

Executive Constraints and Economic Growth

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Abstract

Despite extensive research on the relationship between democracy and development, the aspects of democracy that are particularly important for this outcome are unclear. Here, I unpack the democracy-growth link by examining the economic effects of two forms of executive constraints: horizontal constraints, the power of the parliament to control the executive, and vertical constraints, the capacity of citizens to keep rulers accountable. Using a dynamic panel modeling approach, my results show that horizontal constraints actually decrease GDP per capita after controlling for the overall effect of democracy. Even though vertical constraints do not directly affect growth, they are strongly associated with less infant mortality, lower social unrest, and higher public expenditure. This research provides evidence that for a country to develop, it is more important to subject rulers to free and fair elections rather than having a strong legislature constraining them.

Keywords: Democracy, executive constraints, institutions, economic growth

1 Introduction

Despite wide agreement that democratic institutions should have positive economic effects (Papaioannou and Siourounis 2008; Acemoglu et al. 2019; Colagrossi, Rossignoli, and Maggioni 2020; Knutsen 2021; Gerring, Knutsen, and Berge 2022), empirical analyses are contradictory, ranging from negative (Barro 1996) to no significant effects (Przeworski et al. 2000; Gerring et al. 2005; Doucouliagos and Ulubaşoğlu 2008).

At least some of this disagreement is due to scholars' use of composite regime measures that neglect the varied nature of democracy. In this article, I unpack democracy into two forms of executive constraints and estimate their effect on economic growth. I

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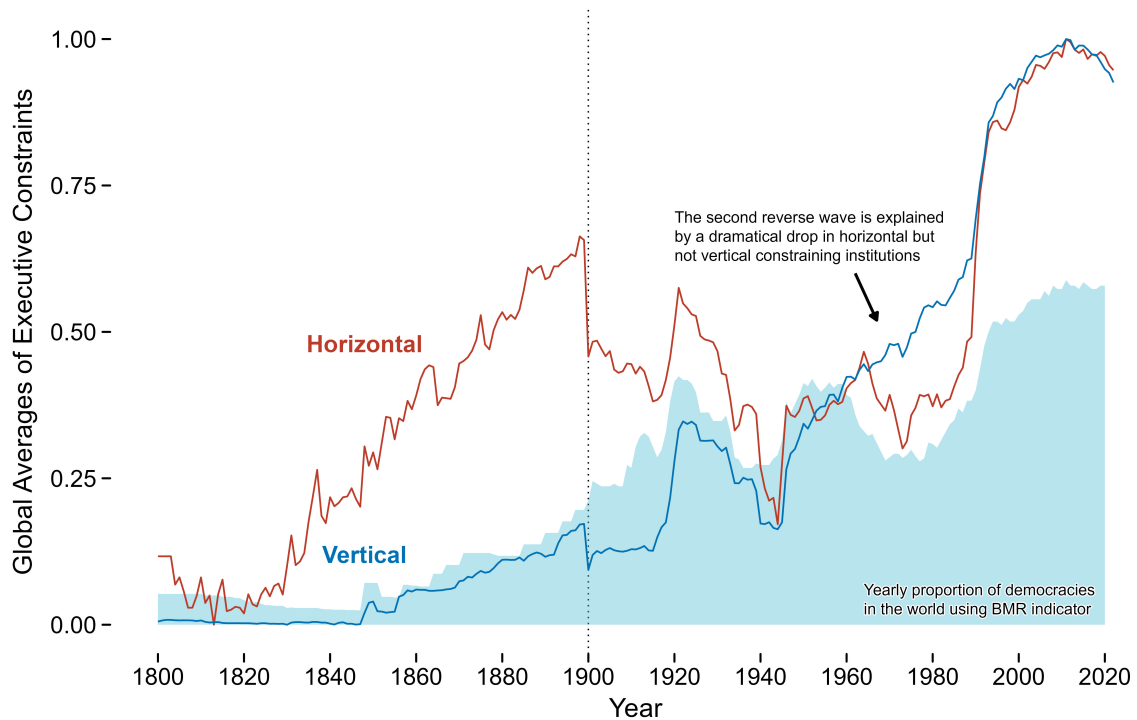
argue that the incentives these constraints provide determine the paths through which democracy influences development. Horizontal constraints affect the incentives for capital investment, whereas vertical constraints are linked to better public goods provision, such as education and health. I use a dynamic panel modeling approach, which allows me to estimate the individual effect of these two different constraints on growth while also accounting for the effect of democracy. Contrary to findings from previous work, I found that horizontal constraints decrease growth in the short and long run. These analyses also demonstrate a strong relationship between vertical constraints and human development indicators.

2 Unpacking the democracy-growth link

The relationship between democracy and economic growth has long been a pivotal issue for social scientists and one marked by contradictory empirical findings. For instance, [Doucouliagos and Ulubaşoğlu \(2008\)](#) found a positive and significant impact of democracy in only 27% of the cases surveyed, while 21% were negative and non-significant, 37% were positive but non-significant, and 15% were negative and significant. They also report that differences in specification, measurement, and estimation account for much of this variation. A common issue is that researchers use composite democracy indicators as proxies for the impact of specific regime components ([Boese et al. 2022](#)). This means that studies that have relied on such indicators cannot identify the specific institution(s) that drive the overall regime effect. Highlighting exclusively one regime component over others may explain why studies find such heterogeneous results in different outcomes.

To account for this concern, several studies have disaggregated 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 ([Boese and Wilson 2023](#)). [Boese et al. \(2022\)](#) propose perhaps the most comprehensive approach, constructing a cube of democracy based on three dimensions: participation, electoral contestation, and constraints on the executive.

In this paper, I take a similar approach to [Cox and Weingast \(2018\)](#), [Fjelde, Knutsen, and Nygård \(2021\)](#) and [Boese et al. \(2022\)](#), focusing on specific executive constraining institutions. I center on these institutions because the limitation of the power itself is a key dimension of democracy, and they have a theoretically and empirically strong link with economic growth. Horizontal constraints provide checks on rulers' behavior by splitting up the power of the government into relatively autonomous branches. 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). Vertical constraints keep leaders accountable to most of the population. These



Data: V-Dem and Boix, Miller and Rosato (2020)

Figure 1: Global averages of vertical and horizontal constraints (1800-2020)

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, in which citizens can evaluate and accordingly sanction their rulers.

Crucially, these constraints are empirically quite distinct. Figure 1 depicts how their evolution has been uneven across modern history.¹ There was a great divergence between the levels of both institutions during the 19th century, 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. During the 20th century, there was a dramatic increase in contestation and participation levels, converging within the second and third waves of democratization. The levels of both constraints differ during the Cold War period: 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.

1. I used Fjelde, Knutsen, and Nygård (2021) approach to construct two constraint indices based on V-Dem mid-level democracy indices traced back to the 18th century (Coppedge et al. 2023).

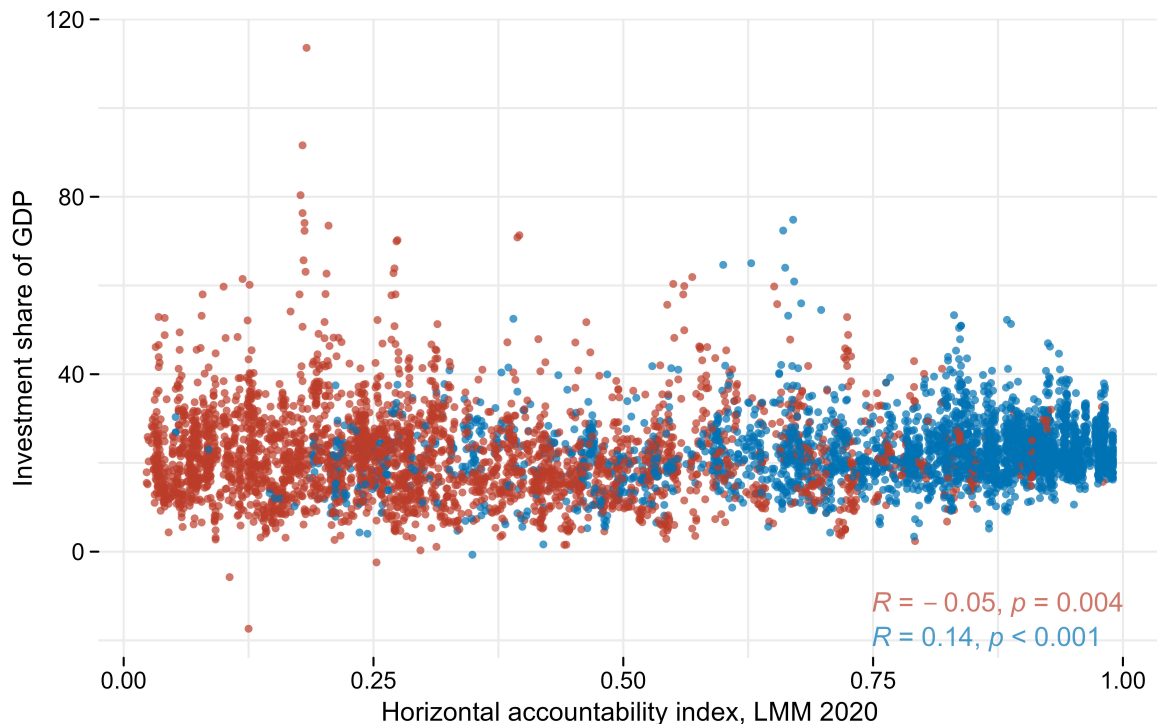
2.1 Investment without democracy?

A large body of scholarship has linked horizontal and vertical constraints to economic growth. [North and Weingast \(1989\)](#) suggest that horizontal constraints over the English crown after the Glorious Revolution were conducive to capital market formation and a greater state capacity to raise revenues. They argue that these institutions were commitment devices that turned credible the monarch’s promises to secure property rights. Many studies have tried to generalize such an argument, suggesting that horizontal constraints give investors a “credible signal that the state will not confiscate investment returns via taxation or frequent policy changes” ([Wright 2008](#), 336). Accordingly, scholars have found that they positively influence private investment ([Stasavage 2002](#); [Wright 2008](#)), while others suggest that they mitigate the investment downturns produced by electoral cycles ([Canes-Wrone and Park 2014](#); [Canes-Wrone, Ponce de León, and Thieme 2023](#)).

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 can own the returns of their productive operations once earned. This means that as long as there is some credible commitment institution, there is no need for other democratic features to ensure prosperity. Indeed, some scholars have treated democratic institutions outside of horizontal constraints as a threat to property rights and investment. In their view, democracy generates demands for immediate public consumption, threatening the profits of capital holders, which reduces investment and retards growth ([Przeworski and Limongi 1993](#)). Facing no electoral accountability, an authoritarian government has fewer pressures to allocate public resources toward immediate consumption.

In line with such arguments, the levels of horizontal constraints should be positively correlated with the levels of investment. Indeed, the Pearson correlation coefficient between both is slightly positive and significant (see Figure 2). More rigorous statistical analyses of this phenomenon ([Stasavage 2002](#); [Cox and Weingast 2018](#)) have tended to treat such constraints as isolated regime institutions without accounting for the fact that they are a fundamental component of democratic politics. Consequently, the alleged impact of horizontal constraints could be absorbing not only the overall effect of democracy but also the potential impact of other sets of institutions.

Figure 2 illustrates this concern. The plot depicts the relationship between investment and horizontal constraints (measured by the horizontal accountability index proposed by [Lührmann, Marquardt, and Mechkova 2020](#)) using a sample of 159 countries from 1960 to 2010. I grouped each observation by Acemoglu et al.’s dichotomous democracy indicator (2019); blue represents democracies and red non-democracies. Although there is no strong relationship between horizontal constraints and investment in either group, contrary to the commitment literature, the relationship for non-democracies is actually negative.



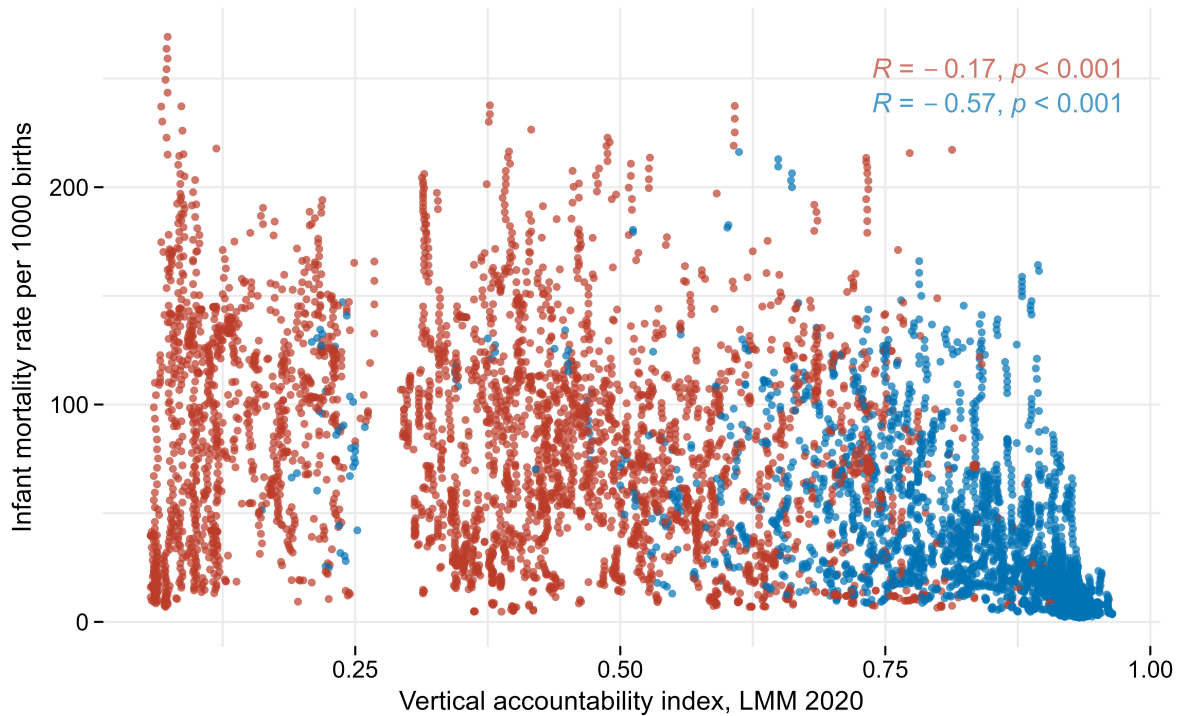
Data: V-Dem and the World Bank

Figure 2: The relationship between horizontal constraints and investment

2.2 Electoral institutions in action

While the relationship between democracy and private investment is still contested, empirical evidence suggests that vertical constraints influence growth by enhancing human capital. Studies have found a strong relationship between electoral democracy and outcomes such as life expectancy (Besley and Kudamatsu 2006) and greater social spending in health and education (Lindert 2004; Mulligan, Gil, and Sala-i-Martin 2004; Haggard and Kaufman 2020). Most recently, Wang, Mechkova, and Andersson (2019) show that the quality of competitive elections has a consistently negative effect on infant mortality rates. Gerring et al. (2021) suggest 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.

Pinto and Timmons (2005) depict how vertical constraints influence human capital by reducing entry barriers to power and allowing citizens to register their preferences and select their leader. Political competition allows voters to use the state to redistribute wealth from rich to poor. Thus, more competitive regimes broaden the median voter, who would be more likely to demand goods with positive externalities, such as schools and health care. Voting can also be an accountability mechanism when politicians fail to meet citizens' welfare thresholds (Ferejohn 1986; 1999); they may align rulers' interests with



Data: V-Dem and the World Bank

Figure 3: The relationship between vertical constraints and human capital

those of their constituents (Barro 1973) or reduce potential predatory behavior (Benhabib and Przeworski 2010). Finally, participatory institutions can produce efficient resource allocation and better provision of public goods by solving collective action problems (Besley et al. 2005, 2007; Gonçalves 2014; Touchton, Wampler, and Peixoto 2021).

Figure 4 shows the relationship between vertical constraints and infant mortality, a common indicator to measure human development in economics. As before, I distinguish two groups of country-year observations based on whether they are democratic per Acemoglu et al. (2019). Although authoritarian regimes developing some degree of vertical constraints appear to reduce infant mortality rates slightly, democracies are those regimes strongly correlated with better living conditions.

3 Data and Methods

Because horizontal and vertical constraints are components of democracy, traditional approaches to modeling their effects face econometric problems. In particular, their true effect may be conflated with that of the other constraint or other democratic institutions. To address this concern, I use a dynamic panel data modeling approach accounting for country and year heterogeneity and growth dynamics. Crucially, I control for democracy using Acemoglu et al. (2019) dichotomous measure. The baseline analysis is based on

an unbalanced panel of 159 countries between 1960 and 2010. The dependent variable is the natural logarithm of gross domestic product (GDP) per capita measured in 2000 U.S. dollars international prices, obtained from the World Bank Development Indicators.

To measure the levels of horizontal and vertical constraints, I use [Lührmann, Marquardt, and Mechkova \(2020\)](#) accountability indices based on V-Dem data ([Coppedge et al. 2023](#)). The horizontal accountability index refers to the extent to which state institutions hold the executive accountable. This form of accountability requires institutions such as legislatures, judiciaries, and other oversight agencies to demand information and punish improper behavior ([Lührmann, Marquardt, and Mechkova 2020](#)). The vertical accountability index reflects the ability of the population to hold its government accountable through elections and political parties. Both measures best capture the concept of executive constraints proposed in this paper as they properly reflect the accountability function that such institutions must produce once established. Conversely, available measures such as those proposed by [Cox and Weingast \(2018\)](#) rely on arbitrary cutoffs using Polity IV indicators, while some indices proposed by [Fjelde, Knutsen, and Nygård \(2021\)](#) and [Boese et al. \(2022\)](#) are constructed under ambiguous aggregation formulas.

3.1 Econometric model

To estimate the effect of executive constraints on economic growth, I use a dynamic linear regression model with unit and time-fixed effects, replicating the baseline model proposed by [Acemoglu et al. \(2019\)](#). Individual fixed effects absorb 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](#)). Unit-invariant time-fixed effects would capture influences of global trends on growth 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 2018](#)).

As [Acemoglu et al. \(2019\)](#), I include four lagged dependent variables, controlling for GDP persistence and the temporary dip in GDP that precedes a democratization (see Appendix XX). This choice is particularly important as it specifies how far back in time the model needs to consider when adjusting for confounding factors. Accordingly, this dynamic panel model assumes a standard sequential exogeneity, which implies that the key independent variables and past GDP are orthogonal to contemporaneous and future shocks to GDP and that the error term is serially uncorrelated. Hence, this model requires sufficient GDP lags to be included to eliminate the residual serial correlation in the error term and to remove the influence of the dip in GDP ([Acemoglu et al. 2019](#)) depicted in Appendix XX. Lastly, GDP lags not only control for the impact of other economic factors, such as commodity prices, agricultural productivity, and technology ([Acemoglu](#)

et al. 2019), but they also assess the propensity to democratize or develop one or more constraints based on past GDP. The model is formally presented in the following equation:

$$y_{ct} = \alpha_c + \delta_t + \beta D_{ct} + \xi C_{ct} + \sum_{j=1}^p \gamma_j y_{ct-j} + \varepsilon_{ct} \quad (1)$$

Where y_{ct} is the natural logarithm of gross domestic product (GDP) per capita measured in 2000 U.S. dollars international prices for country c and time t . α_c and δ_t are unit and time-fixed effects correspondingly. β is the coefficient capturing the effect of democracy measured by Acemoglu et al. (2019). ξ is the impact of horizontal or vertical constraints C_{ct} , and γ_j reports coefficients for up to 4 lags of the dependent variable y_{ct-j} .

4 Estimation results

This section reports estimation results from different specifications of Equation 1. The reported coefficients are multiplied by 100 to ease their interpretation.² Robust standard error against heteroskedasticity and serial correlation at the country level are reported in parentheses. Table 1 reports estimation results using Lührmann, Marquardt, and Mechkova (2020) accountability indices and including up to four lagged dependent variables. These estimates imply that controlling for the effect of democracy, one unit increase in horizontal constraints decreases GDP per capita by .027 percent in the short run. This means autocratic regimes developing more horizontal constraints grow less than their democratic counterparts. Conversely, vertical constraints appear not to affect growth significantly. Appendix XX provides additional robustness tests by changing the ANRR democracy indicator to the BMR variable and using different constraint measures. Again overall patterns remain: conditional on democracies, higher levels of horizontal constraints retard growth, while the effect of vertical ones is insignificant.

Table 2 provides an additional specification of Equation 1, using dichotomous measures of executive constraints based on Polity IV variables (see Appendix XX). The first row replicates Acemoglu et al. (2019) within and GMM estimates, while the rest of the panel shows the impact of horizontal constraints conditional on such effect. Here, the presence of horizontal constraints is estimated to be negative and significant, with a coefficient of 1.24 (standard error = .582). These estimates compare observations coded as having horizontal constraints controlled by those already coded as democratic. In other words, these results imply that developing horizontal constraints in authoritarian political settings would decrease GDP per capita by roughly 1 percent in the short run.

2. Because of Y 's logarithmic transformation, the equation's functional form 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, reflecting the effect of unit increases of the X s in percentage changes in GDP per capita.

Accordingly, Appendix XX provides estimates of country-year observations coded as only horizontally or vertically constrained regimes.³ Again, horizontal constraints negatively influence growth, decreasing GDP per capita by 1.063 percent (standard error = .505). The effect of vertical constraints on growth – although positive – is insignificant.

4.1 Long-run effects

Equation 1 specifies a fixed effects panel model that includes lagged dependent variables, controlling for dynamics such as the time-persistence behavior of GDP and the economic shocks produced by democratization processes. This implies that key coefficients must be interpreted as contemporaneous effects and that GDP dynamics determine how this effect unfolds over time. Iterating the short-run estimates, the cumulative long-run effect of executive constraints on growth is given by the following formula:

$$\frac{\hat{\xi}}{1 - \sum_{j=1}^p \hat{\gamma}_j} \quad (2)$$

Where $\hat{\xi}$ denotes the parameter estimates of executive constraints, and $\hat{\gamma}$ denotes the parameter estimates of the lagged dependent variables included in the model. Applying this formula to the estimates from column 3 in Table 2, I find that transitions characterized by evolving only horizontal constraints decrease GDP per capita by 27.55 percent in the long run (standard error = 12.67), conditional on the impact of democratic transitions.⁴ These estimate simulations imply that developing some degree of checks and balances in an authoritarian political setting negatively affects short- and long-term growth. In other words, political regimes that are not fully democratized would experience declines in growth if they only develop horizontally constraining institutions.

Figure 4 plots the estimated log GDP per capita change caused by transitions developing only horizontal constraints. Yearly effects are obtained by forward iteration of the estimated process modeled in Equation 2. This figure simulates what the development path would look like if a non-democratic political regime were to develop only horizontal constraints. As shown, countries following such a transition path would experience consistently declining growth over the long run.⁵

Explain the negative effect of horizontal constraints: - There are other sources of commitment and no direct effect of any constraint through investment. - Societies that

3. Horizontally constrained observations are coded as having only horizontal but no vertical constraints, and vertically constrained observations follow the same logic, having vertical but no horizontal constraints. Both indicators use the Polity IV variables described in Appendix XX.

4. Appendix XX shows a similar pattern using the estimates in Table 1; here, every unit increase in horizontal constraints decreases GDP per capita by .610 percent in the long run (standard error = .179 percent).

5. Appendix XX plots the estimated log GDP per capita change caused by unit increases on the horizontal constraints index in non-democratic cases. The graph depicts the same consistent negative impact as Figure 4.

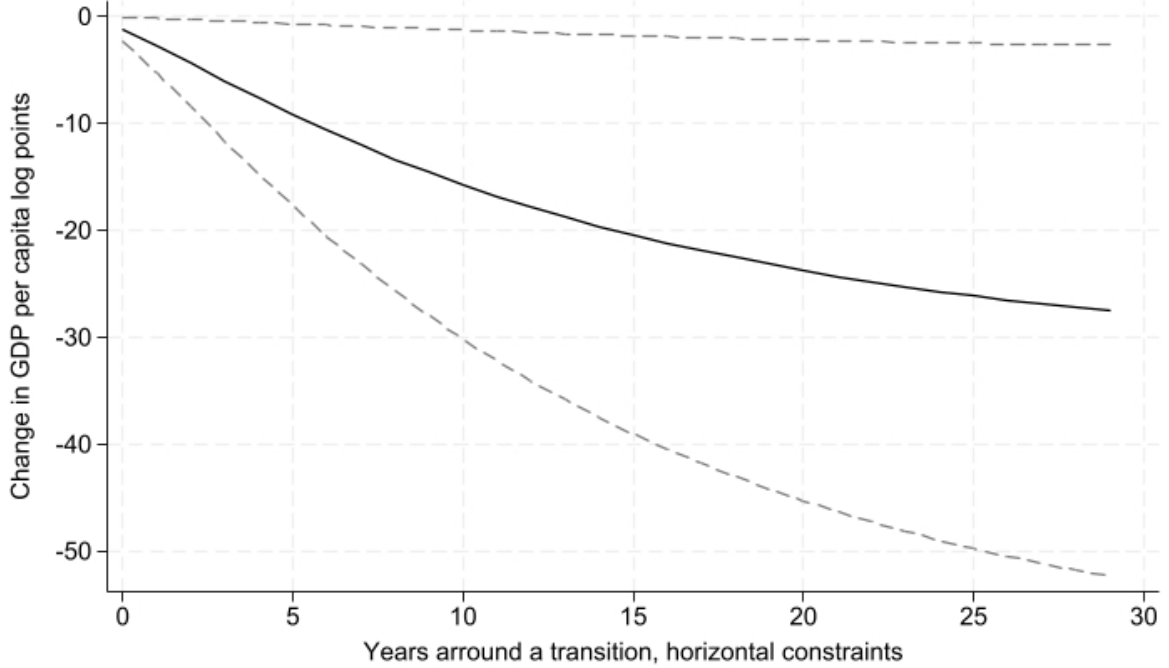


Figure 4: Dynamic panel model estimates of the over-time effects of horizontal constraints on log GDP per capita

are profoundly unequal with exclusive political systems.

4.2 Mechanisms of growth

Finally, the following equation is used to evaluate the potential mechanisms via which executive constraints might affect growth:

$$m_{ct} = \alpha_c + \delta_t + \xi C_{ct} + \sum_{j=1}^p \gamma_j y_{ct-j} + \sum_{j=1}^p \eta_j m_{ct-j} + \varepsilon_{ct} \quad (3)$$

Where m_{ct} corresponds to one of several potential mechanisms: investment, economic reforms, trade, taxes, primary and secondary school enrollment rates, infant mortality rate, and the social unrest dummy. This model assumes the same dynamic properties of Equation 1; thus, lagged dependent variables on the right-hand side of the equation account for the persistent behavior of each outcome. Additionally, GDP lags in the right-hand side control for both the dip in GDP preceding democratization and the mechanical effect of greater GDP on some of the intermediating variables (Acemoglu et al. 2019). Appendix XX shows estimation results from this model. Horizontal constraints have a positive but insignificant effect on outcomes such as private investment. In contrast, vertical constraints are associated with more public spending, less infant mortality, and less propensity for social unrest.

Additional variables used include investment (as gross capital formation as a percent-

age of GDP), trade (as the sum of exports and imports of goods and services as a share of GDP), gross primary education and secondary education enrollment rates, 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 (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).

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 cause of growth. However, we still don't have conclusive arguments about what aspect of democratic politics drives such an effect. This research's main contribution is to uncover how particular components of democracy influence growth separately and jointly and identify the channels through which these institutions may influence development. This research shows that horizontal constraints decrease growth in the short and long run once controlled by the effect of democracy. Vertical constraints do not directly affect growth but strongly influence outcomes such as infant mortality, public expenditure, and social unrest. 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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Table 1: The effect of executive constraints on (log) GDP per capita

	Within estimates			Arellano-Bond estimates		
	(1)	(2)	(3)	(4)	(5)	(6)
Democracy effect	1.69 (.365)	1.30 (.380)	1.78 (.405)	1.68 (.454)	1.19 (.467)	1.62 (.445)
Horizontal accountability index, 0-100 scale	-.027 (.007)		-.024 (.008)	-.024 (.009)		-.021 (.009)
Vertical accountability index, 0-100 scale		-.016 (.008)	-.007 (.009)		-.010 (.009)	-.004 (.009)
Log GDP, first lag	1.23 (.040)	1.23 (.040)	1.23 (.040)	1.20 (.039)	1.20 (.038)	1.21 (.039)
Log GDP, second lag	-.199 (.049)	-.202 (.049)	-.200 (.049)	-.186 (.047)	-.186 (.047)	-.190 (.047)
Log GDP, third lag	-.028 (.031)	-.028 (.031)	-.028 (.031)	-.028 (.030)	-.028 (.030)	-.029 (.030)
Log GDP, fourth lag	-.041 (.019)	-.044 (.019)	-.042 (.019)	-.042 (.020)	-.041 (.020)	-.040 (.020)
Effect after 25 years	-.569 (.164)	-.340 (.160)	37.54 (9.13)	-.393 (.157)	-.167 (.148)	28.15 (7.87)
Long-run effect	-.712 (.226)	-.420 (.201)	46.89 (12.67)	-.433 (.175)	-.185 (.165)	31.61 (9.21)
Persistence of GDP	.962 (.006)	.962 (.006)	.962 (.006)	.945 (.007)	.946 (.007)	.949 (.007)
Unit root test t -statistics	-3.76	-3.91	-3.83			
p -value (reject unit root)	.00	.00	.00			
AR2 test p -value				.468	.389	.480
Observations	5,786	5,786	5,786	5627	5627	5627
Countries in the sample	159	159	159	159	159	159

Note.— The table presents estimates of the effect of executive constraints on log GDP per capita. Reported coefficients are multiplied by 100. Robust standard errors against heteroscedasticity and serial correlation at the country level are reported in parentheses. All specifications are controlled for a full set of country and year fixed effects and four lags of log GDP per capita. Columns 1-3 report results using the within estimator, and columns 4-6 using the [Arellano and Bond \(1991\)](#) GMM estimator. The AR2 row reports the p -value for a test of serial correlation in the residuals of the GDP series, AR1 test p -value is committed; still, all values are less than .00. The first two columns report long-run effects for horizontal and vertical constraints correspondingly, whereas the third column reports this effect for democracy. Appendix XX reports additional columns reporting up to eight lagged dependent variables to depict how GDP persistence behaves across models.

Table 2: The effect of the presence of executive constraints on (log) GDP per capita

	Within estimates			Arellano-Bond estimates		
	(1)	(2)	(3)	(4)	(5)	(6)
Democracy effect	1.38 (.594)	.782 (.783)	1.43 (.880)	1.69 (.845)	1.26 (.975)	1.99 (1.08)
Presence of horizontal constraints	-1.24 (.582)		-1.21 (.538)	-.975 (.758)		-1.10 (.688)
Presence of vertical constraints		-.498 (.744)	-.097 (.719)		-.585 (.920)	-.266 (.852)
Log GDP, first lag	1.24 (.039)	1.24 (.039)	1.24 (.039)	1.18 (.042)	1.20 (.040)	1.20 (.040)
Log GDP, second lag	-.227 (.049)	-.228 (.049)	-.227 (.049)	-.205 (.048)	-.211 (.047)	-.212 (.047)
Log GDP, third lag	-.009 (.031)	-.009 (.031)	-.009 (.031)	-.003 (.030)	-.005 (.030)	-.005 (.030)
Log GDP, fourth lag	-.044 (.022)	-.044 (.022)	-.044 (.022)	-.042 (.024)	-.044 (.025)	-.042 (.025)
Effect after 25 years	-25.75 (11.87)	-10.39 (15.42)	29.84 (18.11)	-13.14 (10.00)	-8.89 (13.64)	30.60 (16.08)
Long-run effect	-31.99 (14.73)	-12.89 (18.94)	37.07 (22.30)	-13.84 (10.49)	-9.60 (14.62)	33.23 (17.32)
Persistence of GDP	.961 (.006)	.961 (.006)	.961 (.006)	.930 (.010)	.939 (.010)	.940 (.009)
Unit root test t-statistics	-3.85	-3.93	-3.81			
p-value (reject unit root)	.00	.00	.00			
AR2 test p-value				.395	.453	.444
Observations	5,421	5,421	5,421	5211	5211	5211
Countries in the sample	153	153	153	153	153	153

Note.— The table presents estimates of the effect of executive constraints on log GDP per capita. Reported coefficients are multiplied by 100. Robust standard errors against heteroscedasticity and serial correlation at the country level are reported in parentheses. All specifications are controlled for a full set of country and year fixed effects and four lags of log GDP per capita. Columns 1-3 report results using the within estimator, and columns 4-6 using the [Arellano and Bond \(1991\)](#) GMM estimator. The AR2 row reports the p -value for a test of serial correlation in the residuals of the GDP series, AR1 test p -value is committed; still, all values are less than .00. The first two columns report long-run effects for horizontal and vertical constraints correspondingly, whereas the third column reports this effect for democracy. Appendix XX reports additional columns reporting up to eight lagged dependent variables to depict how GDP persistence behaves across models.