

Executive Constraints and Economic Growth

Erick Alvarez Barreno

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Abstract

Using panel data of 143 countries from 1950 to 2010, this article estimates the effects of executive constraints on economic growth. We characterize two types of constraints. Horizontal constraints are linked to the powers of the parliament to control executive's actions. Vertical constraints are associated with political accountability in which the executive responds to the general electorate. By identifying the economic functions of each constraint, a typology of four institutional settings is proposed. This typology describes the degree to which a ruler is committed to securing individual rights, and accountable to the sanction of citizens. Fixed effects and GMM estimates suggest that the exclusive presence of horizontal constraints is associated with a decrease of about 0.21 percent of GDP per capita. Vertical Constraints have no significant effect, but the presence of both institutions is associated with an increase of about 0.18 percent of GDP per capita. The results show an empirically relevant interaction between both institutions.

Keywords: Constraints on rulers, horizontal and vertical constraints, institutions, growth

1. Introduction

Political economist have widely contended that securing property rights and enforcing contracts have a positive effect on development (Acemoglu, Jonhson and Robinson 2001, 2005; Rodrik, Subramanian and Trebbi 2004; Acemoglu and Robinson 2012). Most of this literature centers on the critical role of economic institutions in reducing transaction costs and enabling individuals to capture the expected gains of voluntary exchange (North and Thomas 1973; North 1990). However, “markets cannot operate in an institutional vacuum” (Johnson and Koyama 2017, 13). For property rights to be secured, there is to be a centralized and powerful enough state to strengthen contract enforcement, resolve coordination failures, and prevent opportunistic behavior from occurring. Thus, not only economic institutions such as markets must provide basic development conditions, but the state – and those who govern it – must establish the foundations for them to properly evolve.

This assumption contrasts with the fact that some states could be extremely inefficient in ensuring order in their territory and protecting basic political and economic rights of the citizenry; while others can be so powerful that they could become a major threat to individuals rights (Menard and Shirley 2005). As a potential solution to this problem, scholars have seen “political institutions of limited government” as the ideal instrument to reduce the menace of state predation. These institutions, also commonly referred to as “executive constraints”, have been treated as conducive to economic development since they tend to protect individual property rights by ensuring rulers' credible commitment not to use the state's coercive power to expropriate private and social assets (North and Weingast 1989).

To what extent (if any) do these institutions shape economic outcomes? This article estimates their direct effect by characterizing two well-specified types of constraints: Horizontal and Vertical. The former is linked to a concept of horizontal accountability where the executive is accountable to the parliament, whereas the latter is associated with vertical accountability where the executive is accountable to the electorate. This theoretical approach allows us to create a novel typology of political regimes based on the interaction between these two institutions. The typology describes four institutional settings that determine the degree to which a ruler is committed to securing rights and or accountable to citizens' sanctions.

Our typology classifies countries with committed and accountable rulers (presence of both constraints); countries with committed, but not accountable ones (presence of horizontal, absence of vertical), countries with uncommitted, but accountable rulers (absence of horizontal, presence of vertical); and, finally, countries with neither committed nor accountable rulers (absence of both constraints). Fixed effects and GMM estimates suggest that the exclusive presence of horizontal constraints is associated with a decrease of about 0.21 percent of GDP per capita. Vertical Constraints have no significant effect, but the presence of both institutions is associated with an increase of about 0.18 percent of GDP per capita. In addition, we found empirical evidence that supports the existence of a synergistic interaction between both types of constraints. This means that the combined effect of both institutions is much greater than the sum of their parts.

The remainder of the article is organized as follows. Section 2 defines two types of constraints (horizontal and vertical), and surveys some of the literature that addresses their economic roles. The section concludes by presenting a novel approach to analyze their interaction, it also surveys the literature on the economic effects of regime type and identifies observable implications. We then pose some hypotheses to test the validity of our approach. Section 3 describes the empirical strategy to assess our argument. Section 4 analyzes estimation results and Section 5 concludes.

2. Constraints on rulers: Types and roles

One of the most puzzling questions for economics is to explain the economic success and failure of societies. Conventionally, scholars have cited as determinants of development factors such as technological change and innovation; specialization (as a result of the division of labor) and the generation of scale economies; the accumulation of physical and human capital; the reduction of markets' information costs; and productivity increase through the efficient resource allocation. The seminal work of North and Thomas contests this approach by suggesting that these factors do not constitute determinants of growth by themselves, but rather they are growth (1973, 2).

North's contributions strengthened the view that places institutions as the fundamental determinant that explains the economic and political divergences across societies.¹ Institutions are defined as

¹ An essential issue to understanding the argument of North and Thomas (1973) is the difference between "fundamental" and "proximate" determinants of development. For the proponents of this view, the factors listed such as innovation, education, or capital accumulation are considered proximate determinants because although they are

the “rules of the game”, or formally, the constraints devised by people that shape human interaction” (North 1990, 3). Institutions are crucial for growth because they reduce the transaction costs of human interaction, which allows for capturing the gains from the voluntary exchange (North and Thomas 1973; North 1990). Thus, societies may adopt efficient economic organizational forms by establishing institutional arrangements that motivate the undertaking of socially beneficial activities – which happens when the relative individual benefit of undertaking these activities exceeds their cost. As Acemoglu, Johnson, and Robinson pinpoint, some ways in which these arrangements are organized “encourage people to innovate, to take risks, to save for their future, to find better ways of doing things, to learn and educate themselves, to solve collective action problems, and to provide public goods” (2005, 397).

Economic institutions are crucial to running the economy by solving market coordination failures and commitment problems (Greif 2000; 2006). Political institutions set the foundations for the former to be sustained by coordinating and processing social conflict, and regulating how political power is distributed and exercised. The economic role of political institutions is to ensure fundamental rights by limiting political power. This may solve the fundamental problem in which a government strong enough to protect individual rights is also strong enough to transgress them. If properly functioning, Executive Constraints (from now on EC) are institutions that may be suitable to fulfill this objective. Nevertheless, how can we define them and what functions must they accomplish to effectively set controls on rulers and have an effect on economic outcomes?

This section proposes a novel approach to understanding and determining the impact of EC on economic growth. First, we distinguish between two types of EC, we also describe some of the literature that has attempted to study them and identify their fundamental economic roles. Next, we briefly review important contributions to the study of the effects of political regimes (this is due to the very limited literature that deals with the effects of EC separately).

2.1. Horizontal constraints

EC are institutions that control the discretionary nature of power. This concept stems from the need to limit rulers due to the menace that the will of the one may overturn the freedom and rights of the many. These institutions are commonly associated with the principle of separation of powers. From *The Federalist*, two characteristics may define how they function: (1) The existence of some degree of “constitutional intrusion” from some branches of government to other branches’ attributions;² and (2) the presence of a conflict of interests among actors involved in those branches.

important for a society to grow, they do not constitute an explanation for the sources of the differences in prosperity between societies. On the contrary, fundamental determinants such as institutions, culture, or geography explain both the higher concentration of a proximate determinant such as education or capital and the differences in prosperity between countries. For a more detailed explanation see Acemoglu, Gallego, and Robinson (2014).

² Specifically, Madison argues: “(. . .) unless these departments are so far connected and blended, as to give to each a constitutional control over the others, the degree of separation which the maxim requires, as essential to a free government, can never in practice be duly maintained” (*The Federalist* No 48, 256).

This conflict of interests – which is developed and processed through formal state institutions – is what characterizes Horizontal Executive Constraints (from now on HC). These institutions split up the power of government into relatively autonomous branches. An effective division of power entails several institutional veto players capable enough of influencing political decision-making. These checks can be imposed from legislative control over executive attributions (E.g. public budget), from the presence of an independent judiciary with legal instruments to review executive decisions (E.g. Judicial Review), or from the ability of other state agencies to remove rulers from office (E.g. impeachments, or votes of no confidence). Conversely, a single veto point reflects the situation of a leader who has unilateral control over political decision-making. This situation commonly indicates the functioning of authoritarian rule.

How do HC may influence economic outcomes? By analyzing the Glorious Revolution of 1688, North and Weingast (1989) found that HC over the royal prerogatives of William III of Orange were conducive to capital market development, the increase of the government's capacity to raise revenues, and the ensuing harnessing of innovations introduced by the Industrial Revolution. Within their study, HC are seen as “commitment devices”³ that turn credible ruler's promises to secure the individual rights of relevant social actors. As noted above, rulers are the principal menace to citizens' rights since they hold power over the confiscatory capacity of the state. The existence of HC enables other institutional veto players to bind rulers' decisions to their interests. Hence, the ruler is obliged to respect individual rights (i.e. property rights), something that, in the absence of the commitment, he would not have incentives to do.

Recent studies show that HC tend to increase the level of private investment because they generate certainty about the political environment, and they reinforce the confidence of investors about the security of their assets. Using data on private investment in 74 developing countries, Stasavage (2002, 42) finds that, on average, the change from a system without checks and balances to one in which the executive and the parliament are controlled by different political parties increases private investment by 16 percentage points. Stasavage's methodological approach also confirms his hypothesis that there is some sort of variance in private investment levels across countries without checks and balances. Which means that there are differences across countries with no HC in their capacity to foster private investment.

Other studies associate political uncertainty resulting from electoral processes with incentives to make irreversible productive investments⁴ (Bernanke 1983). Canes-Wrone and Park argue that “the larger the effects of an electoral outcome on an individual's financial situation, the more likely she should be to delay costly-to-undo investments” (2014, 87). Their analysis shows that investment

³ For Sanchez-Cuenca, a commitment is “a manipulation of your set of alternatives enabling you to achieve an outcome that would be impossible to attain in the absence of the commitment” (1998, 79-80). This manipulation adopts two forms: constraining available sets of alternatives, or imposing high costs on some of those alternatives.

⁴ Irreversible investments can be those that have to do, but not exclusively, with durable goods (Bernanke 1983, 104), physical and capital investment (Rodrik 1991, 230-231), real estate (Canes-Wrone and Park 2014, 84), fixed capital investments (Cox and Weingast 2017, 293) such as construction inputs, infrastructure and equipment, and other types of durable goods such as those in the automobile sector (Canes-Wrone and Ponce de Leon 2015, 4).

would decline due to the uncertainty produced by the electoral competition. Moreover, Canes-Wrone and Ponce de Leon claim that democratic development should reduce “inverse electoral investments and opportunistic business cycles” (2015, 19). They specifically suggest that the lesser the degree of executive power oversight, the greater the political uncertainty associated with electoral competition and, consequently, the larger the decline in private investment. This outcome is reproduced when political power “faces few institutional constraints, government transparency is low, and freedom of speech is curtailed” (Canes-Wrone and Ponce de Leon 2015, 19).

In conclusion, the literature suggests that there is a strong and positive relationship between HC and incentives to invest in different sectors of the economy. Checks and balances tend to increase private investment because they reduce macroeconomic and political uncertainty. This in turn reinforces investors’ confidence in the rules of the game and the security of their private property.

2.2. Vertical constraints

EC contribute to growth by fulfilling a function: restricting rulers’ behavior. An outstanding scholarly tradition pinpoints that retrospective voters should control politicians whose performance is perceived as ineffective. Barro (1973, 19) develops a model in which the electoral process serves as a mechanism to align the interests of politicians with the interests of their constituents. Ferejohn (1986; 1999) argues that voting can be exercised as an accountability mechanism when politicians fail to meet a determined citizen’s welfare threshold. Vertical Executive Constraints (from now on VC) are defined as those institutions that impose electoral controls on politicians. They allow for vertical accountability to occur, in which citizens are capable of evaluating and accordingly sanctioning their rulers’ performance.

VC are institutions that bind power holders with political stakeholders that are not part of formal state bodies. This relationship is understood as a principal-agent interaction in which the former (voters) delegate key attributions to the latter (rulers) to represent their interests. Within this approach, elections may solve the problems of adverse selection and moral hazard that emerge from the agency relationship. In Persson, Roland, and Tabellini, these institutions perform at least four distinct functions:

- (1) They aggregate and represent voter’s conflictive preferences; (2) they aggregate and disperse information about correct political decisions; (3) they address the problem of adverse selection by allowing citizens to select the most competent individuals for public office; and (4) they provide a mechanism to control moral hazard by holding elected officials accountable to citizens (1996, 2).

How VC may contribute to economic growth? Some of the studies that address the effects of VC suggest that they can indeed influence some economic factors, especially when they reinforce political accountability. For example, Benhabib and Przeworski (2010) examine the impact of specific types of accountability on economic growth. They distinguish between two restrictions that make politicians accountable: electoral and criminal controls. The former occurs when governments are politically accountable as they are subject to citizen sanctions, while the latter

occurs when governments are criminally accountable to other autonomous agencies. They conclude that countries in which rulers are accountable grow faster than countries in which they are not. This is because, when rulers extract resources beyond a socially justified threshold, voters would have the capacity to remove them from office, generating in turn political incentives for better public policy management (Benhabib and Przeworski 2010, 79). In other words, elections may contribute to growth when they allow citizen sanction over rulers' performance.

The following subsection describes the extent to which HC and VC interaction may inform not only about how their specific economic functions are met but if the sequence in which they emerge in the society produces different economic outcomes. As a result, it is possible to identify the economic functions that EC perform, how they influence growth and the channels through which their potential effects are produced.

2.3. Two functions, four institutional settings

One of the main objectives of this article is to examine how EC shape economic outcomes. With this in mind, the study can look forward to exploring how and to what extent HC and VC may contribute to economic growth. The literature suggests that HC tend to create a commitment to secure property rights, which encourages the undertaking of beneficial economic activities such as investment. This is generated by reinforcing actors' certainty that their property will not be expropriated and that the rules of the game will not be changed. Meanwhile, when VC strengthen political accountability (i.e. the citizen's ability to sanction the performance of politicians) they tend to promote policy improvements conducive to better economic results. In sum, there are two essential functions through which EC may contribute to economic growth: HC through credible commitments, and VC through electoral accountability.

A puzzling fact is that empirical evidence suggests that there is no regular pattern to the sequence in which these institutions emerge in society. For example, there are institutional settings with the presence of both EC, such as democratic political systems with an effective division of powers and free and fair elections. Other settings may present different combinations of both types of constraints such as systems with exiguous checks and balances, but where regular elections are held, or settings in which the leader is controlled neither by the parliament nor by the citizenry.

The English case illustrates this point. The need to levy taxes by the Stuarts between 1603 and 1651 encouraged conflicts between their supporters and opponents. After they were deposed as a result of the English Civil War, and after their restoration in 1660, between 1686 and 1688, King James II excluded the Whigs from the political process and then tried to do the same with his supporters, the Tories. These actions prompted his final overthrow, and the Crown's offering to William III of Orange in exchange for abiding by The Bill of Rights, which protected the interests of the actors represented in the Parliament. As a result of the Glorious Revolution of 1688, the new constitutional foundation provided various actors with veto power over government decisions, creating the foundations of a division of powers (North and Weingast 1989, 818).

Although this “constitutional watershed” (Cox 2012) allowed the formation of representative institutions that ceded power to a broader segment of society, political inequalities still prevailed. Barely two percent of the English population could vote in the 18th century (Acemoglu and Robinson 2012, 230). What is more, the franchise in the country was not extended until 1832, then in 1867 and 1884 by incorporating the majority of the adult male population, and finally in 1919 and 1928 when women were finally included (Acemoglu and Robinson 2000, 1182).

The English case shows the fact that the introduction of checks and balances preceded the extension of universal suffrage by many years until finally the country was democratically arranged. This means that if we consider the extension of the franchise to the majority of the adult male population that took place in 1884, and the last extension between 1919 and 1928, England had between 196 and 240 years of institutional performance reflected by the exclusive presence of HC (taking 1688 as its year of introduction), and between 131 and 87 years of institutional performance characterized by the presence of both HC and VC (taking 2015 as a reference year).

Empirical evidence of different institutional sequencing allows the argument that the interaction between HC and VC forms at least four institutional settings built accordingly to all their possible combinations. As described above, these settings determine the extent to which a ruler is committed to protecting rights, and/or is accountable to citizens’ sanctions. Therefore, we should expect to observe countries with committed and accountable rulers (presence of both constraints); countries with committed, but unaccountable ones (presence of horizontal, absence of vertical), countries with uncommitted, but accountable ones (absence of horizontal, presence of vertical); and, finally, countries with neither committed nor accountable rulers (absence of both constraints). Table 1 describes these settings:

Table 1. Type of ruler as a function of the presence and/or absence of executive constraints

	Presence of horizontal constraints	Absence of horizontal constraints
Presence of vertical constraints	<i>Committed and accountable ruler</i>	<i>Uncommitted but accountable ruler</i>
Absence of vertical constraints	<i>Committed but unaccountable ruler</i>	<i>Neither committed nor accountable ruler</i>

Source: The author.

By adopting this approach, two relevant contributions to the literature are made. First, we explore the interaction between two institutions often linked and treated together. By separating and examining their specific functions, it is possible to identify that both institutions may influence economic outcomes through different channels and at different degrees. Second, the proposal is somewhat distanced from theoretical and empirical approaches that treat the economic consequences of political institutions according to a specific regime type. Thus, we contribute with

a novel approach to evaluating the impact of institutional variations that take place within these regimes. This is done by evaluating the impact of different institutional settings that may arise in societies in different sequences and different periods.

2.4. The direct effect of political institutions

The relationship between democracy and development has been extensively surveyed, though little consensus has been found about its significance. For instance, Barro (1996a, 1996b) examines the determinants of growth across countries using linear regressions that include political, social, and economic factors. Using a panel of 100 countries from 1960 to 1990, Barro (1996b) examines the direct impact of democracy on growth. By including as controls some proximate determinants of development,⁵ he finds that the overall effect of democracy on growth is weakly negative (Barro 1996b, 1). In addition, the author argues that there is evidence of a non-linear relationship in which more democracy increases growth at low levels of political freedom, but depresses growth when a moderate level has been reached (Barro 1996b, 23). This means that the relationship between democracy and growth has a bell or hump shape: semi-democratic regimes tend to grow faster than regimes treated as more autocratic and more democratic. In later work, Barro (1997, 1) tersely concludes that “more political rights have no significant impact on growth.”

The study by Przeworski et al. (2000) is another relevant source. With a sample of more than 4000 country-year observations ranging from 1950 to 1990, the authors analyze the impact of democracy on material welfare. They conclude that “total output grows at the same rate under the two regimes in both poor and richer countries” (Przeworski et al. 2000, 179). However, their research does find some evidence that democracies are associated with slightly higher per capita GDP growth than dictatorships. The analysis also identifies that there is much greater variation in economic performance between different dictatorships than between different democracies. This suggests that there may be considerable institutional variation between dictatorships and that this factor may play a role in explaining their greater variation in growth levels.

Gerring et al. (2005) reach similar conclusions regarding the net effect of democracy on economic performance. The authors analyze democracy as a variable that accumulates over time, creating a stock of capital (i.e. physical, human, social, and political) that tends to affect growth. They conclude that democracy does not have a statistically significant economic effect (Gerring et al. 2005, 349). These results are supported using different indicators and specifications of their model.

In contrast, the influential work of Papaioannou and Siourounis (2008) examines the evolution of growth before and after incidents of permanent democratic transitions in a sample of 174 countries over the period 1960-2003. Their study is one of the main contributions that focus on estimating the dynamic evolution of annual growth during a political transformation. Specifically, the authors use static and dynamic panel data techniques that control for general trends and time-invariant and

⁵ These factors are the maintenance of the rule of law and free markets, low government consumption, human capital accumulation and the initial level of GDP (Barro 1996b).

country-specific characteristics that are not observed by their baseline model. As a result, their study shows that a permanent democratic transition is associated with an increase of about 1% in annual real GDP per capita growth⁶ (Papaioannou and Siourounis 2008, 1520). The descriptive analysis also reveals some interesting facts. In some cases, transitions to democracy tend to occur during recessions that possibly coincide with the downturn of the business cycle. After the transition, there seems to be an immediate increase in economic performance, which fluctuates in subsequent years. However, after the consolidation of democracy, which the authors argue that happens after the fifth, sixth, and seventh post-transition year, growth stabilizes at a higher rate than in the pre-transition period⁷ (Papaioannou and Siourounis 2008, 1542).

The case for democracy is supported by the study of Acemoglu et al. (2019). The authors use dynamic panel models controlling for fixed effects and growth dynamics to estimate the effect of democracy on GDP per capita. Their results suggest that a country transitioning from autocracy to democracy achieves 20 percent more GDP per capita over the next 25 years than a country that remains nondemocratic (Acemoglu et al. 2019, 48). Their fixed effects and GMM estimates do not vary significantly with the implementation of different econometric strategies and specifications, including a semiparametric treatment effects model and an IV approach.⁸ Finally, the authors also investigate the channels through which democracy increases GDP. They conclude that democracy contributes to growth by increasing investment, encouraging economic reforms, improving the provision of education and public health, and reducing social unrest (Acemoglu et al. 2019, 51).

As Papaioannou and Siourounis (2008) and Acemoglu et al. (2019), we argue that EC have a positive effect on economic growth. We hold this argument because two institutional settings (portraying the presence and absence of both EC) emulate the basic types of political regimes used by previous research (i.e. democracy and dictatorship). Countries with committed and accountable rulers should grow at higher levels than other countries with different types of rulers. However, the difference between countries with committed but unaccountable rulers and those with uncommitted but accountable ones is not clear. For this reason, a conservative hypothesis for this relationship is maintained by arguing that countries that fit into these intermediate categories grow at similar levels, but experience better economic performance than countries without any constraints. Formally, these first two hypotheses are expressed in the following terms:

H₁. Developmentalist hypothesis: Countries with committed and accountable rulers (presence of both EC) grow at higher levels in terms of GDP per capita than countries with other types of rulers.

⁶ Their estimates imply that in a country that abandons autocracy and consolidates representative institutions, annual growth accelerates after transition approximately 0.7% to 1.1% faster relative to the absence of regime change (Papaioannou and Siourounis 2008, 1533).

⁷ The authors also find evidence consistent with Barro's (1996b, 1997) finding that growth accelerates when a country moves from total autocracy to intermediate levels of political freedom.

⁸ The authors use regional waves in transitions to and from democracy as an instrument for country-level democracy. In this specification, their analysis finds that a democratization increases GDP per capita by about 25 percent in the first 25 years (Acemoglu et al. 2019, 51).

H₂. Conservative hypothesis: Countries with the exclusive presence of HC or exclusive presence of VC grow at similar levels, but at higher rates than countries with the absence of both constraints.

The typology developed in this research also allows us to evaluate the non-linear relationship found by Barro (1996b) in which countries with intermediate levels of political freedom grow at higher levels than more autocratic and more democratic countries. In this sense, countries that fit into the intermediate categories of our typology should experience higher levels of growth compared to countries with both EC and those with no constraints. This hypothesis is presented as follows:

H₃. Barro's non-linear relationship: Countries with the exclusive presence of HC or exclusive presence of VC grow at higher levels than countries with the presence and absence of both constraints.

3. Data and Methods

To empirically assess the hypotheses, we examine the political institutions of an unbalanced panel of 143 countries between 1950 and 2010. However, several analyses are conducted using subsamples that vary in terms of the number of countries and the number of years available. The overall sample covers a total of 7603 country-year observations, but this number changes depending on the availability of information. The entry year for each country is 1950 but varies according to its year of independence or the first year in which its growth data were available. The exit year corresponds to 2010 for all countries.

3.1. Dependent variable: Log GDP per capita

To measure economic growth we use the natural logarithm of gross domestic product (GDP) per capita measured in 1990 U.S. dollar international prices (dollar Geary-Khamis). This variable is conventionally used in the literature, and it is available for the unbalanced panel of 143 countries between 1950 and 2010. Its information was obtained from the Maddison Project Database version 2013 (Bolt and van Zanden 2014), whose statistics correspond to a historical and exhaustive study of the world's economic growth over centuries.

3.2. Horizontal Constraints

HC refer to the extent to which rulers are subject to constitutional constraints operating at the same level of political influence. Such constraints can be exercised through legislative control over some executive attributions (E.g. public budget), or through the ability of other state bodies to remove rulers from office (E.g. impeachments, censure motions, or votes of no confidence).

As Cox and Weingast (2017), we quantify HC using the concept of Polity IV (variable *xconst*) which describes the degree of checks and balances between the various parts of the government on a 7-point scale. Marshall and Gurr describe that this variable refers to “the extent of institutional

constraints⁹ on the decision-making powers of the chief executive, whether an individual or a collective executive” (2020, 61). They explain that their notion of EC uses the notion of “horizontal accountability” described in democratic literature, except that it is assumed that dictatorships may also be subject to certain institutional controls.

To capture the presence of HC, a dummy variable was generated from the concept of Polity IV which is equal to 1 when country i in time t has “substantial limitations” ($xconst = 5$), fits into the “intermediate category number three” ($xconst = 6$), or there is “parity or subordination of the executive” to other state powers ($xconst = 7$). Meanwhile, a country i in time t does not have HC when Polity IV classifies it as “unlimited executive authority” ($xconst = 1$), “intermediate categories one and two” ($xconst = 2$; $xconst = 4$), and it has “moderate limitations” ($xconst = 3$). The dataset has both the ordinal 7-point scale HC variable from Polity IV, and the dichotomous variable generated from the latter.

3.3. Vertical Constraints

VC are institutions that impose electoral controls on rulers. They can be characterized, for example, by the degree to which the right to vote has been extended in society, or by the presence of periodic, free, and fair elections. For many authors, the latter characteristic is often considered sufficient to denote a minimum definition of democracy, so it has been a common practice to associate VC with the concept of “electoral democracy” (Cox and Weingast 2017). Consequently, we measure VC by using the dichotomous coding of Boix, Miller, and Rosato (2012). Accordingly, a country classified as an electoral democracy in their denomination is treated as a country that has VC.¹⁰ The information for this variable is available for all countries and years of the sample.

Another way to measure this concept is with the Polity IV indicator related to the “competitiveness of executive selection” ($xrcomp$ variable in Marshall and Gurr 2020). As Cox and Weingast (2017), a country is considered to have VC when at least one of the chief executives was elected by a competitive election ($xrcomp = 2$), or the heads of the executive are elected through elections with two or more parties or candidates ($xrcomp = 3$). In contrast, there is an absence of VC when transfers of power are not regulated ($xrcomp = 0$), and when the heads of the executive are determined by hereditary succession ($xrcomp = 1$) (Marshall and Gurr 2020, 20). Both its ordinal scale and the generated dummy are available for all countries and years of the sample.

⁹ “Limits on the chief executive may be imposed by any “accountability group” in the polity.” These groups are the legislative and judicial branches of government in western democracies, and other groups such as “the ruling party in a one-party system, a council of nobles or powerful advisors in monarchies, and the military in coup-prone polities” (*Addendum B: Polity IV Executive Constraints Concepts* in Marshall and Gurr 2020, 61-65).

¹⁰ Boix, Miller, and Rosato define a country as democratic when it satisfies the following conditions for the dimensions of contestation and participation in Robert Dahl’s theory of polyarchy: “Contestation: 1. The executive is directly or indirectly elected in popular elections, and is accountable directly to the voters or to a legislature. 2. The legislature (or the executive if directly elected) is elected in free and fair elections. Participation: 1. A majority of adult males have the right to vote” (2012, 1530-31).

3.4. Institutional settings

To evaluate the expected effects of each institutional setting described in Table 1, four *dummy* variables were generated from Polity IV's concept of "constraints on the executive" for the case of HC, and the coding of Boix, Miller, and Rosato (2012) and Polity IV's concept of "electoral competitiveness" for the case of VC. The first setting (LH LV) takes the value of 1 when the variables *HConst* and *VConst* obtain the value of 1 in country *i* and time *t*. The variable is equal to 0 in all the remaining cases. The second setting (LV ~LH) is equal to 1 when the variable *VConst* obtains the value of 1 and *HConst* the value of 0; and it is equal to 0 in all other cases. The third setting (LH ~LV) is equal to 1 when the variable *HConst* is equal to 1 and *VConst* is equal to 0; and it is 0 in all the remaining cases. Finally, the fourth setting (~LH ~LV) is equal to 1 when the variables *HConst* and *VConst* obtain the value of 0; and it is equal to 0 in all the remaining cases. This latter is treated as the reference category.

3.5. Control variables

To construct the set of control variables, the research takes as a reference empirical studies that have successfully estimated the evolution (either static or dynamic) of annual growth during the irruption of political transformations. Thus, building on the contributions of Papaioannou and Siourounis (2008, 1548), and Acemoglu, Naidu, Restrepo, and Robinson (2019) the first set of controls include investment (as gross capital formation as a percentage of GDP), trade (as the sum of exports and imports of goods and services as a share of GDP), primary and secondary education enrollment rate, and infant mortality rate, all from the World Bank Development Indicators (WDI). In addition, we also include as controls the level of total factor productivity (henceforth TFP) in constant national prices from the Penn World Table version 10.0 (PWT 10.0) constructed by Feenstra, Inklaar, and Timmer (2015); tax revenues as a percentage of GDP from Hendrix (2010); the economic reforms index from Giuliano et al. (2013); and the dichotomous measure of social unrest constructed by Acemoglu, Naidu, Restrepo, and Robinson (2019) from the Cross-National Time-Series Data Archive of Banks and Wilson (2013).

The next subsection presents the econometric model implemented to estimate the impact of EC on economic growth. These estimations mainly use Static and Dynamic Panel (Linear) Models that are conducive to controlling for the potential heterogeneity of cross-sectional and temporal units, and the dynamic characteristics of GDP (Acemoglu, Naidu, Restrepo, and Robinson 2019, 57).

3.6. Econometric model

A dynamic panel data model with country and year-fixed effects is proposed to estimate the effect of EC on economic growth. We incorporate entity fixed effects that would account for country-specific characteristics that do not vary over time, such as geography, natural resources, social norms, and even the long-term impact of colonization strategies that may have influenced both the economic and political development of some countries (Papaioannou and Siourounis 2008, 1525). On the other hand, time-fixed effects would reflect influences of global trends on growth that are

common to all countries in the sample, such as, for example, the impacts produced by the two oil shocks that occurred in the 1970s (Cox and Weingast 2017, 285-286).

As Acemoglu et al. (2019), our specification includes lags of the dependent, which allows for controlling for GDP dynamics. According to the authors, a standard assumption of this type of model is that the key independent variable and past values of the dependent are orthogonal to current and future values of the dependent, and that the error term has no serial autocorrelation (formally described as “sequential exogeneity”). For this reason, this specification requires the incorporation of sufficient lags of the dependent variable to eliminate the residual of this autocorrelation. Finally, the inclusion of lags of GDP also allows for controlling for the impact of many economic factors such as commodity prices, agricultural productivity, and technology (Acemoglu et al. 2019, 57). Our specification is formally represented in the following equation:

$$Y_{it} = \alpha_i + \delta_t + \beta HC_{it} + \lambda VC_{it} + \vartheta(HC \times VC)_{it} + \sum_{j=1}^p \gamma_j Y_{it-j} + \eta X'_{it} + \varepsilon_{it} \quad (1)$$

Where the subscript i represents the country and t the year. The dependent variable Y_{it} is the natural logarithm of gross domestic product (GDP) per capita measured in 1990 U.S. dollar international prices. α_i is a contry-specific fixed effect, and δ_t the year fixed effect, both represented as vectors of dichotomous variables for each cross-sectional and temporal unit. β is the coefficient that captures the impact of horizontal constraints HC_{it} , and λ the impact of vertical ones VC_{it} . The coefficient ϑ is the effect of the interaction between HC_{it} and VC_{it} . Since both variables are binary or dichotomous, this multiplicative term would report coefficients of all possible combinations between both, which would generate a serious multicollinearity problem. For such reason, this interaction term only reports the coefficient of the presence of both EC (when their respective coding is equal to 1) as compared to their absence. γ_j is the coefficients of p lags of the dependent variable since this value (represented as j) is equal to 1. Similar to Acemoglu et al. (2019), up to a total of 8 lags of GDP per capita are included, so γ_j will reflect regressors from the first lag or when $j = 1$, i.e. Y_{it-1} , through the last lag or when $j = 8$, i.e. Y_{it-8} . η is the coefficient of a set of control variables, X'_{it} described above: investment, infant mortality, primary and secondary schooling, trade, fiscal revenue, social unrest, and market reforms. Finally, ε_{it} is the error term.

4. The Effect of Executive Constraints

The following tables report basic statistics for each dichotomous classification of HC and VC. Table 2 reports summary statistics for observations coded with the presence and absence of HC. Countries coded as horizontally constrained appear to perform better economically than their unconstrained counterparts (with a difference of \$5128.94 in favor of the former). In terms of infant mortality rate per 1000 births, there is a difference of almost 49 percentage points between the two groups. In particular, unconstrained countries have a disturbingly much higher rate (83.2 percent). On the other hand, horizontally constrained countries appear to have higher levels of both primary

(difference of 14.9 percent) and secondary schooling (difference of 36.7 percent), a higher index of market reforms (difference of 25.3 points), a moderately higher human capital index (difference of 0.8 points), a moderately higher protection of property rights implying lower investment risk (difference of 1.6 points), and a moderately lower level of corruption (difference of 0.9 points). In contrast, there are no significant differences in factors such as productivity, government stability, the level of investment in physical capital, trade, and tax revenue.

Table 2. Statistical summary for the presence and absence of horizontal constraints

	Horizontally unconstrained			Horizontally constrained		
	N	Median	St. Dev	N	Median	St. Dev.
GDP per capita	3817	2983.741	3850.625	3060	8112.681	6825.808
Investment Profile (0-12)	1274	6.276	2.265	1773	7.901	2.423
Human capital index	2966	1.568	0.445	3143	2.359	0.651
TFP in const. nat. prices	1914	1.066	0.556	2711	0.913	0.251
Government Stability (0-12)	1274	7.496	2.482	1773	7.704	1.933
Corruption (0-6)	1274	2.512	1.029	1773	3.469	1.413
Investment share of GDP	2530	0.219	0.103	2617	0.235	0.069
Infant mortality rate	3172	83.189	48.341	2951	34.434	34.132
Primary-school enrollment rate	2337	86.298	28.494	2285	101.188	15.012
Secondary-school enrollment rate	1958	38.429	27.546	1999	75.142	29.702
Trade share of GDP	2608	0.644	0.505	2692	0.685	0.394
Tax revenue share of GDP	2783	0.158	0.093	2337	0.205	0.097
Market reforms index (0-100)	2519	26.444	22.538	2438	51.709	25.175

Source: The author.

Table 3 reports statistics for the case of observations that were coded with the presence and absence of VC. Countries coded as vertically constrained have higher levels of economic performance as measured by GDP per capita (there is a difference of \$4780.7 in favor of the former). Unconstrained countries appear to have a much higher rate of infant mortality (83.2 percent) than their constrained counterparts (34.4 percent). In terms of schooling level, constrained countries have higher primary and secondary enrollment rates (percentage differences in favor of 14.9 and 36.7, respectively). Likewise, there are moderate differences in favor of the constrained countries in terms of factors such as lower investment risk (difference of 1.6 points), higher human capital index (difference of 0.7 points), lower corruption (difference of 0.9 points), and higher market reform index (difference of 25 points). Finally, there are no substantial differences in the level of productivity, government stability, investment in physical capital, trade, and tax revenue.

Table 3. Statistical summary for the presence and absence of vertical constraints

	Vertically unconstrained			Vertically constrained		
	N	Median	St. Dev.	N	Median	St. Dev.
GDP per capita	3537	2944.051	3832.785	3340	7724.74	6759.853
Investment Profile (0-12)	1148	6.28	2.25	1899	7.79	2.457
Human capital index	2720	1.56	0.43	3389	2.309	0.671
TFP in const. nat. prices	1731	1.084	0.575	2894	0.912	0.251
Government Stability (0-12)	1148	7.426	2.488	1899	7.733	1.965
Corruption (0-6)	1148	2.509	1.031	1899	3.408	1.409
Investment share of GDP	2312	0.221	0.103	2835	0.233	0.072
Infant mortality rate	2937	83.843	48.45	3186	37.428	36.729
Primary-school enrollment rate	2203	86.583	28.81	2419	100.104	16.13
Secondary-school enrollment rate	1834	38.415	27.549	2123	73.01	30.793
Trade share of GDP	2411	0.651	0.483	2889	0.676	0.425
Tax revenue share of GDP	2568	0.159	0.095	2552	0.2	0.096
Market reforms index (0-100)	2301	25.451	22.5	2656	50.496	25.13

Source: The author.

To contrast the information presented in the previous tables, Table 4 reports summary statistics of observations coded as democracies and non-democracies based on the dichotomous classification of Boix, Miller and Rosato (2012). Again, some familiar patterns can be observed such as democracies are on average richer than non-democracies (with a difference of \$5574.5), have a much lower infant mortality rate per 1000 births (with a difference of 48, 2 percentage points), have a more educated population (with a difference in favor of 12.9 percent for primary schooling and 35.9 percent for secondary schooling), and have a higher market reforms score than their counterparts (difference of 24.8 points). There are moderate differences between the two regimes in indicators such as the protection of property rights (difference of 1.8 points in favor of democracies), the human capital index (difference of 0.8 points in favor of democracies), and the level of corruption (difference of 1.1 points in favor of democracies). Finally, there appear to be no significant differences in the level of productivity, government stability, investment in physical capital, trade, and tax revenue.

Table 4. Statistical summary by regime type

	Non democracies			Democracies		
	N	Media	Des. Est.	N	Media	Des. Est.
GDP per capita	4230	2891.595	3763.51	2890	8466.073	6832.535

Investment Profile (0-12)	1478	6.158	2.312	1685	7.934	2.467
Human capital index	3279	1.592	0.449	2980	2.378	0.658
TFP in const. nat. prices	2116	1.053	0.535	2596	0.91	0.252
Government Stability (0-12)	1478	7.367	2.521	1685	7.713	1.929
Corruption (0-6)	1478	2.436	1.075	1685	3.53	1.393
Investment share of GDP	2809	0.217	0.101	2475	0.235	0.068
Infant mortality rate	3577	81.588	47.899	2770	33.372	33.722
Primary-school enrollment rate	2571	87.647	28.056	2154	100.573	15.49
Secondary-school enrollment rate	2125	39.483	27.47	1915	75.417	30.445
Trade share of GDP	2932	0.654	0.494	2519	0.669	0.394
Tax revenue share of GDP	3101	0.158	0.092	2205	0.206	0.098
Market reforms index (0-100)	2772	27.353	23.575	2331	52.112	24.557

Source: The author.

The following figures present scatter plots between the log transformation of GDP per capita and the Polity IV indicators that were used to generate the dichotomous measures of HC and VC. Figure 1 presents a scatter plot between GDP per capita and the Polity IV measure of executive constraints, both variables averaged over the period 1950-2010. Countries were reported with their respective abbreviations based on the World Bank nomenclature. The blue line represents a linear regression generated to simulate the relationship between the variables described in the plot. In addition, a Pearson correlation coefficient and its respective p-value have been computed. From its values (reported in the upper right corner of the graph) we can determine that there is a positive and moderately strong correlation between the two variables. Specifically, the coefficient presents a value of 0.61 out of 1, and its p-value is less than 0.001. This suggests that the more restricted the executive is in a country, the higher its level of growth as measured by the natural logarithm of GDP per capita. Another aspect to take into account in the plot is the existence of several outliers such as the United Arab Emirates, Kuwait, Qatar, Singapore, and Saudi Arabia.

Figure 2 presents a scatter plot between GDP per capita and the Polity IV competitiveness of executive selection measure, both variables averaged over the period 1950-2010. As in the previous figure, the Pearson correlation coefficient reports a positive and moderately strong correlation between the two variables. In particular, the coefficient presents a value of 0.64 out of 1, and its p-value is less than 0.001. This means that the more competitive the political process for selecting the executive in a country is the higher the level of growth measured by the natural logarithm of GDP per capita. It should be noted that these observations are descriptive but not causal in nature. The figure also presents some outlier cases. United Arab Emirates, Kuwait, Qatar, and Singapore again show high levels of GDP per capita, but much lower levels in the competitiveness indicator.

Figure 1. Relationship between executive constraints and GDP per capita

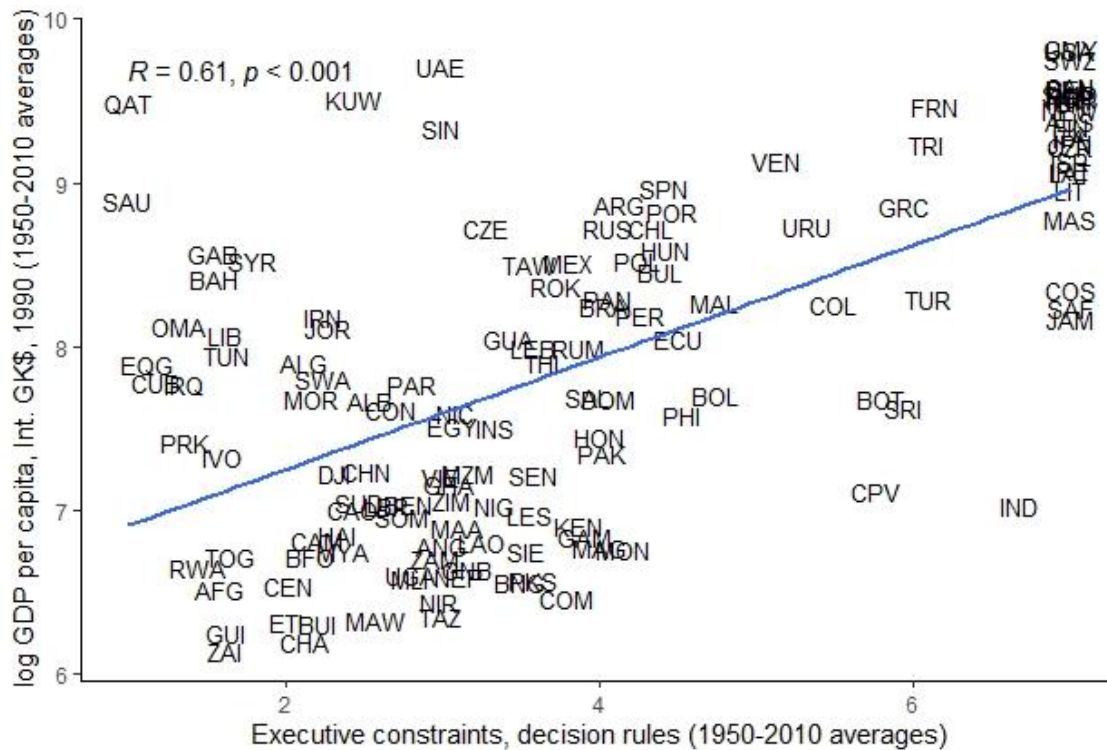
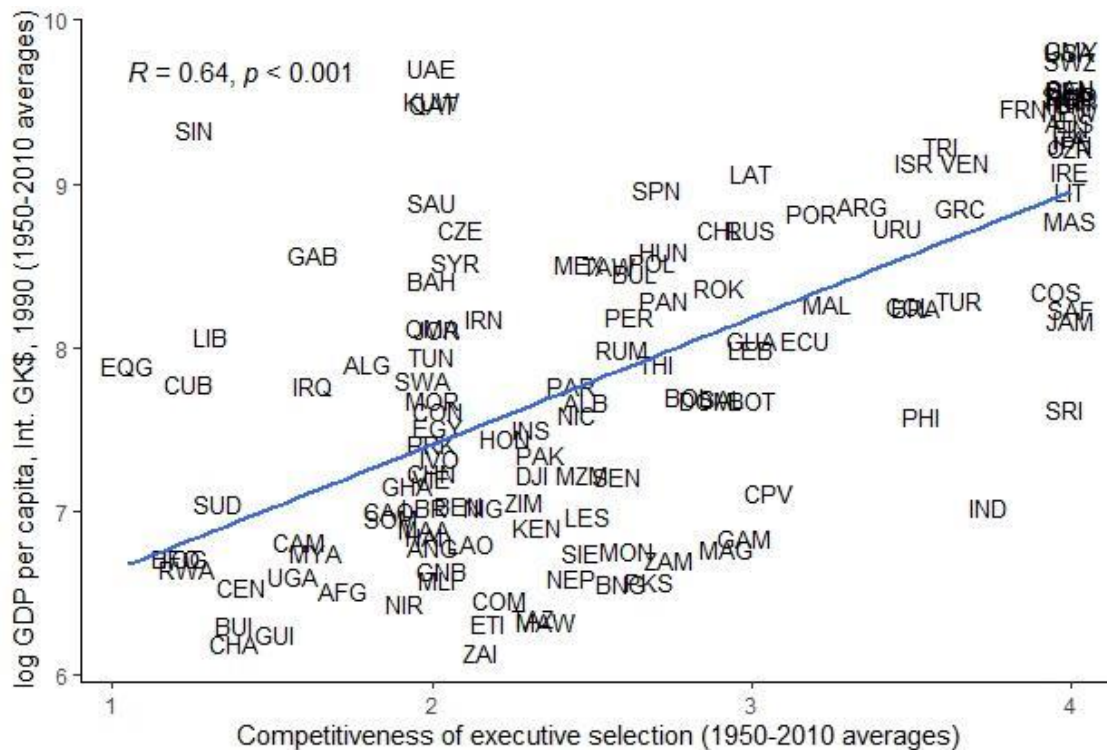


Figure 2. Relationship between competitiveness and GDP per capita

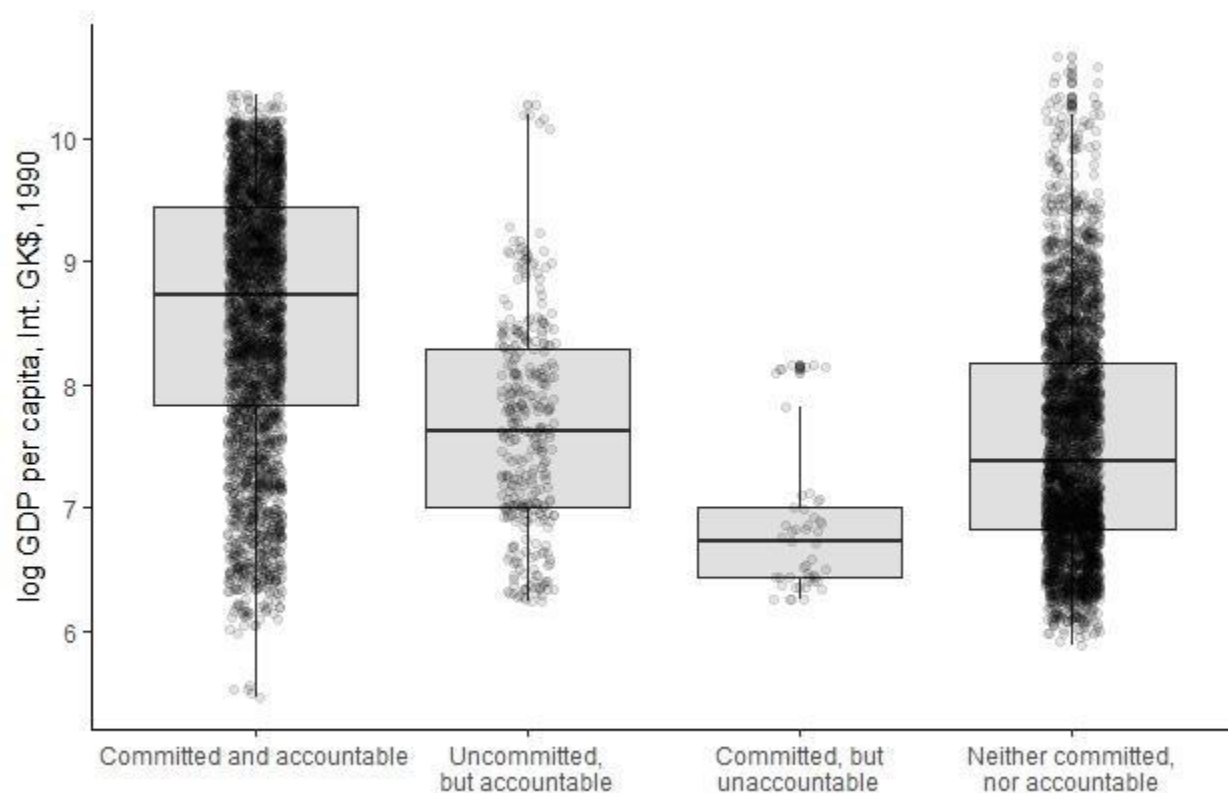


Source: The author from Bolt and van Zanden (2014), and Polity IV.

Finally, Figure 3 reports a box plot with information on GDP per capita and the typology of rulers constructed for this research. Here we can observe an apparent positive relationship between countries coded with committed and accountable rulers and the level of GDP per capita. The two intermediate categories report a decreasing relationship, while the fourth category presents a higher level of development than the third, but no higher than the second and much lower than the first. The pattern of observations represented in the diagrams fits some of the empirical descriptions already mentioned. In particular, if we look at the first and fourth boxes, we can see a higher concentration of observations at higher levels of GDP per capita for the case of countries coded with committed and accountable rulers, and a higher concentration of observations at lower levels of GDP per capita for countries with neither committed nor accountable rulers.

Based on the correlations presented, it can be concluded that at least descriptively there is a strong and positive relationship between GDP per capita and measures that capture information on democratic political institutions in general, and our conceptualization of constraints on the executive in particular. Accordingly, there seems to be a higher degree of economic development in political systems characterized as democratic (as defined by Boix, Miller, and Rosato 2012), with the presence of horizontal and/or vertical constraints (both according to different Polity IV definitions and measurements), and with committed and accountable rulers (according to the variable constructed for this research).

Figure 3. GDP per capita and type of ruler



Source: The author with information from Bolt and van Zanden (2014).

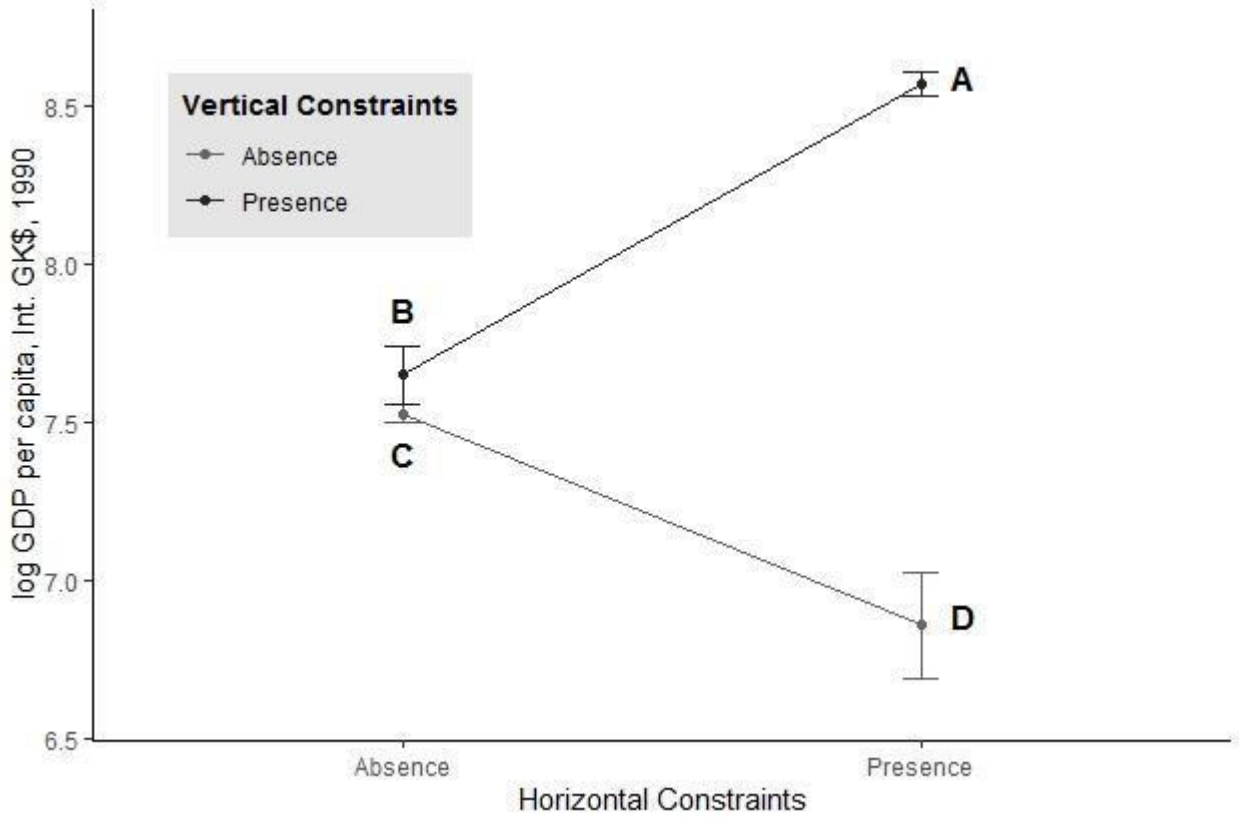
4.1. Estimation results

Recall Equation 1 presented in the following terms:

$$Y_{it} = \alpha_i + \delta_t + \beta HC_{it} + \lambda VC_{it} + \vartheta(HC \times VC)_{it} + \sum_{j=1}^p \gamma_j Y_{it-j} + \eta X'_{it} + \varepsilon_{it} \quad (1)$$

Here, the key coefficients to interpret the effect of the EC are β , λ , and ϑ . The first two coefficients represent the effect of each type of EC separately, while the third one reflects the effect of the interaction between both institutions.

Figure 4. Log GDP per capita (averaged over 1950-2010) as a function of executive constraints



Note.— Each point depicts the means of log GDP per capita by one of the four possible combinations of the interaction between horizontal and vertical constraints. To construct these variables, I used the codification proposed by Cox and Weingast (2017). Observations were codified as horizontally constrained when they have at least “substantial constraints” on the Polity IV executive constraints indicator (Marshall and Gurr, 2020). Observations were codified as vertically constrained when at least one of the chief executives was elected as a result of a competitive election, as measured by the indicator “competitiveness of executive selection” on Polity IV. GDP information came from the Maddison Project (Bolt and van Zanden 2014).

Figure 4 reports an interaction plot for the natural logarithm of GDP per capita (averaged for the period 1950-2010) as a function of the presence and/or absence of HC and VC. The trajectories illustrated in the figure reveal that both institutions have a synergistic interaction. This type of interaction occurs when two variables combine to amplify an effect. Therefore, the average GDP per capita for countries with the absence of both EC (or countries with neither committed nor

accountable rulers in our typology, spatially located at point C in the figure) is lower than the average GDP for countries with the presence of VC and absence of HC (uncommitted but accountable rulers located at point B in the figure). However, the average GDP of dictatorships appears to be substantially low when compared to the cases of countries that have only introduced HC (point D in the figure). In contrast, for the case of countries that have already introduced VC, the introduction of HC (point A in the figure) seems to substantially favor their growth prospects.

These observations have important implications. First, they provide empirical evidence that there is a relevant interaction between HC and VC, in which their different combinations are associated with different economic outcomes. Second, the figure also suggests that the order in which different political institutions were introduced across societies matters for growth. The most relevant observation is that the joint impact of both constraints appears to be notably larger than the sum of their individual impacts. In particular, the introduction of horizontal constraints on the executive is found to be of much greater economic benefit to countries that have already introduced vertical constraints, compared to countries with no constraints at all.

The following tables report estimation results from different specifications derived from Equation 1. Table 5 provides estimates of the effect of EC on log GDP per capita. Columns 1 and 5 report estimates of a static panel with fixed effects, that is, our baseline model without including lags of the dependent variable. Columns 2-4 and 6-8 report these same estimates controlling for different numbers of lags. The dependent variable is the natural logarithm of GDP per capita. Using this logarithmic transformation allows us to interpret the regression coefficients in percentage changes (Angrist and Pischke 2015, 60). Additionally, robust standard errors against heteroscedasticity and serial autocorrelation are reported in parentheses for all estimates.

Our preferred specification in Table 5 is the one presented in column 7, which includes four lags of the dependent variable. The coefficient for the binary HC indicator is -0.205 (standard error of 0.064). The estimate presents a negative and highly significant relationship between HC and growth (99 percent confidence level). This suggests that the exclusive presence of HC is associated with a decrease of about 0.21 percent of GDP per capita, conditional on the controls included in the model (other growth determinants, VC performance alone, the interaction performance, and a number of lags of the dependent variable). The coefficient of the binary VC indicator remains not significantly different from zero, so the presence of VC seems not to affect economic growth. In contrast, the interaction between HC and VC denoting country-year observations coded with committed and accountable rulers presents a positive and highly significant coefficient (coefficient of 0.18 and standard error of 0.058). This suggests that the presence of both EC is associated with a 0.18 percent increase in GDP per capita, compared to the absence of both institutions and conditional on the controls included in the model.

Table 5. The effect of executive constraints on log GDP per capita (fixed effects estimates)

	OLS with individual fixed effects				OLS with individual and time fixed effects			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Horizontal constraints	-.712*** (.133)	-.185*** (.029)	-.191*** (.061)	-.204*** (.074)	-.664*** (.143)	-.200*** (.060)	-.205*** (.064)	-.219*** (.073)
Vertical constraints	.007 (.036)	.011 (.012)	.010 (.011)	-.002 (.013)	.019 (.038)	.006 (.011)	.003 (.011)	-.008 (.013)
Horizontal \times Vertical	.632*** (.141)	.153*** (.031)	.161*** (.055)	.184*** (.069)	.591*** (.150)	.174*** (.053)	.182*** (.058)	.206*** (.069)
Investment share of GDP	.719*** (.110)	.253*** (.032)	.279*** (.053)	.289*** (.060)	.600*** (.104)	.242*** (.047)	.270*** (.048)	.284*** (.056)
Infant mortality rate	-.002*** (.001)	-.0002 (.0001)	-.0001 (.0002)	-.00004 (.0002)	-.001 (.001)	-.0004 (.0002)	-.0003 (.0002)	-.0002 (.0002)
Human capital index	.755*** (.056)	.206*** (.010)	.200*** (.049)	.214*** (.051)	.595*** (.071)	.207*** (.060)	.206*** (.059)	.217*** (.062)
Trade share of GDP	.038 (.035)	-.004 (.008)	-.001 (.008)	-.003 (.009)	.071** (.033)	-.0005 (.008)	.0001 (.008)	-.004 (.010)
TFP in const. nat. prices	.372*** (.042)	.115*** (.007)	.113*** (.031)	.112*** (.030)	.324*** (.043)	.113*** (.033)	.109*** (.031)	.109*** (.031)
Tax revenue share of GDP	.528*** (.133)	.196*** (.032)	.209** (.092)	.227*** (.085)	.479*** (.132)	.208** (.087)	.223** (.088)	.236*** (.081)
Social unrest	-.056*** (.013)	-.021*** (.006)	-.025*** (.006)	-.025*** (.006)	-.053*** (.012)	-.021*** (.006)	-.024*** (.006)	-.025*** (.006)
Log GDP, first lag		.502*** (.012)	.445*** (.094)	.444*** (.090)		.491*** (.072)	.433*** (.091)	.431*** (.087)
Log GDP, second lag		.284*** (.011)	.170*** (.046)	.165*** (.053)		.283*** (.038)	.167*** (.046)	.158*** (.053)

Log GDP, third lag			.177*** (.062)	.173*** (.051)			.177*** (.061)	.167*** (.051)
Log GDP, fourth lag			.003 (.060)	-.001 (.057)			.016 (.059)	.001 (.056)
Log GDP, fifth lag				.077 (.086)				.079 (.085)
Log GDP, sixth lag				-.031 (.065)				-.023 (.065)
Log GDP, seventh lag				-.104 (.073)				-.095 (.072)
Log GDP, eight lag				.057 (.051)				.066 (.050)
R ²	.542	.819	.814	.789	.293	.699	.700	.675
R ² Adjusted	.532	.815	.810	.784	.273	.690	.691	.664
Observations	7603	7317	7031	6459	7603	7317	7031	6459
Countries in the sample	143	143	143	143	143	143	143	143

*Significance levels: *p<0.1; **p<0.05; ***p<0.01.*

Note.— The table presents estimates of the effect of executive constraints on the natural logarithm of GDP per capita. Columns 1-4 present the results for the estimator with individual fixed effects, and columns 5-8 for the estimator with individual and time fixed effects. Robust standard errors against heteroscedasticity and serial autocorrelation are reported in parentheses. Columns 1 and 5 report results for the static panel analysis, while the remaining columns report results for the dynamic panel. Columns 2 and 6 include two lags of the dependent variable, columns 3 and 7 include four, and columns 4 and 8 include eight lags as controls.

Source: The author.

Estimates with fixed effects from dynamic panel models such as those presented in Table 5 have an asymptomatic bias of order $1/T$, known as the Nickell bias. This is a product of the violation of the assumption of strict exogeneity in dynamic panel models (Nickell 1981 in Acemoglu et al 2019, 62). Thus, the lags of the dependent variable included in equation 1 may be correlated with the idiosyncratic and non-stochastic characteristics of the cross-sectional units (Montero 2010). Table 6 provides estimates with the Generalized Method of Moments (GMM) that potentially addresses this bias. This estimator uses instrumental variables based on the lags of the dependent variable and differences of the other variables in the model (Montero 2010, 1). Columns 1, 2 and 3 present results with the systematic MGM estimator of Blundell and Bond (1998), while columns 4, 5 and 6 present results with the difference MGM estimator of Arellano and Bond (1991). Columns 1 and 4 include two lags as controls, columns 3 and 5 include four, and columns 4 and 6 include eight.

Our preferred specification is the one presented in column 2 which includes four lags and is estimated with the systematic MGM. Most patterns observed in previous specifications are maintained. The coefficient of the binary indicator of HC is negative and highly significant (coefficient of -0.46 and standard error of 0.14). This suggests that the exclusive presence of HC is associated with a decrease of about 0.46 percent of GDP per capita, keeping everything else constant. VC do not appear to have a significant impact on growth. However, the indicator capturing information on the presence of both EC has a positive and highly significant coefficient (coefficient of 0.22 and standard error of 0.07). This suggests that the presence of both institutions is associated with an increase of around 0.22 percent in GDP per capita, conditional on the controls included in the model.

Table 6. The effect of executive constraints on log GDP per capita (GMM estimates)

	GMM Blundell and Bond (1998)			GMM Arellano and Bond (1991)		
	(1)	(2)	(3)	(4)	(5)	(6)
Horizontal constraints	−.458*** (.141)	−.454*** (.142)	−.471*** (.155)	−.604** (.248)	−.545** (.253)	−.534* (.281)
Vertical constrains	.024 (.021)	.027 (.022)	.035 (.026)	.003 (.022)	.001 (.025)	−.005 (.027)
Horizontal × Vertical	.224*** (.069)	.220*** (.070)	.225*** (.076)	.294** (.122)	.268** (.126)	.256* (.137)
Investment share of GDP	.267*** (.066)	.310*** (.062)	.376*** (.072)	.235*** (.074)	.268*** (.078)	.324*** (.088)
Infant mortality rate	−.001*** (.0004)	−.001*** (.0004)	−.001*** (.0004)	−.001 (.0005)	−.001 (.0005)	−.0005 (.0004)
Human capital index	.243*** (.069)	.229*** (.063)	.222*** (.065)	.319*** (.093)	.308*** (.090)	.299*** (.086)
Trade share of GDP	.008 (.019)	.008 (.019)	.009 (.020)	−.005 (.011)	−.017 (.010)	−.011 (.011)
TFP in const. nat. prices	.160*** (.048)	.146*** (.044)	.138*** (.044)	.143*** (.042)	.136*** (.042)	.129*** (.039)
Tax revenue share of GDP	.221** (.091)	.214** (.088)	.210** (.085)	.373*** (.136)	.378*** (.128)	.368*** (.118)
Social unrest	−.018** (.008)	−.024*** (.009)	−.026*** (.010)	−.017*** (.006)	−.025*** (.006)	−.021*** (.006)
Log GDP, first lag	.488*** (.081)	.321*** (.088)	.257*** (.086)	.387*** (.076)	.327*** (.082)	.304*** (.082)
Log GDP, second lag	.277*** (.035)	.188*** (.048)	.118** (.051)	.242*** (.037)	.157*** (.048)	.147** (.057)

Log GDP, third lag	.200*** (.058)	.166*** (.057)		.154*** (.055)	.166*** (.057)
Log GDP, fourth lag	.071 (.059)	.059 (.048)		.036 (.060)	.023 (.053)
Log GDP, fifth lag		.110 (.083)			.049 (.075)
Log GDP, sixth lag		.022 (.068)			.009 (.049)
Log GDP, seventh lag		-.054 (.074)			-.084 (.074)
Log GDP, eight lag		.111** (.052)			.049 (.049)
Hansen-Sargan Test (p-value)	1	1	1	1	1
Observations used	14391	13919	12775	7174	6888
Countries in the sample	143	143	143	143	143

*Significance levels: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.*

Note.— The table presents estimates of the effect of executive constraints on the natural logarithm of GDP per capita. Columns 1-3 present the results for the Blundell and Bond (1998) GMM estimator, and columns 4-6 for the Arellano and Bond (1991) GMM estimator. All specifications include a full set of country and year fixed effects as controls. Robust standard errors against heteroscedasticity and serial autocorrelation are reported in parentheses. Columns 1 and 4 include two lags of the dependent variable, columns 2 and 5 include four, and columns 3 and 6 include eight lags as controls. The Hansen-Sargan test reports the validity of the instruments implemented in each specification (H_0 = instruments are valid).

Source: The author

5. Conclusions

Research that has studied the economic impact of political institutions has opted to aggregate them into broad categories such as democracy and dictatorship. These efforts have not yet been able to generate broad academic consensus on which type of regime produces better economic outcomes. Likewise, this approach does not take into account the potential impact of institutional variations within these broad categories, nor the possible institutional settings that may be in place. For this reason, the main contribution of this research has been to design a novel approach that allows us to exploit the institutional variations and combinations that may arise in society to determine the effect of political institutions on economic performance.

Our descriptive analysis suggests that democratic institutions are associated with good economic performance. Henceforth, it was possible to observe a higher degree of economic development in political systems characterized as democratic (as defined by Boix, Miller, and Rosato 2012), with the presence of horizontal and/or vertical constraints (both according to different definitions and measures of Polity IV), and with committed and accountable rulers (according to the variable constructed for this research). Measures of different democratic institutions also suggest that these on average are associated with higher levels of wealth, lower infant mortality rates, higher levels of education in their populations, and greater capacity to carry out market reforms. In addition, moderate differences in favor of democratic institutions were observed for the protection of property rights, the human capital index, and the level of corruption. Finally, no significant differences were found in the level of productivity, government stability, investment in physical capital, trade, and tax revenue.

Formally, to estimate the effect of executive constraints on economic growth, a dynamic panel analysis was performed with different specifications. The results obtained indicate that there is a negative effect of the presence of horizontal constraints on the level of GDP per capita; vertical constraints have no significant effect; and there is a positive effect of the presence of both compared to their absence. Our preferred specification shows that the exclusive presence of horizontal constraints is associated with a decrease of about 0.21 percent in GDP per capita compared to the other country-year observations coded with the presence of other constraints and holding all else constant. In contrast, we found that the presence of both constraints is associated with an increase of about 0.18 percent of GDP per capita, compared to observations coded with the absence of both constraints and conditional on the controls included in the model.

Contrary to the literature, our results suggest that the only presence of horizontal constraints does not generate a positive impact on growth. This effect is a product of controlling the performance of horizontal constraints by other determinants of growth, and the relative performance of other institutional settings. The study also found empirical evidence that supports our hypothesis that the presence of both constraints increases economic growth. In addition, the hypothesis that countries with only one EC grow at similar rates is rejected. The exclusive presence of VC produces no economic impact, while the exclusive presence of HC produces a negative one. We find evidence against Barro's non-linear hypothesis that intermediate levels of democracy are associated with

better economic outcomes. In this sense, the joint presence of both EC produces much better outcomes than the other possible combinations.

Results can be summarized as follows. Empirical evidence was found that supports the existence of a synergistic interaction between both types of constraints. This means that the joint effect of both institutions is much greater than the sum of their parts. Neither institutional setting appears to be related to greater physical capital accumulation. However, the presence of both constraints has a positive effect on human capital accumulation, suggesting that the indirect effect of these institutions may be produced through this channel compared to others.

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