Culture, Political Order, and COVID-19 Mortality

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THE COVID-19 PANDEMIC HAS CHALLENGED countries’ capabilities of quick reaction, mobilization, governance, organization, and implementation, as well as the efficiency and effectiveness of public policies. Responding to the COVID-19 pandemic, some countries have performed excellently, while other countries have not performed well. Many studies have explored the COVID-19 pandemic from a variety of aspects and suggested some reasons for the differences in country performance.1 Motivated by this phenomenon and the emerging literature, this study identifies some important country-level factors that determine country performance fighting the COVID-19 pandemic—cultural background, state capacity, government capacity to effectively formulate and implement sound policies (hereafter referred to as government

1Francis Fukuyama, “The Pandemic and Political Order: It Takes a State,” Foreign Affairs 99 (July/August 2020): 26–32.
efficiency), and social trust—and conducts empirical investigation of how these factors are related to the handling of the COVID-19 pandemic.

This study proceeds in two phases. In the first phase, we adopt the concepts of individual resources and societal resources to suggest a simple model. This model demonstrates that for each country, there exists a specific price ratio of individual resources to societal resources, and that ratio determines the optimal strategy for responding to the COVID-19 pandemic in the absence of vaccines. We further build a theoretical framework to show that cultural background, government efficiency, and social trust can determine the price ratio of societal resources to individual resources in a country, and thereby determine the best strategies or responses to the COVID-19 pandemic. In the second phase, we collect data from a variety of sources and empirically test the association between these factors and mortality due to COVID-19.

The article is organized as follows: The next section builds the theoretical framework and develops the hypotheses. The following section introduces the main variables and their measurements, describes the data, and reports the results of the analysis. The final section concludes the article with discussion and reflection on some questions.

THEORETICAL FRAMEWORK AND HYPOTHESIS DEVELOPMENT

Dealing with the COVID-19 pandemic requires a variety of resources. First we consider a model of the relationship between resources and responses to the pandemic without effective vaccines. Assume that in an economy (country), there are two resources—individual resources and societal resources—and these two resources are used to fight or defeat COVID-19. In fighting against the coronavirus, the cost of the individual resources of a country can refer to the expense or loss of individual interests, for example, infection cases, number of deaths, or money spent on personal preventive equipment or kits for personal virus testing. The cost of the societal resources of a country can refer to the expense or loss of societal interests, for example, the nationwide mobilization of doctors, nurses, and healthcare workers; the resources invested in vaccine research; and requirements that people wear face masks, practice social distancing, or stay at home.

In handling the pandemic, various strategies correspond to different combinations of individual resources and societal resources. For example, the requirement for people to wear face masks would consume or cost certain societal resources (for example, inconvenience to a society), but it would reduce, to some extent, the cost of individual resources (for
example, infection cases); this can be expressed by a point in the coordinates in Figure 1. In Figure 1, each point on the isoquant curve (IQ) represents the combination of individual resources and societal resources employed by a government implementing a set of public policies to deal with the COVID-19 pandemic. Specifically, Point A represents the implementation of a set of public policies using more individual resources—for example, requiring that anyone with symptoms of COVID-19 stay at home rather than going to the hospital, or encouraging people to use the internet rather than the telephone to get information—but mobilizing less societal resources—for example, allowing all economic and entertainment activities to proceed as usual. Hence, Point A, which mobilizes less societal resources and uses more individual resources, represents the implementation of a relatively passive strategy for responding to the COVID-19 pandemic. In contrast, Point B, which mobilizes more societal resources and uses less individual resources, represents a relatively active strategy in responding to the COVID-19 pandemic. For example, policymakers might decide to lock down a city with high community transmission to prevent further transmission to other communities.

In Figure 1, the straight lines FF and PP are isocost lines representing individual resources and societal resources. The slope of the isocost line is determined by the cost of individual resources versus societal resources, or the price ratio of mobilizing societal resources to individual resources. Each country has a specific isocost line whose slope is determined by its cultural background and political order. It is well known that for each isocost line, there is a unique point on the isoquant curve where the isocost line is tangent to the isoquant curve. In other words, the point indicates the optimal combination of individual and societal resources in
the specific context of a country fighting the pandemic. In addition, the slope of the isocost line is a decreasing function of societal resources. For example, the slope of the tangent line at Point A is steeper than that at Point B in Figure 1; in other words, the slope of the isocost line is less steep when the optimal strategy is more active.

**Culture and the Pandemic**

In a country with an individualist culture, when mobilizing societal resources, the government would put more weight on the disturbance of individual interests such as living conventions or free activities because the institutional rules in individualist countries emphasize the protection of individual interests. U.K. Prime Minister Boris Johnson explained that “if you ask, why are we doing this now, why now, why not earlier, or later? Why bring in this very draconian measure? The answer is that we are asking people to do something that is difficult and disruptive of their lives.” When these measures are implemented, they will encounter cultural resistance because they hinder personal interests. Many people, for example, resisted wearing masks in public places in the United States.

In contrast, in a country with a collectivist culture, when mobilizing societal resources, the government would give more consideration to societal interests and put less weight on the disturbance of individual interests because the institutional rules in collectivist countries encourage people to consider societal interests rather than individual interests. When implementing public policies that may affect individual activities, governments will meet less resistance from residents in countries with collectivist cultures than in countries with individualist cultures. This is because a collectivist culture encourages residents to follow policies that may sacrifice individual interests for the benefit of the society. In this regard, an individualist culture emphasizes individual freedoms and might sympathize with activities that violate such policies.

In summary, the relative price of mobilizing societal resources versus individual resources is higher in a country with an individualist culture than in a country with a collectivist culture; that is, the slope of the isocost line in an individualist country will be steeper than that of the isocost line in a collectivist country. Integrating the arguments about the slopes of active and passive strategies in Figure 1, we can see that in the cultural environment of collectivism, the active strategy is the best solution for the whole society, including both policymakers and citizens.

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2U.K. Government, “PM Statement on Coronavirus,” 16 March 2020, accessed at https://www.gov.uk/government/people/boris-johnson, 25 May 2020.
On the contrary, in the cultural environment of individualism, the passive strategy is optimal for the whole society. Although vaccines and treatments are gradually available, compared with passive strategies, active strategies are still more effective in terms of prevention and control in some situations because of the emerging variants of the COVID-19 virus and the uneven distributions of vaccines and drugs in countries and regions. Therefore, we formulate the first hypothesis as follows:

**Hypothesis 1:** Handling the novel coronavirus in the absence of vaccines, countries with collectivist cultures would perform better than countries with individualist cultures.

**Political Order and the Pandemic**

Our model suggests that the optimal strategy for responding to COVID-19 pandemic is determined by the slope of the isocost line of individual resources and societal resources. In addition to culture, the slope of a country’s isocost line might also be determined by the composite effects of that country’s political order characteristics—that is, state capacity, government efficiency, and social trust. Recent studies suggest that these three characteristics are determinants of country performance in response to the pandemic. The following discussion will show how these three characteristics affect the isocost line of a country and further the optimal strategy for responding to the COVID-19 pandemic based on our model.

In the literature pertaining to civil conflict, state capacity is defined as military capacity, bureaucratic/administrative capacity, and political institutional coherence and quality. To measure state capacity, James Fearon and David Laitin use the logarithm of per capita gross domestic product (GDP) to proxy state capacity, as military, administrative, and bureaucratic capacities are highly correlated with GDP per capita. However, the implementation or realization of state capacity is “relative”; the existence of economic agencies or overruled bureaucracies may compromise the impact of state capacity. To put it more directly, state capacity is the state’s ability to overcome opposition from vested interests.

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3 Fukuyama, “The Pandemic and Political Order.”
4 Cullen Hendrix, “Measuring State Capacity: Theoretical and Empirical Implications for the Study of Civil Conflict,” *Journal of Peace Research* 47 (May 2010): 273–285.
5 James Fearon and David Laitin, “Ethnicity, Insurgency, and Civil War,” *American Political Science Review* 97 (February 2003): 75–90.
6 Iza Ding, “Performative Governance,” *World Politics* 72 (October 2020): 525–556.
in policy formulation,7 and it is especially true of the relationship between state capacity and country performance in responding to the COVID-19 pandemic. As illustrated by our model, country performance in responding to the COVID-19 pandemic depends upon the capacity to mobilize resources (the ratio of societal resources to individual resources) rather than the commonly defined state capacity that the country possesses.

At first glance, countries with strong state capacity should be more capable of mobilizing more societal resources than countries with weak state capacity. But this does not mean that the price ratio of societal resources to individual resources is necessarily lower in countries with strong state capacity, or that countries with strong state capacity necessarily mobilize more societal resources relative to individual resources. For example, governments in countries with strong state capacity might trade the benefit of mobilizing more societal resources for costs such as the negative impact on the economy’s productive system8 or the disturbance of residents’ normal lives.9 Therefore, state capacity (measured by the logarithm of per capita GDP) should have no systemic effects on country performance in the COVID-19 pandemic.

Two other characteristics—government efficiency and social trust—can improve government performance.10 The cross-country empirical literature has shown that government capacity to effectively formulate and implement sound policies is positively associated with social well-being and public health.11 In our model, countries with higher degrees of government efficiency are more capable of and efficient in mobilizing societal resources relative to individual resources than countries with lower degrees of government efficiency; therefore, the isocost line in countries with higher degrees of government efficiency tends to have a flatter slope than the isocost line in countries with lower degrees of government efficiency (refer to Figure 1). Also from Figure 1, the optimal strategy implemented by countries with higher degrees of government efficiency would be more active than in countries with lower degrees of

7Jonas Meckling and Jonas Nahm, “The Power of Process: State Capacity and Climate Policy,” Governance 31 (February 2018): 741–757.
8Spain’s Lockdown Could Be Extended until 10 May,” EU Observer, 10 April 2020, accessed at https://euobserver.com/tickers/148045, 11 May 2020.
9U.K. Government, “PM Statement on Coronavirus.”
10Stephen Knack, "Social Capital and the Quality of Government: Evidence from the States,” American Journal of Political Science 46 (October 2002): 772–785; and Sören Holmberg, Bo Rothstein, and Naghmeh Nasiritousi, “Quality of Government: What You Get,” Annual Review of Political Science 12 (June 2009): 135–161.
government efficiency, and the responses of countries with higher degrees of government efficiency would be more active and effective without vaccines. Our argument is based on the following reasons. Any policy mobilizing societal resources will affect certain people’s interests to various extents—for example, active strategies for responding to the pandemic would often be at the expense of economic growth. Facing the pandemic, a higher degree of government efficiency is necessary to convince and lead society to adopt and implement more active strategies in mobilizing the appropriate amounts of societal resources and individual resources. Therefore, Hypothesis 2a is as follows:

**Hypothesis 2a:** Handling the COVID-19 pandemic in the absence of vaccines, ceteris paribus, countries with higher government capacity to effectively formulate and implement sound policies will perform better.

In addition to state capacity and government efficiency, social trust is another vital factor in fighting the pandemic and determining policy adoption and implementation regarding mobilization of societal resources. Social trust (social cohesion) reflects positive expectations (1) that the natural and moral order will persist, (2) that others will be technically competent to carry out their role relationships with us, and (3) that others will be willing to carry out their responsibilities to us. At the individual level, social trust is associated with volunteering, donating to charity, tolerance, and other forms of prosocial behavior. In the aggregate, societies are characterized by more efficient collective decision-making. Back to our model in Figure 1, higher social trust would facilitate the mobilization of societal resources relative to individual resources, and thus flatten the slope of the isocost line. Consequently, the optimal strategy would be more active, and countries with higher social trust would perform better in the absence of vaccines. This is because a government without sufficient trust or facing strong opposition would have to compromise to certain extent by reducing the consumption of societal resources. For example, when Spain closed all airports and seaports for 30 days from 23 March 2020 with certain exceptions, the opposite force warned that these

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12Robert V. Robinson and Elton F. Jackson, “Is Trust in Others Declining in America? An Age–Period–Cohort Analysis,” *Social Science Research* 30 (March 2001): 117–145.
13Kim Mannemar Sønderskov, “Explaining Large-N Cooperation: Generalized Social Trust and the Social Exchange Heuristic,” *Rationality and Society* 23 (February 2011): 51–74.
14Peter Thisted Dinesen and Kim Mannemar Sønderskov, “Ethnic Diversity and Social Trust: Evidence from the Micro-Context,” *American Sociological Review* 80 (June 2015): 550–573.
new initiatives could destroy “the entire productive system” of the country, which was already “very affected.” And when Spanish Prime Minister Pedro Sánchez said on 9 April 2020 that he would have to ask to extend the state of emergency two more weeks when the current deadline for the lockdown ended, the opposition threatened to stop supporting further extensions to the lockdown.16

Social trust can determine the slope of the isocost line in a country because it determines how policies are implemented in response to the pandemic. Without social trust, it is difficult to fully mobilize a party’s resources and even more difficult to mobilize the resources of the whole society in the implementation of the policies. Francis Fukuyama emphasizes that countries also need a great deal of social consensus to successfully handle the initial stages of a crisis, and he attributes one root of the United States’ poor performance to “its current highly polarized society.”17 When the pandemic began, many Americans took to the streets to protest the policy of protecting public health. In contrast, social trust helped China, where the pandemic was successfully contained. At the initial stage of the COVID-19 pandemic, traffic restrictions were imposed on Wuhan and the surrounding areas to achieve the goal of “no proliferation within the city and no spread out of the city”; the central government arranged for 19 provinces to support different cities in Hubei Province, a policy known as “one province helps one city.”18

Thus, the last hypothesis is as follows:

**Hypothesis 2b:** Handling the COVID-19 pandemic in the absence of vaccines, ceteris paribus, countries with higher social trust will perform better.

**DATA AND ANALYSIS**

**Variables and Measurement**

To measure country performance in responding to the COVID-19 pandemic, we use mortality.19 The team finds that to minimize mortality

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15Elena Sánchez Nicolás, “Spain Prays to Reach Peak of Pandemic This Week,” EU Observer, 24 March 2020, accessed at https://euobserver.com/coronavirus/147850, 11 May 2020.
16EU OBSERVER, 2020.
17Fukuyama, “The Pandemic and Political Order.”.
18“SCIO Briefing on Epidemic Control and Medical Rescue in Hubei,” HBTV, 16 February 2020, accessed at http://news.hbtv.com.cn/p/1785099.html, 22 March 2020; and “List of Provincial Counterpart Support to Hubei,” Hubei Government Report, 10 February 2020, accessed at http://fgw.hubei.gov.cn/fljy/dtyw/yqtb/, 20 March 2020.
(daily deaths) and reduce infections, the most effective policy is suppression—that is, population-wide social distancing combined with home isolation of cases and school and university closure. These mitigation measures are further ranked according to their activeness, and they are listed in ascending order of mortality and infections: closure of schools and universities, case isolation, case isolation and household quarantine, case isolation, home quarantine and social distancing of those over age 70, and the three-month period in which these interventions are assumed to remain in place. For example, assume that $R_0$ equals 2 and trigger point is 60 new COVID-19 cases diagnosed weekly in ICUs at the national level. The total number of deaths seen in a two-year period would be 410,000, 47,000, 6,400, and 5,600 for “do nothing,” “case isolation + home quarantine + social distancing,” “school/university closure + case isolation + social distancing,” and all four interventions for Great Britain, respectively (see the appendix). Since testing capacity may differ across countries, the number of confirmed infection cases may not be directly comparable across countries. Therefore, we use mortality or total deaths to measure performance in responding to the COVID-19 pandemic. The data on reported COVID-19 deaths are from the World Health Organization’s situation report.20

To classify whether a country is more of a collectivist or an individualist culture, we use the mean value of institutional collectivism practices from the culture value survey.21 The definition of institutional collectivism is the degree to which organizational and societal institutional practices encourage and reward the collective distribution of resources and collective action. The specific questionnaire item is “Leaders encourage group loyalty even if individual goals suffer.” A higher value means that the country has a more collectivist culture.

Following Fearon and Laitin,22 we use the logarithm of per capita GDP to proxy the state capacity or overall economic capacity of a country. We adopt the Global Health Security Index (GHSI) to proxy the overall

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19See the discussion in Neil M. Ferguson et al., “Impact of Non-Pharmaceutical Interventions (NPIs) to Reduce COVID-19 Mortality and Healthcare Demand,” Imperial College COVID-19 Response Team, 16 March 2020, accessed at https://www.imperial.ac.uk/media/imperial-college/medicine/sph/ide/gida-fellowships/Imperial-College-COVID19-NPI-modelling-16-03-2020.pdf, 25 March 2020.
20World Health Organization, “Situation Report-112,” 11 October 2020, accessed at https://www.who.int/emergencies/diseases/novel-coronavirus-2019/situation-reports, 1 November 2020.
21Shalom Schwartz, “Beyond Individualism/Collectivism: New Cultural Dimensions of Values,” in Uichol Kim, Harry C. Triandis, Çigdem Kagıtcıbasi, Sang-Chin Choi, Gene Yoon, eds., Individualism and Collectivism: Theory, Method, and Applications (Thousand Oaks, CA: Sage, 1994), 85–119; and Shalom Schwartz, Cultural Value Orientations: Nature and Implications of National Differences (Moscow: Publishing House of SU HSE, 2008), 468.
22Fearon and Laitin, “Ethnicity, Insurgency, and Civil War.”
health environment of a country. The GHSI report notes that “because infectious diseases know no borders, all countries must prioritize and exercise the capabilities required to prevent, detect, and rapidly respond to public health emergencies. Every country also must be transparent about its capabilities to assure neighbors it can stop an outbreak from becoming an international catastrophe.” To deal with the imbalance of resources and capacities across countries, the report points out that “global leaders and international organizations bear a collective responsibility for developing and maintaining robust global capability to counter infectious disease threats. This capability includes ensuring that financing is available to fill gaps in epidemic and pandemic preparedness. These steps will save lives and achieve a safer and more secure world.” Therefore, the GHSI “is intended to be a key resource in the face of increasing risks of high-consequence and globally catastrophic biological events and in light of major gaps in international financing for preparedness.”

A country with higher GDP per capita and higher GHSI score has more resources and capability to fight the COVID-19 pandemic.

To measure government efficiency, we use the aggregate score from the Global Competitiveness Index database. The World Economic Forum conducts a survey every year on important questions relevant to global competitiveness; higher scores indicate better performance or more competitiveness. The aggregate score on government efficiency is the average score across four components: wastefulness of government spending, burden of government regulation, efficiency of the legal framework, and transparency of government policymaking. Higher scores indicate more efficient governments. To measure social trust, we use the average score on “public trust in politicians” from the Global Competitiveness Index database. Higher scores indicate higher social trust in a country.

In addition, we use several variables to control for the general conditions of a country. The data on country population and the median age of the population are obtained from the latest United Nations (UN) Population Division estimates. Table 1 presents the descriptive statistics and the data sources of main variables.

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23 Global Health Security Index report, 2019, accessed at https://www.ghsindex.org/, 10 May 2020.
24 Global Health Security Index report.
25 United Nations, “World Population Prospects 2019,” 2019, accessed at https://population.un.org/wpp/, 15 June 2022.
Baseline Results

Ordinary least squares (OLS) regressions are estimated using the cross-sectional data. The model regarding state capacity is specified as follows:

\[
\ln(\text{death}) = \beta_0 + \beta_1 X + \beta_2 \ln(\text{Population}) + \beta_3 \ln(\text{Age}) + \varepsilon
\]  

(1)

where \(\ln(\text{death})\) is the natural logarithm of total deaths due to COVID-19; \(X\) is alternatively \(\ln(\text{perGDP})\) (the natural logarithm of GDP per capita) and \(\text{GHSI}\) (2019 Global Health Security Index); \(\ln(\text{Population})\) is the natural logarithm of the country population; and \(\ln(\text{Age})\) is the natural logarithm of the median age of the country population. These two terms in the model are used to control the potential confounding effects of population and age on death.

The model regarding culture, government efficiency, and social trust is specified as follows:

\[
\ln(\text{death}) = \beta_0 + \beta_1 X + \beta_2 \ln(\text{Population}) + \beta_3 \ln(\text{Age}) \\
+ \beta_4 \ln(\text{perGDP}) + \beta_5 \text{GHSI} + \varepsilon
\]  

(2)

where \(X\) is \(\text{Collectivism}\) (the institutional collectivism score), \(\text{GovEff}\) (the average score of “government efficiency”), or \(\text{Trust}\) (the average score of “public trust in politicians”); all other variables are defined as in equation (1).

Table 2 reports the estimation results for the association between state capacity and COVID-19 mortality. In Model 1, the coefficient of \(\ln(\text{perGDP})\) is significantly positive at the 1 percent level. In Model 2, the coefficient of \(\text{GHSI}\) is insignificant. In Model 3, including both \(\ln(\text{perGDP})\) and \(\text{GHSI}\), the coefficient of \(\ln(\text{perGDP})\) remains significantly positive and the coefficient of \(\text{GHSI}\) remains insignificant. As expected, the coefficients of \(\ln(\text{population})\) are significantly positive in all three models. However, the coefficient of \(\ln(\text{age})\) is significantly positive at the 10 percent level in Model 1 when including \(\ln(\text{perGDP})\), remains significantly positive at the 1 percent level in Model 2 when including \(\text{GHSI}\), and becomes insignificant when including both \(\ln(\text{perGDP})\) and \(\text{GHSI}\). This indicates the partial effect of age in Model 1, and Model 2 is misestimated because it omits the factors of state capacity. The results suggest higher mortality in countries with higher per capita GDP; this is consistent with our conjecture that there is no systemic relationship between social capacity and COVID-19 mortality. One explanation is that COVID-19 is a new virus and the most effective way of reducing mortality...
| Variable     | Description                                      | Observations | Mean    | SD      | Source                                         |
|--------------|--------------------------------------------------|--------------|---------|---------|------------------------------------------------|
| ln(death)    | Natural logarithm of total COVID-19 deaths       | 191          | 5.566   | 2.660   | World Health Organization                      |
| ln(perGDP)   | Natural logarithm of gross domestic product per capita | 156          | 8.661   | 1.540   | World Bank, World Development Indicators       |
| GHSI         | Global Health Security Index                      | 157          | 43.140  | 14.173  | Global Health Security Index report (2019)     |
| ln(population)| Natural logarithm of country population          | 166          | 15.961  | 2.047   | United Nations Population Division estimates (2019) |
| ln(Age)      | Natural logarithm of median age of country population | 159          | 3.367   | 0.324   | United Nations Population Division estimates (2019) |
| Collectivism | Cultural values                                   | 55           | 4.257   | 0.432   | Culture value survey in Schwartz (1994 and 2008) |
| GovEff       | Government efficiency (1–7 (best))               | 137          | 3.623   | 0.848   | World Economic Forum, Global Competitiveness Report |
| Trust        | Public trust in politicians (1–7 (best))         | 137          | 3.222   | 1.225   | World Economic Forum, Global Competitiveness Report |
| Favoritism   | Favoritism in decisions of government officials (1–7 (best)) | 137          | 3.265   | 1.011   | World Economic Forum, Global Competitiveness Report |
| Diversion    | Diversion of public funds (1–7 (best))           | 137          | 3.724   | 1.200   | World Economic Forum, Global Competitiveness Report |
is active suppression, but this will negatively affect economic activities, so countries with higher GDP are more hesitant to adopt active suppression measures.

Table 3 reports the estimation results for the association between culture, government efficiency, social trust, and COVID-19 mortality. The coefficient of Collectivism in Model 1, the coefficient of GovEff in Model 2, and the coefficient of Trust in Model 3 are all significantly negative at the 1 percent level. The results suggest lower mortality in countries with more collectivist cultures, countries with a higher degree of government efficiency, and countries with higher social trust, supporting Hypotheses 1, 2a, and 2b. The results for other variables are qualitatively similar to those reported in Table 2.

**Additional Analyses.** To check whether the positive association between \( \ln(\text{perGDP}) \) and mortality is due to outliers, we exclude data from the United States, India, and Brazil and reestimate the model in equation (1). The results reported in Table 4 are qualitatively identical to the results in Table 2.

To further examine how culture interacts with state capacity and whether culture moderates the association between state capacity and mortality, we add an interaction term to the regression model specified in equation (3):
### TABLE 3
*Baseline Analyses (Culture and Political Order)*

| Dependent variable: ln(Total deaths) | Model 1     | Model 2     | Model 3     |
|--------------------------------------|-------------|-------------|-------------|
| Intercept                            | 11.325      | 2.150       | 0.267       |
| (1.34)                               | (0.36)      | (0.05)      |             |
| Collectivism                         | –1.775***   | –0.781***   | –0.527***   |
| (–3.49)                              | (–4.02)     |             | (–3.91)     |
| GovEff                               |             |             |             |
| Trust                                |             |             |             |
| ln(perGDP)                           | 0.721*      | 0.875***    | 0.863***    |
| (1.97)                               | (3.86)      | (3.93)      |             |
| GHSI                                 | 0.003       | 0.005       | 0.003       |
| (0.1)                                | (0.27)      | (0.14)      |             |
| ln(population)                       | 1.079***    | 1.078***    | 1.080***    |
| (7.46)                               | (9.5)       | (9.64)      |             |
| ln(age)                              | –1.839      | –0.108      | 0.082       |
| (–1.23)                              | (–0.11)     | (0.09)      |             |
| Adjusted R²(%)                       | 53.9        | 60.6        | 60.8        |
| N                                    | 55          | 114         | 114         |

*Source:* See Table 1.

*Notes:* Numbers in parentheses represent t-values based on standard errors corrected for heteroskedasticity. The superscripts ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

### TABLE 4
*Additional Analyses (Excluding United States, India, Brazil)*

| Dependent variable: ln(Total deaths) | Model 1     | Model 2     | Model 3     |
|--------------------------------------|-------------|-------------|-------------|
| Intercept                            | –9.700**    | –17.652**** | –9.770**    |
| (–2.11)                              | (–6.63)     | (–2.1)      |             |
| ln(perGDP)                           | 0.396**     | 0.426**     |             |
| (2.46)                               | (2.34)      |             |             |
| GHSI                                 | 0.014       | –0.003      |             |
| (0.89)                               | (–0.18)     |             |             |
| ln(population)                       | 0.995***    | 0.920***    | 1.020***    |
| (10.79)                              | (9.58)      | (9.79)      |             |
| ln(age)                              | 1.321*      | 2.436***    | 1.360*      |
| (1.75)                               | (4.05)      | (1.73)      |             |
| Adj. R²(%)                           | 52.9        | 51.3        | 53.3        |
| N                                    | 142         | 142         | 140         |

*Source:* See Table 1.

*Notes:* Numbers in parentheses represent t-values based on the standard errors corrected for heteroskedasticity. The superscripts ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.
where Culture is a dummy variable that equals 1 if a country has a more collectivist culture (that is, a country’s institutional collectivism score is higher than the median score) and 0 otherwise; all other variables are as defined in equation (1). In Model 1 of Table 5, the coefficient on the interaction term is significantly negative, which suggests that culture moderates the association between ln(perGDP) and mortality; in other words, in countries with a collectivist culture, the positive association between ln(perGDP) and mortality is significantly weaker than in countries with an individualist culture.
The literature suggests that governments of high quality or accountability act impartially, efficiently, and without corruption. Many empirical studies have documented the negative consequences of corruption in the health sector in both developed and developing countries. We deem government quality or accountability to be important in fighting the COVID-19 pandemic, so we select two more proxies for government quality or accountability from the Global Competitiveness Index database. One proxy is the average score on “favoritism in decisions of government officials”; higher scores indicate that government officials show a lower extent of favoritism to well-connected firms and individuals when making decisions about policies and contracts. The other proxy is the average score on “diversion of public funds”; higher scores indicate that illegal diversion of public funds to companies, individuals, or groups is less common. We run the model specified in equation (2) where is alternatively Favoritism (the average score of “favoritism in decisions of government officials”) and Diversion (the average score of “diversion of public funds”). The results are presented in Model 2 and Model 3 of Table 5, respectively. The coefficient of Favoritism in Model 2 and the coefficient of Diversion in Model 3 are significantly negative at the 1 percent level. The results suggest that governments of high quality or accountability are associated with lower mortality.

DISCUSSION AND CONCLUSION
Responding to the COVID-19 pandemic, countries have performed differently. This study suggests a simple model to associate country performance with cultural background and political order. Applying the model, we formulate the following hypotheses: Handling the COVID-19 pandemic in the absence of vaccines, ceteris paribus, (1) countries with a collectivist culture would perform better than countries with an individualist culture; (2) countries with higher degree of government efficiency would perform better; and (3) countries with higher social trust would perform better. We collected cross-country data to empirically test these hypotheses. We find lower mortality in countries with a collectivist culture, in countries with a higher degree of government efficiency, and in countries with higher social trust. These findings are consistent with the hypotheses.

26Nicholas Charron, Victor Lapuente, and Paola Annoni, “Measuring Quality of Government in EU Regions across Space and Time,” Papers in Regional Science 98 (February 2019): 1925–1953.
27Holmberg, Rothstein, and Nasiritousi, “Quality of Government.”
The results also find higher mortality in countries with strong economic capacity as measured by GDP per capita, and that culture moderates the association between mortality and per capita GDP (that is, the positive association is significantly weaker in countries with collectivist cultures than in countries with individualist cultures). The additional analyses confirm that governments of high quality/accountability in terms of impartiality and incorruptibility perform better, or are associated with lower mortality.

The findings of this research lead to reflection on some questions. First, it is about the evolution of human social culture and the convergence of various cultures. On the one hand, individualist cultures evolve with industrial revolution and economic development. The development of science and technology enables human beings to pursue and enjoy more individual freedom, as people rely less on collective power and can survive independently. In the meantime, individualist cultures encourage innovation, and this is an engine of further development. On the other hand, in thousands of years when individuals are not capable of handling natural disasters, collectivist cultures will be able to mobilize collective wisdom and action to survive successfully. Especially when responding to the new COVID-19 virus, collectivist culture has outperformed individualist culture. Therefore, a profound understanding of the strengths and weaknesses of different cultures can help policymakers take proper measures to overcome the unexpected challenges that will threaten human survival in the future.

Second, despite the ongoing debate on the government’s role as a “helping hand” or a “grabbing hand,” the model in this study suggests that to effectively handle the COVID-19 pandemic, governments need to mobilize a certain amount of societal resources, and governments with higher capacity to effectively formulate and implement sound policies, or with higher social trust, should perform better in terms of mobilizing societal resources. The cross-country evidence indicates that if governments are more efficient and more accountable, they will receive higher trust and wider support, and efforts to combat the pandemic will be more successful. Therefore, dealing with the COVID-19 pandemic, we should get the most out of governments as “helping hands,” and governments should play a more active role in soliciting advice from professionals, taking proper measures, coordinating the relations between different parties, balancing the trade-off of different goals, and leading societies out of the crisis.
Third, as early as March 2020, scientists proposed models to predict the long-term and short-term development trends of COVID-19 and the consequences of various response strategies. At the same time, the director-general of the World Health Organization said that “[t]he challenge for many countries who are now dealing with large clusters or community transmission is not whether they can do the same—it’s whether they will.” So the question is why some countries responded to the pandemic as if they did not believe in science and gave up, and why some countries were unwilling to adopt more active measures. This study documents that country performance is jointly determined by cultural background, government efficiency, and social trust. When fighting the COVID-19 pandemic, a country needs to employ both individual and societal resources, and the cost ratio of societal resources to individual resources is determined by the cultural background and the political order in the country. In other words, each country’s isocost line has a slope specific to that country, and there is an optimal strategy for responding to the COVID-19 pandemic in the specific context of that country. In short, each country has an optimal strategy with minimum costs, no matter whether it is active or passive. If the passive strategy is optimal for a country, even though sometimes it is forced to adopt more active measures (for example, during the second wave of the outbreak), those active measures cannot be sustained for a long time because they are costly for these countries. These countries would retreat to a passive strategy once the situation eases, even if the relief is temporary. Therefore, we should take a dynamic view of country performance in handling the COVID-19 pandemic. Finally, we note that this study only provides a preliminary understanding of the determinants of country performance in managing the COVID-19 crisis, and certainly we can benefit from further research in this area.*

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28See Ferguson et al., “Impact of Non-Pharmaceutical Interventions (NPIs) to Reduce COVID-19 Mortality and Healthcare Demand.”
29Tedros Adhanom Ghebreyesus, “WHO Director-General’s Opening Remarks at the Media Briefing on COVID-19,” 11 March 2020, accessed at https://www.who.int/dg/speeches/detail/who-director-generals-opening-remarks-at-the-media-briefing-on-covid-19, 11 May 2020.
## APPENDIX

### Suppression Strategies for the Great Britain

| R₀  | On Trigger | Do nothing | CI_HQ_SD | PC_CI_SD | PC_CI_HQ_SD |
|-----|------------|------------|----------|----------|-------------|
| 2   | 60         | 410,000    | 47,000   | 6,400    | 5,600       |
|     | 100        | 410,000    | 47,000   | 9,900    | 8,300       |
|     | 200        | 410,000    | 46,000   | 17,000   | 14,000      |
|     | 300        | 410,000    | 45,000   | 24,000   | 21,000      |
|     | 400        | 410,000    | 44,000   | 30,000   | 26,000      |
| 2.2 | 60         | 460,000    | 62,000   | 9,700    | 6,900       |
|     | 100        | 460,000    | 61,000   | 13,000   | 10,000      |
|     | 200        | 460,000    | 64,000   | 23,000   | 17,000      |
|     | 300        | 460,000    | 65,000   | 32,000   | 26,000      |
|     | 400        | 460,000    | 68,000   | 39,000   | 31,000      |
| 2.4 | 60         | 510,000    | 85,000   | 12,000   | 8,700       |
|     | 100        | 510,000    | 87,000   | 19,000   | 13,000      |
|     | 200        | 510,000    | 90,000   | 30,000   | 24,000      |
|     | 300        | 510,000    | 94,000   | 43,000   | 34,000      |
|     | 400        | 510,000    | 98,000   | 53,000   | 39,000      |
| 2.6 | 60         | 550,000    | 110,000  | 20,000   | 12,000      |
|     | 100        | 550,000    | 110,000  | 26,000   | 16,000      |
|     | 200        | 550,000    | 120,000  | 39,000   | 30,000      |
|     | 300        | 550,000    | 120,000  | 56,000   | 40,000      |
|     | 400        | 550,000    | 120,000  | 71,000   | 48,000      |

Source: Ferguson et al., “Impact of Non-Pharmaceutical Interventions (NPIs) to Reduce COVID-19 Mortality and Healthcare Demand,” 2020. Notes: Impact of three different policy options (case isolation + home quarantine + social distancing, school/university closure + case isolation + social distancing, and all four interventions) on the total number of deaths seen in a two-year period. Social distancing and school/university closure are triggered at the national level when weekly numbers of new COVID-19 cases diagnosed in ICUs exceed the thresholds listed under “On trigger,” and are suspended when weekly ICU cases drop to 25% of that trigger value. Other policies are assumed to start in late March and remain in place.