

Measuring Long Run Constitutional Textual Entrenchment and Its Effects

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Abstract: The ability for a society's institutions to provide certainty to organizations and individuals has been theoretically and empirically linked to beneficial long run political, economic and social outcomes. Among the political institutions subject to turnover is a nation's constitution itself. But in contrast to the long-heralded benefits of constitutional entrenchment are the empirically identified benefits of sufficient flexibility in amendment rules and increasing constitutional specificity. These countervailing forces suggest a theoretically optimal level of constitutional entrenchment. In our analysis here, we develop a set of computational measures of textual constitutional change over time, and then consider the relationship between these measures of entrenchment in a nation's fundamental ruleset with several measures of political economic, and social outcomes. More specifically, we generate distance measures between constitutional texts within a given nation and explore the relationship between the change in textual distance over time, and governance outcomes, GDP per capita, and augmented human development. Our empirical results suggest that constitutional text matters most significantly for governance, but also appears to influence economic output and human development more broadly.

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I. Introduction

Constitutional change tends to signify a profound turning point in a nation's governance. Even if the events that led to an overhaul of country's fundamental governance charter were long fomenting, the moment itself is fundamental with respect to the (re)definition of the institutional principles (and constraints) that will shape the nation's future governance. Thus, most new constitutions arise through demand for fundamental change. Regardless of the antecedents, a new constitution typically represents a major break in the governance institutions of a given nation. However, where constitutions may vary is in the extent of change, or progress, the new constitution implies as compared to the reality that exists at the time of constitutional enactment, a reality greatly defined by the prior constitutional regime, for better or worse.

This truism with respect to constitutional enactment, and the change a new constitution envisions, has important theoretical implications. Seminal empirical studies of constitutional change have identified greater flexibility in terms of amendment (Elkins et al 2009), or specific substantive definition in subnational governments (Versteeg and Zackin 2016) as evidence that change in constitutional text is net beneficial with respect to observable outcomes. Yet there is also evidence that more constitutional change is not unambiguously better. A new constitution that contemplates greater levels of change is necessarily more costly to implement and may take a greater length of time to realize its transformative potential (Ginsburg and Huq 2020). Such a context of greater constitutional change also implies greater implementation discretion for the new government constituted by the fundamental document. Past a certain point of change, a failure to realize the transformative vision can delegitimize the constitution more broadly, which means that change is inextricably bound up in the health of a constitution in complex ways. Change in one direction may ultimately beget adjustment in the other direction, as constitutional implementation tradeoffs diverge from underlying constitutive governance beliefs.

The margin of change itself is thus a robust field of comparative constitutional scholarship (Contiades and Fotiadou 2012; Contiades and Fotiadou 2020), much of which has focused on comparing amendment difficulty (Lutz 1994; Lorenz 2005; Rasch and Congleton 2006; Elkins et al 2009; Tsebelis 2017). Crucial for our analysis is the increasing turn in applying methods of computational text analysis to questions in comparative constitutional design (Rockmore et al 2018; Rutherford et al 2018; Law and Whalen 2020; Engstrom et al 2021). In particular, drawing upon the idea of textual distance (Rockmore et al 2018; Rutherford et al 2018), we explore a distinct question within the fixed boundaries of a given nation's constitutional history as opposed to the cross-national comparisons of similarity that have predominated so far. Within a given nation, instead of exploring the extent to which a given amendment is more akin to constitutional replacement (Law and Whalen 2020), we focus on the amount of formal textual change a nation has experienced across its entire constitutional history. Although less granular and context-sensitive, our lengthier frame of analysis enables us to explore more structural forces whose persistence may operate at a time scale beyond that of any single constitutional change (or amendment creating such change). By both focusing on constitutional replacement and choosing the entire constitutional history, our analysis avoids the specific critique that a particular constitutional change is more a function of the context than the specific amendment institutions in play (Roberts 2009).

Of course, a constitution is not implemented in a vacuum, and can therefore be a fundamental input to subsequent political and economic outcomes (Dixit et al 2000; Persson and Tabellini 2003; Elkins et al 2009). A comparatively broad menu of constitutional priorities from which to choose is more likely to empower rather than constrain an implementing executive – this suggests that constitutional textual change may be linked to increases in political instability as each group vying for control views the constitution as part of an “winner takes all” electoral contest. A context of institutional stability has been credibly linked to institutions’ fundamentally coordinative function in democratic social orders (Broadberry and Wallis 2016), such that instability in the most fundamental set of secondary rules could affect resilience in the face of unanticipated shocks, and hence, potentially lower achievement of economic and social development over time. Among economic institutions sensitive to uncertainty, property institutions rank highly due to the way in which investments hinge on relative surety of returns. Furthermore, continued uncertainty in property institutions have been identified as part and parcel of the political economy of many nations, to the detriment of development outcomes more generally (North 1990; La Porta et al 1998; Albertus 2021); one potential input to this economic institutional uncertainty is instability in constitutional definition writ large (Riker 1980; and Shepsle and Weingast 1981). Thus, in addition to direct governance outcomes, economic output over time is plausibly linked to stability in the enforcement of long-lived commitments.

Our analysis deploys a dual methodology, first generating distance measures of textual change over time, and then creating a comprehensive measure of the extent of long-run constitutional textual change a nation has experienced. These predictions suggest several outcome measures worth assessing compared to our textual measures of constitutional change. In addition to governance outcomes, we consider economic output per capita as related to the textual stability of a given nation’s constitution. Most broadly, we consider the relationship between our measures of constitutional textual entrenchment and a comprehensive measure of human development, based upon the insight that the pursuit of objectives integral to human flourishing depend observably upon some level of stability in fundamental social rule sets.

Because new constitutions tend to arise in contexts of fundamental demands for change and describe a government that does not yet exist, they are all aspirational. But the extent required to achieve one set of aspirations can vary immensely as compared to another, a truism that applies when it comes to constitutions. New constitutions thus vary considerably as to the extent to which they contemplate change as compared to preceding regimes. In linking our novel measures of textual constitutional change to governance, economic and human development outcomes, we uncover evidence that *quantifiable change in constitutional text matters*. More specifically, long-run constitutional textual change is linked to decreased governance capacity, per capita economic output, and human development. Our analysis adds to the literature on comparative constitutional change, suggesting a link between long run formal textual change and the host of political and economic factors that greatly influence human development.

II. Constitutional Change as Integral Yet Destabilizing

Given that a new constitution tends to arise from a fundamental demand for change, or reorientation in a nation’s developmental trajectory, this makes some measure of change rationally linked to the emergence of a new constitution. If the process of reconstituting the

fundamental organs of public governance is itself costly and contentious, then this process would not be undergone trivially by those empowered to initiate such change. This makes all instances of changing a nation's constitutional document likely to entail an observable measure of change to that document. Yet the historical and cultural context in which a particular constitutional change occurs carries many contextual factors likely to provoke different scope and extent of change in the constitution. Furthermore, countries may themselves vary in terms of their legal origins or colonial legacies, each of which has been theorized to influence the observed timing and extent of constitutional change in a given moment it occurs (Hayo and Voigt 2010; Tsebelis 2018; Rutherford et al. 2018). This makes explaining the effects of changes in constitutional text, separately from the (observable) social forces that gave birth to the constitutional change itself, a vexing question in empirical identification. Nonetheless, empirical patterns have been observed with respect to comparing textual features of constitutions on the global level.¹ Despite the many endogenous factors leading to the length of time a constitution endures within a given nation, the number of nations governed by constitutions for decades, if not centuries, allows for the identification of cross-national patterns.

The endurance of a given constitution directly suggests another measure of constitutional change relevant to understanding a nation's constitutional history – how much constitutional change has a given nation experienced? Beyond numerically counting the number of constitutions a nation has had, there are other ways to consider, and therefore develop measures of, the extent of constitutional change a given nation has experienced. Scholars considering the problem of differentiating constitutional amendment from wholesale constitutional turnover have noted two overarching approaches to the question: considering constitutional turnover and amendment *formalistically* by the terms constitutional drafters and assemblies give to the document itself, or considering constitutional change *objectively* by more thoroughly grappling with the extent of change that the amendment or new constitutional document actually entails for the society it governs (Law and Whalen 2020). This divide is less acute than it might seem, given that word choice in constitutional design has long been shown to have potentially significant downstream implications. Our focus herein is unquestionably formalistic as a function of written constitutional text, but therefore allows us to explore the extent to which formal constitutional change has an observable effect.

Much of the study of constitutional change has focused on the amendments a constitution had experienced. A major division in this literature surrounds the extent to which amendments can be properly understood in terms of the extent of change they substantively represent (whether as replacements (Law and Whalen 2020) or dismemberments (Albert 2018)), or if such analysis is productive given the context specificity of textual change as implemented, enforced and interpreted by a given political and judicial system (Doyle 2021). Our focus on formal constitutional replacement does not answer this debate, nor belittle the extent to which amendments (and their individual significance) can influence outcomes (Law and Whalen 2020). Beyond our animating question of how to more comprehensively measure constitutional change, though, comes identifying whether there are any generalizable relationships between

¹ Most seminally, Elkins Ginsburg and Melton (2009) identified a link between constitutional flexibility as measured by amendment procedures, and the endurance of a nation's constitution. Notably, both these measures are related to the formal constitutional document itself, a methodological approach that motivates much of our analysis here.

constitutional change and other outcomes of interest. Consistent with our animating premise that there are costs and benefits to change, the comparative constitutional literature also displays clear benefits and costs to this change. This suggests that while entrenchment of precommitments (Elster 1994) may help overcome the time inconsistency problem (Tsebelis and Nardi 2016; Tsebelis 2017; Dove and Young 2019), the relationship is one of competing demands for change (and the benefits associated thereto) weighed against the structural costs of such change, which likely exceed these benefits past a certain optimal point.

Perhaps the broadest lesson from the literature on constitutional should be one of theoretical and empirical humility. In addition to their specific relevance for our research question, the extant scholarship identifies numerous margins by which reductionist accounts of constitutional change miss an important margin. Flexibility is related to endurance (Elkins et al 2009). Specificity is necessary to realize the emergent benefits of flexibility (Versteeg and Zackin 2016). Increased length can result in greater tendency toward executive authority, corruption, and tendency to default on public finance (Tsebelis and Nardi 2016; Tsebelis 2017; Dove and Young 2019). Changes tend to come either incrementally and frequently or sharply and infrequently (Law and Whalen 2020). The extent of change contemplated in a new constitution can implicate an immediate and persistent constitutional political economy of rights implementation (Alston 2018; 2020). Changes are linked to cultural individualism and risk tolerance (Tarabar and Young 2021). The number of plausible margins of variation that have been identified are alone sufficient to demand context-specific analysis to suggest which margins are most likely to have primarily determined outcomes in a given instance.

However, as further cause for humility in the pursuit of empirical regularity are additional comparative findings that suggest the effects of constitutional change are even more complex than the net positive or negative characterization the aforementioned tradeoffs suggest. The ability of a constitution to provide “political insurance” depends on the way in which it balances the assurances of constitutional design across distinct organs of constitutional political authority (Dixon and Ginsburg 2018); at a minimum, this suggests that changing one branch of government’s authority may be more destabilizing than doing so in a more balanced way across distinct government authorities, the latter of which might require more formal constitutional text to achieve. Furthermore, not all cross-country quantitative comparisons of constitutional entrenchment result in identifiable effects (Callais and Young 2021). We therefore characterize the complex field of understanding constitutional change sufficiently to delimit its margins tractable to quantitative comparison across nations and time as one that has yielded findings of costs, benefits, and effects not as tractable to this dichotomous comparison. This suggests a fruitful field for further research (Contiades and Fotiadou 2020), albeit one that requires careful analysis of specific cases of constitutional change, including the means by which the “little c” constitution influences change processes, however comparatively more difficult such change processes are to identify, let alone quantify (Chilton and Versteeg 2022).

Nonetheless, the existing benefits and costs of constitutional change that have been identified through the careful application of empirical techniques suggest that these technical approaches will continue to play a role in improving our understanding of the complex dynamic of constitutional change and its effects. With this recognition, we review in the following

subsections the literature that most closely informs our approach in this area and to which our contributions most closely follow.

A. Constitutional Change Provides Identifiable Benefits

The traditional theory of constitutional entrenchment has been subject to a variety of critiques in recent years, including using the tools of comparative empirical analysis. The position that constitutional change is beneficial is intuitive – if constitutional moments are costly to private and public actors alike, some measure of constitutional change is necessary to produce political, economic and social benefits in excess of this cost. Furthermore, the constitution should ideally reflect the governance preferences of the governed, which change as generations age and new generations become the majority of those governed within a given constitutional system (Elkins et al 2009). While this intuitive frame partly motivates our theory and empirical tests here, the identified benefits of some measure of constitutional change are considerably more well-developed in the literature to warrant more detailed review. The seminal Elkins, Ginsburg and Melton text (2009), in studying the role of amendment flexibility, found that a constitution’s lifespan was positively related to its ease of amendment.

More recently, Versteeg and Zackin (2014) argue for a more nuanced understanding of “American Constitutionalism” as one that contemplates the role that comparatively mutable state constitutions play in defining the full scope of activity subject to constitutional authority across the country. Of direct relevance to our analysis is Versteeg and Zackin’s subsequent use of an entrenchment score to explore the extent to which state and national constitutions display increasing flexibility and specificity over time (2016). Our measure differs fundamentally in terms of its construction, and can best be understood as complementary, in the sense that our use of computational text analysis is deliberately constrained to considering textual constitutional change on its face. In contrast, Versteeg and Zackin contemplate the number of years that a nation has experienced constitutional moments in terms of replacement or amendment.

Innovations in computational textual analysis have since been applied to more granularly identify the tradeoffs associated with textual entrenchment and increasing textual length over time. In particular, constitutional amendment tends to reduce the need for replacement, suggesting a potential benefit from more frequent and incremental change that reduces more wholesale overhaul less frequently (Law and Whalen 2020) – to the extent gradual change is less harmful than wholesale constitutional replacement, this suggests discrete benefits to spreading change over time. Our approach in terms of assessing textual change from the formal constitutional text is closest to that employed by Law and Whalen, using computational text analysis algorithms to identify the extent of constitutional distance between texts. Despite their relying on similar techniques in their construction, our constitutional change measures are used to explore a question of greater temporal scope. When confronting the complex question of generalizable effects of constitutional change over time, this again makes our measures and empirical findings complementary to those already developed in the literature.

The increasing prevalence of flexibility and specificity in constitutional orders poses the question as to the perceived and realized benefits of drafters’ tendency to choose these design options over time. Versteeg and Zackin (2016) argue that specificity is necessary to realize constitutional flexibility, which at a minimum can be tied empirically to a constitution’s

endurance, which suggests the need to conform to changes in generational governance preferences over time (Elkins et al 2009). The desirability of constitutional endurance is at least partly consistent with the arguments for the benefits of constitutional stability, if not entrenchment. As Law and Whalen (2020) suggest, some measure of constitutional change may be inevitable, such that the design choice may be between incremental or not. Nonetheless, increased constitutional specificity is argued to restrain the legislature and judiciaries otherwise empowered to implement and interpret the constitution (Versteeg and Zackin 2016; 2018).

B. Constitutional Change is Nonetheless Costly

From a cost-based perspective of constitutional implementation, the magnitude of change a given constitution implies closely tracks the net cost of implementation, at least in the immediate term. More change as compared to the status quo of governance tends to involve greater expenditure of government resources, including the time and consideration of the different branches of government.² A legislature can only consider so many topics during its annual sessions, and a court can only hear so many cases brought before it. Similarly, an executive branch can only spend so many resources on a set number of implementation priorities. In different cost terms, the change each constitutional provision implies can require significant time to be fully realized. The greater the change, the greater this temporal component, and hence, cost to the implementing government. In a broader sense, the sum of change implied by a new constitution also carries a potential cost to legitimacy; the more an aspirational constitution strains, and on some margins fails to satisfy its promised constraints and government programs, the less likely it is to be seen as legitimate by the people it governs (Alston 2020).

Thus, the degree of transformation (Ginsburg and Huq 2020) that a new constitution contemplates is closely associated with its implementation cost. The greater the change in society and government contemplated by a new constitution, the more aspirational that constitution is (Alston 2018). At some theoretical point, it is likely that the marginal costs of additional change demanded by the constitution outweigh the marginal benefits this change implies. In contrast to the emergence of flexible and therefore lengthier constitutions as evidence of functional benefits (Versteeg and Zackin 2016) stands the empirical finding that longer constitutions correlate to lower per capita income and higher corruption (Tsebelis and Nardi 2016; Tsebelis 2017), or in the context of historical United States state constitutions, lower likelihood of default (Dove and Young 2019). Put in economic terms, the degree of a constitution's transformation can be argued to display diminishing marginal returns past a given point. This more general tendency derives directly from the broader literature on rights tradeoffs (Hewlett 1979; Donnelly 1984; Henkin et al 2009, 107-109; Bosselmann 2015), as well as legal transitions more generally (Kaplow 1986, 2003; Levmore 1999; Logue 2003; Shavell 2008). This suggests several significant consequences associated with the aspirational nature of a given constitution in theory.

² This tendency is only amplified as a given constitutional trajectory includes more modern progressive positive rights, such as those to health care, education, environment, and rights of indigenous communities (Alston 2018). Public provenance of health care and education is costly in the short to medium term (before the longer run anticipated positive impact of such investments can be realized). Executive agencies to ensure environmental protections and oversight bodies to ensure community consultation with indigenous communities both require legislative definition and ongoing revenue to support their activities.

One immediate consequence of increasing the extent of change contemplated by a constitution is that such a choice is likely to facilitate governmental discretion in terms of which rights to prioritize. Trading off between implementation priorities is a task that faces every regime formed under a new constitution. Nonetheless, as the transformative potential increases, the extent of discretion afforded to the implementing government as to which rights to prioritize also increases. While true of every constitutional implementation process, the concern exists that past a certain point, this dynamic can be destabilizing; a constitution is meant to constrain just as it is meant to enable and guide. If the range of rights a government is intended to both protect and provide is sufficiently broad, then the implementing government must prioritize the implementation of some rights, both from a legislative and judicial standpoint (Alston 2018; 2020). Put differently, the relative costs on the demand side to organize for rights enforcement can determine which rights are enforced on the margin (Chilton and Versteeg 2020).

In a context where the magnitude of change implied by the constitution dwarfs the ability of the government to immediately implement this change, which aspects of implementation are likely to receive priority by the first governments under the new constitution? One possibility is that governments are likely to prioritize those policies that are most likely to result in their reelection, whether this be those policies most popular with the public, or with the groups whose wealth or power are needed to secure reelection. In newly counter-hegemonical regimes, the coalition of interests that gave rise to the process is often composed of those who were most disenfranchised under the previous regime. To give but one example of catering to such a popular coalition, implementing governments have prioritized the aspects of implementation providing clear improvements in the standard of living for most citizens (Alston 2018). Of course, given a choice of entrenching or insulating their regime against future electoral pressures, an implementing regime is likely to prioritize those aspects of the constitutional implementation program over others, as well.

Whether or not rights are explicitly non-hierarchical in a constitution, the persistence of a dynamic of unequal rights implementation could itself become deligitimizing, if certain rights are systematically deprioritized in terms of implementation. A constitution's legitimacy is based, at least in part, in the belief of its constituents that it will be predictably and impartially enforced. If over time certain rights are deprioritized to the extent that citizens do not believe claims based upon these rights will be enforced, then they are less likely to bring such claims, simply due to the costs associated with doing so weighed against the low likelihood of meaningful relief. Many new constitutional regimes are borne from the impression on the part of citizens that the prior constitutional regime no longer provided any kind of predictable restraint on government that they could rely upon in the event the rights articulated therein were violated by the government or a private actor. A greater scope of constitutional choice for an implementing government is thus arguably likely to present greater scope of choice for electoral or populist reasons, which increases the possibility for change in constitutional terms in pursuit of the populist or political-power-entrenching objectives outlined here. This suggests a dynamic by which constitutional textual can result in persistent consequences as successive periods of constitutional change present new margins of definition for distinct interest groups.³

³ While outside the scope of our analysis, the recent finding by and Versteeg (2020) surrounding rights enforcement being more likely in cases where the costs of organizing to enforce such a right are low has troubling implications

Economic institutions are not immune to a constitutional political economy themselves (Albertus 2021). Monetary and financial institutions have long been subject to tight political oversight, and often give on the margins in times of crisis in response to the demands of an elite coalition or populist forces (Calomiris and Haber 2015). The less entrenched fiscal rules are constitutionally, the more the public purse can be subject to political pressures in expenditure that eventually lead to default (Hayek 1976; Dove and Young 2019). Our analysis is agnostic about an important structural question surrounding increased specificity – whether such increases in constitutional specificity on net constrain implementing legislatures and judiciaries. Nonetheless, given enough textual change associated with constitutional turnover, it becomes more likely that these specific terms come up for grabs under the terms of a new constitution, and by design enable rather than constrain the incoming regime. These outcomes surrounding rent capture as a function of too much constitutional change (de Viteri Vázquez and Bjørnskov 2020) are consistent with the empirical evidence that greater constitutional length correlates with greater corruption and lower per capita income (Tsebelis and Nardi 2016; Tsebelis 2017). This choice of outcomes motivates our own examination of governance and economic output as a function of long-run constitutional textual change.

If constitutional drafters are uncertain as to which aspects of a constitution will bind with more force than others, comparative constitutional scholars themselves face a difficult question when it comes to assessing the change contemplated by a given constitution. If the extent of constitutional change a new constitution entails compared to the constitutional and social status quo implies increased implementation costs, increased choice for the implementing government, and possibly, costs for the implementing government and economy over time, then the need for correction due to the increased cost and implementation choice this contexts entails is also likely to be greater (Alston 2020). This suggests a complex intertemporal dynamic of constitutional change and governance outcomes as a function of regime change.

From the perspective of the legitimization needed for a constitutional document to stick (whether among a broad electoral constituency, or a more narrow coalition of elite actors) the new constitution needs to accommodate a sufficient extent of change to placate the demands that led to constitutional turnover in the first place. This stylized narrative indicates a more important theoretical point; revelation of constitutional turnover directly suggests expected gains from this fundamental institutional change, but the logical change model developed here also indicates diminishing marginal returns as to the scope and magnitude of change contemplated. A constitution that simultaneously guarantees every citizen a job and the right to choice in employment is unfortunately completely unlikely to result in a nation of billionaires, astronauts, and rock stars.⁴ Put more directly, past a certain point, the extent of change formalized within a constitutional document can be directly harmful to the success of the governance project in its entirety. This tendency is amplified amid the tendency of groups with lower costs of collective action being more capable of enforcing constitutionally defined rights (Chilton and Versteeg

when viewed through the lens of constitutional political economy developed by Buchanan and Tullock (1962) and Olson (1965). Put simply, what prevents the constitutionally-specific terms that lend themselves to enforcement through collective action from capture by special interest groups?

⁴ Lest this example seem too fantastical, it should be noted that one of the authors encountered this exact combination of rights in an early and confidential constitutional draft on which he was providing technical advice.

2020). Diminishing marginal returns to constitutional change suggests an optimal level of constitutional change, however subject to measurement and incommensurability concerns the clear identification of any singular optimum would be in constitutional design practice, per our earlier discussion of humility with respect to assuming the universality of empirically identifiable tradeoffs in the context of constitutional change processes.

III. Constitutional Change as Linked to Political, Economic and Social Outcomes

The costs of constitutional change accrue to public and private actors alike, with the government called upon to implement and individuals and companies called upon to adjust their behavior. This suggests consequences from the scope and magnitude of constitutional change that are not limited to the implementation program and legitimacy of the constitutional document itself. Put more simply, constitutions matter for the societies they govern, a basic insight that motivates comparative constitutional scholars, designers, and drafters, let alone society in its entirety during moments of wholesale constitutional replacement. But this suggests that social outcomes also therefore hinge on the dynamics of constitutional change we describe in the preceding section. What does a greater scope for implementation choice mean for politicians, including executives? What does greater textual change mean for the certainty economic actors have as to how laws and regulations will be defined and enforced? Do new constitutions matter as much for social outcomes as the heated debates surrounding their overhaul may indicate? In this section, we consider how higher levels of constitutional change are plausibly linked to outcomes of interest ranging from the political to the economic to the level of human development writ large.

Constitutional change as related to specific characteristics of the political system has been studied previously. The fragmentation of political parties has been linked to greater amendment frequency in Latin American constitutions (Negretto 2012), while in contrast, the number of parties within control of the cabinet in EU nations has been linked to less amendments (Karlsson 2016). The fact that the relative predominance of presidential systems in Latin America does not permit parliamentary coalitions for control suggests the distinction between these outcomes. Greater coalitional control tends toward lower amendments in the EU, whereas greater political fragmentation begets greater constitutional changes as unitary control of the system shifts from one party to another in Latin America. In contrast to these findings, though, stands the titular question of “Does the constitutional amendment rule matter at all?” in which Ginsburg and Melton (2015) suggest that the specific rigidity of formal amendment procedures is less determinative of frequency than amendment culture, which they measure by examining the amendment rate in the prior constitution. Beyond the specific context in which constitutional change is taking place, then, lurks the question of persistence in a nation’s constitutional preferences as shaped by prior constitutional periods (Chilton and Versteeg 2022). This insight motivates our analysis across an entire nation’s constitutional history, exploring contemporary political stability as related to the extent of constitutional textual change experienced over time.

With respect to political outcomes as a first instance of observable effects from constitutional change, the case of Ecuador displays how the extent of change contemplated by a constitution can be harmful, but also clearly identifies the implementation tradeoffs discussed previously (Alston 2018; Alston 2020). As the scope and magnitude of the change contemplated

by a new constitution increase, this change nonetheless faces the binding constraints of budget and government capacity that a given nation's context creates. If a government can only achieve three priorities in a set period, yet is presented ten such priorities by a new constitution, this constitution presents the government much greater choice than a constitution that only presents five such priorities for implementation. This stylized example exemplifies how past a certain point of transformation envisioned in a new constitutional document, a set of constraints on executive and legislative action instead can become a menu from which an increasingly unconstrained government can choose, while claiming constitutional authority for pursuing the objectives most closely aligned to those they would have pursued in a context without binding constitutional constraints. In the Ecuadorean context, this ultimately resulted in significant political turnover, and ultimately, revision of the constitutional document itself (Alston 2020). The case of Ecuador emphasizes how the boundary between proximal constitutional choice and more directly, political outcomes, is necessarily fuzzy.

Just as the constitutional defines the political on important margins, so too do the constitutional and political influence economic outcomes. Normatively-preferable institutions can be understood as a scalar mechanism in human social ordering, facilitating a greater scope and magnitude of voluntary human interactions given the same underlying demographic, technological and capital stock (Alston et al 2018), which makes one benefit of normatively preferable institutions greater economic output, *ceteris paribus*.⁵ Less beneficial institutions are ones that hinder voluntary coordination in the face of shocks, whether this coordination is on the part of a dominant coalition or the entirety of a more democratically-governed polity of interest groups (Broadberry and Wallis 2016). This fundamentally coordinative role of liberal constitutional institutions indicates that political systems ideally should not foment uncertainty among economic actors⁶, which suggests an additional private margin on which too much constitutional change can create persistent costs (Elster 1996).

An optimal level of constitutional change means all constitutions will contemplate change to society and its governance institutions, but the specific level of change contemplated is linked in complex and structural ways with the success of the ongoing governance project itself. If some measure of transformation is necessary given the costly nature of constitutional change, the messy non-ergodic nature of the world means that some constitutional projects will get it wrong, and only moreso given the political economic and public choice considerations we review in this subsection. Given constitutional institutions' long-identified role in undergirding more capable and equitable governments, this makes it likely the level of constitutional change discussed here is directly linked to political outcomes. An executive empowered to prioritize among many rights to enforce or increase public sector output is one that is less constrained than

⁵ This does not imply that more economic output is strictly better, all else not equal. Normatively preferable institutions facilitate greater voluntary output across all dimensions of human activity, which could mean a better environment at the cost of some economic output, depending on the preferences of those governed by the institutions in question.

⁶ On the more micro level, private economic actors' incentives are shaped by their institutional context governing land, minerals, and water, and national-level uncertainty in these institutions can have identifiable and persistently negative economic effects (Alston and Smith 2022). This can be understood as one example of a context where national policies created a "property rights gap" for certain economic actors, a pattern that more broadly has been identified as central to the choice set of dominant actors within national and regional political economies around the world (Albertus 2021).

one with less choice. At a simple mechanical level, new constitutional institutions (including unconventional fonts of authority like independent review commissions) beget more political change by design. Private economic actors contemplating long-term complex investments requiring the coordination of many independent veto players are less certain of future outcomes in a context of drastic institutional change, and accordingly less willing to invest.

Given the theory in this section, there are a number of outcomes one could predict from either too much or too little change. An insufficient level of change should diminish constitutional endurance (Elkins et al 2009), because the same demand that led to the initial constitutional change would be likely to generate demand for a new constitution, due to the extent of change implicated by the demand being unsatisfied. If constitutions are on average getting longer and more flexible (Versteeg and Zackin 2016), then Relatedly, an excessive level of change can be predicted to lead to lower provenance of rights protections, and perhaps, itself lead to lower levels of constitutionalism due to the perception that the constitution was not being implemented as drafted. This potentially suggests that constitutional change is a self-fulfilling prophecy. If a culture of constitutional change begets further constitutional change, then a shorter first-period constitution (Ginsburg and Huq 2020) would arguably predict greater levels of future constitutional turnover, or change contemplated within the next constitutional document(s). This leads to a specific need to develop measures conditional on endurance due to the well-identified temporal component associated with constitutional design and implementation.

Given these constitutional channels of influence, an excessive amount of change can be predicted to lead to relatively unconstrained government, especially as constitutional change becomes an expectation of incoming regimes as a means of cementing their agenda. But economic and social outcomes are not independent of these political forces, such that the theory outlined above also indicates more constitutional instability is likely linked to lower economic growth over time, due to the comparatively lower commitment credibility environment that constitutional instability creates for powerful organizations in society. Finally, these channels operating at the level of national outcomes are likely propagated through more micro-founded processes, such that this theory also predicts greater uncertainty in fundamental economic institutions like property rights, especially in contexts where the definition of property rights is bound up in the extant political economy itself. To the extent that development over time hinges on some measure of constitutional stability, then this would suggest lower measures of human development writ large.

IV. Measuring Textual Constitutional Change Within a Country

These theoretical channels associated with constitutional change pose a challenging empirical question surrounding how to measure such change. We adopt a formalistic approach, both in terms of focusing strictly on new constitutional documents as defined by drafters, as well as using constitutional texts as the basis for our change measures, as opposed to substantive measures of change calculated by experts in political science and constitutional law.⁷ Given the theory developed thus far, we first calculate measure of textual change between a predecessor

⁷We return to complementarities between our formalistic and computational measures and more qualitative approaches to constitutional change assessment in Section VI.

and successor constitutional document using distinct computational text analysis algorithms, and then use each of these raw measures to calculate the cumulative extent of textual constitutional change from the first to current constitution for each nation. This approach is intended to identify whether a sufficient level of long-term instability in constitutional institutions itself has a persistent effect on outcomes, distinct from the specific effects of a given level of constitutional change posed in a discrete constitutional moment (such as the measure developed by Law and Whelan (2020)). Given the ability to calculate textual change between constitutions, we have thereby developed a long-run measure of constitutional entrenchment.

We generate distinct constitutional measures, which are largely neutral with respect to substantive judgment, although they vary as to the way in which they represent a given textual data into an mathematical object that enables the calculation of distance (dissimilarity) between documents.⁸ This distinction is often referred to as lexical versus semantic similarity, although it should be noted that topic modeling and other techniques are intended to approximate semantic meaning, as opposed to reflect it perfectly. Given these comprehensive measures of long-run textual entrenchment, we next test the extent to which our measures of long-run constitutional textual change are related to governance, economic output and human development. In the following subsections, we present our methods for generating textual distance measures, and then proceed to specify our data sources for our dependent variables alongside our regression specifications relating these data sources to our measures of constitutional change over time.

A. Generating Measures of Long-run Constitutional Textual Change

Our empirical assessment of constitutional change is based on Natural Language Processing (NLP) techniques to quantify the similarity between texts. According to Wang and Dong (2020), the textual similarity analysis can be divided into two different aspects: text distance and text representation. Text representation is the set of all possible approaches available to transform text data into a mathematical structure, while the former represents the set of all possible methods of computing the distance of a text converted into a mathematical representation. Although there is no consensus on what the best textual similarity method is (Gomaa et al. 2013; Mozer et al. 2019; Wang and Dong 2020), substantively similar work has tended to converge on a limited number of approaches (Rockmore et al. 2018; Shaffer and Elkins 2019; Law and Whalen 2020; Rawte et al. 2021).⁹ Our analysis consists of finding convenient lexical and semantic similarity measures that have already been applied to analogous corpora to explore distinct research questions. We ultimately employ three major measures.¹⁰ We calculate

⁸ The motivation of measuring textual similarity across constitutions is well-founded, for a number of interesting findings have resulted from scholars using latent semantic allocation (LSA) and latent Dirichlet allocation (LDA) to explore the substantive similarity of constitutions across nations (Rockmore et al 2018; Rutherford et al 2018) or between constitutional amendments and replacements (Law and Whalen 2020).

⁹ To provide a comprehensive exposition of these techniques would be duplicative of this rapidly maturing field of literature, and well exceed our journal article length constraints. We therefore direct the reader to this source list for a detailed exposition of the application of computational text analysis techniques to a corpus consisting of written constitutions.

¹⁰ Before applying each of the similarity estimation algorithms described, we preprocessed the data. We first lemmatized all texts. Lemmatizing means the use of morphological analysis to identify the root of each word. In our case we did so using the Spacy package (Python language). We then lowercase the words, removed punctuations, digits, references to websites and references to common roman numerals. We then removed stopwords - such as

the constitutional change between each predecessor and successor constitutional document of the same country as well as between the first constitution and all the subsequent constitutions.

For the most lexical measure of similarity between constitutions, we choose the Term Frequency-Inverse Document Frequency (TF-IDF) representation and measured document similarity based on the cosine angle of the vector produced by the TF-IDF algorithm. This approach reflects how important a word is to a constitution in the corpus by weighting its relative frequency in a text compared to its relative presence in the corpus. TF-IDF only accounts for the differences in the lexical features of the constitutions. This approach performs particularly well for longer and more technical texts as is the case for constitutions (Shahmirzadi et al. 2019).

Our second measure uses Latent Dirichlet allocation (LDA) and then applies the Jensen–Shannon Distance to the output of the algorithm. LDA is a generative statistical model that treats documents as bags of words generated by a mix of topics. When passing a corpus of texts as input, the algorithm estimates latent topics of the corpus and classifies each document according to the relevance of those topics. LDA topic modelling has already been used in many domains involving large quantity of documents (Griffiths and Steyvers 2004; Bogdanov and Mohr 2013; Murdock et al. 2017; Barron et al. 2018). By applying the LDA algorithm in the constitutions database, we can describe each article as a probability distribution over the k topics.¹¹ The goal then is to measure the similarity between two probability distributions. Although combining LDA with Jensen-Shannon Distance does not imply perfect semantic similarity as a result, the latent topics uncovered by this approach tend to be embedded with human meaning.

The third measure and closely related to LDA is the Structural Topic Model (STM) (see Roberts et al. 2013; 2014) with subsequent use of Jensen–Shannon Distance. Based on same text representation as the LDA, STM also allows for document-level covariate information. We then use the length of each constitution after the pre-processing, the year and the colonization origin of each country to improve inference of the latent topics. We set the number of topics to equalize with the LDA approach. Figure 1 shows the relationship between those metrics:

“the”, “a”, “an”, for which it is common practice to remove for Computational Text Analysis (CTA) - and saved all 597 constitutions as a dataset containing the country name, year of publication and the cleaned text.

¹¹ We choose the number of topics based on the selection criteria of Coherence Score – 50 topics.

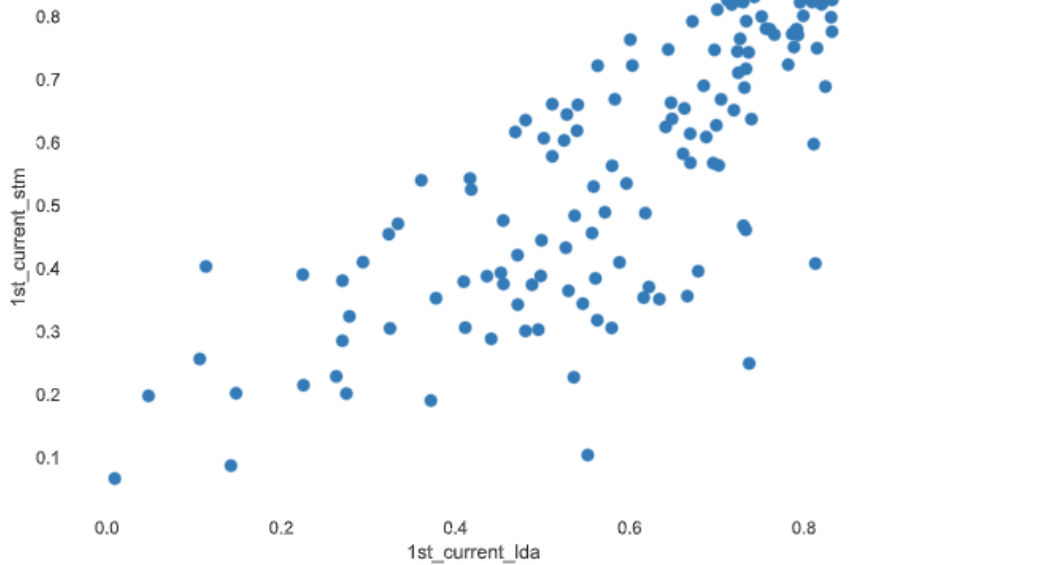


Figure 1: relation between LDA and STM

In our dataset, 63 countries have never changed their constitution. We set those countries with a value of zero as the textual distance and took the sum over all distances between a constitution and their predecessors as an adjusted measure of constitutional change. This approach allows appropriately weight countries that changed their constitutions multiple times while compensating for the estimated change between of each constitution, ultimately producing a better variable than simply counting the number of documents.¹² Given that a raw algorithmic measure of change may be too blunt, though, we transform our “raw” measures of textual change to better approximate the extent of constitutional textual change a given nation has experienced. Our outcome variable of distance (using each of the CTA techniques described here) thus sums the distance between constitutions and their predecessors.

In order to evaluate the quality of our measurements we tested whether the textual change variables have some predictive behavior described by the literature. We first tested if the textual distance between first and current constitution of a given country is related to the endurance of the first constitution and the total amount of constitutional time. We also control for the legal origin,¹³ number of amendments and an average of per capita income (from 2015 to 2019) and an aggregate averaged governance variable (from 2015 to 2020). The results are robust to the theory and are displayed below in Table 1 and 2. All coefficients regarding the endurance of first constitution are negative and significant, implying that countries with short first period tend to have more change between the first and last constitutions.¹⁴ Also, there is a strong correlation

¹² See Table 2.2 to find the label of our variables. We also created an average change by dividing the accumulate

¹³ Legal origin comes from la Porta et al. (2008). We only had two countries with Socialist origin in our constitutional dataset and we thus choose to drop them of the analysis (Myanmar and North Korea).

¹⁴ We also tested for the average change – dividing the sum over all distances between a constitution and their predecessors by the number of documents – results is also highly significant.

between constitutional time and the textual change, implying that time distant constitutions tends to be different. We defined “f_average_governance_2015to2019” as the factorized by Principal Component Factor (PCF) average of the governance measures.¹⁵

The second check we performed was a test if our results are robust to removal of outliers in the dataset. France, Venezuela, Yugoslavia and Spain all have more than nine constitutions on total, which tend to increase the values of textual distance. Our results are robust to the exclusion of these countries from our regressions (See Appendix A for results).

	(1) st_current_tfidf	(2) st_current_lda	(3) st_current_stm	(4) st_current_use
first_regime_time	−0.00353*** (0.000)	−0.00313*** (0.000)	−0.00350*** (0.000)	−0.000662*** (0.003)
constitutional_time	0.00410*** (0.000)	0.00324*** (0.000)	0.00331*** (0.000)	0.00113*** (0.000)
legor_uk	−0.288 (0.124)	−0.363*** (0.000)	−0.315*** (0.002)	−0.0655* (0.100)
legor_fr	−0.162 (0.402)	−0.287*** (0.008)	−0.266*** (0.010)	−0.0270 (0.495)
legor_ge	−0.0987 (0.623)	−0.221** (0.050)	−0.241** (0.024)	−0.0160 (0.688)
num_amendments	−0.00362*** (0.005)	−0.000571 (0.641)	0.000185 (0.854)	−0.000773* (0.099)
avg_l_gdp_2015_2019	−0.0264 (0.371)	−0.0113 (0.624)	−0.0174 (0.411)	−0.00457 (0.544)
f_average_governance_2015to2020	−0.0896** (0.020)	−0.112*** (0.001)	−0.110*** (0.001)	−0.0316*** (0.006)
_cons	0.688** (0.034)	0.660*** (0.005)	0.663*** (0.003)	0.124 (0.117)
<i>N</i>	157	157	157	157
<i>R</i> ²	0.507	0.510	0.553	0.417
adj. <i>R</i> ²	0.480	0.483	0.529	0.385
pseudo <i>R</i> ²				
<i>AIC</i>	36.27	−18.82	−38.60	−316.6
<i>BIC</i>	63.78	8.690	−11.10	−289.0

p-values in parentheses
* *p* < 0.10, ** *p* < 0.05, *** *p* < 0.01

Table 1: Relationship Between Textual Distance Measures and Other Salient Change Measures

B. Change as Related to Major Development Indicators

Our motivating premise surrounds a level of constitutional change past which the costs exceed the anticipated benefits. A constitution is deeply bound up in the operation of the government (Riker 1980; Shepsle and Weingast 1981), which makes a focus on governance indicators (World Bank 2022) a natural choice of outcome to explore. Economic outcomes also hinge on sufficient certainty for costly investments among independent economic actors (Alston and Smith 2022; Wallis 2022), such that we also consider per capita gdp (World Bank 2022) as a measure that has theoretical linkages to constitutional change. A yet broader argument is that stability in fundamental rulesets is an input to reducing uncertainty for costly responses to

¹⁵ Using all governance data from Word Bank. This approach has already been used on Knack and Langbein (2010).

negative outcomes. The countries that avoid periods of stagnation and decline that result from these shocks are the ones that prosper over the long run (Broadberry and Wallis 2016). This both serves to justify our chosen time scale of analysis, but also motivates our exploration of human development outcomes, for which we chose the indicator of augmented human development (Leandros de la Escosura 2020). The full suite of our independent variables, dependent variables, and controls can be found in Tables 2.1 and 2.2 below.

There are several limitations to this research design. Those for which there are commonly accepted empirical controls we consider in this section due to their appearance in our regression analyses. Those limitations for which there are less clear empirical controls appear in our discussion section, for many of them offer promising extensions of our research agenda. First, one concern surrounds the long-studied distinction between common and civil law systems, for which we include a control a dummy variable in our regression analysis for countries that have a common law system. A second critique is related to constitutions in authoritarian regimes, which arguably have different functions than providing the improvements in governance and human welfare traditionally associated with constitutional turnover in more liberal orders. We accordingly use a measure of democracy in our regressions. Lastly, we include a variety of national-level controls in our analysis to control for the other factors that have been more closely linked to our outcomes of interest in the extant literature on the topic.

	Mean	SD	Min	Max	N
<i>Constitutional variables</i>					
Distance between first and current constitutions USE algorithm	0.10	0.11	0.00	0.52	190
Distance between first and current constitutions LDA algorithm	0.39	0.32	0.00	0.83	190
Distance between first and current constitutions STM algorithm	0.37	0.31	0.00	0.83	190
Distance between first and current constitutions TFIDF algorithm	0.41	0.37	0.00	1.00	190
The accumulated distance between all constitutions USE algorithm	0.18	0.25	0.00	1.84	190
The accumulated distance between all constitutions LDA algorithm	0.83	0.97	0.00	5.31	190
The accumulated distance between all constitutions STM algorithm	1.13	1.75	0.00	13.76	190
The accumulated distance between all constitutions TFIDF algorithm	1.06	1.44	0.00	8.81	190
Amount of years in constitutional regime	85.73	57.43	11.00	233.00	190
Number of constitutions	3.10	2.73	1.00	21.00	190
Estimated length of last constitution after preprocessing	19520.64	14153.78	2860.00	67260.00	183
Number of years with amendments in all constitutions	14.76	17.63	0.00	98.00	180
<i>Historical/Socio-economics indicators</i>					
French Legal Origin	0.53	0.50	0.00	1.00	172
German Legal Origin	0.12	0.32	0.00	1.00	172
Scandinavian Legal Origin	0.03	0.17	0.00	1.00	172
British Legal Origin	0.33	0.47	0.00	1.00	172
log GDP per capita (USD)	9.35	1.14	6.65	11.68	173
Augmented Human Development Index (AHDI) - Los Prados (2021)	0.43	0.19	0.11	0.86	155
Net Foreign direct investment (BoP - current USD)	-7.0e+08	2.2e+10	-1.2e+11	1.2e+11	155
Human Capital Index (HCI - 2020)	0.56	0.14	0.29	0.88	162
Military expenditure (% of GDP) - 2020	1.95	1.57	0.00	10.87	140
Population - 2020	4.1e+07	1.5e+08	10834.00	1.4e+09	182
Control of Corruption: Estimate - 2020	-0.06	1.00	-1.91	2.27	185
Government Effectiveness: Estimate - 2020	-0.07	0.99	-2.34	2.34	185
Political Stability: Estimate - 2020	-0.08	0.99	-2.73	1.70	186
Regulatory Quality: Estimate - 2020	-0.08	0.99	-2.34	2.21	185
Rule of Law: Estimate - 2020	-0.07	0.99	-2.35	2.08	185
Voice and accountability: Estimate - 2020	-0.03	1.00	-2.08	1.73	186
Principal Component Factor of governance (unique) - 2020	0.00	1.00	-2.19	2.03	185
Inflation, consumer prices (annual %) - 2020	8.20	47.43	-2.60	557.20	150
Country total area (sq. km) - 2020	7.1e+05	2.0e+06	2.03	1.7e+07	181
real interest rate (%) - 2020	7.24	12.52	-79.80	48.52	103

Table 1.1 Summary Statistics

Variable	Description	Source
st_current_tfidf	Distance between first and current constitutions - TFIDF algorithm	Authors - Constitutional text from CCP
st_current_lda	Distance between first and current constitutions - LDA algorithm	Authors - Constitutional text from CCP
st_current_use	Distance between first and current constitutions - USE algorithm	Authors - Constitutional text from CCP
st_current_stm	Distance between first and current constitutions - STM algorithm	Authors - Constitutional text from CCP
tfidf_distance	Accumulated distance between all constitutions - TFIDF algorithm	Authors - Constitutional text from CCP
lda_distance	Accumulated distance between all constitutions LDA algorithm	Authors - Constitutional text from CCP
use_distance	The accumulated distance between all constitutions USE algorithm	Authors - Constitutional text from CCP
stm_distance	Accumulated distance between all constitutions STM algorithm	Authors - Constitutional text from CCP
constitutional_time_2020	Amount of years in constitutional regime - 2020	Authors - CCP data
constitutional_time_2015	Amount of years in constitutional regime - 2015	Authors - CCP data
num_constitutions	Total number of constitutions	Authors - CCP data
e_len_last_const	Estimated length of the last constitution after preprocessing	Authors - Constitutional text from CCP
num_amendments	Total number of years that amendments happened in any constitution of the country	CCP dataset - characteristics of National Constitutions
legor_fr	French Legal Origin	La porta et al. (2008)
legor_ge	German Legal Origin	La porta et al. (2008)
legor_sc	Scandinavian Legal Origin	La porta et al. (2008)
legor_uk	British Legal Origin	La porta et al. (2008)
log_gdp_capita_2020	Log GDP per capita, PPP (current international \$) - 2020	World Bank, World Development Indicators (searched in 2022)
ahdi_2015	Augmented Human Development Index (AHDI) - 2015	Prados de la Escosura (2021)
n_fdi_2020	Net Foreign direct investment (BoP - current USD) - 2020	World Bank, World Development Indicators (searched in 2022)
n_fdi_2020	Net Foreign direct investment (BoP - current USD) - 2015	World Bank, World Development Indicators (searched in 2022)
hci_2020	Human Capital Index (HCI) - 2020	World Bank, World Development Indicators (searched in 2022)
milit_expend_gdp_2020	Military expenditure (% of GDP) - 2020	World Bank, World Development Indicators (searched in 2022)
population_2020	Population - 2020	World Bank, World Development Indicators (searched in 2022)
population_2015	Population - 2020	World Bank, World Development Indicators (searched in 2022)
control_corruption_2020	Control of Corruption: Estimate - 2020	World Bank, Worldwide Governance Indicators (searched in 2022)
control_corruption_2015	Control of Corruption: Estimate - 2015	World Bank, Worldwide Governance Indicators (searched in 2022)
gov_effectiveness_2015	Government Effectiveness: Estimate - 2015	World Bank, Worldwide Governance Indicators (searched in 2022)
political_stability_2020	Political Stability: Estimate - 2020	World Bank, Worldwide Governance Indicators (searched in 2022)
political_stability_2015	Political Stability: Estimate - 2015	World Bank, Worldwide Governance Indicators (searched in 2022)
regulatory_quality_2020	Regulatory Quality: Estimate - 2020	World Bank, Worldwide Governance Indicators (searched in 2022)
regulatory_quality_2015	Regulatory Quality: Estimate - 2015	World Bank, Worldwide Governance Indicators (searched in 2022)
rule_of_law_2020	Rule of Law: Estimate - 2020	World Bank, Worldwide Governance Indicators (searched in 2022)
rule_of_law_2015	Rule of Law: Estimate - 2015	World Bank, Worldwide Governance Indicators (searched in 2022)
voice_accountability_2020	Voice and accountability: Estimate - 2020	World Bank, Worldwide Governance Indicators (searched in 2022)
voice_accountability_2015	Voice and accountability: Estimate - 2015	World Bank, Worldwide Governance Indicators (searched in 2022)
factor_governance_2020	Principal Component Factor of governance (unique) - 2020	Authors - Estimation of factorized (PCF) aggregate variable using WGI data
factor_governance_2015	Principal Component Factor of governance (unique) - 2015	Authors - Estimation of factorized (PCF) aggregate variable using WGI data
inflation_consum_2020	Inflation, consumer prices (annual %) - 2020	World Bank, World Development Indicators (searched in 2022)
inflation_consum_2015	Inflation, consumer prices (annual %) - 2020	World Bank, World Development Indicators (searched in 2022)
area	Country total area (sq. km) - 2020	World Bank, World Development Indicators (searched in 2022)

Table 2.2 Variables and Data Sources

V. Results & Interpretation

Our results for our three distinct regression specifications; testing governance, economic and human development outcomes respectively; can be found in tables 3.1, 3.2, and 3.3 below. In sum, we identify a strongly significant negative relationship between cumulative constitutional textual distance and contemporary governance outcomes within a given nation for all three of our measures of constitutional textual distance. With respect to contemporary economic output per capita, we identify a moderately significant (95% level) negative relationship for constitutional textual change for two of our three measures of constitutional textual distance. Finally, as regards augmented human development, we identify a moderately significant (95% level) negative relationship between textual change for two of our three distance measures.

	(1) factor_governance_2020	(2) factor_governance_2020	(3) factor_governance_2020
tfidf_distance	-0.107** (0.014)		
lda_distance		-0.190*** (0.003)	
stm_distance			-0.142*** (0.000)
constitutional_time_2020	0.00228* (0.056)	0.00260** (0.021)	0.00334*** (0.004)
num_amendments	0.000682 (0.816)	0.000411 (0.884)	0.000219 (0.940)
legor_fr	-0.704*** (0.000)	-0.686*** (0.000)	-0.652*** (0.000)
legor_uk	-0.456*** (0.004)	-0.443*** (0.004)	-0.402** (0.013)
legor_ge	-0.480** (0.010)	-0.459** (0.013)	-0.424** (0.019)
population_2020	-2.93e - 10* (0.091)	-3.07e - 10* (0.068)	-2.06e - 10 (0.113)
log_gdp_capita_2020	0.227** (0.016)	0.222** (0.015)	0.216** (0.019)
hci_2020	2.759*** (0.001)	2.756*** (0.001)	2.597*** (0.002)
inflation_consum_2020	-0.00806*** (0.000)	-0.00796*** (0.000)	-0.00814*** (0.000)
milit_expend_gdp_2020	-0.0694** (0.011)	-0.0704*** (0.008)	-0.0716** (0.011)
_cons	-2.922*** (0.000)	-2.863*** (0.000)	-2.814*** (0.000)
<i>N</i>	119	119	119
<i>R</i> ²	0.796	0.801	0.810
adj. <i>R</i> ²	0.775	0.780	0.790
pseudo <i>R</i> ²			
<i>AIC</i>	154.0	150.9	145.5
<i>BIC</i>	184.5	181.5	176.1

p-values in parentheses

* *p* < 0.10, ** *p* < 0.05, *** *p* < 0.01

Table 3.1 - Governance Effects of Change

Table 0.3: OLS Regressions

	(1) log gdp capita 2020	(2) log gdp capita 2020	(3) log gdp capita 2020
tfidf_distance	-0.0784** (0.018)		
lda_distance		-0.103** (0.045)	
stm_distance			-0.0539 (0.170)
constitutional_time_2020	0.00207* (0.086)	0.00187 (0.118)	0.00176 (0.173)
num_amendments	-0.00258 (0.265)	-0.00248 (0.298)	-0.00229 (0.330)
e_len_last_const	0.00000255 (0.428)	0.00000299 (0.348)	0.00000343 (0.300)
legor_fr	0.355** (0.027)	0.357** (0.020)	0.342** (0.029)
legor_uk	0.221 (0.246)	0.221 (0.231)	0.211 (0.252)
legor_ge	0.186 (0.216)	0.188 (0.188)	0.165 (0.265)
n_fdi_2020	-8.80e - 14 (0.964)	-1.51e - 13 (0.939)	-3.49e - 13 (0.854)
population_2020	-1.39e - 10 (0.468)	-1.79e - 10 (0.352)	-1.44e - 10 (0.452)
hci_2020	5.254* * * (0.000)	5.281* * * (0.000)	5.225* * * (0.000)
area	1.22e - 08 (0.565)	1.40e - 08 (0.514)	1.25e - 08 (0.545)
political_stability_2020	0.0702 (0.398)	0.0615 (0.475)	0.0788 (0.354)
rule_of_law_2020	-0.00883 (0.964)	-0.00493 (0.980)	-0.0179 (0.928)
voice_accountability_2020	-0.172 (0.144)	-0.168 (0.157)	-0.174 (0.153)
regulatory_quality_2020	0.343** (0.041)	0.330* (0.053)	0.353** (0.037)
gov_effectiveness_2020	0.124 (0.498)	0.126 (0.495)	0.116 (0.532)
control_corruption_2020	0.00730 (0.957)	0.0163 (0.904)	0.0172 (0.898)
_cons	6.053* * * (0.000)	6.045* * * (0.000)	6.060* * * (0.000)
<i>N</i>	132	132	132
<i>R</i> ²	0.844	0.842	0.840
adj. <i>R</i> ²	0.820	0.818	0.816
pseudo <i>R</i> ²			
<i>AIC</i>	186.6	188.2	189.6
<i>BIC</i>	232.8	234.3	235.7

p-values in parentheses* *p* < 0.10, ** *p* < 0.05, *** *p* < 0.01

Table 3.2 - Economic Effects of Change

Table 0.4: OLS Regressions

	(1) ahdi_2015	(2) ahdi_2015	(3) ahdi_2015
tfidf_distance	-0.0103** (0.029)		
lda_distance		-0.0180** (0.016)	
stm_distance			-0.00610 (0.249)
constitutional_time_2015	0.000507*** (0.001)	0.000537*** (0.001)	0.000457*** (0.005)
num_amendments	-0.000282 (0.329)	-0.000290 (0.317)	-0.000257 (0.383)
e_len_last_const	-0.000000196 (0.699)	-0.000000111 (0.830)	-7.87e - 08 (0.887)
legor_fr	-0.0106 (0.630)	-0.00836 (0.685)	-0.0149 (0.479)
legor_uk	-0.0264 (0.313)	-0.0259 (0.305)	-0.0297 (0.251)
legor_ge	0.0575*** (0.006)	0.0616*** (0.002)	0.0519** (0.012)
gov_effectiveness_2015	0.123*** (0.000)	0.122*** (0.000)	0.124*** (0.000)
rule_of_law_2015	-0.0395** (0.041)	-0.0389** (0.042)	-0.0400** (0.038)
voice_accountability_2015	0.0950*** (0.000)	0.0940*** (0.000)	0.0947*** (0.000)
population_2015	-1.08e - 10*** (0.000)	-1.13e - 10*** (0.000)	-1.09e - 10*** (0.000)
area	4.71e - 09** (0.018)	5.09e - 09** (0.011)	4.68e - 09** (0.027)
_cons	0.421*** (0.000)	0.420*** (0.000)	0.422*** (0.000)
<i>N</i>	142	142	142
<i>R</i> ²	0.902	0.903	0.900
adj. <i>R</i> ²	0.893	0.894	0.891
pseudo <i>R</i> ²			
<i>AIC</i>	-379.9	-380.9	-377.0
<i>BIC</i>	-344.4	-345.5	-341.5

p-values in parentheses

* *p* < 0.10, ** *p* < 0.05, *** *p* < 0.01

Table 3.3 - AHDI Effects of Change

We consider the implications of each of our identified outcomes in turn. Our tightest relationship, both in terms of statistical significance and uniformity of result across all measures, surrounds a cumulative measure of good governance compiled by the World Bank. The strongest significance directly corresponds to the tighter link between constitutional processes and the production of governance by public sector actors. Whether a constitution constrains or defines a governance plan for powerful public sector organizations (Ginsburg and Simpsen 2013), it is spelling out the boundaries within which government authorities are acting. Greater changes to

these margins over time thus could mean less effective constraints on behavior, or greater scope of choice for public sector actors. To the extent that poor governance directly informs expectations, and therefore, constitutional norms over time, this could be a channel by which persistence in unconstrained governance propagates through formal textual channels. While the most mechanical of our findings, we believe this tight relationship between long-run textual stability and contemporary measures of good governance additionally grounds our moderately significant findings as to economic output and human development. If good governance is an input to economic or human prosperity, then our stronger negative relationship with respect to governance may well be an input to our additional findings.

With respect to economic output being negatively related to textual constitutional change over the long run, we view this result as consistent with the role that constitutional stability plays in providing the institutional stability necessary to build durable commitments (Broadberry and Wallis 2016). Credible impersonal enforcement of economic contracts and organizations is viewed as an important input to economic activity over time (North 1990; North, Wallis and Weingast 2010; Wallis 2022; Wallis Forthcoming). Uncertainty as to the microeconomic terms of these commitments has been linked persistently less economic development over extended periods of time (Alston and Smith 2022). We see the link between average individual economic output and constitutional textual as uncovering one mechanism by which institutional instability can affect the scope and magnitude of costly intertemporal economic commitments that are feasible over time. This is directly consistent with the characterization of economic and financial institutions as “fragile by design” (Calomiris and Haber 2015), wherein political actors retain control of the margins of these institutions to secure electoral support in future periods (Albertus 2021). Furthermore, with increasing global capital market integration, the relative stability of different institutional environments is itself an input to relative levels of productive economic investment over the long term (Alston et al 2021). These all suggest channels of influence from public institutional definition to economic outcomes over the long run. Our findings may suggest one way how comparative economic development diverges through the extent to which greater levels of constitutional change destabilize or facilitate the capture of economic rents over time.

Our third finding indicates an effect on broader measures of human development, as opposed to more narrowly delineated measures of governance and economic output. Our findings in the same direction and moderate statistical significance can be interpreted in a similar lens to our economic output results – while less mechanically linked to the formal textual definition in the constitution itself, all forms of voluntary interaction in large complex human societies depend on the impersonal enforcement of institutions across all classes of activity. Beyond the class of interactions that can be quantified as economic production, human associations ranging from the religious to the philanthropic to the intimate nonetheless depend on the institutional backdrop ultimately delineated by the organs of authority laid down in the constitution. Clearly, human development is about more than impersonal institutional enforcement, but the relationship between the rule of law and human development is well-recognized. We view our results as in line with this relationship, although we are hesitant to make a definitive causal claim, given the time scale and breadth of countries subject to our analysis, a point of causal identification humility we develop further in the following section.

Finally, we consider our results as adding to the rapidly developing field of computational text analysis using written constitutions as the corpus. Of relevance to studies of constitutional entrenchment surrounds the extent to which our result is robust to the inclusion of the number of constitutional amendments and the length of the prior constitution. Despite the comparatively well-identified role that each of these margins of constitutional change has in the literature, our results suggest that cumulative change in constitutional text is an additional variable of interest. One possible interpretation of the comparative insignificance of constitutional length in our outcomes is that it is not necessarily the size of the constitution that matters but the fact the new constitution tends to get bigger and having too much constitutional change might be harmful (or a harmful signal). Furthermore, in a world of increasingly mobile human and financial capital, this effect could be a relative one – while all nations may need to permit some measure of constitutional flexibility (Elkins et al 2009; Versteeg and Zackin 2016; Law and Whalen 2020), being sufficiently far outside the norm with respect to the level of constitutional change that a given order accommodates may have detrimental and persistent effects on governance, economic activity, and human development more generally.

VI. Limitations & Extensions

A clear limitation of our approach so far is implicated by the extent to which our motivating discussion on constitutional change surrounds amendments. Amendment procedures, frequency, and substance are all clearly margins of constitutional change that matter alongside wholesale constitutional overhaul. Indeed, our empirical analysis controls for amendment frequency because of this concern. Nonetheless, there is more work to be done here, at a minimum taking the most recent constitution as amended to the final point before constitutional turnover may arguably be a better measure than constitutional text to its proximal replacement.¹⁶ At a more granular level, our techniques could be applied from each constitution as amended to display constitutional textual evolution more faithfully. This would be most like the previous use of computational text analysis to assess whether a constitutional amendment is more of a replacement than a marginal adjustment (Law and Whelan 2020). An interesting extension we envision with respect to including an analogous approach to assessing the textual change a given amendment entails is whether sufficiently transformative amendments are themselves likely to forestall or avoid constitutional replacement.

Another salient critique is that applying a rigidly quantitative empirical lens on constitutional change is painting with too broad of a brush given the highly specific role that different constitutional provisions and sections play, as well as the political, economic, and cultural context in which a new constitution is to be implemented. In particular, recent findings emphasize that some fundamental rights governing organization are likely to bind in ways that other more individually-adherent rights provisions are not (Chilton and Versteeg 2020), suggesting that there are limitations to a mechanical estimation of change without more granular substantive assessment of the specific changes to the constitution at the article level. Relatedly, the recognition that the role the constitution plays in balancing opposing political interests is one

¹⁶ This approach would correspond closely to Albert's (2018) preferred means of measuring change resultant from a given constitutional amendment, as that constitutional understanding most temporally proximate to when the change occurred.

where changes to one area may be far more destabilizing than others (Dixon and Ginsburg 2018). Entrenchment of specific provisions in an otherwise flexible context is another model suggesting that analysis at the corpus level may miss specific change margins that matter more than others (Dixon and Landau 2018). Although this critique does not invalidate our research project, we are nonetheless quite sensitive to the benefits of a qualitative approach to analysis of constitutional change. Rather than effacing the detail that a more qualitative lens can reveal, our approach should instead be understood as complementary. Simply by identifying contexts of constitutional replacement that resulted in the most change to a particular constitutional regime, our project directly suggests specific case studies for further research into questions of constitutional change (and its determinants and effects).

The Comparative Constitutions Project also provides a specific qualitative textual complement to our research question, which we are currently pursuing as an extension. The amount of granular qualitative data surrounding the actual content of constitutions around the world provides a unique opportunity to consider the preceding question of the impact of comparative levels of constitutional change within a country. The CCP tabulates over eight hundred substantive aspects that a constitution might contain, from fundamental government structures, to rights provisions, to subnational governments, to transitional oversight, to name a few key areas. This dataset therefore provides a readily definable baseline by which to measure the amount that a new constitution changes compared to the preceding one. We intend to use the robust CCP dataset to measure the amount of constitutional change between each turnover in each nation's constitution, as measured by changes to the specific questions answered in compiling the CCP dataset.¹⁷ At the level of comparative measures, a valuable methodological question surrounds the extent to which computational measures of textual distance correlate to a measure of formal constitutional change as manually coded by research associates of the CCP.

We also cannot rule out deeper structural forces that codetermine constitutional change and the political, economic, and social outcomes we identify as significantly correlated with this change. We are therefore hesitant to overconfidently ascribe causal identification at a level spanning centuries and continents. At a minimum, identifying a relationship between aggregate textual change over time and contemporary outcome measures provides a quantitative margin by which to explore how constitutional textual change matters.

While we have added a persistent cost associated with too much textual change over time, we do not consider this finding dispositive of the debate we briefly review in our second section. Indeed, our synthesis of the literature indicates how netting out these at times countervailing, and at time complementary forces is not only case-specific, but also requires a deep understanding of the constitutional values that animate the formal text (Chilton and Versteeg 2022). Nonetheless, even if we take a more agnostic view of the causality of textual change and outcome measures, the relationship we have identified suggests sufficiently high levels of textual instability as a possible third best constitutional institutional equilibrium. In contexts with sufficient physical or political conflict, textual change may be endogenous to the broader set of national characteristics that determine this potential for conflict. Therefore, the

¹⁷ One of the coauthors has coded a large number of constitutions using the CCP instrument, a familiarity with which should prove a beneficial input to generating aggregate change measures from the raw changes to survey answers from one constitution to another.

benefits of constraining implementation and interpretation of constitutional text could be net beneficial despite margins of appreciable costs along the lines for which we provide evidence here. Even taking no small measure of the political and economic costs we identify as due to omitted features of the national context, our results suggest that there are upper limits to the desirability of constitutional change before such change becomes part of the poor governance context that constitutional entrenchment is intended to ameliorate.

Finally, this research design provides suggestive evidence about the limitations of formal constitutional textual measures intended to improve human rights outcomes and governance. Namely, those countries most in needs of improvements to these outcomes that enact constitutional measures to create progress are paradoxically the same countries where such measures face some upper limit on their ability to realize their intended effects. By focusing on a broader measure of change, and how this may strain a given nation's governance capacity, our research provides suggestive evidence as to the limits to which formal textual change can itself foment, as opposed to hinder, this intended change.

VII. Conclusion

The study of constitutional turnover is animated by the idea that wholesale overhaul of the constitutional regime does not typically occur absent a massive demand for change in governance institutions, either popular or on the part of the elite. Absent such a demand, constitutional change does not make sense considering the major costs associated with such overhaul. However, past a certain point, a constitution that promises (or envisions) too much change can delegitimize itself due to the inability of the implementing regime to live up to the mandates of the constitution. These competing pressures therefore imply some optimal level of constitutional change. Too little, and the underlying need for change goes unsatisfied. Too much, and the constitution fails to live up to its promise, and may directly contribute to poor governance and more broadly detrimental economic and human development outcomes. Over time, an overly entrenched constitution may not endure. In contrast, though, a fully unentrenched constitution may prove to weaken the animating vision for constitutional ordering itself.

Our research question is thus grounded in competing visions for constitutional change. On the side of entrenchment is the recognition that some amount of institutional certainty is an input to economic, social, and human development. Institutions' coordinative and constraining function depends on stability in the secondary rules that facilitate governance in an ongoing sense. If sufficient stability in secondary rules is central to the institutional definition and redefinition that defines complex modern polycentric orders, then constitutions should provide a fertile ground by which to consider the importance of institutional stability. Nonetheless, sufficient flexibility and increasing specificity over time are emergent properties of observed constitutional orders globally, which tracks with the recognition that some measure of constitutional change is necessary, given the fact that constitutional replacement is mechanically costly and bound up in moments of fundamental change for a country.

To further explore these countervailing forces of constitutional change, we develop a set of measures of textual distance over time, and then consider the relationship between these measures of entrenchment in a nation's fundamental ruleset with measures of governance outcomes, economic output, and human development. We proceed by generating a set of "raw"

measures of textual constitutional change using several computational text analysis approaches, and then create comprehensive measures more suitable for cross-country comparison, controlling for some of the obvious concerns such as temporal variation and amendments over time. Once these measures are generated, this then poses an empirical identification question in terms of the specification and controls for regression models intended to explore the relationship between textual change and political, economic, and social outcome measures.

Our novel measures of textual change between each predecessor and successor constitutional document are estimated using computational text analysis algorithms that vary as to the extent to which they approximate lexical as opposed to semantic similarity. This choice hinges on the recognition that formal constitutional text matters, as does the substance animating this text. While our measures hinge on the actual constitutional text, the distinction between lexical and semantic measures of textual content both potentially estimate the amount of change between constitutions. In the first case, comparing two constitutions is conceptually similar to measuring the union of their word sets. Importantly, though, our technique also controls for position and repetition to deal with the fact that constitutional change often operates through addition, something a mere plagiarism check would count as similarity, falsely so for the purposes of the research question here. As to the more semantic approaches, we use topic modelling algorithms to generate a distribution of topics for each nation's constitutions.

Thus, for countries with more than one constitution, we calculate the distance between the topic distribution of each constitution, both between each predecessor and successor document, as well as total cumulative distance from first to current constitution (in the cases of nations with three or more constitutions). This results in a distinct measure of textual similarity which we regress alongside more traditional measures of constitutional change. We apply other relevant standard controls with respect to the constitutional text itself including legal origin, which is plausibly a direct transmission channel for constitutional culture which likely influences the frequency and magnitude of constitutional change a nation experience.

With our novel set of measures of long-run constitutional textual entrenchment, we explore the relationship between formal constitutional textual change and political, economic and human development outcomes. We use: (i) governance outcomes; (ii) conventional GDP per capita measures (iii) the Adjusted Human Development index, and find a largely negative set of results across our chosen indicators. These results are strongly significant and consistently negative across all three of our measures of constitutional change. Our results with respect to economic output and augmented human development are moderately significant (95%) across two of our three distance measures. In addition to the specific links between constitutional entrenchment and governance, economic output, and human development that we explore in our discussion, we see the results in general as indicating that constitutional textual change matters. While economic and human development outcomes rely on more than a nation's constitutional firmament, our results suggest that sufficient instability in a nation's secondary rules can have persistently negative outcomes.

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