

*Encoding Interesting Times:
Managing Unpredictability with
Vague Constitutional Language*

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Abstract

If ‘a long constitution is a (positively) bad constitution’ (Tsebelis and Nardi 2016), what specific textual elements cause the most damage? This paper presents evidence from machine reading and analysis of 644,422 words from thirty-three OECD constitutions. Findings suggest that adjectives and adverbs have the greatest effect on the interpretability of constitutional texts. Difficulties in interpretation are to the advantage of elites who can more readily pay for or fight for their preferred interpretations. This reliance on authoritative interpretation of powers, duties and rights leads to rigidity in the constitutional text, which in turn has observable implications for economic performance and corruption.

Keywords: Constitution, Language, Interpretation, Economics, Corruption

INTRODUCTION

‘There is a great difficulty in the way of a writer who attempts to sketch a living Constitution.’ – Walter Bagehot.

If ‘a long constitution is a (positively) bad constitution’ (Tsebelis and Nardi 2016), what specific textual elements cause the most damage? Tsebelis and Nardi concluded that ‘substantive restrictions’ contained in long constitutions are overly rigid and generate demand for amendments when shifting ideological coalitions reject the restrictions. In addition, they demonstrated that longer constitutions are correlated with lower levels of GDP per capita and higher levels of corruption. Their evidence is compelling, but begs the question: is it just the substance of long constitutions that is ‘(positively) bad’ or can the language used have an impact as well? Longer constitutions are a product not only of more detail, but other elements of ‘garrulity’ (Voigt 2009; Bjørnskov and Voigt 2014; Tsebelis and Nardi 2016, 459). Most notable of which, I will argue, are the use of noun-qualifying adjectives and adverbs. This essay will demonstrate (1) that these indeterminate parts of speech are increasingly used in constitutional language, (2) they are more difficult to interpret, and (3) they therefore give greater influence to elites with the resources to impose their preferred interpretations. As such, besides substantive restrictions, it is important to consider the danger posed by under-substantiated restrictions. These enable determination of meaning by a narrow elite, and create ideological rigidity with the potential for intense opposition. The findings suggest that social contracts dependent on extensive post-promulgation interpretation contribute to the deleterious effects associated with wordy constitutions in both economic performance and corruption.

This paper therefore brings together the works of Tsebelis and Nardi (2016) on the dangers of constitution length with the analysis of the ‘Comparative Constitutions

Project' on constitutional interpretability (Melton et al 2013). Furthermore, I have expanded and updated the research design of Tsebelis and Nardi, and drilled down into the specific grammatical elements that have had the greatest effects on governance. By utilising computer-assisted natural language processing (NLP) technology, it has been possible to analyse the parts of speech used in 644,422 words from thirty-three OECD constitutions. The aim is to observe textual differences in constitutions and model the effects these differences have.

Such research is especially pertinent to 'interesting times'. Times are interesting when unpredictable and surprising. Unforeseen events, ideological realignments, and globalised decision-making all work against predictability in policy-making (Lindblom 1959). The response, especially in the democratic world, has been to future-proof constitutions. Clear exposition of principles is increasingly rejected in favour of loose constitutional language that can enable discretion and adaptability. Henry Maine described a shift in the nineteenth century from status to contract. What indeterminate parts of speech achieve is the capacity for those with status to reinterpret the social contract. It is not a contract that is of equal benefit to citizen and state, but is significantly to the advantage of the latter. Prominent examples include the 'elastic clause' (Art 1(8)) of the US Constitution that allows Congress to pursue federal policies to the extent they believe is 'necessary and proper'. Just two adjectives and a conjunction have enabled a variety of ideological interpretations, and encouraged fierce legal and extra-legal battles. The key nuance to Tsebelis and Nardi is therefore that language is important, as well as word length. Even a relatively short text (such as the US Constitution's taciturn 7,762 words) can create vast quantities of verbiage in contextual, sub-textual and inter-textual elaborations. In other words, scholars would need to read vastly more than the constitution itself to be able to interpret it, and this is especially the case with *prima facie* indeterminate parts of speech, such as adjectives. Much is made of the importance of institutional and contextual variables in the study of constitutions, but more attention is needed on the textual variables. Language is the medium through which institutions share, pool and exert their authority. This medium is an important explanatory variable in many of the pertinent policy debates of our age (Schmidt 2008; Hönnige 2011; Williams 2017).

As with Tsebelis and Nardi, my case selection draws on OECD countries. These are culturally and historically diverse, but with shared commitments to democracy and open trade. These differences and commonalities allow for comparisons to be made and inferences to be drawn as to the effects of different styles of constitutional language. As with Tsebelis and Nardi, Israel and the United Kingdom have been omitted from the analysis as neither has a codified constitution. Included in this paper but missing from Tsebelis and Nardi is Chile. This sole South American member of the club joined the OECD in 2010, and thereby fell outside the 2000-2006 timeframe for independent variables in the earlier work. This paper presents several

binary regressions as well as recreating multivariate regressions run by Tsebelis and Nardi. The binary regressions display strong correlations between the proportion of adjectives and adverbs in a constitution and its interpretability, as well as the country's macroeconomic performance and corruption. Findings suggest that adjectives and adverbs provide greater explanatory power than constitutional length, although the multivariate analysis offers only a tentative basis for conclusion. The findings nonetheless suggest that machine reading of textual elements offers important insights for constitutional engineering.

The paper begins with an elaboration of the theory and hypotheses. This is followed by analysis of the data and research design. After which, the results are presented and analysed. The final section concludes.

THEORY AND HYPOTHESES

Examples are needed to describe the argument. Already mentioned are the three famous words – ‘necessary and proper’ – that have elasticated the First Article of the US Constitution. There have been various eras of ‘federalism’ (the contraction and expansion of federal government power) that have been enabled by these three words. Small state policies of the early twentieth century (the ‘Lochner’ era) gave way to rapid ‘New Deal’ expansion after the Supreme Court case of *West Coast Hotel Co. v. Parrish* in 1937. Great Society social reforms of the 1960s then created a period of ‘regulated federalism’, before a long period of ‘new federalism’ was inaugurated by the Nixon administration, with significant federal retrenchment (Kettl 1980). The point is that assessing constitutional language on the basis of how many words there are can overlook the effect of different words. Some parts of speech may be *prima facie* indeterminate and find their meaning when the text is interpreted. Just three words in the US constitution were able to sustain fundamentally different policy goals.

Another short constitution muddied by vague language is Iceland's. The island nation sustains its government on just 4,089 constitutional words, but its freedom of expression provision is both wordy and reliant on indeterminate language:

‘Freedom of expression may only be restricted by law in the interests of public order or the security of the State, for the protection of health or morals, or for the protection of the rights or reputation of others, if such restrictions are deemed necessary and in agreement with democratic traditions.’ (Art 73).

Three linguistic features are especially likely to undermine plainness: adjectives and adverbs, conditional conjunctions and indeterminate modal verbs. Adjectives in the provision above allow those restricting freedom of expression to determine the

meanings of ‘necessary’ and ‘democratic’. Conditional conjunctions (in particular ‘if’/‘and’/‘or’) ensure that any determination of the law depends on circumstance, so as to protect ‘health *or* morals, *or* for the protection of the rights *or* reputations of others, *if* such restrictions are deemed necessary *and* in agreement with democratic traditions.’ Finally, the modal verb ‘may’ offers a looser grip than alternatives such as ‘will’ or ‘shall’ would provide; as in ‘Freedom of expression may only be restricted...’

The language of Iceland’s freedom of expression provisions compares starkly to that of Poland’s:

‘The freedom to express opinions, to acquire and to disseminate information shall be ensured to everyone.’ (Art 54).

Poland’s constitution is, at 19,602 words, nearly five times longer than Iceland’s. But its protection of free speech is far less elastic and liable to elite dominance. It had been the ambition of Iceland to become a haven of free speech (Vallance 2010), but the European Court of Human Rights became a notable critic of the country’s record in this regard (Arnarsdóttir 2015).

It is my contention that constitutions increasingly rely on language that can sustain order amidst chaos. This is achieved with a form of language, similar to the adaptive cybernetics used in modern computing. In that the language used expands the range of interpretations available for a text. All legal provisions need interpreting and can be dominated by powerful agents. But plainness of exposition enables citizen interpreters, where indeterminacy can allow the powerful to trade in constitutional language and raise the costs of its interpretation. It also allows ideological interpretations to become crystallised. For example, an ideological coalition defined ‘necessary and proper’ to mean limited government for one generation, then with much difficulty a new coalition came and redefined the words to sanction expanded government. This battling over definition and redefinition of words creates instabilities similar to those formed by substantive restrictions that are regularly amended. The specific addition to Tsebelis and Nardi’s argument is the point that both substantive and indeterminate restrictions create legal rigidity. The former through substantive limitation on action and the latter through elite interpretation and the crystallisation of vested interests. The most effective constitutional language is that which provides for a limited range of substantive restrictions and does so with plain, and easily comprehensible speech. Any reader who has had a contract to sign – such as with a landlord or a telecoms company – will likely have realised that both the length of the contract and its use of vague language both signalled an asymmetry of power.

Difficulties in interpreting the constitutional text is the key force in the causal mechanism therefore. From these difficulties arise subsidiary effects on society and the economy. Of course, the difficulties in interpretation were themselves caused by various social and political forces that affected the drafting and ratification processes. Constitutional language derives from the choices made by actors to cement or augment their status (Elster 1995). Besides status, constitution drafters will seek to address current circumstances and redress past failings of the state. Furthermore, this drafting takes place within a context of increasingly demanding international norms with regard to constitutional content (Levitsky and Way 2006). Given all these forces acting on the text, it is tempting to dismiss the nuts and bolts of constitutional language as ephemera and more a matter for technical jurisprudence. But even constitutions framed within similar contexts have wide variances in their language. The lustration of formerly fascist regimes led to extraordinary variances in constitutional linguistics. This is despite the contents being cut from a similar liberal democratic cloth. Austria's 41,366-word constitution is nearly four times the length of Italy's 11,708-word constitution. But the latter contains more adjectives and adverbs (10% of all words) than the former (9%). Italy's constitution also utilizes more conditional conjunctions (5%, to Austria's 3%) and more indeterminate modal verbs (0.88%, to Austria's 0.31%). The interpretability of these texts is likely to be very different.

Interpretability of a constitutional text is, as Melton et al (2013) demonstrated, a latent variable. In that it cannot be observed directly. The textual and contextual elements of interpretability are too many and varied. What can be measured are the inter-coder reliability scores of academics and students who have read the constitutions and offered their interpretations. Melton et al (2013) have such reliability scores for all the world's major constitutions and these data are used here to test whether specific parts of speech are correlated with greater or lesser reliability scores. The specific theory presented here is that adjectives and adverbs (as compared to conditional conjunctions and indeterminate modal verbs) have the greatest impact on reliability scores and have the greatest policy effects. The reasoning focusses on sentence structure and the means of interpretation. Adjectives and adverbs primarily influence the subject of a sentence. They qualify the interpretation of nouns and determine how the subject of a sentence clause – be it the government, the legislature or the citizen – will interpret the powers, duties and rights enumerated. Even when the adjectives or adverbs qualify the object of a sentence, they place the onus on the subject to offer a viable interpretation. These parts of speech also tend towards rigidity. Once interpreted authoritatively, their meaning can be difficult to reinterpret. What, for instance, a '*free* citizen' is has been subject to waves of reinterpretation by different generations, across various contexts and by different constellations of elites. But once given a central tendency of meaning, qualifications like 'free' require a 'critical juncture' before a fundamentally different interpretation will be accepted (Collier and Collier 2002). Hence, as with

excessively long constitutions replete with substantive restrictions, under-substantiated restrictions also create rigidity.

Conditional conjunctions, alternatively, focus on the object of sentences. And, of course, the modality of 'may' focusses on the verb of a sentence. These parts of speech can also be indeterminate and capable of authoritative interpretation. But, they rely far more on contextual variables that may be beyond the control of the subject of a sentence. These parts of speech are, therefore, less prone to ideological rigidity when compared to adjectives and adverbs. Where conjunctions and modal verbs interact with context, adjective and adverbs additionally rely on subtext and inter-textual interpretations. On this point, one of the potential limitations of Tsebelis and Nardi's focus on word count is that the constitutional text is the tip of an iceberg. Any scholar wishing to understand the US constitution cannot stop after reading its 7,762 words. It would also be necessary to understand the subtext and read multiple inter-textual references. It is adjectives and adverbs that, in particular, propagate these extra-textual debates.

But, in agreement with Tsebelis and Nardi, I contend that rigidity in the constitutional text is damaging to economic growth and supports corruption. Rigidity favours those with no incentives to change the status quo. They will be better placed to make change more difficult for agitators if i) there are many substantive restrictions, or ii) there are under-substantiated restrictions that have been subject to authoritative interpretation. A middle way between these extremes creates the most effective constitution, because unrestrictive and plain language empowers citizens rather than state elites.

There are four linked hypotheses derived from this theory. The first is historical:

H1: Modern constitutions contain more adjectives and adverbs than older constitutions.

Newer constitutions are written to address more complex political contexts with more varied demands for social policies than would have been true in the nineteenth or early twentieth centuries. The so-called 'new constitutionalism' caters for extensive and complex powers and liberties across a range of policy spaces (Hirschl 2004; Hirschl 2006). It is increasingly difficult to distil these various policy demands into plain contractual language.

H2: Constitutions with a higher proportion of adjectives and adverbs are less interpretable (have lower inter-coder reliability scores).

Of all the linguistic elements, adjectives and adverbs are expected to create the greatest indeterminacy as to meaning. This can be presented formally by adapting the equations used by Melton et al (2013, 12). Firstly:

$$I_{jk} = \alpha_0 + \alpha_t T_{jk} + \alpha_c C_k + v_k + u_{jk} \quad (1)$$

Where ‘ I ’ denotes interpretability of constitutions (j) in different countries (k). ‘ T ’ denotes the textual attributes of the constitution, and ‘ C ’ captures the characteristics of each country. To flesh out the textual attributes, I have added three parts of speech which are particularly impactful on the interpretability of texts (IT):

$$IT_{jk} = \alpha + \beta_1 ADJ_{jk} + \beta_2 CON_{jk} + \beta_3 MOD_{jk} + e_{jk} \quad (2)$$

Adjectives and adverbs (ADJ), conditional conjunctions (CON) and indeterminate modal verbs (MOD) are expected to affect interpretability. But, in particular, adjectives and adverbs are expected to offer a statistically significant linear correlation with interpretability. This, in turn, requires the next two steps in Melton et al’s formal analysis:

$$R_{ij} = \beta_0 + \beta_p P_{ij} + \beta_n I_j + u_j + r_{ij} \quad (3)$$

‘ R ’ denotes the reliability scores of different coders. This score is a linear function of the coding process (P) and the interpretability of the text (I), across ‘ i ’ iterated measurements of ‘ j ’ constitutions, with ‘ u ’ and ‘ r ’ as residuals for the constitution and the coding respectively. Melton et al then substitute the ‘ I ’ in equation 3, with the formula in equation 1:

$$R_{ijk} = \gamma + \beta_p P_{ijk} + \gamma_t T_{jk} + \gamma_c C_k + e_{ijk} \quad (4)$$

This in turn allows me to substitute the ‘ T ’ in equation 4 with a coefficient capturing the most impactful textual attribute – noun-qualifying adjectives and adverbs:

$$R_{ijk} = \gamma + \beta_p P_{ijk} + \gamma_{adj} ADJ_{jk} + \gamma_c C_k + e_{ijk} \quad (5)$$

As argued, lesser interpretability (and hence lower reliability scores) are of benefit to a narrower section of elites. This in turn closes down the utility of a constitutional text and can create rigidities and divisions that inhibit economic performance. Hence,

beyond the institutions responsible for economic performance, are the effects of inter-institutional language (Persson and Tabellini 2003; Blume et al 2009):

H3: Constitutions with a high proportion of adjectives and adverbs are more rigid (have a lower predicted probability of amendment).

H4: Constitutions with a high proportion of adjectives and adverbs are associated with lower levels of GDP per capita.

Also, the elite's capacity to authorise constitutional meaning suggests that indeterminate constitutional language will also facilitate corruption:

H5: Constitutions with a high proportion of adjectives and adverbs are associated with higher levels of corruption.

Of course, there is a possibility of reverse causation here. More corrupt political cultures may draft a constitutional text with a greater number of restrictions couched in more indeterminate language. Furthermore, indeterminate constitutional language may be fully endogenous to corrupt political culture, where corruption is both cause and symptom of indeterminacy in social discourse. A 'logic of communication' between institutions depends on a shared set of cultural and linguistic norms that will more likely be absent from a country with a weak or non-existent public sphere (Schmidt 2008). Despite these difficulties in establishing causation, I argue that textual variables sustain some important independent effects on economic and political outcomes.

RESEARCH DESIGN

Data from thirty-three OECD countries (all bar Israel and the UK) has been collected from the Comparative Constitutions Project and the World Bank. The case selection looks to countries with similar commitments to the rule of law and the independence of the judiciary. Commitments to constitutionalism are essential if textual variables are to count at all in political and economic outcomes. In addition, all 644,422 'tokens' (all parts of speech including punctuation) were analysed using the Natural Language Toolkit (NLTK). This is natural language processing (NLP) software compatible with the Python programming language. The NLTK is able to 'tokenise' large amounts of text and pick out key parts of speech, including all adjectives and adverbs, all conjunctions and all modal verbs. There are limitations to this method of linguistic analysis. Notably, the program occasionally miscategorises words. For instance, some homonyms can be categorised as nouns, adjectives or verbs – such as 'the free', 'free of charge' and 'to free'. The program is nonetheless sufficiently sophisticated that mistakes are rare. It is also more efficient and capable

of broader analysis than qualitative approaches, and does not depend on inter-coder reliability tests.

The inter-coder reliability scores from Melton et al were also collected for each of the thirty-three countries, in order to test H2. And, for H3 and H4, the key correlations run by Tsebelis and Nardi (2016, 476) were repeated with updated data. To update, I included Chile and the latest version of the Swedish constitution, which was significantly amended in 2009 and 2012. For New Zealand, I used the truncated version on the University of Richmond's 'Constitution Finder' website. This is because the Comparative Constitutions Project has an extremely long version of New Zealand's constitution that includes addenda and treaties. I also used the latest available economic data from the World Bank. Data on GDP per capita was averaged from 2007-2015. Tsebelis and Nardi noted that their data cuts off before the financial crisis, so as to avoid unrepresentative figures. My data covers the financial crisis and much of its aftermath. These data may not be representative of longer-term trends, but have sufficient scope to give a good indication of each economy's relative performance.

All variables and their operationalisations are summarised in Table 1:

ENCODING INTERESTING TIMES

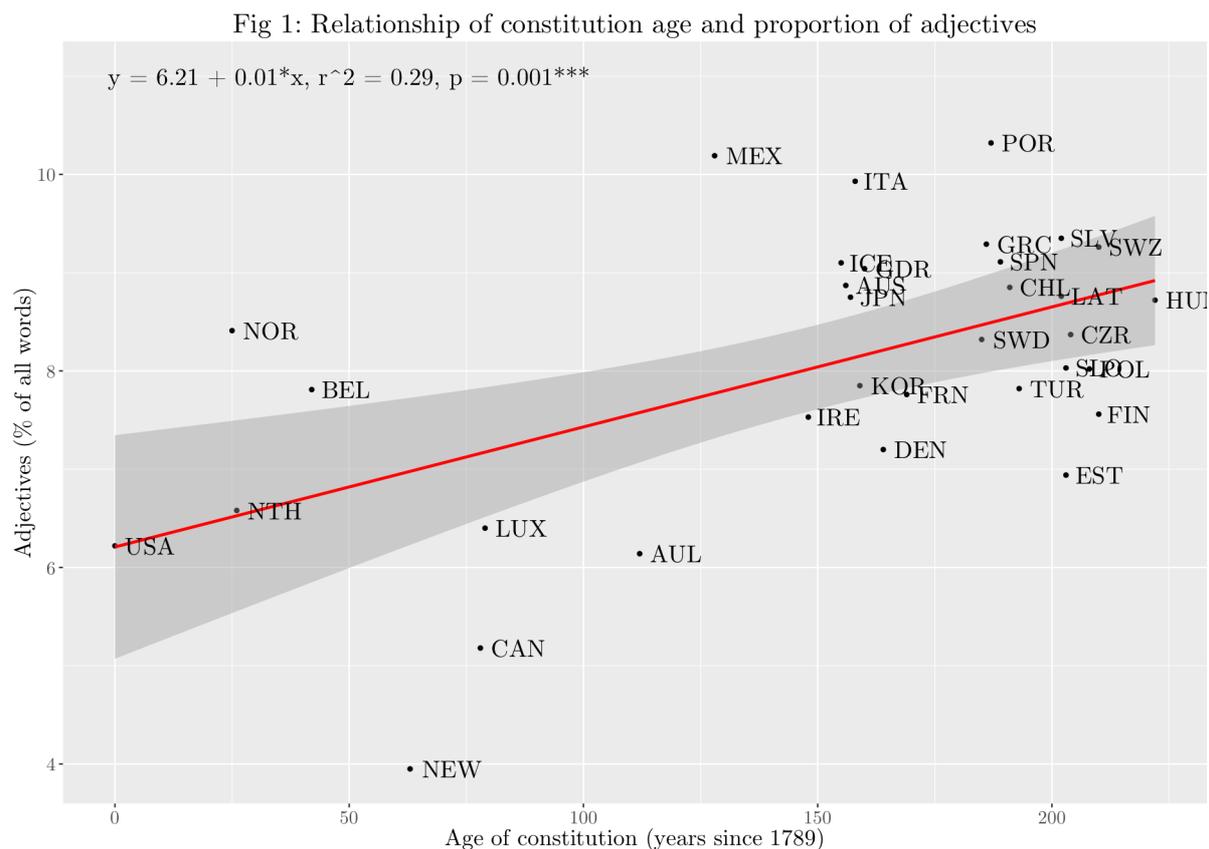
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Table 1: Descriptive statistics

<i>Frame</i>	<i>Description</i>	<i>Min</i>	<i>Mean</i>	<i>Media</i>		<i>SD</i>
				<i>n</i>	<i>Max</i>	
Constitutional	Constitutional interpretability (inter-coder reliability score from Melton et al) [REL]	65.49	77.13	77.45	92.13	6.70
	Predicted probability that a const amendment will <i>not</i> occur (from Tsebelis and Nardi) [RIGID]	0.001	0.54	0.54	0.999	0.36
	Constitution age (years since 1789) [YEAR]	0	150.73	164	222	61.40
	Constitution length (in log words) [LOGLEN]	8.16	9.62	9.63	11.05	0.73
	Constitutional devolution to sub-national government [LEVELS]	0	0.88	1	1	0.33
	Constitutions with common law origin [LAWCOM]	0	0.15	0	1	0.36
Textual	Adjectives and adverbs as % of all constitutional words [ADJ]	3.95	8.05	8.32	10.32	1.39
	Conditional conjunctions incl “if”/“or”/“and”, excl “not”, as % of all words [CON]	2.89	4.42	4.45	5.77	0.67
	Indeterminate modal verbs (“may”/“might”) as % of all words [MOD]	0.31	0.72	0.72	1.65	0.27
	Sum of all indeterminate parts of speech as % of all words [ADD]	8.82	13.19	13.29	16.02	1.53
Economic	Log of GDP per capita PPP, averaged 2007-2015 (World Bank) [LOGGDP]	9.67	10.45	10.50	11.41	0.37
	% of labour force with a secondary education, 2015 (World Bank) [EDUSEC]	20.30	46.91	45.10	72.90	12.41
	Total natural resources rent as % of GDP, 2015 (World Bank) [NATRES]	0.00	1.04	0.29	12.20	2.31
	Trade as % of GDP, 2015 (World Bank) [TRADE]	28.00	106.67	85.99	391.50	68.41
	FDI as % of GDP, (World Bank) [FDI]	-3.63	4.10	2.08	33.86	6.69
	Gross savings as % of GDP, 2015 or latest available (World Bank) [SAVE]	9.97	26.37	24.88	53.95	8.95
Political	Transparency Intl Corruption Perceptions Index inverted, 2015-16 [CORRINV]	10	31.61	28	70	15.79

RESULTS

First to be considered is H1: whether constitutions are increasingly reliant on adjectives and adverbs. Fig 1 presents the linear relationship between the age of a constitution (measured as the years since 1789) and the proportion of all constitutional words that are adjectives and adverbs.

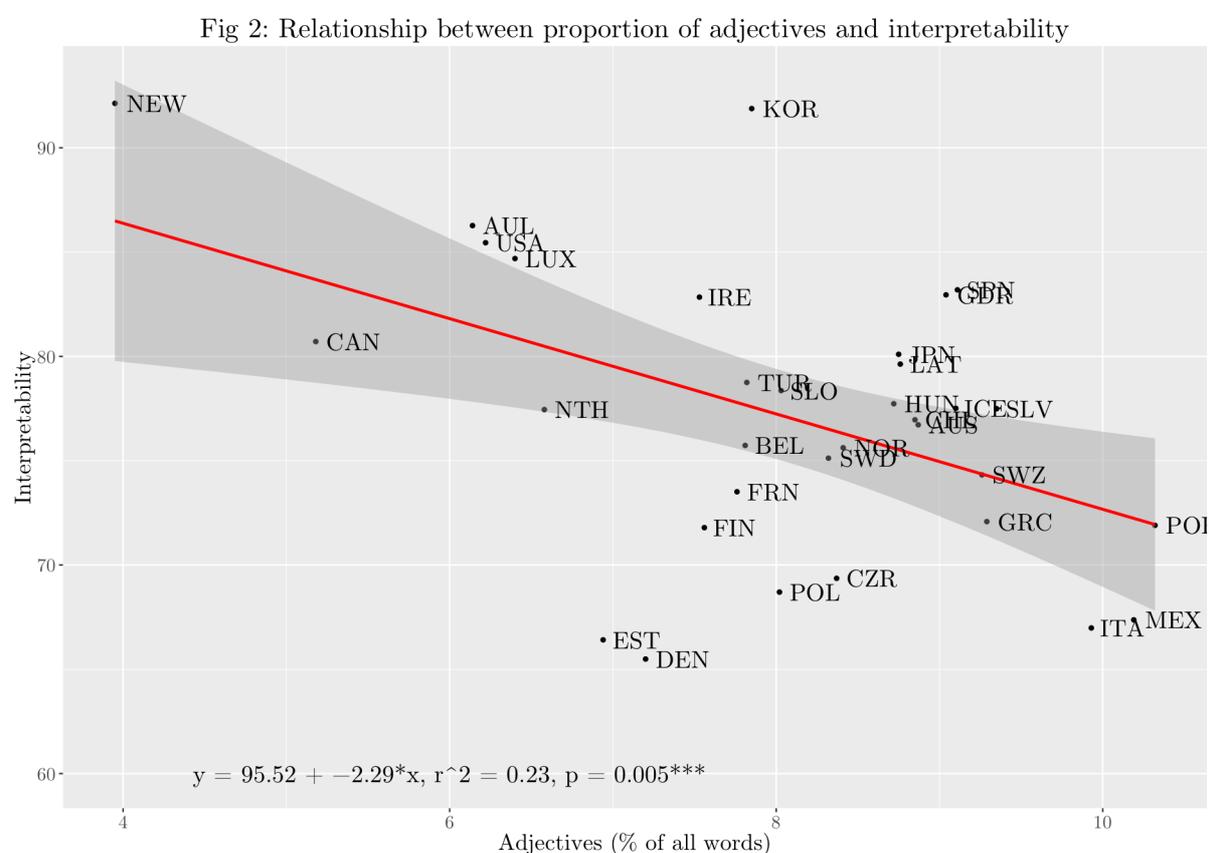


This graph presents good evidence to reject the null hypothesis, that there has been no increased use of adjectives and adverbs in constitutional language. Portugal's constitution outlies the general trend, but shows both youthfulness (it was promulgated in 1976) and an unusual reliance on adjectives and adverbs (10.32% of all words). As argued, this trend suggests a shift in constitutionalism with time. The very genre of constitutional language has changed, from plain contractual exposition, to more qualified language.

Interestingly, there is no significant correlation between the age of constitutions and the use of conditional conjunctions or indeterminate modal verbs. Increased use of conjunctions would suggest desires to manage processes, to conjoin principles, and to

reconcile the constitutional text with its context (if x and/or y occurs, then do z). Increased use of the indeterminate modal verb ‘may’ would signal an increased reliance on deliberate delegation (the government *may* authorise). That neither conjunctions nor the use of ‘may’ have increased significantly suggests that modern constitutionalism adopts a subtler approach to granting discretion. Adjectives and adverbs allow the meaning of key concepts to be authorised by powerful actors, without relying on specified conditions, nor the deliberate delegation of discretion.

There is also a strong correlation between the proportion of adjectives and adverbs used, and the interpretability of the constitutional language (measured with inter-coder reliability scores), as Fig 2 shows:



The graph displays a statistically significant relationship and evidence to reject the null in favour of H2. Table 2 shows that in comparison with other explanatory variables, the presence of adjectives and adverbs (ADJ) yields the largest coefficient and strong statistical significance. All variables were normalised to between 0-1 to make for comparable coefficients:

Table 2: Interpretability regressed on proportion of adjectives and other textual variables (binary regressions)

<i>Frame</i>	<i>Variable</i>	<i>Coefficient</i>	<i>Constant</i>	<i>Multiple R²</i>
Constitution	YEAR	-0.34** (0.15)	0.67*** (0.11)	0.14
	LOGLEN	-0.32* (0.17)	0.6*** (0.1)	0.1
	LEVELS	-0.2 (0.13)	0.61*** (0.13)	0.07
	LAWCOM	0.37*** (0.11)	0.38*** (0.04)	0.28
Text	ADJ	-0.55*** (0.18)	0.79*** (0.12)	0.23
	CON	0.23 (0.19)	0.31*** (0.11)	0.05
	MOD	0.13 (0.22)	0.4*** (0.08)	0.01
	ADD	-0.38* (0.2)	0.67*** (0.13)	0.1

N=33. Standard errors in parentheses.

***p<0.01,**p<0.05,*p<0.1.

Only constitutions derived from the Common Law tradition (LAWCOM) present a stronger R² than ADJ. Just five nations in the sample have Common Law origins (AUL, CAN, IRE, NEW, USA), and one could expect the coders, being based in North America, were somewhat more familiar with Common Law constitutions. Although Melton et al address this point (2013, 401):

‘One would think that the coders, who were primarily graduate students working in North America in the early twenty-first century, would have great

difficulty understanding constitutions from different contexts, and that we would observe a bias towards modern constitutions produced in countries with cultural and political traditions similar to those of the United States. While we do find that constitutions vary significantly in their level of interpretability, contextual barriers do *not* seem to challenge readers. Constitutions written in bygone eras, in different languages, or in extremely different cultural milieux are no less interpretable by readers than are those written in closer temporal and cultural proximity.’ [Emphasis in original]

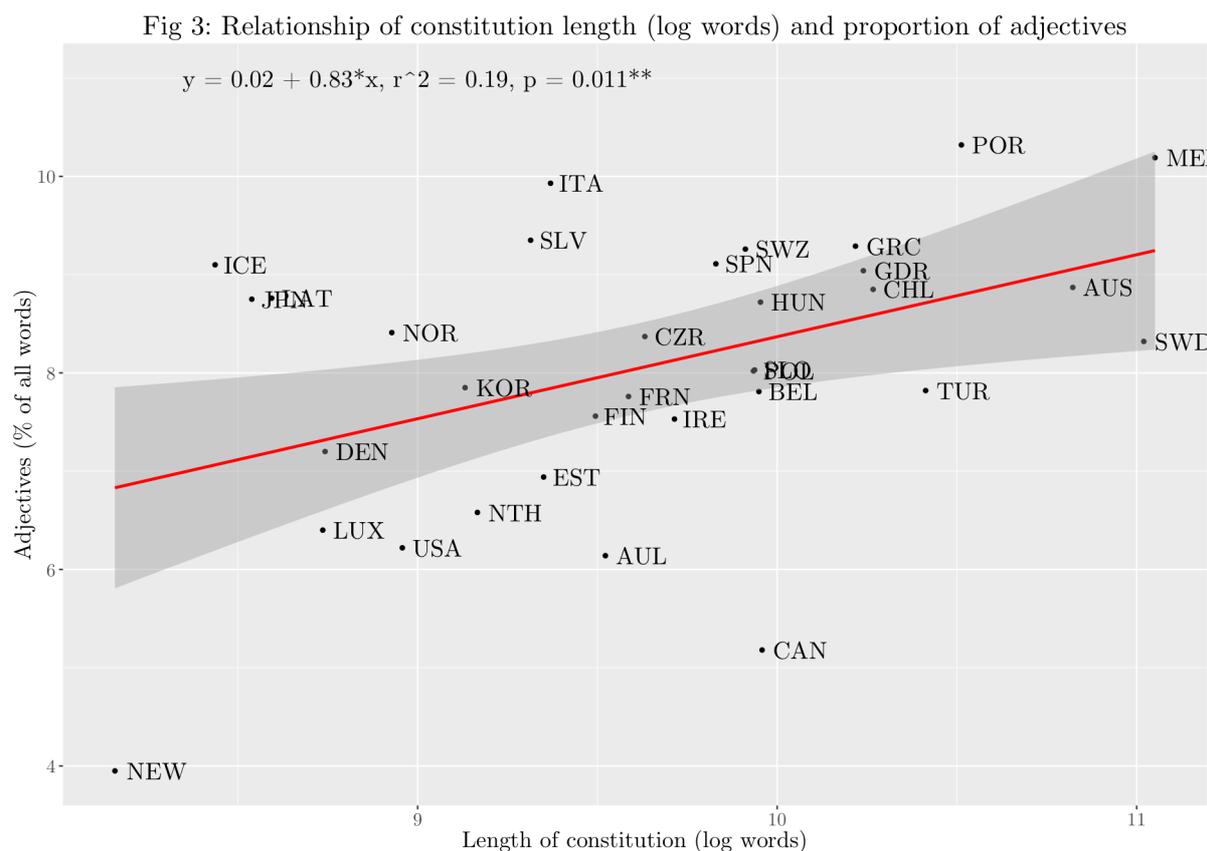
Table 3 presents multivariate regression models:

Table 3: Interpretability regressed on proportion of adjectives and other constitutional variables (multivariate regressions)

<i>Variable</i>	(1)	(2)	(3)	(4)	(5)
ADJ	-0.55*** (0.18)	-0.48** (0.2)	-0.5** (0.21)	-0.42* (0.24)	-0.13 (0.28)
LOGLEN		-0.13 (0.18)	-0.04 (0.21)	-0.03 (0.21)	-0.09 (0.21)
LEVELS			-0.14 (0.15)	-0.12 (0.15)	-0.11 (0.14)
YEAR				-0.12 (0.18)	-0.06 (0.17)
LAWCOM					0.27 (0.15)
CONSTANT	0.79*** (0.12)	0.81*** (0.13)	0.89*** (0.16)	0.91*** (0.16)	0.66** (0.21)
Multiple R ²	0.23	0.24	0.26	0.28	0.35
Adjusted R ²	0.2	0.19	0.19	0.17	0.23

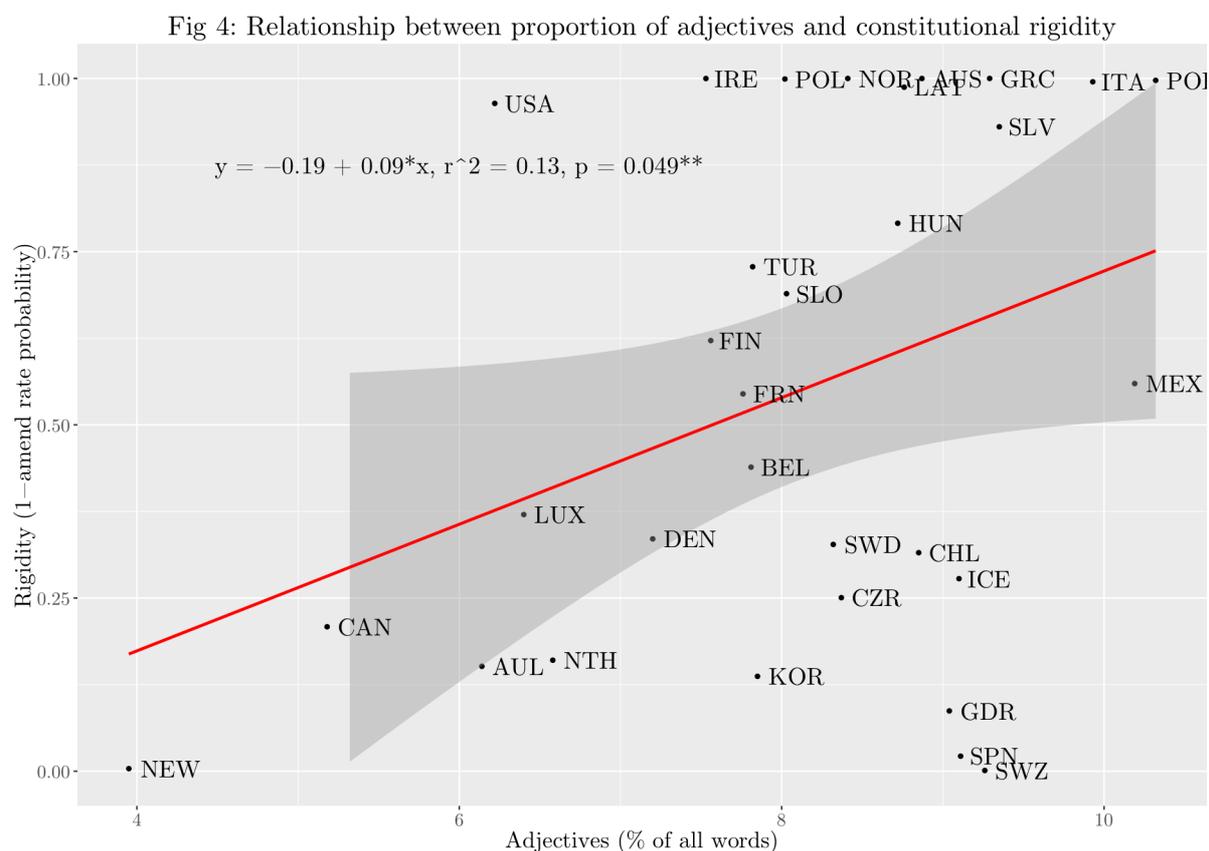
N=33. Standard errors in parentheses. ***p<0.01,**p<0.05,*p<0.1. Variance inflation factors for (5): ADJ (1.57); LOGLEN (1.33); LEVELS (1.21); YEAR (1.23); LAWCOM (1.42).

These models show that the statistical significance of ADJ is retained, even when controlling for a constitution's word length (LOGLEN), and the federalisation of the constitution (LEVELS). Statistical significance slips to an unsatisfactory single star ($p < 0.1$) when the age of the constitution is added (Model 4) and loses all significance when LAWCOM is added (Model 5). Given several of the independent variables correlate with each other, there is a risk to multicollinearity and a suppression effect. Also, as Figs 1 and 2 suggest, there is autocorrelation on the dependent variable, in that constitutions have become somewhat less interpretable with time. Although, the variance inflation factors for all variables in model 5 do not exceed the threshold of 2 that would signal strong multicollinearity. Nonetheless, models 4 and 5 present challenges to the assumptions of OLS modelling to be uninformative. The key finding therefore, is model 2, that even when controlling for differences in word length, ADJ has a strong and statistically significant impact. This adds nuance to Tsebelis and Nard's argument that word length is 'positively bad', by considering the differential effect of specific parts of speech. Further, Fig 3 demonstrates that whilst there is a correlation between word length and the proportion of adjectives and adverbs used, there are several outliers:



Some countries deviate significantly from the trend displayed. Notably, Iceland has one of the shortest constitutions in the OECD (4,613 words), but it relies on a high

proportion of adjectives and adverbs (9.1%). Conversely, Canada's 19,565-word constitution is one of the longest in the OECD, but only 5.2% of those words are adjectives or adverbs. Of course, this means there are significantly more adjectives in Canada's constitution as compared to Iceland's (1,095 and 420 respectively). But, the proportion is important. A smaller proportion of adjectives and adverbs suggests that for all indeterminate parts of speech there are many plain parts of speech that may clarify away the indeterminacies. Whilst longer constitutions have been shown by Tsebelis and Nardi to be correlated with suboptimal policy outcomes, it is worth noting that even short constitutions can create ideological rigidity if there is a high proportion of adjectives and adverbs. Indeed, Canada's constitution is marginally less rigid (having a lower predicted probability of remaining unchanged at 0.21) than Iceland's much shorter text (0.28). This pattern is borne out for all the OECD countries in Fig 4:



Tsebelis and Nardi found that the number of amendments to a constitution was positively correlated with rigidity, when word length was controlled for (2016, 464). Fig 4 demonstrates that rigidity is also positively correlated with the proportion of adjectives and adverbs in a constitutional text, albeit with large residuals. This is

evidence to reject the null in favour of H3. Further, higher proportions of adjectives and adverbs correlates positively with greater constitutional scope, as well as with more executive and legislative powers (all measures taken from the Comparative Constitutions Project). But, high proportions of adjectives and adverbs in a text is negatively correlated with levels of judicial independence (also taken from the Comparative Constitutions Project). This therefore suggests, as theorised, that adjectives and adverbs in a constitutional text presage high levels of state authority, to the potential detriment of civil society. The effects of this asymmetry between state and society can be seen in economic performance. The following graphs demonstrate that adjectives and adverbs have stronger predictive power (Fig 6) than does word length (Fig 5). In addition to which, Figs 7 and 8 demonstrate that adjectives and adverbs are better predictors of corruption than is word length. Corruption is here measured, as per Tsebelis and Nardi, as the inverse of Transparency International's Corruption Perceptions Index, where high scores mean high perceptions of corruption:

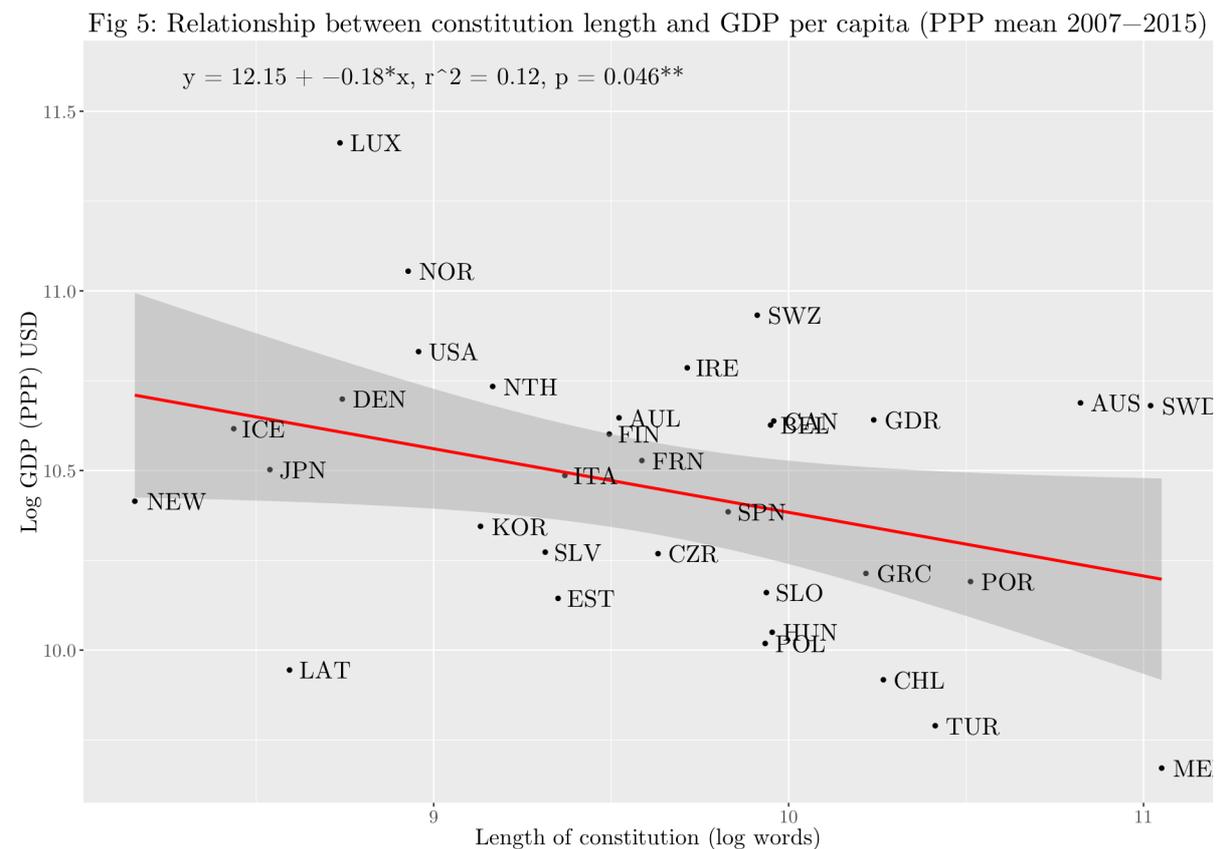


Fig 6: Relationship between prop of adjectives and GDP per capita (PPP mean 2007–2015)

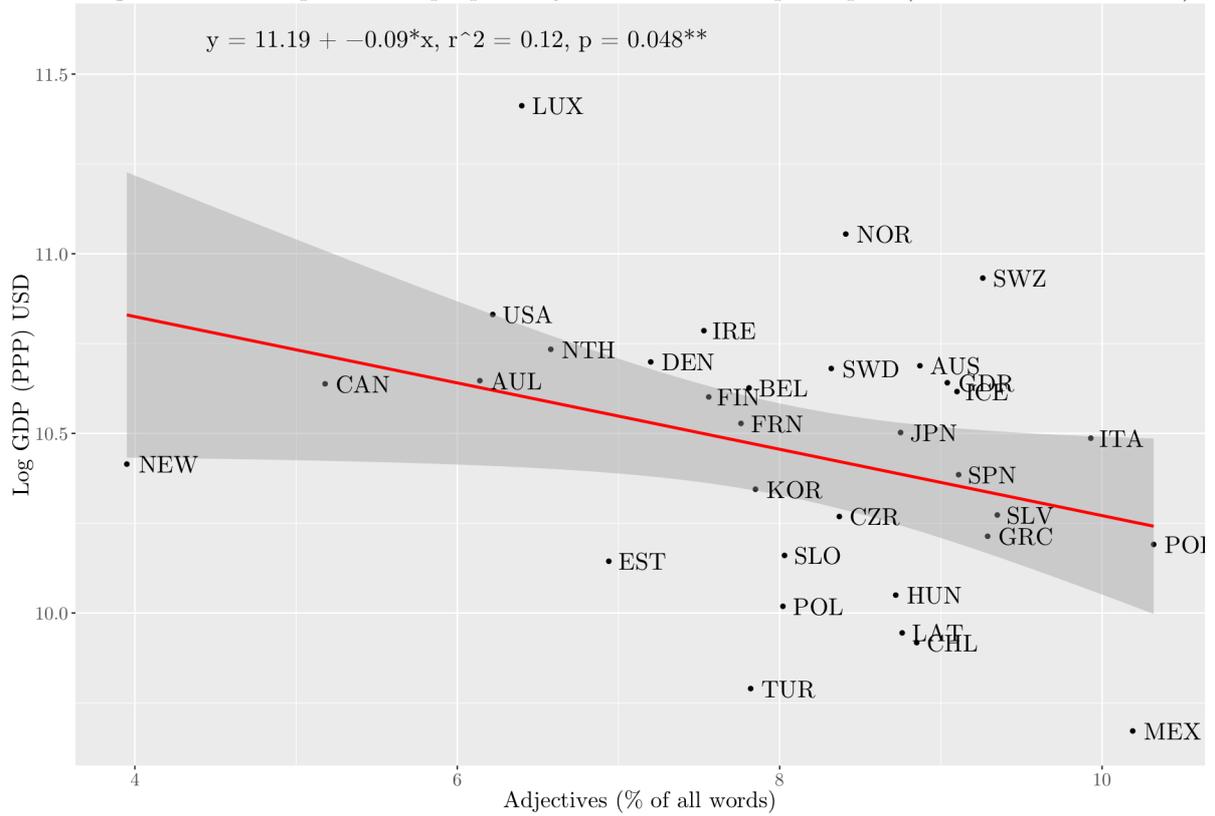
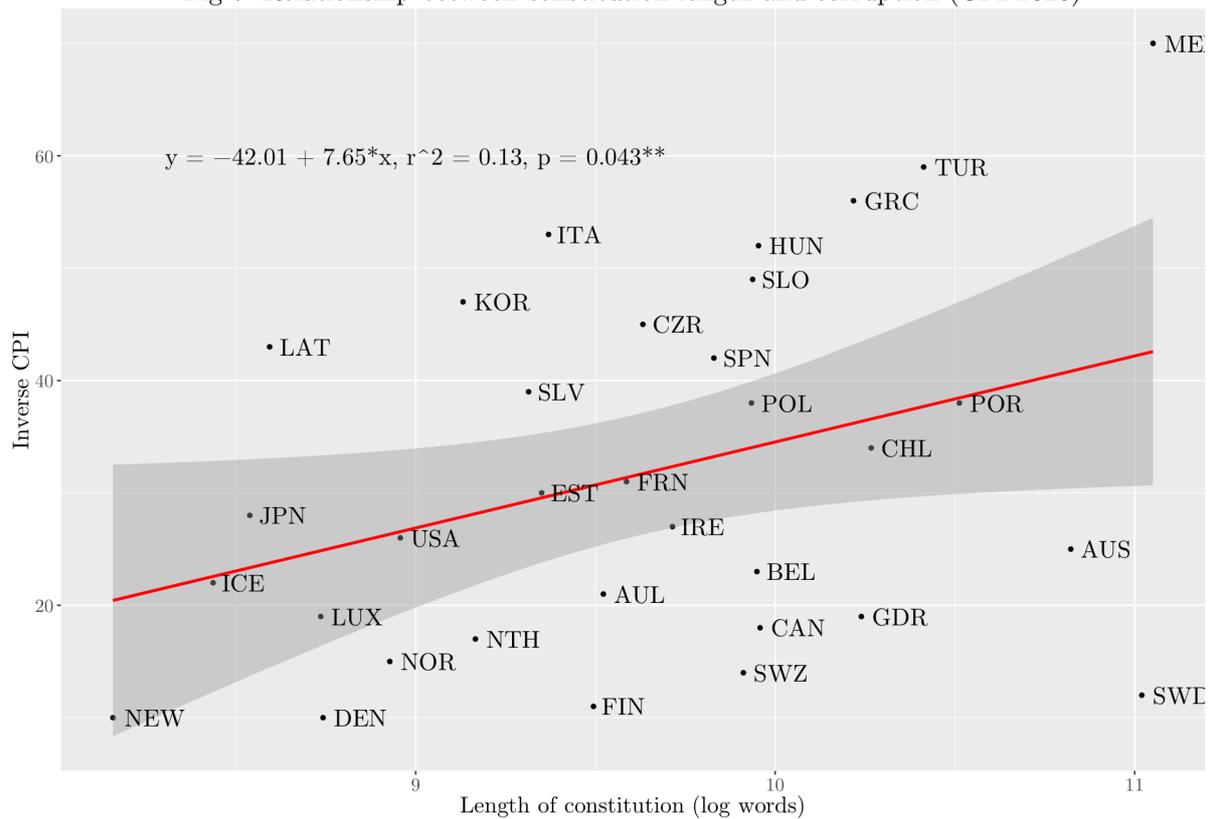
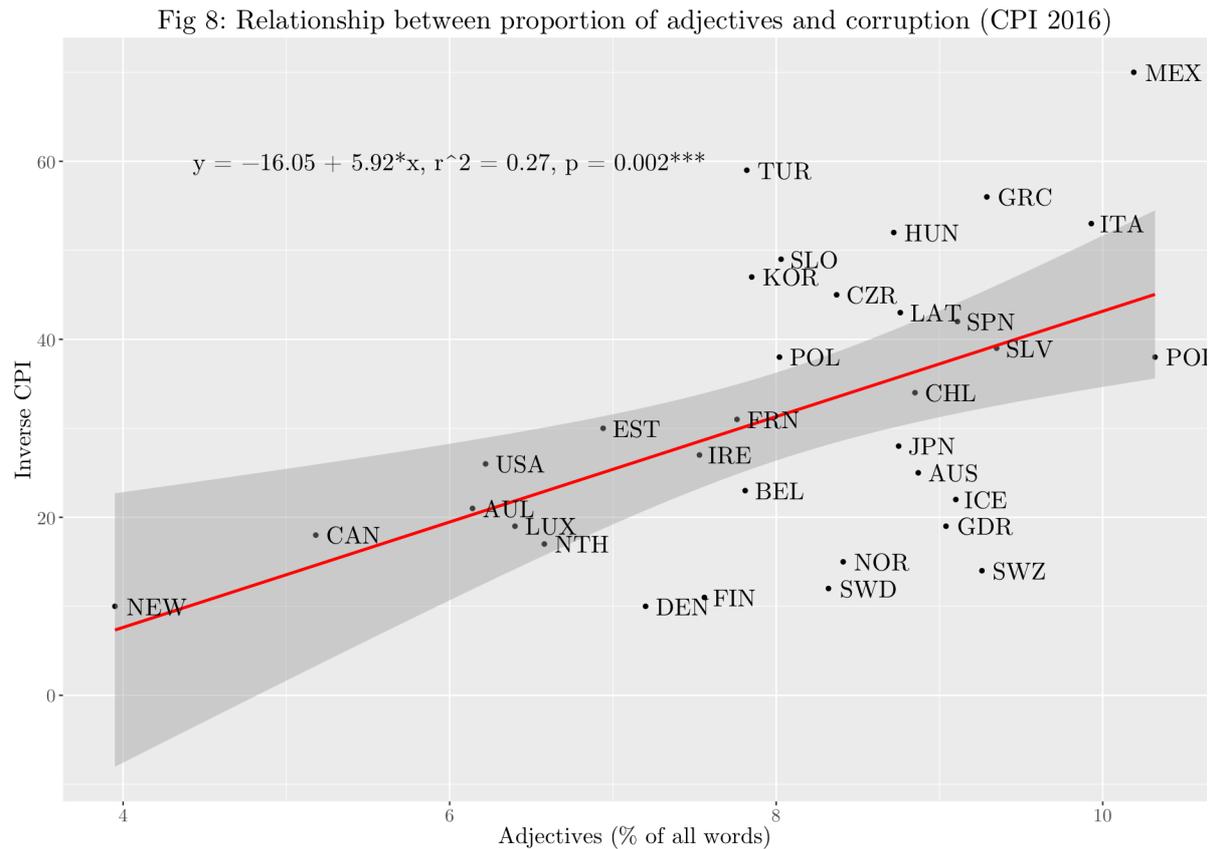


Fig 7: Relationship between constitution length and corruption (CPI 2016)





Figs 6 and 8 provide some preliminary evidence to reject the null in favour of H4 and H5. However, as discussed above, there are complications in modelling causation. Economic performance and corruption are multifaceted and ascertaining the independent effect of constitutional language will be difficult. Table 4 offers some further evidence that the relationship between GDP and the presence of adjectives and adverbs holds when other variables are controlled for:

Table 4: GDP per capita regressed on proportion of adjectives, constitution length and corruption

<i>Variable</i>	(1)	(2)	(3)	(4)	(5)	(6)
ADJ	-0.32*	-0.32*	-0.29*	-0.29*	-0.29*	0.06
	(0.17)	(0.17)	(0.16)	(0.17)	(0.14)	(0.13)
EDUSEC	-0.14	-0.13	-0.16	-0.16	-0.22	-0.15
	(0.15)	(0.15)	(0.15)	(0.16)	(0.13)	(0.09)
NATRES		-0.19	-0.12	-0.11	-0.15	-0.17
		(0.19)	((0.19)	(0.2)	(0.17)	(0.12)
TRADE			0.31	0.32	0.17	0.24
			(0.19)	(0.25)	(0.18)	(0.13)
FDI				-0.02		
				(0.27)		
SAVE					0.47***	0.17
					(0.15)	(0.13)
CORRINV						-0.56**
						*
						(0.11)
CONSTANT	0.73***	0.74***	0.66***	0.66***	0.49***	0.56***
	(0.13)	(0.13)	(0.14)	(0.15)	(0.13)	(0.1)
Multiple R ²	0.14	0.17	0.24	0.24	0.44	0.71
Adjusted R ²	0.09	0.09	0.13	0.1	0.34	0.64

N=33. Standard errors in parentheses. ***p<0.01,**p<0.05,*p<0.1.

Variance inflation factors for (6): ADJ (1.22); EDUSEC (1.04); NATRES (1.03); TRADE (1.08); SAVE (1.20); CORRINV (1.34).

A single star ($p < 0.1$) is not sufficient statistical significance to reject the null hypotheses for H4 and H5. It is nonetheless interesting that a relatively low p-value is sustained through models 1-5, even when other important predictors of economic performance are added. It is only in model 6 when the p-value for ADJ creeps above 0.1. Given the strong correlation between the presence of adjectives and adverbs with corruption (Fig 8), there is likely a suppression effect at work here that has affected

the p-value and the direction of the coefficient for ADJ. Albeit, the variance inflation factors for model 6 do not exceed 2, and thereby suggest no significant multicollinearity.

Clearly, modelling the relationship between textual and contextual elements is complicated by the possibility of endogeneity. Indeed, Tsebelis and Nardi in their equivalent regression table also found no significant correlation of word length and GDP when savings and corruption were included (2016, 475). And yet, as preliminary findings, the evidence presented offers a basis for further inquiry into the effects of specific parts of speech on policy outcomes.

CONCLUSIONS

I have argued that constitutional language has changed significantly over time and that these changes are worthy of our attention. Besides other textual attributes, such as word length, and content, certain parts of speech have effects on interpretability and policy outcomes. Not only do substantive restrictions in a constitutional text lead to rigidity, but so to do under-substantiated restrictions couched in qualified language. Even short constitutions can leave significant latitude to state elites when adjectives and adverbs are used. It raises the key point that the word length of a constitution belies the thousands, even millions of words of subtext and inter-textual writings that will be encouraged by indeterminacies such as ‘necessary and proper’.

There are empirical, moral and policy implications of these findings. The empirical implications are that despite these strong preliminary findings, more research is needed to test for causal links between constitutional language and policy effects. Various research designs besides correlation analysis will likely be fruitful. Qualitative research is well-placed to build and test hypotheses regarding the interplay of textual and contextual factors. Natural experiments will also be available in countries with sub-national governments, or when the same country institutes major constitutional reform. Sweden, for instance, significantly increased the length of its constitution in 2009 and 2012 (from 13,635 words to 60,045 words). But, the newer constitution has a significantly lower proportion of adjectives and adverbs (from 9.34% to 8.32%). Whether the newer constitution is more empowering of the state or the citizenry is a worthy area of research.

More broadly, research is needed to consider modern political cybernetics. In other words, the codes and discourses used in modern politics to achieve specific outcomes. The use of adjectives and adverbs rely on analogic language rather than logical language. Analogical language requires meaning to be inferred from like cases. The action at time t was ‘necessary and proper’, so a similar action at $t+1$ should also be so categorised. The issue with analogic reasoning is the reliance on authority, be it

governmental or judicial. Logical reasoning, conversely, admits of fewer shades of grey. A Polish citizen does not need to know past precedent or shared usage to interpret: ‘The freedom to express opinions... shall be ensured to everyone.’ Analogical language can allow for more adaptable policy-making, when power is put behind its adaptation, but it also makes interpretation more subject to contestation and elite dominance.

How states should adapt to interesting times is therefore the moral question derived from this paper. By utilising elastic language, the state can potentially address a wider range of citizen demands with greater efficiency. But broad civic empowerment is traded for this efficiency. The longer-term effects of which are, arguably, ineffective for delivering sustained economic growth without corruption. The key policy implication of the paper is therefore that constitutional language is best when kept short in length and plain in exposition. Both substantive restrictions and under-substantiated restrictions create power asymmetries that benefit the state and disempower the citizen.

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