# Government responses, democracy, and COVID-19 containment:
# A cross-country study

**Toan Luu Duc Huynh**[*] **• Duy Duong**

*University of Economics Ho Chi Minh City, Vietnam*

## Abstract

This study examines the effectiveness of government responses and the level of democracy in containing the COVID-19 spread by drawing monthly data from 33 advanced economies in 2020. Our findings indicate that government responses effectively "flatten the curve" of infected and fatal cases. Concurrently, the higher level of democracy contributes to the joint effect of government responses to lower these countries' number of infected cases. However, more noticeably, this effect does not last nor exhibit significant heterogeneous effects. These two points add a speck of empirical evidence to the existing literature on the COVID-19 studies. Therefore, our study provides relevant policy implications.

## 1. Introduction

The human race faced an unprecedented event in 2020, known as the COVID-19 pandemic, with a slew of restrictions and social distancing. The lockdown policy, which may harm the economy but effectively reduce the number of infected cases, has been one of the most contentious policies over the last few decades. Although some countries have implemented strict policies to discourage social gatherings, other economies chose to create herd immunity (as the Swedish public health experiment demonstrated; Kok et al., 2021). However, the current literature indicates that cultural dimensions cause differences in practicing the government's social instructions (Huynh, 2020b). Furthermore, a debatable concept exists between autocratic and democratic regimes to do a better job of avoiding COVID-19 consequences, implying a need to explain whether the political regime could support government responses in fighting COVID-19.

  The intensive literature tries explaining the relationship between democratic and national health-performance (e.g., Besley and Kudamatsu, 2006; Hall and Jones, 2007). Accordingly, countries with higher democratic levels tend to take better care of their citizens, with longer life expectancy and higher health expenditure. Similarly, Zimmerman et al. (2020) contended that

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deeper globalization could drive the intensive spread of COVID-19 in terms of two dimensions: speed and scale. More importantly, Karabulut et al. (2021) explored how the political regime, particularly the democratic level, could be positively associated with COVID-19 outcomes. Unlike previous research that focused solely on the effects of democracy on coronavirus effectiveness, our study went deeper by examining a combination of government responses and political regimes. Therefore, our study contributes to the literature in two ways:

- First, this study provides a comprehensive dataset consisting of two dimensions – different countries over a 12-month period, which is built as a panel data for an in-depth analysis of the relationship between government responses, democratic level, and COVID-19 effectiveness.
- Second, our paper offers a predictive power on the number of infected cases and deaths in 33 advanced economies in 2020 based on three factors: government responses, political regime (democratic level), and their interactive effect.

We chose these developed countries primarily due to the availability of data. Furthermore, developed economies are frequently lauded as the coronavirus fighting model; thus, we want to examine how effective they are in this difficult situation.

The rest of the paper is structured as follows. Section 2 provides a brief overview of the relevant literature, and Section 3 explains our data and model specifications. Section 4 discusses the findings and results. Finally, Section 5 concludes the paper.

## 2. Relevant literature review

The emergence of the COVID-19 pandemic in countries has raised the question of whether the regime, which introduced policies to deal with epidemics and crisis problems, determines the number of cases and deaths. Claiming that democratic countries frequently fail to respond quickly and effectively to crises, such as the COVID-19 pandemic, is difficult because in reality, the infection rate appears higher, and the death rate is lower in other countries (Karabulut et al., 2021; Grossman et al., 2020; Fisman et al., 2021). The COVID-19 pandemic has also provided many benefits to authoritarianism, as strong policies in suppressing outbreak areas, which disregard democratic freedom, have effectively prevented the spread (Maçães, 2020). However, the dictatorship's aggressive cover-up turned the infectious disease at the regional level into a pandemic, and its quick policy efforts resulted in sacrifices and significant economic loss (Alon et al., 2020). According to The New York Times (2020), "it is hard to draw up a conclusive balance sheet on the relative disease-fighting abilities of autocracies and democracies."

Because of the consequences of the COVID-19 pandemic, which methods should be identified and implemented is still debatable (Hale et al., 2020). According to Hussain (2020), the government's austerity in implementing policy measures to respond to the spread of the disease can help reduce the number of cases and deaths while upsetting the social balance in countries. The government's response to each wave of the pandemic is also a factor influencing the severity of the disease and the economic loss (Ashraf, 2020; Cheng et al., 2020). Furthermore, Greer et al. (2020) showed that government responses to outbreaks are influenced by four major factors: social policies, regime type (democracy or autocracy), political institutions (federalism or presidentialism), and the national governance systems' capacity. Meanwhile, Rabhi et al. (2020) analyzed the relationship between government intervention and economic unsustainability during the COVID-19 pandemic outbreak. Previous research findings reveal that the economy's instability increases when it responds to containment policies, whereas economic support helps stabilize the economy (Pötsönen et al., 2020). Dergiades et al.'s (2020) study is also based on the rigor of 32 countries' policies, which resulted in the decreasing rate of the number of deaths in the early stages of the epidemic due to government interventions.

This means that the government's decision to act as soon as possible is critical for controlling the virus spread.

However, unlike previous studies, this study examines both the political regime and the government's response to policymaking simultaneously. Furthermore, national policies should propose and implement measures to mitigate the losses caused by the COVID-19 pandemic, and these measures should be considered and adjusted appropriately for each different political situation. In each country, the balance between reducing the number of infections and deaths and economic growth must be studied and considered. Following a review of the current literature, we found that no study has examined the simultaneous effects of government responses and political regime. Therefore, this present study will fill this research gap by examining these factors and the interactive effect with stringent control variables.

## 3. Data and model specifications

Our study uses monthly pool data from 33 countries[1] from January to December in 2020, constituting the panel data for further analysis. This is the most critical period, as it represents the government's comprehensive response to a major pandemic after decades. The policies, stringency, government response, containment index, and ecosystem support for government responses were retrieved from The Oxford Coronavirus Government Response Tracker database by Hale et al. (2021). Concurrently, we collect data representing each country's democracy, which was obtained from the Economist Intelligence Unit. Noteworthily, this index is representative of the specific country's pluralism, civil liberties, and political culture. Our control variables (e.g., GDP per capita) are used to capture the characteristics of the countries.

This section also explains our model specifications, which are used to investigate two major research questions: (i) Are government responses effective to contain the COVID-19? (ii) How does democracy affect strengthening or impeding government responses?

$$\text{Infected}_{it} = \beta_0 + \beta_1 \text{GovRes}_{it} + \beta_2 \text{Democratic}_i + \sum_{j=3}^{5} \beta_i \text{Control}_{j_{it}} + \nu_i + \xi_t + \varepsilon_{it} \quad \text{(Model 1)}$$

where "Infected" denotes the natural logarithm of increasing infected cases in country i at month t. "GovRes" represents government policies aimed at halting the spread of the coronavirus, with two dimensions: country and time. Furthermore, with updated data until 2020, the "democratic" is a proxy for capturing how democratic the political regime is. All the control variables in our models are represented by the sigma notation and are the terms for the country-effect and time-effect. Meanwhile, the residual is represented by the final symbol (). The coefficients are denoted as betas, with a subscript for the constant (0) and other variables (from 1 to 5).

$$\text{Deaths}_{it} = \beta_0 + \beta_1 \text{GovRes}_{it} + \beta_2 \text{Democratic}_i + \sum_{j=3}^{5} \beta_i \text{Control}_{j_{it}} + \nu_i + \xi_t + \varepsilon_{it} \quad \text{(Model 2)}$$

Basically, Model 2 is similar to Model 1, except for the dependent variable – the natural logarithm of increasing deaths due to COVID-19. Furthermore, this study uses the interaction term between GovRes and Democratic () to determine whether the effects are stronger or weaker with the presence of a political regime. Before proceeding with any further regressions, we explain our summary of descriptive statistics in the following section.

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[1] The countries are Australia, Austria, Belgium, Canada, Chile, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, Luxembourg, Mexico, Netherlands, Norway, Poland, Portugal, Russia, Slovakia, Slovenia, South Korea, Spain, Sweden, Switzerland, United Kingdom, and the United States.

## 4. Results

### *4.1. Principal component analysis for government policies*

Figure 1 summarizes the correlation matrix across government policies, namely the stringency, government response, containment index, and ecosystem support. A high correlation exists between government policies; thus, we decided to group our determinants using principal component factors and a rotation based on orthogonal Varimax (Kaiser on). Table 1 summarizes our methodology for compiling government responses to the COVID-19 situation in 33 countries.

*Figure 1.* Correlation matrix.
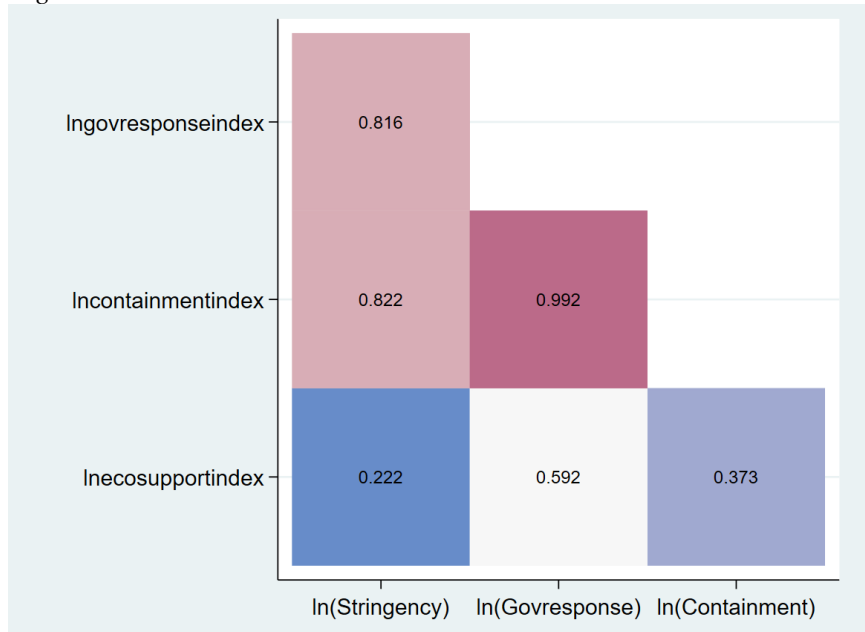


Accordingly, Table 1 emphasizes the distinct factor, hereinafter "*Government responses*," which represents how the country deals with the difficult situation. We referred to Huynh's (2020a) study by omitting loadings less than 0.5 for our study. Finally, one factor captures all government policies, which fits our main purpose of measuring government efficacy.

*Table 1.* Rotated factor loadings of four government reponses.

| Variable | 'Responses' | Uniqueness |
|---|---|---|
| Ln(Stringency) | 0.6872 | 0.5277 |
| Ln(Govresponse) | 0.973 | 0.0532 |
| Ln(Containment) | 0.9225 | 0.1489 |
| Ln(Ecosupport) | 0.6388 | 0.5919 |

*Notes:* Kaiser-Meyer-Olkin measure of sampling adequacy (overall) is 0.4160. We also employed the scoring coefficients with regression for the ln(stringency), ln(Govresponse), ln(Containment), ln(Ecosupport) with 0.256, 0.363, 0.344, and 0.238, respectively.

Table 2 depicts a summary of descriptive statistics for our main variables before proceeding to the regressions to examine whether the government responses are effective in reducing the severity of COVID-19. In this table, two major points are worth mentioning. First, over a one year period, these 33 countries managed death cases effectively (negative death cases). Our findings are consistent with those of Hsiang et al. (2020). Second, we observed that 52.45% of the 33 countries have higher democratic features than the average, representing the unbiased ratio to use them as binary variables in our model.

*Table 2.* Summary of descriptive statistics.

| Variable | Mean | Std. Dev. | Min | Max | Skewness | Kurtosis |
|---|---|---|---|---|---|---|
| Infected cases | 1.0122 | 1.8077 | -0.0105 | 9.4552 | 2.8106 | 10.0079 |
| Death cases | -0.4507 | 1.2267 | -8.5713 | 6.2837 | -0.7932 | 20.3744 |
| Responses[(*)] | 0.8540 | 1.0000 | -4.3479 | 1.6887 | -0.8997 | 3.7310 |
| Democratic[(**)] | 0.5245 | 0.5001 | 0.0000 | 1.0000 | -0.0979 | 1.0096 |
| GDP Per Capita | 40781.53 | 14802 | 17336.47 | 94277.97 | 1.4374 | 6.1515 |
| Unemployment | 6.6682 | 3.9727 | 0.1397 | 21.2000 | 1.6916 | 6.2472 |

*Notes:* [(*)] The mean value of responses after constructing by PCA has $10^{-10}$ unit. [(**)] The 'democratic' represents the percentage of countries having the higher democratic level than average. The number observation ranges from 306 to 368 for 33 countries over the 12 months. We obtained the panel data with the time-horizon setting in monthly frequency. The infected cases and death cases were calculated by using the exponential function with natural logarithm changes based on the previous literature (Hsiang et al., 2020).

### 4.2. The effectiveness of government responses on infected cases and deaths

Figure 2 depicts the fitted linear estimator of relationship between infected cases, deaths, and the level of democracy among 33 countries from January to December in 2020. As shown in Figure 2, a marginally negative relationship exists between infected cases and democracy, whereas the line appears to be flattened with deaths, representing the null result.

*Figure 2.* The relationship between infected cases, deaths, and the level of democracy.



| (a) Infected cases | (b) Deaths |
|---|---|
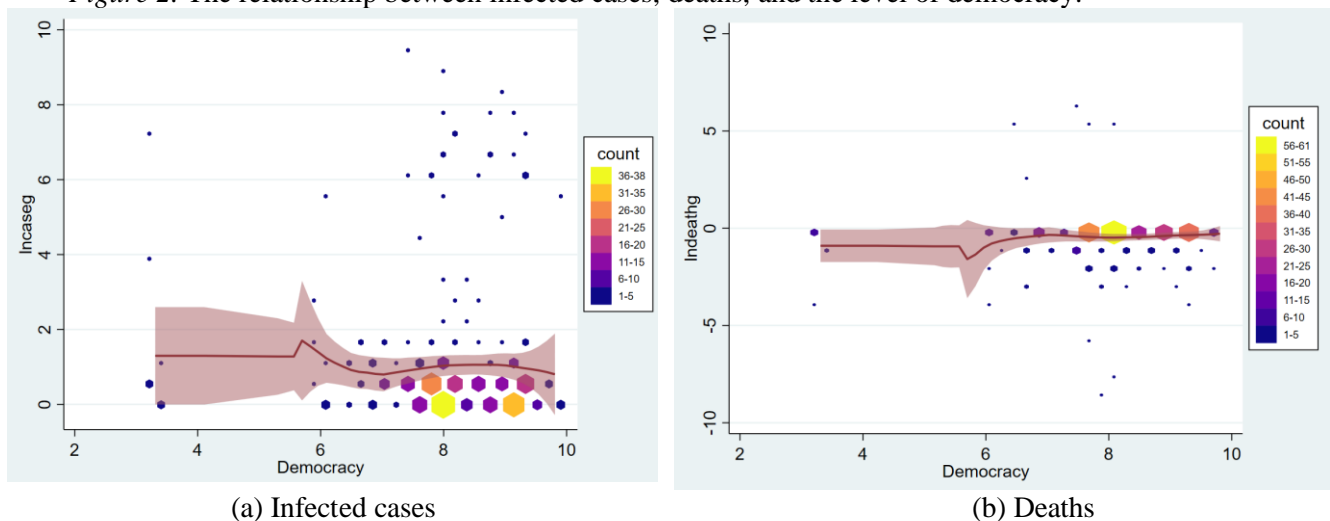
The previous estimation only considers two variables. Therefore, Table 3 depicts the heterogeneous effects of government responses to the severity of COVID-19, as proxied by both infected and death cases, with additional control variables. Surprisingly, we discovered that government responses are probably effective in containing the COVID-19 spread.

We found that government responses are effective in containing the growth of infected cases in 33 developed countries. Even González-Bustamante (2021) found that the heterogeneous effects of government in South Africa are likely to challenge policymakers. Our research contributes empirical evidence to the literature that government responses are effective in advanced countries (Hale et al., 2020), implying the appropriate economic stimulus to recover these economies' losses (Elgin et al., 2020). In contrast to the existing literature on democracy by Karabulut et al. (2021), our study emphasizes the simultaneous presence of government responses and the level of democracy. We also discovered that the higher the democracy likely predicts the lower infected cases, but not deaths, in the developed countries. Our findings put a strain on policymakers as they consider policies for various groups of countries (Gerard et al.,

2020). More notably, after controlling for the country-effect and time-effect, we determine that government responses are less likely to impede the growth of deaths. This point applies the new perspective of the health system, specifically cutting-edge machines or experienced medical doctors. Thus, the following concern may be the most critical in restricting new deaths in the COVID-19 fighting.

*Table 3.* Regressions of government responses on COVID-19 severity.

| Variables | Infected Cases | Infected Cases | Death cases | Death cases |
|---|---|---|---|---|
| Responses | -0.826*** | -0.263** | -0.294** | -0.182 |
|  | [-5.402] | [-2.315] | [-2.384] | [-0.672] |
| Democratic | -0.070 | -1.424** | 0.097 | 0.654 |
|  | [-0.316] | [-2.227] | [0.503] | [0.913] |
| Constant | 0.715** | 10.762*** | -0.415 | 0.358 |
|  | [2.099] | [4.330] | [-1.632] | [0.119] |
| Other macroeconomics control | Yes | Yes | Yes | Yes |
| Country-effect | No | Yes | No | Yes |
| Time-effect | No | Yes | No | Yes |
| R-squared | 0.204 | 0.899 | 0.279 | 0.280 |
| Observation | 300 | 300 | 285 | 285 |

*Notes:* $* < 0.1$; $** < 0.05$; $*** < 0.01$. The macro control variables are GDP per capita and Unemployment rate. The country-effect includes 33 countries in our sample while the time-effect consists of the time dimension over the period from January 2020 to December 2020. Democratic is the binary variable having '1' (the level of democracy is higher than average) and '0' for otherwise. The first two columns has the dependent variable as the growth of infected cases while the remaining ones contain the growth of deaths.

### 4.3. Does democratic regime strengthen or impede the government responses?

This section examines the effects of government responses on growth cases when democratic regimes are present. Table 4 summarizes our findings using interaction terms based on the effectiveness of government responses and democratic regimes.

*Table 4.* Regressions of government responses and political regime on infected cases.

| Variables | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| Responses | -0.800*** | -0.441** | -0.467** | -0.741*** | -0.251** |
|  | [-5.533] | [-1.982] | [-2.007] | [-2.995] | [-2.046] |
| Democratic | 0.011 | 0.066 | 0.005 | -0.382 | -1.416** |
|  | [0.064] | [0.340] | [0.020] | [-0.341] | [-2.145] |
| Responses*Democratic |  | -0.612** | -0.626** | -0.850** | -0.022 |
|  |  | [-2.183] | [-2.144] | [-2.448] | [-0.132] |
| Constant | 0.966*** | 0.904*** | 0.632* | -0.672 | 10.756*** |
|  | [7.087] | [5.985] | [1.870] | [-0.154] | [4.278] |
| Other macroeconomics control | No | No | Yes | Yes | Yes |
| Country-effect | No | No | No | Yes | Yes |
| Time-effect | No | No | No | No | Yes |
| R-squared | 0.194 | 0.221 | 0.232 | 0.478 | 0.899 |
| Observation | 316 | 316 | 300 | 300 | 300 |

*Notes:* $* < 0.1$; $** < 0.05$; $*** < 0.01$. The macro control variables are GDP per capita and Unemployment rate. The country-effect includes 33 countries in our sample while the time-effect consists of the time dimension over the period from January 2020 to December 2020. The dependent variable is the growth of infected cases. Democratic is the binary variable having '1' (the level of democracy is higher than average) and '0' for otherwise.

We discovered that adding the interaction term tends to be effective in impeding the growing cases in these countries. This means that countries with stricter policies and a higher level of democracy are more likely to predict lower-case scenarios. Moreover, different numbers paint the same picture as the studies of Karabulut et al. (2021), Cukierman et al. (2021), and Narita and Sudo (2021). Our study has novelty in that it considers both effects, namely, government responses and democracy, in containing the spread of the COVID-19 virus. However, our study also raised the possibility that the interaction term would vanish once the individual effects of time were controlled. This implies the importance of democracy in the early stages of policy implementation; however, the dynamic of time may not help ensure regulatory compliance in these advanced countries. Therefore, we can conclude that the combined effect of government responses and democracy in containing the coronavirus may be effective. However, the application should not be used regularly.

## 5. Concluding remarks

This study sheds new light on the predictive power of government responses and democratic regimes in 33 economies on COVID-19 containment effectiveness. Accordingly, we found that government responses have a negative relationship with infected cases but not deaths. Concurrently, the interaction effect of the political regime is effective at impeding infected cases. Despite the benefit of a higher level of democracy, the effect disappeared when the time-effect was set to a monthly level. Our findings have two policy implications. First, these advanced countries could consider the aforementioned policies to help contain the growing number of infected cases. However, because death rates are independent of government policies, these economies should also invest in the strength of the health system, such as cutting-edge medical machines and experienced nurses and doctors. Second, policymakers should exercise caution when enacting stringent policies due to the restriction of time dynamics. It means that in a country with a high level of democracy, simultaneous government responses may be effective for a short time, but they may disappear due to time dynamics (at least one year). They can act immediately, but they must keep their eyes open due to the possibility of time changes. Our study provides insights into government responses and democratic regimes from the perspectives of 33 advanced countries in 2020. Future research could increase the sample size and the time horizons to obtain more information, which will be a promising path.

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