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GENERAL & APPLIED ECONOMICS | RESEARCH ARTICLE

Are constitutional characteristics a proxy for institutional quality? Evidence from 109 countries

Ayşe Y. Evrensel^{1*}

Abstract: The paper investigates the question whether constitutions are a proxy for institutional quality. It provides a discussion of institutions and states that constitutions are an example of a formal institution. As any other formal institution, constitutions are also influenced by countries' informal institutions, including customs and belief systems. The novel content analysis goes beyond the often-used constitutional characteristics of government systems and electoral rules. In addition to the mentioned characteristics, the length, the number of revisions, and over 30 additional characteristics are coded for 109 constitutions, such as state religion and religious freedom as well as referring to state as mother, father or holy. Based on the content analysis, alternative constitutional scores are calculated. Statistically significant correlations are observed between measures of institutional quality such as corruption control and some of the constitutional scores. Based on the two widely-used economic development models, the OLS and two-stage least squares estimations are conducted with and without the institutional quality-related variables, where in the latter case the institutional quality-related variables are replaced by constitutional scores. Especially in two-stage least squares estimations, constitutional scores that emphasize the length, mention state religion, and refer to state as mother, father or holy statistically significantly and negatively affect income per capita. These findings point out to possible limitations to change that is aimed by constitutional revisions.

ABOUT THE AUTHOR

Ayşe Y. Evrensel is an Associate Professor of Economics in the Department of Economics and Finance at Southern Illinois University Edwardsville. Her teaching is focused on International Economics and Macroeconomics at the undergraduate and graduate level. Her earlier publications examined exchange rate regimes, effectiveness of IMF programs, FDI, preferential trade agreements, and the corruption-growth relationship. Recently, her research focus has been directed toward culture and institutions. She has published empirical multi-country studies on the historical and cultural origins of institutional quality.

PUBLIC INTEREST STATEMENT

Institutions can be formal, such as written laws and constitutions, or informal, such as culture and the shared belief system that implicitly describes acceptable behavior in a given social group. There are important reasons as to why we examine various types of institutions and institutional quality, the most important of which is that the characteristics of institutions in a country have an effect on the country's economic development. Some institutional characteristics such as promoting the rule of law, corruption control, limits to the power of the country's executive (that of the president or prime minister) are believed to support economic development. Only a few studies examine constitutions in a multi-country setting and these studies usually focus on two characteristics of constitutions: government type and electoral rules. This study conducts a more comprehensive content analysis of a large number of constitutions to find out whether constitutional and institutional characteristics are related.

Subjects: Socio-Legal Studies; Culture & Development; Economics and Development

Keywords: Constitutions; institutions; colonialism; culture; income

Subjects: K39; O43; Z10

1. Introduction

Economists' initial interest in constitutions focused on constitutions' ability to generate the most basic layer of rules for societies, which was expected to affect economic outcomes (Buchanan & Tullock, 1962). North and Weingast (1989) provide the application of this view to the constitutions of Western European countries to identify different economic outcomes associated with different sets of basic rules in these countries. Subsequent empirical studies on constitutions analyze the relationship between the most obvious constitutional characteristics and economic outcomes. Some studies examine the effects of government types (presidential vs. parliamentary) on fiscal policy outcomes (Andersen & Aslaksen, 2008; Eicher et al., 2018; Milesi-Ferretti et al., 2002; Persson & Tabellini, 2002; Rockey, 2012; Sutter, 1998). The others focus on the effects of electoral rules (majoritarian vs. proportional) on corruption and infrastructure investment (Eicher et al., 2018; Persson et al., 2003; Persson and Tabellini 2004a , 2004b).

The motivation for this paper came from the author's reading of the 1982 Turkish Constitution more than three decades ago. The first page of the Turkish Constitution contains the phrase *Holy Turkish State* as opposed to *We the People* in the U.S. constitution. Additionally, the Turkish Constitution is a fairly long book that basically talks about everything under the sun compared to the U.S. constitution that looks like a short template. Clearly, countries have different approaches to their constitutions. Some of them elevate state to a high status and adorn it with phrases such as mother, father, or sacred. As North (1990) suggests, formal institutions are influenced by informal institutions where informal institutions are defined as the cultural and historical collective experience of a society. This view enables us to go beyond the often-used constitutional characteristics such as government systems and electoral rules and add other constitutional characteristics to the list.

The paper aims to demonstrate that constitutional characteristics are related to countries' institutional characteristics. If this is the case, constitutional characteristics can be used as a proxy for institutional characteristics, for example, in economic development and growth regressions. However, this objective necessitates a multidimensional content analysis of a large number of constitutions. The novel dataset includes 109 countries whose constitutions are coded for over 30 characteristics. Among these characteristics, there is the length of constitutions as well as mentioning state religion and referring to state as mother, father or holy. Based on the content analysis, six alternative constitutional indices are calculated, which are normalized as constitutional scores between 0 and 1. The normalization of scores is done in a way so that higher scores would indicate higher institutional quality. Assuming that constitutions are an example for formal institutions, statistically significant correlations are observed between corruption control, bureaucratic quality, and the average institutional quality, which are considered informal institutions, and some of the constitutional scores.

The constitutional scores are put to the test by replicating two widely-used economic development models. The benchmark OLS and the two-stage least squares estimations are first conducted with institutional quality-related variables. Then, these variables are replaced by constitutional scores. The results suggest that the explanatory power of constitutional scores for real GDP per capita depends upon the empirical model. Especially in two-stage least squares estimations, constitutional scores that emphasize the length, mention state religion, and refer to state as mother, father or holy are statistically significant.

While novel, this study represents a crude content analysis of a large number of constitutions. The fact that only some of the constitutional scores correlate with (informal) institutional quality implies the presence of noise in the measurement of constitutional characteristics, which stems from various issues. First, a common challenge in institutional quality-related studies is that complementarity of formal and informal institutions (or the lack thereof) can vary among countries (Helmke & Levitsky, 2004; Poppo & Zenger, 2002). For example, even though presidential government systems are assumed to be associated with smaller and more efficient governments, a country's political culture would make this system less efficient. Second, bluntly put, the content of constitutions may reflect wishful thinking in that the country's constitution is unable to improve the conditions that are aimed to be improved. In other words, the content of the constitution is not effectively implemented. Third, additional dimensions of constitutional characteristics are needed to create a higher degree of variation in constitutional quality.

Viewing constitutions as a formal institution and assuming that constitutions should be related to countries' informal institutional characteristics such as corruption or bureaucratic quality is an important line of inquiry. This view tells us that constitutions or their revisions should not be examined in a vacuum. A country's informal institutional characteristics are expected to be visible in its constitutions and constitutional revisions. The implication of this line of inquiry is that new constitutions or constitutional revisions may not bring the expected change, as long as informal institutions that affect constitutions do not change.

The paper is organized as follows. Section 2 provides a discussion on institutions and constitutions as well as their connection to economic outcomes. Section 3 describes the content analysis of 109 constitutions, creates constitutional scores, and examines the relationship between constitutional scores and some of the well-known measures of institutional quality. Section 4 presents the results of the OLS and two-stage least squares estimations and reflects on the empirical results by relating them to the concepts that are discussed in Section 2. Finally, Section 5 concludes.

2. Institutions and constitutions

This section's aim is to provide a succinct discussion regarding the relationship between institutions and constitutions as well as their possible influence on economic outcomes, notably on economic development. This discussion is necessary so that the empirical analysis in Sections 3 and 4 are based on a conceptual framework.

According to North (1990), institutions refer to the rules of the game by providing both the content and the limits of individuals' choices, which in turn defines the incentive structure in an economy. Based on this understanding of institutions, economic outcomes depend on what institutions reward or penalize. For example, promoting independent judiciary, property rights enforcement, equal access to education, and civil liberties are expected to encourage investment and growth. Currently, there is no classification of institutions, which satisfies Acemoglu and Johnson's (2005) suggestion of unbundling institutions. Their vision is that the current black-box nature of institutions is replaced with a system that recognizes the influence areas of institutions, such as contracting vs. property rights institutions, economic vs. political institutions, etc.

Currently, we have a coarse but informative classification of institutions as formal and informal institutions. Formal institutions imply written instructions or blueprints that define the codes of conduct, the decision-making mechanisms, etc. Written laws that define the political, judicial, and social system as well as regulations constitute formal institutions, which includes courts, legislatures, bureaucracies, constitutions, laws, and regulations. The rules and procedures associated with formal institutions are created, communicated, and enforced through official channels.

Informal institutions, on the other hand, imply learned, expected, and valued patterns of behavior, which may not be explicitly written. North (1990) describes informal institutions as mental constructs, such as ideas and ideologies that reflect the collective belief system of a society, in short, culture. To provide an example, no constitution notes that the country shall be highly corrupt. The country ends up being highly corrupt due to the characteristics of its informal institutions such as shared values, belief system, or culture.

Social sciences define culture as the collection of acceptable norms and practices that are shared by members of a society and learned through successive generations. The content of shared values reflects the sense of morality for a group of people regarding acceptable and punishable behavior (Greif, 1994; Fukuyama, 1995; North et al., 2009). Culture motivates and justifies actions consistent with its values through its impact on policies (Schwartz & Boehnke, 2004). A common cultural heritage provides a means of reducing the divergence in the mental models in a society. It also ensures intergenerational transfer of culture and therefore the continuation of unifying perceptions. In recent decades, culture has been increasingly recognized for its influence on formal institutions as well as on economic outcomes (Guiso et al., 2003, 2006; Licht et al., 2007; Mokyr, 2017; Roland, 2004; Williamson, 2000). For example, Mokyr (2014) states that beliefs support institutions and without understanding beliefs or culture, we cannot really understand why societies have the institutions they do.

In his pathbreaking study, Schwartz (1994, 1999) has provided a set of cultural value dimensions, the combinations of which can be helpful to understand informal institutions of a society. The *embeddedness/autonomy* dimension implies the desirable relationship between the individual and the group. Embeddedness refers to a cultural emphasis on the person as embedded in the group and committed to maintaining the status quo without disrupting group solidarity or the traditional order. Autonomy, on the other hand, describes cultures in which the person is viewed as an autonomous member of the society. In this case, culture emphasizes the desirability of individuals independently pursuing their own ideas and life directions. The *hierarchy/egalitarianism* dimension is concerned with the ideal way to elicit cooperative behavior in society. Hierarchy refers to a cultural emphasis on obeying role obligations despite unequal distribution of power and resources. Egalitarianism implies the willingness of voluntarily surrendering selfish interests in favor of promoting the welfare of others. The *mastery/harmony* dimension concerns the relation of humankind to the natural and social world. Mastery refers to a cultural emphasis on getting ahead through active self-assertion in order to master, change, and exploit the natural and social environment. Harmony refers to an emphasis on accepting the social and physical world as it is, trying to comprehend it, and fitting in rather than to change it.

Religion is suggested as one of the most important components of culture based on which the mentioned cultural value dimensions are further established and reinforced. Weber (Weber, 2001) stated that the Reformation provided the moral justification for worldly activities such as work, profit, and wealth accumulation by making routine productive activities consistent with religious beliefs. Similarly, North and Thomas (1973) explained the European economic transformation in the 16th century especially in England and the Netherlands based on the Protestant Reformation and argued that the habits and norms introduced by the Reformation were a significant source of capital accumulation. The change in the cultural fabric of England and the Netherlands promoted work ethics and thrift, which laid the foundation of capital accumulation and industrialization. The cultural origins of current economic and institutional systems have been further examined in other studies (Acemoglu et al., 2001; Greif, 1994; North, 1981).

The empirical evidence suggests that a higher share of Protestants in a country is associated with institutions of higher quality with less corruption, more emphasis on the rule of law, and

stronger democracy (Inglehart, 1999; Landes, 1998; Licht et al., 2007; La Port et al., 1997; Putnam R, 1993). Other studies examine the effects of religious denominations on trust, which considered to be important for institutional quality and economic performance (Tabellini, 2008, 2010). Predominantly Catholic, Muslim, and Hindu countries exhibit lower trust toward others than the predominantly Protestant countries (Barro and McCleary, 2003; La Port et al., 1997). While most of the mentioned empirical studies use cross-section data, more recent studies make use of micro data that contain individuals' attitudes on a variety of subjects in many countries, which mostly confirm the overall cross-country results. For example, Guiso et al. (2003) found that religious upbringing among Protestants is positively related to trust, while it is negatively related to trust among Catholics, Muslims, and Hindus in increasing order of distrust. In other words, the negative effect of religious upbringing on trust is the weakest among Catholics and strongest among Hindus.

However, culture is not assumed to be the only source of variation in institutional quality. Acemoglu et al. (2001) emphasize that there is a need to isolate the exogenous sources of variation in institutions. They trace the sources of current institutions to the past institutions, where the latter is affected whether the colonial past was characterized by extractive economic activities, as measured by settler mortality. In colonies where settlers died in larger numbers, colonial administrations focused on extracting agricultural or mining resources without importing their European institutions. In more temperate places such as North America, New Zealand, and Australia, Europeans settled in larger numbers and colonial administrations created homeland-like institutions.

In the tradition of Douglass North, there exists an unbreakable relationship between formal and informal institutions. The direction of causality is assumed to be going from informal to formal institutions. The distinction between formal and informal institutions has led to studies that examine the interaction between them. One of the important questions in this respect is whether formal and informal institutions or social contracts are complements or substitutes (Poppo & Zenger, 2002). Helmke and Levitsky (2004) proposes a typology of four patterns of formal and informal institutional interaction. In a *complementary* relationship, informal institutions provide the motivation for formal institutions, thereby making the formal institutions effective. The *accommodating* relationship implies that informal institutions create incentives to behave in ways that alter the substantive effects of formal rules without directly violating them. In a *competing* relationship, formal rules and procedures are not systematically enforced, which enables actors to ignore or violate them. A *substitutive* relationship implies that informal institutions have made the formal ones ineffective. For example, it is not enough to have written laws allowing women to participate in the labor force, if the society's expectations regarding the role of women prevent it. In this case, the relationship between formal and informal institutions becomes competing or even substitutive rather than complementary or accommodating.

Now, I turn to constitutions. According to North (1990), constitutions represent one of the dimensions of formal institutions. The question is as to what to look for in a constitution. Some of the economic studies on constitutions follow Fuller (1964) that has the perspective of legal philosophy. Hadfield and Weingast (2014), for example, suggests that effective constitutions should have certain legal attributes such as *generality* (subjects human conduct to the rules), *stability* (promotes compliance through established coordination patterns, because instability lowers the value of the rule and therefore current and future compliance), *clarity* (reduces ambiguity about the law and the line between constitutional and unconstitutional behavior), and *consistency* (promotes uniform implementation of the announced rules). Additionally, some scholars observe that a central role of constitutions is to help people coordinate. Nonauthoritarian constitutions are believed to have the ability to achieve the coordination equilibrium (Mittal & Weingast, 2013;

Weingast, 1997). Constitutional characteristics such as government systems and electoral rules are also examined because of their possible effects on fiscal policy outcomes (Andersen & Aslaksen, 2008; Eicher et al., 2018). The mentioned studies about constitutions imply as to which conceptual objectives constitutions should fulfill.

In reality, at times policy makers face the necessity of a reform, a widely supported fundamental change, whose legitimacy will stem from a new constitution. In this sense, some constitutions are aspirational such as that of South Africa following the end of apartheid.¹ Even an aspirational constitution may fail to reach its goal. Historically speaking, first Ottoman constitutions are an example for quasi-aspirational constitutions that failed. The edicts of Tanzimat and Islahat were introduced in 1839 and 1853, respectively, to modernize the Empire by introducing human and property rights. Later in response to the European pressure to limit Sultan Abdulhamid II's absolute power, the first Constitution was introduced in 1876, which created a legislative assembly. However, the Sultan suspended the General Assembly in 1878 and ruled the Empire with absolute power for another 30 years (Karaveli, 2011; Özbudun, 2011). Other times constitutional revisions may be initiated by a specific political group with stronger or weaker support from citizens. The 1982 constitutional revisions that clearly reflected the Turkish military's view on the pre-1980 violence in the country was approved by over 91% of votes in a referendum. However, the 2010 revision aimed at reducing the military's influence on politics as well as improving Turkey's human rights record to make the country more attractive to the European Union. These revisions were approved by 58% of the votes in a referendum.

The above discussion indicates that constitutions are written or revised for a variety of reasons. While these reasons can be investigated in a country study, in an empirical study with many countries it is difficult to distinguish the reasons for every initial constitution and subsequent revisions. One solution is to adopt the tradition of Douglass North and view constitutions as a product of the belief system of a society. Constitutions as formal institutions are expected to be related to informal institutions in countries (North, 1990). This is an important point, when it comes to conducting a content analysis of constitutions. The assumption is that a society in which an individual is viewed as embedded in a group and her cooperation with the rest of the society is secured through hierarchy and harmony will produce a different constitution than the society that prescribes individualism and egalitarianism. For example, referring to state as sacred may indicate a hierarchical society.

Our interest in constitutions (and generally speaking in institutions) is not just intellectual curiosity. The effect of institutional quality on countries' income is well established in empirical studies (Acemoglu et al., 2003; Barro, 1991; Easterly & Levine, 2003; Hall & Jones, 1999; Knack & Keefer, 1995; Mauro, 1995; La Porta et al., 1999; Rodrik, 1999). This paper investigates whether constitutional characteristics, as an example of a formal institution, are interchangeable with characteristics of informal institutions as well as whether constitutional characteristics have an effect on economic development. The empirical analysis aims to answer the following questions. 1) Are informal institutional characteristics and constitutional characteristics related in the sample countries, if we assume that constitutions represent the formal aspect of countries' institutions? 2) If they are related, is it possible to substitute institutional characteristics with constitutional characteristics in income regressions and verify the effects of constitutions on economic development?

3. Content analysis of constitutions, constitutional scores, and the relationship between constitutional indices and institutional quality

The dataset has 109 countries' constitutions.² Table 1 provides the list of the sample countries with written constitutions.³ Table 2 introduces the variables that reflect the constitutional characteristics in the sample countries. Some of the variables have already been used in previous studies on constitutions, such as government type and electoral rules. Therefore, this data come from

Table 1. Sample countries

Albania	Finland	Libya	Slovenia
Algeria	France	Luxembourg	Somalia
Angola	Gabon	Madagascar	South Africa
Argentina	Gambia	Malaysia	Spain
Australia	Germany	Maldives	Sri Lanka
Austria	Ghana	Mali	Sudan
Bahamas	Greece	Malta	Suriname
Bahrain	Guatemala	Mexico	Sweden
Bangladesh	Guyana	Mongolia	Switzerland
Belgium	Haiti	Morocco	Syria
Botswana	Honduras	Mozambique	Taiwan
Brazil	Hong Kong	Namibia	Tanzania
Bulgaria	Hungary	Netherlands	Thailand
Burkina Faso	Iceland	Nigeria	Togo
Cameroon	India	Norway	Tunisia
Canada	Indonesia	Oman	Turkey
Chile	Iran	Pakistan	UK
China	Iraq	Paraguay	USA
Colombia	Ireland	Peru	Uganda
Congo, Republic of	Israel	Philippines	Uruguay
Costa Rica	Italy	Poland	Venezuela
Cote d'Ivoire	Jamaica	Portugal	Vietnam
Cuba	Japan	Qatar	Yemen
Cyprus	Jordan	Romania	Zambia
Denmark	Kenya	Saudi Arabia	Zimbabwe
Ecuador	Kuwait	Senegal	
Egypt	Lebanon	Sierra Leone	
Ethiopia	Liberia	Singapore	

a variety of studies and the CIA World Fact Book. All other variables are compiled by the author during the content analysis of the sample countries' constitutions. In the following, as a variable is introduced, the relevance of this variable as well as what it measures will be discussed.

In Table 2, the variable *state* implies that the constitution refers to state as mother, father, holy, etc., which effectively puts state as an elusive authority figure on a pedestal. As mentioned in the previous sections, Schwartz's (Schwartz, 1994, 1999) work focuses on classifying societies based on their emphasis on embeddedness or individuality. Deep-rooted beliefs in a society may lead to the position that the continuation of state is more important than individuals' freedom. Measures of freedom in countries are positively related to income levels (De Haan & Sturm, 2000). *State* takes on the value of 1, if the constitution mentions state as mother, father, holy, etc. and 0 otherwise.

There are two religion-related variables that stress embeddedness and individuality, respectively: *staterel* (state religion) and *relfree* (freedom of religion). If a country declares a state religion in its constitution, it may be an indication that informal institutions and decisions in this country will reflect the official religion's point of view. The inclusion of freedom of religion in a constitution,

Table 2. Constitutional characteristics

Characteristic	Description
state	Referring to state as mother, father, holy, etc.
staterel	State religion
relfree	Freedom of religion
rev	Number of constitutional revisions
page	Length of constitution in number of pages
word	Length of constitution in number of words
govsys	Parliamentary government system
electrule	Proportional electoral rule
assem	Right to assemble
assocp	Right to political association
assocs	Right to social association
expr	Freedom of expression
move	Right to freedom of movement
conf	Right to confidentiality in communication
priv	Right to privacy
inf	Right to information
lib	Right to liberty
hdig	Right to human dignity
jud	Right to fair/just judicial system
innoc	Presumption of innocence
equal	Right to expect equality
discrim	Prohibits any kind of discrimination
tort	Prohibits torture
elect	Right to democratic elections
life	Right to live
mar	Right to marriage
fam	Right to have family
child	Rights of children
educ	Right to education
health	Right to health care
intprop	Right to intellectual property
prop	Inviolability of property
econ	Right to economic activity
work	Right to work
slav	Prohibits slavery
flabor	Prohibits forced labor
strike	Right to strike
union	Right to unionize
envir	Right to healthy environment
socsec	Right to social security

The variables *rev*, *page*, and *word* are continuous variables. The rest of the variables is binary. Binary variables take on the value of 1, if the content of the variable is mentioned in the constitution and 0 otherwise.

on the other hand, implies not only a nominal acceptance of diversity in worship but also that of different customs or belief systems than the majority religion. The problem with religious freedom is that there could be a divergence between what the constitution states and whether it is implemented effectively so that citizens in fact experience religious freedom in the country. *Staterel* and *relfree* variables are indicator variables that take on the value of 1, if state religion or freedom of religion is mentioned in the constitution and 0 otherwise. As in the case of *state*, *staterel* and *relfree* reflect information about countries' informal institutions or belief systems.

The variable *rev* indicates the number of constitutional revisions. While revisions may imply that the country is trying to change certain legal or political structures, it is an empirical issue whether these changes are positive or negative. It has been noted that especially in the case of a violent regime change, new leaders often radically alter constitutional rules (Hadfield & Weingast, 2014). Violent regime changes are reported to be quite common in that the median number of years between violent regime changes in the world is about eight. Only about two dozen of current constitutions have been in place for 60 or more years (Elkins et al., 2009; North et al., 2009). When revisions are made, it is difficult to attach an adjective such as positive or negative to these constitutional changes, especially in a large number of countries. Even when we can classify the revisions as positive for possible economic outcomes, the problem of implementation emerges (Ben-Bassat & Dahan, 2008).⁴ There is no guarantee that the initial constitution or its revisions are actually implemented.

The variables *page* and *word* indicate the length of constitutions. The fact that some constitutions are longer and more detailed than others may reflect the fact that a longer and detailed constitution looks substantial and credible to their constituents, independent from the actual implementation of the content. Another explanation is that as the number of problems in a country increases, so does the length of its constitution. If, for example, a constitution explicitly states the right to have a family or prohibits slavery, chances are that starting a family or abolishing slavery may have been a problem in the country. Therefore, constitutions could become rather long, when countries try to denounce the wrongs of the past. In this view, the length of constitutions may have a negative connotation, especially the commitment to implement the positive change is weak. Therefore, in addition to *page* and *word*, the dataset keeps track of a number of items that are either prohibited (slavery, forced labor, torture, etc.) or mentioned as rights (expression of ideas, assembly, having family, etc.). On Table 2, there are 32 constitutional characteristics between *assem* (right to assemble) and *socsec* (right to social security), which are indicator variables. Each of these variables takes a value of 1, if the indicated subject is in the constitution and 0 otherwise.

As mentioned in Introduction, *govsys* (government system) and *electrule* (election rules) have been the most frequently used constitutional characteristics in existing empirical studies on constitutions. In terms of government systems, presidential regimes are thought to increase competition between both politicians and voters, which is expected to lead to lower taxes, less public goods, and smaller government as well as greater transparency and accountability (Persson & Tabellini, 1999, 2003, 2004b). However, a recent study finds that presidential regimes are consistently associated with inferior performance in economic growth (McManus & Özkan, 2018). In parliamentarianism, on the other hand, government has a majority in parliament, which is assumed to lead to higher taxation and higher provision of public goods than under a presidential regime. In many parliamentary democracies, coalition governments have to be responsive to a broad set of citizen demands to be able to remain in power, which also leads to higher spending and larger government (Persson & Tabellini, 1999, 2003, 2004a). The variable *govsys* takes on a value of 1 for a parliamentary system and 0 otherwise.

With respect to electoral types, the majoritarian (pluralistic) and proportional election rules are identified. Majoritarian elections increase competition between parties by focusing on pivotal districts, which leads to smaller government and welfare spending (Persson & Tabellini, 2004a). Even though majoritarian election rules seem to increase politicians' accountability, it is possible that politicians would be more responsive to pivotal groups of voters (Persson & Tabellini, 2004b). Proportional election rules imply that voting occurs on already established party lists, which may reflect a fragmented party system. There is evidence that proportional electoral systems increase government spending in parliamentary and presidential systems. There are studies that examine the effects of the various combinations of government types and electoral rules. One of the studies indicate that the combination of presidentialism and proportional election rules are associated with higher levels of corruption (Kunicova & Rose-Ackerman, 2005). However, the types of government systems and electoral rules may not be clear cut. There is a good amount of heterogeneity within these categories with respect to important institutional attributes so that the presidential-parliamentary or the majoritarian-proportional distinctions are not systemic. For example, Cheibub et al. (2014) examine whether the defining attributes of presidential and parliamentary constitutions predict other attributes that are stereotypically associated with these government types. Their results suggest the need for considerable skepticism of the systemic nature of this classification (Cheibub et al., 2014). The variable *electrule* takes on a value of 1 for proportional electoral rule and 0 otherwise.

Descriptive statistics associated with constitutional characteristics are provided in Table 3 for all, advanced, and other countries.⁵ In terms of the continuous variables, the mean number of revisions is 2.79, where the average is higher in non-advanced countries. These countries also have longer constitutions than advanced countries, whether the length is measured by page or word. While the average word count is almost 23,000 words, the mean length of advanced and other countries' constitutions is 16,871 and 25,134 words, respectively. In terms of the other relevant characteristics, 13% of all countries refer to state as mother, father or holy, where the advanced and other country averages are 7 and 15%, respectively. The explicit mention of a state religion in a constitution is also more pervasive in non-advanced countries (29%). About 82% of constitutions in the sample mention religious freedom, where advanced countries have a higher mean (83%) than other countries (81%).

In terms of government systems, on average 43% of sample countries have a parliamentary system, where the average in advanced countries is much higher (83%) compared to other countries (27%). On average, about 49% of the sample countries have the proportional electoral rule, where the mean in advanced countries (67%) is higher than that of other countries (42%). Additionally, 32 indicator characteristics between *assem* (right to assemble) and *socsec* (right to social security) are generally about the right to do something and prohibiting an undesirable outcome. With only two exceptions (right to liberty and democratic elections), the means are higher in non-advanced countries. As discussed previously, frequent declarations of these rights and prohibitions may be contributing to longer constitutions in non-advanced countries.

As seen in Tables 2 and 3, the content analysis of constitutions uses 40 characteristics, which makes it difficult to use them as such. Therefore, six alternative constitutional indices are constructed by attaching different weights to constitutional characteristics. Table 4 lists these alternative constitutional indices (*ci*). The constitutional indices 1, 2, and 3 put an emphasis on the length of constitutions, while the length is captured by attaching a higher weight to 32 constitutional characteristics in constitutional index 5. The mention of *state religion* and referring to *state* as holy, mother, or father are common to all six constitutional indices with varying weights. The number of constitutional *revisions* is common to constitutional indices 1, 5, and 6. The constitutional index 4 includes government systems and electoral types. Table 5 summarizes the

Table 3. Descriptive statistics on constitutional characteristics

Characteristics	All countries			Advanced countries			Other countries		
	Obs	Mean	Std dev	Obs	Mean	Std dev	Obs	Mean	Std dev
rev	109	2.79	3.82	30	2.07	3.43	79	3.06	3.94
page	108	66.59	56.19	29	51.55	36.15	79	72.11	61.22
word	105	22,852	27,029	29	16,871	9,495	76	25,134	30,989
state	109	0.13	0.34	30	0.07	0.25	79	0.15	0.36
staterel	109	0.22	0.42	30	0.03	0.18	79	0.29	0.46
relfree	109	0.82	0.39	30	0.83	0.38	79	0.81	0.39
govsys	109	0.43	0.49	30	0.83	0.38	79	0.27	0.45
electrule	109	0.49	0.50	30	0.67	0.48	79	0.42	0.49
assem	109	0.74	0.44	30	0.73	0.45	79	0.74	0.44
assocp	109	0.85	0.36	30	0.80	0.41	79	0.87	0.34
assoc	109	0.87	0.34	30	0.80	0.41	79	0.89	0.30
expr	109	0.89	0.30	30	0.87	0.35	79	0.91	0.29
move	109	0.68	0.47	30	0.53	0.51	79	0.73	0.45
conf	109	0.57	0.49	30	0.40	0.49	79	0.63	0.49
inf	109	0.64	0.48	30	0.50	0.51	79	0.65	0.48
priv	109	0.72	0.45	30	0.67	0.48	79	0.73	0.45
lib	109	0.69	0.47	30	0.77	0.43	79	0.65	0.48
hdig	109	0.49	0.50	30	0.37	0.49	79	0.54	0.50
jud	109	0.92	0.28	30	0.83	0.38	79	0.95	0.22
innoc	109	0.62	0.49	30	0.43	0.50	79	0.68	0.47
equal	109	0.86	0.35	30	0.77	0.43	79	0.89	0.30
discrim	109	0.71	0.46	30	0.57	0.50	79	0.76	0.43
tort	109	0.66	0.48	30	0.48	0.51	79	0.72	0.45
elect	109	0.57	0.49	30	0.60	0.49	79	0.55	0.50

(Continued)

Table 3. (Continued)

Characteristics	All countries			Advanced countries			Other countries		
	Obs	Mean	Std dev	Obs	Mean	Std dev	Obs	Mean	Std dev
life	109	0.79	0.40	30	0.70	0.47	79	0.84	0.37
mar	109	0.61	0.49	30	0.50	0.51	79	0.65	0.48
fam	109	0.69	0.47	30	0.50	0.51	79	0.76	0.43
child	109	0.62	0.49	30	0.40	0.49	79	0.71	0.46
educ	109	0.87	0.34	30	0.77	0.43	79	0.91	0.29
health	109	0.77	0.42	30	0.57	0.50	79	0.85	0.36
intprop	109	0.18	0.39	30	0.10	0.31	79	0.22	0.41
prop	109	0.95	0.23	30	0.87	0.35	79	0.98	0.16
econ	109	0.71	0.46	30	0.57	0.50	79	0.76	0.43
work	109	0.85	0.36	30	0.70	0.47	79	0.91	0.29
slav	109	0.39	0.49	30	0.20	0.41	79	0.47	0.50
flabor	109	0.40	0.49	30	0.30	0.47	79	0.44	0.49
strike	109	0.41	0.49	30	0.37	0.49	79	0.43	0.49
union	109	0.57	0.49	30	0.43	0.50	79	0.62	0.49
envir	109	0.39	0.49	30	0.37	0.49	79	0.44	0.49
socsec	109	0.61	0.49	30	0.50	0.51	79	0.65	0.48

descriptive statistics associated with six constitutional indices as well as their minimum and maximum values. It is expected that, for a country with a longer constitution and higher number of revisions, state religion, a parliamentary system and a proportional electoral rule, and referring to state as holy or sacred, the constitutional index will be higher.

In order to limit the influence of outliers and reduce spurious variability, constitutional indices are normalized as constitutional scores (*ciscore*) as follows:

$$ciscore_{ij} = 1 - \frac{ci_{ij} - ci_{j,min}}{ci_{j,max} - ci_{j,min}} \quad (1)$$

where $ciscore_{ij}$ and ci_{ij} indicate the constitutional score and the constitutional index of the i th country using the constitutional index j , where $j = 6$, respectively. $ci_{j,min}$ and $ci_{j,max}$ denote the minimum and maximum values of the constitutional index j , respectively, and provided in Table 5. Based on Equation 1, constitutions that are longer and revised often, mention a state religion, and put state on a pedestal produce a smaller constitutional score. In fact, Table 6 shows the summary statistics of constitutional scores for all, advanced, and other countries. We observe that advanced countries have higher average constitutional scores than other countries, except for the constitutional score 4.

As discussed in Section 2, the main hypothesis of this paper is that constitutional scores based on constitutional characteristics should provide information about institutional quality, where institutional quality is defined such that higher institutional quality is associated with better economic outcomes. Therefore, before introducing the estimations, the relationship between constitutional scores and institutional quality in the sample countries should be examined. Table 7 shows the

Table 4. Alternative constitutional indices

Constitutional index (ci)	Weights
ci1	Length (page): 50% Mention of state: 25% Mention of state religion: 25%
ci2	Length (page): 25% Number of revisions: 25% Mention of state: 25% Mention of state religion: 25%
ci3	Length (page): 30% Number of revisions: 30% Mention of state: 30% Mention of state religion: 10%
ci4	Parliamentary government system: 25% Proportional election type: 25% Mention of state: 25% Mention of state religion: 25%
ci5	Number of revisions: 40% Mention of state: 15% Mention of state religion: 15% 32 constitutional characteristics: 0.9375% each, 30%
ci6	Number of revisions: 50% Mention of state: 25% Mention of state religion: 25%

The 32 constitutional characteristics are those that are listed in Table 2 between right to assembly (*assem*) and right to social security (*socsec*).

Table 5. Descriptive statistics of constitutional indices

	All countries				
	Obs.	Mean	Standard deviation	Minimum	Maximum
ci1	108	33.38	28.08	2.25	115
ci2	108	17.43	14.15	1.5	58.25
ci3	108	20.87	16.99	1.6	69.9
ci4	109	0.32	0.22	0	0.75
ci5	109	1.37	1.56	0.01	8.79
ci6	109	1.48	1.94	0	10.75

ci stands for constitutional indices as described in Table 4.

institutional quality-related variables used in this paper. *Corruption* is one of the most frequently used variables on institutional quality and is defined as the use of public office or power for private gain (Bardhan, 1997; Rose-Ackerman, 1999). Widespread corruption is believed to render law enforcement agencies and the judiciary dysfunctional, which has negative consequences on economic development (Herzfeld & Weiss, 2003). While there is no consensus regarding the sources of corruption

Table 6. Descriptive statistics of constitutional scores

	Obs.	Mean	Std dev.	Minimum	Maximum
<i>All countries</i>					
ci1score	108	0.73	0.25	0	1
ci2score	108	0.72	0.25	0	1
ci3score	108	0.72	0.25	0	1
ci4score	109	0.58	0.30	0	1
ci5score	109	0.85	0.18	0	1
ci6score	109	0.86	0.18	0	1
<i>Advanced countries</i>					
ci1score	29	0.79	0.16	0.35	0.96
ci2score	29	0.79	0.16	0.37	0.97
ci3score	29	0.79	0.16	0.36	0.96
ci4score	30	0.47	0.26	0	1
ci5score	30	0.89	0.16	0.32	1
ci6score	30	0.90	0.16	0.30	1
<i>Other countries</i>					
ci1score	79	0.70	0.27	0	1
ci2score	79	0.69	0.27	0	1
ci3score	79	0.69	0.27	0	1
ci4score	79	0.62	0.30	0	1
ci5score	79	0.83	0.18	0	1
ci6score	79	0.85	0.19	0	1

ci#score is calculated by using alternative *ci* indices and the minimum and maximum values of these indices as shown in Table 5, according to Equation 1 in the text.

Table 7. Definition of the institutional quality-related variables

Variables	Definition
Corruption control	Corruption in government as faced by business, such as special payments, bribes, nepotism, job reservations, etc.; values range between 1 and 10 where higher numbers indicate higher corruption control; 2003–2015 average
Bureaucratic quality	Characteristics and efficiency of public administration; values range between 1 and 10 where higher numbers indicate higher bureaucratic quality; 2003–2015 average
Average institutional quality	Arithmetic average of corruption control (0–10), bureaucratic quality (1–10), openness of executive recruitment (1–4), and executive constraints (1–7); higher numbers indicate higher institutional quality; 2003–2015 average

Corruption control is provided by the WDI (World Development Indicators) of the World Bank (<http://databank.worldbank.org/data/home.aspx>). Bureaucratic quality, executive openness, and executive constraints are provided by the Polity IV Project, which is available at <http://www.systemicpeace.org/polity/polity4.htm>. Average institutional quality is calculated by the author.

(Ehrlich & Lui, 1999; Shleifer & Vishny, 1993), some suggest that colonial heritage may account for some international variation in the incidence of corruption (Treisman, 2000). Additionally, culture and religion as one of the most important dimensions of culture are viewed as another possible source of corruption (Gerring & Thacker, 2004; La Port et al., 1997; Rose-Ackerman, 1999). Table 7 includes two other institutional quality-related variables: *bureaucratic quality* and *average institutional quality*, where the latter is the arithmetic average of corruption control, bureaucratic quality, openness in executive recruitment, and constraints on the executive.

Table 8 provides descriptive statistics for the institutional quality-related variables in the sample countries. The table shows that corruption control, bureaucratic quality, and average institutional quality are higher in advanced countries. Correlations between institutional quality-related variables and constitutional scores are shown in Table 9. In the following, only the statistically significant correlations at the 5% level are mentioned. First, institutional quality-related variables (corruption control, bureaucratic quality, and average institutional quality) are highly and positively correlated (between 0.81 and 0.89) with each other. Second, linear associations between institutional quality-related variables and constitutional scores are limited to constitutional scores 4, 5, and 6. As expected, they are positive (between 0.24 and 0.36). Surprisingly, the correlation

Table 8. Descriptive statistics associated with institutional quality-related variables

	All countries			Advanced countries			Other countries		
	Obs.	Mean	Std dev.	Obs.	Mean	Std dev.	Obs.	Mean	Std dev.
Corruption control	109	5.74	2.29	30	8.39	1.73	79	4.73	1.57
Bureaucratic quality	109	5.52	2.52	30	8.59	1.67	79	4.35	1.66
Average institutional quality	103	3.78	1.57	27	5.84	0.96	76	3.05	0.98

See Table 7 for variable definition.

Table 9. Correlation coefficients between institutional quality-related variables and constitutional scores

	1	2	3	4	5	6	7	8
Bureaucratic quality (2)	0.81*							
Average institutional quality (3)	0.89*	0.87*						
ci1score (4)	0.12	0.04	-0.11					
ci2score (5)	0.13	0.06	-0.09	0.99*				
ci3score (6)	0.13	0.06	-0.10	0.99*	0.99*			
ci4score (7)	-0.26*	-0.24*	-0.24*	-0.12	-0.11	-0.11		
ci5score (8)	0.24*	0.36*	0.29*	0.19	0.26*	0.26*	0.02	
ci6score (9)	0.24*	0.35*	0.29*	0.16	0.22*	0.22*	0.03	0.99*

Column (1) indicates corruption control. (*) indicates 5 percent level of significance. The correlation matrix includes 102 observations. *ci#score* indicates constitutional scores, which are based on constitutional indices. See Table 4 for definition of alternative constitutional indices. See Table 7 for definition of corruption control, bureaucratic quality, and average institutional quality.

coefficients between the institutional quality-related variables and constitutional score 4 are negative. As Table 4 indicates, government system and electoral rule have a 50% weight in constitutional index and therefore in constitutional score 4. Additionally, Table 3 shows that 83 and 67% of advanced economies have a parliamentary government system and a proportional electoral rule, respectively. As expected, the correlations between the institutional quality-related variables and constitutional scores 5 and 6 are positive.

The ultimate test of whether constitutional scores are substitutes for institutional quality-related variables is to use them in regression analysis. The next section introduces some of the well-known income regressions, in which institutional quality-related variables as well as constitutional scores are used.

4. OLS and two-stage least squares estimations

There is a large number of empirical studies that use institutional quality as an explanatory variable in income regressions (for example, Barro, 1991; Levine & Renelt, 1992; Mauro, 1995; Sachs & Warner, 1997; Sala-i-martin, 1997; Acemoglu et al., 2001, 2003; Easterly & Levine, 2003). I follow these studies' empirical estimation strategy of initial OLS estimations as a benchmark followed by two-stage least squares (2SLS) estimations. In terms of the explanatory variables, two regression models are used. The first regression model is similar to those in Barro (1991), Levine and Renelt (1992), Mauro (1995), Sachs and Warner (1997), and Sala-i-martin (1997), which have many common variables such as initial GDP per capita, fixed capital investment, human capital-related variables such as literacy rate as well as primary, secondary or tertiary school enrolment, regional dummies such as for Sub-Saharan Africa and Latin America, openness, export structure, religious beliefs, and legal origins. The second regression model is similar to those used in Acemoglu et al. (2003) and especially Easterly and Levine (2003) with limited variables such as legal origins, religious beliefs, ethnic fractionalization, latitude, and settler mortality rates.

Table 10 provides the definition of the variables used in the OLS and 2SLS estimations. In both estimations, *real GDP per capita* is the dependent variable. In terms of the explanatory variables, many empirical income models such as Barro (1991), Acemoglu et al. (2003), and Easterly and Levine (2003) include an initial measure of real GDP per capita. As the mentioned empirical studies,

Table 10. Variables used in income regressions

Variable	Definition
Real GDP per capita	Real income per capita in US dollars, base year 2000; World Bank (2010)
Real GDP per capita in 1960	Real income per capita in 1960 in US dollars, base year 2000; World Bank (2010)
Fixed capital investment	Fixed capital investment, percent of GDP; World Bank (2010)
Human capital index	Weighted index of probability of survival to age 5, expected years of school as well as test scores, and the fraction of the 15 years old group who survive to Age 60; World Bank (2018)
Openness	Exports plus imports, percent of GDP; World Bank (2010)
Legal origins	Dummy variables that take on the value of 1 for French or British legal origin and 0 otherwise; La Porta et al. (1999)
Ethnic fractionalization	Probability that two individuals drawn randomly in a country are from different ethnic groups; Alesina et al. (2003)
Religious beliefs	Percent Christians, Protestants, and Muslims in population; CIA (2007)
Sub-Saharan Africa	Dummy variable that takes on the value of 1 for a Sub-Saharan African country and 0 otherwise
Latin America	Dummy variable that takes on the value of 1 for a Latin American country and 0 otherwise
Latitude	Normalized between 0 and 1 by dividing the country's southern/northern most latitude (in northern and southern hemisphere, respectively) by 90; CIA (2007)
Settler mortality rate	Mortality rates per 1000 of European soldiers, clergy, administrators, settlers, etc.; Acemoglu et al. (2001)
Pronoun-drop rule	Dummy variable that takes on the value of 1 if the language allows pronoun drop and 0 otherwise; Kashima and Kashima (1998)

Most variables imply the 2000-2015 average, unless indicated otherwise.

this paper also uses *real GDP per capita 1960* as initial income. *Fixed capital investment* as a percent of GDP and the *human capital index* represents the physical and human capital requirement for economic development. In terms of the trade structure, I use *openness*, which is defined as exports plus imports divided by the GDP. Even though trade restrictions are not directly measured, an increase in this ratio is generally considered increased openness to foreign trade.

The relevance of *legal origins* is well established in Glaeser and Shleifer (2002), La Porta et al. (1999), and La Porta et al. (2008). Generally speaking, the British and French legal traditions are recognized as historically being at the opposite end of the legal spectrum. The difference between these two legal traditions is said to be endogenous to the historical power of kings in respective countries. While weaker French kings led the way to a centralistic, state-controlled judicial system represented by judges, powerful rulers of England motivated property owners to protect themselves from kings. The opposite emphasis on state and the individual is thought to have consequences on the efficiency of the judicial system in the protection of property rights. However, recently the idea of legal origins has been questioned especially in countries that received their legal structure exogenously during the colonial era (Guerriero, 2016a, 2016b). There may be heterogeneity in given legal traditions in former colonies depending upon whether Europeans

settled in large numbers and imported their institutional structure to the colony, including their judicial setup, or used the colony for resource extraction purposes, which may have not necessitated elaborate institutions.

Since Hall and Jones (1999), many empirical studies use *latitude* as a proxy for colonial past. Lower latitudes closer to the equator in both hemispheres are assumed to reflect extraction-based economies. A number of studies, among them Easterly and Levine (2003), find that there is a strong positive association between latitude and economic development as measured in real per capita GDP. *Ethnic fractionalization* is another widely used regressor that measures the probability of two randomly selected individuals in a country being from different ethnic groups. There is an ethnolinguistic variation of this variable as well. The relevance of this variable is that higher ethnic and ethnolinguistic diversity is associated with political and economic power struggle among groups, especially in endowment-rich countries. The group in power is inclined to make political and economic decisions that would exclude and therefore weaken the economic and political position of the other group (Alesina et al., 2003; Easterly & Levine, 1997; Mauro, 1995).

Religious affiliation as percent of Protestants, Catholics, Muslims, etc. in a country is used in many studies. Even though God is perceived to be moral in many religions, punishing those who engage in opportunistic behavior (Mokyr, 2014), studies reveal differences in the implementation of beliefs in different religions. Weber (2001) certainly set the stage with the Protestant ethics that is thought to have shaped economic policies regarding freedom, property rights, and competition. Putnam (1993) and Landes (1998) argue that Catholic and Muslim countries attach less value to individualism and favor a powerful state-church combination. This paper uses the percent share of Muslims in the estimations.⁶

Table 11 shows the descriptive statistics associated with the regression variables. As expected, both the current and initial real GDP per capita is higher in advanced countries. Similarly, fixed capital investment, human capital index, and openness is higher in advanced countries. While 33% of advanced countries have the British legal origin, it is only 9% in other countries. When it comes to the French legal origin, the outcome is the opposite. While only 23% of advanced countries have the French legal origin, it increases to 57% in other countries. Ethnic fractionalization is much higher in non-advanced countries as well. The share of Christians and Protestants is much higher in advanced countries, while that of Muslims is lower. The mean latitude of advanced countries is also much higher than the mean latitude of other countries.

Table 12 summarizes the correlation coefficients between the regression variables. In the following, only the statistically significant correlation coefficients at the 5% level are mentioned, unless indicated otherwise. Because the first column is real GDP per capita, first, linear relations between the former and the other variables are discussed. Positive relationships are observed between initial real GDP per capita, human capital index, British legal origin, the share of Christians, and latitude. Correlations coefficients between real GDP per capita and ethnic fractionalization and the share of Muslims are negative. Second, there are interesting linear relationships on the diagonal. For example, there is a negative relationship between settler mortality rate and latitude (-0.56).

In the following, the results of the OLS and 2SLS estimations are presented. In these estimations, all variables except for the regional dummies, legal origins, and pronoun-drop rule are expressed in natural logarithm.

The OLS estimations are based on the following model:

Table 11. Descriptive statistics on the regression variables

	All countries				Advanced countries				Other countries			
	Obs.	Mean	Std dev.		Obs.	Mean	Std dev.		Obs.	Mean	Std dev.	
Real GDP per capita	102	19,082	20,022		29	37,688	12,843		73	11,690	17,417	
Real GDP per capita 1960	105	14,801	17,318		29	29,271	9,528		76	9,279	16,435	
Fixed capital Investment	104	22.26	6.00		30	23.16	4.02		74	21.89	6.63	
Human capital index	100	0.58	0.16		29	0.78	0.04		71	0.50	0.11	
Openness	101	82.19	50.44		27	98.18	65.96		74	76.36	42.51	
British legal origin	109	0.16	0.37		30	0.33	0.48		79	0.09	0.29	
French legal origin	109	0.48	0.50		30	0.23	0.43		79	0.57	0.49	
Ethnic fractionalization	101	0.46	0.28		26	0.25	0.19		75	0.53	0.26	
Christians	107	48.47	36.21		30	67.13	27.29		77	41.19	36.79	
Protestants	98	16.49	22.53		28	24.95	30.10		70	13.1	17.84	
Muslims	100	30.09	38.66		29	3.26	4.26		71	41.05	41.06	
Latitude	109	0.29	0.19		30	0.49	0.16		79	0.21	0.13	
Settler mortality rate	54	257.72	510.58		6	26.21	28.97		48	286.66	534.96	
Pronoun-drop rule	109	0.78	0.42		30	0.30	0.47		79	0.96	0.19	

See [Table 10](#) for variable description.

Table 12. Correlation coefficients among the regression variables

	1	2	3	4	5	7	8	9	10	11	12	13	14
Real GDP per capita 1960 (2)	0.97*												
Fixed capital investment (3)	0.21	0.17											
Human capital index (4)	0.75*	0.67*	0.16										
Openness (5)	-0.02	-0.01	0.19	-0.11									
British legal origin (7)	0.34*	0.33*	0.08	0.27	-0.07								
French legal origin (8)	0.08	0.11	-0.11	0.07	0.13	-0.59*							
Ethnic fractionalization (9)	-0.47*	-0.40*	-0.06	-0.63*	-0.01	-0.20	-0.02						
Christians (10)	0.33*	0.37*	-0.27	0.27	-0.14	0.15	-0.03	0.01					
Protestants (11)	0.16	0.22	0.03	0.06	0.14	0.35*	-0.28	0.21	0.61*				
Muslims (12)	-0.48*	-0.48*	0.17	-0.48*	0.04	-0.01	-0.17	0.26	-0.79*	-0.50			
Latitude (13)	0.57*	0.53*	-0.03	0.51	-0.26	0.36*	0.01	-0.66*	-0.09	-0.23	-0.17		
Settler mortality rate (14)	-0.58*	-0.50*	-0.27	-0.65*	0.33	0.09	-0.40	0.48	-0.06	-0.06	0.37*	-0.56*	
Pronoun-drop rule (15)	-0.39*	-0.37*	-0.06	-0.30	0.02	0.38*	-0.72*	-0.06	0.03	-0.32	0.02	-0.23	0.30

(*) indicates 5 percent level of significance. Column (1) is real GDP per capita.

$$y_i = \mu + X_i' \gamma + \beta I_i + e_i \quad (2)$$

where y_i is real GDP per capita of the i th country, X is a vector of control variables, I denotes either an institutional quality-related variable of constitutional scores, and e_i is the error term with usual properties. The coefficient β measures the correlation between institutional quality (or constitutional score) and income per capita in the presence of other control variables. It is expected that this coefficient is statistically significantly positive, which reflects the expected positive relationship between income per capita and institutional quality. The OLS regressions use the heteroskedasticity consistent standard errors. Therefore, the estimated coefficients can be interpreted as robust correlations between the dependent variable and the explanatory variables.

Table 13 summarizes the results of the OLS regressions. Models 1 through 5 are similar to those used in Barro (1991), Levine and Renelt (1992), Mauro (1995), Sachs and Warner (1997), and Sala-i-martin (1997). Models 6 through 10 are similar to those used in Acemoglu et al. (2001) and Easterly and Levine (2003). In the first five models and in terms of the control variables, the results are similar to those in the previous studies. The mentioned variables are statistically significant, unless indicated otherwise. Starting with Model 1, the initial real GDP per capita has the largest coefficient and is positive. While fixed capital investment is positive in most specification, in some models it becomes marginally significant. Except for Models 2 and 3, human capital index is also positive. While the Latin America dummy is not statistically significant, the Sub-Saharan Africa dummy is consistently significant at better than 1% level of significance and negative. Starting with Model 2, institutional quality-related variables and constitutional scores are added to the basic model (Model 1). Corruption control and average institutional quality are positively related to real GDP per capita. A 1% increase in corruption control and average institutional quality is associated with 0.12 and 0.15% increase in real GDP per capita, respectively. When the institutional quality-related variables are substituted by constitutional scores, the only statistically significantly positive constitutional scores are, 5 and 6, albeit marginally. Additionally, the size of the coefficients associated with constitutional scores 5 and 6 are about the half of the coefficients associated with corruption control and average institutional quality. As shown in **Table 4**, these two constitutional scores have a higher weight of the number of constitutional revisions. In Models 1 through 5, 98% of the variation in real GDP per capita is explained by the regressors. Additionally, the p value associated with F statistic indicates that the null hypothesis of all coefficients being zero is rejected at better than 1% level of significance.

In **Table 13**, Model 6 through 10 use a limited number of regressors. Model 6 shows the basic estimation, where only latitude and ethnic fractionalization are statistically significant in some of the estimations. Latitude has a positive relationship with real GDP per capita. Ethnic fractionalization is negative; however, it is marginally significant in most estimations. When corruption control and average institutional quality are added in Models 7 and 8, respectively, the coefficients associated with these variables become highly statistically significant, large, and positive. For example, a 1% increase in corruption control is associated with 1.17% increase in real GDP per capita. Models 9 and 10 replace corruption control and average institutional quality with constitutional scores. Except for constitutional scores 4 and 5, none of the remaining scores are statistically significant. Model 9 shows that constitutional score 4 has a negative relationship with real GDP per capita. In fact, a 1% increase in real GDP per capita is associated with a 0.53 decrease in real GDP per capita. As shown in **Table 4**, the constitutional score 4 is based on the constitutional index 4, which includes government system and electoral rule. Because of the previous studies cited in previous sections, where the parliamentary government system and the proportional electoral rules are believed to be associated with lower institutional quality, the constitutional score 4 assigns 1 to parliamentary system and proportional electoral rule and 0 otherwise. However, **Table 3** shows that in this paper's dataset the majority of the advanced countries have

Table 13. OLS estimations (Dependent variable: natural log of real GDP per capita)

	1	2	3	4	5	6	7	8	9	10
RGDP PC ₁₉₆₀	0.82 (.00)	0.81 (.00)	0.81 (.00)	0.81 (.00)	0.81 (.00)					
Fixed capital investment	0.19 (.08)	0.20 (.07)	0.23 (.05)	0.19 (.08)	0.20 (.08)					
Human capital index	0.39 (.04)	0.21 (.31)	0.19 (.40)	0.40 (.04)	0.41 (.04)					
Openness	0.02 (.55)	0.02 (.50)	0.01 (.84)	0.02 (.53)	0.02 (.53)					
Latin America dummy	−0.07 (.23)	−0.06 (.29)	−0.07 (.23)	−0.06 (.31)	−0.06 (.30)					
Sub-Saharan Africa dummy	−0.29 (.00)	−0.37 (.00)	−0.36 (.00)	−0.29 (.00)	−0.29 (.00)					
British legal origin						0.32 (.38)	0.06 (.83)	−0.19 (.44)	0.38 (.29)	0.26 (.46)
Muslims						−0.003 (.25)	−0.001 (.85)	0.003 (.39)	−0.004 (.33)	−0.004 (.180)
Latitude						0.45 (.02)	0.25 (.13)	0.23 (.17)	0.36 (.08)	0.43 (.02)
Ethnic fractionalization						−0.25 (.09)	−0.20 (.09)	−0.19 (.09)	−0.23 (.15)	−0.29 (.04)
Corruption control		0.12 (.04)					1.17 (.01)			
Avg. institutional quality			0.15 (.06)					2.04 (.00)		
Constitution score #4									−0.53 (.09)	
Constitution score #5				0.06 (.10)						0.13 (.00)
Constitution score #6					0.06 (.10)					
Constant	1.55 (.00)	1.30 (.01)	1.25 (.03)	1.59 (.00)	1.58 (.00)	9.66 (.00)	7.44 (.00)	6.25 (.00)	9.23 (.00)	9.66 (.00)
# of obs.	90	90	88	90	90	87	87	87	79	87
R ²	0.98	0.98	0.98	0.98	0.98	0.29	0.45	0.47	0.31	0.33
Prob > F	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Number in parentheses are *p* values associated with estimated coefficients. All estimations use the heteroskedasticity-consistent standard errors. All variables are in natural logs except for the regional dummies, legal origin, and share of Muslims in a country. See Table 10 for variable descriptions. The model shown in 1 through 5 is similar to those used in Barro (1991), Levine and Renelt (1992), Mauro (1995), Sachs and Warner (1997), and Sala-i-martin (1997). The model shown in 6 through 10 is similar to those used in Acemoglu et al. (2001) and Easterly and Levine (2003).

parliamentary systems and proportional electoral rules. In Model 9, constitutional score 5 is positively associated with real GDP per capita at better than 1% level of significance. The size of the coefficient is twice as large as that in Model 4. In Models 6 through 10, between 29 and 47% of the variation in real GDP per capita is explained by the regressors. Additionally, the *p* value associated with F statistic indicates that the null hypothesis of all coefficients being zero is rejected at better than 1% level of significance.

The OLS estimations are associated with well-known problems. One of them is the fact that institutional quality (or constitutional scores) may not be exogenous. It is possible that income per

capita affects institutional quality (simply put, richer economies can afford better institutions) and this reverse causation would render the estimated OLS coefficient associated with institutional quality as biased. Another possibility is that there is an omitted variable that is in fact correlates with income per capita and that should have been used instead of institutional quality. Finally, institutional quality-related variables may well be associated with measurement errors, because their definition usually implies that they are multi-dimensional concepts (Acemoglu et al., 2003; Easterly & Levine, 2003). Therefore, based on reverse causation, omitted variables, and measurement errors associated with the OLS estimations, we are able to talk about the correlations between the dependent and explanatory variables and not about causality.

The 2SLS estimations necessitate the use of instruments for the endogenous variable, which is institutional quality. While these instruments should be correlated with the endogenous variable, they should be orthogonal to the error term. A number of tests are conducted to make sure that the instruments for the endogenous variable are valid. Tables 14 and 15 summarize the results of the 2SLS estimations, where the institutional quality and constitutional scores are used as the endogenous variables, respectively. At the bottom of these tables, three test results are reported. First, the endogeneity test has the null hypothesis of the relevant variable being exogenous. Because the 2SLS estimations use the heteroskedasticity-consistent standard errors, the p value shown in tables is associated with Wooldridge's χ^2 score test. A p value of 5% or less leads to the rejection of the null hypothesis and the conclusion that the relevant variable is endogenous.

Second, a valid instrument should be correlated with the endogenous regressor, but not with the error term. The p value associated with first-stage F-test shows whether the instrument has some explanatory power for the endogenous variable. Because the null hypothesis for the first-stage F-test states that the instruments do not explain the cross-country variation in institutional quality, a p value of 5% or less may indicate the validity of the instrument. Third, because the instrument must be uncorrelated with the error term, when the number of instruments exceeds the number of endogenous regressors (the model is overidentified), one can test whether the instruments are uncorrelated with the error term. If the model is just identified (the number of instruments equals the number of endogenous variables), a test of overidentifying restrictions (OIR) cannot be performed. Because of the use of the heteroskedasticity-consistent standard errors, the p value associated with OIR is based on Wooldridge's robust score test of OIR. In this test, the null hypothesis implies that the instruments do not explain per capita income beyond the ability of instruments to explain institutional quality. In other words, a p value of 5% or less may indicate an invalid instrument.

Tables 14 and 15 also report the instrumental variables used for each estimation. It certainly is not easy to come up with valid instruments. *Settler mortality* is an important contribution of Acemoglu et al. (2001) to a short list of instruments for institutional quality. They argue that differences in colonial experience could be a source of exogenous variation in institutions. Europeans did not see the feasibility of settlements in certain colonies with higher mortality rates and were therefore motivated to create extractive institutions. In contrast, in colonies with lower settler mortality rates, Europeans established European-like institutions, notably in North America, Australia, and New Zealand. Acemoglu et al. (2001) and (2003) as well as Easterly and Levine (2003) find that the settler mortality rate is a valid instrument for institutional quality, when estimating the effect of the latter on current per capita income. While this paper uses settler mortality as an instrument, unfortunately this instrument is available only for 54 out of 109 sample countries, which considerably decreases the number of observations.

Latitude is also used as an alternative instrument for institutional quality. Easterly and Levine (2003) show that there is a strong positive association between latitude and economic

Table 14. Two-stage least squares estimations (Dependent variable: natural log of real GDP per capita; endogenous variable: average institutional quality)								
	1	2	3	4	5	6	7	8
RGDP PC ₁₉₆₀	0.80 (.00)	0.80 (.00)	0.80 (.00)	0.80 (.00)				
Physical capital	0.22 (.06)	0.22 (.05)	0.25 (.03)	0.25 (.06)				
Human capital index	0.07 (.87)	0.06 (.88)	0.05 (.84)	0.04 (.93)				
Openness	-0.01 (.89)	-0.01 (.90)	0.004 (.89)	0.004 (.90)				
Latin America dummy	-0.05 (.49)	-0.04 (.49)	-0.07 (.21)	-0.07 (.21)				
Sub-Saharan Africa dummy	-0.39 (.00)	-0.40 (.00)	-0.42 (.00)	-0.42 (.02)				
Average institutional quality	0.31 (.40)	0.31 (.39)	0.27 (.09)	0.28 (.41)	4.57 (.00)	4.72 (.00)	3.47 (.00)	4.16 (.00)
British legal origin					1.19 (.09)	1.26 (.09)	0.53 (.04)	0.73 (.09)
Muslims					-0.002 (.58)	-0.002 (.61)	-0.01 (.06)	-0.01 (.08)
Ethnic fractionalization					-0.57 (.00)	-0.58 (.00)	-0.20 (.04)	-0.15 (.32)
Constant	1.03 (.16)	1.02 (.16)	0.99 (.09)	0.97 (.25)	2.14 (.23)	1.92 (.30)	3.68 (.00)	2.69 (.12)
Instrumental variable(s)	Settler mortality, pronoun-drop rule	Settler mortality	Latitude, pronoun-drop rule	Latitude	Settler mortality, pronoun-drop rule	Settler mortality	Latitude, pronoun-drop rule	Latitude

(Continued)

Table 14. (Continued)								
	1	2	3	4	5	6	7	8
# of observations	46	46	88	88	43	43	87	87
Endogeneity, p value	0.59	0.57	0.42	0.69	0.05	0.04	0.01	0.09
First-stage, Prob > F	0.19	0.07-	0.00	0.03-	0.07	0.03-	0.00	0.01-
Overid restrictions, p value	0.37		0.97		0.46		0.44	

Number in parentheses are z values associated with estimated coefficients. All estimations use the heteroskedasticity-consistent standard errors. All variables are in natural logs except for regional dummies, legal origin, and share of Muslims in a country. See Table 10 for variable description. The model shown in 1 through 4 is similar to those used in Barro (1991), Levine and Renelt (1992), Mauro (1995), Sachs and Warner (1997), and Sala-i-martin (1997). The model shown in 5 through 8 is similar to those used in Acemoglu et al. (2003) and Easterly and Levine (2003).

Table 15. Two-stage least squares estimations (Dependent variable: natural log of real GDP per capita; endogenous variable: constitutional scores)

	1	2	3	4	5	6
British legal origin	0.74 (.26)	0.72 (.11)	0.99 (.09)	0.99 (.10)	0.99 (.10)	0.68 (.10)
Muslims	-0.01 (.03)	-0.01 (.17)	-0.01 (.26)	-0.01 (.23)	-0.05 (.23)	-0.01 (.19)
Ethnic fractionalization	-0.01 (.96)	0.003 (.99)	-0.11 (.63)	-0.10 (.65)	-0.10 (.66)	-0.07 (.79)
Constitutional score #1	1.96 (.04)		2.12 (.07)			
Constitutional score #2				2.21 (.07)		
Constitution score #3					2.21 (.08)	
Constitution score #4	-2.69 (.04)	-3.33 (.00)				-2.87 (.01)
Constant	7.68 (.00)	7.29 (.00)	9.96 (.00)	10.02 (.00)	10.03 (.00)	7.48 (.00)
Instrumental variable(s)						
Settler mortality, pronoun-drop rule						
Latitude, pronoun-drop rule	Latitude					
# of obs.	40	79	85	85	85	79
Endogeneity, <i>p</i> value						
First-stage, Prob > F	0.02	0.00	0.01	0.01	0.01	0.02
Overidentifying restrictions, <i>p</i> value	0.01	0.00	0.06-	0.01-	0.06-	0.00-
	0.61	0.43				

Number in parentheses are *z* values associated with estimated coefficients. All estimations use the heteroskedasticity-consistent standard errors. All variables are in natural logs except for regional dummies, legal origin, and share of Muslims in a country. See Table 10 for variable description. These estimations are similar to those used in Acemoglu et al. (2003) and Easterly and Levine (2003).

development in that countries with higher absolute latitude tend to have higher levels of real GDP per capita. They further argue that lower latitudes could be an objective measure of tropics, in which case one would expect a negative relationship between latitude and settler mortality. In fact, Table 12 shows that the correlation coefficient between latitude and settler mortality is -0.56 and is statistically significant at the 5% level of significance.

Finally, the *pronoun-drop rule* may represent an alternative instrument of cultural nature. As opposed to the argument implied by settler mortality and latitude that current institutions may partly be the product of the colonial past, an innate aspect of a country's majority culture may represent an impediment to higher institutional quality. The fundamental characteristics of a language such as the rule regarding the pronoun drop pioneered by Kashima and Kashima (1998) would function as an instrument for institutional quality. The idea implies that whether a language allows the drop of a pronoun (such as "I" or "you") may imply information of this particular culture's approach to the autonomy or embeddedness of the individual, a concept that was developed by Schwartz (1994). While allowing pronoun drop is interpreted as an emphasis on embeddedness of the individual where she cannot be distinguished from the general context, not allowing pronoun drop implies an emphasis on the individual. It could be argued that the emphasis

on belonging to a group may shape people to be submissive and interfere with their willingness to improve their environment, including institutional quality.

For space reasons, Table 14 uses only one institutional quality-related variable, which is the average institutional quality. As shown in the table, the endogenous variable is instrumented by alternative variables. As in the OLS regressions, two basic models are employed. The results in Models 1 through 4 indicate that the instrumented average institutional quality is marginally statistically significant only in Model 3. It means that the exogenous component of average institutional quality barely explains real GDP per capita. In Models 1 through 4, the endogeneity tests do not allow the rejection of the null hypothesis that institutional quality is exogenous. *p* values associated with F statistic indicate that instruments are valid on Models 2 through 4. As indicated before, Models 5 through 8 are similar to those used in Acemoglu et al. (2003) and Easterly and Levine (2003). British legal origin is positive and at times marginally significant. In Models 7 and 8, a higher share of Muslims marginally decreases real GDP per capita. Ethnic fractionalization has a negative effect on real GDP per capita in most estimations, except for Model 8 where it is not statistically significant.

In these models, we observe a large effect of the exogenous component of average institutional quality on real GDP per capita. The endogeneity tests reject the exogeneity of average institutional quality. The first-stage F statistic is statistically significant and indicates the validity of instruments.

In Table 15, constitutional scores replace institutional quality, where the former is now assumed to be endogenous. There are only six models, all of which are similar to those used in Acemoglu et al. (2003) and Easterly and Levine (2003).⁷ In Table 15, Models 1 and 2 use the settler mortality-pronoun-drop rule and the latitude-pronoun-drop rule combinations as instruments for constitutional scores, respectively, while Models 3 through 6 use only latitude. Starting with the control variables, British legal origin is marginally significant and positive in Models 3 through 6, which is consistent with Models 5 through 8 in Table 14. The share of Muslims and ethnic fractionalization are not statistically significant in Table 15, when constitutional indices are used instead of institutional quality. Constitutional scores 1 through 4 are statistically significant, depending upon the instrument(s) used in estimations. When constitutional scores 1, 2, and 3 are used as a proxy for institutional quality, the coefficients are statistically significantly positive and quite large (between 1.96 and 2.21). They are, however, not as large as those associated with average institutional quality in Table 14. Nevertheless, one can conclude that an increase in constitutional scores leads to an increase in real GDP per capita.

As in the OLS estimations (xTable 13, Model 9), Table 15 shows that constitutional score 4 produces a statistically significantly negative coefficient in Models 1, 2, and 6. It means that an increase in constitutional score 4 leads to a decline in real GDP per capita. Again, when examining Table 4, it is clear that the constitutional score 4 is based on the constitutional index 4, which attaches 25% weight each to government system and electoral rule. Because of the previous studies cited in previous sections, where the parliamentary government system and the proportional electoral rules are believed to be associated with lower institutional quality, the constitutional score 4 assigns 1 to parliamentary system and proportional electoral rule and 0 otherwise. Empirically, however, Table 3 shows that in this paper's dataset the majority of the advanced countries have parliamentary systems and proportional electoral rules.

In terms of the overall validity of the results presented in Table 15, the use of settler mortality as an instrument decreases the number of observations considerably. Still, the exogeneity of constitutional scores is rejected at better than 5% level of significance in all models. The first-stage F statistic is statistically significant and indicates the validity of the instrument(s). When two

instruments are used, the OIR tests show that the null hypothesis of the inability of the instruments in explaining per capita income beyond the ability of instruments in explaining constitutional scores cannot be rejected. Overall, the empirical evidence indicates that there is a large effect of the exogenous component of constitutional scores on real GDP per capita.

4.1. Discussion of the empirical results

The main question of this paper is whether constitutions as formal institutions can be used as a proxy for informal institutional quality, assuming that informal institutions affect formal institutions. There are various stumbling blocks on the way, when trying to answer this question. The main problem seems to be to capture the various dimensions of a formal institution such as constitutions. This paper represents a first attempt to provide a content analysis of constitutions and it is a crude attempt at best. Acemoglu and Johnson (2005) insightfully criticize the current black-box nature of institutions and suggest unbundling institutions by differentiating the influence areas of institutions, such as contracting vs. property rights institutions, financial development vs. contracting institutions, economic vs. political institutions. However, one can argue that all formal and informal institutions find their way to influencing economic outcomes. At times, it is not clear through which channels institutions end up affecting economic outcomes. Additionally, this paper demonstrates the difficulty of focusing on one clearly defined formal institution, namely constitutions, and providing a content analysis of it so that the selected dimensions of constitutions would explain the variation among countries' real income in a consistent fashion. This kind of data has noise in it for the following reasons.

First, a common challenge in institutional quality-related studies is that complementarity of formal and informal institutions (or the lack thereof) can vary among countries (Helmke & Levitsky, 2004; Poppo & Zenger, 2002). For example, even though presidential government systems are assumed to be associated with smaller and more efficient governments, a country's political culture would make this system less efficient. In fact, two of the widely used constitutional characteristics, government systems and electoral rules, did not perform as expected using this paper's dataset. Most advanced countries in the dataset have a parliamentary government system and implement proportional electoral rule, which are believed to be associated with lower institutional quality. Recent studies such as Cheibub et al. (2014) and McManus and Özkan (2018) point out that the two-dimensional government systems (parliamentary vs. presidential) and electoral rules (proportional vs. majoritarian) as well as their perceived negative (parliamentary-proportional) or positive (presidential-majoritarian) combinations are not fully capable of explaining economic outcomes. The problem is that even with well-defined institutional characteristics the implementation of these characteristics or their combinations can vary among countries for a variety of reasons, which leads to weaker results in institutional research. Therefore, while this paper provides various constitutional scores to capture the content of constitutions, these scores suffer from the same difficulties that are common in institutional research.

Second, the content of constitutions may reflect wishful thinking in that the country's constitution is unable to improve the conditions that it has aimed to improve. In other words, the content of the constitution is not effectively implemented. As discussed in Section 2, one of the challenges of institutional research is that formal and informal institutions interact in a variety of ways (Helmke & Levitsky, 2004; Poppo & Zenger, 2002). If the formal-informal institutional interaction is not complementary or accommodating, the informal institution can effectively compete with the formal institution or even substitute it. For example, the specific culture or the belief system of a country could increase or decrease the negative aspects of the parliamentary system. Or, even though the constitution protects religious freedom, the country may choose not to implement it. Third, additional dimensions of constitutional characteristics are needed to create a higher degree of variation in constitutional quality.

Nevertheless, the paper's empirical results are encouraging. There is evidence of simple correlations among the constitutional scores and institutional quality-related variables. In both OLS and 2SLS estimations, the results indicate that constitutional indices can be substituted for institutional quality-related variables. In OLS estimations as robust correlations and in 2SLS as causal relationships, there is evidence that constitutional scores are related to real income. The important limitation in this respect is that instead of a consistent relationship to real income in all models, we observe that the statistical significance of constitutional scores changes based on empirical specifications. Another limitation is that despite 2SLS estimations, cross-country regressions may still suffer from the omitted variable bias. Hopefully, over-time variations in constitutional characteristics would make panel fixed-effect estimations feasible in future research.

5. Conclusions

This paper investigates the question whether constitutions as formal institutions can be used as a proxy for informal institutional quality. To answer this question, first, the paper provides a discussion about institutions and constitutions based on the existing research and concludes that constitutions are an example of a formal institution. As any other formal institution, constitutions are influenced by countries' informal institutions such as customs and belief systems. The use of constitutions as another institutional quality-related variable necessitates a detailed content analysis that goes beyond the often-used constitutional characteristics such as government systems and electoral rules. The paper provides a novel content analysis of 109 constitutions, which includes the length, the number of revisions, and over 30 additional characteristics. Based on the content analysis, six alternative constitutional indices are calculated, which then normalized as constitutional scores between 0 and 1. The normalization of scores is done in a way so that higher scores would indicate higher institutional quality. Statistically significant correlations are observed between corruption control, bureaucratic quality, and the average institutional quality and some of the constitutional scores.

The constitutional scores are put to the test by replicating two widely-used empirical income models. The benchmark OLS and the two-stage least squares estimations are first conducted with institutional quality-related variables. Then, these variables are replaced by constitutional scores. The results suggest that the explanatory power of constitutional scores for real GDP per capita depends upon the empirical model. Especially in two-stage least squares estimations, constitutional scores that emphasize the length, mentioning state religion, and referring to state as mother, father or holy statistically significantly explain income per capita. It seems that the weights attached to various characteristics of constitutions in the calculation of constitutional indices that underlines normalized constitutional scores make a difference in estimation results. Even though constitutional scores are normalized in a way so that a higher constitutional score should be correlated with higher institutional quality, the constitutional score 4 has a statistically significantly negative effect on real GDP per capita. In the constitutional score 4, government system (presidential = 1) and electoral rules (proportional = 1) have a weight of 25% each. This anomaly occurs, because most of the advanced countries in the dataset have presidential government systems and proportional electoral rules, contrary to the general belief. This is a good example for challenges that is associated with quantifying institutional quality. It emphasizes the need to recognize the interactions between formal and informal institutions.

Even though this paper's approach to constitutions is novel, its limitations have to be recognized as well. This is the first crude analysis of the content of a large number of constitutions. Still, the sample constitutions constitute less than half of world's constitutions. Additionally, the fact that some of the six alternative constitutional scores work well with only one growth model reflects a common challenge to all measurements of institutional quality, which involves the discrepancy between the nominal constitutional characteristics and their actual implementation in a country.

Viewing constitutions as a formal institution and assuming that constitutions should be related to countries' informal institutional characteristics such as corruption or bureaucratic quality is an important line of inquiry. This view tells us that constitutions or their revisions should not be examined in a vacuum. A country's informal institutional characteristics are expected to be embedded in its constitution and constitutional revisions. The implication of this line of inquiry is that new constitutions or constitutional revisions may not bring the expected change, as long as informal institutions that affect constitutions do not change.

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Notes

1. I thank to one of the anonymous referees for raising this point.
2. The dataset is available at: <https://dataverse.harvard.edu/dataset.xhtml?persistentId=doi:10.7910/DVN/VMERCI>
3. While the UK is generally known as not having a written constitution but a collection of laws, various studies including the Comparative Constitutions Projects assumes Magna Carta of 1215 as the UK constitution. See: <https://comparativeconstitutionsproject.org/ccp-rankings/>
4. Ben-Bassat and Dahan (2008) presents interesting results on the implementation of constitutional commitments. They construct quantitative indices of social rights for 68 countries. Their results suggest that countries with the tradition of French civil law generally have a higher commitment to social rights than countries adhering to the English common law tradition. However, in terms of whether the constitutional commitment is translated into actual public policy, they could not find a robust effect of social rights on public policy except for the constitutional right to social security.
5. Advanced countries are identified based on the IMF's classification. Other countries include low-income developing, emerging, and transition countries. The IMF's country classifications are available at <https://www.imf.org/external/pubs/ft/weo/2015/02/weodata/groups.htm#cc>.
6. Settler mortality rate and the pronoun-drop rule are discussed later in relation to 2SLS estimations.
7. When the model that is similar to Barro (1991), Levine and Renelt (1992), Mauro (1995), Sachs and Warner (1997), and Sala-i-martin (1997) is used, none of the constitutional scores were statistically significant. Therefore, the results of these estimations are not shown.

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