Death by Capitalism: Quantifying 'Social Murder' Using Cross-Country Data on COVID-19 Fatalities*

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Abstract

We empirically evaluate whether capitalism is implicated in the deaths of individuals during the COVID-19 pandemic using data from January 2020 through March 2021. We separate out the effects of the economic regime (extent of capitalism) from that of the political regime (extent of democracy) and control for a whole host of relevant factors. We find a significantly positive and robust correlation between the extent of capitalism and COVID-19 fatalities, which rises over the 14 months of the pandemic. In terms of mechanisms, we show that capitalist governments are less likely to impose stringency measures that potentially hurt profits. Further analysis shows, however, that stringency measures alone are unlikely to explain the fatalities. Thus, we then isolate a number of factors that magnify the deleterious effect of capitalism on pandemic deaths and some that attenuate them. Among the former, income inequality proves to be a factor that greatly enhances the effect of capitalism; also, globalization, the deregulation of labor markets, and military spending are enablers of capitalism. In contrast, strong kinship ties in society dampen the harmful effect of capitalism. In sum, to our knowledge this paper provides the first rigorous statistical evidence to substantiate the concept of social murder that Engels coined 175 years ago.

JEL classification: F01, I14, I18, I31, P10
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1 Introduction

In comparing the performance of capitalism and socialism along various dimensions, it is usually the case that capitalist countries are taken as the benchmark. Whether it is economic growth, human rights, health outcomes, or mass atrocities, the outcomes are narrowly defined, without exercising care on whether the definitions tilt the case in favor of capitalism. There could be intrinsic problems with capitalism that impinge seriously on outcomes but which are not attributed to capitalism per se. A case in point is what Engels (1844) dubbed "social murder." This paper uses cross-country data on COVID-19 deaths and attempts to operationalize, isolate, and quantify the social murder that capitalism may engender. The idea is that there may be systemic aspects of capitalism that are inimical to the adoption of measures that would be life-saving because they go against the interests of capitalists.[1] While there are recent attempts to identify whether the handling of the COVID-19 pandemic depends on the nature of the political regime in place, especially democracy [Karabulut et al. (2021), Cronert (2020), Frey et al. (2020)], there has been no attempt to identify the separate effect of capitalism. That is precisely what this paper attempts. To our knowledge, using data from the current pandemic, we provide the first piece of evidence that provides some rigorous statistical backing for the concept of social murder.

In the nineteenth century, Engels penned a classic work entitled *The Conditions of the English Working Class in 1844*. In this book he described the plight of the poor in Victorian English cities. A large proportion of the poor were from the rural areas of England, who came to the cities looking for work after they were dispossessed following the enclosure of the commons. Even artisans who did not primarily live off the land came to the cities after capitalist agriculture, rapid technological change, and mass production in the textile industry led to the loss of their traditional livelihood. The working poor huddled in overcrowded, poorly ventilated, and unhygienic hovels. These unhealthy accommoda-

[1] It is being recognized, especially by scholars in the field of health, that COVID-19 deaths can be classified as social murder. See, for example, the editorial in BMJ by Abbasi (2021) identifying political systems as perpetrators of this. More generally, Chernomas and Hudson (2009) write about the social murder that can be attributed to conservative economic policies. Navarro (1992) suggests, on the basis of continent by continent comparison, that socialism has performed better in terms of health outcomes than capitalism. More recently, Navarro et al. (2006) shows that health outcomes in OECD countries depend on political ideologies.

tions took a toll on their health and, ultimately, their lives. These deaths Engels referred to as 'social murder' – the death toll arising, directly or indirectly, in societies adhering to the capitalist ideology.

Currently, social murder arises from different causes. The inequality that seems to prevail in capitalist societies makes access to healthcare grossly unequal. If healthcare access is not universal and depends on the ability to pay, it in turn depends on access to education and well-paying jobs. The health effects of inequality that may point to capitalism in a systemic way seem to have manifested in most dramatic form in the deaths due to COVID-19. Not only were these deaths much larger in rich capitalist societies, they were also disproportionately concentrated among the poorer ethnic groups – Blacks and Hispanics in the U.S. and the BAMES (Blacks, Asians, and Minority Ethnicities) in the U.K., for example. We focus on the pandemic deaths in order to get a quantitative handle on the notion of social murder in capitalist societies.

Of course, deaths due to the COVID-19 pandemic have numerous causes, of which capitalism may be only one. For example, capitalist countries are frequently, but not always, democratic; democracy may have an effect on COVID-19 casualties that is independent of capitalism. The latter is defined as the economic system where (i) the profit motive drives economic behavior and (ii) the ideological premise is that market system outcomes (based on private property) are acceptable because it has certain well-known welfare properties under some ideal conditions. The freedom to pursue economic goals without undue interference from the government is a defining characteristic of capitalist systems. Democracy, on the other hand, is the political system characterized by individual freedom, civil liberties, egalitarian rights, and competition between political parties. While the liberal democracies of the West are also capitalist, a country like China is undemocratic yet offers a reasonable amount of economic freedom to harness the incentives offered by capitalism. It is essential to account for the independent effects on COVID-19 casualties of capitalism and of democracy (and of other determinants) in order to isolate the social murder that can be attributed to capitalism.

There is increasing evidence that the interests of capitalism and those of democracy can diverge, with dire consequences.[2] This may be seen especially in the COVID-19

[2] See, for example, Hacker and Pierson (2010) and Case and Deaton (2020).

pandemic. The democratic goal is ostensibly the maximization of some measure of the aggregate wellbeing of the entire population since all are deemed to have equal rights. A competitive market system may bring about Pareto optimal outcomes in an abstract world, but with a blatant externality like COVID-19, this is far from likely. The capitalist goal, more narrowly, is the maximization of returns on capital. In the early twentieth century, capitalists at the national level in democracies acquired influence on government policies with regard to tariffs, trade, and foreign direct investment. As Piketty and Zucman (2014) have shown, the share of GDP going to capital has steadily risen in the advanced economies since 1970.

Even more disturbingly, with the rise of globalization, the production process has been parceled out across many nations and capitalists are no longer national but transnational [Robinson and Harris (2002), Sklair (2002)]. Furthermore, this transnational capital has pushed a neoliberal ideology through institutions like the World Economic Forum, World Trade Organization, International Monetary Fund, and numerous multinational firms. The result has been that the rules of the world economic order have essentially been dictated by the elites aligned with capitalism of the developed countries, whose interests are those of transnational capital. This has eroded the scope of national governments to implement policies in the welfare of their own citizens [Merkel (2014)]. In this milieu, we would expect that capitalism would have veered liberal democracies in this pandemic towards policies that minimize the effect on capital even if they prove disastrous to other classes, both domestically and internationally. Indeed, the more fractionalized a nation's elites are (in terms of ethnicity, religion, political ideology, etc.), the less clout they would likely have to counter the force of transnational capital in the national interest, and the more nationally irresponsible the pandemic response could be.

A graphic illustration of how capitalism can impinge adversely on the health of the population at large is provided by the opioid crisis in the United States. In a very recent book called *Deaths of Despair and the Future of Capitalism*, Case and Deaton (2020) discuss an earlier pandemic – that started in the 1990s, where middle-aged, non-Hispanic whites in the U.S. are dying by suicide, alcohol and drugs. One drug in particular, which they refer to as 'legalized heroin', was a prescription painkiller produced by a large pharmaceutical company (Johnson & Johnson). This pharmaceutical company, among several

others, greatly exaggerated the benefits of the drug in advertisement campaigns to doctors, leading to addiction and overdose deaths among prescription users. More generally, the detrimental influence of capitalist lobbies on public policy in the past three decades in the U.S. has been clearly spelled out by Hacker and Pierson (2010).

We begin the paper by offering a simple and suggestive theoretical framework to show how capitalism may possibly skew the implemented policies, potentially resulting in excess pandemic deaths. Since the relevance of such a potential outcome is ultimately a matter of evidence, we quickly turn to an empirical analysis of the cross-country data on COVID-19 deaths, starting from January 2020 through March 2021, drawn from CSSE at John Hopkins University. To capture the influence of capitalism, we use an index that measures the freedom to invest from the Heritage Foundation. The freedom to invest when and where one wants, to move capital in and out of industries, countries, and regions, in the pursuit of the highest returns is the hallmark of capitalism. The ease of mobility of capital in the present day may well confer on large multinationals the power to compel governments to align their policies during the pandemic to the interests of capitalists. We show that our results are robust to using alternative measures of capitalism.

For democracy, we use an aggregate index from The Economist Intelligence Unit that summarizes the various political aspects that characterize democracy, namely, civil liberties, political competition, equal rights, etc.

Finally, in our estimation of the effects of capitalism, as distinct from that of democracy, we control for a slew of other possible determinants – economic, government, health, geographic, demographic, and continent fixed effects.

With the above controls in place, we find a very robust and significant positive correlation between our preferred measure of capitalism and deaths in the COVID-19 pandemic. Our estimates suggest that, when the capitalism index (which ranges from 0 to 100) goes from 10 to 85, the associated number of COVID-19 deaths rise by 490 per million people. For the U.S., this amounts to a total of around 163,000 additional deaths.

We do not claim to establish causality from capitalism to additional deaths because, despite our extensive inclusion of controls, there may yet be unobserved variables that impinge on the outcome. However, the strong robustness of our point estimates across various specifications suggests that this is unlikely. In particular, the Altonji ratio [Altonji

et al. (2005)] suggests that the impact of the unobserved variables would have to be about 11 times that of all our controls in order to nullify the impact of capitalism, a scenario we believe is highly unlikely given our extensive controls. Moreover, the results pass several additional robustness checks.

When tracked over the entire period (January 2020 - March 2021) on a monthly basis, from virtually zero in the first two months, the regression coefficient of capitalism is seen to rise over the remaining 12-month period, thereby establishing that the effect of capitalism does not fade during the course of the pandemic.

Next, we examine the possible mechanisms that may explain these findings. An obvious route is through the stringency measures that governments implemented in the face of the pandemic. For this purpose, we group the various stringency measures by whether they are likely to affect business profitability (dubbed 'capitalist stringency policies'), whether they are other policies like investing in vaccine R&D or income support (dubbed 'investment stringency policies'), and whether they prohibit public gatherings, etc. (dubbed 'other stringency policies'). For each sub-aggregate, we construct a stringency measure and investigate how capitalism impinges on their adoption. We find that capitalism is significantly negatively correlated with capitalist stringency policies, in line with the expectation that capitalism may stifle the imposition of life-saving policies that would undermine profits.[3]

Ideally, we would like to directly add the stringency measure to our main specification, to see how much the effect of capitalism changes. However, deaths and stringency measures are jointly determined and thus highly endogenous. To make progress, we follow the approach in Becker and Woessmann (2009). Instead of estimating the effect of stringency on deaths, we assume various values for this impact parameter, subtract out the impact of capitalist stringency policies on the deaths per million, and then regress this residual on capitalism, along with controls. We find that the assumed impact of capitalist stringency policies on COVID-19 deaths has to be implausibly high to entirely rob capitalism of its impact on deaths. This suggests that capitalism likely has an independent effect

[3]When we regress the capitalist stringency measure on our index of capitalism on a monthly basis (using all the controls mentioned), we find that the effect of capitalism on stringency turns negative after 3 months and remains steadily negative. This confirms the suspicion that capitalism impedes the imposition of policies that are salutary for health but are harmful for business profits.

on COVID-19 deaths, even above what it may have in undermining the implementation of capitalist stringency policies.

We next consider the effects on deaths per million for variables that are interacted with the capitalism index, an exercise that helps us grasp which factors magnify the effect of capitalism and which tend to temper them. Among the factors that temper the effect of capitalism on deaths are democracy, strong kinship ties, and the size of the agricultural sector. We surmise that democracy does so by forcing a greater degree of concern for classes other than the capitalist class. Strong kinship ties have been shown by Schultz et al. (2019) to engender greater respect for authority and conformity. We believe this would have induced greater adherence with the stringency measures imposed (closures, etc.) in the interest of health safety. Larger agricultural employment dilutes the effect of capitalism presumably because social distancing is naturally maintained in agricultural activity.

Among the factors that magnify the effect of capitalism on deaths through interactive effects are political globalization, military spending, the size of the manufacturing sector, labor market freedom, the openness of the economy, and tourism. We think political globalization, by integrating countries and thus promoting transnational capitalism, empowers domestic capitalists in influencing policies. Military spending magnifies the role of capitalism because, we surmise, it intensifies the effect of capitalism by raising the returns to private firms' R&D and the economy's productivity, as has been recently shown in the literature [Moretti et al. (2019)]. Furthermore, the military is particularly effective in lobbying on behalf of the arms producers, and raises their profits and clout.

The size of the manufacturing sector increases transmission of the virus due to proximity of the workers. Interestingly, the interaction of the freedom of labor index with capitalism increases COVID-19 fatalities per million. We argue that the decrease in labor's rights, unionization, etc. (which increases the freedom of labor index) enhances the bargaining power of capital relative to labor. This increases capitalist reluctance to impose restrictions that hurt profits. (This is consistent with another counter-intuitive finding of ours: an increase in the labor force participation reduces COVID-19 fatalities per million. This, we suggest, is because the bargaining power of labor increases with greater participation.) Openness of the economy and tourism would contribute to deaths by facilitating

the spread of the virus. In all, our empirical results provide compelling evidence in favor of the social murder perpetrated by capitalism, with some factors that mitigate its effect and others that enhance it.

Finally, since inequality within countries seems to be visibly related to COVID-19 deaths, we paid special attention to examining how the effect of inequality plays out within capitalism. For countries at a high level of income, we find a strong positive correlation between fatalities and the interaction between capitalism and inequality. All else constant, using our regression estimate, the predicted value of this effect alone for the U.S. is 4,220 additional deaths per million over the 14-month period. This goes a long way towards explaining the difference between U.S. fatalities in this pandemic compared to those in other countries in the OECD, bringing home the consequences of the rising inequality in the U.S. over the past few decades.[4]

The remainder of the paper is organized as follows. Section 2 lays out a simple conceptual framework. Section 3 introduces the data. Section 4 illustrates our empirical strategy. Sections 5 and 6 present the main results and possible mechanisms, respectively. In Section 7 we summarize our results. Finally, in Section 8, we offer our view on what our results imply in terms of the literature and the broader picture on one dark side of capitalism that has heretofore received little attention.

2 Conceptual Framework

The basic theoretical conjecture from which this paper stems is that the capitalist class faces a trade-off that is different from those of other classes like labor during the COVID-19 pandemic. For labor, with exceptions, earning a living is associated with greater exposure to the virus. And if they fall sick, access to healthcare may be problematic where healthcare is not universal. It is well-established that access to healthcare, even in rich liberal democracies, depends on socioeconomic status [Banks et al. (2006), Mackenbach et al. (2002)]. Capitalists and people with high levels of human capital are much less exposed to the health hazards of COVID-19 and also have better access to healthcare.

Capitalists, therefore, may not support – or may actively resist – stringency measures

[4] As of March 2021, the US had a mortality rate of 1,700 per million. The OECD countries had an average mortality rate of around 100 per million.

that impinge adversely on business profits even if the measures have positive health benefits for the general population. (The opposition would be even stronger with transnational capitalism.) If there is any validity to this conjecture, we would expect that deaths due to the pandemic would be higher with capitalism and the excess could be rightly labeled as social murder.

To motivate the empirical work that follows, we sketch a very parsimonious model here to enable us to carry a framework in our minds. We use a static, one good model that uses capital (k) and labor (l) to produce output (Y) according to the Cobb-Douglas production function,

$$Y = Ak^{\alpha}l^{(1-\alpha)},$$

where A denotes the total factor productivity and $0 < \alpha < 1$. We take the output as the numeraire in what follows. We assume that the economy allows no immigration and the total labor supply l is fixed at 1 and that the total endowment of capital is K. We also assume that domestic capitalists do not have the option of investing their money in international markets and vice versa.[5] We assume capitalists and workers are distinct groups and that the size of the capitalist class is a fraction μ of the size of the working class. The rate of return on capital in this economy will be given by the marginal product of capital:

$$r = \alpha AK^{-(1-\alpha)},$$

and the wage rate will be given by the marginal product of labor:

$$w = (1-\alpha)AK^{\alpha}.$$

The government imposes a policy to reduce the impact of COVID-19 on the health of the population. There are many policies that governments can implement. But for simplicity, we consider one simple policy: restrictions on businesses in order to reduce interactions between people. Stringency of this type we shall refer to as 'capitalist stringency' because the immediate impact is on businesses, although the workers will also naturally be

[5]The suggestive results from this restriction will only be strengthened if we allow investment in international markets because that would give capitalists the option to withdraw their capital from the local economy and increase their political influence.

affected. We model capitalist stringency with the variable denoted by s (with $0 \leq s \leq 1$), where the lower bound on s denotes no restrictions whatsoever and the upper bound represents complete business shut down. We view the effect of stringency as reducing the total factor productivity from A to $(1-s)A$. With this policy in place, the aggregate income, Y_W, of the workers can be written

$$Y_W = (1-\alpha)(1-s)AK^{\alpha}, \tag{1}$$

and that, Y_C, of capitalists by

$$Y_C = \alpha(1-s)AK^{\alpha}. \tag{2}$$

The benefit of imposing stringency measures is that it reduces the damage inflicted by COVID-19 on the health of the citizens. We presume that, under normal circumstances, all individuals in the economy have an index of health that is valued, in monetary terms, at β.[6] The probability that a person falls sick is posited to be $\gamma(1-s)^2$, where $0 < \gamma < 1$, and so the probability that she does not fall sick is $1-\gamma(1-s)^2$. If D is the damage to health (assumed to be finite) inflicted in the event of sickness, the expected health index, H, of a person would be given by

$$H = \beta - \gamma(1-s)^2 D. \tag{3}$$

Negligence in imposing stringency restrictions, captured by $(1-s)$, has increasing and convex health costs, as posited in (3). Some people who fall sick will end up dying. It is reasonable to presume that the probability of a person dying is a sharply decreasing function of H.

We further posit that the damage in health, denoted by D_W, to a worker who falls sick is greater that the damage in health, denoted by D_C, to a capitalist who falls sick.[7] The reason is that wealth brings access to healthcare and insurance that the poor tend not to

[6] We eschew here the traditional practice of valuing a person's health in terms of the present value of the income she generates. To follow that practice would, by definition, rig the outcome here in favor of capitalism in what follows because they tend to be richer and their lives deemed more valuable. We adopt the more normative view that social murder should not distinguish between the identities of those who die.

[7] The same caveat mentioned in the above footnote applies here, too.

possess [Banks et al. (2006), Mackenbach et al. (2002)]. We assume the utility of a person is additive in income and health. So U_C and U_W, the respective aggregate utilities of capitalists and workers, are given by

$$U_C = \alpha(1-s)AK^{\alpha} + \mu(\beta - \gamma(1-s)^2 D_C), \tag{4}$$

$$U_W = (1-\alpha)(1-s)AK^{\alpha} + \beta - \gamma(1-s)^2 D_W, \tag{5}$$

where, recall, that the size of the worker class is 1 and that of the capitalist class is μ. The objective functions of the capitalist and labor classes are strictly concave in s. To ensure that they are increasing at $s = 0$, we assume that $2\gamma D_W > (1-\alpha)AK^{\alpha}$ and that $2\mu\gamma D_C > \alpha AK^{\alpha}$. We shall also assume that the objective functions are hump-shaped in s for both classes, that is, some degree of restriction is preferred to either no restriction at all or complete shut-down.

We model the social planner as putting equal weight on the welfare of every individual in society. This represents a Utopian society with an ideal democracy.[8] We then model the planner's solution as one that maximizes the Benthamite welfare function, W, by choice of s:

$$W = U_W + U_C. \tag{6}$$

The planner's solution, s^*, is readily seen to be given by

$$s^* = 1 - \frac{AK^{\alpha}}{2\gamma(D_W + \mu D_C)}, \tag{7}$$

where we assume the right hand side to be greater than zero.

Note that the income of the country in the absence of any restrictions is given by AK^{α}. According to (7), higher income countries are less stringent and, therefore, will suffer more health damage. This is a testable hypothesis, though this prediction cannot

[8]The conflict between the goals of the social planner and the capitalists is essentially modeled here as the choice between rights in *persons* as opposed to rights in *property*, to invoke the dichotomy used by Bowles and Gintis (1982).

be taken too literally because we do not model the possibility that rich countries can also use their wealth and organization to minimize the pandemic's damage on their citizens. Furthermore, the greater the expected damage (D_W and D_C) inflicted by the pandemic, the more stringent the measure is. Finally, (7) says the social planner puts more weight on the damage inflicted on workers than on that of capitalists because of two reasons. First, the capitalists fall sick with lower probability and so, all else constant, their expected health damage has a lower expected value. Second, if the proportion of people comprising capitalists is smaller than that of workers ($\mu < 1$) the planner would weight their damage less.

To see what the democratic outcome may be when the trade-offs are class dependent, we consider a two party system with one representing the interests of the capitalists and the other the interests of workers. (These may roughly correspond to the Republicans and Democrats in the U.S. or the Tory and Labor Parties in the U.K.) We identify the stringency policy that would be obtained as the outcome of Nash bargaining between members of these two parties.[9] Let the relative bargaining powers of the capitalist and the worker parties be θ and $1-\theta$, respectively, where $0 \leq \theta \leq 1$. The increasing clout of the corporations and the declining clout of labor in the past few decades in the U.S., for example, would show up as an increase value of the parameter θ.[10] We take the default option (when no bargain is struck due to noncooperation) by the utilities that are obtained when no action is decided upon, that is, $s = 0$. We denote these default utilities of the capitalists and workers by U_C^0 and U_W^0, respectively. The generalized Nash bargaining solution, $\hat{s}(\theta)$, is then the value of s which maximizes the Nash product

$$(U_C - U_C^0)^{\theta}(U_W - U_W^0)^{1-\theta}, \tag{8}$$

where the optimization in (8) is subject to the participation constraints $U_C \geq U_C^0$ and $U_W \geq U_W^0$. In keeping with the intuitive orientation of this simple model, we assume that these

[9] We may ask why the income shares are taken to be those from a standard neoclassical model (which assumes competitive market outcomes and income shares are determined by marginal productivities) and not by bargaining. This is the right approach, given that the economy comprises thousands of individual businesses. Stringency policy, by contrast, is a political decision informed by the collective economic interests of special interest groups.

[10] The systematic way in which this was accomplished is spelled out in Hacker and Pierson (2010). See also Rhinehart et al. (2020).

participation constraints are satisfied at the maximized value of (8).

If the capitalist party had all the bargaining power (that is, $\theta = 1$), it is easy to verify that they would implement the policy, $\hat{s}(1)$, given by

$$\hat{s}(1) = 1 - \frac{\alpha A K^{\alpha}}{2\mu\gamma D_C}. \tag{9}$$

At the other extreme, if the worker party had all the bargaining power (that is, $\theta = 0$), they would implement the policy, $\hat{s}(0)$, given by

$$\hat{s}(0) = 1 - \frac{(1-\alpha) A K^{\alpha}}{2\gamma D_W}. \tag{10}$$

In general, for arbitrary θ the policy outcome of Nash bargaining would lie between the bounds $\hat{s}(1)$ and $\hat{s}(0)$, both assumed to be positive.

We may loosely identify $\theta = 1$ as an economy displaying an extreme form of crony capitalism where the politicians and capitalists are completely aligned. We can also identify $\theta = 0$ as the scenario in a strictly socialist or communist society. On comparing (9) and (10), we see that that $\hat{s}(1) < \hat{s}(0)$ if and only if

$$\frac{D_W}{D_C} > \frac{1-\alpha}{\frac{\alpha}{\mu}}. \tag{11}$$

If the ratio of the per capita anticipated COVID-19 health cost of workers to that of capitalists exceeds the ratio of their respective per capita incomes in GDP to that of capital's, a crony capitalist economy would impose less stringent restrictions than a socialist economy. This would happen because the capitalists have more to lose than labor in terms of aggregate income and also because the expected health costs of the pandemic are lower for them.

Since our focus in this paper is the health consequence under capitalism during COVID-19, it is instructive to compare the capitalist solution $\hat{s}(1)$ in (9) with the solution s^* of the social planner in (7). Comparing these expressions, it is readily seen that $\hat{s}(1) < s^*$ and $s^* < \hat{s}(0)$ if and only if (11) holds. Thus, if (11) is satisfied, we have

$$\hat{s}(1) < s^* < \hat{s}(0). \tag{12}$$

This raises the question of whether we can expect (11) to hold. Within countries, there are more deaths in high density areas and among those prone to poverty because they have less ability to social distance and are more likely to be essential workers [Jung et al. (2021), Blau et al. (2020)]. Since $D_W > D_C$, assumed for reasons given earlier, the ratio on the left hand side would be greater than 1. Regarding the right hand side, the figures for the share of capital in GDP in Piketty and Zucman (2014, Fig. XII) are currently roughly around 1/3. In the U.S., for example, only about 5 percent of the population receive higher incomes from capital (e.g., dividends, rental income, income from self-employment) than from wages, salaries, or social security income. If we identify these as constituting the capitalists and the rest as workers, we may estimate that $\mu \approx 0.05$. Thus the right hand side of (11) would likely be much less than 1. In other words, *a priori* we would expect the inequality in (11) to be satisfied.[11]

If (11) holds, the excess deaths that occurred in capitalist countries may be deemed to be social murder. Whether this is true and whether this putative claim against capitalism is generally consistent with the fatality data of COVID-19 across countries is, of course, an empirical matter. With this brief theoretical prelude, we now turn to the data.

3 Data

We combine several datasets from various sources to obtain our final dataset, which is comprised of 144 countries. We restrict ourselves to countries with populations above one million. Table 1 reports the summary statistics for all our main variables.

Fatality Data Fatality data is provided by the CSSE at John Hopkins University.[12] The CSSE combines various data sources, such as information provided by national government agencies, international health organizations, and newspaper reports, to obtain daily estimates on the number of COVID-19 deaths per country, starting on January 22, 2020. This dataset is widely used and we believe this to be the best and most reliable data avail-

[11] Roughly 30 percent of the population receive *some* income from capital. Note that this last figure is likely an upper bound for μ (nevertheless (11) would still hold). All calculations are based on data from the March 2016 Current Population Survey in the US.

[12] The data itself is downloaded from the Our World in Data (owid) website maintained by the University of Oxford.

able. We normalize the number of deaths by country population (in millions). On average there are 511 reported deaths per million people with a maximum of 2,450 deaths (Czech Republic) in our sample. The U.S. has the 10th highest death rate with about 1,700 deaths per million. The world map in Figure B.1 in Appendix B shows that there exists significant spatial variation in fatalities.

Capitalism and Democracy Indices Data on capitalism is taken from the Heritage Foundation, which provides yearly, country-level estimates on the state of economic freedom. To do so, they combine information from various sources (e.g., the World Bank, national government agencies). Their overall index is based on several subindices, meant to capture different aspects of economic freedom. In particular, they define four subcategories: rule of law, government size, regulatory efficiency, and market openness. 'Rule of law' concerns, for example, property rights. 'Government size' takes into account government spending and fiscal health. 'Regulatory efficiency' includes, for example, an independent central bank (monetary freedom) as well as non-rigid labor market regulations. Finally, 'market openness' consists of the freedom to invest, financial freedom, and trade freedom.

We believe that market openness and the freedom to invest in particular best capture the essence of capitalism and we will use that subindex in our baseline regressions (financial freedom is narrowed to a very special subsector, i.e., the financial industry; trade freedom is mostly concerned with international transactions). Moreover, a look into the source and data code book confirms that the freedom to invest index is by far the most comprehensive.

Henceforth, we will refer to the freedom to invest index as our capitalism index. However, unsurprisingly, several of the subindices are highly correlated and we will provide evidence that they all give qualitatively similar results. We describe these alternative indices in more detail in Appendix A.

Our capitalism index ranges from 0 to 100, with an average score of around 60 and a standard deviation of 20 in 2018. The lowest score in our sample is five (held by Bolivia and Sudan) and the highest score in our sample is 90 (held by the U.K., Ireland, and other

Table 1: Summary Statistics

	Mean	Std.Dev.	Min	Max	Obs.
A. Endogenous Variables					
# Fatalities per million	511.95	623.95	0.35	2448.60	144
B. Variables of Interest					
Capitalism Index, 0-100	59.58	20.62	5.00	90.00	144
Democracy Index, 0-10	5.50	2.18	1.13	9.81	144
C. Stringency Variables					
Overall Stringency Index	0.00	9.46	−33.28	26.66	140
Capitalist Stringency	−0.00	3.72	−10.95	7.69	140
Investment Response	0.00	2.51	−3.58	15.99	140
Other Responses	0.00	5.13	−18.74	11.91	140
D. Demography Controls					
Population Density, per square kilometer	203.13	720.82	2.13	8305.19	144
Population, in million	52.35	170.59	1.17	1439.32	144
Fraction of Rural Population, in %	39.80	22.06	0.00	86.75	144
Ethnic Fractionalization Index, 0-1	0.46	0.26	0.00	0.93	142
Fraction of European Descent, in %	34.17	42.65	0.00	100.00	144
Median Age of Population	30.73	9.53	15.10	48.20	144
Fraction of Population above 65 years	9.17	6.67	1.09	27.58	143
E. Economy Controls					
GDP per capita, '000, PPP	20.84	20.37	0.76	97.74	141
GINI Coeffcient	37.83	7.90	24.60	63.00	140
Unemployment Rate, in %	6.85	5.30	0.11	26.91	142
Fraction of Labor Force in Agriculture, in %	24.95	21.94	0.06	86.25	142
Labor Participation Rate, in %	62.66	10.33	38.13	86.70	142
F. Health Controls					
Government Health Spending per capita	1201.75	1975.42	18.51	10623.85	140
Life Expectancy	72.19	8.00	52.81	84.21	142
Mortality Rate, per 1,000	7.93	2.85	1.20	15.40	142
G. Government Controls					
Government Spending, % of GDP	15.65	5.40	3.60	38.71	135
Women in Parliament, in %	23.17	11.88	0.00	61.25	140
Fractionalized Elites Index, 0-10	6.45	2.43	1.00	10.00	143
H. Geography Controls					
Terrain Ruggedness Index	1.29	1.18	0.02	6.20	144
Fraction with Desert, in %	3.71	11.52	0.00	77.28	144
Fraction with Tropical Climate, in %	34.78	43.02	0.00	100.00	144
Average distance to nearest ice-free coast, '000 km	0.36	0.42	0.00	2.21	144
Fraction of Country within 100 km of ice-free coast, in %	38.34	37.10	0.00	100.00	144
Fraction with Fertile Soil, in %	37.63	22.64	0.00	88.65	144
I. Additional Health Controls					
# Deaths from Cardiovascular Disease, per 100,000	256.85	118.82	79.37	597.03	144
Diabetes Prevalence (Fraction of adults), in %	7.26	3.80	0.99	22.02	143
Fraction of Female Smokers, in %	10.62	10.36	0.10	37.70	120
Fraction of Male Smokers, in %	32.71	13.26	7.70	76.10	118
BCG Immunization, in %	80.53	30.10	0.00	99.00	130

The unit of observation is a country. We restrict ourselves to countries with at least one million inhabitants. Data sources are provided in the text.

countries).[13] The U.S. comes second with a score of 85. Again, to give a visual overview,

[13]The other four countries with a 90 score are Estonia, Denmark, Austria, and the Netherlands.

Figure B.2 in Appendix B shows the geographical distribution of our index.

For democracy, we use an aggregate index from The Economist Intelligence Unit that summarizes the various political aspects that characterize democracy, namely, civil liberties, political competition, equal rights, etc. The index ranges from 0 to 10, with the highest score achieved by Norway (9.81) and the lowest score held by the Democratic Republic of the Congo (1.13). The average index value amounts to 5.50.

Stringency Indexes To measure stringency in government policy we use data from the Oxford COVID-19 Government Response Tracker (OxGRT).[14] Importantly, the data does not only provide an overall stringency index but also includes disaggregated data for individual government responses. We group these into three broad categories: 1) capitalist responses that allegedly disrupt the economy, which include closing schools, closing workplaces, as well as restricting public transport, internal movement and international travel; 2) investment responses that provide economic relief or investments in vaccines, which include income support, debt relief, and investments in vaccines and public health; 3) other responses that are confined to an individual's leisure time or do not greatly disrupt the economy, which include canceling public events and restricting public gatherings, implementing stay at home requirements, public information campaigns, special testing policies, extensive contact tracing, requiring facial coverings, and special directives to protect the elderly.

Generally, these responses are evaluated on an ordinal scale between 0 (no restrictions) and 3 (heavy restrictions) scale, with the exception of two investment measures. To calculate our three subindices we standardize the individual outcomes and sum them.

The stringency data is available daily. For consistency reasons, we pick the same starting date as for the fatality data (January 22, 2020).

Additional Controls To minimize omitted variable bias, we control for numerous additional variables. Most of the data is provided by TheGlobalEconomy.com, a data site that collects various socio-economic indicators such GDP per capita, population size, health spending, or ethnic fractionalization, to name a few.[15] A complete list of all our main

[14] Downloaded here: https://data.humdata.org/dataset/oxford-COVID-19-government-response-tracker.
[15] https://www.theglobaleconomy.com/.

variables, along with their summary statistics, is given in Table 1. In the interests of space, we only discuss a few important controls here and all the others in Appendix A.

GDP per capita from 2019 is taken from the World Bank and based on purchasing power parity (PPP) in constant 2011 international dollars. Average income per capita is around PPP $21,000. Data on government spending are also provided by the World Bank. We use total government spending as a percentage of GDP and, given that the COVID-19 crisis predominantly affects the health sector, we also include total health spending per capita. We complement this socio-economic data with geographical data from Nunn and Puga (2012). Those variables are shown in Panel H in Table 1 and again discussed in more detail in the Appendix A.

To understand the mechanisms below, we use a number of additional factors. Data on the fractionalization of elites in a country is provided by Fund for Peace. Their index ranges from 0 to 10 and measures the degree of fragmentation of state institutions along ethnic, class, racial or religious lines. The higher the value of this index, the more fragmented the state institutions in a country are. Next, the Swiss Economic Institute at ETH Zurich provides a political globalization index (0 to 100) which measures the degree to which a country is embedded in international treaties and organizations. Finally, based on five raw ingredients, Schultz et al. (2019) provide an index on the intensity of kinship relations. The index is explained in more detail in Section 6 below. All other variables used to understand mechanisms are more straightforward and thus discussed in Appendix A. The summary statistics of these additional variables are also presented in Appendix A (Table A.1).

4 Empirical Strategy

We use OLS regressions throughout and estimate the effect of our capitalism index on the number of fatalities per million in the following way

$$\frac{\#Fatalities_{ic}}{Population_{ic}} = \alpha + \beta\ Capitalism_{ic} + \lambda\ Democracy_{ic} + \mathbf{X}_{ic}\pi + \gamma_c + \varepsilon_{ic}, \tag{13}$$

where $\#Fatalities_{ic}$ is the number of COVID-19 deaths in country i in continent c for the time from January 22, 2020 to March 22, 2021. $Capitalism_{ic}$ is our main explanatory variable of interest: an index that measures the level of capitalism in country i. To minimize the possibly of reverse causality we use the capitalism index from 2018. $Democracy_{ic}$ is our most important control and measures the state of democracy in each country i. X_{ic} is a vector of additional country-specific controls, explained below and also lagged by one to two years (i.e., from 2018 or 2019). Finally, γ_c are continent fixed effects (to control for broad geographic and institutional differences), and ε_{ic} is the error term. We allow for heteroskedasticity and report robust error terms. However, one may worry that robust standard errors may not sufficiently address the spatial nature of the data. For instance, the assumption that the error terms from neighboring countries exhibit zero correlation would be unreasonable if, as is likely, a COVID-19 outbreak in one country affects its neighbors. For the sake of robustness, we thus also allow error terms to be spatially correlated within a 2,000 to 10,000 km radius in increments of 2,000 km [Conley (1999)].

Naturally, a country's level of capitalism is not randomly assigned but emerges endogenously. Thus, although we somewhat minimize the problem of reverse causality, it may still be the case that our estimate for β is plagued by omitted variable bias. To address this issue we will show that our results are highly robust to a battery of control variables, all of which likely to be correlated both with capitalism and fatality levels. In particular, we group these into five broad categories: 1) economic controls; 2) demographic controls; 3) health controls; 4) government controls; and 5) geography controls. We discuss the controls in more detail together with the results below. Moreover, to gauge how strong the unobservable variables relative to our large set of observables would have to be to potentially drive the estimate of β to zero, we also report the Altonji ratio.

Furthermore, we will provide several auxiliary results that are perfectly consistent with capitalism being a strong driver of COVID-19 deaths but inconsistent with other explanations. Nevertheless, we will not be claiming a strict causal effect but rather a very robust correlation.

5 Results

Main Results Our main results are shown in Table 2. Overall, the relationship between capitalism and COVID-19 fatalities is positive and strongly statistically significant across various different specifications. The point estimates range between 4.78 and 7.14, with values of 6.53 and 5.02 in our two preferred specifications (regressions 4 and 5). In terms of magnitude, the results suggest that a one-standard deviation increase in the Capitalism index (20.62) increases COVID-19 deaths by about 26 percent (measured at the mean of around 512 deaths) or 0.2 standard deviations. Alternatively, in going from a capitalism index of 10 (e.g., Cuba) to an index of 85 (e.g., the United States), the increase in the number of deaths using regression 4 would be 490 deaths per million. With the current population of the U.S., this would amount to a total of 162,680 additional deaths due to capitalism. This is a very substantial number.

Capitalism is a country's endogenous choice and potentially correlated with a vast array of factors. Most importantly, as noted in the introduction, capitalist countries are often, although not exclusively, democratic. Since recent work suggests that democracies handle the COVID-19 crisis differently than, say, autocracies [Karabulut et al. (2021), Cronert (2020), Frey et al. (2020)], we thus always control for the degree of democracy with its index in all our regressions. Although insignificant, taken at face value the point estimates suggest that democratic countries experience lower death rates. Next, to account for broad geographic, institutional, and ethnic factors we add six continent effects.

COVID-19 is said to predominantly affect the elderly. We thus add controls for a country's demographic composition such as the median age and the fraction of the population above 65 years. We also control for population, population density, the fraction of people living in rural areas, and ethnic fractionalization, since all of these likely affect the possibility of social distancing.

Naturally, richer countries are more likely to be capitalistic and potentially in better positions to handle the crisis, thus GDP per capita is an important confounder which we control for. Besides, despite these advantages, the simple theory of Section 2 predicts that GDP should be associated with higher levels of deaths per million. The point estimates in Table 2 are generally positive, however, insignificant throughout.

Table 2: Main Effects

Dependent Variable:	# COVID-19 Fatalities per million						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Capitalism Index	7.138	4.782	5.700	6.530	5.026	6.276	6.565
	(2.597)***	(1.819)***	(2.277)**	(2.542)**	(2.469)**	(2.933)**	(3.088)**
Democracy Index	90.709	−6.396	−24.513	−18.172	−2.528	−26.096	−23.918
	(24.401)***	(22.423)	(24.355)	(25.521)	(31.536)	(39.515)	(49.603)
GDP per capita, '000			0.200	1.818	3.178	2.041	0.410
			(3.782)	(4.509)	(5.742)	(7.345)	(7.134)
Continent Effects	no	yes	yes	yes	yes	yes	yes
Demographic Controls	no	no	yes	yes	yes	yes	yes
Economy Controls	no	no	yes	yes	yes	yes	yes
Health Controls	no	no	no	yes	yes	yes	yes
Government Controls	no	no	no	yes	yes	yes	yes
Geography Controls	no	no	no	no	yes	yes	yes
Additional Health Controls	no	no	no	no	no	yes	yes
Colonizer Effects	no	no	no	no	no	no	yes
Altonji-Ratio		2.03	3.96	10.75	2.38	7.29	11.47
R^2	0.25	0.61	0.66	0.67	0.70	0.75	0.77
N	144	144	135	129	129	100	100

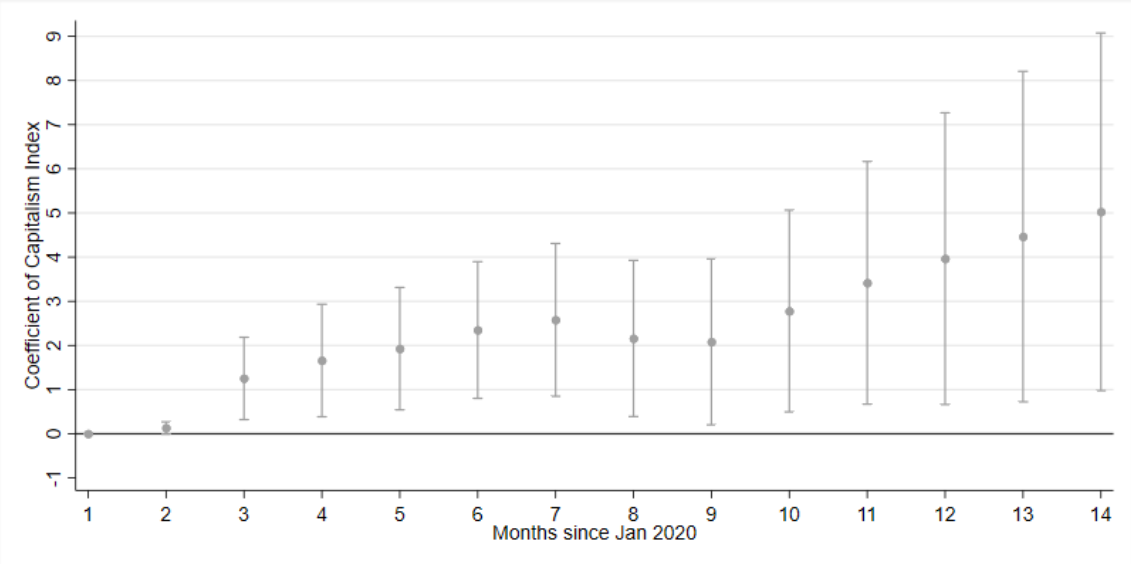
Notes: All control variables are defined in Table 1. The Altonji-ratio measures how strong the unobservables have to be relative to the observables included in each regression to drive the point estimate on Capitalism down to zero. Standard errors are robust. *significant at 10 percent, **significant at 5 percent, ***significant at 1 percent.

An important factor in connection with the COVID-19 crisis is inequality. We thus also control for the income Gini coefficient. We further control for the unemployment rate (high rates might make the situation more pressing), the labor force participation rate, and the fraction of the work force employed in agriculture. Besides GDP, we also explicitly take into account government spending and in particular spending on public health as well as life expectancy and general mortality rates.

Finally, we control for a number of geographical factors such as terrain ruggedness (which might also affect social distancing) or tropical climates as well as additional health factors such as cardiovascular disease, diabetes prevalence, and the fraction of smokers in the female and male population. All of these likely affect the number of fatalities since individuals with pre-existing health conditions are more likely to fall seriously ill.

The positive effect of our Capitalism index on COVID-19 fatalities per million of the population is extremely robust across all specifications. Nevertheless, it might still be the case that we are missing out on controls that could render the effect insignificant. We thus do not claim a casual effect. However, to give some guidance as to how strong those unobservables would have to be in order to drive our estimate of the effect of capitalism on fatalities down to zero, we also provide a measure introduced by Altonji et al. (2005),

Figure 1: Fatalities over Time



Notes: In this figure we replace the dependent variable in our preferred regression ((5) in Table 2) with the number of fatalities for different time periods – we vary the number of months since the start of the pandemic – and report the point estimates on Capitalism (together with confidence intervals). Each circle represents a separate regression. For example, the second circle represents the point estimate when regressing the number of fatalities in the first two months on Capitalism.

shown at the bottom of Table 2. For example, the unobservables would need to have 10.75 times as much explanatory power as all the controls in regression 4 combined (i.e., continent fixed effects, demography controls, economy controls, health controls, and government controls combined) to drive the point estimate on Capitalism down to zero. We believe this to be highly unlikely, given the various powerful controls already included.

Effects Over Time Finally, to assess the stability of the impact of capitalism on deaths, Figure 1 plots the estimated coefficient of the capitalism index on cumulative fatalities per million over time. Note that except for the first two months, we observe significantly positive effect of capitalism on deaths throughout. Furthermore, the effect seems to increase over time. The rising coefficient suggests that capitalism's effect does not get neutralized as the pandemic proceeds but that it persistently explains the accumulating COVID-19 deaths over the period. This is not only important in itself but also provides a first robustness check, i.e., the positive effect on fatalities after 14 months (which we report in or baseline regressions above) is not simply an artefact of the choice of the period but is part of a trend.[16]

[16]Note that the positive trend towards the end is statistically significant, i.e., the point estimates for months 9 and later are always statistically different from their predecessors.

Alternative Indexes As noted in the data section, the Heritage Foundation economic freedom index is based on various subindices. Besides those, there exist other organizations such as the World Economic Forum that provide their own indices. Above and below, we focus on the particular subindex that measures the freedom to invest, something we believe to capture the essence of capitalism. However, to show that we do not simply get the effect with that particular choice, in Table 3 we re-run our preferred specification from Table 2 replacing the Capitalism Index with other available ones. The results for most of the alternative definitions confirm the strong positive relationship between capitalism and COVID-19 fatalities. The two clear exceptions are labor freedom and fiscal freedom. The point estimates on these two are insignificant and small (in one case even negative). However, this result is readily explained by looking at Table B.1 in Appendix B which shows the pair-wise correlations of all indices: labor market freedom and fiscal health are clear outliers. This is unsurprising, since fiscal health, defined as the size of the government deficit, and labor market freedom, defined as the level of unionizations, worker rights, etc., capture very different aspects of capitalism. However, we will show below that labor market freedom does affect fatalities via its interaction with capitalism. Note that for the index on competitiveness we also lose statistical significance (perhaps due to the drop in the number of observations for that regression), however the point estimate is still positive and large. Finally, the index of property rights is just shy of 90 percent significance.

The results on democracy and income also mirror the ones in Table 2 – taken at face value, fatality rates are lower in democratic countries but higher in richer countries. However, the point estimates are generally insignificant.

Robustness Checks Next, we provide a number of additional robustness checks. To rule out that the results are driven by outliers we drop one continent at a time and re-run our baseline specification. Figure B.3 in Appendix B confirms that the resulting point estimates are all close to the original one. The scatter plot in Figure B.4 further confirms that the positive relationship is not influenced by individual outliers.

One may also worry that the results are driven by high-death countries. To check for this, we drop the top one and five percent of the distribution of fatalities. Regressions 1 and

Table 3: Alternative Measures of Capitalism

A. Dependent Variable:	# Fatalities per million				
Name of Capitalism Index:	Economic Globalization Index	Overall Globalization Index	Competitiveness Index	Financial Freedom Index	Monetary Freedom Index
	(1)	(2)	(3)	(4)	(5)
Alternative Capitalism Index	8.792	17.410	9.424	10.601	14.253
	(4.277)**	(7.318)**	(11.741)	(3.558)***	(5.223)***
Democracy Index	−4.841	−18.640	−23.748	−35.579	−10.777
	(25.567)	(24.926)	(30.232)	(24.669)	(24.786)
GDP per capita, '000	1.673	0.801	0.213	1.199	1.504
	(4.325)	(4.280)	(4.363)	(3.994)	(4.181)
Continent Effects	yes	yes	yes	yes	yes
Demographic Controls	yes	yes	yes	yes	yes
Economy Controls	yes	yes	yes	yes	yes
Health Controls	yes	yes	yes	yes	yes
Government Controls	yes	yes	yes	yes	yes
R^2	0.67	0.67	0.66	0.70	0.68
N	132	132	121	131	132
B. Dependent Variable:	# Fatalities per million				
Name of Capitalism Index:	Freedom To Invest Index	Property Rights Index	Trade Freedom Index	Labor Market Freedom Index	Fiscal Health Index
	(1)	(2)	(3)	(4)	(5)
Alternative Capitalism Index	6.530	6.366	9.517	2.429	−1.278
	(2.542)**	(4.254)	(5.258)*	(3.285)	(1.101)
Democracy Index	−18.172	−13.140	−9.681	4.473	7.680
	(25.521)	(26.929)	(26.607)	(25.445)	(25.199)
GDP per capita, '000	1.818	1.432	2.761	2.807	3.955
	(4.509)	(4.654)	(4.606)	(4.666)	(4.643)
Continent Effects	yes	yes	yes	yes	yes
Demographic Controls	yes	yes	yes	yes	yes
Economy Controls	yes	yes	yes	yes	yes
Health Controls	yes	yes	yes	yes	yes
Government Controls	yes	yes	yes	yes	yes
R^2	0.67	0.66	0.67	0.66	0.66
N	129	132	131	132	132

Notes: The name of the alternative capitalism index we use in each regressions is given in the column header. All controls variables are defined in Table 1. We add (but do not report) the Democracy Index in all regressions. Standard errors are robust. *significant at 10 percent, **significant at 5 percent, ***significant at 1 percent.

2 in Table B.2, also in Appendix B, suggest that the results are robust. The results are also robust to the addition of several more controls to our baseline specification (regression 3).

In regressions 4 to 8 of the same table, we show that the results are further robust to adjusting standard errors for spatial correlation within 2,000 to 10,000 kilometers (in increments of 2,000 kilometers). Importantly, the spatial standard errors of the coeffi-

Table 4: Mechanism: Government Stringency

Dependent variable:	Overall Stringency Index		Capitalist Response		Investment Response		Other Responses	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Capitalism Index	−0.013	−0.024	−0.048	−0.050	0.014	0.014	0.021	0.012
	(0.055)	(0.054)	(0.023)**	(0.023)**	(0.012)	(0.013)	(0.033)	(0.032)
Democracy Index	1.452	1.660	0.577	0.694	0.149	0.183	0.726	0.783
	(0.712)**	(0.800)**	(0.288)**	(0.325)**	(0.153)	(0.159)	(0.404)*	(0.455)*
GDP per capita, '000	0.080	0.105	0.029	0.053	0.030	0.011	0.021	0.041
	(0.092)	(0.107)	(0.038)	(0.042)	(0.025)	(0.028)	(0.052)	(0.059)
Continent Effects	yes	yes	yes	yes	yes	yes	yes	yes
Demographic Controls	yes	yes	yes	yes	yes	yes	yes	yes
Economy Controls	yes	yes	yes	yes	yes	yes	yes	yes
Health Controls	yes	yes	yes	yes	yes	yes	yes	yes
Government Controls	yes	yes	yes	yes	yes	yes	yes	yes
Geography Controls	no	yes	no	yes	no	yes	no	yes
R^2	0.48	0.52	0.43	0.49	0.59	0.62	0.42	0.46
N	127	127	127	127	127	127	127	127

Notes: Dependent variables are defined in Section 3 (Data). All control variables are defined in Table 1. Standard errors are robust. *significant at 10 percent, **significant at 5 percent, ***significant at 1 percent.

cients of capitalism are very robust at around 1.6-2.0 – slightly lower than our baseline standard error from above. To give some geographical guidance, Paris is about 8,000 km away from Beijing, 6,000 km away from New York, and about 2,000 km away from Stockholm, respectively.

6 Mechanisms

So far we have documented a very robust positive relationship between capitalism and COVID-19 deaths. Next, we try to understand the possible mechanisms behind this correlation.

6.1 Stringency Measures

Main Effects Governments responded to the pandemic with a plethora of policies, including, but not limited to, closed schools and workplaces, face masks, public transportation restrictions, and elderly home restrictions. Some of these policies will likely have strong disruptive effects on the economy, others less so. A natural first question is thus whether capitalist countries' governments responded differently than others. In particular, were they less likely to impose disruptive policies on the economy?

In Table 4, we report the results from regressing various government response measures on capitalism using our preferred specification from above. Regressions 1 and 2 sug-

Table 5: Mechanism: Gauging the Magnitude

Dependent variable:	# Fatalities per million - δ Capitalist Stringency				
Estimate for the Effect of Stringency on Fatalities	$\delta = 0$	$\delta = -10$	$\delta = -35$	$\delta = -60$	$\delta = -85$
	(1)	(2)	(3)	(4)	(5)
Capitalism Index	5.026	3.751	2.515	1.279	0.044
	(2.469)**	(2.595)	(2.835)	(3.159)	(3.543)
Continent Effects	yes	yes	yes	yes	yes
Demographic Controls	yes	yes	yes	yes	yes
Economy Controls	yes	yes	yes	yes	yes
Health Controls	yes	yes	yes	yes	yes
Government Controls	yes	yes	yes	yes	yes
Geography Controls	yes	yes	yes	yes	yes
R^2	0.70	0.70	0.68	0.65	0.62
N	129	127	127	127	127

Notes: All control variables are defined in Table 1. Standard errors are robust. *significant at 10 percent, **significant at 5 percent, ***significant at 1 percent.

gest that there are no significant differences for overall stringency, the sum of all normalized individual responses. However, as already alluded to above, the overall stringency index might hide important heterogeneities. In the columns that follow, we split government responses into those disruptive to the economy (capitalist stringency responses), those focused on providing R&D incentives and supporting the economy financially (investment stringency policies) and, finally, all other stringency responses. Importantly, regressions 3 and 4 show that capitalist governments are significantly less likely to implement capitalist stringency responses, that is, to impose restrictions that potentially hurt the economy. Examples include closing schools, or restricting travel and public transport. The point estimate of -0.050 suggests that a one-standard deviation in our capitalism index decreases the capitalist response index by almost 0.3 standard deviations, an economically meaningful effect. Finally, we find no significant differences for investment stringency or other stringency responses (regressions 5 to 8).

Interestingly, democratic governments seem significantly more likely to impose restrictions. While this finding may warrant a separate investigation, it is beyond the scope of this paper and we only mention it here in passing.

Gauging the Magnitude Thus, one of the reasons for the higher number of fatalities in capitalist countries is that their governments were less likely to impose restrictions that would hurt the economy. The resulting additional deaths are precisely what constitute social murder. Ideally, we would have liked to add the capitalist stringency response as

an explanatory variable in our main specification above to check how much this reduces the effect of capitalism on fatalities. Unfortunately, this exercise is infeasible because stringency is jointly determined with the number of fatalities and thus highly endogenous.[17] To nevertheless get an idea of how much stringency can account for the number of fatalities, we run the following augmented regressions

$$\frac{\#Fatalities_{ic}}{Population_{ic}} - \delta\ Capitalist\ Stringency_{ic} = \alpha + \beta\ Capitalism_{ic} + \mathbf{X}_{ic}\pi + \gamma_c + \varepsilon_{ic}, \tag{14}$$

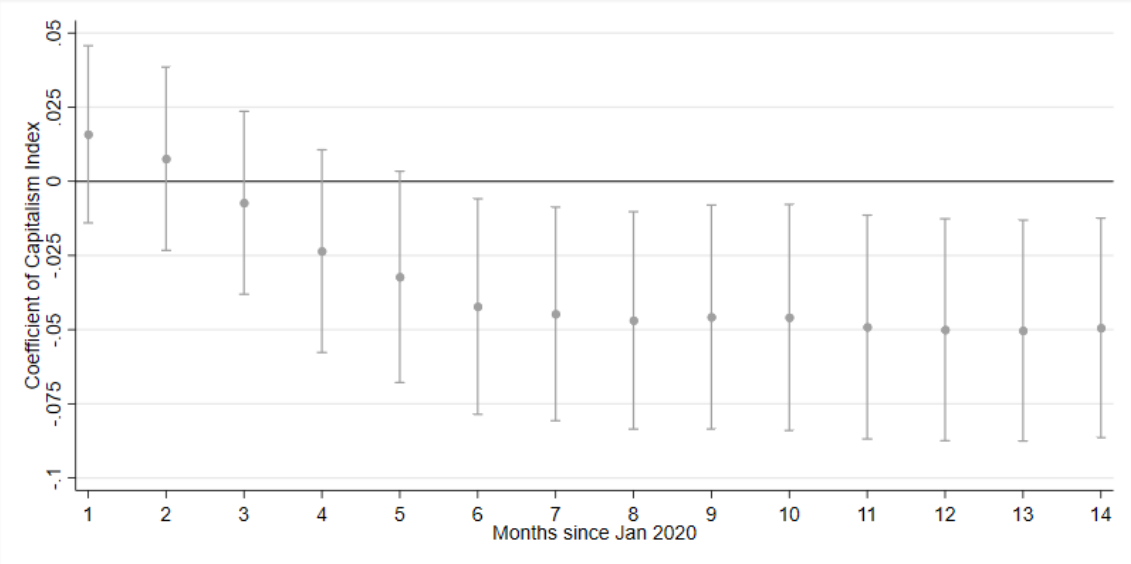
where $Capitalist\ Stringency_{ic}$ is our measure of capitalist responses in country i and continent c and δ is the true causal effect of stringency on fatalities. Thus, in this regressions β captures the effect of capitalism once stringency is accounted for. Put differently, if $\beta = 0$, then the effect of capitalism on fatalities would be entirely explained by capitalist stringency policies. Since the true δ is unknown, following Becker and Woessman (2009), we run specification (2) for various possible values of δ. The results are reported in Table 5. As shown, the residual effect of capitalism (β) turns zero when $\delta = -85$. Is -85 a large effect? This number would imply that a one standard-deviation increase in the capitalist stringency measure reduces fatalities by almost 65 percent – likely an upper bound. The true effect is probably lower.[18] Thus capitalism likely affects fatalities more than just via the difference in its policy responses to the pandemic. We will try to shed some more light on this in the next subsection.

Stringency Over Time In Figure 2, we plot the effect of capitalism on cumulative stringency over time (recall that Figure 1 shows the same exercise but for deaths as the dependent variable). The effects turn negative some 3-4 months into the pandemic and stay almost constant after around 6 months. Note that this timing supports the idea that reticence in capitalist stringency measures is at least partly driving the fatalities, since

[17] As a side note, in a regression of deaths on capitalist stringency, the point estimate on stringency is positive and highly significant. This obviously does not suggest that capitalist stringency policies increase deaths but, rather, that high deaths rates induce more capitalist stringency measures.

[18] Note that the effect of capitalism turns insignificant already at the much lower level of $\delta = -10$. However, the point estimates, although insignificant, are still relatively large in regressions 2 and 3. Thus, a less conservative interpretation of Table 5 would be that the effect of capitalism turns zero for δ somewhere between -60 and -85. This would imply that a one-standard deviation increase in capitalist stringency reduces fatalities by about 50 to 65 percent, arguably large effects, still leaving much to be explained by other channels.

Figure 2: Capitalist Stringency over Time



Notes: In this figure we replace the dependent variable in our baseline regressions (5 in Table 4) with capitalist stringency for different time periods – we vary the number of months since the start of the pandemic – and report the point estimates on Capitalism (together with confidence intervals). Each circle represents a separate regression. For example, the second circle represents the point estimate when regressing our capitalist stringency index in the first two months on Capitalism.

fatalities also start to increase after roughly 3 months (recall Figure 1).[19]

6.2 Substitutes and Complements of Capitalism – Interaction Effects

The interaction effects of the capitalism index with many other variables are interesting and revealing. We divide our heterogeneous effects into four broad groups; transnational capitalism and kinship, inequality, workers' rights and the structure of the economy, and the degree of openness of the economy. Results are reported in Tables 6-9.

Transnational Capitalism and Kinship We first see, in regression 1 of Table 6, that democracy tempers the effect of capitalism. We expect that greater representation of other classes, apart from the capitalist, would have precisely this effect. The point estimate on the interaction with the democracy index is just short of reaching the 90 percent confidence level. However, it does turn strongly significant in regression 6, where we control for all our interactions in one regression (since these variables are likely correlated).

[19]For the sake of completeness, we report the effects of capitalism on our other two stringency indices over time in Appendix B (Figure B.5). The figure confirms the insignificant results from regressions 5 to 8 in Table 4.

Table 6: Interaction Effects – Transnational Capitalism and Kinship

Dependent Variable:	# Fatalities per million					
	(1)	(2)	(3)	(4)	(5)	(6)
Capitalism Index	16.960	−23.847	−8.842	−2.973	5.959	−33.373
	(6.330)***	(11.463)**	(11.008)	(4.342)	(2.489)**	(30.129)
... × Democracy Index	−2.159					−3.765
	(1.331)					(1.731)**
... × Political Globalization		0.415				0.491
		(0.166)**				(0.262)*
... × Elite Fractionalization			1.946			1.592
			(1.299)			(1.833)
... × Military Spending				1.237		1.079
				(0.432)***		(0.490)**
... × Kinship Intensity Index					−4.877	−6.333
					(2.715)*	(2.960)**
Continent Effects	yes	yes	yes	yes	yes	yes
Demographic Controls	yes	yes	yes	yes	yes	yes
Economy Controls	yes	yes	yes	yes	yes	yes
Health Controls	yes	yes	yes	yes	yes	yes
Government Controls	yes	yes	yes	yes	yes	yes
R^2	0.68	0.69	0.68	0.69	0.68	0.74
N	129	129	129	124	128	123

Notes: All control variables are defined in Table 1. We always include (but not always report) all main effects in each regression. Standard errors are robust. *significant at 10 percent, **significant at 5 percent, ***significant at 1 percent.

When political globalization is interacted with capitalism in regression 2, its coefficient is positive and significant. The index of political globalization is intended to measure the degree of integration of a country with the rest of the world. It is constructed from measures of the number of foreign embassies and international organizations (e.g., World Bank, International Monetary Fund, World Economic Forum, etc.) located in the country. The latter are prime organizations that promote transnational capitalism.

For analogous reasons, the elite fractionalization interaction term in regression 3 is positive and again just shy of significance. We suspect that when the elites in a country are fractionalized and not aligned, transnational capitalism's clout on national policy increases and this exacerbates the effect of capitalism on deaths by undermining a nation's capitalist stringency response.

The impact of the interaction effect of military spending as a proportion of GDP and capitalism, shown in regression 4, is intriguing. In the U.S. the military-industrial complex plays a large role in giving arms-producing firms access to the government. These firms influence policies by lobbying (donating to the election campaigns of political candidates) and various incentives such as promising lucrative employment with them in the

future [Vittori (2019)]. Berger et al. (2013) show that when the U.S. government intervenes in foreign countries and regimes change, it has trade consequences that favor America.[20] We argue that this is one manner in which military spending benefits its own capitalists and bolsters their clout in the economy.

Arms-exporting firms lobby the U.S. government in a similar manner for grants, subsidies, tax breaks, etc., and even manage to export arms to countries that flagrantly violate human rights [Hartung (1996)]. Interestingly, these firms have migrated to the southwest of the U.S. because of the lower incidence of unionization. These firms are also precisely those that would exercise capitalist clout. The military-industrial complex is not a monopoly of the U.S., however. Other liberal democracies like the U.K., France, Canada, Belgium, and others also have similar phenomena.

Recently, Moretti et al. (2019) used OECD data to show that Defence R&D expenditures boosts private sector R&D and raises the nation's total factor productivity. In fact, Defence R&D expenditures dedicated to an industry in the U.S. elicits higher private R&D expenditures of similar industries in other OECD countries. We suggest that at least a component of government's military expenditures in capitalist countries strengthens capitalism in the economies exhibiting such spillovers. We surmise that the sign of the interactive term involving military expenditures in regression 4 could also be a reflection of this; military expenditures augment the freedom to invest measure of capitalism. Furthermore, we expect that the hegemony of neoliberal economies in the post-World War II era has facilitated the spread of transnational capitalism [Taylor (2017)]. In fact, there are many examples of capitalist countries (predominantly, but not exclusively, the U.S.) that have also used their military strength to topple foreign leaders who were autocratic or socialist and replaced them with market-friendly ones. This provides an additional rationale for our finding.

The role of kinship is very interesting and bears some discussion. Recently, Gelfand et al. (2021) estimated the effects of the degree of tightness of social norms on COVID-19 deaths up to October 16, 2020. Their variable aggregates various measures of what are acceptable norms of behavior in a society and how strictly they are enforced. This

[20] See also Zachary et al. (2015), who find, using data on U.S. interventions in Latin America, that Berger et al's finding may not be generally true of U.S. interventions in other periods.

is somewhat analogous to, but not the same as, our measure of kinship ties. They found in their sample of 57 countries that countries with loose social ties had 8.71 times the deaths per million than those with tight ties had. However, compared to our analysis, the analysis of Gelfand et al. (2021) has different controls. In particular, they do not control for the extent of capitalism. In our analysis, we find that kinship has an insignificant direct effect on COVID-19 deaths. Instead, kinship intensity works through its interaction with capitalism, with stronger kinship ties tempering the ill-effect of capitalism.

The interaction effect with the kinship intensity index in regression 5 of Table 6 is negative and significant. This index measures how close kinship relationships are for a country's residents. According to Schultz et al. (2019), from whose work this index is drawn, the closer these relationships are the greater is obedience, respect shown to elders, etc., essentially stemming from the extended family kinship arrangements that prevail in such regions. Low values of the index, which characterize the Whites from Western Europe who also subsequently migrated to North America, and elsewhere, are associated with people being more independent and resistant to authority. If this argument carries weight in the context of COVID-19, mandated masks, social distancing and other measures, are less likely to be imposed and less likely to be followed if they are imposed – thereby exacerbating the impact of capitalism on deaths. The finding in regression 5 is consistent with this interpretation: countries with strong kinship bonds temper the effect of capitalism on COVID-19 fatalities.

Finally, note that the results are robust, or even significantly stronger, when including all interaction effects into one regression to account for potential correlation among them (regression 6).

Workers' Rights and the Structure of the Economy Next, we consider how workers' rights and the structure of the economy influences capitalism's effect on deaths. Results are reported in Table 7.

First, the labor force participation rate (LFPR) interacted with capitalism has a negative and significant effect, as seen in regression 1. Generally, countries with high labor force participation are also poor – poverty forces participation – and thus tend to be agricultural (the two are positively correlated). Moreover, the agricultural sector has natural

Table 7: Interaction Effects – Structure of the Economy and Workers' Rights

Dependent Variable:	# Fatalities per million						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Capitalism Index	34.072	12.090	4.712	33.874	3.161	−3.189	−8.758
	(10.970)***	(4.224)***	(2.442)*	(11.019)***	(2.520)	(4.753)	(9.117)
... × Labor Force Participation Rate	−0.434			−0.356			
	(0.162)***			(0.164)**			
... × Size of Agricultural Sector		−0.408		−0.333			
		(0.189)**		(0.210)			
... × GDP per capita			0.148	−0.015			
			(0.151)	(0.159)			
... × Labor Freedom Index, Dummy					9.420		
					(4.867)*		
... × Size of Manufacturing Sector						0.759	
						(0.405)*	
... × Size of Service Sector							0.289
							(0.188)
Continent Effects	yes	yes	yes	yes	yes	yes	yes
Demographic Controls	yes	yes	yes	yes	yes	yes	yes
Economy Controls	yes	yes	yes	yes	yes	yes	yes
Health Controls	yes	yes	yes	yes	yes	yes	yes
Government Controls	yes	yes	yes	yes	yes	yes	yes
R^2	0.69	0.68	0.68	0.69	0.69	0.68	0.69
N	129	127	129	127	129	122	127

Notes: All control variables are defined in Table 1. We always include (but not always report) all main effects in each regression. Standard errors are robust. *significant at 10 percent, **significant at 5 percent, ***significant at 1 percent.

social distancing built into it. In fact, regression 2 confirms that the effects of capitalism are precisely lower in countries with a larger agricultural sector. Thus, the effect of LFPR may possibly be driven by the agricultural sector. However, when we add both variables into one regression (including income for the sake of completeness), the interaction effects on the LFPR variable remains significantly negative (regression 4). Thus, an alternative explanation is needed.

We think that a large labor force increases workers *de facto* political power vis-a-vis the capitalists and thus mutes capitalism's negative effects on stringency. Additional evidence for this hypothesis is shown in regression 5 where we interact capitalism with the labor freedom index, higher values of which correspond to more fluid labor markets. Importantly, the positive interaction effect suggests that the effect of capitalism is stronger in countries with less regulated labor markets and fewer worker rights (easier to hire additional workers or fire redundant workers, etc.). In the past few decades, employers have become increasingly hostile towards the organization of labor in capitalist countries. In the U.S., for example, on the one hand, they have been using even illegal means (threats, intimidation, firing, etc.) to thwart unionization [Bronfenbrenner (2009)]. On the other, capitalists have been increasingly employing lobbyists and contributing to politicians'

Table 8: Interaction Effects – Inequality

Dependent Variable:	# Fatalities per million					
	(1)	(2)	(3)	(4)	(5)	(6)
Capitalism Index	23.647	20.737	53.987	9.030	6.828	20.431
	(13.166)*	(14.251)	(15.014)***	(5.795)	(5.800)	(6.967)***
... × GINI	−0.456	−0.407	−1.324			
	(0.323)	(0.342)	(0.372)***			
... × GINI × GDP per capita			0.052			
			(0.018)***			
... × Top 20/Bottom 20				−0.319	−0.251	−2.022
				(0.522)	(0.518)	(0.818)**
... × Top 20/Bottom 20 × GDP per capita						0.095
						(0.057)*
... × GDP per capita		0.087	−1.654		0.139	−0.429
		(0.161)	(0.609)***		(0.175)	(0.385)
Continent Effects	yes	yes	yes	yes	yes	yes
Demographic Controls	yes	yes	yes	yes	yes	yes
Economy Controls	yes	yes	yes	yes	yes	yes
Health Controls	yes	yes	yes	yes	yes	yes
Government Controls	yes	yes	yes	yes	yes	yes
R^2	0.68	0.68	0.71	0.68	0.68	0.72
N	129	129	129	123	123	123

Notes: All control variables are defined in Table 1. We always include (but not always report) all main effects and double interactions in each regression. Standard errors are robust. *significant at 10 percent, **significant at 5 percent, ***significant at 1 percent.

campaign funds in order to pass laws that undermine unions and enhance their own interests.[21] Unionization, and hence the bargaining power of labor, has been declining in the U.S. and in other neoliberal economies over the past few decades.[22]

To complement the findings on the agricultural sector (and its inherent social distancing) we also report interactions with the size of the manufacturing and the service sector in regressions 6 and 7. Since production in the manufacturing sector often requires proximity and hinders social distancing, in this case we would expect a positive interaction effect. For the service sector, the prediction is less clear since certain business such as the financial industry allow for working from home whereas for instance the restaurant industry requires physical presence. These predictions are borne out in the data with a large and significant interaction effect for the size of the manufacturing sector and a smaller (and insignificant) effect for the service sector.

[21] See Rhinehart et al. (2020) for a historical and statistical account of this.

[22] See https://stats.oecd.org/Index.aspx?DataSetCode=TUD

Inequality Next we consider the important interaction of capitalism with inequality.[23] For the latter, we use two measures – the income Gini and the ratio of the income shares of the top quintile to that of the bottom quintile. The results are shown in Table 8. We first consider the simple interaction with Capitalism and our two inequality measures in regressions 1 and 4. The interaction effects are insignificant and even negative. However, inequality is generally lower among rich countries and thus GDP may be a confounder. This is particularly so since COVID-19 has caused greater fatalities per million in rich countries, as documented by Goldberg and Reed (2020) and Deaton (2021). Thus, in regressions 2 and 5, we add the interaction of Capitalism with GDP per capita, but the interaction effects with inequality remain the same.

Lastly, in regressions 3 and 6 we explicitly allow for the possibility that the interaction between inequality and capitalism depends on the level of income. In other words, to isolate the effect of inequality on fatalities under capitalism, we need to compare countries that are at the same level of development but exhibit different levels of inequality or embrace capitalism to different degrees. Econometrically, we need the coefficient of the triple interactive term between per capita GDP, capitalism, and inequality. We see from regressions 3 and 6 of Table 8 that this coefficient is positive and highly significant with both our measures of inequality. Capitalism has more damaging effects in richer countries with greater inequality. Using the 0.095 estimate of this coefficient in the last regression, we compute the predicted contribution of capitalism in conjunction with inequality in the U.S. to be 4,220 additional deaths per million.[24]

Openness Finally, we turn to the openness of an economy. In particular, we would expect capitalism to have stronger effects in better connected countries. These conjectures are supported by the data. Results are reported in Table 9. Domestic air travel interacted with capitalism raises deaths positively and significantly, in regression 1. The last three regressions further show that openness and tourism have positive and significant interaction

[23] Davies (2021) has examined the correlation between poverty and income inequality (Gini coefficient) with COVID-19 deaths with data from 141 countries over the first wave of the pandemic, until August 2020. He found poverty to be negatively correlated with deaths and income inequality to be positively correlated. However, he does not separately incorporate capitalism in his analysis.

[24] Note that this exercise implies a move from perfect equality to U.S.-level inequality. If we were to move from the level of inequality in Denmark (which has a similar GDP per capita level and a similar Capitalism score) to the U.S., the increase in deaths would still be around 2,333.

Table 9: Interaction Effects – Openness of the Economy

Dependent Variable:	# Fatalities per million			
	(1)	(2)	(3)	(4)
Capitalism Index	5.888	4.322	2.726	−3.412
	(2.514)**	(2.593)*	(3.552)	(3.675)
... × Domestic Airline Travelers	0.034			
	(0.014)**			
... × Tourists		0.174		0.211
		(0.057)***		(0.056)***
... × Openness			0.050	0.099
			(0.045)	(0.046)**
Continent Effects	yes	yes	yes	yes
Demographic Controls	yes	yes	yes	yes
Economy Controls	yes	yes	yes	yes
Health Controls	yes	yes	yes	yes
Government Controls	yes	yes	yes	yes
R^2	0.71	0.70	0.68	0.72
N	109	124	129	124

Notes: All control variables are defined in Table 1. We always include (but not always report) all main effects in each regression. Standard errors are robust. *significant at 10 percent, **significant at 5 percent, ***significant at 1 percent.

effects, as would be expected.

The positive and significant coefficient on the interaction between capitalism and openness is noteworthy. Tassinari et al. (2020) examined why the incidence of COVID-19 stringency measures across Italy showed considerable variation. They find that the regions of Italy that were most export-oriented had the lowest levels of stringency measures. They argue that this was due to the lobbying pressure of business interests, which determined when the region should lock down and open up. This is consistent with our finding here using cross-country data. Trade policy is only one possible, but important, vehicle available to capitalists for pressing their interests.

Thus our evidence suggests that many variables either exacerbate or temper the effect of capitalism in ways that are intuitive. All of them are consistent with the evidence that capitalism is positively correlated with COVID-19 deaths, strongly suggesting social murder.

7 Summary of Results

In this paper, we used COVID-19 deaths over a 14-month period as a metric that gave us a handle on how to quantify the concept of "social murder" attributed to capitalism. When the role of capitalism is separated from that of democracy, we uncovered a very robust correlation between our preferred index of capitalism with COVID-19 fatalities under numerous specifications that controlled for a whole host of potentially contributing factors. The effect is not merely statistically significant but also numerically substantial. This correlation is also seen with a number of alternative measures of capitalism.

Over the 14-month period from January 2020 through March 2021, the estimated coefficient of capitalism on fatalities increased and remained significant, indicating that capitalism retained its explanatory power as the pandemic proceeded. The capitalist stringency measures (that is, those that were likely to adversely impinge on profits) declined over the period and remained steady at a significantly negative level.

By parametrically assuming the impact of capitalist stringency measures on fatalities to be at various values, we find that the assumed impact has to be unreasonably high to wipe out the effect of capitalism on the residual COVID-19 fatalities with the stringency impact netted out.

Democracy dilutes the effect of capitalism, presumably by ensuring concern for the general population rather than merely for the capitalist class. Likewise, the interaction effect with stronger kinship ties is found to reduce COVID-19 fatalities.

Greater political globalization and military spending magnify the effect of capitalism on fatalities. Both do so, we suggest, by facilitating an increase in the presence of transnational capitalism in a country. Greater freedom of labor (associated with an increase in the bargaining power of capital relative to that of labor) augments the harmful effect of capitalism. The size of the manufacturing sector, too, magnifies the damage of capitalism and the size of the agricultural sector does the opposite. Income inequality seriously magnifies the damage of capitalism.

8 Discussion and Conclusion

The number of COVID-19 deaths was of staggering cost to the U.S., and the world more broadly, and could possibly be attributed to capitalism as the culprit, in conjunction with inequality.[25] Perhaps when the pandemic is viewed through a neoclassical lens, while rounding up the usual suspects for mortality (poverty, inequality, availability of medical interventions, etc.) the possibility that the economic system of capitalism itself is a suspect may be overlooked. In this paper, we include this as a real possibility and offer some measure of the magnitude of the lives lost due to capitalism. The rigorous statistical evidence we have provided points to the fact that capitalism – often aided by a constellation of enablers – is strongly implicated in the fatalities of the current pandemic. In other words, we have provided, to our knowledge, the first statistical test of social murder.

It has been shown in the literature that the number of COVID-19 fatalities is positively correlated with a country's per capita GDP [Goldberg and Reed (2020), Deaton (2021)]. Goldberg and Reed find that this correlation is strong and survives the incorporation of many controls. We find that when we explicitly take into account of the role of capitalism and its interactions, the correlation between per capita GDP and fatalities becomes insignificant. It would appear that COVID-19 caused greater devastation in rich countries than in poor ones because capitalism is more entrenched in the former.

Other studies have found significant relationships between democracy and COVID-19 fatalities [e.g., Karabulut et al. (2021)]. Our study suggests that seeking to examine the correlation between the political regime and fatalities without accounting for capitalism may suffer from serious omitted variable bias because a substantial number of democracies are also capitalist. In our results, the political regime seems to play a secondary role in COVID-19 fatalities; capitalism appears to be the driving force.

One of the ways in which capitalism contributes to fatalities in the pandemic is by curbing stringency measures that would have impinged adversely on profits. There are active steps that governments in capitalist economies could have taken to minimize deaths through stringency measures but were either not undertaken or only inadequately done (e.g., lockdowns, contact tracing, etc.); these may be viewed as its sins of omission. But

[25] Of course, inequality itself is probably highly linked with capitalism but that is an issue we cannot address here.

there are also steps that governments did take that they should not have (like opening up too soon after a lockdown); these can be considered its sins of commission. But the contribution of capitalism to the human tragedy goes well beyond these and harks back to what it has engineered over decades.

American conservatism in the economic sphere has changed considerably since the days when Friedman (1970) famously articulated the view that business should attend to business and that this required the state to stand clear of the private sector and merely enforce the laws. In the last four decades, American capitalism has taken deliberate steps, not merely to keep the state out of its affairs when it reduced profits, but to actively recruit politics to tilt the laws in favor of itself and against labor [Hacker and Pierson (2010)]. The consequences of this orientation to the health of ordinary American citizens have been dire.

To be sure, capitalism in the United States is not necessarily representative of capitalism elsewhere in the world. In Western Europe, for example, the neoliberal countries typically have kinder and gentler versions of capitalism. Social programs are more abundant and inequality is not as great. To that extent, the damage done by capitalism during this pandemic has been commensurately milder elsewhere. Compare, for example, COVID-19 fatalities in the U.S. with those in Denmark. We saw that in the United States, in conjunction with capitalism, inequality would have been responsible for 4,220 additional deaths per million of the population in this pandemic.[26] (The actual lower number of fatalities, of course, is due to offsetting factors.) The ratio of the income share of the top quintile to that of the lowest quintile in Denmark is 4.1 as opposed to 9.0 in the U.S. Using the estimate in regression 6 of Table 8, we compute the contribution of capitalism to Danish deaths through inequality at 1,887 per million – still substantial but less than half of the 4,220 fatalities per million for the U.S.

Given the way capitalism functions in the present day, it seems that transnational capitalism may well be viewed as a contemporary form of imperialism. By dint of getting much of the world to play by the rules of neoliberal capitalist democracies, capital has ex-

[26]The corresponding predicted value of deaths for the entire population due to capitalism functioning through inequality in the absence of offsetting factors would be 1.35 million over the 14-month period. As a point of comparison, we may note that the total number of homicides in the U.S. in 2018 was 16,214 (see https://ucr.fbi.gov/crime-in-the-u.s/2018/crime-in-the-u.s.-2018/topic-pages/tables/table-1)

tended its sphere of influence to earn higher returns, or buttress falling returns in domestic markets. In the current pandemic, nowhere is this as apparent as in the field of intellectual property of Big Pharma (TRIPS), enforced by the WTO. For example, in October 2020, India and South Africa made an urgent plea to the WTO that patents be waived on COVID-19 vaccines so as to make the vaccine available to the billions of people in poor countries. Despite the fact that pharmaceutical companies have been heavily subsidized by governments for COVID-19 research and have already made revenues several times any liberal estimates of their R&D costs, they are still opposed to the temporary patent waiver.[27] Though the urgent request was made 7 months ago, it is only now that the question of waiver is being taken up seriously, after President Biden's administration decided that it is willing to concede to a waiver, subject to a consensus. Since supply has obviously not kept up with demand, the rich countries have bought up several times their populations' needs. There are many such glaring aspects of capitalism that contribute to COVID-19 deaths but which cannot be easily quantified in a statistical analysis like ours.

We have only used the available data on fatalities in the current pandemic to empirically assess the notion of social murder. But even in our day-to-day existence prior to the pandemic, there are undoubtedly countless fatalities that capitalism is directly or indirectly responsible for but which go unnoticed. Perhaps we are so inured to these fatalities that they seem to be the acceptable natural course of events and that it takes a pandemic as devastating as COVID-19 to bring them into sharper focus by furnishing the necessary data for an evaluation. But the arguably systemic consequences of capitalism have been visible everywhere.[28]

There seems to be little doubt that capitalism has insinuated itself into the functioning of politics in liberal democracies. This is certainly true of the U.S., the most powerful of these economies. Companies spend billions of dollars lobbying in Washington (an activity protected by the First Amendment to the Constitution) to sway politicians to bend policies their way. Though it may be unclear theoretically whether lobbying is welfare-improving or welfare-reducing, in some major issues there seems to be little doubt that

[27]The R&D costs of Big Pharma for a molecule is usually estimated at $800 million. Pfizer, which has already received revenues many times this figure and yet is strongly opposed to the waiver, has predicted its revenues will be $26 billion in 2021. See https://www.pharmaceutical-technology.com/features/pfizer-COVID-19-vaccine-revenue/.

[28]Read, in Ansell (2017), the graphic portrayal of the health disparities caused by inequality.

it is welfare-reducing.[29] As Case and Deaton note (2020, p. 99), the National Rifle Association has lobbied Congress to prevent the Center for Disease Control from funding research on the violence caused by the availability of guns (because it might lead to gun control).[30] But the deep connection between business and politics is also prevalent in other democracies.[31]

Case and Deaton (2020) give a graphic account of the thirty-year epidemic that started in the 1990s, comprising the deaths of non-Hispanic whites without college degrees due to the triple causes of suicide, alcohol, and drugs. In the opioid crisis, in particular, the pharmaceutical companies were definitely involved in willfully selling addictive drugs. The reckless greed engendered by capitalism was on full display. Here is a quote from Case and Deaton (2020, p.9):

> "The rising economic and political power of corporations, and the declining economic and political power of workers, allows corporations to gain at the expense of ordinary people, consumers, and particularly workers. At its worst, this power has allowed some pharmaceutical companies, protected by government licensing, to make billions of dollars from sales of addictive opioids that were falsely peddled as safe, profiting by destroying lives. More generally, the U.S. healthcare system is a leading example of an institution that, under political protection, redistributes income upward to hospitals, physicians, device makers, and pharmaceutical companies while delivering among the worst health outcomes of any rich country."

The findings of our paper, which uses cross-country data from the COVID-19 pandemic, strongly resonate with this view of American health care.[32] It also provides evidence on the deleterious effect of capitalism that is not necessarily confined to pharmaceutical companies or to the U.S. It is hard to avoid the conclusion that capitalism is a major purveyor of social murder.

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[29] For a recent survey of the empirical literature on lobbying, see Bombardini and Trebbi (2020).

[30] The two-decade old Dickey Amendment in the annual appropriations legislation that hindered the research of the CDC (and later also of the National Institutes of Health) was recently diluted in 2018 in the wake of school shootings in Florida, but it is unclear what its effect will be.

[31] Culpepper (2011), for example, analyzes this in four countries: France, Germany, Netherlands, and Japan. He argues that the influence of business organizations in writing the rules by which they are governed is greater when the issues at stake at not of much interest to voters. They can engage in 'quiet politics' to rig the rules in their own favor.

[32] Rudolf Virchow, who is deemed one of the founders of social medicine, believed that politics could make healthcare available to all, and famously claimed, "Medicine is a social science and politics is nothing but medicine at a larger scale." [Mackenbach (2009)]. Capitalism in the U.S. today seems to have upended this effort; it seems to have harnessed democracy to make access to healthcare and medicine the outcome of politics at large.

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Online Appendix

A.1 Data Descriptions

In this section we give a short description of the variables not covered in the main paper. The order of the presentation follows our summary statistics in Tables 1 and A.1.

Demographic Controls Data on population are provided by the UN Population Division and uses a de facto definition of population, i.e., it includes all residents (from around midyear) irrespective of legal status or citizenship. Data on the fraction of people above 65 years are also provided by the UN Population Division using the same de facto definition of population. Population Density is provided by the FAO. It uses the same definition of population as above. A country's area excludes water bodies, such as rivers and lakes, national claims to continental shelf and exclusive economic zones. Data on the fraction of people living in rural areas (as opposed to urban areas) are taken from the World Bank. The classification of whether an area is rural is provided by national statistical offices. Data on median age are provided by the UN population division.

The ethnic fractionalization index is taken from Alesina et al. (2003) and measures the probability that two random people meeting are from different ethnicities.

The fraction of the population of European origin estimates the percentage of the year 2000 population in every country that is descended from people who resided in Europe in 1500. This data is taken from Nunn and Puga (2012) .

Economy Controls The unemployment rate is provided by the World Bank. Note that the group of unemployed are people actively seeking employment. Those that dropped out of the labor force are not included in this figure.

The labor force participation rate is also provided by the World Bank and based on all individuals aged 15 and older.

The fraction of the labor force in agriculture includes people working in agriculture, fishing, hunting, and forestry. The data is also provided by the World Bank.

Data on the Gini Coefficient are also provided by the World Bank.

Health Controls Life expectancy at birth, provided by the World Bank, gives the number of years a newborn infant would live if mortality patterns at the time of its birth were to stay the same throughout its life. Death rates are also provided by the World Bank and measured midyear.

Government Controls Women in parliament data is taken from the World Bank and measured as the percentage of parliamentary seats in a single or lower chamber held by women.

Geography Controls All the geography controls are taken from and explained in more detail in Nunn and Puga (2012). Using elevation data, the terrain ruggedness index captures the changes in altitude across 30 arc-second cells. The index was originally devised

to quantify topographic heterogeneity in wildlife habitats, providing concealment for prey and lookout posts, and provides a measure of the general accessibility of a country.

The fraction of a country with fertile soil is based on the FAO/UNESCO Digital Soil Map of the World. Fertile soil is defined as soil that is not subject to severe constraints for growing rain-fed crops in terms of soil fertility, depth, chemical and drainage properties, or moisture storage capacity.

The percentage of the land surface area of each country covered by sandy desert, dunes, rocky or lava flows, was calculated on the basis of the desert layer of the Collins Bartholomew World Premium digital map data.

The fraction of tropical climate is defined the percentage of the land surface area of each country that has any of the four Köppen-Geiger tropical climates.

Distances to ice-free coasts are based on the sea and sea ice area features contained in the fifth edition of the Digital Chart of the World.

Additional Health Controls The COVID-19 death data taken from the Our World in Data website provides a number of supplementary health variables. In particular, the death rate (per 100,000 people) from cardiovascular disease is sourced from Global Burden of Disease Collaborative Network and available for 2017. Diabetes prevalence among the young adult population (aged 20 to 79) is sourced by the International Diabetes Federation. Finally, the share of women and men that smoke is taken from the World Health Organization.

Data on BCG (Bacillus Calmette-Guérin) immunization is also taken from the World Health Organization.

Alternative Capitalism Indices The Swiss Economic Institute at ETH Zurich provides the Economic Globalization Index, which measures the degree to which a country is embedded in international trade, as well as whether restrictions exist on trade and capital.

The World Economic Forum provides the Global Competitiveness Index, which is composed of 12 factors: institutions, infrastructure, ICT adoption, macroeconomic stability, health, skills, product market, labor market, financial system, market size, business, dynamism, and innovation capability. All other of the following indices are taken from the Heritage Foundation.

The financial freedom index evaluates the extent of government regulation of financial services, the degree of state intervention in banks and other financial firms through direct and indirect ownership, the extent of financial and capital market development, government influence on the allocation of credit and openness to foreign competition. Higher index values denote banking efficiency and independence from government control and interference in the financial sector.

The property rights index measures the degree to which a country's laws protect private property rights and the degree to which its government enforces those laws. It also assesses the likelihood that private property will be expropriated and analyzes the independence of the judiciary, the existence of corruption within the judiciary, and the ability of individuals and businesses to enforce contracts. Higher index values denote more certain legal protection of property.

The labor freedom index is composed of six quantitative factors: ratio of minimum wage to the average value added per worker, hindrance to hiring additional workers, rigid-

ity of hours, difficulty of firing redundant employees, legally mandated notice period, and mandatory severance pay. It also takes into account unionization. The index is based on data collected in connection with the World Bank's Doing Business study.

The score for the monetary freedom index is based on two factors: the weighted average inflation rate for the most recent three years and price controls. Higher index values denote price stability without microeconomic intervention.

The Trade freedom index is based on two indicators: the trade-weighted average tariff rate and non-tariff barriers (including quantity, price, regulatory, customs and investment restrictions, and direct government intervention).

The Investment freedom index evaluates a variety of investment restrictions (burdensome bureaucracy, restrictions on land ownership, expropriation of investments without fair compensation, foreign exchange controls, capital control, security problems, a lack of basic investment infrastructure, etc.). Points are deducted from the ideal score of 100 for each of the restrictions found in a country's investment regime.

The Fiscal Health index is based on the size of the government deficit, with large deficits limiting government flexibility in times of crisis.

Additional Controls The fraction of females and children (age 0-14) are taken from the United Nations Population Division and based on a de facto definition of population, i.e., counting all residents.

Data on the size of the agricultural, manufacturing, and service sector are taken from the World Bank. The size of a sector is defined as the net output (value added) normalized by a country's GDP. Agriculture includes fishing, hunting, forestry, as well as crop cultivation and livestock. The service sector includes wholesale and retail trade (including hotels and restaurants), transport, and government, financial, professional, and personal services such as education, health care, and real estate services. Manufacturing includes, for instance, the automobile or electronics industry.

The Human Development Index is sourced from the United Nations. It's based on three dimensions of human development: a long and healthy life, knowledge, and a decent standard of living. Four indicators are used to produce the index: life expectancy at birth, mean years of schooling, expected years of schooling, and gross national income per capita.

The Fragile State index is sourced from the Fund for Peace. It measures the vulnerability in pre-conflict, active conflict and post-conflict situations. The index comprises 12 conflict risk indicators that are used to measure the fragility of a state: security apparatus, factionalized elites, group grievance, economic decline, uneven economic development, human flight and brain drain, state legitimacy, public services, human rights and rule of law, demographic pressures, refugees and IDPs, and external intervention. The higher the value of the index, the more "fragile" the country is.

The political rights index is provided by Freedom House. It is based on three categories: electoral process, political pluralism and participation, and the functioning of government.

The government effectiveness index is taken from the World Bank and captures perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies.

Rainfall data is taken from the FAO. The variable captures long-term average precipitation in the country. Precipitation is defined as any kind of water that falls from clouds as a liquid or a solid.

Additional Interaction Variables Data on the size of the military budget as a fraction of total government spending is provided by the Stockholm International Peace Research Institute (SIPRI). Military expenditures data are based on the NATO definition, which includes all current and capital expenditures on the armed forces, including peacekeeping forces, defense ministries and other government agencies engaged in defense projects, paramilitary forces, if these are judged to be trained and equipped for military operations, and military space activities.

The total number of tourists entering and leaving a country is sourced from the World Tourism Organization.

Data on Trade Openness is provided by the World Bank and is defined as the sum of exports and imports normalized by GDP.

The number of airline passengers is provided by The International Civil Aviation Organization. It sums all passengers (domestic and international) of domestically owned airlines.

Data on the fractions of income held by the richest 20% and poorest 20% of the population are provided by the World Bank.

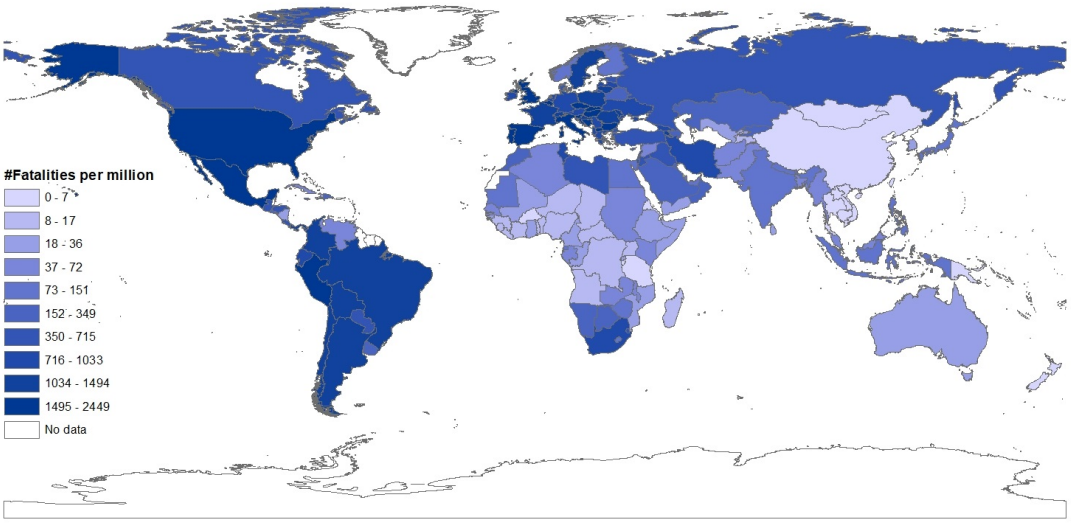
Table A.1: Additional Summary Statistics

	Mean	Std.Dev.	Min	Max	Obs.
A. Alternative Capitalism Indices, 0-100					
Economic Globalization Index	59.43	16.48	29.81	93.63	142
Overall Globalization Index	65.50	14.12	37.90	90.79	143
Competitiveness Index	59.90	12.70	35.50	85.60	129
Financial Freedom Index	51.56	18.10	10.00	90.00	141
Monetary Freedom Index	76.85	7.96	51.30	91.60	144
Property Rights Index	52.79	20.20	5.00	98.00	144
Trade Freedom Index	77.50	9.67	52.00	90.00	143
Labor Market Freedom Index	58.44	13.90	20.00	93.00	144
Fiscal Health Index	67.24	29.69	0.00	99.80	144
B. Additional Controls					
Fraction of Female Population, in %	49.91	3.66	24.50	54.54	143
Fraction of Young Population (0-14), in %	27.57	10.99	12.28	49.98	143
Kinship Intensity Index	−0.03	0.98	−1.56	1.53	143
Human Development Index, 0-1	0.71	0.16	0.38	0.95	142
Size of Agricultural Sector, in % of GDP	10.79	11.06	0.03	58.93	138
Size of Manufacturing Sector, in % of GDP	13.40	6.38	1.72	39.91	131
Size of Service Sector, in % of GDP	53.31	10.81	16.77	76.89	138
Political Globalization Index, 0-100	74.10	14.79	34.71	97.98	143
Fragile State Index, 0-120	67.68	24.62	17.90	112.70	143
Government Effectiveness Index, -2.5-2.5	−0.01	0.98	−2.24	2.23	144
Political Rights Index, 1-7	3.57	2.15	1.00	7.00	143
Absolute Latitude	27.04	17.26	0.05	64.50	144
Average Rainfall	1084.04	742.45	51.00	3240.00	142
C. Interaction Effects					
Military Spending, in % of Total Budget	6.41	5.12	0.00	31.99	134
Top20 income share relative to Bottom20 income share	8.47	4.64	3.56	24.98	131
# Domestic Airline Passengers, millions	34.15	102.26	0.01	889.02	121
Openness, Export + Imports in % of GDP	85.01	44.07	17.93	326.94	136
# Tourists	15530.71	29608.65	42.00	194400.00	133

The unit of observation is a country. We restrict ourselves to countries with at least one million inhabitants. Data sources are provided in the text. The Alternative Capitalism Indices are used in Table 3. Additional Controls are used in Table B.2.

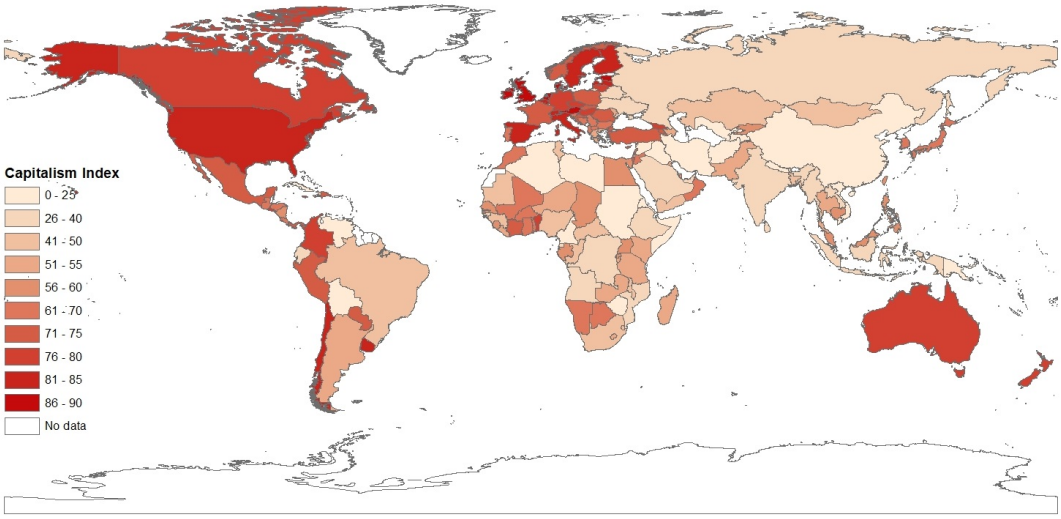
B.1 Additional Figures and Tables

Figure B.1



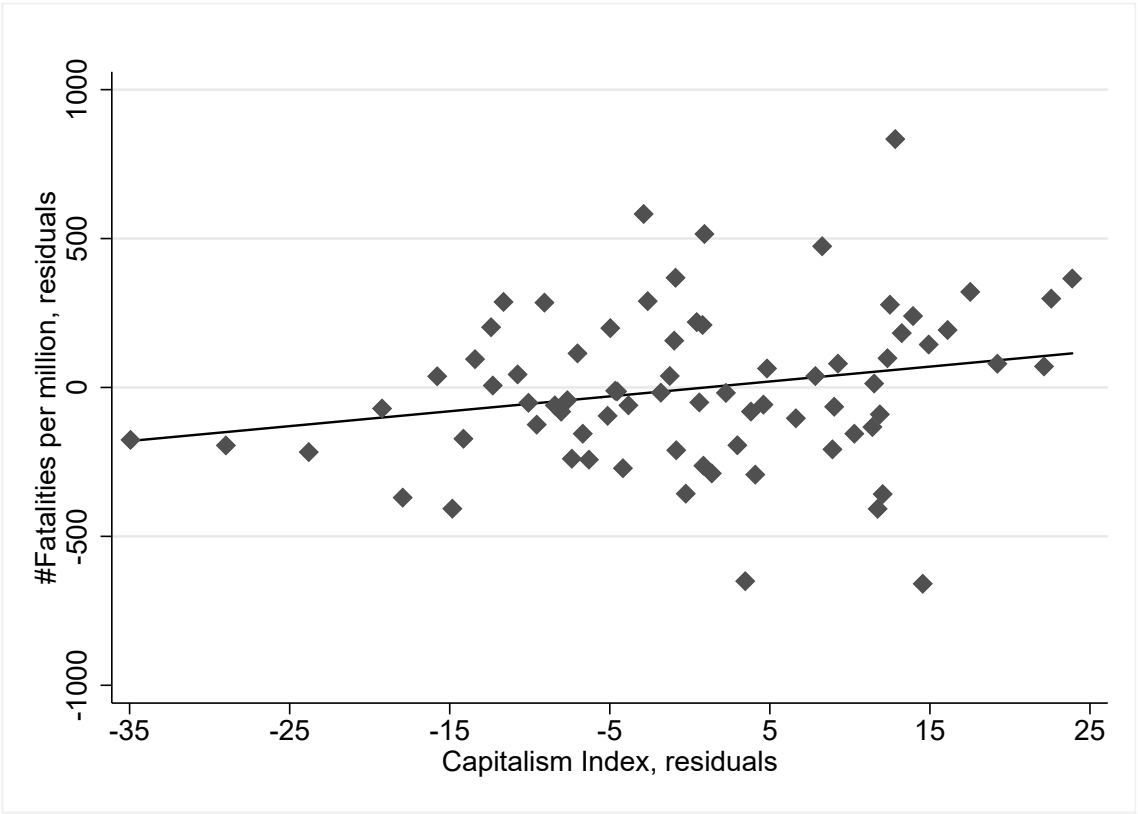
The map is constructed by the authors using the COVID-19 fatality data described in the paper.

Figure B.2



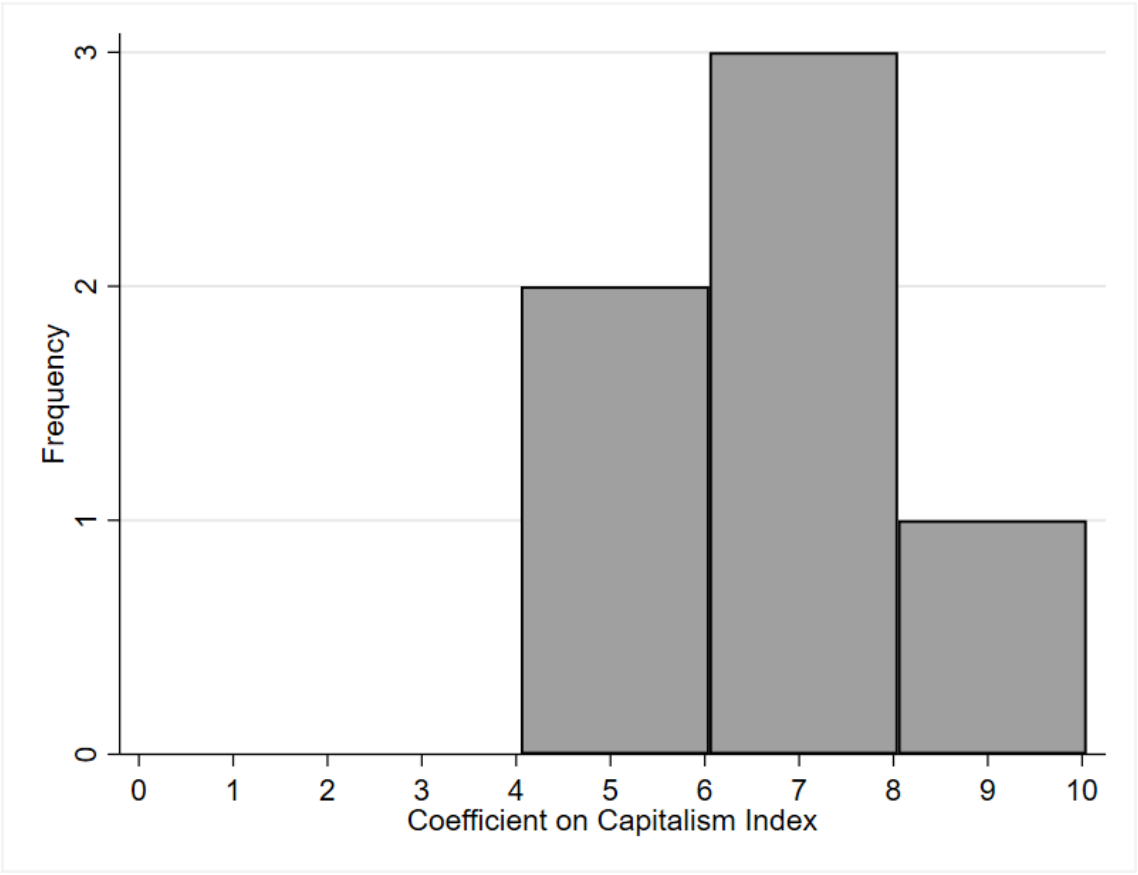
The map is constructed by the authors using the Capitalism index data described in the paper.

Figure B.3: Outlier Check I



Notes: Observations are grouped into 75 equal-sized bins. All controls from our preferred specification (regression 5 in Table 2) are used to construct residuals.

Figure B.4: Outlier Check II



Notes: This figure shows the distribution of point estimates on the Capitalism Index when dropping one continent at a time in our baseline specification (regression 4 in Table 2).

Table B.1: Correlation Matrix

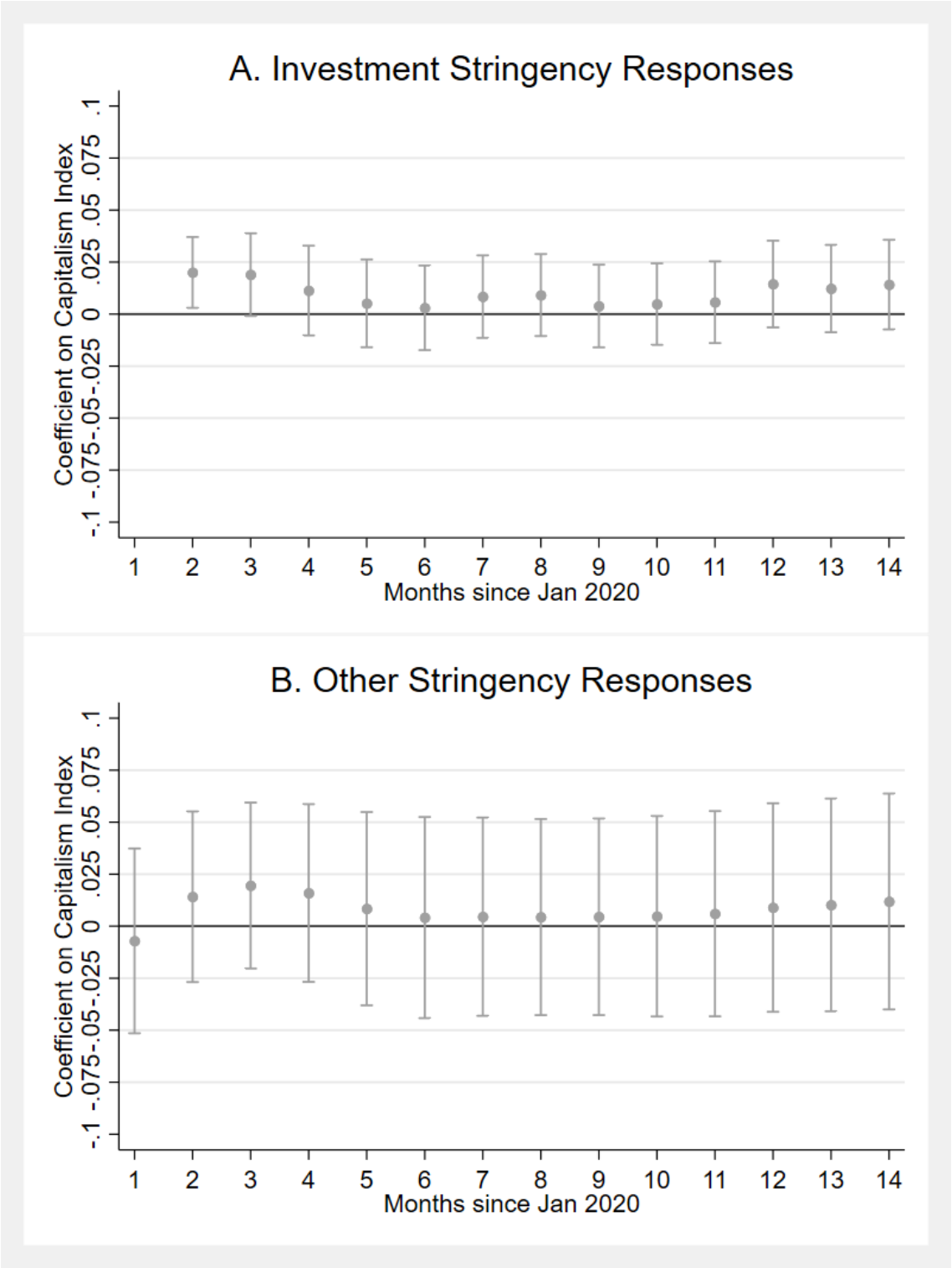
	Economic Globalization Index	Overall Globalization Index	Competitiveness Index	Financial Freedom Index	Monetary Freedom Index	Freedom To Invest Index	Property Rights Index	Trade Freedom Index	Labor Market Freedom Index	Fiscal Health Index
Economic Globalization Index	1									
Overall Globalization Index	0.881	1								
Competitiveness Index	0.787	0.903	1							
Financial Freedom Index	0.742	0.718	0.727	1						
Monetary Freedom Index	0.595	0.580	0.551	0.556	1					
Freedom to Invest Index	0.642	0.627	0.558	0.732	0.622	1				
Property Rights Index	0.817	0.842	0.905	0.750	0.604	0.663	1			
Trade Freedom Index	0.832	0.803	0.735	0.677	0.539	0.605	0.706	1		
Labor Market Freedom Index	0.396	0.289	0.416	0.367	0.258	0.321	0.474	0.350	1	
Fiscal Health Index	0.226	0.220	0.246	0.198	0.235	0.229	0.262	0.258	0.145	1

Table B.2: Robustness Checks

Dependent Variable:	# Fatalities per million							
Sample:	W/o Top 1%	W/o Top 5%	Full Sample					
Standard Errors:	Robust		Spatially Adjusted					
Cutoff in km:	n.a.			2,000	4,000	6,000	8,000	10,000
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Capitalism Index	5.210	4.684	7.701	5.026	5.026	5.026	5.026	5.026
	(2.409)**	(2.077)**	(3.461)**	(1.964)**	(1.671)***	(1.575)***	(1.559)***	(1.520)***
Democracy Index	−13.311	−0.589	−66.898	−2.528	−2.528	−2.528	−2.528	−2.528
	(29.876)	(28.648)	(70.859)	(21.510)	(18.830)	(16.510)	(15.850)	(15.710)
Continent Effects	yes	yes	yes	yes	yes	yes	yes	yes
Demographic Controls	yes	yes	yes	yes	yes	yes	yes	yes
Economy Controls	yes	yes	yes	yes	yes	yes	yes	yes
Health Controls	yes	yes	yes	yes	yes	yes	yes	yes
Government Controls	yes	yes	yes	yes	yes	yes	yes	yes
Geography Controls	yes	yes	yes	yes	yes	yes	yes	yes
Additional Controls	no	no	yes	no	no	no	no	no
R^2	0.70	0.70	0.75	0.70	0.70	0.70	0.70	0.70
N	128	122	118	129	129	129	129	129

Notes: All controls variables (except 'Additional Controls') are defined in Table 1 in the paper. 'Additional Controls' are defined in Table A.1 in Appendix A. Standard errors in regressions 4 to 8 are spatially adjusted (Conley, 1999). Cutoffs are given in the column headers. *significant at 10 percent, **significant at 5 percent, ***significant at 1 percent.

Figure B.5: Investment Stringency Response and Other Stringency Responses over Time



Notes: In this figure we replace the dependent variable in our preferred specifications (6 and 8 in Table 4) with the investment stringency response or other stringency responses for different time periods – we vary the number of months since the start of the pandemic – and report the point estimates on Capitalism (together with confidence intervals). Each circle represents a separate regression.