Inherited Corporate Control and Economic Growth

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Abstract

While many argue that high wealth concentration is associated with slow economic growth, this paper shows that this may depend on sources of wealth of the ultra rich. Using hand-collected data, I classify billionaires as *heirs* if they inherit corporate control from their family and *founders* if they are first-generation entrepreneurs. I find that one-standard-deviation increase in heirs' (founders') wealth/GDP correlates with 1.69% decline (2.36% increase) in total-factor-productivity growth over next five years. To alleviate endogeneity, I show that market indexes react positively around billionaires' sudden deaths and that they react more strongly in countries with weaker institutions, indicating that billionaires generate spillovers and are more influential in these countries. I conclude that heir (founder) billionaires hinder (promote) economic productivity when institutions are weak, while both are results of creative destruction when institutions are strong.

JEL classification: O16, F30, G38

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1. Introduction

Billionaires around the world have increasingly gained control of their national economies over the past three decades. Figure 1 plots the aggregate billionaires' wealth over GDP from 1986 to 2017[1] using data from Forbes's lists of billionaires. Over this period, billionaires' wealth/GDP has increased over eight-fold in North America as well as Europe & Central Asia, four-fold in Asia & Pacific, and seven-fold in Latin America. Middle East & North Africa appears to have highly fluctuating billionaires' wealth/GDP perhaps because wealth of billionaires in this region is tied to oil and gas prices. Africa also sees an upward trend of this measure, but its billionaires only started to appear in the Forbes's list in 1993.

[Insert Figure 1 about here.]

As of 2017, billionaires' wealth/GDP is approximately 15.4% in North America, 11.7% in Europe & Central Asia, 10.4% in Asia & Pacific, 8.8% in Latin America, 7.4% in Middle East & North Africa, and 5.5% in Africa. While appearing substantial, these numbers likely understate the actual *control* billionaires have over their national economies. This is because Forbes estimates their wealth based on their *ownership*, as opposed to *control*, of firms or other assets. La Porta, de Silanes, and Shleifer (1999) argue that voting control stakes as small as 10% or 20%, if no other stakes are larger, can provide effective control over a firm. Thus, ownership stakes worth one billion USD, for example, may translate into control of assets worth 5 (=1/20%) billion USD or much more.

Such increasing concentration of wealth is consistent with Piketty (2014)'s observations. While prior literature suggests that high concentration of wealth is generally associated with negative economic outcomes (Piketty, 2014; Islam and McGillivray, 2020; Persson and Tabellini, 1994; de la Croix and Doepke, 2003), I argue that the economic impact of wealth concentration may depend on the sources of wealth of the ultra rich. Morck, Stangeland,

[1] Since the Forbes uses the information from the year before to report billionaires' wealth in the current year, the wealth in year t in this graph is therefore from Forbes's list of billionaires in year $t + 1$. Missing data points on billionaires' wealth are also imputed using the method proposed in Section 2.

and Yeung (2000) posit that billionaires may have heterogeneous impact on the economy. They show that countries with larger fractions of self-made billionaires' wealth over GDP grow more rapidly, while those with larger fractions of heir or old-money billionaires' wealth over GDP grow more slowly.

Morck, Wolfenzon, and Yeung (2005) review several plausible explanations to the above finding. In short, wealthy families behind large business groups might be necessary for growth in the early stage of economic development. This is because an economy at this stage lacks adequate capital markets and strong legal institutions, causing transaction costs between two independent firms to be too high. With control over several firms, often in distinct industries, wealthy families can overcome such economic frictions by instructing firms under their control to transact with one another. This ultimately reduces transaction costs and thus makes projects that are otherwise deemed infeasible by independent firms profitable, resulting in accelerated economic growth (Khanna and Yafeh, 2007).

As wealthy business families in developing economies become more successful, control of the private sector in these economies also becomes more concentrated in the hand of a few business elites. Such concentration of corporate control risks turning into impediment for growth when the control is passed down to younger generations. This is because heirs to large business groups cannot reliably inherit the entrepreneurial talent from their successful parents (Perez-Gonzalez, 2006; Bennedsen, Nielsen, Perez-Gonzalez, and Wolfenzon, 2007; Mehrotra, Morck, Shim, and Wiwattanakantang, 2013). However, as heirs to business elites, they grew up in a privileged circle, allowing them to reliably inherit their parents' connections. With their talent regressing to the population's average, heirs to large business groups are more likely to make use of their strong family connections by investing in political rent-seeking in order to prevent entry from more talented entrepreneurs. This can be done through lobbying to reverse their countries' financial development, making it difficult for new entrepreneurs to raise capital to finance their firms (Rajan and Zingales, 2004).

The above literature sheds light on the heterogeneous nature of inequality. That is, inequality resulted from large-scale entrepreneurship is good for the economy, whereas inequality resulted from inherited control of large corporations detrimental. Morck et al. (2000)'s empirical support on this argument is based on a small cross-section of 32 countries in 1993. In this paper, I extend Morck et al. (2000)'s dataset and construct a panel of country-level billionaire wealth that covers 78 countries over a period from 1986 to 2017. This new dataset not only allows for more powerful statistical tests, but also the exploration of subsamples of countries with different institutions. Furthermore, unlike conventional data on inequality which rely on the wealth distribution, the important feature of this dataset is that it takes into account sources of wealth (i.e, inherited *vis*-à-*vis* self-made) that create disparity between the ultra rich and the average citizen. This feature allows for a nuanced set of findings that let us better understand inequality.

Using this new dataset, I report the following findings. First, I find that one-standard-deviation increase in heir billionaires' wealth/GDP is significantly associated with 1.69% decline in total-factor productivity (TFP) growth over the next five years, whereas one-standard-deviation increase in founder billionaires' wealth/GDP is significantly associated with 2.36% increase in TFP growth over the same period. When considering growth of per capita GDP in place of TFP, the coefficient on heir billionaires' wealth/GDP as well as that on founder billionaires' wealth/GDP are not consistently significant. Thus, unlike Morck et al. (2000) who find significant correlations between billionaires' wealth/GDP and future GDP growth, this paper suggests that billionaires likely affect their national economies through aggregate productivity rather than aggregate output.

Second, I take advantage of the long panel and examine the impact of billionaires on long-term economic growth. I find that the differential impact of heir *vis*-à-*vis* founder billionaires on TFP growth remains significant and that its magnitude becomes larger. Specifically, one-standard-deviation increase in heir (founder) billionaires' wealth/GDP is significantly associated with 5.86% decline (9.65% increase) in TFP growth over the next 20 years.

Finally, with the larger dataset, I investigate the impact of billionaires on subsamples of countries with different institutions. I find that the negative impact of heir billionaires on TFP growth is exacerbated in less democratic countries (as indicated by the Polity Index), suggesting that heir billionaires or old-money families are more powerful in countries with weaker political institutions. On the other hand, the positive impact of founder billionaires on TFP growth is magnified in countries with high social security (as measured by the State Fragility Index) and economic freedom (as measured by the Economic Freedom Index). This result is consistent with a hypothesis that low barriers to entry allow for the rise of new highly successful entrepreneurs who propel the pace of creative destruction.

Despite the substantially more comprehensive dataset, I recognize that the results stated above are by no means causal. In other words, it is still inconclusive weather billionaires influence productivity growth, or they might be a result of productivity growth itself.

To elaborate, in an economy with weak institutions, founder billionaires may indeed overcome economic frictions and thus drive their countries' productivity growth. On the other hand, heir billionaires may tend to invest in political rent-seeking to block new entrants, resulting in a slow pace of creative destruction. However, the reverse causality (i.e., creative destruction has differential impact on billionaires) may also be true. That is, in an economy with strong institutions, low entry barriers allow new innovative firms to flourish, causing highly successful entrepreneurs to attain the billionaire status. Meanwhile, they also let these new firms destroy stagnant ones, causing wealth of old-money families to wither away.

To identify the direction of causality, I utilize the sudden deaths of billionaires around the world who have appeared on the Forbes's lists during 1986−2017 as a natural experiment. Note that using *annual* TFP growth as the dependent variable as before would induce substantial confounders since various other plausible events could have occurred during the year the billionaire died. Therefore, to observe the spillovers generated by billionaires, I investigate reactions of the *entire stock market* instead as these can be measured at a daily frequency. With a much shorter event window, I can exclude extreme confounders such as political unrest that may drive the results. Further, since deaths are arguably random[2], they are uncorrelated with other confounding factors which should cancel out as the sample size increases (MacKinlay, 1997).

Following are the findings from this natural experiment. First, I find that Datastream total market indexes react positively around the deaths of billionaires. Specifically, the cumulative abnormal return (CAR) on the indexes is 0.612% around the events. This CAR is statistically significant with a $p-$value of 0.080. This result confirms that billionaires have an impact not only on their firms but also the rest of the stock markets.

Second, I find that the magnitude of market reactions, measured by cumulative abnormal volatility (CAV), to billionaires' sudden deaths is larger in countries with less representative governments, weaker social security, and low economic freedom. This result lends support to the hypothesis that billionaires behind large business groups or conglomerates do influence the economy when its institutions are weak. In contrast, billionaires become less influential as institutions become stronger and thus are a result of creative destruction. It must be stressed that the results above do not indicate that the causality is unidirectional. It can well be circular, i.e., billionaires can cause growth, and the other way around at the same time. Nevertheless, these results help identify that causality is more likely to run from billionaires to TFP growth in countries with weak institutions, but from TFP growth to billionaires in countries with strong institutions.

This paper offers three main contributions to the literature. First, its novel dataset shows that wealth has been increasing concentrated in the hand of the ultra rich around the world. Although Piketty (2014) also reports this trend, this dataset goes one step beyond conventional data on inequality by taking into account sources of wealth of the ultra rich. This feature allows for more nuanced findings on inequality. That is, inequality arising from large-scale entrepreneurship benefits growth, while inequality arising from inherited control of large corporations stalls it. Furthermore, this result offers additional insights to

[2]Endogenous deaths such as suicide and assassination are excluded.

the inequality literature which generally regards high concentration of wealth as impediment for growth.

Second, the substantially larger dataset allows us to explore which institutions matter more to the billionaire impact on economic growth. I show that the negative impact of heir billionaires is exacerbated in countries with less representative government (more autocratic). On the other hand, the positive impact of founder billionaires is magnified in countries with more social security (less fragile) and more economic freedom.

Finally, this paper shows that billionaires or controllers of large business groups can influence firms outside their control and that such influence in higher in countries with weaker institutions. Thus, unlike the conventional belief in finance that controlling shareholders are firm-specific risks, this result indicates that these powerful individuals can be regarded as systematic risks. As a result, they can cause efficiency or a lack thereof at the macroeconomic level, particularly in developing economies where business groups are ubiquitous (Dau, Morck, and Yeung, 2021). This result also helps identify the direction of causality. That is, heir (founder) billionaires likely slow (accelerate) the process of creative destruction in countries with weaker institutions, resulting in slower (faster) productivity growth. In contrast, in countries with strong institutions, creative destruction creates more highly successful entrepreneurs while destroying wealth of stagnant old-money families.

The rest of this paper is organized as follows. Section 2 presents the construction process of the billionaire data. Section 3 reports the main findings. Section 4 discusses the endogeneity issues of the main findings, demonstrates the methodology that mitigates these issues, and reports the results. Finally, Section 5 concludes.

2. The Billionaire Data

I collect a panel of billionaires' wealth from Forbes's lists of billionaires from 1987 to 2018. Forbes started reporting this list in 1987. To retrieve the list of billionaire candidate, Forbes deploys its employees to interview people familiar with the matter in each country. They then estimate the wealth of each candidate using his/her ownership in publicly listed companies. If the candidate owns privately held companies, Forbes estimates his/her wealth using comparable matrices to assess the market value. In cases where the information is available, Forbes also includes the candidate's miscellaneous ownership in real estate, jewelry or art pieces.

Note that Forbes's estimation of wealth depends solely on *ownership* rather than *control*. Therefore, some large business families such as the Wallenbergs who control approximately half of the Stockholm Stock Exchange's total market capitalization (Agnblad, Berglof, Hogfeldt, and Svancar, 2002) are excluded from the Forbes's list of billionaires if their aggregate wealth does not exceed one billion USD. Forbes also excludes large multi-generational dynasties such as the United States' Du Pont family whose wealth is dispersed among several tens or even hundreds family members.

Like any estimates, Forbes's estimation of billionaires' wealth may contain errors. However, even with its plausible errors and lack of coverage on certain powerful business families, Forbes appears to offer the best executed and most comprehensive estimation available. For comparison, Forbes started reporting the list of billionaires in 1987, and so far has covered over 78 countries and any individual or family with wealth above one billion USD. On the other hand, Bloomberg's lists of billionaires cover only the top 500 richest people in the world and started in 2012.

I employ the following steps to construct the billionaire data.

1) Gather Forbes's lists of billionaires from 1987 to 2018 and lag all billionaires' wealth by one year. The Forbes's lists constitute a panel of billionaires' wealth that covers 78 countries and contains over 20,000 billionaire-year observations. Since Forbes reveals the list around the end of the first quarter or early of the second quarter of the current year, the information used to estimate the wealth is as of the year before. Put differently, the wealth reported in the list in year t reflects the information from year $t-1$. Therefore, wealth reported in

the list must be lagged by one year. As a result, the final panel of billionaires' wealth from 1986−2017 is from the Forbes lists from 1987−2018.

2) Classify each billionaire as a *founder* or an *heir*. A *founder* billionaire is a successful first-generation entrepreneur who started his firm from the beginning. I verify this by checking his family background. Specifically, he must not be from a family that owns a company or is known as an old-money family. If the information on his family background is not available, I check his career path—a founder billionaire must have started his career as a blue- or white-collar worker. If the information on both family background and career path is unavailable, I follow the classification by Forbes. Finally, if the billionaire is not classified as a *founder*, he is classified as an *heir*.

3) Exclude politician billionaires and drug lords. Since the focus of this paper is to study the impact of billionaires or families behind large businesses on economic growth, I exclude politician billionaires who have amassed their wealth mainly through expropriating government's assets. These politician billionaires include, for example, Iraq's Saddam Hussein and Indonesia's Suharto. I also exclude billionaires who gained wealth from illegal drug businesses such as Colombia's Pablo Escobar and Mexico's Joaquin Guzman Loera.

4) Aggregate wealth and classify the billionaire from the individual level to the family level. The panel data obtained from Steps 1) to 3) are at the individual billionaire level. Many billionaires are part of wealthy families that often make corporate decisions as a group. Therefore, classifying a billionaire as founder or heir at the individual level does not reflect this practice. To classify billionaires as founder or heir at the family level, I consider the classification of each individual billionaire in the same family. If all family members are classified as founders (e.g., entrepreneur siblings and couples), or there is at least one founder (i.e., the founder patriarch/matriarch who is the head of the family), this family is classified as founder. If all family members are classified as heirs, this family is classified as heir. Then, I aggregate wealth of all family members in each year to obtain the total wealth at the family level. Note that if the billionaire at hand is the first-generation entrepreneur

who does not belong to any wealthy family, his classification is as it is in Step 2).

5) Assign a country to each family. I assign each billionaire family 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 and listed or headquartered in another. In these cases, the assigned country is the one in which their firms operate, e.g., where their factories or mines are located.

6) Impute the missing wealth. Note that Forbes's lists of billionaires only include individuals or families with wealth above one billion USD. This threshold excludes some very wealthy individuals from the list in some years because their businesses do not perform well in that period, although they might reappear after their businesses gain sufficient value. Wealth of these individuals is thus considered *missing*, as opposed to zero, because, in *missing* period, they are still running large corporations or business groups.

To alleviate this missing data problem, I propose the following method to impute, i.e., replace the missing observations with the best predictions based on some assumptions. To begin with, note that some billionaires may appear on the Forbes list in one year and disappear for several years before they reappear. Consequently, there can be very few observations on their wealth. This makes a conventional imputation method that requires a regression model an unviable option.

Constrained by this small sample issue, I utilize the following imputation method that does not require a regression model. This method assumes that the billionaire's wealth/GDP grows at a constant rate during the missing period. This assumption is plausible because billionaires in the missing period are still running their firms; thus, their impact, as measure by their wealth divided by GDP, should be positive but may increase or decrease at a constant rate.

To implement this imputation, I compute the rate at which a billionaire's wealth/GDP grows, r, as follows:

$$(Wealth/GDP)_{t+T} = (Wealth/GDP)_t \cdot r^T \tag{1}$$

$Wealth/GDP_t$ is the billionaire's wealth divided by GDP at the year before his wealth becomes missing. $t+T$ is the first year his wealth becomes available. With (1), we can solve for r. Using this r, we can back out the missing billionaire's wealth in year $t+n$ as follows:

$$Wealth_{t+n} = (Wealth/GDP)_t \cdot r^n \cdot GDP_{t+n} \tag{2}$$

To prevent the results from being driven by imputed data points, I only impute the billionaire's wealth if the missing period is shorter than five years.

7) Aggregate billionaires' wealth to the country level. For a particular country and year, I sum all the wealth of billionaires by their type to form a) total founders' wealth over GDP (FD/GDP) and b) total heirs' wealth over GDP (HE/GDP). Using the final dataset, I plot aggregate heirs' wealth/GDP and founders' wealth/GDP over time by geographical regions in Figure 2. In the top graph, heirs' wealth/GDP shows an increasing trend over 1986−2017 in all regions but the Middle-East & North Africa. As with the top graph, the bottom graph shows that founders' wealth/GDP has been increasing substantially over the same period in all regions except the Middle-East & North Africa.

[Insert Figure 2 about here.]

Table 1 reports summary statistics of the main variables. All variable definitions and data sources are provided in Table A1. FD/GDP ranges from 0 to 20.9%, while HE/GDP ranges from 0 to 12.8%. FD/GDP fluctuates more greatly than HE/GDP as indicated by the former's larger standard deviation. The data also cover a wide range of country-level characteristics. GDP ranges from as small as 38,462 million USD (2017 constant at PPP) to 4,871 billion USD, $GDPPC$ from 4,400 to 59,399 USD. Other measures of institutions also vary greatly. For example, *Polity* varies from -7 (highly autocratic) to 10 (highly democratic).

[Insert Table 1 about here.]

Table 2 shows Pearson correlation coefficients among the main variables. FD/GDP correlates significantly with HE/GDP, which is consistent with Figure 2 above that both increase over time. It also correlates significantly with productivity growth ($TFPgr$), per capita GDP growth ($GDPPCgr$) and GDP growth ($GDPgr$). These correlations appear to be consistent with the idea that a) founder billionaires overcome economic frictions, resulting in faster economic growth, or b) creative destruction accelerates growth, creating more founder billionaires.

[Insert Table 2 about here.]

HE/GDP, on the other hand, is associated with slower TFP growth. This may be because heir billionaires are largely adept rent-seekers and thus create negative spillovers to TFP. However, this may also be because the slow pace of creative destruction that prevents new entrepreneurs from breaking in the barriers and destroying the wealth of old-money families.

The correlation coefficients reported in Table 2 are univariate tests that do not account for country-level characteristics and certain unobservables, such as the global economic conditions in a certain year that drive billionaires' wealth as well as economic growth. The following subsection conducts more rigorous tests that control for these characteristics.

3. Main Findings

Successful first-generation entrepreneurs or founder billionaires may be good for economic growth if they allocate their vast resources efficiently. In contrast, heirs to large conglomerates or business groups may be bad for growth since they cannot reliably inherit their parents' entrepreneurial talent and thus might rely on their strong family connections instead of innovation.

To test the above hypothesis, I follow a standard growth regression as in Mankiw (1995) and augment two measures of billionaire corporate control, FD/GDP and HE/GDP. I also add $\log(GDP)$ in the regression to control for any relation between growth and the denominator of the key variables. The baseline regression is as follows:

$$\begin{aligned} Growth_{it,t+5} = \alpha + \beta_1 FD/GDP_{it} + \beta_2 HE/GDP_{it} + \beta_3 \log(GDPPC)_{it} + \beta_4 \log(GDP) \\ + \beta_5 \log(HC)_{it} + \beta_6 \log(KPC)_{it} + YearFE + \epsilon_{it} \end{aligned} \tag{3}$$

where i and t index country and year, respectively. The dependent variable is logarithmic growth of either TFP ($TFPgr$) or per capita GDP ($GDPPCgr$) over year t to $t+5$. Other variables are defined in Table A1. All regressions include year fixed effects, $YearFE$, to control for year-specific unobservables. Since FD/GDP and HE/GDP come from billionaires' wealth which can greatly fluctuate, I attenuate the effects of such fluctuation using their averages over years t, $t-1$, and $t-2$ as their representative values. Lastly, I cluster standard errors two ways by country and year to simultaneously account for serial and contemporaneous correlations in the economic growth.

Table 3 reports the results based on (3). Consistent with the hypothesis above, the coefficient on HE/GDP in column (1) is negative and statistically significant at 5% level. The magnitude of this coefficient is also economically significant. One-standard-deviation increase[3] in HE/GDP is associated with 1.69% (-0.345×4.9) decline in TFP growth over the next five years. In contrast, the coefficient on FD/GDP in column (1) is positive and statistically significant at 1% level. One-standard-deviation increase in FD/GDP is associated with 2.36% (0.281×8.4) increase in TFP growth over the same period.

Column (2) in Table 3 presents the results when per capita GDP growth is the dependent

[3] I use one-standard-deviation increase instead of one-percentage-point increase because HE/GDP's fluctuation is high. Therefore, its increase of one percentage point is uncommon.

variable. The coefficient on HE/GDP in this specification is positive, but its statistical significance wanes. This suggests that, based on this paper's new dataset, there is no evidence that heir billionaires or old-money families affect output growth. It is possible that heir billionaires retard productivity growth by rearing entry barriers so as to preserve their old technology. However, to keep pace with the growing economy, they put in more labor and capital. Therefore, with lower productivity and higher labor and capital, the aggregate output remain constant[4]. The coefficients on FD/GDP on column (2) remains positive, and their statistical significance declines with p-value of 0.068. This result suggests that higher fractions of founder billionaires' wealth over GDP are associated with more rapid growth in per capita GDP.

Overall, the results in this subsection are consistent with Morck et al. (2000) in that more corporate control concentrated in old-money families behind large corporations or heir billionaires is associated with slower economic growth, while more corporate control concentrated in first-generation entrepreneurs or founder billionaires is associated with faster economic growth. However, the evidence is statistically significant only when TFP growth is the dependent variable.

3.1. Robustness Checks

3.1.1. Excluding the United States and the United Kingdom

Masulis, Pham, and Zein (2011) note that billionaires are not influential in these two countries because their laws and regulations prevent the formation of pyramidal business groups. Without pyramidal business groups, it is difficult for wealthy families to turn their wealth into control of assets worth vastly more. Thus, how billionaires impact growth in the US and the UK in the sample may not be consistent with the hypothesis proposed earlier.

[Insert Table 4 about here.]

[4] In an unreported test, I find that HE/GDP is positively associated with more rapid growth in capital (with $p-$value = 0.222) and the number of persons engaged in the economy (with $p-$value = 0.118).

In Table 4, I drop the US and the UK from the sample and then rerun equation (3). Note that the data are aggregated to the country level. Dropping these two countries reduces the sample size by 54 observations. When TFP growth is the dependent variable, the coefficient on HE/GDP remains significantly negative, and that on FD/GDP significantly positive. Overall, the results are robust to excluding the US and the UK.

3.1.2. Alternative Imputation Methods

As pointed out in Section 2, some of the billionaires' wealth is considered missing. That is, some influential wealthy families may not make the billionaire list in some years because value of their assets plunges in this period. To alleviate these missing data issues, I proposed an imputation method in Step 6) in Section 2 which assumes that billionaires' wealth over GDP (a proxy for billionaire corporate control) grows (or declines) at a constant rate during missing periods. In this section, I propose the following three alternative imputation methods, all of which rely on different assumptions. Imputation A assumes that the billionaire's wealth grows at the same rate as GDP during the missing period. This assumption is plausible because some billionaires holds a diversified portfolio; thus, their value fluctuates with the state of the economy. Imputation B assumes that the billionaire's wealth grows at the same rate as the total wealth of other billionaires during the missing period. This assumption implies that assets of billionaires in the same country comove, which is plausible given that they belong to the same group of elites. Finally, Imputation C assumes that the billionaire's wealth grows at a constant rate during the missing period. This method requires that the billionaire's assets grow independently and do not correlate with the economy or other billionaires in the same country.

[Insert Table 5 about here.]

Table 5 shows that imputing the billionaire data with method A, B or C does not quantitatively change the results. When productivity growth is the dependent variable, the coefficient on HE/GDP remains approximately -0.300 and statistically significant, and that on FD/GDP around 0.270 and also statistically significant. Similar to the main results in Table 3, when per capita GDP growth is the dependent variable, the statistical significance of HE/GDP and FD/GDP wanes.

The results are also relatively robust when the data are not imputed. The coefficient on HE/GDP in column (7) is -0.292 which is very close to that in other specifications, although its p-value is close to 0.100. This insignificance appears to be due to the loss of statistical power from decreased sample size, but not because the imputation method biases the results. The coefficient on FD/GDP in column (7), on the other hand, remains significantly positive.

Overall, Table 5 demonstrates that the results are not driven by the imputation method proposed earlier in Section 2.

3.1.3. Alternative Measures of Billionaire Corporate Control

In this final robustness check, I propose the following alternative measures of billionaire corporate control. I replace billionaires' wealth over GDP by the number of billionaires over population. With this measure, I test if countries that churn out more founder billionaires per capita grow more rapidly; or, in contrast, countries that produce more heir billionaires grow more slowly. I rerun equation (3) with these two alternative measures.

[Insert Table 6 about here.]

Table 6 reports the results that are robust to these alternative measures. TFP grows more rapidly in countries with more founder billionaires per capita, but more slowly in countries with more heir billionaires per capita. As with other specifications, when per capita GDP is the dependent variable, the coefficient on the number of heir billionaires per capita does not exhibit statistical significance, while the coefficient on the number of founder billionaires per capita remains significantly positive.

3.2. *Billionaire Impact on Long-Run Economic Growth*

Schumpeter (1942) contends that the outcomes of the creative destruction process should be observed in a very long run. With the new dataset that covers over three decades, it is possible to test the differential impact of billionaires on long-run economic growth over the next two decades.

[Insert Table 7 about here.]

Table 7 reports the results where the dependent variable is economic growth over year t to $t+20$. In column (1) where long-run TFP growth is the dependent variable, the coefficient on HE/GDP is significantly negative. Its magnitude is also economically significant—one-standard-deviation increase in HE/GDP is associated with 5.89% (-1.199×4.9) decline in TFP growth over the next 20 years. In contrast, the coefficient on FD/GDP is significantly positive and large—one-standard-deviation increase in FD/GDP is associated with 9.65% (1.149×8.4) increase in TFP growth over the same period.

On the other hand, in column (2) where per capita GDP growth is the dependent variable, the coefficient on FD/GDP remains significantly positive and large. One-standard-deviation increase in FD/GDP is associated with an increase of 21.49% (2.558×8.4) in per capita GDP growth over the next 20 years. The coefficient on HE/GDP, however, is insignificant.

In summary, Table 7 demonstrates that, when the outcome variable is long-run TFP growth, the differential impact of billionaires reported earlier also remains significant and that such impact becomes much larger.

3.3. *Billionaire Impact in Different Institutions*

Institutions play a crucial role in reducing or increasing economic frictions. In an economy with low barriers to entry and more economic freedom, innovative firms flourish, creating new waves of highly successful entrepreneurs while destroying stagnant old firms. In contrast, an economy with weak institutions allows rent seekers to influence the political system and rear barriers against new entrants so as to preserve their status quo.

In this subsection, I examine the impact of billionaires on TFP growth in different levels of institutions using the new comprehensive dataset. I consider three types of institutions. First, a political institution as measured by the Polity Index (*Polity*). A higher value of *Polity* indicates that the country is more democratic or has a more representative government. Second, a social institution as measured by the State Fragility Index (SFI). A higher value of SFI indicates that the country is more at risk at becoming a failed state. Since high values of SFI suggests weak institutions, I opt to use Neg-SFI or negative values of SFI in the regressions so that a higher value of Neg-SFI indicates a stronger social institution. Third, an economic institution as measured by the Economic Freedom Index ($EconFree$). A higher value of $EconFree$ indicates more economic freedom, i.e., lower barriers to entry.

[Insert Table 8 about here.]

I test the above hypotheses by interacting each of the three institutional measures with the billionaire corporate control measures, FD/GDP and HE/GDP. Table 8 presents the results. In column (1), the significantly positive coefficient on $HE/GDP \times Polity$ suggests that the impact of heir billionaires on TFP growth is now given by $-0.282 + 0.034 \cdot Polity$. This means that the less democratic the country (lower *Polity*), the more negative the impact of heir billionaires on TFP growth. This result is consistent with the hypothesis that less representative government allows heir billionaires or old-money families to influence the political system in order to protect their capital, resulting in slow economic growth. Political institutions, however, appear to not affect the positive impact of founder billionaires.

Columns (2) and (3) in Table 8 show significantly positive coefficients on both $FD/GDP \times$ Neg-SFI and $FD/GDP \times EconFree$. This result implies that the impact of founder billionaires on TFP growth is given by $0.408 + 0.051 \times$ Neg-SFI and $-0.514 + 0.010 \times EconFree$. Consistent with the above hypothesis that low entry barriers allow for innovative entrepreneurs to succeed, this result suggests that stronger social and economic institutions manify the positive impact of founder billionaires on economic growth.

Interestingly, the result in column (3) in Table 8 implies that the impact of founder billionaires can turn negative if $EconFree$ is below 51.4. Countries in this category include, for example, Kazakhstan, India, Angola, Republic of Congo, Russia, Turkey, Venezuela, Vietnam, Zimbabwe and Ukraine. This suggests that founder billionaires in countries with economic freedom too low may gain wealth primarily through rent seeking, which in turn causes negative spillovers on TFP growth.

Overall, results in Table 8 suggest that institutions matter to the billionaire impact on TFP growth. In particular, the negative impact of heir billionaires is exacerbated in countries with weak democracy. Moreover, the positive impact of founder billionaires is magnified in countries with strong social security and high economic freedom.

4. Endogeneity

Without establishing the direction of causality, the results reported above shed light on the heterogeneous nature of inequality. That is, inequality arising from inherited control of large corporations is detrimental for productivity growth, while inequality arising from large-scale entrepreneurship beneficial.

In this section, I identify which direction of causality is more likely in what institutions. The main hypothesis is that, in countries with weak institutions, billionaires cause growth. That is, founder billionaires indeed overcome market frictions and thus drive economic growth, while heir billionaires use their strong family connections to rear barriers against new competitors so as to preserve their old capital. Conversely, billionaires in countries with strong institutions are more likely a result of creative destruction. This is because strong institutions weaken barriers to entry and make rent-seeking unprofitable. This accelerates the pace of creative destruction allowing self-made billionaires to rise while destroying the wealth of old-money billionaires.

4.1. Empirical Methodology

To test if billionaires influence economic growth as modeled in equation (3), one would need an instrumental variable that can extract the exogenous variations in wealth of founder and heir billionaires. This can be very challenging when the dependent variable is economic growth because growth at the economy level can be affected by several factors other than billionaire corporate control. Therefore, the potential instrument for billionaire corporate control is likely to be correlated with one of these factors, making it an invalid instrument.

Because an instrumental variable is not a viable empirical strategy, I adopt an event study approach with billionaires' sudden deaths as a natural experiment. Also, instead of using economic growth as an outcome variable, I investigate reactions of the *entire equity market* to billionaires' sudden deaths instead. I do so because, unlike economic growth which is measured at an annual frequency, stock market reactions can be observed at the daily frequency. The smaller window substantially narrows down plausible extreme confounders that may drive the results.

To measure the entire market reactions to the sudden deaths of billionaires, I follow the event study methodology as in MacKinlay (1997). Note that, in this paper, I conduct the event study at a global level where returns on the country's market index are regressed on those on the world market index as in the following market model:

$$R_{it} = \alpha_i + \beta_{i,t}R_{w,t} + \beta_{i,t-1}R_{w,t-1} + \beta_{i,t+1}R_{w,t+1} + \epsilon_{it} \tag{4}$$

R_{it} is return on the market index of country i on day t. R_{wt} is return on the *world* index on day t. Note that differences in time zones can make a shock on the world index on day $t-1$ or $t+1$ affect a particular country's market index on day t. For example, a shock on the United States' stock market that occurs on day $t-1$ can affect Thailand's stock market on day t because Thailand is 12 hours ahead of New York. To account for these circumstances, I add $R_{w,t-1}$ and $R_{w,t+1}$ as additional controls. $\beta_{i,t}, \beta_{i,t-1}$ and $\beta_{i,t+1}$ therefore capture the influence the world market has on country i's equity market. α captures the mean return on the country's market index over the estimation period. ϵ_{it} is an error term.

Returns on the market index are computed from Datastream's total market index, which accounts for dividends and other payouts. Returns on the world market index are from Datastream's MSCI world index, which also accounts for all payouts. The estimation period is from day -110 to day -10, where day 0 is the event date. I require that the return data for each sample be available at least 80 days to run equation (4). If not, the sample is excluded.

Running equation (4) gives us the estimates of the market model parameters, $\hat{\alpha}$, $\hat{\beta}_{i,t}, \hat{\beta}_{i,t-1}$ and $\hat{\beta}_{i,t+1}$. Using these estimates, an abnormal return on the market index i on day t during the event window is computed as:

$$AR_{it} = R_{it} - \hat{\alpha}_i - \hat{\beta}_{i,t}R_{w,t} - \hat{\beta}_{i,t-1}R_{w,t-1} - \hat{\beta}_{i,t+1}R_{w,t+1}. \quad (5)$$

With this abnormal return, I measure the market reactions to billionaires' sudden deaths using a standard Cumulative Abnormal Return (CAR), where CAR from day τ_1 to τ_2 is defined as $\sum_{t=\tau_1}^{\tau_2} AR_{it}$.

4.2. The Sudden Death Sample

To be included in this sample, the billionaires must meet the following criteria: 1) They have appeared at least once in the Forbes's lists of billionaires from 1987 to 2018 and passed away before 2020. This step yields 548 samples ($N = 548$); 2) They must not be from the United States or the United Kingdom. I apply this criterion because, as Masulis et al. (2011) point out, pyramidal business groups that allow wealthy families to wield control over vast assets in these two countries are rare, making billionaires unlikely to have significant impact on their economies ($N = 321$); 3) Their deaths are sudden. That is, they did not die from long illnesses such as old age, cancer, and organ failure. However, if they have been hospitalized unexpectedly and died thereafter, they are included in the sample, and the hospitalization day is the event date ($N = 62$); 4) At the time of their death, they must be a patriarch or matriarch of the family. Billionaires who died while their heads of families were still alive are excluded ($N = 50$); 5) They were not drug lords or dictators because these individuals are not relevant to the notion of creative destruction ($N = 44$); 6) Their death must be exogenous. Endogenous deaths such as suicide and murder are excluded ($N = 39$); 7) There must not be significant political events such as political unrest within the event window. These cases are excluded to ensure that the results are not driven by outliers these extreme events may cause ($N = 37$); 8) Data on market returns are available for at least 80 days in the estimation period ($N = 36$).

[Insert Table 9 about here.]

The final sample contains 36 sudden death events. Table 9 lists causes of death of the sample billionaires. The majority of the causes are heart attack or heart failure, which account for 36.11% of the sample.

[Insert Table 10 about here.]

Table 10 reports the summary statistics. This sample covers a wide range of countries with different characteristics. Per capita GDP ranges from 6,748 to 69,507 USD (constant 2017 dollars at PPP); GDP from 190 to 4,596 billion USD; *Polity* from highly autocratic countries (*Polity* score of -5.65) to highly democratic (*Polity* score of 10). Half of the sample are billionaires who control at least one public firm. Approximately 41.7% of the sample are heir billionaires. Below, I report the findings based on this sudden death sample.

4.3. Do billionaires have an impact on the entire market?

If billionaires drive economic growth, they must have an impact, be it negative or positive, on the entire stock market. To test this hypothesis, I examine the reactions on market indexes around the sudden deaths of billionaires.

[Insert Table 11 about here.]

Panel A in Table 11 reports the results. Columns (1) and (2) show no significant reactions of market indexes before the sudden deaths of billionaires. However, columns (3) and (4) show that upon the deaths of billionaires, market indexes react positively. Specifically, the market indexes go up, on average, by 0.612% around the events. This suggests that billionaires can, in fact, impact the entire stock markets.

Using a market index to measure reactions of the entire market may raise the following concern. If a billionaire controls a substantial portion of the market index portfolio, the reactions we observe might be only from his firms, not firms outside of his control. If this is the case, we cannot conclude that the billionaire impacts the entire equity market. To address this concern, I compute returns on a portfolio that excludes firms under control of the sample billionaire[5].

I report the results based on this portfolio in Panel B, Table 11. Similar to Panel A, the non-billionaire-controlled portfolio in Panel B does not show significant reactions before the sudden deaths of billionaires. However, around these events, the value of this portfolio increases by 0.667%, with a p-value of 0.060. This result confirms that billionaires can impact firms outside of their control.

The markets' positive reactions reported in Table 11 indicate that billionaires, in general, have negative spillovers on listed firms. Ideally, observing positive market reactions to heir billionaires' deaths and negative reactions to founder billionaires' deaths would be consistent with the hypothesis that heirs are detrimental for the economy, while founders beneficial. However, with a small sample size of 36, it is impractical to observe the differential market reactions to the death of founders and heirs due to low statistical power. Nevertheless, the results above support the hypothesis that billionaires can impact the entire equity market.

[5]Following Masulis et al. (2011), control is established if he has at least 20% of voting rights. This cutoff is down to 10% if he or his family member is a CEO, Chairman or Founder.

4.4. *Where are billionaires more influential?*

To understand the direction of causality in the baseline regression (3), it is important to identify where billionaires are more influential. If they were more influential in countries with weak institutions, this would suggest that they are more likely to drive economic growth in these countries than the other way around. However, if they were less influential in countries with strong institutions, this would indicate that billionaires individually do not drive economic growth and are thus a result of creative destruction.

To test the above hypothesis, we first need to measure the magnitude of billionaire influence. Using an average of CAR to measure the billionaire influence is not appropriate because CAR can take a negative or positive value. Therefore, an average CAR of close to zero does not necessarily indicate that billionaires do not influence on the markets.

To resolve this issue, I use Cumulative Abnormal Volatility (CAV) to measure the billionaire influence. CAV from day τ_1 to τ_2 is defined as $\sum_{t=\tau_1}^{\tau_2} AR_{it}^2$. This is a more appropriate measure because its higher value reflects the fact that markets react more strongly, regardless of the positive or negative direction, when a more influential billionaire suddenly dies.

[Insert Table 12 about here.]

To observe where billionaires are more influential, I regress a measure of billionaire influence, log(CAV), on a series of institutional variables, $Polity$, Neg-SFI and $EconFree$ from section 3.3. I use an ordinary least square (OLS) technique to run these regressions and account for the heteroskedasticity in the error term using robust standard errors. As in equation (3), I add log(GDP) as an additional control variable.

Table 12 reports the results. In all specifications, the coefficients on these three institutional variables are negative and statistically significant. This indicates that billionaires are more influential in countries with less developed democracy, lower social security as well as economic freedom. Therefore, this result lends support to the hypothesis that billionaire drive economic growth in these countries. Moreover, since they are less influential in countries with stronger institutions, this result suggests that billionaires are likely a result of creative destruction.

5. Conclusions

What do we learn from this paper? First, this paper shows that, in aggregate, billionaires' control over their national economies has increased over the past three decade. While many argue that such inequality in corporate control slows economic growth, this paper show that it may be beneficial or detrimental to the economy depending on sources of wealth of the billionaires. That is, inequality arising from inherited control of large corporations is detrimental for productivity growth; whereas, inequality arising from large-scale entrepreneurship beneficial.

This result has important policy implications. First, excessive taxes on innovative entrepreneurs may deter growth. As Okun (1975) contends, taxing the rich to lower inequality can cause inefficiency due to government bureaucracy and a loss of big incentives to become successful entrepreneurs. Mukherjee, Singh, and Žaldokas (2017) also show that corporate taxes reduce future innovation which is central to the process of creative destruction. The second policy implication is that, while prior literature shows that passing down control to family members can hurt firm performance, this paper demonstrates that such negative effects may extend to the economy level if control is passed down in large business groups. This result implies that inheritance taxes on large family business groups may benefit growth. Such taxes could potentially take away inefficiency heirs might cause by reducing their future investments (Pagano and Volpin, 2005; Tsoutsoura, 2015).

Finally, this paper provides empirical evidence that billionaires or controllers of large business groups can pose as systematic risks and that they are more influential in countries with weaker institutions. This implies that these individuals can cause (in)efficiency at the macroeconomic level, especially in emerging markets where business groups are prominent.

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Tables

Table 1: Summary Statistics of the Billionaire Sample

This table shows summary statistics of the main variables. Variable definitions and data sources are provided in Table A1.

	Obs	Mean	SD	p5	p25	p50	p75	p95
FD/GDP	1,470	0.050	0.084	0.000	0.007	0.023	0.054	0.209
HE/GDP	1,470	0.032	0.049	0.000	0.005	0.019	0.037	0.128
$TFPgr$	1,214	0.014	0.099	−0.122	−0.022	0.017	0.057	0.142
$GDPPCgr$	1,272	0.133	0.273	−0.124	0.049	0.121	0.229	0.469
$GDPPC$	1,470	28,002	18,883	4,400	11,819	27,191	39,411	59,399
GDP (millions)	1,470	1,341,373	2,608,798	38,461	255,762	490,873	1,350,047	4,871,486
KPC	1,470	146,952	97,825	13,126	58,084	143,802	222,604	308,511
HC	1,419	2.806	0.567	1.844	2.349	2.842	3.278	3.635
$Polity$	1,380	6.193	5.842	−7	6	9	10	10
SFI	1,144	4.763	4.728	0	0	3	9	13
$EconFree$	1,184	66.221	9.982	50.4	59.6	66.2	72.6	82.1

Table 2: Correlation Matrix of the Main Variables

This table shows the correlation matrix of the main variables. Variable definitions and data sources are provided in Table A1. Correlation coefficients with * indicate statistical significance at 10% or better.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
FD/GDP	1										
HE/GDP	0.165*	1									
$TFPgr$	0.063*	−0.174*	1								
$GDPPCgr$	0.107*	−0.007	0.588*	1							
$\ln(GDPPC)$	−0.014	0.128*	−0.123*	−0.165*	1						
$\ln(GDP)$	−0.303*	−0.147*	0.024	−0.066*	0.052*	1					
$\ln(KPC)$	0.057*	0.101*	0.021	−0.008	0.886*	−0.009	1				
$\ln(HC)$	0.074*	−0.049*	0.099*	−0.080*	0.717*	0.227*	0.669*	1			
$Polity$	−0.122*	−0.165*	0.130*	−0.040	0.198*	0.177*	0.284*	0.438*	1		
SFI	0.178*	0.045	−0.002	0.047	−0.811*	−0.101*	−0.816*	−0.710*	−0.450*	1	
$EconFree$	0.161*	0.168*	0.071*	0.072*	0.674*	−0.079*	0.635*	0.551*	0.268*	−0.620*	1

Table 3: Billionaire Corporate Control and Economic Growth

This table shows the differential effects of corporate control under founder and heir billionaires on economic growth. The data are a country-level panel covering 78 countries from 1986 to 2017. The dependent variables include $TFPgr$ and $GDPPCgr$ which are logarithmic growth of real TFP, real GDP per capita from year t to $t+5$. FD/GDP and HE/GDP are averaged over years t, $t-1$, and $t-2$ to attenuate the effects of billionaires' wealth fluctuation. Variable definitions and data sources are provided in Table A1. All regressions include year fixed effects. Standard errors are two-way clustered by 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:	$TFPgr$	$GDPPCgr$
	(1)	(2)
FD/GDP	0.281***	0.466*
	(0.007)	(0.068)
HE/GDP	−0.345**	0.315
	(0.034)	(0.560)
log($GDPPC$)	−0.092***	−0.238**
	(0.001)	(0.035)
log(GDP)	−0.004	−0.005
	(0.560)	(0.691)
log(HC)	0.147***	−0.007
	(0.000)	(0.935)
log(KPC)	0.047**	0.173
	(0.017)	(0.105)
Year FE	Yes	Yes
R^2	0.251	0.186
Observations	1,087	1,087

Table 4: Robustness: Removing the United States and the United Kingdom

This table demonstrates the robustness of the results in Table 3 when samples from the United States and the United Kingdom are removed. FD/GDP remains associated with faster TFP growth, while HE/GDP associated slower TFP growth. The coefficients on both variables remain statistically significant and their magnitudes change slightly. FD/GDP and HE/GDP are averaged over years t, $t-1$, and $t-2$ to attenuate the effects of billionaires' wealth fluctuation. Variable definitions and data sources are provided in Table A1. All regressions include year fixed effects. Standard errors are two-way clustered by 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:	$TFPgr$	$GDPPCgr$
	(1)	(2)
FD/GDP	0.267***	0.440*
	(0.009)	(0.083)
HE/GDP	−0.342**	0.323
	(0.035)	(0.543)
log($GDPPC$)	−0.097***	−0.247**
	(0.001)	(0.039)
log(GDP)	−0.006	−0.010
	(0.391)	(0.489)
log(HC)	0.147***	−0.013
	(0.000)	(0.879)
log(KPC)	0.050**	0.178
	(0.015)	(0.107)
Year FE	Yes	Yes
R^2	0.256	0.192
Observations	1,033	1,033

Table 5: Robustness: Different Imputation Methods

This table demonstrates the robustness of the results in Table 3 to different imputation methods. A billionaire's wealth temporarily drops below one billion USD in some years, making Forbes exclude him from the list of billionaires. Because such billionaire was still running large corporations during those years, his wealth is therefore considered missing and must be imputed. This table shows the results with three different imputation methods: A, B and C as well as those without data imputation. Imputation A assumes that a billionaire's wealth grows at the same rate as GDP during the missing period. Imputation B assumes that a billionaire's wealth grows at the same rate as total wealth of other billionaires during the missing period. Imputation C assumes that a billionaire's wealth grows at a constant rate during the missing period. FD/GDP and HE/GDP are averaged over years t, $t-1$, and $t-2$ to attenuate the effects of billionaires' wealth fluctuation. Variable definitions and data sources are provided in Table A1. All regressions include year fixed effects. Standard errors are two-way clustered by 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.

	Imputation A		Imputation B		Imputation C		No Imputation	
	TFPgr	GDPPCgr	TFPgr	GDPPCgr	TFPgr	GDPPCgr	TFPgr	GDPPCgr
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
FD/GDP	0.278***	0.457*	0.279***	0.434*	0.289***	0.473*	0.272**	0.397
	(0.007)	(0.070)	(0.009)	(0.095)	(0.005)	(0.063)	(0.014)	(0.140)
HE/GDP	-0.353**	0.312	-0.328*	0.373	-0.347**	0.305	-0.292	0.452
	(0.030)	(0.562)	(0.058)	(0.507)	(0.031)	(0.571)	(0.110)	(0.454)
$\log(GDPPC)$	-0.091***	-0.238**	-0.088***	-0.242**	-0.091***	-0.238**	-0.093***	-0.251**
	(0.001)	(0.035)	(0.002)	(0.036)	(0.001)	(0.035)	(0.002)	(0.034)
$\log(GDP)$	-0.004	-0.005	-0.002	-0.005	-0.003	-0.005	-0.002	-0.005
	(0.556)	(0.686)	(0.655)	(0.629)	(0.569)	(0.697)	(0.729)	(0.669)
$\log(HC)$	0.147***	-0.007	0.155***	0.000	0.147***	-0.007	0.170***	0.005
	(0.000)	(0.931)	(0.000)	(0.998)	(0.000)	(0.932)	(0.000)	(0.950)
$\log(KPC)$	0.047**	0.173	0.044**	0.180*	0.047**	0.173	0.045**	0.187*
	(0.017)	(0.106)	(0.033)	(0.095)	(0.016)	(0.105)	(0.025)	(0.084)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.251	0.186	0.261	0.185	0.253	0.186	0.269	0.183
Observations	1087	1087	1068	1068	1087	1087	1040	1040

Table 6: Robustness: Alternative Measures of Billionaire Corporate Control

This table demonstrates the robustness of the results in Table 3 to the alternative measures of billionaire corporate control. Instead of summing up wealth of all billionaires in each country-year, the alternative measure sums up the number of all billionaires in each country-year divided by their countries' total population. Variable definitions and data sources are provided in Table A1. All regressions include year fixed effects. Standard errors are two-way clustered by 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:	$TFPgr$ (1)	$GDPPCgr$ (2)
$\log(1 + \#FD/POP)$	0.094***	0.136*
	(0.000)	(0.058)
$\log(1 + \#HE/POP)$	−0.082**	0.010
	(0.040)	(0.912)
$\log(GDPPC)$	−0.100***	−0.249**
	(0.000)	(0.027)
$\log(GDP)$	−0.002	−0.002
	(0.779)	(0.858)
$\log(HC)$	0.157***	−0.031
	(0.000)	(0.752)
$\log(KPC)$	0.049**	0.173
	(0.011)	(0.101)
Year FE	Yes	Yes
R^2	0.265	0.184
Observations	1,087	1,087

Table 7: Billionaire Impact on Long-Run Economic Growth

This table shows the differential effects of corporate control under founder and heir billionaires on long-term economic growth. The data are a country-level panel covering 78 countries from 1986 to 2017. The dependent variables include $TFPgr20$ and $GDPPCgr20$ which are logarithmic growth of real TFP and real GDP per capita from year t to $t+20$. FD/GDP and HE/GDP are averaged over years t, $t-1$, and $t-2$ to attenuate the effects of billionaires' wealth fluctuation. Variable definitions and data sources are provided in Table A1. All regressions include year fixed effects. Standard errors are two-way clustered by 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:	$TFPgr20$	$GDPPCgr20$
	(1)	(2)
FD/GDP	1.149***	2.558**
	(0.001)	(0.012)
HE/GDP	−1.199**	−0.765
	(0.047)	(0.406)
$\log(GDPPC)$	−0.281**	−0.667**
	(0.013)	(0.041)
$\log(GDP)$	−0.003	−0.002
	(0.886)	(0.974)
$\log(HC)$	0.679***	−0.380
	(0.001)	(0.236)
$\log(KPC)$	0.111	0.560*
	(0.195)	(0.084)
Year FE	Yes	Yes
R^2	0.390	0.390
Observations	368	368

Table 8: Billionaire Impact in Different Levels of Institutions

This table shows the differential impact of billionaire corporate control on TFP growth in different types of institutions. The data are a country-level panel covering 78 countries from 1986 to 2017. The dependent variable is $TFPgr$ defined as logarithmic growth of real TFP from year t to $t+5$. FD/GDP and HE/GDP are averaged over years t, $t-1$, and $t-2$ to attenuate the effects of billionaires' wealth fluctuation. Variable definitions and data sources are provided in Table A1. All regressions include year fixed effects. Standard errors are two-way clustered by 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:	$TFPgr$		
Institutional Variable, $[Inst]$:	$[Polity]$	[Neg-SFI]	$[EconFree]$
	(1)	(2)	(3)
$FD/GDP \times [Inst]$	0.025	0.051*	0.010*
	(0.344)	(0.075)	(0.070)
FD/GDP	−0.073	0.408	−0.514
	(0.656)	(0.188)	(0.150)
$HE/GDP \times [Inst]$	0.034**	−0.001	−0.025
	(0.036)	(0.976)	(0.347)
HE/GDP	−0.282*	−0.135	1.470
	(0.085)	(0.491)	(0.443)
$[Inst]$	−0.003	−0.000	0.003
	(0.153)	(0.952)	(0.112)
log($GDPPC$)	−0.096***	−0.108***	−0.127***
	(0.002)	(0.002)	(0.000)
log(GDP)	−0.003	0.001	0.004
	(0.606)	(0.846)	(0.314)
log(HC)	0.167***	0.202***	0.187***
	(0.001)	(0.000)	(0.000)
log(KPC)	0.051**	0.045*	0.051***
	(0.016)	(0.064)	(0.008)
Year FE	Yes	Yes	Yes
R^2	0.256	0.319	0.378
Observations	1,034	860	884

Table 9: Causes of Death

This table provides the distribution of causes of death in the sudden death sample. The sample includes billionaires who have been listed in the Forbes lists of billionaires from 1987 to 2017 and died or incapacitated suddenly.

Cause of Death	Number of Cases	Percentage of Cases (%)
Heart attack or heart failure	13	36.11
Helicopter, plane or car crash	6	16.67
Accident (fall, post-surgery)	4	11.11
Stroke	4	11.11
Unexpected natural cause	4	11.11
Respiratory failure (cardiac arrest, phlegm, pneumonia, COVID)	4	11.11
Aneurysm	1	2.78
Total	36	100.00

Table 10: Summary Statistics of the Sudden Death Sample

This table reports summary statistics of the main variables for the sudden death sample. Variable definitions and data sources are provided in Table A1.

	Obs	Mean	SD	p5	p25	p50	p75	p95
GDPPC	32	33,811	19,485	6,748	18,210	33,744	42,629	69,507
GDP	32	1,805,439	1,452,202	190,088	437,063	1,576,541	2,608,083	4,595,737
Polity	30	6.667	5.732	−5.65	8	9.5	10	10
SFI	30	3.467	4.273	0	0	1	5	12
EconFree	32	66.278	8.897	53.705	60.575	65.850	70.375	84.610
Public	36	0.500	0.507	0	0	0.500	1	1
Heir	36	0.417	0.500	0	0	0	1	1
AgeAtDeath	36	74.25	11.152	54.500	68.000	76.000	82.250	91.000

Table 11: Cumulative Abnormal Return around Billionaires' Sudden Deaths

This table reports cumulative abnormal return around billionaires' sudden deaths on a) a portfolio of a market index and b) a portfolio of firms outside of the billionaire's control. Control is established through the chain of at least 10% voting rights. The event day ($t = 0$) is defined as the day the incapacitation or death occurs. If it is found that the event occurs after trading hours, the event day is set to the next trading day. Panel A reports the results on a portfolio of a market index. Panel B reports the results on a portfolio of firms in the market index but excluding firms under the billionaire's control. Numbers in parentheses are p-values for rejecting a null hypothesis of zero mean. ***, ** and * indicate statistical significance at 1%, 5%, and 10% levels, respectively. Numbers in square brackets are numbers of observations. Two observations are dropped in Panel B due to data unavailability on the total market capitalization.

	Pre-event Window		Event Window	
	CAR[−7, −2]	CAR[−5, −2]	CAR[−1, 2]	CAR[0, 2]
	(1)	(2)	(3)	(4)
Panel A: Market Index Portfolio				
Avarage CAR, %	0.214	0.212	0.612*	0.513*
p-value	(0.617)	(0.544)	(0.080)	(0.090)
Observations	[36]	[36]	[36]	[36]
Panel B: Non-billionaire-controlled Portfolio				
Avarage CAR, %	−0.060	0.018	0.667*	0.572*
p-value	(0.890)	(0.959)	(0.060)	(0.063)
Observations	[34]	[34]	[34]	[34]

Table 12: Where are billionaires more influential?

This table reports the varying degree of the billionaire impact over different types of institutions. The dependent variable is the billionaire impact on country i over an event window $[\tau_1, \tau_2]$ which is defined as $\log(\sum_{t=\tau_1}^{\tau_2} AR_{it}^2)$, where AR is abnormal return on the market index. The following measures of institutions are considered: $Polity$, Neg-SFI and $EconFree$. Variable definitions and data sources are provided in Table A1. All regressions include a constant and $\log(GDP)$ to control for the fact that billionaires might matter less in larger economies. Heteroskedasticity-consistent standard errors are used. $p-$values of coefficients are reported in parentheses. ***, ** and * indicate statistical significance at 1%, 5%, and 10% levels, respectively.

Dependent Variable:	$\log(CAV[-1,2])$			$\log(CAV[0,2])$		
	(1)	(2)	(3)	(4)	(5)	(6)
$Polity$	−0.072**			−0.073*		
	(0.022)			(0.055)		
Neg-SFI		−0.072*			−0.111**	
		(0.087)			(0.033)	
$EconFree$			−0.033**			−0.043**
			(0.033)			(0.015)
$\log(GDP)$	0.257	0.108	−0.017	0.149	0.011	−0.163
	(0.107)	(0.455)	(0.910)	(0.477)	(0.953)	(0.399)
Constant	−11.64***	−10.285***	−6.093**	−10.487***	−9.418***	−3.706
	(0.000)	(0.000)	(0.031)	(0.001)	(0.001)	(0.267)
R^2	0.135	0.092	0.074	0.079	0.122	0.073
Observations	30	30	31	30	30	31

Figures

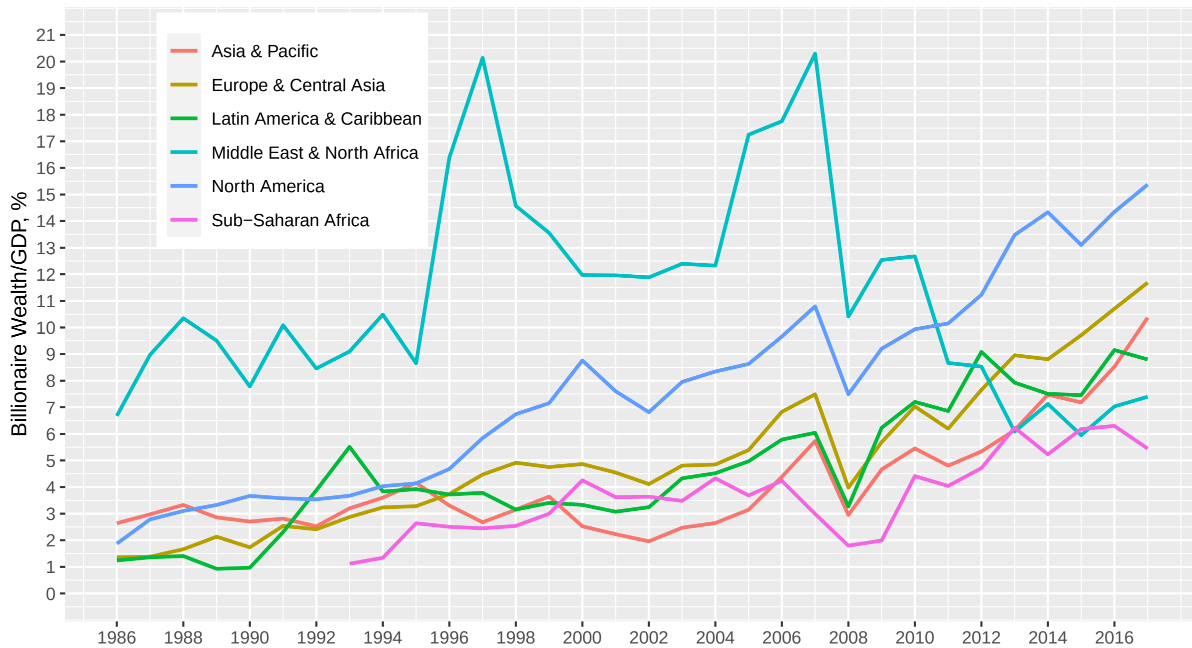

Fig. 1. Billionaires' Wealth by Region from 1986 to 2017

Asia & Pacific include Australia, Brunei, China, Hong Kong, China, Indonesia, Japan, South Korea, Macao, China, Malaysia, New Zealand, Philippines, Singapore, Thailand, Taiwan, Vietnam, India, Nepal, Pakistan. **Europe & Central Asia** include Austria, Belgium, Switzerland, Cyprus, Czech Republic, Germany, Denmark, Spain, Finland, France, United Kingdom, Georgia, Greece, Ireland, Iceland, Italy, Kazakhstan, Liechtenstein, Lithuania, Monaco, Netherlands, Norway, Poland, Portugal, Romania, Russia, Serbia, Sweden, Turkey, Ukraine. **Latin America & Caribbean** include Argentina, Brazil, Chile, Colombia, Cuba, Ecuador, Guatemala, Mexico, Peru, Venezuela. **Middle East & North Africa** include United Arab Emirates, Bahrain, Algeria, Egypt, Iraq, Israel, Kuwait, Lebanon, Morocco, Oman, Qatar, Saudi Arabia, Syria. **North America** includes Canada, United States. **Sub-Saharan Africa** includes Angola, Congo, Nigeria, Tanzania, Uganda, South Africa.

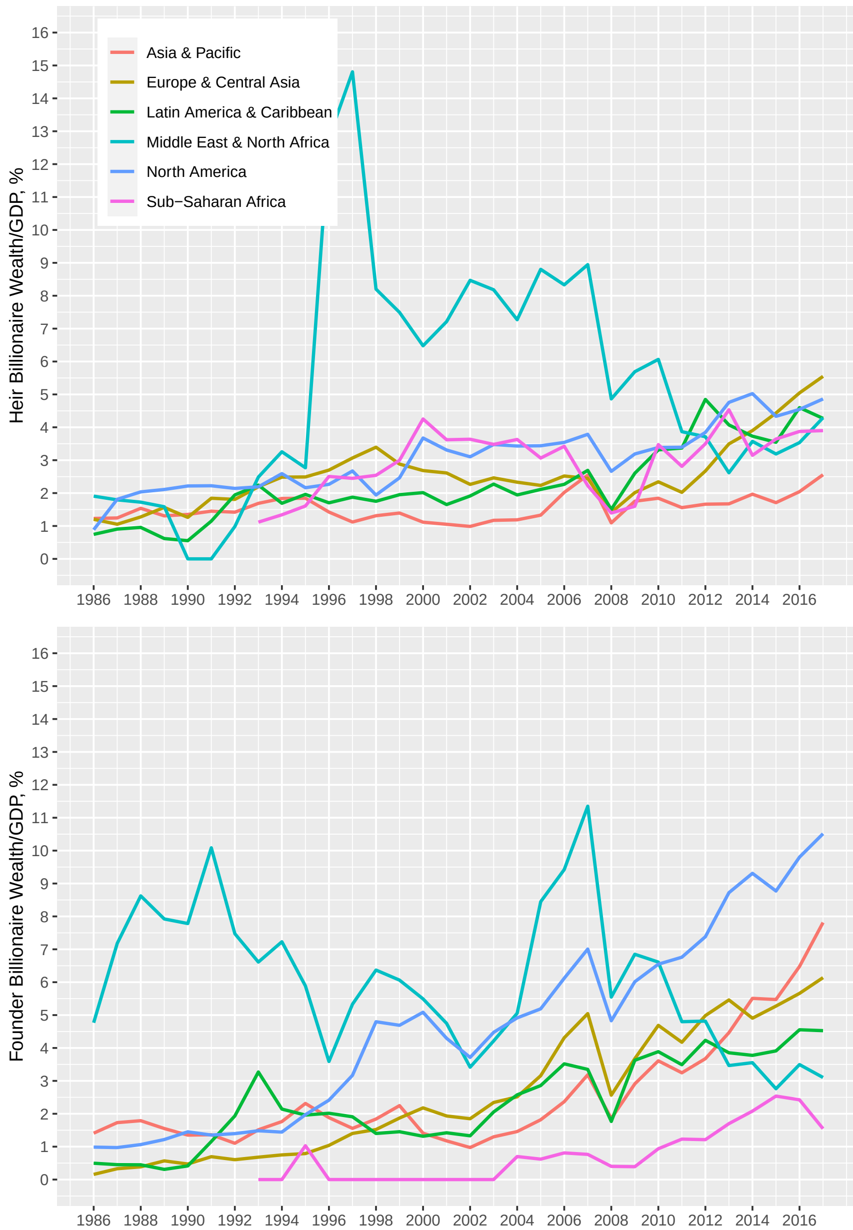

Fig. 2. Heir and Founder Billionaires' Wealth by Region from 1986 to 2017

Asia & Pacific include Australia, Brunei, China, Hong Kong, China, Indonesia, Japan, South Korea, Macao, China, Malaysia, New Zealand, Philippines, Singapore, Thailand, Taiwan, Vietnam, India, Nepal, Pakistan. **Europe & Central Asia** include Austria, Belgium, Switzerland, Cyprus, Czech Republic, Germany, Denmark, Spain, Finland, France, United Kingdom, Georgia, Greece, Ireland, Iceland, Italy, Kazakhstan, Liechtenstein, Lithuania, Monaco, Netherlands, Norway, Poland, Portugal, Romania, Russia, Serbia, Sweden, Turkey, Ukraine. **Latin America & Caribbean** include Argentina, Brazil, Chile, Colombia, Cuba, Ecuador, Guatemala, Mexico, Peru, Venezuela. **Middle East & North Africa** include United Arab Emirates, Bahrain, Algeria, Egypt, Iraq, Israel, Kuwait, Lebanon, Morocco, Oman, Qatar, Saudi Arabia, Syria. **North America** includes Canada, United States. **Sub-Saharan Africa** includes Angola, Congo, Nigeria, Tanzania, Uganda, South Africa.

Appendix A. Appendix

Table A1: Variable Definitions and Data Sources

Variable	Definition
FD/GDP	The sum of all founder billionaires' wealth in each country-year divided by GDP. Source: Forbes.
HE/GDP	The sum of all heir billionaires' wealth in each country-year observation divided by GDP. Source: Forbes.
$\#FD/POP$	The total number of founder billionaires in each country-year divided by total population. Source: Forbes.
$\#HE/POP$	The total number of heir billionaires in each country-year divided by total population. Source: Forbes.
$Heir$	An indicator variable equal to one if the billionaire is an heir, and zero otherwise.
$Public$	An indicator variable equal to one if the billionaire controls at least one public firm, and zero otherwise.
$AgeAtDeath$	Age of the billionaire at the time of his death or incapacitation.
$GDPPC$	Real per capita GDP in 2017 USD at purchasing power parity. Source: PWT10.0.
GDP	Real GDP in 2017 USD at purchasing power parity. Source: PWT10.0.
KPC	Real per capita capital in 2017 USD at purchasing power parity. Source: PWT10.0
HC	Human Capital Index. A higher value indicates higher human capital. Source: PWT10.0.
$TFPgr$	Logarithmic growth over year t to $t+5$ of real TFP. Source: PWT10.0.
$GDPPCgr$	Logarithmic growth over year t to $t+5$ of real per capita GDP. Source: PWT10.0.
$GDPgr$	Logarithmic growth over year t to $t+5$ of real GDP. Source: PWT10.0.
$TFPgr20$	Logarithmic growth over year t to $t+20$ of real TFP. Source: PWT10.0.
$GDPPCgr20$	Logarithmic growth over year t to $t+20$ of real per capita GDP. Source: PWT10.0.
$GDPgr20$	Logarithmic growth over year t to $t+20$ of real GDP. Source: PWT10.0.
$Polity$	Polity index. A higher value indicates higher level of democracy or more representative government. Source: https://www.systemicpeace.org
SFI	State Fragility Index. A higher value indicates that the state is more fragile or has less social security. To elaborate, I quote the following from the data source, the Center for Systemic Peace. "A country's fragility is closely associated with its state capacity to manage conflict, make and implement public policy, and deliver essential services, and its systemic resilience in maintaining system coherence, cohesion, and quality of life, responding effectively to challenges and crises, and sustaining progressive development." Source: https://www.systemicpeace.org
Neg-SFI	Negative value of the State Fragility Index. A higher value indicates that the state is less fragile ore has more social security. Source: https://www.systemicpeace.org
$EconFree$	Economic Freedom Index from the Heritage Foundation. A higher value indicates more economic freedom which encompasses market openness, rule of law, government size and regulatory efficiency. Source: https://www.heritage.org