary Influence Score captures the amount of deleted and inserted text during legislative review and provides a bill-level score, that is reliable and comparable. Using data from Germany and United Kingdom, I attempt to validate this new measure. The results are encouraging. The measure correlates positively with previously used measures and seems to relate as expected with other factors.

More work is needed to complete the validation of the measure. I plan to investigate individual bills qualitatively to which of the PIS and the proportion of articles perform better. In addition, I want to replicate Martin and Vanberg (2014)'s analysis, to improve the construct validation. In any case, this study is meant to be the first step bringing text analysis to the institutional study of legislatures and lay the foundation for further research. One could for instance think of distinguishing between insertion - constraining the implementation freedom of the executive - and deletions - increasing the implementa-

tion freedom-. One could also weigh the textual changes according to their concentration. For instance, changing three whole articles of a bill suggest more influence than sparse changes of the same total length scattered over the whole bill. Finally, recent innovations allow distinguishing technical from substantial terms (Denny 2019). This would also represent an opportunity to improve the measure. Technical and substance speaks to different political mechanisms that could be ultimately measured using the text of the bills.

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