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Democracy and fiscal-policy response to COVID-19

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Abstract

In this paper, we investigate the relationship between the level of democracy and fiscal-policy response to the economic crisis induced by the COVID-19 pandemic. We use a novel cross-country panel dataset of fiscal-policy responses with time variation. Our results suggest that more democratic countries adopted substantially larger fiscal-policy packages (in % GDP), and the gap regarding the size of packages between more democratic and less democratic countries widened over time. Our analysis of the components of fiscal policy shows that democracies, in particular, provide larger packages that benefit the broad public. Furthermore, our system-equations estimations suggest that the relation of democracy level with the fiscal-policy response is established through democracy's relation with inclusive institutions, represented by the parliamentary system, and corruption.

Keywords COVID-19 · Democracy · Fiscal policy · Parliamentary System · Corruption · Pandemic

JEL Classification D72 · H12 · H30 · H59

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1 Introduction

The coronavirus disease (COVID-19) outbreak emerged in Wuhan, China, in December 2019 and persists globally. The outbreak was declared to be a pandemic by the World Health Organization (WHO) on March 11, 2020, and spread globally, causing more than 766.90 million cases and 6.93 million deaths as of the end of May 2023 (WHO, 2023).

The COVID-19 pandemic has direct adverse effects on the economy. Infected workers who are isolated or hospitalized cannot join the workforce. Furthermore, uncertainty about the progress of the outbreak leads citizens to withdraw from economic activity. In addition to these direct effects, the non-pharmaceutical measures adopted by governments (i.e., travel bans, city lockdowns) to slow down the spread of the virus have contributed to economic inactivity by limiting human mobility and business operations (Atkeson, 2020; Eichenbaum et al., 2020). Consequently, the COVID-19 pandemic and associated public health controls have disrupted supply chains, halted economic activity in many sectors, and led to mass unemployment. Governments have adopted economic stimulus packages to mitigate these negative consequences and sustain public welfare (Gourinchas, 2020). These packages consist of monetary, fiscal, and exchange rate policies and show wide variation across countries concerning their size and scope.

In this study, we investigate whether countries' level of democracy has any effect on the economic policies adopted by governments in response to COVID-19. Given the current state of the literature, this is an important question to ask and worth investigating. On the one hand, one would expect democratic states to be more generous in introducing economic stimulus packages in the case of a pandemic. Previous studies have shown that democratic states with accountable institutions respond more aggressively to disasters and crises (Noy and Nualsri, 2011), and having democratic institutions strengthens incentives for governments to be responsive (Besley and Burgess, 2002). Consequently, these governments have become more effective in reaching out to people in need (Acemoglu and Robinson, 2006). Besides, non-democratic or less democratic countries are usually run by a small group of political elites [who may have knowledge problems about various things, including pandemic-related issues, as also suggested by Storr et al. (2021)], who provide wealth to themselves rather than the larger population, thereby providing less public goods (Olson, 1993). On the other hand, one might expect non-democratic governments to introduce larger economic packages in the case of a pandemic. Since negative social events with catastrophic consequences for public welfare may lead to unrest and resistance, the ruling elite in nondemocratic states may engage in economic concessions to prevent social and political unrest (Acemoglu and Robinson, 2001). The COVID-19 pandemic and associated economic responses provide a setting where we can investigate whether countries' democracy level affects the extent of their policy responses to an exogenous adverse event. In this regard, we should yield that there are also important political economy considerations both in democratic and non-democratic states that shaped the response to the pandemic [see Coyne et al. (2021); Boettke and Powell (2021) for examples] That being said, according to our results, political elites in democratic societies were able to redirect flows of money from fiscal packages faster.

The effects of countries' democracy levels on public health measures against COVID-19 have been discussed elsewhere (Frey et al., 2020). Moreover, some articles look at the association between economic freedom and stringency measures adopted by the pandemic, such as stay-at-home orders (McCannon and Hall, 2021) and economic contractions and recoveries (Candela and Geloso, 2021). However, no research has yet

looked at democracy's effect on fiscal measures. Using a novel cross-country dataset consisting of countries' fiscal policies during the pandemic, we examine whether democratic countries introduced larger stimulus packages and how their response evolved.

Overall, our results suggest that more democratic countries adopted a substantially larger fiscal-policy package, expressed in % GDP. Additionally, the gap between democratic and autocratic countries' fiscal responses increased over time. Our system-equations estimations show that the relation of democracy level with the fiscal-policy response is established through democracy's relation with more inclusive institutions, as represented by the parliamentary system, and its connection with lack of corruption.

Our paper also connects to the literature on cyclicality of fiscal policy, which includes, for example, Tornell and Lane (1998), Talvi and Vegh (2005), Alesina et al. (2008), Cicek and Elgin (2011) and Vegh and Vuletin (2014). The general finding in this literature is that whether fiscal policy is countercyclical (i.e. being contractionary in booms and expansionary in busts) or not, as well as the degree of the countercyclicality varies significantly across countries. Notably, the literature identified several factors, including some political ones, such as democracy and control of corruption, as in Alesina et al. (2008), that prevents governments from following countercyclical policy. Our paper also contributes to this literature as it identifies a political factor that affects the (in)ability of governments to design and apply an expansionary policy during the downturn brought on by the pandemic.

Moreover, our paper is related to the literature that analyzes the effects of democracy on government spending. For example, Plumper and Martin (2003) argue that the level of democracy and government's share of GDP are related in a U-shaped manner. On the other hand, using cross-country data, Mulligan et al. (2004) do not find any relationship between the level of democracy and overall government spending or tax revenue. Similarly, using panel data from developing countries, Profeta et al. (2013) show that there is no robust relationship between democracy and government spending and tax revenues. However, contrary to our paper, these papers do not focus on periods of adverse shocks, such as natural disasters, health crises, or economic downturns per se.

In the distinct field of public choice, the research on democracies vs. autocracies goes back to Tullock (1974, 1987), which presents theoretical ideas and empirical examples of autocracies and revolutions, yet in an unsystematic way, as Voigt (2011) states. Wintrobe (1990, 1998) proposes a classification of autocracies, and Islam and Winer (2004) test his theories about the effects of economic growth on rights and liberties in autocracies. Mueller (2003) also allocates a chapter on dictatorships in his book Public Choice III. McGuire and Olson (1996) develop a model showing that democracies using unanimity rule perform better than autocracies in the public-good provision and income level, and Plumper and Martin (2003) and de Haan (2007) empirically explore these relations. Recently, Gersbach and Siemers (2014) explain under which conditions democracy overcomes the poverty trap, and Roessler (2019) investigates when democracy promotes public-good provision. These papers focus on the relationship of democracies with long-term outcomes. Our paper contributes to this literature by exploring the fiscal response of countries with varying levels of democracies to an economic downturn induced by a pandemic. Kammas and Sarantides (2016) investigate redistribution around elections in democracies when there is a threat of

autocracy. Yet, they only focus on redistribution in new democracies during normal times. In our analysis, we investigate the fiscal response of all countries in emergency times.[1]

The rest of the paper is organized as follows: The following section includes a description of our data sources and our estimation methodology. Section 3 presents our regression results. Section 4 discusses the mechanisms that the democracy level connects to fiscal response to COVID-19. Finally, Sect. 5 provides some concluding remarks. We also have an appendix where we give more information about our data and present some additional regressions for robustness checks.

2 Data and methodology

2.1 Data

Data on countries' fiscal policies designed and implemented during the pandemic are retrieved from two sources: the COVID-19 Economic Stimulus Index (CESI) constructed by Elgin et al. (2020) and the Fiscal Monitor Database of Country Fiscal Measures in Response to the COVID-19 Pandemic (FMDB) released by the International Monetary Fund (IMF) Fiscal Affairs Department. The CESI dataset was constructed by the authors in late March 2020 and has been continuously updated up until May 2021. It has both a cross-country and time-series dimension and (along with some additional variables related to monetary and macro-financial policy) includes total fiscal stimulus measures (coded by the authors as a % of GDP) adopted by 168 countries throughout the pandemic.[2] These are extraneous fiscal stimulus spending not anticipated in 2019 when the 2020 budgets were prepared by national governments. The authors mention that they have used the IMF's Policy Tracker website for COVID-19[3] as well as various other national and international sources for data collection. The first version of the dataset was made public on March 25, 2020. The CESI dataset has been regularly updated, and the final version, Version-16, was released on May 5th, 2021.[4] On the other hand, the FMDB has only a cross-country dimension and provides a snapshot of only key fiscal measures as of July 2021. However, it includes a more detailed description of fiscal measures (as % of GDP) composed of six different categories. These are (1) health and (2) non-health spending that represent additional spending and forgone revenue in the health and non-health sectors, respectively. (3) Accelerated spending, which represents fastened spending and deferred revenue in areas other than health. (4) Below-the-line measures include equity injections, asset purchases, loans, and debt assumptions; (5) guarantees are mainly for loans and deposits; and finally, (6) quasi-fiscal operations that include the noncommercial activity of public corporations on behalf of the government. Notice that our total fiscal stimulus measure variable is available

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[1] There is also another line of research that explores the factors affecting the emergence of democracies. Some recent papers in this literature are, for example, Przeworski (2005), Rahman et al. (2017), Gorod-nichenko and Roland (2021) and Fleck and Hanssen (2018).

[2] The list of the countries is given in Appendix A. The latest version of the data is available here: https://web.boun.edu.tr/elgin/COVID.htm.

[3] Available here: https://www.imf.org/en/Topics/imf-and-covid19/Policy-Responses-to-COVID-19#U.

[4] Dates for the remaining versions are as follows: Version-2 April 9th, Version-3 April 16th, Version-4 April 23rd, Version-5 May 7th, Version-6 May 21st, Version-7 June 4th, Version-8 June 18th, Version-9 July 1st, Version-10 16th July, Version-11 August 14th, Version-12 September 10th, Version-13 October 8th, Version-14 November 20th, all up to here in 2020, and Version-15 on February 4th, 2021.

as panel data; however, the summary of key fiscal measures provided under six categories is only available in a cross-country form. In summary, our benchmark dependent variable (available as panel data) is the overall fiscal stimulus (denominated as a percentage of GDP), which we obtained from Elgin et al. (2020). For some additional analysis, we also use the FMDB detailed fiscal spending data, but this one is only available as a cross-sectional data.

To measure the degree of democratization in different countries, we use the Polity indicator[5] from the Polity5 Project which is also employed, for example, by Acemoglu et al. (2019). The main purpose behind this index is to place autocratic and democratic characteristics on a single dimension, seeing them as alternatives or opposites. This indicator is constructed on a 21-point scale, ranging from -10 (most autocratic and least democratic) to 10 (least autocratic and most democratic). In our analysis, by adding 11 to the original index, we re-scale it between 1 and 21 to work with positive scalars.

Following Elgin et al. (2020), we control for several variables that might be associated with the size of the fiscal packages. Since richer countries generally adopted larger packages, we control for the pre-pandemic real GDP per capita. Here, we use the most recent real GDP per capita as of 2019, and obviously, this data series is available in a cross-country form only.

As for the public-health and pandemic-related variables, we control for the infection rate and death rate, defined by the ratio of total COVID-19 cases and deaths to population, respectively. Moreover, for the stringency level of governments' public health measures taken during the pandemic, we use the index developed by Hale et al. (2020). All these three data series are available as panel data.

As for economic indicators, we control government expenditures and public debt (both denominated as a percent of GDP) as of the end of 2019. We control for these two cross-country data series because governments with high spending before the pandemic may tend to allocate larger resources to support the economy. For public debt, on the one hand, having a higher debt may be an indicator of the ability to borrow more easily and reach a larger amount of resources. On the other hand, because they already have high public debt, they may avoid borrowing more and allocate less fiscal resources to the economy.

Finally, we also control for median age in the population (again as of the end of 2019), which is yet another cross-country variable. We hypothesize that countries with older people are more sensitive to the pandemic, and their economies would need more expansionary measures to mitigate the adverse economic impact of the pandemic.

Finally, in several regressions, we also include dummies for six different country groups, namely OECD-EU, Latin American and Caribbean, MENA, Sub-Saharan Africa, post-socialist transition economies, and Australia and Asia, among our regressors. In several regressions, we also include country and/or time-fixed effects. We specifically mention that whenever we do so.

The descriptive summary statistics of all variables used in the empirical analysis are given in the appendix in Tables 6 and 7. In the same section, we also present the correlations table in Table 8, where we present correlations between all variables used in the benchmark analysis.

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[5] For additional robustness checks, we also use the democratic accountability index of the International Country Risk Guide. These additional results with a different measure of democracy are available upon request from the corresponding author.
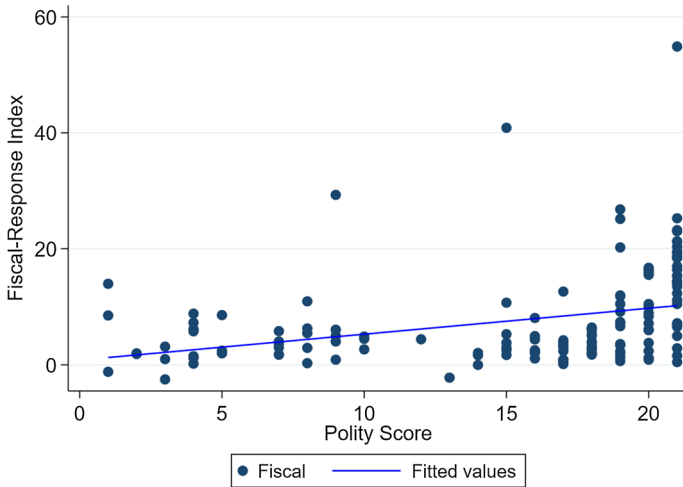
Fig. 1 Latest fiscal response and Polity
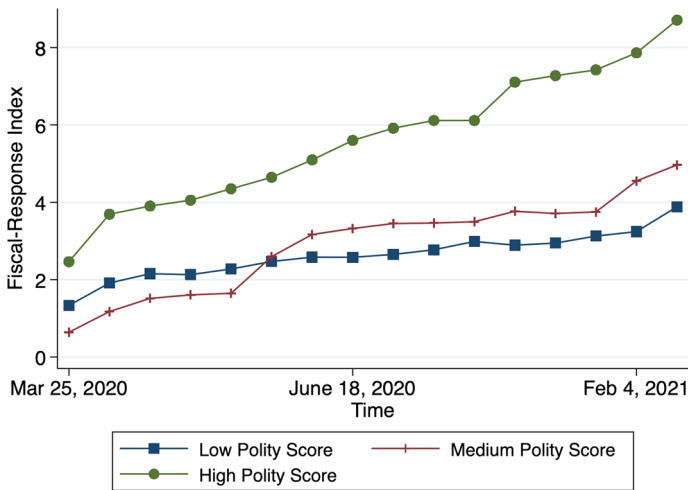
Fig. 2 Polity and fiscal response over time

Before proceeding with the full-fledged econometric analysis, in Fig. 1, we give a first look at the data to understand how the fiscal-stimulus index is related to the democracy level. As seen in the figure, there is a positive correlation between the latest (as of May 2021) fiscal stimulus on the y-axis and the Polity score on the x-axis, with a correlation coefficient of 0.33. While the most democratic countries, such as Canada, Denmark, and New Zealand, have an average fiscal-stimulus index equal to 15.60, the least democratic countries, such as Bahrain, Qatar, and Saudi Arabia, have an average fiscal-stimulus index equal to 7.11.

Next, in Fig. 2 we present how the fiscal-stimulus index has evolved for different democracy levels. In the figure, we categorize countries into three groups[6] according to their democracy levels. As seen in the figure, in general, countries with a higher democracy level have been providing a larger fiscal package to support the economy in response to COVID-19. When we look at the overtime evolution of indices, we see that the difference between the fiscal indices has been increasing over time among different democracy levels to the advantage of more democratic countries, specifically for the countries with high democracy levels.

2.2 Methodology

In our benchmark regressions, using the panel structure of our overall fiscal stimulus data, to investigate the association between fiscal response and democracy over time, we estimate the following equation using an ordinary least squares (OLS) estimator with robust standard errors:

$$Fiscal_{i,t} = \beta_0 + \beta_1 DEM_i + \beta_j \sum_j X_{j_i} + \beta_k \sum_k Z_{k_{i,t}} + \gamma_t + \epsilon_{i,t} \tag{1}$$

Here, for country i, $Fiscal_{i,t}$ denotes the fiscal-policy measure at time t, DEM_i denotes the measure for democracy which does not change over time in our sample, X_{j_i} denotes a set of control variables that are constant over time, $Z_{k_{i,t}}$ are a set of control variables that change over time and are measured at the time t. Also, γ_t refers to fixed effects whenever they are included. A-priori, based on what we observe in Fig. 1, we expect to have a positive value for the estimate of β_1. The results of these regressions are presented in Table 1.

On top of our benchmark regressions, we present two sets[7] of additional regressions in the results section. In the first set, we use interactions of the Polity with time-varying variables. Specifically, we estimate the following OLS equation with robust standard errors:

$$Fiscal_{i,t} = \beta_0 + \beta_1 DEM_i \cdot Interact_{i,t} + \beta_j \sum_j X_{j_i} + \beta_k \sum_k Z_{k_{i,t}} + \gamma_t + \epsilon_{i,t} \tag{2}$$

The notation here resembles the one of the previous equation with the exception that we now interact the democracy measure with a time-varying measure indicated as the $Interact_{i,t}$. In five different regressions that will be presented in Table 2, we use time, lagged death rate, lagged infection rate, lagged number of confirmed deaths, and lagged number of confirmed cases in place for this interaction variable. The results of these regressions are presented in Table 2. Based on what we observe in Fig. 2, we expect to see a positive value for the estimate of β_1.

In the second set of additional regressions, which is presented in Table 3, we run panel regression where the interaction variable of the previous set is still present. But here, we do not use any cross-country control variables but instead use country-fixed effects along with time-fixed effects. In this case, we estimate the following regression equation:

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[6] Countries with an original Polity score below and equal to 0 are categorized as having a low polity score, those with a score larger than 0 and less than or equal to 5 have a medium score, and finally those having a score larger than 5 have a high polity score.

[7] We thank an anonymous reviewer for suggesting these regressions.

Table 1 Benchmark panel-OLS estimations

Variables	(1) Fiscal	(2) Fiscal	(3) Fiscal	(4) Fiscal	(5) Fiscal	(6) Fiscal	(7) Fiscal	(8) Fiscal
Polity	0.29***	0.29***	0.19***	0.14***	0.15***	0.14***	0.09***	0.06***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.01)	(0.01)
Real GDP per cap. (000 USD)				0.17***	0.18***	0.18***	0.19***	0.16***
				(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Stringency index (lagged)					−0.01	−0.01	0.001	0.001
					(0.01)	(0.01)	(0.004)	(0.005)
Infection rate (lagged)					0.07*	0.07*	0.03	0.004
					(0.04)	(0.04)	(0.03)	(0.03)
Death rate (lagged)					−2.63	−2.71	−0.71	0.49
					(2.93)	(2.94)	(0.83)	(0.96)
Govt. expenditure (% GDP)						0.04**	0.06***	0.02
						(0.02)	(0.02)	(0.02)
Public debt (% GDP)							0.06***	0.05***
							(0.01)	(0.01)
Median age								0.17***
								(0.02)
Constant	0.43	−2.46***	−3.50**	−3.14***	−1.71***	−2.34***	−5.62***	−7.85***
	(0.27)	(0.41)	(0.43)	(0.37)	(0.42)	(0.49)	(0.64)	(0.72)
Time fixed effects	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Region dummies	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2463	2463	2463	2399	2078	2033	2033	2033
R-squared	0.09	0.15	0.34	49	0.54	0.55	0.62	0.64

Robust standard errors in parentheses

*$p < 0.1$

**$p < 0.05$

***$p < 0.01$

$$Fiscal_{i,t} = \beta_0 + \beta_1 DEM_i \cdot Interact_{i,t} + \beta_k \sum_k Z_{k_{i,t}} + \theta_i + \gamma_t + \epsilon_{i,t} \tag{3}$$

The notation here resembles the one of the previous equation with the exception that we now also use country fixed effects as indicated by θ_i. Again, based on what we observe in Fig. 2, we expect to see a positive value for the estimate of β_1 here, too.[8]

Once we have established a robust relationship between democracy and fiscal policy response to the pandemic, additionally, to investigate through which channels this association might be working, we estimate the following equations system motivated by our findings and the literature:

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[8] Moreover, in the appendix, we also present results of several instrumental variable regressions.

Table 2 Panel-OLS estimations with the severity of the pandemic

Variables	(1) Fiscal	(2) Fiscal	(3) Fiscal	(4) Fiscal	(5) Fiscal
Polity × time	0.01***				
	(0.00)				
Polity × lagged death rate		1.20***			
		(0.18)			
Polity × lagged infection rate			0.03**		
			(0.01)		
Polity × lagged confirmed deaths				0.58***	
				(0.17)	
Polity × lagged confirmed cases					0.02***
					(0.002)
Real GDP per capita (000 USD)	0.16***	0.17***	0.17***	0.16***	0.16***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Stringency index (lagged)	0.004	0.003	0.005	0.004	0.004
	(0.01)	(0.004)	(0.005)	(0.005)	(0.005)
Infection rate (lagged)	0.005	0.008	−0.59	−0.002	−0.01
	(0.03)	(0.03)	(0.35)	(0.03)	(0.03)
Death rate (lagged)	0.37	−2.27	0.17	0.56	0.76
	(0.88)	(3.50)	(0.91)	(0.84)	(0.84)
Government expenditure (% GDP)	0.02	0.04**	0.03**	0.04**	0.04**
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Public debt (% GDP)	0.04***	0.05***	0.05***	0.05***	0.05***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Median age	0.17***	0.17***	0.18***	0.19***	0.19***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Constant	−6.89***	−7.00***	−7.50***	−7.33***	−7.36***
	(0.70)	(0.71)	(0.71)	(0.73)	(0.73)
Time fixed effect	Yes	Yes	Yes	Yes	Yes
Region dummies	Yes	Yes	Yes	Yes	Yes
Observations	2033	2033	2033	2029	2029
R-squared	0.64	0.64	0.64	0.64	0.64

Robust standard errors in parentheses

***$p < 0.01$

**$p < 0.05$

*$p < 0.1$

$$PAR_i = \beta_0 + \beta_1 DEM_i + u_{i,P},$$
$$MEDF_i = \gamma_0 + \gamma_1 DEM_i + u_{i,M},$$
$$TAXR_i = \beta_0 + \beta_1 DEM_i + u_{i,T}, \tag{4}$$
$$CPI_i = \gamma_0 + \gamma_1 DEM_i + u_{i,C},$$

and

Table 3 Panel-OLS estimations with country fixed effects

Variables	(1) Fiscal	(2) Fiscal	(3) Fiscal	(4) Fiscal	(5) Fiscal
Polity × time	0.02***				
	(0.002)				
Polity × lagged death rate		0.86***			
		(0.11)			
Polity × lagged infection rate			0.005**		
			(0.001)		
Polity × lagged confirmed deaths				0.63***	
				(0.23)	
Polity × lagged confirmed cases					0.02***
					(0.003)
Stringency index (lagged)	0.007*	0.004	0.004	0.003	0.003
	(0.004)	(0.004)	(0.004)	(0.004)	(0.003)
Infection rate (lagged)	0.04	0.04	0.66	0.03	0.02
	(0.03)	(0.03)	(0.46)	(0.03)	(0.03)
Death rate (lagged)	2.91**	166.18***	2.51**	2.13**	1.79*
	(1.16)	(20.76)	(1.10)	(1.02)	(0.94)
Constant	−1.46***	0.17	0.15	0.37	0.35
	(0.53)	(0.45)	(0.44)	(0.43)	(0.43)
Country fixed effect	Yes	Yes	Yes	Yes	Yes
Time fixed effect	Yes	Yes	Yes	Yes	Yes
Observations	2107	2107	2107	2102	2102
R-Squared	0.91	0.90	0.90	0.90	0.90

Robust standard errors in parentheses

*$p < 0.1$

**$p < 0.05$

***$p < 0.01$

$$Fiscal_{i,t} = \theta_0 + \theta_1 PAR_i + \theta_2 MEDF_i + \theta_3 TAXR_i + \theta_4 CPI_i$$
$$+ \theta_j \sum_j X_{j_i} + \theta_k \sum_k Z_{k_{i,t}} + \gamma_t + u_{i,F,t},$$

where PAR_i is a dummy variable that is equal to one if country i has a parliamentary system, and $MEDF_i$, $TAXR_i$, and CPI_i represent media freedom, tax revenue (% GDP), and corruption perception index, respectively, and $u_{i,K}$ is the error term of the respective equation for each $K \in \{P, M, T, C, F\}$. We use panel data in the last equation because both the dependent variable ($Fiscal_{i,t}$) and several independent variables ($Z_{k_{i,t}}$) are available as a panel. We also use time-fixed effects (γ_t) in that regression.

The corruption perception index gets a lower value if there is high corruption in a country, and it takes a higher value otherwise. Media freedom gets a higher value as freedom increases in a country. As discussed in Besley and Persson (2011), parliamentary regimes are more inclusive than presidential regimes. Thus, we can expect parliamentary regimes to have a positive association with democracy. They also show that democracy improves states' ability to collect taxes and increases tax revenues. Additionally, as Gehlbach and

Sonin ([2014](#)) show in their model, democracies improve media freedom. Furthermore, Persson et al. ([2000](#)) show that, compared to presidential regimes, parliamentary regimes redistribute tax revenues toward a majority and lead to less underprovision of public goods by improving legislative cohesion, and Besley and Burgess ([2002](#)) show that media freedom strengthens governments' fiscal responses to natural disasters by improving political accountability and informing the public about governments' policies. So, we expect a parliamentary regime and media freedom to be positively associated with democracy. Similarly, higher tax revenue and lower corruption shall increase government spending. Using system equations, we test if democracy is positively associated with fiscal response through its relation to the parliamentary regime, media freedom, tax revenues, and corruption.

3 Results

In this section, we discuss the relation of democracy with the fiscal-policy response to COVID-19 using the data and empirical methodologies introduced in the previous section.

In Table [1](#), we first present our benchmark regressions as given by Eq. ([1](#)) above. In this table, we present the results of eight panel regressions. In the first one, we only have Polity on the right-hand side of the equation. Then we gradually add time-fixed effects, region dummies, and various controls.

The first observation we make from the first row in Table [1](#) is that the estimated coefficient of the Polity variable is significantly positive in all regressions, i.e., more democratic countries have announced larger fiscal packages. This significant relationship between the two variables is robust to the inclusion of various time and cross-country varying variables. This also indicates that the plain correlation we observe in Fig. [1](#) is robust. The marginal effect of the Polity score (an increase of 1 point) increases fiscal stimulus spending between 0.29 to 0.06 percentage points. Considering that the range of the Polity score is from 1 to 21, this on average, translates to a difference in the fiscal stimulus measures in the range of 5.8 to 1.2 percentage points from least to most democratic countries.

Next, we also observe that the coefficient of GDP per capita, public debt to GDP ratio, and the median age are consistently significant and are all positive. Government spending is also significantly positive until median age is included in the regression. This first suggests that richer countries, not surprisingly, were able to spend more on fiscal stimulus measures. Second, having a higher public debt-to-GDP ratio by the end of 2019, right before the pandemic, does not seem to reduce the fiscal capacity of governments to spend more. Finally, as well known, older people are disproportionally more prone to COVID-19 and it seems from Table [1](#) that governments of countries with older populations (as indicated by a higher median age) spent relatively more on fiscal measures. None of the other variables have consistently significant coefficients.

Overall, our estimations here support a positive and significant relationship between democracy and fiscal response to COVID-19. This result is in line with the result of Besley and Burgess ([2002](#)), which find a similar relationship between democratic institutions and food distribution by state governments in India after a natural disaster. Departing from their theory, we can explain our result with the fact that democracies develop political accountability. Specifically, if the incumbent politicians do not respond to citizens' needs, in strong democracies, it is easier for the citizens to replace them with the new politicians. Thus, a higher democracy level gives a stronger incentive to governments for supporting the

economy in response to the COVID-19 crisis.[9] However, in autocracies, the governments can keep their power despite their poor performance in responding to people's needs. So, as autocracy gets deeper, the incumbents' incentive to make an effort to support the economy in response to the COVID-19 crisis gets weaker.

Next, in Table 2, we present estimations of Eq. (2). Here, we present the results of five estimations with the same set of control variables but a different interaction variable in each. Also, in all regressions, we control for time-fixed effects and region dummies. Results are highly supportive of what we see in Fig. 2. That is, the interaction of the democracy variable with several different time-varying variables has a significantly positive coefficient in all five regressions. Moreover, taking the interaction into account, the average marginal effect of our democracy variable (Polity) on fiscal stimulus is 0.16, 5.18, 8.30, 4.11, and 5.19 percentage points, respectively. The first implication of this result is that for any given democracy level, the time has increased countries' fiscal response. The second implication is that when the pandemic gets more severe—that is, as cases, deaths in total, or as rates increase—more democratic countries give a stronger fiscal response to support the economy. Thus, the difference in fiscal response between democracies and autocracies has increased over time. In addition to the interaction term, in these regressions, the coefficients of GDP per capita, government spending, public debt, and median age are overall significantly positive, except for the coefficient of government spending in the first regression. The coefficients of the public debt and median are discussed above for the results in Table 1. As for the government spending, we also observe that governments that had a higher government spending to GDP ratio by the end of 2019, could also continue spending more and were the ones, which have spent more during the pandemic.

Our estimations revealed a strong association between the level of democracy and fiscal response to COVID-19. However, these results do not necessarily mean a causal relation between democracy level and fiscal response. Moreover, several of our right-hand side variables, particularly GDP per capita, public debt, government spending, and median age, can also suffer from an endogeneity bias. To investigate the causal relationship between the level of democracy and fiscal response to the pandemic, in our next estimations, we drop potentially endogenous variables from the regression and only keep the severity of the pandemic as an exogenous shock and interact it with our Polity measure. In particular, we focus on the relationship between fiscal response and the interaction of time, lagged confirmed cases, and deaths with Polity. In these regressions, since we do not have any cross-sectional independent variable, we are also able to include country-fixed effects along with the time-fixed effects as given by Eq. (3). We present our results in Table 3.

In Table 3, we present a total of six regressions with different interaction variables in each. In all regressions, time and country fixed effects are jointly included. Similar to Table 2, in all the regressions, the estimated coefficient of the interaction term is significantly positive, further supporting the results that are presented in Table 2. Moreover, taking the interaction into account, the average marginal effect of our democracy variable (Polity) on fiscal stimulus is 0.32, 3.60, 0.86, 1.11, and 0.79 percentage points,

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[9] See de Haan (2014), which suggests that political budget cycles are observed in different types of democracies, where expansionary fiscal policy increases the likelihood of reelection. Also, in another related and earlier research, Sobel (1998) finds evidence in favor of the existence of political costs for fiscal conservativeness.

Table 4 OLS estimations of different fiscal packages

Variables	(1) Health spending	(2) Non-health spending	(3) Accelerated spending	(4) Below-the-line spending	(5) Guarantees spending	(6) Quasi-fiscal spending
Polity	−0.01	0.09**	0.19	0.05	0.08	0.22
	(0.01)	(0.04)	(0.14)	(0.05)	(0.08)	(0.27)
Real GDP per cap. (000 USD)	0.02	0.13***	0.10	0.02	−0.13**	0.07
	(0.01)	(0.04)	(0.11)	(0.04)	(0.05)	(0.14)
Stringency index (lagged)	0.001	0.02	−0.004	0.02	0.04	−0.18
	(0.005)	(0.03)	(0.06)	(0.02)	(0.03)	(0.11)
Infection rate (lagged)	−0.03	−0.12	0.04	−0.20	0.83*	−0.66
	(0.07)	(0.22)	(0.44)	(0.31)	(0.48)	(0.80)
Death rate (lagged)	0.74	1.49	0.65	7.21	29.08*	24.64
	(2.31)	(7.10)	(14.80)	(10.48)	(16.30)	(27.21)
Median age	−0.01	0.14*	0.21	0.19***	0.45**	0.35
	(0.02)	(0.08)	(0.24)	(0.07)	(0.19)	(0.36)
Govt. exp. (% GDP)	0.009	−0.02	−0.08	0.16	0.002	1.06
	(0.01)	(0.05)	(0.28)	(0.12)	(0.11)	(0.63)
Public debt (% GDP)	0.006**	0.02*	0.003	0.003	0.009	0.09***
	(0.003)	(0.01)	(0.05)	(0.02)	(0.02)	(0.03)
Constant	0.14	−3.56**	−5.41	−6.95**	−11.06***	22.20*
	(0.42)	(1.53)	(4.74)	(2.90)	(4.16)	(11.89)
Observations	126	125	54	74	76	26
R-Squared	0.20	0.61	0.46	0.40	0.49	0.79

Robust standard errors in parentheses. All estimations include region fixed effects

*$p < 0.1$

**$p < 0.05$

***$p < 0.01$

respectively. Other than the interaction term, we do not have a consistently significant coefficient, though.[10]

4 Discussion on mechanisms

In this section, we aim to shed some light on the relationship between the level of democracy and fiscal stimulus by discussing via which mechanisms democracy strengthens the fiscal response. For this purpose, first, we focus on the relation of democracy with the components of the fiscal package separately. Second, we investigate various channels by which the democracy level can affect fiscal response.

Table 4 presents OLS estimations of different types of fiscal packages in response to the pandemic. There are six categories of spending in the table. Health and non-health spending represent additional spending and forgone revenue in the health and non-health sectors, respectively. Accelerated spending represents fastened spending and deferred revenue in areas other than health. Below-the-line measures include equity injections, asset purchases, loans, and debt assumptions; guarantees are mainly for loans and deposits and lastly, quasi-fiscal operations include the noncommercial activity of public corporations on behalf of the government. As seen in the table, Polity has a positive and significant relation only with additional non-health spending. The most common non-health spending measures cover a broad segment of society by including wage subsidies, targeted transfers to households, expanded unemployment insurance, and tax deferral for households (IMF, 2020). The structure of the non-health spending indicates that governments in democracies specifically take measures to improve the welfare of the broad segments of society, which enables them to keep their power. On the contrary, in autocracies, the political power of rulers depends on the support of elites, which need broad-based fiscal support during the pandemic Acemoglu and Robinson (2006). Thus, from these results, we interpret that democracy strengthens the fiscal response to COVID-19 by spreading the source of political power to the general public.

Our analysis above discusses sources of democracy's relation with the fiscal response, yet it does not reveal through which channels this effect takes place. To explore these channels, we estimate the equations system that we discussed in our methodology section. We give our estimation results for system equations in Table 5. As seen in the first four columns, the level of democracy is positively associated with the parliamentary regime, media freedom, tax revenues, and corruption perception at a 1% significance level. Remember that the corruption perception index increases as corruption in a country decreases. The last column gives the association of the last four variables with the fiscal response. This column shows that the corruption perception index and the parliamentary regime among the four variables are significantly associated with fiscal response, and they both have a positive association—that is, parliamentary regimes and countries where the corruption perception index score is higher (i.e., there is less corruption) give stronger fiscal responses to COVID-19. This result sheds some light on potential channels through which democracy could be associated with fiscal policy responses to the pandemic. Moreover, what we observe is also in line with Besley and Persson (2011), which state that parliamentary

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[10] To establish further robustness of our results, we also present some additional instrumental variable regressions results in the appendix.

Table 5 System-equation estimations of fiscal stimulus

Variables	(1) Parliamentary regime	(2) Media freedom	(3) Tax revenue (% of GDP)	(4) Corruption perception	(5) Fiscal
Parliamentary regime					0.52**
					(0.24)
Media Freedom					−0.20
					(0.57)
Tax revenue (% GDP)					−0.01
					(0.02)
Corruption perception					0.08***
					(0.01)
Real GDP per capita (000 USD)					0.07***
					(0.01)
Stringency index (lagged)					0.02***
					(0.006)
Infection rate (lagged)					− 0.05
					(0.04)
Death rate (lagged)					3.21***
					(1.00)
Median age					0.13***
					(0.03)
Government expenditure (% GDP)					0.03
					(0.03)
Public debt to GDP ratio					0.02***
					(0.004)
Polity	0.03**	0.04***	0.37***	1.18***	
	(0.01)	(0.003)	(0.13)	(0.32)	
Constant	−0.08**	0.19***	10.33***	18.87***	−7.99**
	(0.03)	(0.01)	(0.57)	(1.44)	(0.81)
Observations	96	96	96	96	1466
R-Squared	0.34	0.72	0.23	0.51	0.63

Robust standard errors in parentheses. All equations include region dummies

*$p < 0.1$

**$p < 0.05$

***$p < 0.01$

regimes are more inclusive than presidential regimes. So, we can expect them to be positively associated with the democracy level. Additionally, as Persson et al. (2000) show, compared to presidential regimes, parliamentary regimes redistribute tax revenues toward a majority, which can explain why they would give a stronger fiscal response to COVID-19. This result is also compatible with our analysis in Table 4, which shows that democracy is specifically positively associated with non-health spending that aims to support a broad base of the society. As for our results vis a vis corruption, again, our results are generally

in line with the broader literature on the corruption-democracy and economic policy nexus. In this literature, among many others, Chowdhury (2004), Drury et al. (2006), and Rock (2009) all associate democracy with less corruption and better economic outcomes.

5 Concluding remarks

The COVID-19 pandemic has direct adverse effects on the economy in several different ways. For instance, infected workers who are isolated or hospitalized cannot join the workforce, which has many supply and demand-side implications. Furthermore, the psychological effect of the pandemic leads to withdrawal from economic activity by agents who prefer to adopt the "wait and see" approach. Elgin et al. (2020) conducted a comprehensive review of different economic policy measures adopted by 168 countries as a response to the COVID-19 pandemic and created an extensive database, including fiscal measures.

In this paper, we investigated the relationship between the level of democracy and fiscal policy responses to the economic crisis induced by the COVID-19 pandemic. Our results show more democratic countries adopted a substantially larger fiscal-policy package (in % GDP). Moreover, we use a battery of econometric specifications that support a robust relationship between a higher level of democracy and a larger fiscal stimulus package size. This suggests that the level of democracy strongly influences the (in)ability of governments to conduct countercyclical fiscal policy.

Using equations-system estimations, we also aimed to show that democracy strengthens fiscal response to COVID-19 through its connection with inclusive institutions and corruption. However, this result definitely has limitations and we should yield that further research is needed for a better understanding of the mechanisms that connect higher levels of democracy with stronger fiscal responses. In this regard, a further analysis that potentially combines a theoretical model with an empirical analysis would be very much needed. These we leave to future research.

A List of countries

Afghanistan, Albania, Algeria, Angola, Argentina, Armenia, Australia, Austria, Azerbaijan, Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bhutan, Bolivia Bosnia and Herzegovina, Botswana Brazil, Brunei, Bulgaria, Burkina Faso Burundi, Cabo Verde, Cambodia, Cameroon, Canada, Central African Republic, Chad, Chile, China, Colombia, Democratic Republic of Congo, Republic of Congo, Costa Rica, Cote Ivory, Croatia, Cyprus, Czech Republic, Denmark, Djibouti, Dominican Republic, Ecuador, Egypt, El Salvador, Equatorial Guinea, Eritrea, Estonia, Eswatini, Ethiopia, Fiji, Finland, France, Gabon, Gambia, Georgia, Germany, Ghana, Greece, Guatemala, Guinea, Guinea Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Iran, Iraq, Ireland, Israel, Italy, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Kosovo, Kuwait, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Libya, Lithuania, Luxembourg, Madagascar, Malawi, Malaysia, Maldives, Mali, Malta, Mauritania, Mauritius, Mexico, Moldova, Mongolia, Montenegro, Morocco, Mozambique, Myanmar, North Macedonia, Namibia, Nepal, Netherlands New Zealand Nicaragua Niger Nigeria Norway Oman Pakistan Panama Papua New Guinea Paraguay Peru Philippines Poland Portugal Qatar Romania Russia Rwanda San Marino

Saudi Arabia Senegal Serbia, Seychelles, Sierra Leone, Singapore, Slovak Republic, Slovenia, South Africa South Korea Spain, Sri Lanka Sudan, Suriname Sweden, Switzerland Tajikistan Tanzania Thailand Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, United Arab Emirates, United Kingdom, Uganda, Ukraine, United States, Uruguay, Uzbekistan, Vietnam, Yemen, Zambia, Zimbabwe.

B Descriptive summary statics

Table 6 presents descriptive summary statistics and sources of our democracy and policy measures. Table 7, on the other hand, illustrates the same statistics for several control variables and variables used in the system estimations.

Table 8 presents the cross-correlation table for all variables used in the benchmark analysis.

Instrumental variable regressions

Table 9 presents the results of four instrumental-variables (IV) regressions. Here, we instrument the Polity measure on latitude and legal-system-origin dummies (French, British, French, Scandinavian, German, and post-socialist transition legal systems) as frequently done in the literature (Hall and Jones, 1999; Chowdhury, 2004; Chong and Calderon, 2000). We assume that the democracy level in a country is affected by latitude and legal-system origin, but these variables do not directly affect fiscal-policy response (La Porta et al., 1999). For all IV estimations, we report the results of the under-identification (using the Kleibergen-Paap rk LM statistic), weak identification (Cragg-Donald Wald F statistic), over-identification tests (Hansen J statistic), as well as the F-test of the first-stage regressions.

Table 6 Descriptive summary statistics: democracy measure and dependent variables

	Mean	SD	Min.	Max.	Obs.	Source
Democracy measure						
Polity	15.42	6.07	1.00	21.00	154	Polity5 Project
Policy measures all in % GDP						
Fiscal stimulus	4.88	5.97	−12.80	54.90	2671	Elgin et al. (2020)
Health spending	1.09	1.58	0.00	16.00	151	IMF Fiscal Affairs Department (2021)
Nonhealth spending	4.74	4.66	0.00	24.25	149	IMF Fiscal Affairs Department (2021)
Accelerated spending	4.66	6.96	0.00	28.72	66	IMF Fiscal Affairs Department (2021)
Below the line measures	3.06	4.00	0.00	21.18	84	IMF Fiscal Affairs Department (2021)
Guarantees	3.70	5.58	0.00	35.63	86	IMF Fiscal Affairs Department (2021)
Quasi-fiscal policies	3.92	7.79	0.00	33.94	30	IMF Fiscal Affairs Department (2021)

SD is the standard deviation, Min. is the minimum value of the observations, Max. is the maximum value of the observations, Obs. is the number of observations

Table 7 Descriptive summary statistics: control variables

	Mean	SD	Min.	Max.	Obs.	Source
Control variables						
Real GDP per capita (000 USD)	14.81	20.14	0.21	110.74	163	World Development Ind. (WDI)
Stringency index	65.78	20.03	6.48	100.00	2550	Hale et al. (2020)
Infection rate (%)	0.71	4.95	0.00	172.64	2426	Johns Hopkins University Coronavirus Resource Center (2020)
Death rate (%)	0.02	0.16	0.00	4.19	2426	Johns Hopkins University Coronavirus Resource Center (2020)
Median age	29.36	8.94	14.90	46.30	165	Our World in Data
Government expenditure (% GDP)	15.99	5.31	3.59	37.67	158	WDI
Public debt (% GDP)	57.96	33.34	2.50	237.10	163	WDI
Instrumental variables						
Latitude	19.87	24.86	−41.28	64.09	167	Our World in Data
UK legal origin	0.30	0.46	0.00	1.00	161	La Porta et al. (2008)
French legal origin	0.55	0.50	0.00	1.00	161	La Porta et al. (2008)
Scandinavian legal origin	0.01	0.08	0.00	1.00	161	La Porta et al. (2008)
System estimation variables						
Media freedom	0.68	0.26	0.6303	0.98	162	V-Dem dataset
Parliamentary regime	0.43	0.50	0.00	1.00	152	Scartascini et al. (2021)
Corruption perception	44.14	18.82	15.00	88.00	162	WDI
Tax revenue (% GDP)	17.12	6.34	0.06	34.12	118	WDI

SD is the standard deviation, Min. is the minimum value of the observations, Max. is the maximum value of the observations, Obs. is the number of observations

Table 8 Cross correlations

Variables	Polity	GDP	Stringency	Inf. rate	Death rate	Govt. exp.	Pub. debt	Median age
Polity	1.000							
GDP per cap.	0.234	1.000						
Stringency	−0.014	−0.074	1.000					
Inf. rate	0.030	0.253	−0.006	1.000				
Death rate	0.072	0.360	−0.008	0.506	1.000			
Govt. exp.	0.208	0.296	−0.106	0.025	0.020	1.000		
Public debt	0.157	0.092	−0.051	−0.048	−0.073	0.063	1.000	
Median age	0.363	0.45	−0.068	0.099	0.113	0.312	0.140	1.000

In the first two regressions, we instrument Polity on the instrumental variables, whereas in the remaining two, we instrument the interaction of Polity with time. We have two regressions in each category: In the first one, we do not use any control variables, and in the other one, we use pandemic-related (and therefore potentially exogenous) variables (i.e., lagged stringency index, infection rate, and death rate) as controls. Polity in the first two regressions and the interaction variable in the remaining two all have significantly positive estimated coefficients, further supporting the results presented in the main text and Figs. 1 and 2, respectively. Moreover, here, we also observe

Table 9 Instrumental variable estimations

Variables	(1) Fiscal	(2) Fiscal	(3) Fiscal	(4) Fiscal
Polity	0.38***	0.45***		
	(0.04)	(0.06)		
Polity × Time			0.05***	0.04***
			(0.01)	(0.01)
Stringency index (lagged)		−0.04	−0.03	
		(0.07)	(0.07)	
Infection rate (lagged)		−0.04	−0.07	
		(0.05)	(0.04)	
Death rate (lagged)		5.21***	5.33***	
		(0.82)	(0.86)	
Constant	−6.51***	−4.25***	1.33**	−1.04***
	(0.68)	(0.98)	(0.54)	(0.29)
Observations	2191	1913	1913	2191
Region dummies	Yes	Yes	Yes	Yes
Time dummies	Yes	Yes	Yes	Yes
Under-identification	0.00	0.00	0.00	0.00
Weak identification	0.00	0.00	0.00	0.00
J-test	0.78	0.66	0.65	0.47
First stage F-test	0.00	0.00	0.00	0.00

Robust standard errors in parentheses

*$p < 0.1$

**$p < 0.05$

***$p < 0.01$

that the coefficient of lagged death rate is significantly positive, indicating that countries with a higher death rate adopted stronger expansionary fiscal measures.

Notice that all the identification and exogeneity tests presented in the table are also satisfactory in the sense that they provide support for the relevancy and exogeneity of our instruments. Nonetheless, we shall note that the IV method with cross-country democracy data has limitations, as discussed in Acemoglu et al. (2019). Thus, our IV results should be approached with some caution.

Declarations

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