

Executive Constraints and Economic Growth

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Abstract

Most work in regime effects focuses on whether democracy matters for development. Despite the vast academic production, it remains unclear what aspects of regimes produce such an outcome. This problem arises partly because scholars use composite measures of democracy, neglecting political regimes' complex and varied nature. I unpack the democracy-growth link by examining the economic roles and effects of two forms of executive constraints. Horizontal constraints are defined as the power of the parliament to control the executive, whereas vertical constraints are the capacity of citizens to keep their rulers accountable. Using an unbalanced panel with 176 countries from 1950 to 2020, I found that a permanent transition from an autocratic to a competitive regime increases GDP per capita by 3 percent in the short run and roughly 17 percent in the long run. Contrary to the literature, having strong checks and balances does not affect growth. These patterns remain insensitive across specifications using within, GMM and IV estimators. This research provides evidence of a relevant interaction between democracy components, in which participatory broad-based inclusive institutions seem to be more relevant for development than liberal institutions.

Keywords: Democracy, executive constraints, institutions, economic growth

1 Introduction

Scholars widely contend that securing property rights and enforcing contracts have a positive effect on long-term growth ([Acemoglu, Johnson, and Robinson 2001, 2005; Rodrik, Subramanian, and Trebbi 2004; Acemoglu and Robinson 2012](#)). This literature centers on the critical role of institutions in reducing transaction costs and enabling individuals to capture the expected gains of voluntary exchange ([North and Thomas 1973; North 1990](#)).

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As with political institutions, most work has focused on the effects of regimes, particularly on whether democracy matters for many desirable social and economic outcomes. However, results from different empirical analyses are contradictory, suggesting for example weakly negative effects (Barro 1996), no significant differences compared to autocracies (Przeworski et al. 2000; Gerring et al. 2005; Doucouliagos and Ulubaşoğlu 2008), or an overwhelming superiority of democracy in driving societies into the path of prosperity (Papaioannou and Siourounis 2008; Acemoglu et al. 2019; Colagrossi, Rossignoli, and Maggioni 2020; Knutsen 2021; Gerring, Knutsen, and Berge 2022).

Despite the vast academic production, scholars have failed to produce a systematical understanding of how democracy fosters growth, and which institutions are essential for that purpose. Most of the ambiguous and heterogeneous results found in the literature are partly because scholars use composite regime concepts that neglect the varied nature of political regimes. I unpack democracy into two forms of executive constraints to unveil the paths through which specific regime components affect growth while capturing greater patterns of institutional settings across space and time. These institutions control rulers' behavior, reducing the threat of arbitrary state predation and fostering socially beneficial economic activities. But to what extent do they shape economic performance? And through which channels do they influence growth?

This article disentangles the political dimensions of development by examining the economic roles and effects of classical democracy components. I define each component within the concept of executive constraints because their primary role is to control rulers' behavior. The incentives produced by such controls determine whether a society develops or not. In autocratic settings, the wealth is concentrated in the hands of one or a few people, there is no control over predatory behavior that may prevent growth and most of the population cannot freely participate in politics or the market. On the contrary, democracies tend to be more unequal, there are more checks on rulers' behavior and the majority of the population can freely participate in major political and economic activities.

Contrary to the commitment literature, the liberal component of democracy (i.e. horizontal constraints) does not seem to promote physical capital accumulation by improving investors' prospects. conversely, empirical evidence widely suggests a strong connection between the competitive component of democracy (i.e. vertical constraints) and human development through electoral accountability and public goods provision. Indeed, Using an unbalanced panel with 176 countries from 1950 to 2020, I found that a permanent transition from an autocratic to a competitive regime increases GDP per capita by 3 percent in the short run and roughly 17 percent in the long run and that horizontal constraints do not affect growth. I use two-way fixed effect regression models to account for both unit-specific (time-invariant) and time-specific (unit-invariant) unobserved confounders. These models include up to eight lags of GDP per capita that control the dip in growth

that occurs right before major political transformations, as documented in [Papaioannou and Siourounis \(2008\)](#), and [Acemoglu et al. \(2019\)](#). For instance, I also present estimates for a [Arellano and Bond \(1991\)](#) Difference Generalized Method of Moments (GMM) that address the problems related to including these lags as regressors.

The article is organized as follows. Section 2 depicts the relevance of unpacking democracy into its classical components, then, I present some hypotheses. Section 3 presents the data, section 4 the results and section 5 concludes.

2 Unpacking the democracy-growth link

The relationship between democracy and economic growth has been a pivotal issue for social scientists over the past 50 years. Despite data availability, the still contested case for democracy is matched by heterogeneous and ambiguous results. [Doucouliagos and Ulubaşoğlu \(2008\)](#) already reported that most of the literature issues are partly a consequence of research decisions, such as differences in specification, measurement, and estimation. Particularly, they found a positive and significant impact of democracy in only 27% of the cases they surveyed, while 21% were negative and non-significant, 37% were positive but non-significant, and 15% were negative and significant. One of the most common flaws is that researchers use composite democracy indicators, even when they are accounting for the impact of specific regime components. As [Boese et al. \(2022\)](#) pinpoint, these indices “typically rely on indicators tapping into different regime dimensions, but then aggregate the information from all dimensions into one composite score, thus masking the concept’s multidimensionality.” Accordingly, unidimensional measures fail to account for the complex and varied nature of political systems ([Boese et al. 2022](#)). This means that studies that have relied almost exclusively on such indicators may be underestimating the potential impact of a whole range and varieties of institutions, preventing us from assessing which one is driving most of the regime effect. Highlighting almost exclusively the role of one component over the other may explain why studies find such heterogeneous results in such different sets of outcomes.

Several studies have applied disaggregated measurement strategies when studying the role of certain institutions such as executive constraints ([Cox and Weingast 2018; Fjelde, Knutsen, and Nygård 2021](#)). Scholars have also unpacked features such as political accountability ([Lührmann, Marquardt, and Mechkova 2020](#)), and polyarchy dimensions ([Alexandra Boese and Charles Wilson 2023](#)). [Boese et al. \(2022\)](#) propose perhaps the most comprehensive approach of a rigorous multidimensional conceptualization of democracy using V-Dem data. They construct a cube of democracy based on three dimensions, namely participation, electoral contestation, and constraints on the executive. They successfully trace many patterns of regime convergence and divergence that were masked by conventional measures, such as participation experiencing an even improvement across

regions since WWII, even where other aspects such as contestation and constraints were absent. Interestingly, this approach also uncovers that “several non-electoral regimes placed extensive legislative or judicial constraints on their executive” ([Boese et al. 2022](#)), and conversely, several other electoral regimes have developed weak constraints.

I use a similar approach to unpacking regimes by distinguishing two forms of executive constraining institutions. I focus on the role of executive constraints because they meet two important conditions, disaggregation and economic significance. First, they are theoretically strong regime components that produce a greater variety of democratization patterns and regime institutional configurations across space and time. Second, a plethora of studies have already linked them to specific sources of economic growth such as private investment and human capital. In general, executive constraints are institutions that control the discretionary nature of power. As [Boese et al. \(2022\)](#) contend “the limitation of the power itself is a key dimension of democracy.” Thus, I define horizontal constraints as institutions providing checks on rulers’ behavior by splitting up the power of the government into relatively autonomous branches. An effective division of power entails horizontal accountability, in which several institutional veto players can influence political decision-making. These checks can be imposed from legislative control over executive attributions (e.g., public budget), or an independent judiciary with legal instruments to review rulers’ decisions (e.g., judicial review). Conversely, I define vertical constraints as institutions that keep leaders accountable to the majority of the population. These institutions bind the will of power holders with the interests of organized masses through contested multi-party elections and extensive franchise rights ([Dahl 1971](#)). Consequently, institutions providing electoral oversight allow for vertical accountability to occur, in which citizens can evaluate and accordingly sanction their rulers.

Figure 1 depicts a basic regime representation inspired by Dahl’s two-dimensional regime typology. Let’s call a regime near the lower left corner of the figure a closed regime, which is characterized by low levels of both constraints. As a closed regime shifts upwards, it is moving toward greater levels of horizontal constraining institutions. Rulers in such settings face more checks on their behavior, but the regime remains non-inclusive as having low levels of both public contestation and participation. If a closed regime changes towards the lower right corner, it is developing competitive and multiparty elections under extensive suffrage. Such vertically constrained regimes would be inclusive and competitive but would have weak checks and balances. As [Dahl \(1971\)](#), my approach also implies that a regime might change along one dimension and not the other. This means that even though considering a democracy requires higher levels of both, many countries may score high on one or lower on the other at any moment of their lives. Thus, a constrained regime may turn democratic by developing higher levels of vertical constraints, and competitive ones would do the same by having higher levels of horizontal constraints.

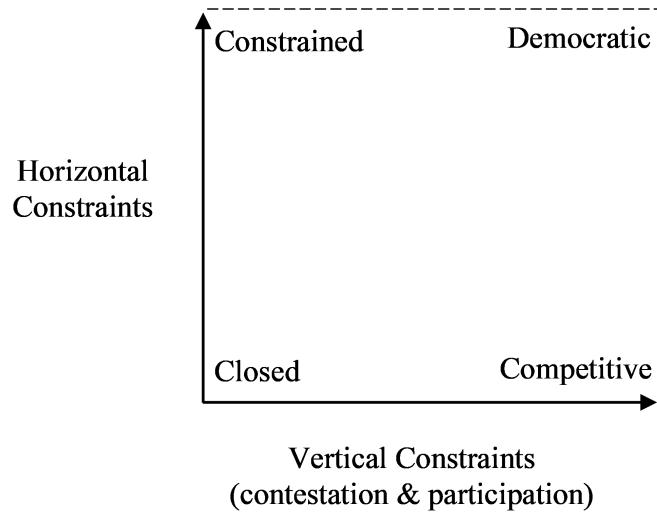
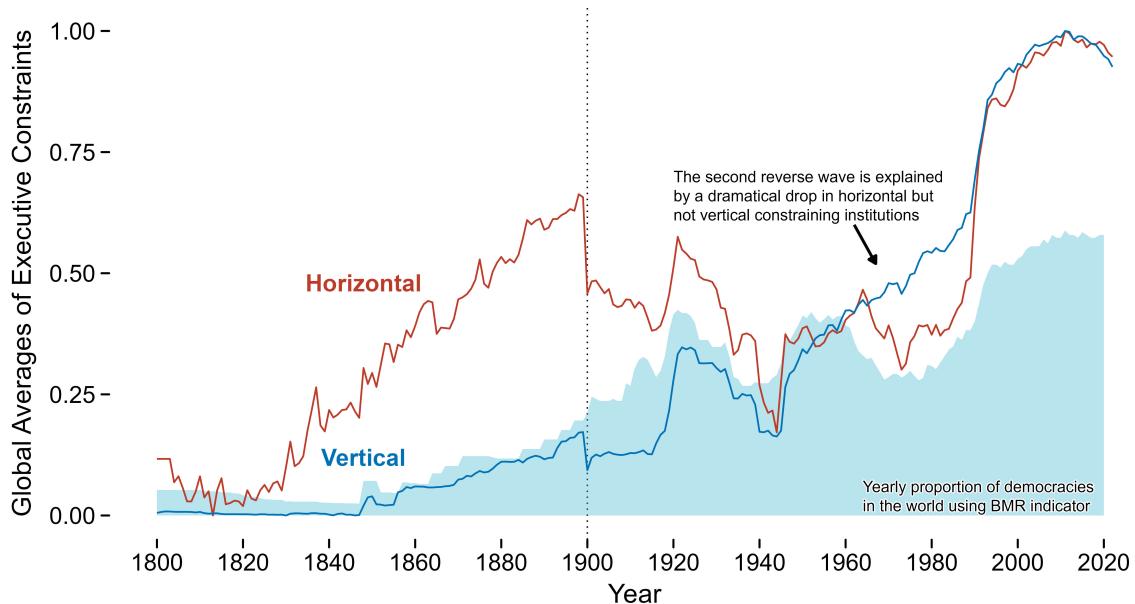


Figure 1: Varieties of regimes from a two-dimensional approach

The Advancement of Democracy has been Uneven across its Components

Executive Constraints and Waves of Democratization



Graph by Erick Alvarez Barreno
Data: V-Dem and Boix, Miller and Rosato (2020)

Figure 2: Global averages of vertical and horizontal constraints (1800-2020)

Using V-Dem data, Figure 2 depicts how the evolution of both components has been uneven across modern history. During the 19th century, 83 different polities were captured across 3871 unit-year observations. This includes all the available data for colonies, autonomous and semiautonomous polities (see Appendix 1 for a list of polities and countries). There is a great divergence between the levels of both institutions during this period, reflecting how the advancement of democracy has been different across dimensions. Most of the divergence is driven by Western countries' early political development, characterized by the implementation of legislatures with binding powers over the executive while the rest of the countries remained highly unequal, restricting multiparty competition or imposing legal restrictions on the right to vote. The sample grew substantially from 1899 to 2022 (which explains the dip in 1900), resulting in 174 countries within 16157 unit-year observations. During the 20th century, there is a dramatic increase in contestation and participation levels converging within the second and third waves of democratization. The levels of both constraints differ interestingly during the Cold War period. Particularly, the second reverse wave appears to be driven by a sudden drop in horizontal constraining institutions rather than vertical. This observation makes sense as most of the world has been experiencing a constant development in vertical constraints such as enfranchisement since the mid-20th century.

The next sections explore the relationship between these components and the sources of growth. Specifically, I use a standard neoclassical model of economic growth to unveil how the literature has been depicting the economic roles of executive constraints. This model takes the Mankiw et al. (1992) growth model that modifies Solow (1956) equation to account for human capital accumulation, and is described as follows:

$$Y_t = K_t^\alpha H_t^\beta (A_t L_t)^{1-\alpha-\beta} \quad (1)$$

Where Y is a function of the stock of physical capital K , stock of human capital H , labor supply L , and technical efficiency A . Because most of the arguments are centered within the first two sources, I provide some empirical evidence using data from 176 countries across modern history. I conclude the sections by providing some expectations that are going to be further tested.

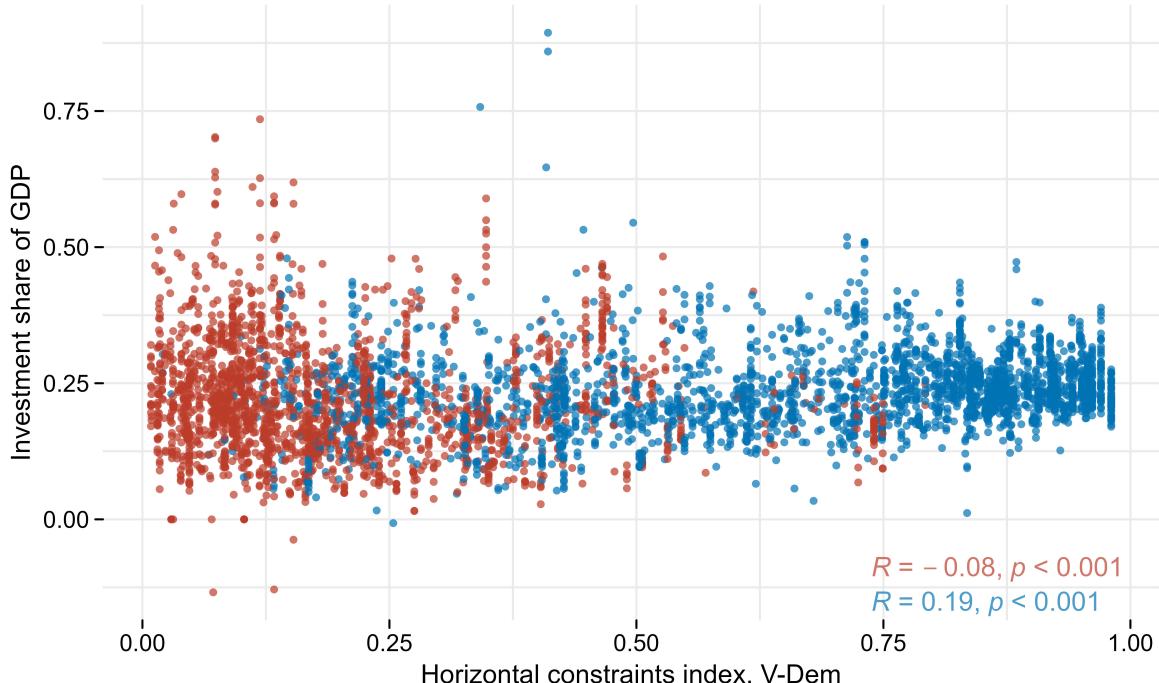
2.1 Investment without democracy?

North and Weingast (1989) is perhaps the most prominent contribution linking horizontal constraints to economic and financial development. Analyzing the England post-Glorious Revolution, they found that constraints over the crown were conducive to capital market formation and a greater state capacity to raise revenues. These institutions are seen as “commitment devices” that turn credible ruler’s promises to secure individual rights. Rulers are the principal menace to private property since they hold power over the con-

fiscatory capacity of the state. The existence of horizontal constraints enables other institutional veto players to bind rulers' decisions to their interests. Many studies have tried to generalize such an argument, suggesting that horizontal constraints provide investors with a "credible signal that the state will not confiscate investment returns, via taxation or frequent policy changes" (Wright 2008, 336). Scholars have found a positive effect of checks and balances and binding legislatures in private investment (Stasavage 2002; Wright 2008), while others have studied the role of such constraints in mitigating the pervasive impacts of electoral cycles in costly-to-undo investments (Canes-Wrone and Ponce de Leon 2015; Canes-Wrone, Ponce de León and Thieme 2023). Accordingly, Cox and Weingast (2017) conclude that to reduce a country's risk of getting stuck in an instability-poverty trap, "it is more important to have a strong legislature constraining the executive than to subject him to free and fair elections" (Cox and Weingast 2017, 280).

The cornerstone of the "commitment" argument is that institutions providing horizontal checks on rulers protect property rights which generates a more predictable business environment. Investors need to ensure certainty that they will be able to own the returns of their productive operations once earned in the future. This means that as long as there is some sort of credible commitment institution functioning, there is no need for other democratic features to ensure prosperity. These ideas are based on the classical liberal concern in which majority-based institutions could be a menace to an individual's self-determination. Accordingly, scholars have treated democracy as a threat to property rights and investment. In this view, democracy generates demands for immediate public consumption. These demands threaten the profits of capital holders, which reduces investment and retards growth (Przeworski and Limongi 1993, 54). For instance, dictatorships are better able to force savings and set a development model in motion. Because there is little or almost no electoral accountability in dictatorships, an authoritarian government has fewer pressures to allocate public resources toward immediate consumption. As a result, dictators can make long-term investments independent of the desires of a "short-sighted" electorate (Przeworski and Limongi 1993).

There is no systematical evidence that points out neither that dictators are better able to promote private investment nor that horizontal constraints are the only commitment source producing such an outcome. Figure 3 shows the relationship between the horizontal constraints index (V-Dem) and investment. The plot depicts country-year observations covering a total of 174 countries from 1800 to 2020. I grouped each observation as having or not vertical constraints using Cox and Weingast (2017) dichotomous variable inspired by Polity IV measurement. Most of the observations coded as having high levels of horizontal constraints and the presence of vertical ones are concentrated on the right hand of the panel. I also computed Pearson correlation coefficients for both groups. Neither dictatorships nor democracies seem to perform differently in terms of



Graph by Erick Alvarez Barreno
Data: V-Dem and World Bank

Figure 3: The relationship between horizontal constraints and investment

accumulating physical capital (although there is a slightly positive correlation within the democracy group). More importantly, countries coded as having higher levels of horizontal constraints without vertical ones are not attracting more capital than their counterparts as suggested by the commitment literature. Hence, there is not a clear correlation between having more horizontally constraining institutions and investment as a source of growth.

2.2 Electoral institutions in action

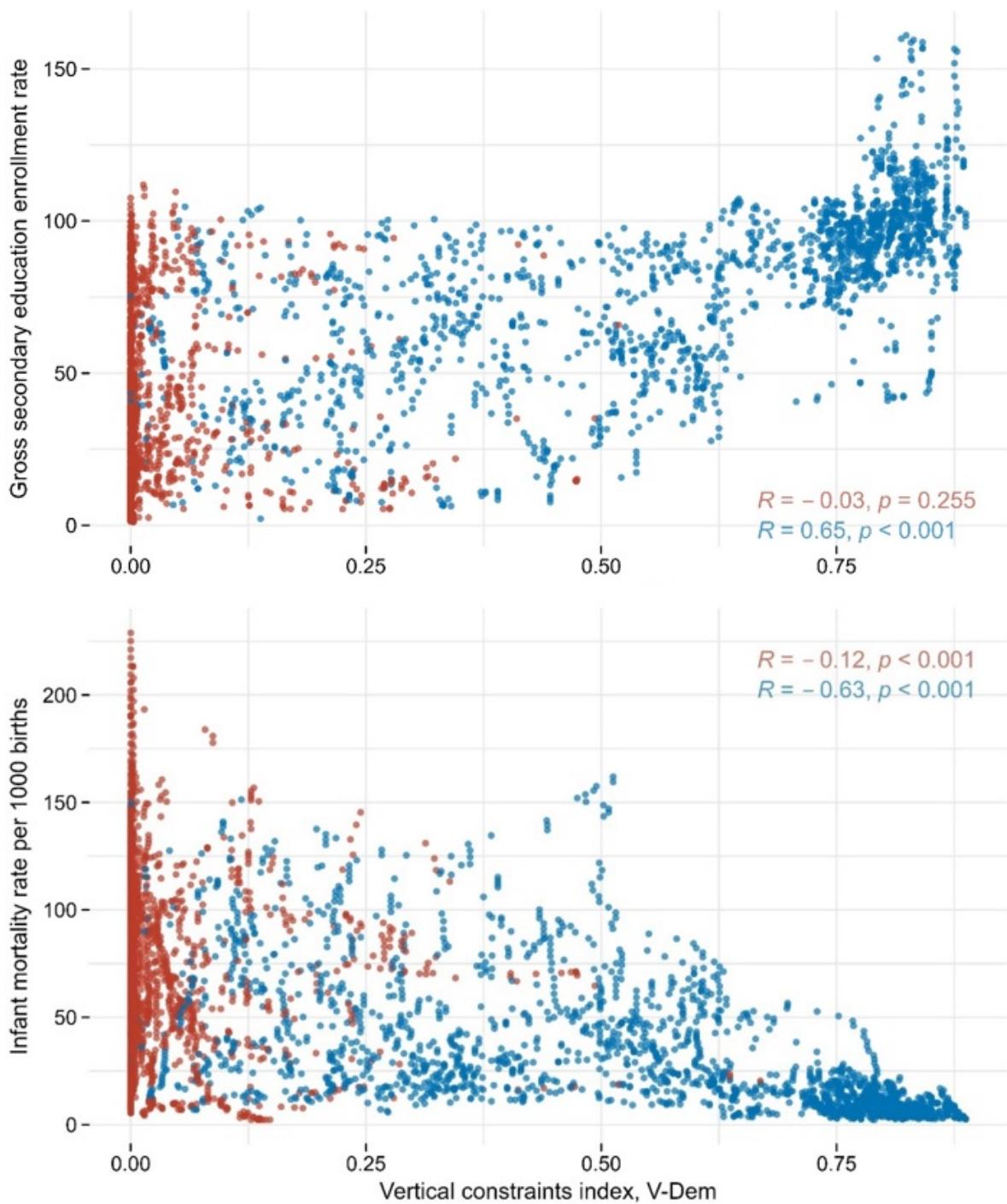
Even though the relationship between democracy and private investment is still contested, empirical evidence widely suggests that vertical constraints depicted as multi-party/competitive electoral institutions influence growth through enhancing human capital. For instance, Besley and Kudamatsu (2006) found a robust correlation between democracy and life expectancy. Electoral democracy also leads to greater public investment in health and education (Mullingan and Sala-i-Martin 2004; Haggar and Kaufman 2008), and suffrage extension to women and the poor is associated with higher levels of social spending (Lindert 2004). Most recently, Wang, Mechkova, and Andersson (2019) show that the quality of competitive elections has a consistent negative effect on infant mortality rate. Gerring et al. (2021) found that competitive elections are more strongly associated with human development than other aspects of democracy. Finally, Miller

(2015) stresses that contested elections both in autocracies and democracies promote human development through health, education, gender equality and civil liberties. Cas-sani (2019, 19) asserts this argument suggesting that “competitive autocracies display higher ratios of school enrollment and lower rates of child mortality relative to military, one-party and hegemonic-party regimes.”

Pinto and Timmons (2005) depict how this relationship works using the median voter theorem. In this view, highly inclusive and extensively open systems (concurring both elections and universal suffrage) reduce entry barriers to power, allowing citizens to register their preferences and select their leader. Political competition allows voters to use the state as a source of redistribution from rich to poor (Pinto and Timmons 2005, 32). Restricting or enhancing electoral institutions would move the median voter to a closer political preference centered either on accumulating physical capital that could benefit the wealthy or targeting human capital to alleviate the necessities of the majority. Consequently, more competitive regimes are more likely “to provide goods with positive externalities, such as schools and health care, raising the level of human capital” (Pinto and Timmons 2005, 34). In sum, higher degrees of participation and public contestation tend to create more inclusive political systems, increasing the size of the electorate (Bueno de Mesquita et al. 2003; Bueno de Mesquita and Smith 2011). Rulers facing broader winning coalitions should have more incentives to provide public goods because of the redistributive pressures of the median voter.

Besides the median voter/winning coalition arguments, there are two more explanations about the impact of electoral institutions on human development. First, an outstanding scholarly tradition stresses that voting can be exercised as an accountability mechanism when politicians fail to meet a determined citizen’s welfare threshold (Ferejohn 1986, 1999). Accordingly, elections may serve as a means to align the interests of rulers with the needs of their constituents (Barro 1973), or they may refrain from potential predatory behavior by making rulers accountable (Benhabib and Przeworski 2010). Second, decentralized broad-based participatory institutions can produce efficient resource allocation and better provision of public goods by solving collective action problems. These institutions are channels through which organized citizens can translate their demands into concrete political results (Abers 2000; Fung and Wright 2003; Avritzer 2006, 2010; Zaremburg, Lavalle, and Guarneros-Meza 2017). Studies suggest that the implementation of participatory institutions such as Gram Sabha in India, or the participatory budgeting in Brazil has a strong positive effect on different outcomes such as public spending, tax revenue, living standards, social benefits, and the supply of specific goods (Besley, Pande and Rao 2005, 2007; Gonçalves 2014; Touchton, Wampler and Peixoto 2020).

Figure 4 shows that higher levels of education enrollment and better living conditions are positively correlated with stronger vertical constraints. I distinguish two subgroups



Graph by Erick Alvarez Barreno
Data: V-Dem and World Bank

Figure 4: The relationship between vertical constraints and human capital

of country-year observations based on whether they are coded as having horizontal constraints using Polity IV measures. Democracies are the top performers on both indicators, still, there is a huge variation in human development among dictatorships.

3 Data and Methods

To examine the effects of executive constraints on growth I proposed two different approaches: using a binary and a level treatment. The baseline analysis is based on an unbalanced panel of 174 countries between 1950 and 2020. The main dependent variable to access the direct effect is the level of economic growth measured as the natural logarithm of gross domestic product (GDP) per capita measured in 1990 U.S. dollar international prices (dollar Geary-Khamis). As controls, I use those proposed by Papaioannou and Siourounis (2008), and Acemoglu, Naidu, Restrepo, and Robinson (2019). The first set of controls includes 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), gross secondary education enrollment rate and infant mortality rate, all from the World Bank Development Indicators (WDI). I also include the level of total factor productivity (henceforth TFP) in constant national prices and the human capital index from the Penn World Table version 10.01 (PWT 10.01) 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 et al. (2019) from Banks and Wilson (2013).

3.1 Horizontal Constraints

To capture the presence of horizontal constraints in a binary scale I use the approach of [Cox and Weingast \(2018\)](#). Therefore, I construct a dummy from $xconst$ variable which is equal to 1 when country i in time t has “substantial limitations” ($xconst = 5$), they fit 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 horizontal constraints 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” ($xconst = 3$). These two variables are available for 167 countries from 1800 to 2018.

On the other hand, I use Fjelde, Knutsen, and Nygård (2021) approach to construct a horizontal constraints indicator (hci). This variable is computed as the average of two V-Dem indices capturing legislative constraints on the executive ($v2xlg_legcon$) and judicial constraints on the executive ($v2x_jucon$). Both variables range from 0 to 1 and measure the de facto capabilities of the legislature and the judiciary to effectively monitor and

hold the executive accountable. The legislative constraints index is formed by taking the point estimates from a Bayesian factor analysis model of four indicators, namely the extent to which the legislature questions officials in practice, executive oversight, the extent to which the legislature investigates in practice, and legislature opposition parties. The judicial constraints index is also constructed from a Bayesian factor analysis from five variables, such as whether the executive respects the constitution, compliance with the high court, and whether the high court and the lower court are independent (Coppedge et al. 2023b, 51). Both mid-level indices may behave as partial substitutes when it comes to determining the degree of horizontal constraints (Fjelde, Knutsen, and Nygård 2021, 229). This means that even though a country would need high scores of both components to be considered as having strong horizontal constraints, the presence of one of them can still constrain a ruler’s behavior in the absence of the other. However, as Boese et al. (2022) suggest, it is also plausible that a strong legislature may be more effective in constraining the executive than an independent judiciary. Accordingly, I follow Coppedge et al. (2019) approach and aggregate both v2xlg_legcon and v2x_jucon indices into one score which is the average of both of their multiplicative and additive procedures. Thus, the aggregation formula is the following: $Hconst = \frac{1}{2}\text{const}_{\text{avg}} + \frac{1}{2}\text{const}_{\text{mult}}$.

3.2 Vertical Constraints

I also use Cox and Weingast (2017) strategy to construct a binary indicator for vertical constraints using Polity IV information. Consequently, a country is considered to have vertical constraints 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 ($xrcomp = 3$). Conversely, a country is coded as not having vertical constraints when transfers of power are not regulated ($xrcomp = 0$), and when the heads of the executive are determined by hereditary succession ($xrcomp = 1$).

Alternatively, I draw again on Fjelde, Knutsen, and Nygård to construct a vertical constraints index (vci) that reflects the extent to which a country has both “free and fair elections and inclusive citizenship” (2021, 228). This variable is constructed using a multiplicative aggregation formula based on 5 mid-level V-Dem indices: suffrage, elected officials, freedom of association, freedom of expression and clean elections. The first indicator refers to the share of adult population with suffrage (v2x_suffr). The elected officials index (v2x_elecoff) measures whether the chief executive and the legislature is – directly or indirectly – elected through popular elections. The freedom of association index (v2x_frassoc_thick) takes six indicators that reflect the autonomy, bans and barriers to political parties, multiparty elections and entry/exit and repression of civil society organizations. Freedom of expression and alternative sources of information (v2x_freexp_altinf) takes nine indicators capturing different aspects of press and media freedom, freedom

of discussion and freedom of academic and cultural expression. The clean elections index (v2xel_frefair) refers to the absence of registration fraud, systematic irregularities, government intimidation of the opposition, vote buying and election violence (Coppedge et al. 2023b, 47-50). I also agree with the multiplicative aggregation logic drawn in Fjelde, Knutsen, and Nygård (2021) to cope with the role of vertical constraints. One of the most important notions behind this concept is that these institutions must serve as instruments for vertical accountability to occur. For instance, clean elections may enhance accountability only if most of the population enjoys the right to vote, or freedom of expression and association are important only if clean elections are held. As Fjelde, Knutsen, and Nygård (2021, 228) argue “all factors are required to ensure that the chain of accountability operates and thus that truly binding vertical constraints on executive exist.”

3.3 Econometric model

To estimate the effect of executive constraints on economic growth I used a two-way fixed effects dynamic panel model, replicating the base-line model proposed by Acemoglu et al. (2019). I incorporate individual fixed effects that 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 countries (Papaioannou and Siourounis 2008, 1525). The inclusion of unit-invariant time-fixed effects would also capture 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), my specification includes lags of the dependent variable, which allows for controlling for GDP dynamics and the dip of GDP that is commonly produced years before a major political transformation (see Appendix XX). Accordingly, 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 variable, and that the error term has no serial autocorrelation (formally described as “sequential exogeneity”). For this reason, this model requires to include sufficient lags of the dependent variable to eliminate the residual of this autocorrelation. GDP lags also allow for controlling for the impact of many economic factors such as commodity prices, agricultural productivity, and technology (Acemoglu et al. 2019, 57). The model is formally represented in the following equation:

$$Y_{it} = \alpha_i + \delta_t + \beta H_{it} + \lambda V_{it} + \sum_{j=1}^p \gamma_j Y_{it-j} + \eta X'_{it} + \varepsilon_{it} \quad (2)$$

Where Y_{it} is the natural logarithm of gross domestic product (GDP) per capita measured in 1990 U.S. dollars international prices for country i and time t . α_i and δ_t are unit and time-fixed effects correspondingly. β is the coefficient capturing the impact of horizontal constraints H_{it} , and λ the impact of vertical constraints V_{it} . γ_j reports coefficients for up to 8 lags of the dependent variable Y_{it-j} . η includes a full set of control variables, X'_{it} namely: investment, infant mortality, human capital, trade, fiscal revenue, social unrest, and market reforms. Finally, ε_{it} is the error term.

4 The effects of executive constraints on growth

The following table reports estimation results from different specifications derived from Equation 2. All columns present dynamic panels with different lag structures. The dependent variable is the natural logarithm of GDP per capita. Because of this logarithmic transformation, the functional form of the equation corresponds to a log-level model, thus the interpretation of β_1 follows the form $\% \Delta y = (100 \times \beta_1) \Delta x$ as described in Wooldridge (2020). Hence, the reported coefficients are multiplied by 100 to ease its interpretation, in other words, each coefficient reflects the effect of unit increases of the X s in percentage changes in GDP per capita. Robust standard error against heteroskedasticity and serial correlation at the country level are reported in parentheses.

The dimension variables are those binary indicators constructed from Polity IV data, whereas the constraints indexes are those proposed by the V-Dem procedure. I also multiplied the latter to 100 to ease its interpretation, thus the coefficients are the effects of one unit increase in the 0-100 scale of the indexes on GDP per capita percentage changes. Column 2 presents my preferred specification, which includes four lags of GDP per capita. The variable capturing the presence of vertical constraints (competitive component) is estimated to be positive and highly significant, with a coefficient of 3.353 (standard error = 1.212). This means that in the short run, the transition from a regime without constraints to a political system with the presence of vertical ones increases GDP per capita by roughly 3 percentage points. Interestingly, the presence of horizontal constraints (i.e. the liberal dimension of democracy) does not have a significant effect on growth.

To calculate the cumulative long-run effect of a permanent transition to a political system with at least one form of constraint I applied the following formula (as suggested in Acemoglu et al. 2019) to the parameter estimates in Table 1:

$$\frac{\hat{\beta}}{1 - \sum_{j=1}^p \hat{\gamma}_j} \quad (3)$$

Applying this formula to the estimates from column 2, I find that a permanent transition from an autocratic regime to one with the presence of vertical constraints increases GDP per capita by 17.65 percent in the long run (5.77 standard error). Conversely, the

presence of horizontal constraints doesn't have a significant effect on growth levels. Column 2 also reports coefficients for a controlled model using V-Dem indexes for horizontal and vertical constraints. The overall pattern remains in this setting, namely that higher levels of vertical constraints increase growth. In particular, a point increase in the vertical constraints index (in the 0-100 scale) increases GDP per capita by 0.151 percentage points (standard error = 0.050). The levels of horizontal constraints do not have a significant impact on growth.

Estimates with fixed effects from dynamic panel models such as those presented in columns 1 to 3 of Table 2 have an asymptotic 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). Columns 4 to 6 provide estimates with the Difference Generalized Method of Moments (GMM) to address this bias. This estimator uses instrumental variables based on the lag structure of the model and the differences of other independent variables. Column 5 reports [Arellano and Bond \(1991\)](#) GMM estimates for a model with four lags of GDP per capita. All the patterns observed in the within estimator remain insensitive, namely the positive and high significant effect of vertical constraints and the non-significant effect of horizontal.

Finally, Figure 5 plots the estimated change in the log of GDP per capita caused by a permanent transition from a regime without constraints to one with the presence of vertical constraints. The effects for each year are obtained by forward iteration of the estimated GDP process model in Equation 2. As shown, political transitions that are characterized by evolving vertical constraints have a consistent positive effect on growth. This graph can be constructed with Figure 6, in which the same iteration is computed for permanent transitions from an autocratic regime to one with the presence of horizontal constraints. As shown in the figure, transitions characterized by evolving horizontal constraints do not impact growth significantly, neither in the short nor in the long run.

5 Conclusion

In recent years, the case for democracy has been strengthened by the accumulation of scientific contributions and evidence pointing to it as a fundamental source of growth. However, we still don't have conclusive arguments about what aspect of democratic politics is driving such a development effect. The main contribution of this research is to uncover how particular components of democracy influence growth separately and jointly and identify the channels through which these institutions may influence development. I take influential academic contributions that use Dahl's Polyarchy theory to construct a regime classification based on the interaction between horizontal and vertical constraints.

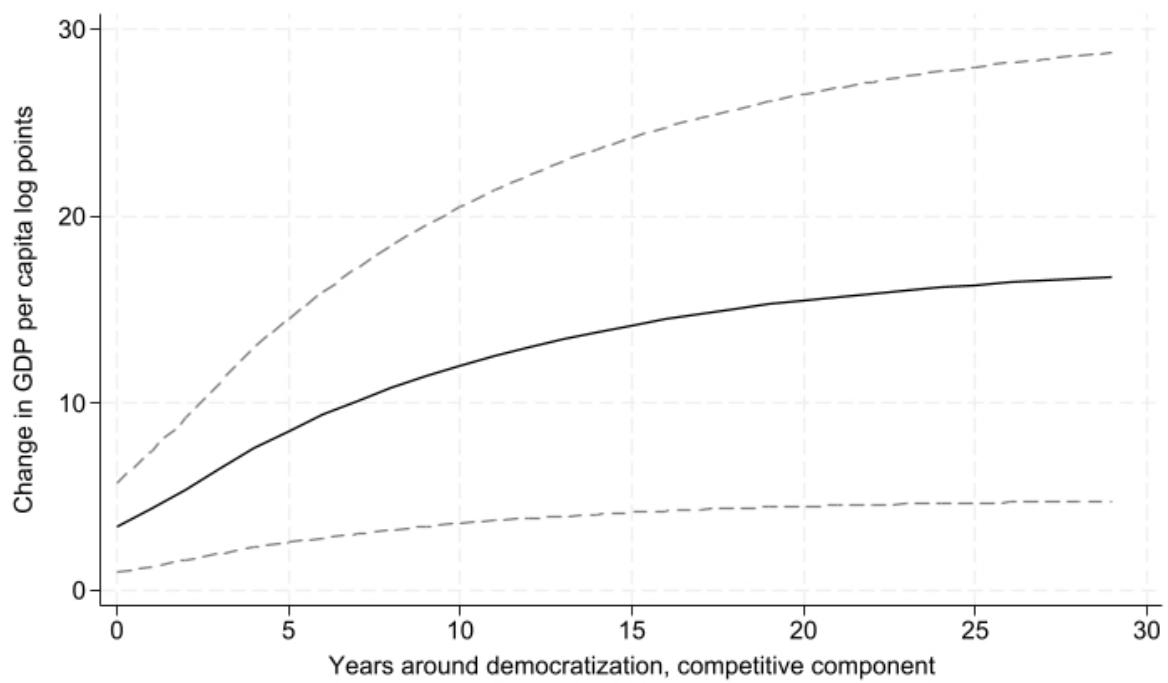


Figure 5: Dynamic panel model estimates of the over-time effects of vertical constraints on log GDP per capita

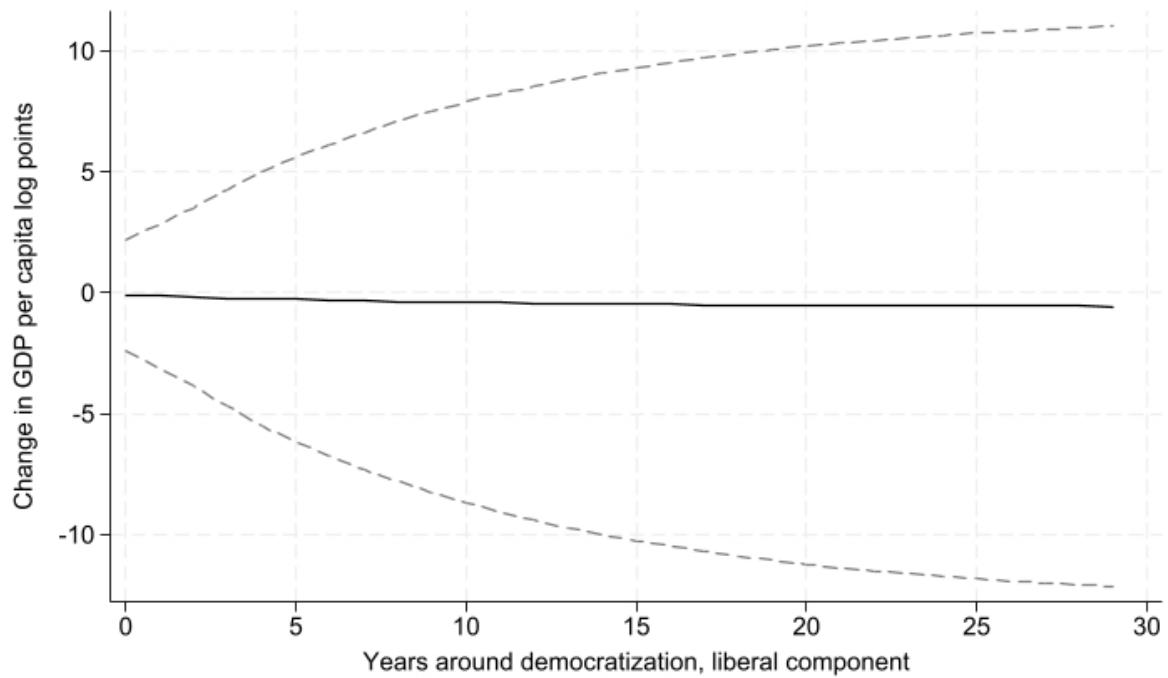


Figure 6: Dynamic panel model estimates of the over-time effects of horizontal constraints on log GDP per capita

These institutions are important for development as they impose control on rulers, reducing the fundamental problem in which a government strong enough to protect individual rights is also strong enough to transgress them (Weingast 1993; 1995).

This research provides evidence that participatory broad-based inclusive institutions seem to be more relevant for development than liberal and elite inclusive ones. These findings challenge the academic consensus claiming the economic superiority of horizontal constraints over other democracy components. Particularly, horizontal constraints do not affect growth when vertical constraints are absent. The next step should be to evaluate the channels between each constraint and the sources of growth. Further research could examine whether these two institutions compete in moderating physical and human capital stocks and analyze whether the sequence in which they emerge in society matters for other social and economic outcomes.

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