Inherited Corporate Control and Inequality: Evidence from the COVID Crisis

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Inherited Corporate Control and Inequality: Evidence from the COVID Crisis

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Abstract

This paper examines wealth inequality during the COVID crisis. Measuring inequality by comparing billionaires' wealth with equity markets, I find that the COVID crisis causes inequality to grow more rapidly by 23.6 ppt and even more in low-income countries where heir billionaires' wealth surges faster than founder billionaires' wealth by 18.0 ppt. Moreover, such increase in inequality from heir billionaires is higher in countries with weaker financial institutions. If heir billionaires are more adept at rent seeking than founder billionaires because family connections can be inherited more reliably than entrepreneurial talent, this paper raises the plausibility that crises give rise to rent seekers in countries with weak financial institutions.

JEL classification: G20, G30, O10

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1. Introduction

The recent COVID crisis has brought about not only wide-spread economic and human capital destruction, but also the unprecedented levels of inequality. It has left individuals and corporations without adequate resources suffering great losses, while those with plenty were able to preserve, if not, advance their status quo. In this paper, I provide empirical evidence on the increased inequality during the COVID crisis around the world. While some past work such as Bodea, Houle, and Kim (2021); de Haan and Sturm (2017); Baldacci, de Mello, and Inchauste (2005) has documented the overall increase in inequality during crises, this paper goes one step beyond this result and identifies the type of inequality that increases during a crisis. Specifically, I show that inequality stemming from rent-seeking, as opposed to efficient resource allocation, rises more in countries with weaker financial institutions.

To identify the type of inequality, we need an inequality measure that takes into account sources of wealth that create disparity between the rich and the ordinary. Breaking down inequality by source of wealth in this manner is important from an economic growth perspective. Morck, Stangeland, and Yeung (2000) show that countries with larger fractions of founder billionaires' wealth over GDP grow more rapidly, while countries with larger fractions of heir billionaires' wealth over GDP grow more slowly. Their result suggests that inequality stemming from the rise of new-money or founder billionaires is beneficial for growth, while inequality stemming from the rise of old-money families or heir billionaires detrimental.

In explaining their finding, Morck et al. (2000) posit that low barriers to new entrants propel the pace of creative destruction. This makes entrepreneurs with innovative ideas become extremely successful, creating new waves of self-made billionaires while destroying old stagnant firms. In contrast, the rise of old-money business families may slow this process. Rajan and Zingales (2004) argue that because heirs to large corporations grew up among elite circles, they can securely inherit their parents' connections. However, they cannot reliably inherit their parents' entrepreneurial talent (Mehrotra, Morck, Shim, and Wiwattanakantang, 2013; Bennedsen, Nielsen, Perez-Gonzalez, and Wolfenzon, 2007; Perez-

Gonzalez, 2006). This makes heirs more likely to invest in political rent-seeking rather than innovation in order to preserve their old capital, creating negative spillovers on economic growth. In sum, the rise of founder billionaires represents a faster pace of creative destruction, while the rise of heir billionaires proxies for increased value of rent-seeking.

Since conventional measures of inequality such as GINI coefficient and top 1% share of wealth do not account for sources of wealth, I propose the following measure of inequality that can circumvent this drawback. To measure inequality, I compare growth of billionaires' wealth to that of equity markets. This follows from the fact that billionaires are at the apex of the wealth distribution; therefore, if they consistently outperform the market, wealth disparity should increase. Then, to account for sources of wealth, I classify each billionaire in the sample as founder or heir. Founder billionaires are successful first-generation entrepreneurs, while heir billionaires inherit corporate control from their parents or other family members. Using these classifications, I break down inequality into a) one stemming from founder billionaires who, on average, gain wealth through innovation or efficient resource allocation, and b) one stemming from heir billionaires or old-money families whose wealth, as argued above, is likely derived from rent-seeking.

With the above inequality measure, I show that the 2020 COVID crisis causes inequality to increase substantially. Specifically, wealth of billionaires grows more rapidly than equity markets by 23.6 ppt when the crisis occurs. Moreover, inequality during the crisis is higher in lower-income countries where assets of heir billionaires outperform not only the equity markets but also those of founder billionaires by 18.0 ppt. These results are quantitatively robust to outliers and alternative inequality measures that compare growth of billionaires' wealth to that of GDP or GDP per capita. To ensure that these results are not merely a consequence of wealth fluctuation, I conduct a placebo test and show that heir billionaires in low-income countries outperform both founder billionaires and the equity markets only when the COVID crisis occurs. In all other circumstances, i.e., in a non-crisis period or in high-income countries, heir billionaires underperform.

Next, I further investigate a channel through which heir billionaires outperform both founder billionaires and the markets in low-income countries. The internal capital market literature suggests that, in times of crises, financing constraint becomes substantially more binding. Billionaires who control vast resources, often in the form of business group or conglomerate, can overcome such heightened financing constraints by reallocating capital within their groups. In support of this argument, Masulis, Pham, Zein, and Ang (2022) show that, compared to freestanding firms, business group affiliates gain significant market share since the start of the 2008−2009 global financial crisis. Such gain enables their stocks to outperform those of similar freestanding firms. Their results are concentrated in a sub-sample of developing economies, indicating that the ability to reallocating capital within groups is beneficial in markets with inadequate external financing. This argument implies that billionaires in general should outperform the markets in countries with underdeveloped financial institutions. Heir billionaires or old-money families, in addition, can amplify their internal capital market advantage by making use of their connections to receive exclusive access to government's information (Acemoglu, Johnson, Kermani, Kwak, and Mitton, 2016) or bailouts (Faccio, Masulis, and McConnell, 2006). Put together, these arguments imply that heir billionaires should outperform founder billionaires and the markets in countries with underdeveloped financial institutions.

To test the above hypothesis, I follow Beck, Levine, and Loayza (2000) and measure the levels of financial development using a) total market capitalization over GDP, b) private credit over GDP and c) total traded volume over GDP. Then, to extract the exogenous variations in these variables, I instrument them using a country's legal origin[1]. Consistent with this hypothesis, I find that heir billionaires outperform both the markets and founder billionaires in countries with weak financial institutions. Specifically, one-percentage-point *decrease* in total market capitalization (also total traded volume and private credits) over

[1]The instrument is an indicator variable equal to one if the country's legal origin is from the United Kingdom (i.e., common law), and zero otherwise. The use of this instrument follows from La Porta, Lopez-de Silanes, and Shleifer (2008) who show that countries with common law origin have stronger outside-investor protection which leads to more developed financial institutions.

GDP *accelerates* the growth of heir billionaires' wealth by 7.8 (7.9 and 13.0) ppt.

I recognize that heir billionaires might gain their wealth during the crisis through other channels than rent-seeking or exploiting their connections. For example, they might control businesses that are "too big to fail" or in the industries "well protected" by the government. Therefore, when a crisis occurs, these businesses will be heavily subsidized by the government, causing heir billionaires to outperform others in low-income countries without using their connections. Although firms that are "too big to fail" or "well protected" by the government might well be a result of heavy use of connections, pinning down the exact mechanism for my empirical findings is beyond the scope of this paper. I relegate this issue to future research and welcome other alternative explanations. These explanations must be able to explain why heir billionaires outperform founder billionaires only in low-income countries and during a crisis, but not in other circumstances. They should also be able to account for the fact that heirs' entrepreneurial talent is, on average, lower than that of founders, which has been extensively documented in the literature.

This paper's main contributions to the literature are two-fold. First, previous studies on inequality and crises, such as Bodea et al. (2021); de Haan and Sturm (2017); Baldacci et al. (2005), employ financial crises as their empirical settings. Although results from such settings are applicable to financial crises in general, they can suffer from endogeneity. For instance, if financial crises are a result of large credit expansion as in Greenwood, Hanson, Shleifer, and Sørenson (2022), then the observed heightened inequality may not be caused by the crises themselves, but by the credit expansion instead.

Using financial crises as an empirical setting might also suffer from reverse causality (i.e., inequality causes a crisis). Rajan (2010) notes that increasing income inequality compels politicians to respond in such a way that causes high indebtedness which eventually leads to a financial crisis. This paper alleviates these endogeneity issues using the COVID crisis which is exogenous to the state of the economy as its empirical setting. Therefore, the results from this paper allow us to correctly conclude that crises indeed cause inequality to increase.

Second, using the new measure that breaks down inequality into one resulted from efficient resource allocation (i.e., founder billionaires) and one from plausible rent-seeking (i.e., heir billionaires), this paper is the first to show that crises give rise particularly to inequality stemming from rent-seeking in countries with weak financial institutions. This result provides additional insights to the literature on crises and inequality. Specifically, while several papers such as Bodea et al. (2021); de Haan and Sturm (2017); Baldacci et al. (2005) show that inequality increases during crises, this paper argues that, in countries with underdeveloped financial institutions, such increase in inequality mainly comes from rent-seeking.

The rest of this paper is organized as follows. Section 2 explains the measure of inequality used in this paper as well as the construction process of the data. Section 3 report the main findings. Section 4 investigates the mechanism through which heir billionaires gain substantial wealth during the COVID crisis only in low-income countries. Finally, section 5 concludes.

2. Data and Variables

In this section, I demonstrate how inequality is measured in this paper as well as its pros and cons. I then describe the construction process of the data required for the analysis and report the summary statistics.

2.1. Measuring Inequality

Conventional measures of inequality such as GINI coefficient and Top 1% share of wealth rely on the wealth distribution. Although these measures can clearly describe the *levels* of inequality, they disregard the sources of wealth that create disparity between the rich and the poor, which can be crucial from an economic growth perspective.

Schumpeter (1942)'s theory of creative destruction posits that, in countries with low barriers to entrants, innovative firms flourish, creating new highly successful entrepreneurs.

At the same time, their innovations replace old technologies, effectively destroying stagnant firms. This process propels the cycle of creative destruction which underlies economic growth. In contrast, controlling shareholders of old firms may invest in political rent-seeking to rear barriers against new entrants. This effectively preserves their status quo, while slowing the pace of creative destruction and hence economic growth.

Morck et al. (2000) provide empirical support for the above theory and document that countries with larger fractions of founder billionaires' wealth over GDP grow more rapidly, while those with larger fractions of heir billionaires' wealth over GDP grow more slowly. Put differently, inequality arising from large-scale entrepreneurship, as represented by founder billionaires' wealth, is positively associated with rapid economic growth, while inequality arising from inherited control of large corporations, as represented by heir billionaires' wealth, exhibits the opposite.

To recognize the heterogeneous nature of inequality, I propose the following measure that takes into account sources of wealth:

$$\eta = \frac{W_{bil}}{W_{avg}} \tag{1}$$

where η denotes inequality, W_{bil} a billionaire's wealth, and W_{avg} an average investor's wealth. η therefore measures the number of times a billionaire is richer than an average investor. Simple algebra implies that $\Delta \ln(\eta) = \Delta \ln(W_{bil}) - \Delta \ln(W_{avg})$ where $\Delta \ln(\cdot)$ denotes contemporaneous log growth. Since growth of an average investor's wealth can be approximated by growth of an equity market index, $\Delta \ln(W_{mkt})$, we have that

$$\Delta \ln(\eta) = \Delta \ln(W_{bil}) - \Delta \ln(W_{mkt}) \triangleq \Delta W - \Delta MKT. \tag{2}$$

For brevity hereafter, $\Delta \ln(W_{bil})$ and $\Delta \ln(W_{mkt})$ will be denoted by ΔW and ΔMKT respectively. The basic intuition behind this measure is that, if billionaires consistently beat their countries' equity markets, we should observe an increase in inequality in those countries, and

vice versa.

Because each billionaire can be classified as *founder* or *heir*, an average of $\Delta W - \Delta MKT$ from a group of *heir* billionaires measures a change in inequality that arises from inherited control of large corporations. Likewise, an average of $\Delta W - \Delta MKT$ from a group of *founder* billionaires measures a change in inequality that arises from large-scale entrepreneurship.

Using an average of $\Delta W - \Delta MKT$ from a group of heir or founder billionaires also helps reduce the standard error of $\Delta W - \Delta MKT$ as the sample size grows larger. This therefore mitigates the concern that $\Delta W - \Delta MKT$ might be a noisy measure because it relies on billionaires' wealth which can fluctuate greatly. Despite its advantages, however, it must be stressed that $\Delta W - \Delta MKT$ cannot gauge the *levels* of inequality as can GINI coefficient or Top 1% share of wealth. It can only indicate the change in inequality; that is, whether or not inequality is narrowing or widening for a particular year.

2.2. Data Construction

The analysis in this paper requires two datasets, namely, a panel of billionaires' wealth around the world and a panel of macroeconomic variables. I hand-collect panel data of billionaires' wealth from lists of billionaires issued by Forbes magazines. These lists provide estimates of billionaires' wealth based on their ownership of publicly listed and private firms. As with any estimation, Forbes's estimates may contain errors. However, they are likely the most comprehensive and best executed ones available. This is because Forbes started its list in 1987 and has covered over 78 countries and any individual whose wealth is above one billion USD. Bloomberg's lists of billionaires, by comparison, started in 2012 and only cover the top 500 richest people in the world.

Following are the steps I use to construct the billionaire data:

Step 1: Gather the lists of billionaires and classify each of them as founder or heir. I gather Forbes' lists of billionaires from 2017 to 2021 and form a panel of billionaire wealth. This panel covers 60 countries and contains over 7,000 billionaire-year observations. I then

classify each billionaire in this panel as *founder* or *heir*. A billionaire is classified as *founder* if they are first-generation entrepreneurs. That is, their family does not own a company or is working- or middle-class. If the information on their family background is not available, I check their career path. Specifically, a founder billionaire must have started their career as a blue- or white-collar worker. If the information on both their family background and career path are not available, I follow the classification provided by Forbes. The information on billionaires' backgrounds is from extensive internet search which includes the billionaire's biography on their company websites, annual reports, and news articles. Finally, if the billionaire is not a *founder*, they are classified as *heir*.

Step 2: Assign a country to each billionaire. I assign each billionaire to a country in which they have the most influence. Most billionaires control firms that operate mainly in one country. However, some may control firms with operations in one country but listed or headquartered in another. In such cases, the assigned country is the one in which their main operations are conducted, e.g., where their factories or mines are located.

Step 3: Lag time series of billionaire wealth by one year. It must be noted that when Forbes reports the wealth of a billionaire in 2020, for example, they use the information from 2019 to value their assets. Therefore, the wealth reported in 2020, in fact, reflects the assessment of wealth in 2019. This suggests that the original billionaire wealth from Forbes must be lagged by one year. As a result, this paper's final data of billionaire wealth from 2016 to 2020 are gathered from the original Forbes' lists of billionaires from 2017 to 2021.

Next, to construct the proposed measure of inequality, $\Delta W - \Delta MKT$, I merge a panel of billionaire wealth obtained above with a panel of growth of equity market indices (ΔMKT) and growth of nominal GDP (ΔGDP) and GDP per capita ($\Delta GDPPC$). Data on equity market indices are from Datastream's total market indices which include dividends and other types of payouts. Nominal GDP and GDP per capita are from the World Bank database. Control variables, which include GDP (GDP), GDP per capita ($GDPPC$), human capital index (HC) and capital per capita (KPC), are from Penn World Table 10.0 (Feenstra,

Inklaar, and Timmer, 2015). Financial institutional variables, which include total market capitalization over GDP ($MktCap/GDP$), total traded volume over GDP ($MktVol/GDP$) and domestic credit to private sector over GDP ($Credit/GDP$), are from the World Bank database. Countries' legal origins are from La Porta et al. (2008). Because control and institutional variables are available only until 2019, I use their averages over a pre-crisis period (2017-2019) as their representative values instead of their time-varying values in the regressions.

[Insert Table 1 about here.]

Table 1 shows the summary statistics of macroeconomic variables in the sample. The final sample covers a wide range of country-level characteristics. For example, the size of the economy as measured by GDP ranges from 0.017 to 20 billion USD (e.g., from Iceland to the United States). The level of economic development as measured by $GDPPC$ ranges from 798 to 111,120 USD (e.g., from Zimbabwe to Singapore).

3. Main Findings

The central finding in this section is that the COVID crisis causes inequality to grow more rapidly than the pre-crisis period (2017−2019) by 23.6 ppt. Inequality grows more rapidly in low-income countries which see a 41.3 ppt increase during the crisis. Importantly, such additional increase in inequality in low-income countries comes mainly from the surging wealth of heir billionaires or old-money families.

3.1. Inequality around the World during the COVID Crisis

Table 2 reports the summary statistics of growth of billionaires' wealth relative to that of the equity markets around the COVID crisis. Panel A shows the results from the entire sample which includes both low- and high-income countries. Before the COVID crisis

(2017−2019), billionaires on average underperform their respective countries' stock markets. Wealth of both heir and founder billionaires grows significantly more slowly than the markets by 13.8 ppt and 8.9 ppt, respectively. This suggests that inequality between the ultra rich and an average investor is in decline during the pre-crisis period.

[Insert Table 2 about here.]

Furthermore, when comparing heir billionaires with founder billionaires, the former significantly underperform the latter by 4.8 ppt. This is consistent with the prior literature which documents that heirs possess lower entrepreneurial talent than founders (Perez-Gonzalez, 2006; Mehrotra et al., 2013). However, when the COVID crisis occurs in 2020, both heir and founder billionaires significantly outperform the stock markets. Wealth of heir and founder billionaires grows more rapidly than the stock markets in that year by 15.1 and 17.2 ppt, respectively. Interestingly, heir billionaires no longer underperform founder billionaires in times of crisis, suggesting that their assets have gained so much value during these times that their performance is now comparable to that of founder billionaires' assets.

To examine where the rise of heir billionaires is more prominent during the crisis, I divide the sample into low- and high-income subsamples. A country is classified as low-income when its $GDPPC$ is below the sample median, otherwise it is classified as high-income.

Panel B, Table 2 reports the results from the subsample of low-income countries. Before the pandemic, both heir and founder billionaires underperform the equity markets by 14.3 and 6.6 ppt, respectively. Heir billionaires also significantly underperform founder billionaires by 4.8 ppt. However, when the pandemic takes place, both heir and founder billionaires significantly outperform the equity markets by 29.4 and 21.9 ppt, respectively. Interestingly, in the low-income subsample, assets of heir billionaires grow significantly more rapidly than those of founder billionaires by 7.5 ppt during a crisis. This result is consistent with the fact that heir billionaires has a certain advantage over founder billionaires in countries with weak institutions. As argued by Rajan and Zingales (2004), this advantage is most likely the strong connections heir billionaires possess which enable them to take advantage of a crisis

better than founder billionaires can. Other alternative explanations will be discussed later in Section 3.2.

Panel C, Table 2 shows the results from the high-income subsample. As in low-income countries, inequality in high-income countries also narrows during the pre-crisis period. In this period, assets of heir and founder billionaires grow more slowly than the equity markets by 13.5 and 11.3 ppt, respectively. Heir billionaires also significantly underperform founder billionaires by 2.2 ppt. But when the COVID crisis occurs, both heir and founder billionaires outperform the markets by 7.3 and 12.1 ppt, respectively. Interestingly, opposite to the results in the low-income subsample, heir billionaires' asset performance remains below that of founder billionaires during the crisis in high-income countries. Specifically, assets of heir billionaires still grow more slowly than those of founder billionaires by 4.8 ppt. This suggests that, in high-income countries where institutions are strong, connections that heir billionaires possess are not as valuable as they are in low-income countries. As a result, their underperformance remains unchanged during the crisis.

Although the results in Table 2 can visualize trends in inequality around the COVID crisis in various subsamples, they are univariate tests that do not take into account the differences across countries as well as within- and cross-country comovement of the dependent variable. To account for these differences and comovement, I run the following regression:

$$\begin{aligned}\Delta W_{ict} - \Delta MKT_{ct} = \alpha &+ \beta_1 Crisis_t \times LowInc_c \times Heir_i + \beta_2 Crisis_t \times LowInc_c \\ &+ \beta_3 Crisis_t \times Heir_i + \beta_4 LowInc_c \times Heir_i \\ &+ \beta_5 Crisis_t + \beta_6 Heir_i + \beta_7 LowInc_c + \Gamma' \mathbf{X}_c + \epsilon_{ict} \quad (3)\end{aligned}$$

where i, c and t index billionaire, country and year, respectively. $\mathbf{X}$ is a vector of country-level controls including $\log(GDPPC), \log(HC)$, $\log(KPC)$ and $\log(GDP)$. Standard errors are double-clustered on country and year to account for a) comovement of billionaires' wealth within the same country due to country-specific shocks and b) comovement of billionaires'

wealth within the same year due to global shocks from the pandemic. All variables are defined in Table A1.

[Insert Table 3 about here.]

Table 3 displays the results from this regression. Consistent with earlier observations, column (1) reports a positive coefficient on $Crisis$[2]. This indicates that the wealth disparity between the ultra rich and an average investor widens during the COVID crisis. The significantly negative coefficient on $Heir$ suggests that assets of heir billionaires generally underperform those of founder billionaires, which is consistent with prior literature. However, during the crisis, heir billionaires in low-income countries outperform founder billionaires by up to 18.0 ppt. This is evidenced by the significantly positive coefficient on $Crisis \times LowInc \times Heir$ of 0.180 in column (1).

Certain time-invariant unobservable characteristics specific to each country such as culture or legal environments might also affect the wealth disparity. For example, some countries might have legal barriers that exclusively protect the wealth of old-money families, effectively allowing them to preserve their status quo even in times of crisis. To control for these unobservables, I replace a vector of controls, $\mathbf{X}$, with country fixed effects[3]. Column (2) in Table 3 reports the results that remain robust to this control. Specifically, the coefficients on $Crisis$ and $Crisis \times LowInc \times Heir$ remain significantly positive, while their magnitudes slightly decrease.

Overall, using the COVID crisis as an exogenous shock to the economy, Tables 2 and 3 provide causal evidence that crises increase wealth inequality and that such inequality rises more in low-income countries where heir billionaires outperform both the equity markets and founder billionaires.

[2]Although this coefficient is insignificant with a $p-$Value of 13.1%, it becomes significant when including country fixed effects or using alternative measures of inequality in Section 3.2

[3]In this specification, $LowInc$ is dropped to avoid multicolinearity.

3.2. Robustness Checks

3.2.1. Alternative Measures of Inequality

Measuring inequality by comparing growth of a billionaire's wealth to that of the equity market may raise a concern that growth of the equity market is not representative of growth of an average citizen's wealth. Thus, to a certain extent, it may not be an effective measure of wealth disparity between the ultra rich and the average citizen.

To address this concern, I measure inequality by comparing growth of a billionaire's wealth to that of GDP and GDP per capita instead. The rationale behind this measure follows from Piketty (2014) who contends that wealth inequality is set to rise if the net rate of return on capital (r) is greater than the growth rate of output (g). In our setting, r is the rate of return on a billionaire's capital (ΔW), and g the growth rate of output, i.e., GDP or GDP per capita (ΔGDP or $\Delta GDPPC$). An increase in $r - g$ (or $\Delta W - \Delta GDP$ and $\Delta W - \Delta GDPPC$ in our setting) thus indicates the rise in wealth inequality.

[Insert Table 4 about here.]

Table 4 shows the results in which I rerun Equation (3) but replace the dependent variable with $\Delta W - \Delta GDP$ and $\Delta W - \Delta GDPPC$ where ΔW, ΔGDP, and $\Delta GDPPC$ are contemporaneous log growth of a billionaire's wealth, GDP, and GDP per capita, respectively. The results reported in Table 4 are consistent with those in Table 3. In particular, across all specifications, the coefficients on $Crisis$ are significantly positive with their magnitudes comparable to those in Table 3. Importantly, the coefficients on $Crisis \times LowInc \times Heir$ also remain significantly positive, indicating that heir billionaires outperform both the stock markets and founder billionaires during the crisis in low-income countries.

3.2.2. Removing Potential Outliers

In this subsection, I alleviate the concern that outliers might be driving the results by winsorizing all continuous variables at the 1^{st} and 99^{th} percentiles, and then rerun Equation

(3) with the dependent variable being either $\Delta W - \Delta MKT$, $\Delta W - \Delta GDP$ or $\Delta W - \Delta GDPPC$. Country-level controls are replaced by country-fixed effects to control for time-invariant country-specific unobservable characteristics.

[Insert Table 5 about here.]

Table 5 shows the results that are robust to the winsorization. Specifically, with potential outliers removed, the coefficients on $Crisis$ as well as $Crisis \times LowInc \times Heir$ remain significantly positive, and their magnitudes are comparable to those in Table 3.

3.3. Alternative Explanations

Thus far, I draw on Rajan and Zingales (2004) who argue that heir billionaires in low-income countries outperform both the equity markets and founder billionaires during a crisis because of their adept use of connections. However, this may not always be the case. I discuss three plausible alternative explanations below.

3.3.1. Wealth fluctuation?

Billionaires' wealth can fluctuate greatly because it is tied to the value of their stocks and other assets. Therefore, the rise of heir billionaires in one particular year (i.e., 2020) could merely be a result of such fluctuation, which has nothing to do with heir billionaires being adept rent seekers. If this were the case, we should observe that, during the non-crisis period, heir billionaires in low-income countries underperform founder billionaires in some years and outperform in other years.

[Insert Table 6 about here.]

To test the above hypothesis, I conduct a placebo test by focusing on a non-crisis period from 2017 to 2019 and rerunning Equation (3) where either 2017, 2018 or 2019 is now taken as a placebo crisis year.

Table 6 reports the results. In all specifications, the coefficients on $Crisis \times LowInc \times Heir$ are no longer significantly positive, some even negative with $p-$value of 11.6%. This result suggests that, in non-crisis years, heir billionaires in low-income countries do not outperform either founder billionaires nor the markets. Put differently, heir billionaires in low-income countries outperform founder billionaires and the stock markets *only* in the crisis year. This result rules out an argument that wealth fluctuation causes heir billionaires to rise in low-income countries during a crisis.

3.3.2. Founder billionaires are in riskier industries?

Founder billionaires may be concentrated in more technology intensive industries than are heir billionaires. These industries are generally highly risky. Thus, when the COVID crisis occurs, their wealth is affected more negatively than that of heir billionaires, causing them to underperform. This argument suggests that the outperformance of heir billionaires during a crisis is due to the types of assets they hold, which is unrelated to rent-seeking. If this were the case, we should observe that heir billionaires in both low- and high-income countries outperform founder billionaires during a crisis.

However, the main results in Tables 2 and 3 contradict this argument. Only heir billionaires in low-income countries outperform founder billionaires during a crisis. Those in high-income countries do not. In fact, they underperform founder billionaires in both crisis and non-crisis periods in high-income countries.

Overall, even though the argument on the distinct types of billionaires' assets merits its traction in a subsample of low-income countries, it does not hold in the subsample of high-income countries. Thus, this argument cannot provide a unified explanation to the full sample.

3.3.3. Weak institutions make heir billionaires richer during a crisis?

The third alternative explanation is that weak institutions in low-income countries allow powerful billionaires to gain substantial wealth during the crisis. This, in turn, causes inequality to be more severe in these countries than high-income ones. This argument does find partial support from Tables 2 and 3. Inequality indeed increases more in low-income than high-income countries during a crisis. However, this argument cannot explain why heir billionaires outperform founder billionaires only in low-income countries, but not in high-income countries where institutions are strong.

In sum, the alternative argument on institutions can only explain different levels of inequality between low- and high-income countries during a crisis, but it cannot explain the differences in performance between heir and founder billionaires.

4. The Mechanism

In this section, I identify a mechanism through which heir billionaires gain so much wealth during the COVID crisis compared to founder billionaires and the stock markets. Because crises can drastically reduce firm liquidity, firms with little internal resources are left to find external financing in order to keep their businesses running. Such external financing may be scarce in countries with underdeveloped financial institutions (Levine, Lin, and Xie, 2016). This allows heir billionaires who control vast resources to not only survive a crisis using their internal financing, but also use their connections to exclusively receive government bailouts or favorable information. Therefore, in countries with weak financial institutions, assets of heir billionaires should outperform both those of founder billionaires as well as the stock markets. I provide the empirical methodology to test this hypothesis below.

4.1. Empirical Methodology

To show that underdeveloped financial institutions allow heir billionaires to rise in times of crisis, I run the following regression:

$$\Delta W_{ict} - \Delta MKT_{ct} = \alpha + \beta_1 Crisis_t \times Inst_c \times Heir_i + \beta_2 Crisis_t \times Inst_c + \beta_3 Crisis_t \times Heir_i + \beta_4 Inst_c \times Heir_i + \beta_5 Crisis_t + \beta_6 Heir_i + CountryFE + \epsilon_{ict} \quad (4)$$

where i, c and t index billionaire, country and year, respectively. $Inst$ is a measure of financial development. $CountryFE$ is country fixed effects. All other variables are defined in Table A1. Because the financial development data are available only until 2019, I use their averages over a pre-crisis period from 2017 to 2019 as their representative values.

With this specification, the effects of financial development on the rise of heir billionaires during the crisis is given by $\beta_3 + \beta_1 Inst_c$. A significantly negative β_1 would imply that less developed financial institutions are associated with larger increase of heir billionaires' wealth during the crisis.

Although it seems straightforward to estimate β_1 using an ordinary least squares (OLS) technique, this coefficient is likely biased because the financial development variable, $Inst$, is endogenous. That is, it can be correlated with other factors that may also contribute to increased inequality during a crisis. For example, if countries with weak financial institutions also have weak legal institutions, we cannot conclusively assert that the rise of heir billionaires in these countries is due to the former, but not the latter.

To circumvent this endogeneity issue, I follow Beck et al. (2000) and instrument the financial development variable, $Inst$, with an indicator variable equal to one if the country's legal origin is common law, and zero otherwise. The basic intuition behind this instrument is that countries with common-law legal origin have stronger outside-investor protection, resulting in more developed financial institutions (La Porta et al., 2008).

For this instrument to be valid, however, the country's legal origin must a) significantly

affect the levels of financial development, and b) affect inequality ($\Delta W - \Delta MKT$) only through the levels of financial development.

To test the first criterion, I run first-stage regressions in which the dependent variable is a measure of financial development and the independent variable ($LegalOriginUK$) is an indicator variable equal to one if the country's legal origin is common law, and zero otherwise. For robustness, I use three measures of financial development, namely, total market capitalization over GDP ($MktCap/GDP$), total traded volume of the stock market over GDP ($MktVol/GDP$), and domestic credit to private sector over GDP ($Credit/GDP$). The significantly positive coefficients on $LegalOriginUK$ in columns (1) to (3), Table 7 indicate that countries with a common-law legal origin indeed have significantly higher levels of financial development. Thus, the first criterion for a valid instrument is met.

To test the second criterion (i.e., the exclusion criterion), we must rely on sound economic reasoning. I argue that, although a country's legal origin was not randomly assigned, it was decided several decades in the past. Therefore, if this variable was correlated with other factors that also contribute to inequality, these factors must be stable over time. In other words, they must be time-invariant and country-specific, which can be controlled for by country fixed effects.

To illustrate this point, if a country's legal origin was decided based partly on a *tradition* that sustains the elite's influence, this tradition would be considered a different channel than financial development through which legal origins affect inequality. However, since tradition is arguably time-invariant and country-specific, its effects can be absorbed by the country fixed effects. Since equation (4) includes country fixed effects, we can conclude that the second criterion is met. With both identifying criteria met, the endogeneity bias on β_1 in Equation (4) is alleviated.

4.2. Why do heir billionaires get so much richer during the COVID crisis?

Columns (4) to (6) in Table 7 report the results from the two-stage-least-square (2SLS) regressions in which the financial development variable, $Inst$, is instrumented by the legal origin indicator variable, $LegalOriginUK$. The dependent variable is inequality as measured by growth of a billionaire's wealth less that of an equity market[4]. The coefficient on $Crisis \times Inst \times Heir$ is significantly negative across all specifications. This result is consistent with the aforementioned hypothesis that underdeveloped financial institutions allow for the rise of heir billionaires during a crisis.

The magnitude of the coefficient is also economically significant. In particular, column (4) in Table 7 shows that an increase in heir billionaires' wealth relative to an equity market during the crisis is given by $0.142 - 0.078 \cdot MktCap/GDP$. This relationship indicates that a one-ppt decrease in $MktCap/GDP$ causes heir billionaires' wealth to grow during the crisis more rapidly than the pre-crisis period by 22.0 ppt. Using $MktVol/GDP$ and $Credit/GDP$ as a measure of financial development yields similar conclusions.

[Insert Table 7 about here.]

Overall, the results in this section suggest that heir billionaires or old-money families gain considerable wealth in countries with weak financial institutions during a crisis. If the increased wealth of heir billionaires largely comes from rent seeking as previously argued, these results suggest that crises give rise to rent seekers in countries with weak financial institutions.

[4]Because of the small sample size and large number of fixed effects, the variance-covariance matrix for computing double-clustered standard errors is not of full rank in the 2SLS regressions. Therefore, in these specifications, I retain the country fixed effects to account for comovement in the dependent variable (Petersen, 2008) and report $p-$values from heteroskedasticity-consistent standard errors instead.

5. Conclusion

What do we learn from this paper? First, crises causally increase wealth inequality. While past research such as Bodea et al. (2021); de Haan and Sturm (2017); Baldacci et al. (2005) show that financial crises increase inequality, it suffers from endogeneity. Specifically, their results are confounded by other factors such as rapid credit expansion (Greenwood et al., 2022), or face reverse causality issues , i.e., inequality in fact causes financial crises (Rajan, 2010). This paper uses the COVID crisis, which is exogenous to the state of the economy, as its empirical setting. Therefore, we can correctly conclude that crises indeed cause wealth disparity to increase.

Second, crises give rise particularly to inequality stemming from heir billionaires or old-money business families in countries with underdeveloped financial institutions. If the rise of heir billionaires is a proxy for the increased value of rent-seeking, this evidence raises a plausibility that crises give rise to rent seekers in countries with weak financial institutions and thus put these countries deeper in the middle-income trap. This paper's empirical evidence provides a compelling case for strong financial markets and banking systems arguably because these financial institutions can help sustain unconnected firms and, consequently, ensure a competitive environment after the crisis.

Finally, I recognize that some of the explanations to my findings are by no means causal. Particularly, heir billionaires or old-money business families in low-income countries might not, on average, represent rent seekers. Therefore, their increased wealth might not be a perfect proxy for the increased value of rent-seeking. One may also argue that some founder billionaires themselves are adept rent seekers. Thus, their increased wealth is not always a result of efficient resource allocation. These errors in measurement should bias the coefficient on the variable of interest, $Crisis \times LowInc \times Heir$, downward. However, despite this downward bias, the coefficient remains significantly positive. Thus, this paper is the first to uncover an empirical pattern that sheds light on the differential dynamics of extreme wealth during a crisis. I welcome future work that can address this identification issues.

References

Acemoglu, D., Johnson, S., Kermani, A., Kwak, J., Mitton, T., 2016. The value of connections in turbulent times: Evidence from the united states. Journal of Financial Economics 121, 368–391.

Baldacci, E., de Mello, L., Inchauste, G., 2005. Macroeconomic Policies and Poverty Reduction, Routledge, chap. Financial crises, poverty, and income distribution.

Beck, T., Levine, R., Loayza, N., 2000. Finance and the sources of growth. Journal of Financial Economics 58, 261 – 300.

Bennedsen, M., Nielsen, K. M., Perez-Gonzalez, F., Wolfenzon, D., 2007. Inside the family firm: The role of families in succession decisions and performance. The Quarterly Journal of Economics 122, 647–691.

Bodea, C., Houle, C., Kim, H., 2021. Do financial crises increase income inequality? World Development 147, 105635.

de Haan, J., Sturm, J.-E., 2017. Finance and income inequality: A review and new evidence. European Journal of Political Economy 50, 171–195.

Faccio, M., Masulis, R. W., McConnell, J. J., 2006. Political connections and corporate bailouts. The Journal of Finance 61, 2597–2635.

Feenstra, R. C., Inklaar, R., Timmer, M. P., 2015. The next generation of the Penn World Table. American Economic Review 105, 3150–82.

Greenwood, R., Hanson, S. G., Shleifer, A., Sørenson, J. A., 2022. Predictable financial crises. The Journal of Finance 77, 863–921.

La Porta, R., Lopez-de Silanes, F., Shleifer, A., 2008. The economic consequences of legal origins. Journal of Economic Literature 46, 285–332.

Levine, R., Lin, C., Xie, W., 2016. Spare tire? stock markets, banking crises, and economic recoveries. Journal of Financial Economics 120, 81–101.

Masulis, R. W., Pham, P. K., Zein, J., Ang, A. E. S., 2022. Crises as opportunities for growth: The strategic value of business group affiliation. Journal of Financial and Quantitative Analysis p. 1–62.

Mehrotra, V., Morck, R., Shim, J., Wiwattanakantang, Y., 2013. Adoptive expectations: Rising sons in Japanese family firms. Journal of Financial Economics 108, 840 – 854.

Morck, R., Stangeland, D., Yeung, B., 2000. Inherited Wealth, Corporate Control and Economic Growth: The Canadian Disease? University of Chicago Press.

Perez-Gonzalez, F., 2006. Inherited control and firm performance. American Economic Review 96, 1559–1588.

Petersen, M. A., 2008. Estimating Standard Errors in Finance Panel Data Sets: Comparing Approaches. The Review of Financial Studies 22, 435–480.

Piketty, T., 2014. Capital in the Twenty-First Century. Harvard University Press.

Rajan, R. G., 2010. Fault Lines: How Hidden Fractures Still Threaten the World Economy. No. 9111 in Economics Books, Princeton University Press.

Rajan, R. G., Zingales, L., 2004. Saving Capitalism from the Capitalists: Unleashing the Power of Financial Markets to Create Wealth and Spread Opportunity. Princeton University Press.

Schumpeter, J. A., 1942. Capitalism, Socialism, and Democracy. Harper & Brothers, New York, third ed.

Tables

Table 1: Summary Statistics of Country-Level Variables

This table shows summary statistics of country-level variables. GDP is real GDP in constant 2017 billion international dollars. $GDPPC$ is real GDP per capita in constant 2017 international dollars. HC is human capital index whose higher value indicates higher human capital. KPC is real capital per capita in constant 2017 international dollars. $MktCap/GDP$ is end-of-year total capitalization of a country's equity market divided by GDP. $MktVol/GDP$ is total traded volume of a country's equity market divided by GDP. $Credit/GDP$ is domestic credit to private sector divided by GDP. Each variable is averaged over a period from 2016 to 2019, immediately before the COVID crisis. Definitions and data sources of all variables are provided in Table A1.

	N	Mean	SD	Min	p25	p50	p75	Max
GDP (const 2017 bil int'l $)	60	1,830	3,654	17	365	655	1,807	19,847
$GDPPC$ (const 2017 int'l $)	60	35,798	22,951	798	16,075	33,603	50525	111,120
KPC (const 2017 int'l $)	60	178,897	120,601	4,758	72,855	189,435	265615	520,821
HC	60	3.108	0.491	1.904	2.756	3.137	3.435	4.072
$MktCap/GDP$	50	0.962	1.679	0.043	0.302	0.571	1.007	11.689
$MktVol/GDP$	45	0.455	0.857	0.000	0.058	0.105	0.471	5.305
$Credit/GDP$	57	0.905	0.502	0.122	0.496	0.853	1.314	2.238

Table 2: Summary Statistics of Inequality during the COVID Crisis

This table reports the summary statistics of inequality around the world during the COVID crisis as compared to those three years before the crisis. Inequality is measured by growth of billionaires' wealth relative to growth of their respective countries' equity markets. The data cover a period from 2017 to 2020 where 2020 is the COVID crisis year. ΔH, ΔF, ΔMKT are log growth of heir billionaire's wealth, log growth of founder billionaire's wealth, and log growth of Datastream's total market index, respectively. Log growth is computed as the difference between log value as of the end of current year and that as of the end of last year. Countries are classified as low-income if their $GDPPC$ are less than the sample median, otherwise they are classified as high-income. Numbers in parentheses are p-values for rejecting a null hypothesis of zero coefficient. ***, ** and * indicate statistical significance at 1%, 5%, and 10% levels, respectively.

	Before COVID Crisis (2017−2019)			COVID Crisis (2020)			Difference: (Crisis − Before)	
	N	Mean	p-Value	N	Mean	p-Value	Mean	p-Value
Panel A: Entire Sample								
$\Delta H - \Delta MKT$	1,525	−0.138***	(0.000)	569	0.151***	(0.000)	0.289***	(0.000)
$\Delta F - \Delta MKT$	3,466	−0.089***	(0.000)	1,453	0.172***	(0.000)	0.261***	(0.000)
Difference: $(\Delta H - \Delta F)$		−0.048***	(0.000)		−0.021	(0.219)		
Panel B: Low-income countries								
$\Delta H - \Delta MKT$	541	−0.143***	(0.000)	201	0.294***	(0.000)	0.437***	(0.000)
$\Delta F - \Delta MKT$	1,733	−0.066***	(0.000)	754	0.219***	(0.000)	0.284***	(0.000)
Difference: $(\Delta H - \Delta F)$		−0.078***	(0.000)		0.075***	(0.005)		
Panel C: High-income countries								
$\Delta H - \Delta MKT$	984	−0.135***	(0.000)	368	0.073***	(0.000)	0.208***	(0.000)
$\Delta F - \Delta MKT$	1,733	−0.113***	(0.000)	699	0.121***	(0.000)	0.234***	(0.000)
Difference: $(\Delta H - \Delta F)$		−0.022**	(0.045)		−0.048**	(0.021)		

Table 3: Inequality around the World during the COVID Crisis

This table reports the results from OLS regressions where the dependent variable is inequality as measured by growth of billionaires' wealth relative to growth of their respective countries' equity markets. Results show that inequality heightens substantially during the COVID crisis, especially inequality that arises from heir billionaires in low-income countries. The data cover a period from 2017 to 2020 where 2020 is the COVID crisis year. ΔW, ΔGDP and $\Delta GDPPC$ are log growth of a billionaire's wealth, log growth of GDP and log growth of $GDPPC$, respectively. Log growth is computed as the difference between log value as of the end of current year and that as of the end of last year. $Crisis$ equals one if year = 2020, and zero otherwise. $LowInc$ equals one if the country's $GDPPC$ is below the sample mean, and zero otherwise. $Heir$ equals one if the billionaire is classified as heir, and zero otherwise. All other variables are defined in Table A1. Standard errors are double-clustered on country and year. Numbers in parentheses are p-values for rejecting a null hypothesis of zero coefficient. ***, ** and * indicate statistical significance at 1%, 5%, and 10% levels, respectively.

Dependent Variable:	$\Delta W - \Delta MKT$	
	(1)	(2)
$Crisis \times LowInc \times Heir$	0.180*	0.177**
	(0.086)	(0.026)
$Crisis \times LowInc$	0.050	0.047
	(0.412)	(0.113)
$Crisis \times Heir$	−0.028*	−0.028**
	(0.090)	(0.029)
$LowInc \times Heir$	−0.052	−0.031
	(0.116)	(0.374)
$Crisis$	0.236	0.236*
	(0.131)	(0.077)
$Heir$	−0.025*	−0.023*
	(0.090)	(0.070)
$LowInc$	0.008	
	(0.517)	
$\log(GDPPC)$	−0.119***	
	(0.001)	
$\log(HC)$	0.153*	
	(0.079)	
$\log(KPC)$	0.062***	
	(0.002)	
$\log(GDP)$	−0.008	
	(0.382)	
Constant	0.347***	−0.093
	(0.000)	(0.388)
Country FE	No	Yes
R^2	0.136	0.147
N	7,013	7,013

Table 4: Robustness: Alternative Measures of Inequality

This table reports the results from OLS regressions where the dependent variable is inequality as measured by growth of billionaires' wealth relative to growth of their respective countries' GDP and GDP per capita. Results show that inequality heightens substantially during the COVID crisis, especially inequality that arises from heir billionaires in low-income countries. The data cover a period from 2017 to 2020 where 2020 is the COVID crisis year. ΔW, ΔMKT, ΔGDP and $\Delta GDPPC$ are log growth of a billionaire's wealth, log growth of Datastream's total market index, log growth of GDP and log growth of $GDPPC$, respectively. Log growth is computed as the difference between log value as of the end of current year and that as of the end of last year. $Crisis$ equals one if year = 2020, and zero otherwise. $LowInc$ equals one if the country's $GDPPC$ is below the sample mean, and zero otherwise. $Heir$ equals one if the billionaire is classified as heir, and zero otherwise. All other variables are defined in Table A1. Standard errors are double-clustered on country and year. Numbers in parentheses are p-values for rejecting a null hypothesis of zero coefficient. ***, ** and * indicate statistical significance at 1%, 5%, and 10% levels, respectively.

Dependent Variable:	$\Delta W - \Delta GDP$		$\Delta W - \Delta GDPPC$	
	(1)	(2)	(3)	(4)
$Crisis \times LowInc \times Heir$	0.089*	0.091*	0.091***	0.093*
	(0.078)	(0.098)	(0.005)	(0.091)
$Crisis \times LowInc$	0.053**	0.050*	0.050*	0.047*
	(0.022)	(0.065)	(0.062)	(0.074)
$Crisis \times Heir$	−0.012	−0.013	−0.013	−0.013
	(0.345)	(0.312)	(0.562)	(0.278)
$LowInc \times Heir$	−0.015	−0.004	−0.014	−0.005
	(0.706)	(0.870)	(0.294)	(0.858)
$Crisis$	0.348**	0.348***	0.349***	0.349***
	(0.016)	(0.004)	(0.000)	(0.004)
$Heir$	−0.030**	−0.030**	−0.031***	−0.030**
	(0.028)	(0.023)	(0.000)	(0.025)
$LowInc$	−0.031		−0.034**	
	(0.256)		(0.013)	
$\log(GDPPC)$	−0.106		−0.091***	
	(0.177)		(0.001)	
$\log(HC)$	0.071		0.052	
	(0.290)		(0.446)	
$\log(KPC)$	0.075		0.062***	
	(0.260)		(0.002)	
$\log(GDP)$	0.003		0.001	
	(0.461)		(0.703)	
Constant	0.056***	−0.035	0.122	−0.029
	(0.004)	(0.568)	(0.311)	(0.636)
R^2	0.246	0.252	0.245	0.251
N	6,893	6,892	6,893	6,892

Table 5: Robustness: Removing Potential Outliers

This table reports the results from OLS regressions where the dependent variable is inequality as measured by growth of billionaires' wealth relative to growth of their respective countries' equity markets, GDP, and GDP per capita. Continuous variables are winsorized at 1 and 99 percentiles to attenuate the effects of outliers. Results show that inequality heightens substantially during the COVID crisis, especially inequality that arises from heir billionaires in low-income countries. The data cover a period from 2017 to 2020 where 2020 is the COVID crisis year. ΔW, ΔMKT, ΔGDP and $\Delta GDPPC$ are log growth of a billionaire's wealth, log growth of Datastream's total market index, log growth of GDP and log growth of $GDPPC$, respectively. Log growth is computed as the difference between log value as of the end of current year and that as of the end of last year. $Crisis$ equals one if year = 2020, and zero otherwise. $LowInc$ equals one if the country's $GDPPC$ is below the sample mean, and zero otherwise. $Heir$ equals one if the billionaire is classified as heir, and zero otherwise. All other variables are defined in Table A1. Standard errors are double-clustered on country and year. Numbers in parentheses are p-values for rejecting a null hypothesis of zero coefficient. ***, ** and * indicate statistical significance at 1%, 5%, and 10% levels, respectively.

Dependent Variable:	$\Delta W - \Delta MKT$	$\Delta W - \Delta GDP$	$\Delta W - \Delta GDPPC$
	(1)	(2)	(3)
$Crisis \times LowInc \times Heir$	0.166**	0.089*	0.091*
	(0.029)	(0.064)	(0.059)
$Crisis \times LowInc$	0.044	0.046**	0.043*
	(0.128)	(0.045)	(0.053)
$Crisis \times Heir$	−0.023*	−0.006	−0.007
	(0.084)	(0.617)	(0.549)
$LowInc \times Heir$	−0.020	0.002	0.002
	(0.516)	(0.890)	(0.903)
$Crisis$	0.227*	0.337***	0.338***
	(0.082)	(0.005)	(0.005)
$Heir$	−0.023	−0.029**	−0.029**
	(0.101)	(0.031)	(0.032)
Constant	−0.092	−0.033	−0.027
	(0.385)	(0.578)	(0.648)
Country FE	Yes	Yes	Yes
R^2	0.159	0.275	0.274
N	7,013	6,892	6,892

Table 6: Placebo Tests

This table reports the results from OLS regressions where the dependent variable is inequality as measured by growth of billionaires' wealth relative to growth of their respective countries' equity markets. The data cover a non-crisis period from 2017 to 2020. ΔW, ΔGDP and $\Delta GDPPC$ are log growth of a billionaire's wealth, log growth of GDP and log growth of $GDPPC$, respectively. Log growth is computed as the difference between log value as of the end of current year and that as of the end of last year. $PlaceboCrisis$ is "placebo" crisis year and equals one if year is either 2017, 2018, or 2019, and zero otherwise. $LowInc$ equals one if the country's $GDPPC$ is below the sample mean, and zero otherwise. $Heir$ equals one if the billionaire is classified as heir, and zero otherwise. All other variables are defined in Table A1. Standard errors are double-clustered on country and year. Numbers in parentheses are p-values for rejecting a null hypothesis of zero coefficient. ***, ** and * indicate statistical significance at 1%, 5%, and 10% levels, respectively.

Dependent Variable:	$\Delta W - \Delta MKT$		
Placebo Crisis Year:	2017	2018	2019
	(1)	(2)	(3)
$PlaceboCrisis \times LowInc \times Heir$	−0.103	0.001	−0.082
	(0.116)	(0.979)	(0.278)
$PlaceboCrisis \times LowInc$	−0.033	−0.028	−0.008
	(0.246)	(0.421)	(0.786)
$PlaceboCrisis \times Heir$	0.027***	0.011	0.001
	(0.000)	(0.460)	(0.962)
$LowInc \times Heir$	0.051	0.023	0.035
	(0.192)	(0.595)	(0.453)
$PlaceboCrisis$	−0.092	0.169	−0.349**
	(0.467)	(0.207)	(0.013)
$Heir$	−0.041***	−0.038**	−0.032*
	(0.001)	(0.023)	(0.062)
Constant	0.010	−0.054	0.058
	(0.939)	(0.680)	(0.496)
Country FE	Yes	Yes	Yes
R^2	0.048	0.062	0.199
N	7,013	7,013	7,013

Table 7: Financial Development and the Rise of Heir Billionaires during the COVID Crisis

This table reports the results from 2SLS regressions where the dependent variable is inequality as measured by growth of billionaires' wealth relative to growth of their respective countries' equity markets. Different measures of financial development, namely, $MktCap/GDP, MktVol/GDP$ and $Credit/GDP$, are used in different specifications. Measures of financial development are instrumented by $LegalOriginUK$ which equals one if the country's legal origin is from the UK, and zero otherwise. Results suggest that strong financial institutions curb the rise of inequality from heir billionaires during the COVID crisis. The data cover a period from 2017 to 2020 where 2020 is the COVID crisis year. ΔW and ΔMKT are log growth of a billionaire's wealth and Datastream's total market index. Log growth is computed as the difference between log value as of the end of current year and that as of the end of last year. $Crisis$ equals one if year $\geq$ 2020, and zero otherwise. $LowInc$ equals one if the country's $GDPPC$ is below the sample mean, and zero otherwise. $Heir$ equals one if the billionaire is classified as heir, and zero otherwise. $MktCap/GDP$ is end-of-year total capitalization of a country's equity market divided by GDP. $MktVol/GDP$ is total traded volume of a country's equity market divided by GDP. $Credit/GDP$ is domestic credit to private sector divided by GDP. Numbers in parentheses are p-values for rejecting a null hypothesis of zero coefficient. ***, ** and * indicate statistical significance at 1%, 5%, and 10% levels, respectively.

	First-Stage Regression			Second-Stage Regression		
Dependent Variable:	$\frac{MktCap}{GDP}$	$\frac{MktVol}{GDP}$	$\frac{Credit}{GDP}$	$\Delta W - \Delta MKT$		
Institutional Variable: $[Inst]$				$\left[\frac{MktCap}{GDP}\right]$	$\left[\frac{MktVol}{GDP}\right]$	$\left[\frac{Credit}{GDP}\right]$
	(1)	(2)	(3)	(4)	(5)	(6)
$LegalOriginUK$	1.412*	0.853**	0.498*			
	(0.064)	(0.031)	(0.073)			
$Crisis \times [Inst] \times Heir$				−0.078**	−0.079*	−0.130*
				(0.013)	(0.089)	(0.078)
$Crisis \times [Inst]$				−0.017	−0.028	−0.057
				(0.313)	(0.391)	(0.296)
$Crisis \times Heir$				0.142***	0.104*	0.187*
				(0.006)	(0.099)	(0.075)
$[Inst] \times Heir$				0.009	0.008	0.022
				(0.663)	(0.748)	(0.562)
$Crisis$				0.281***	0.292***	0.341***
				(0.000)	(0.000)	(0.000)
$Heir$				−0.038	−0.035	−0.055
				(0.268)	(0.329)	(0.318)
Constant	0.651***	0.760***	1.109***	−0.260***	−0.263***	−0.260***
	(0.000)	(0.003)	(0.000)	(0.001)	(0.001)	(0.001)
Country FE	No	No	No	Yes	Yes	Yes
R^2	0.126	0.183	0.209	0.127	0.140	0.152
N	6,372	6,163	6,741	6,372	6,163	6,741

Appendix A. Variable Definitions

Table A1: Variable Definitions and Data Sources

Variable	Definition
$Heir$	An indicator variable equal to 1 if a billionaire is classified as an heir, and 0 if classified as a founder.
$Crisis$	An indicator variable equal to 1 if year = 2020, and 0 otherwise.
$PlaceboCrisis$	"Placebo" crisis year and equals one if year is either 2017, 2018, or 2019, and 0 otherwise.
ΔW	Log growth of a billionaire's wealth defined as log difference between a billionaire's wealth at the end of the current year and that at the end of last year. Source: Forbes.
ΔH	Log growth of an heir billionaire's wealth defined as log difference between a heir billionaire's wealth at the end of the current year and that at the end of last year. Source: Forbes.
ΔF	Log growth of a founder billionaire's wealth defined as log difference between a founder billionaire's wealth at the end of the current year and that at the end of last year. Source: Forbes.
ΔMKT	Log growth of an equity market index defined as log difference between the value of Datastream total market index at the end of the current year and that at the end of last year. Source: Datastream.
ΔGDP	Log growth of nominal GDP defined as log difference between nomial GDP at the end of the current year and that at the end of last year. Source: World Bank.
$\Delta GDPPC$	Log growth of nominal GDP per capita defined as log difference between nomial GDP per capita at the end of the current year and that at the end of last year. Source: World Bank.
GDP	Real GDP in billion constant 2017 international dollars averaged over a period from 2017 to 2019. Source: PWT 10.0.
$GDPPC$	Real GDP divided by population in constant 2017 international dollars averaged over a period from 2017 to 2019. Source: PWT 10.0.
HC	Human Capital Index which ranges from 1 to 5 and is averaged over a period from 2017 to 2019. A higher value indicates higher human capital. Source: PWT 10.0.
KPC	Real Capital per capita in constant 2017 international dollars averaged over a period from 2017 to 2019. Source: PWT 10.0.
$LowInc$	An indicator variable equal to 1 if a country's $GDPPC$ is less than the sample median, and 0 otherwise.
$LegalOriginUK$	An indicator variable equal to 1 if a country's legal origin is from the United Kingdom (common law legal origin), and 0 otherwise.
$MktCap/GDP$	End-of-year total capitalization of a country's equity market divided by GDP. The values are averaged over a period from 2017 to 2019. Source: World Bank.
$MktVol/GDP$	Total traded volume of a country's equity market divided by GDP. The values are averaged over a period from 2017 to 2019. Source: World Bank.
$Credit/GDP$	Domestic credit to private sector divided by GDP. The values are averaged over a period from 2017 to 2019. Source: World Bank.