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The Origins of the Superrich: The Billionaire Characteristics Database

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Abstract

This working paper presents a new dataset on the sources of billionaire wealth and uses it to describe changes in extreme wealth in the United States, Europe, and other advanced countries. The data classify wealth as either self-made or inherited and identify the company and industry from which it comes. Among self-made billionaires, individuals are further classified as company founders, executives, politically-connected, or in finance. Data analysis shows that the superrich in the United States are more dynamic than in Europe. Just over half of European billionaires inherited their fortunes, as compared with one-third in the United States. The median age of a company of a European billionaire is nearly 20 years older than that of an American billionaire. Traditional sectors explain more than half of the rise in wealth in Europe; the financial sector and technology-related sectors together are largely responsible for the rise in US wealth. There is some evidence that rents are higher in the United States than Europe, as not only is the number of US billionaires expanding rapidly, but US billionaires are also getting richer on average over time, especially when wealth is connected to resources, nontradables, or finance.

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1. INTRODUCTION

Despite slow global income growth, extreme wealth is increasing rapidly. The 2015 Forbes World's Billionaires list shows a record number of billionaires in the world (1,826), as well as a record number of billionaires under age 40, self-made billionaires, and female billionaires.[1] These records break the same records set by the 2014 list. The billionaire characteristics dataset used in this paper, by compiling the Forbes lists from 1996–2015 and adding detailed information on the individuals listed, helps identify patterns in the most well-rewarded activities across countries and over time.

This paper provides an overview of the dataset, along with the methodology used for creating new variables and researching individual billionaire characteristics. The data, built from 20 years of the Forbes World's Billionaires list, include information on the sector and characteristics of each billionaire as well as information on the company associated with a billionaire's wealth and how a billionaire became a member of the superrich.

The data show three interesting trends. First, extreme wealth is growing significantly faster in emerging markets than in advanced countries. The rise of emerging-market wealth is the subject of our book using this dataset, *Rich People Poor Countries: The Rise of Emerging-Market Tycoons and their Mega Firms* (Freund 2016). The book shows that there has been a sharp increase in billionaires from emerging markets over the past 20 years, a large and growing share of whom are company founders, creating new and innovative products. The emerging-market superrich are no longer concentrated in the resource and politically-connected sectors of the past.

Second, wealth is increasingly self-made, even in the advanced countries. The relatively rapid growth in the number of self-made billionaires and their wealth alleviates some concerns raised by the economist Thomas Piketty about returns to capital growing faster than income, which would cause fortunes to become more concentrated over time if capital remained in the same hands. In fact, extreme wealth is created and destroyed at a nearly constant rate in the United States, such that the median age of the businesses behind American fortunes is about the same now as in 2001. There is somewhat less dynamism in the other advanced economies, especially Europe, where fortunes are older and aging over time.

Finally, there are marked differences across regions and countries, even within income groups, which offer information about the climate for big business. Among emerging markets, East Asia is home to the large-scale entrepreneur. In contrast, the Middle East and North Africa is the only region where the share of inherited wealth is growing and the share of company founders is falling. Other emerging-market regions fall somewhere in between. Using the data to evaluate wealth creation in the advanced countries

1. Kerry Dolan, "Inside the 2015 Billionaires List: Facts and Figures," *Forbes*, March 2, 2015, http://www.forbes.com/sites/kerryadolan/2015/03/02/inside-the-2015-forbes-billionaires-list-facts-and-figures/ (accessed on January 3, 2016).

shows that the United States is relatively more dynamic. In Europe, inherited wealth still makes up the majority of billionaire wealth, while the growth in US billionaires has been driven by self-made wealth.

This paper is divided into seven sections. The next section describes related research using the Forbes World's Billionaires List. Section three describes the list and explains the individual and company variables added to the data. Section four discusses regional trends in wealth creation. Section five focuses on wealth creation among advanced countries. Section six estimates the share of wealth growth stemming from growth in the number of billionaires and growth in their average wealth. Section seven concludes.

2. RELATED WORK

The Forbes World's Billionaires lists have been used in previous research for a number of purposes. The data are sometimes used to fill gaps in income data at the top of the wealth distribution in order to provide a more complete analysis of income inequality. Both Hurst et al. (1998) and Klevmarken et al. (2003), for example, use Forbes data to supplement the Panel Study of Income Dynamics (PSID) wealth share data for the United States. Piketty (2014) uses the data to describe trends in wealth inequality in his book *Capital in the Twenty-First Century*.

Other work has used Forbes data to analyze business trends in specific countries or years. While the billionaire population is a small part of the business community, data on this group offer insights into how business is done in the most lucrative sectors, which are likely to reflect the economic climate for big business more generally. Gandhi and Walton (2012) use Forbes data from 1996 to 2012 to assess the impact being politically connected has on billionaire wealth in India. Similarly, Guriev and Rachinsky (2005) use Forbes data from 2004 to understand the role of oligarchs in Russia's transition to capitalism. Sharma (2012) uses turnover among the 10 wealthiest people in a country as a measure of the overall health of emerging-market economies. Bagchi and Svejnar (2013) use Forbes data from 1987 to 2002 to look at whether the type of wealth in a country is connected to overall growth. They find that politically-connected billionaire wealth has a negative effect on economic growth, while unconnected wealth is not correlated with GDP growth.

The most closely related paper to this work is Kaplan and Rauh (2013) who use the World's Billionaires lists from 1987, 1992, 2001, and 2011 to compare US billionaires to billionaires in the rest of the world. They assess US and non-US billionaires in three areas: self-made versus inherited wealth, income level of billionaires' families, and industry. They argue that the composition of US billionaires supports the importance of skills-biased technological change—and subsequent development of tech "superstars" who are increasingly likely to have made their own fortunes—as a contributor to increased income inequality in the United States. However, this same phenomenon is not present in the rest of the world.

This paper's contribution to the previous analysis is to provide a more comprehensive look at the movement of the superrich and their businesses across years, countries, and industries. This paper also uses the data to examine the most highly rewarded economic activities in advanced countries.

3. DESCRIPTION OF THE DATA

The billionaires characteristics database builds on 20 years of the Forbes World's Billionaires list, from 1996 to 2015.[2] Forbes uses shareholder information, company financial statements, current exchange rates, and meetings with candidates to estimate individual net worth.[3] The data list all individuals with a net worth over $1 billion in a given year. From 1996 to 2010, the data include the name, rank, country of citizenship, and net worth (current US dollars) of the world's billionaires. From 2011 on, the source of wealth is also provided, listed either as a specific company or broader sector. According to Forbes' methodology, the absence of a particular country in the data, such as China before 1997, is an indication that the country had no billionaires in that year rather than an indication of missing data.[4] The advantage of Forbes is that it has the longest series available and lists billionaires by name.

Forbes is not the only source of information about the super wealthy. The firms Knight Frank and Wealth-X both also compile yearly data on the world's superrich. Wealth-X uses a different methodology from Forbes and claims to be the most comprehensive, as they have a proprietary database of privately and publicly-held companies, created in association with UBS; however, the data are only available for recent years. All three sources show very similar patterns for the years for which they have data. For example, in 2013, the share of emerging-market billionaires on the Forbes list is 44 percent of the total billionaires in that year. In the same year, Knight Frank and Wealth-X both put the emerging-market share at 44 and 42 percent respectively. Knight Frank and Wealth-X also offer information on individuals with tens or hundreds of millions of dollars. Table 1 shows a comparison of the total wealth, number of billionaires, and emerging-market share for each of the three data sources in 2013, a year when all three datasets are available.

There are likely to be discrepancies between the reported number of billionaires and the actual number of billionaires in the world, as some billionaires may prefer to keep the size of their fortunes confidential. These discrepancies can exist both in cases of inherited fortunes and wealth tied to private

2. Following initial publication of the 2014 list, Forbes began updating changes in billionaire net worth and relative rank daily. This analysis uses the 2014 list as it stood at the time of initial publication in March 2014. In addition to the March 2015 list, this dataset also includes net worth as of September 2015.

3. An important source is the Orbis database from Bureau van Dijk Electronic Publishing, which provides data on ownership stakes in both public and privately held companies. Forbes values the privately held companies by coupling estimates of revenues or profits with prevailing price-to-revenues or price-to-earnings ratios for similar public companies.

4. The World's Billionaires: 25 Anniversary Timeline, *Forbes*, 2012, http://www.forbes.com/special-report/2012/billionaires-25th-anniversary-timeline.html (accessed January 3, 2016).

companies. Inherited wealth, which may not remain in the specific company that initially created it, may be more likely to be diversified and thus may be overlooked by Forbes journalists. Indeed, only 12 percent of the 2014 billionaires have wealth that Forbes classified as "diversified" (5 percent) or the result of "investments" (7 percent). Alternatively, it is also likely that many private companies are overlooked, at least until the company goes public or the founder dies. In some cases, private company fortunes first make the list when an inheritance is taxed, potentially making inheritors more likely to be on the list. Table A2 in the appendix alleviates such concerns by comparing wealth at the top of the distribution, where these discrepancies are likely to be smaller, and finds that self-made billionaires are also more prevalent among the group of the wealthiest 100 billionaires in both the advanced countries and emerging markets, and broad patterns remain intact.

Another type of billionaire excluded from the list are those whose income is tied to illegal extraction of rents, including corrupt government officials or drug lords. For example, Hosni Mubarak, Viktor Yanukovych, and Muammar Gaddafi, among others, acquired wealth that by various estimates reached into the billions. As a rule, Forbes does not include monarchs and other country leaders whose wealth is tied to their position of power. Forbes made an exception in 1997 and 1998, including eight monarchs and four dictators, but the list was incomplete and this group was discontinued in later years.[5] Still, provided the measurement error is roughly constant over time, the analysis should reflect recent trends—or at least recent trends in private business.

One shortcoming of this dataset is Forbes' inconsistent reporting of family fortunes across part of the sample. In 1996 and 2001–14, billionaires are reported as individuals unless "ownership breakdown among [siblings] isn't clear," and in those cases siblings must have a net worth of at least US$2 billion to be included.[6] However, from 1997 to 2000, the list aggregates individual billionaires by family. As a result, the number of billionaires is systematically lower in these years, and the average net worth of billionaires is systematically higher. A clear example of this is the Walton family, heirs to the Walmart fortune, who appear on Forbes' lists every year. In 1996, five Walton family members, with an average rank of 40 and net worth of $4.7 billion appear on the list. From 1997 to 2000, there is a single Walton family observation, with a fortune ranging from $15.1 billion to $46.7 billion (in 1996 US dollars). However, in 2001 the family members are once again reported separately, and the five originally listed

5. Royalty include: Sultan Hassanal Bolkiah, Brunei; King Fahd bin Abdul Aziz Al Saud, Saudi Arabia; Sheikh Zayed bin Sultan Al Nahyan and Sheikh Maktoum bin Rashid Al Maktoum, United Arab Emirates; Queen Beatrix, the Netherlands; King Bhumibol Adulyadej, Thailand; Sheikh Jaber Al-ahmed Al-jabar Al-sabah and Sheikh Hamid bin Khalifa Al Thani, Qatar. Dictators include: Suharto family, Indonesia; Hafez Al-Assad, Syria; Sadaam Hussein, Iraq; and Fidel Castro, Cuba.

6. Luisa Kroll, "Inside the 2013 Billionaires List: Facts and Figures," *Forbes*, March 4, 2013, http://www.forbes.com/sites/luisakroll/2013/03/04/inside-the-2013-billionaires-list-facts-and-figures/ (accessed January 15, 2016).

billionaires return with an average rank of 42 and an average net worth of $14.5 billion (along with a sixth Walton with a real net worth of $2 billion). Since the data from 1997 to 2000 cannot be used to track the changes in the number of billionaires or average real net worth, observations from 1997 to 2000 are excluded when necessary.

The compiled Forbes data are supplemented with variables on characteristics of the billionaires and their businesses. Table A1 in the appendix includes a brief summary of each variable and the years for which it is available. The next section presents the methodology and description of the additional variables.

Additions for all years: Sector and region variables

An industry and sector variable is added to each observation. The industry variable is two-tiered, beginning with 15 disaggregated categories based on those created by Kaplan and Rauh (2013). The detailed industry categories are subsequently aggregated into five broad sector categories: resource related, new, traded, nontraded, and financial. The source of wealth variable present in the data is used to classify billionaires appearing between 2011 and 2013. When wealth was listed as diversified, internet and LexisNexis searches were used to determine the primary company associated with wealth to categorize these individuals. These classifications were extended to all years an individual billionaire was present in the data. In order to classify billionaires who do not appear after 2010, web searches were used to determine the source of wealth. Table 2 presents a breakdown of the industry categories present in each of the aggregate sectors.

The resource-related sector seeks to capture how much natural resource extraction and the energy sector benefit billionaires. Though steel is not a natural resource, it is included in this category because the key inputs need for its production, coal and iron ore, are major contributors to the resource sector. The new sector category seeks to assess how changing computer and medical technology affects billionaire wealth, while traded sectors are separated from nontraded sectors in order to assess the impact of trade openness and globalization. Real estate is grouped with the financial sector, because real estate investment more closely resembles an asset than a good or service for consumption.

A region variable was also added. In 1996, the billionaires list represented only 40 countries; by 2015, 70 countries appeared on the list. (An additional seven countries appear at some point during the sample, but not in the last year.) The world's billionaires fall into six regions: Europe (separated by high- and low-income countries), Latin America, sub-Saharan Africa, the Middle East and North Africa, South and Central Asia, and East Asia (separated by high- and low-income countries). A final category, Anglo countries, encompasses billionaires from the United States, Canada, Australia, and New Zealand. Table 3 presents a list of the countries included in each regional category.

Additions to the 1996, 2001, and 2014 lists

To evaluate the underlying determinants of the rise in extreme wealth across countries, new variables on the characteristics of billionaires and their businesses were created for three years in the sample period: 1996, 2001, and 2014. Data were collected on the primary companies associated with billionaires, the founding date of those companies, the source of wealth creation, and gender. The variables were created using information from the 2014 Forbes' billionaire biographies, news articles, and company websites.[7] At least some information is publically available for 95 percent of billionaires on the 1996 list, 98 percent on the 2001 list, and 99 percent on the 2014 list.

Company variables

Where a single company can be identified as the main or initial source of an individual's wealth, two variables describe that primary company. The first variable determines whether the company is new, acquired, or the result of privatization. Firms are considered new when a billionaire or relative founded the company. Firms are considered acquired when a billionaire or family member bought a company from someone outside of the family. Firms are considered privatized when the company was originally state-owned. About 1 percent of firms do not fit these broader categories and include subsidiaries (such as Shinsegae Group, which branched off of Samsung) and franchises (such as McDonald's Japan), which are categorized by their specific type of company rather than being included in the larger three categories. In addition to identifying the type of company, the second variable is the founding date, as self-reported on the company's website or other company information.

Wealth creation variables

Categorizing wealth is a subjective process, as available information does not always provide complete individual or company histories and self-reporting may tend to glorify success. A conservative approach is used in this paper to define self-made wealth,[8] especially company founders, requiring them to have no stories connecting them to relatives or friends in government and the source of their wealth to be unrelated to natural resources, finance, or privatization. The methodology is described below in detail.

Determining the extent to which wealth is inherited or self-made is challenging, since some billionaires inherited a fortune already worth billions when they made it on the Forbes list, while others built up a smaller company into a billion dollar one. Wealth is considered inherited if the 2014 billionaire is a relative (sibling, child, spouse, etc.) of the founder of the company from which the primary source

7. The dataset provides links to specific sources for each individual.

8. Information from Forbes biographies was not relied on, as some data are missing and a relatively large share of billionaires self-report their wealth as self-made.

of wealth is derived. Using this broad definition of inherited wealth helps to avoid overestimating the impact of self-made wealth and classifies billionaires who built existing companies into billion dollar ones in the inherited category. The group of questionable cases is about 10 percent of the total sample.[9] An example is Gina Rinehart, worth $17.7 billion, who inherited the $125 million family business in 1992. Although she grew her fortune substantially (while also benefitting from booming commodity prices), her wealth nonetheless stemmed from a sizable family fortune. The methodological reason for using a low threshold to define inherited wealth is that the information regarding who founded a particular business is generally available on company websites or in news articles, but the dollar amount inherited, or the size of the company at the death of a company founder, or even when the wealth was passed to the second generation, is not. The one exception is when billionaires inherit only a single store or factory from their family, in which case they are considered self-made (about 2 percent of the sample). For example, GEMS Education Chair Sunny Varkey took over a single school with less than 400 students from his parents in 1980, and thus his wealth is considered self-made rather than inherited.

Wealth is classified as “self-made” either when the individual listed was the founder of the company, or when their source of wealth is a result of their position at a particular company. Billionaires who may have benefitted from political connections but did not inherit their wealth are also considered self-made (though these billionaires are separated into their own self-made subcategory later). In parent-child, sibling, and husband-wife partnerships, both members are considered to be self-made if both members of the partnership were involved in the founding.[10]

Self-made wealth is further divided into four categories: founders, executives, finance, and resource and politically-connected billionaires. Billionaires are first categorized as either founders or executives and then further defined into two additional groups based on their sector and political connections.

Individuals who are explicitly listed as founders on company websites are defined as company founders. A second category of self-made wealth encompasses those self-made billionaires whose wealth comes from their position as an executive at a particular company (such as Facebook Chief Operating Officer Sheryl Sandberg). Cases where the billionaire was described as chairman, chief executive officer, or other leadership position, without also being listed as the founder, are coded as executives in the data set. This group also includes those individuals who own a particular company but are not explicitly listed as

9. In their analysis of the Forbes lists of billionaires for 1987, 1992, 2001, and 2012, Kaplan and Rauh (2013) distinguish between billionaires whose wealth is self-made, inherited, and built from a “modest business.” According to their analysis, these inheritors of modest businesses make up less than 10 percent of total observations both in the United States and in the world in 2012. Kaplan and Rauh do not provide a cutoff for what constitutes a modest business.

10. In 2014, seven observations (0.43 percent of the sample) list a married couple jointly as billionaires. All of these couples are self-made and each have a combined net worth of at least $2 billion, so for this analysis, these couples are split into two observations, dividing their wealth in half. In 2001, there is one self-made married couple and one inherited brother and sister listed jointly as billionaires, but as the total net worth of each pair is less than $2 billion, they are excluded from the analysis.

founders or given executive titles and those billionaires who inherited only a single store or factory from their family.

From these two broad categories, founders and executives, all financial sector and real estate billionaires are then grouped into a single finance category. The financial sector represents a wide range of people who are difficult to otherwise categorize, so they are treated as a separate group. Some are the people who backed new and innovative companies early on or developed new products to make markets function more efficiently. Others benefitted from political connections, weak regulatory oversight, or insider trading.

Three types of self-made billionaires end up in the politically-connected/resource-related category. A billionaire is identified as politically connected if there are news stories connecting wealth to past positions in government, close relatives or friends in government, or questionable licenses.[11] Though being related to a politician may not necessarily lead to being more favorable treated than other entrepreneurs, this paper treats all political connections as the same rather than attempting to judge the impact of these connections on current wealth. In each case where a billionaire is classified as politically connected, the data include a note explaining the classification, as well as a link to the news source or webpage where the data were collected.

Privatizations, which by definition require connections with the state, also fit into this category. As in the case of political connections, there are some cases where billionaires are entrepreneurs who transformed their newly private companies into successful industry leaders. On the other hand, privatizations often allow insiders to cherry-pick undervalued state-owned companies. To avoid subjective value judgements, all privatizations were included in the politically-connected/resource-related category.

Finally, self-made billionaires whose wealth originates in resource-related industries, including oil, natural gas, minerals, and coal, are placed in this category because resource extraction relies on control of territory associated with the resource, which is frequently disbursed through government contracts. Resource wealth also accrues to those who have the good luck of finding resources in their backyards. In both cases, company value is largely driven by external forces and company management is secondary. Some such companies do benefit from good management, but much of the return from resource extraction comes from world prices and is therefore outside of managerial control.

To further disaggregate inherited wealth, inherited billionaires are divided by generation and self-made wealth based on the sector and the billionaire's relationship to the company and home government. Including the generation of the heir of a fortune demonstrates how quickly fortunes dissipate. A generational variable for the 2001 and 2014 lists classifies the the relationship of the current

11. Billionaires who use their wealth to then gain political connections are also part of the overall landscape but are beyond the scope of this analysis. See West (2014) for an analysis of the role of extreme wealth and politics.

billionaire to that of the company founder in terms of generational difference. A billionaire who inherited from either a parent, aunt, uncle, or in-law is considered a second generation inheritor, while a grandchild is considered third generation; up to five or more generations are defined. Spouses of billionaires represent the final type of inherited wealth.

Other variables

The threshold for making the Forbes list is having a net worth of $1 billion in current US dollars, implying that the marginal billionaire in 1996 is richer than the one in 2014 in real terms. In light of this, a real net worth variable in constant 1996 US dollars is included to adjust the current real net worth for inflation.

In addition to the real net worth variable, the real billionaires variable equals 1 where billionaire wealth meets the $1 billion cutoff in 1996 US dollar terms. The rationale for excluding these billionaires in analysis of long-term trends is that since inflation has decreased the minimum threshold for inclusion in the list, the growth in the number of billionaires is overreported over time. However, in practical terms, excluding those billionaires who do not make the $1 billion cutoff using 1996 dollars does not noticeably change results. Figure 1 plots real net worth over time for all billionaires, separated by emerging-market and advanced country billionaires. In each case, the darker line represents the full sample of billionaires and the lighter line excludes those billionaires who do not make the $1 billion cutoff in 1996 dollars. While there is a change in the level of total real net worth, particularly in later years, the trends are consistent across both groups.

4. TRENDS IN BILLIONAIRE WEALTH 1996–2015

Overall, there are two important shifts in the makeup of billionaires over the past 20 years. First, the number and total net worth of billionaires in emerging markets has grown rapidly. Second, over this period, the population of self-made billionaires overtook the population of inheritors.

The rapid growth in emerging-market wealth is displayed in figures 2 and 3, which map the number of billionaires by country over time. Europe and East Asia particularly highlight this trend. In East Asia, the concentration of billionaires shifts from Japan to China, while Southeast Asia sees billionaire fortunes collapse with the Asian financial crisis, followed by a resurgence in more recent years (figure 2). A similar shift to emerging markets is apparent in Europe, with wealth moving eastward over time (figure 3).

Breaking down billionaires by self-made and inherited wealth shows that inherited billionaires were more numerous than self-made billionaires in 1996. The tech boom in 2001 helped put self-made billionaires in the majority. Rapid emerging-market growth strengthened self-made wealth even more over the next decade (figure 4).

5. TRENDS IN THE UNITED STATES, EUROPE, AND OTHER ADVANCED COUNTRIES

To determine how important different sources of wealth in the industrialized world are, the advanced countries are split into three groups. First, since over half of all advanced country billionaires in 2014 were US citizens, US billionaires are treated as a single group. The second group encompasses advanced countries in Europe. Australia, Canada, Japan, New Zealand, and South Korea are grouped together as "other advanced economies."

Among advanced countries, the share of self-made billionaires has been expanding most rapidly in the United States. In Europe, despite a sizable drop from 1996 to 2001, inheritances still account for over half of all fortunes in 2014. In other advanced countries the share of inherited fortunes has fallen somewhat over the last decade. Figure 5 shows the breakdown of the number of billionaires by type for the United States, Europe, and other advanced economies. Figure A1 in the appendix shows the distribution of wealth (instead of number) by type of billionaire, and similar patterns emerge. Table A3 records the distribution of billionaires by country and type in the full sample.

Extreme Wealth Is Driven by Finance in the United States

Figure 5 shows one group that is growing especially rapidly in the United States: financial sector billionaires. The United States, with 27 percent of billionaires working in finance in 2014, now has significantly more financial sector billionaires as a share of the total billionaire population than Europe (10 percent) or other advanced countries (20 percent).[12]

The importance of finance in the United States can be seen in the sectoral contributions to growth in extreme wealth. Table 4 shows the contributions of each sector to overall growth in wealth and the number of billionaires in each of the three advanced country regions from 1996 to 2014. Over 40 percent of the growth in the total US billionaire population is attributable to growth in financial sector billionaires, as compared with 14 percent in Europe and 12 percent in other advanced economies (table 4). After finance, new sectors are most important in growing US extreme wealth. In Europe, the traded sectors provided the biggest boost to wealth growth. In other advanced countries, the nontraded sectors contributed the most to wealth growth.

Within the US financial industry, hedge funds have played an especially large role in creating extreme wealth. This group made up less than 10 percent of American financial sector wealth in 2000 and 22 percent in 2015. While the total real net worth of hedge fund billionaires in other advanced economies has stayed more or less constant since 1996 (after accounting for inflation), total US hedge fund wealth

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12. Other financial centers, including the United Kingdom (19 percent), Singapore (25 percent), and Hong Kong (40 percent), also have high concentrations of financial wealth (table A3).

ballooned to over $120 billion by September 2015 (figure 6). Over 80 percent of hedge fund billionaires are from the United States.

This shift towards the hedge fund industry among US financial sector billionaires is emblematic of a broad trend, showing hedge funds providing relatively high returns and as a result attracting people from other types of business, especially over the last two decades. Kostovetsky (2009), using data from 1993 to 2004, finds that young, high-performing mutual fund managers exited mutual funds to create or join hedge funds at faster rates in the late 1990s and early 2000s than in the early 1990s, even controlling for the effects of the dotcom bubble in 1999–2000. Additionally, mutual fund managers in the Northeast region of the United States (where hedge funds are overwhelmingly concentrated) were more likely to recruit from outside the top 15 business schools in later years, as more of the top graduates were instead recruited to the hedge fund sector. Michael Lewis (2010) describes how hedge funds pulled the best and brightest from the bond-trading floors of the big banks and tracks the hedge funds that saw the mortgage market bubble well before any of the banks did. Sebastian Mallaby (2010) chronicles the rise of the hedge fund industry in the 21st century and their survival (and success) after the financial crisis, highlighting the fact that it was not the hedge funds that needed a bailout.

Europe: Extreme Wealth Is Still Largely Inherited

While US fortunes are increasingly in the financial sector and the high-tech sector, Europe has a greater share of inherited wealth. Europe is home to the oldest fortunes, where over 20 percent of inherited billionaires are fourth generation or later heirs. In contrast, less than 10 percent of inherited US fortunes are fourth generation or older, and in other advanced countries no fortunes are older than three generations (figure 7).

The relatively high share of inherited wealth in Europe can also be seen in the age of companies associated with European billionaires. The median American business associated with a large fortune is 42 years old, as compared with 61 in Europe. The age gap between inherited firms is also large. In the United States, inherited firms have a median age of 76 years, consistent with the large share of inherited wealth currently in the hands of the second generation. In contrast, European inherited firms have a median age of 91.

Even self-made firms tend to be older in Europe, suggesting that businesses take longer to grow large in Europe. The firms associated with self-made wealth in the United States and Europe are closer in age than those of inherited wealth, with a median age of 33 and 38 years respectively—but there is still a 15 percent gap. The difference is partly because the United States is home to a much greater number of self-made technology sector billionaires, representing 12 percent of all US billionaires (56 individuals) versus 5 percent of billionaires in Europe (17 individuals), and their businesses tend to be young.

But even within industries, American businessmen and women are younger. For example, businesses associated with company founders in new sectors in the United States and Europe have median ages of 24 and 30, respectively. Growing a company into a billion-dollar firm appears to be a slower process in Europe than in the United States.

Figure 8 shows the distribution of firm age in 2014 for billionaires in the United States, Europe, and other advanced countries. The United States has a large concentration of young firms. While Europe and other advanced economies have similar modes, around 50 years, the number of firms over 50 in other advanced economies drops sharply as firms approach 100. In contrast, there is a heavier and longer tail in the distribution of European firm age, stretching out to 400 years.

In addition to being relatively old, European fortunes are aging rapidly, with a median age of 52 in 2001 and 61 in 2014, respectively (figure 9). By 2014, there is a notable absence of any businesses established post-2007 in creating extreme wealth in Europe. In contrast, wealth is created and destroyed at a nearly constant rate in the United States, such that the median American fortune was roughly the same age in 2014 (42) as it was in 2001 (38), and the shape of the distribution is almost unchanged.

6. WEALTH GROWS MAINLY ON THE EXTENSIVE MARGIN

There are two potential sources of growth in total real net worth of billionaires over time. First, individual billionaires may be getting richer on average over time (intensive margin). Alternatively, the increase in total real net worth could be primarily driven by an increase in the number of billionaires overall (extensive margin).

The following time-series regressions together determine the relative contributions of intensive and extensive margins to total billionaire wealth, where the coefficients on average real net worth and number of billionaires sum to 1 (by construction).

$$(1)\ \ln(\text{average real net worth})_t=\beta_0+\beta_1\ln(\text{total real net worth})_t+\varepsilon_t$$

$$(2)\ \ln(\text{number of billionaires})_t=\beta_0+\beta_1\ln(\text{total real net worth})_t+\varepsilon_t$$

This set of regressions is run for the entire sample, excluding 1997–2000, since the methodology used for calculating net worth and number of billionaires in these years systematically overreports net worth and underreports the number of billionaires. The regressions are run using real billionaires and real wealth to avoid any potential overcounting due to inflation, though results are similar using data in current dollars.

In all regions, growth is primarily from the extensive margin, meaning that the growth in the total real net worth in these countries is driven by additions of new superrich to the list rather than growth of existing fortunes. Put differently, some individuals may be getting richer, but there are now more low net worth billionaires, so average wealth remains constant. In Europe and other non-European advanced economies, the growth in total net worth from richer billionaires is insignificant—indicating that growth in extreme wealth is due to a bigger population of superrich. In contrast, in the United States, almost 20 percent of the growth in billionaire wealth is driven by the intensive margin. There are more American billionaires and on average they are getting richer over time (table 5).

Industrial composition may explain variation in the intensive margin across the three regions, or the intensive margin may be significant within industries only in the United States. Industries with a sizable intensive margin may matter more in the United States than elsewhere. Table 6 reports results by region and industry. In resources, nontradables, and finance, US billionaires are getting significantly richer over time. In contrast, in the other regions, with the exception of nontradables in Europe, none of the other industry-region combinations show a significant intensive margin, and even in nontradables the coefficient is significantly smaller for Europe than for the United States. Although the United States is more dynamic, with more self-made wealth and younger firms, the importance of the intensive margin in these particular sectors, which tend to be less open to competition, is suggestive of especially high rents in the United States relative to other advanced countries.

7. CONCLUSION

This paper provides an overview of the data and methodology used to amend the Forbes World's Billionaires List with individual and company characteristics and discusses trends in extreme wealth creation in the advanced countries. By adding variables classifying billionaires by industry, and details about the billionaires' relationship to the company that represents their source of wealth, these data provide an important tool for analyzing worldwide trends in billionaire wealth growth. The data can also be used for studies of wealth inequality or big business.

The analysis presented here shows wealth creation in the United States is more dynamic than in Europe, with more self-made wealth and younger businesses. It also shows the surge of US hedge fund wealth is a distinctly US phenomena. Finally, the paper finds that among the rich countries, only American billionaires are getting richer on average over time, potentially reflecting extreme rents in resources, finance, and nontradables.

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Table 1 Forbes billionaires list versus other billionaires data, 2013

	Total wealth (billions of dollars)	**Total number of billionaires**	**Emerging-market share** (percent)
Forbes	5,319	1,386	44
Knight Frank	n.a.	1,553	44
UBSWealth X	6,366	2,149	42

n.a. = not available

Sources: Forbes World's Billionaires list, Knight Frank, and Wealth-X and UBS World Ultra Wealth Report.

Table 2 Sector classifications for billionaires

Broad sector category	**Major components**	**Industry subcategories** (based on Kaplan and Rauh 2013)
Resource-related	Energy (excluding solar and wind), mining, steel	Energy, mining, metals
New	Computer technology, software, medical technology, solar and wind power, pharmaceuticals	Computer technology, medical technology
Nontradable	Retail, entertainment, media, telecommunications, construction, restaurants and other service industries	Retail/restaurant, media, construction
Financial	Banking, insurance, hedge funds, private equity, venture capital, investments, diversified wealth, real estate	Money management, venture capital, hedge funds, private equity/leveraged buyout, real estate
Tradable	Agriculture, consumer goods, shipping, manufacturing	Consumer goods, nonconsumer industrial
Other[1]	Education, engineering, infrastructure sports team ownership, unidentified diversified wealth	Diversified/other

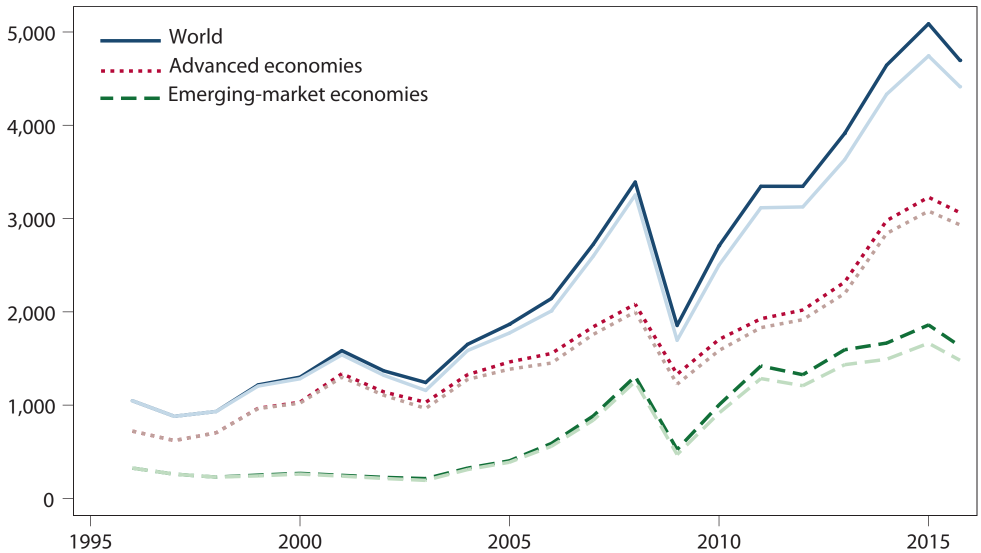
1. Accounts for less than 5 percent of observations.

Table 3 Countries represented in each regional group

Regions	**Countries**
Anglo	Australia, Canada, New Zealand, United States
Europe	
High income	Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Liechtenstein, Monaco, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom
Emerging market	Cyprus, Czech Republic, Georgia, Lithuania, Poland, Romania, Russia, Serbia, Ukraine
East Asia	
High income	Japan, Republic of Korea
Emerging market	China, Hong Kong SAR, Indonesia, Macao SAR, Malaysia, Philippines, Singapore, Thailand, Taiwan, Vietnam
Latin America	Argentina, Belize, Brazil, Chile, Colombia, Ecuador, Guatemala, Mexico, Peru, St. Kitts and Nevis, Venezuela
Middle East and North Africa	Algeria, Bahrain, Egypt, Israel, Kuwait, Lebanon, Morocco, Oman, Qatar, Saudi Arabia, Turkey, United Arab Emirates
South Asia	India, Kazakhstan, Nepal, Pakistan
Sub-Saharan Africa	Angola, Nigeria, South Africa, Swaziland, Tanzania, Uganda

Figure 1 Total real net worth of billionaires, 1996–2015

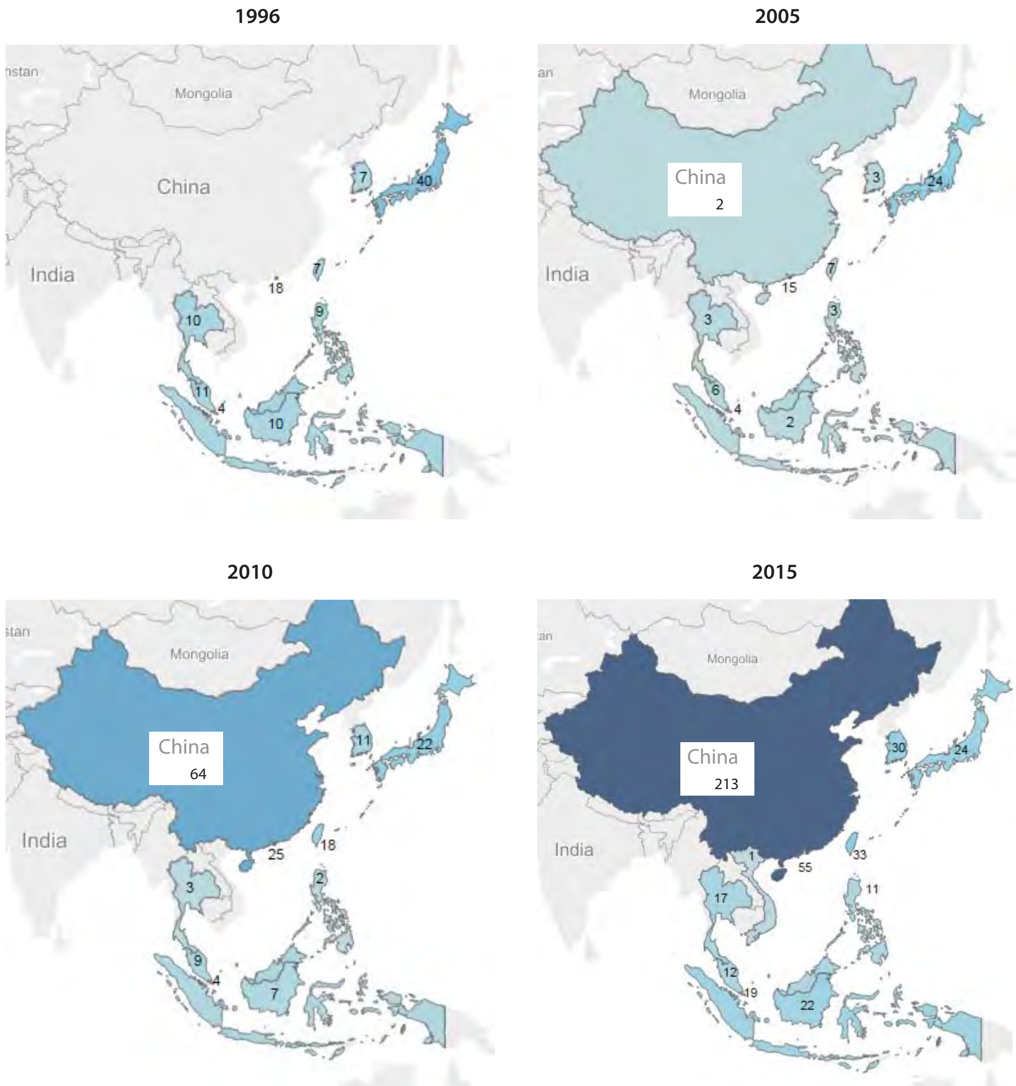
billions of US dollars, 1996



Note: Darker lines represent the full sample of billionaires, and lighter lines exclude those billionaires who do not make the $1 billion cutoff in 1996 US dollars.

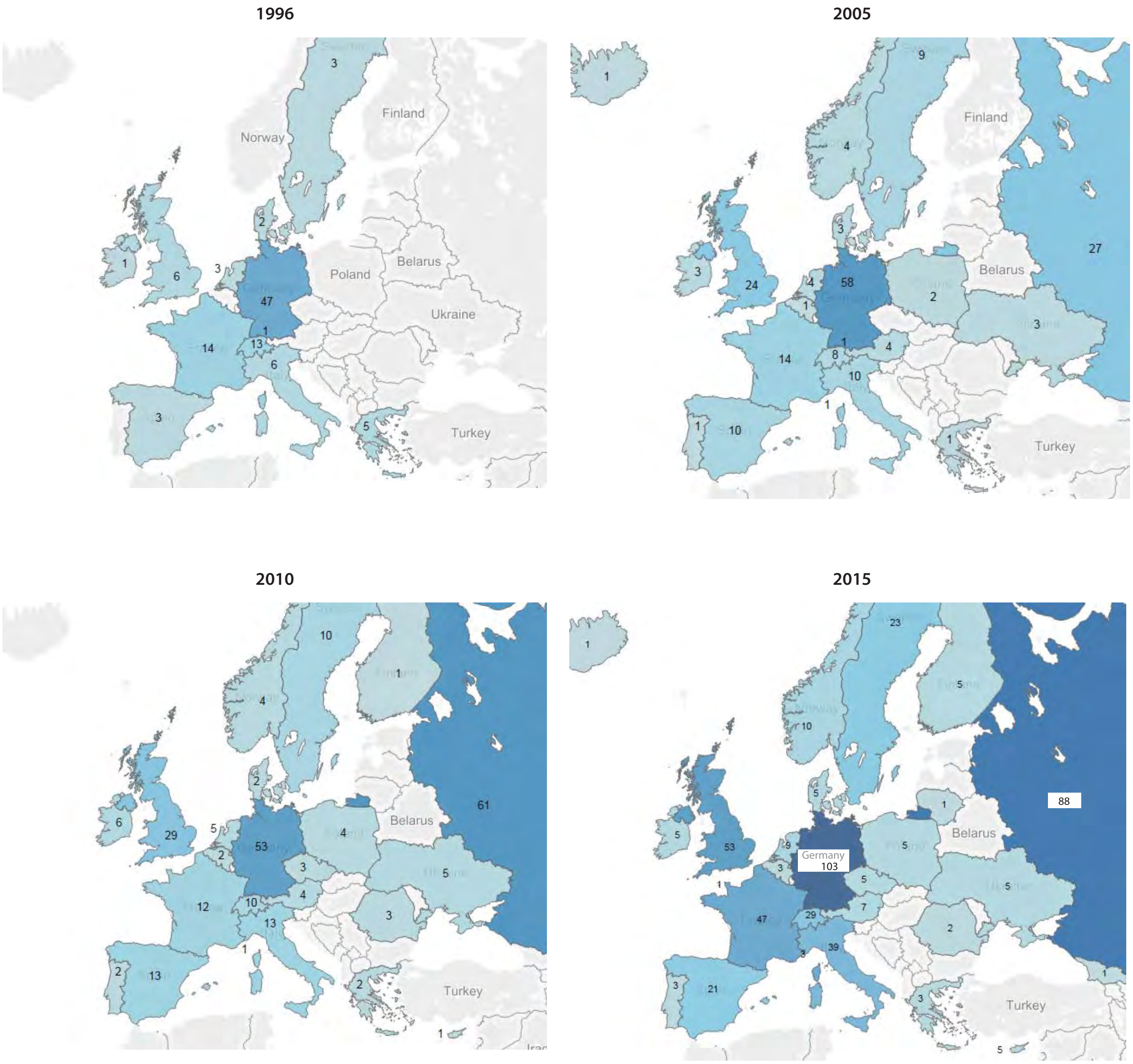
Source: Authors' calculations using Forbes World's Billionaires list.

Figure 2 Billionaires by country, East Asia



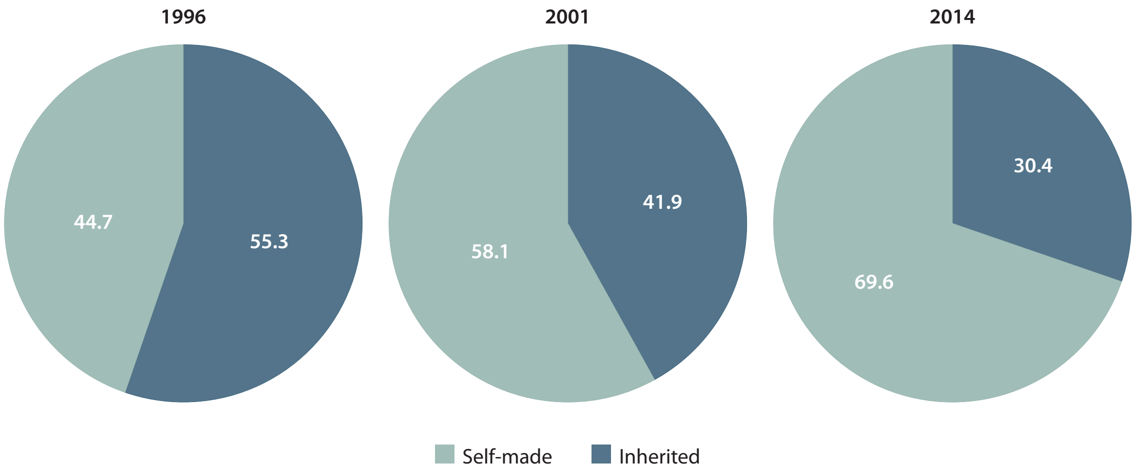
Source: Authors' calculations using Forbes World's Billionaires list.

Figure 3 Billionaires by country, Europe



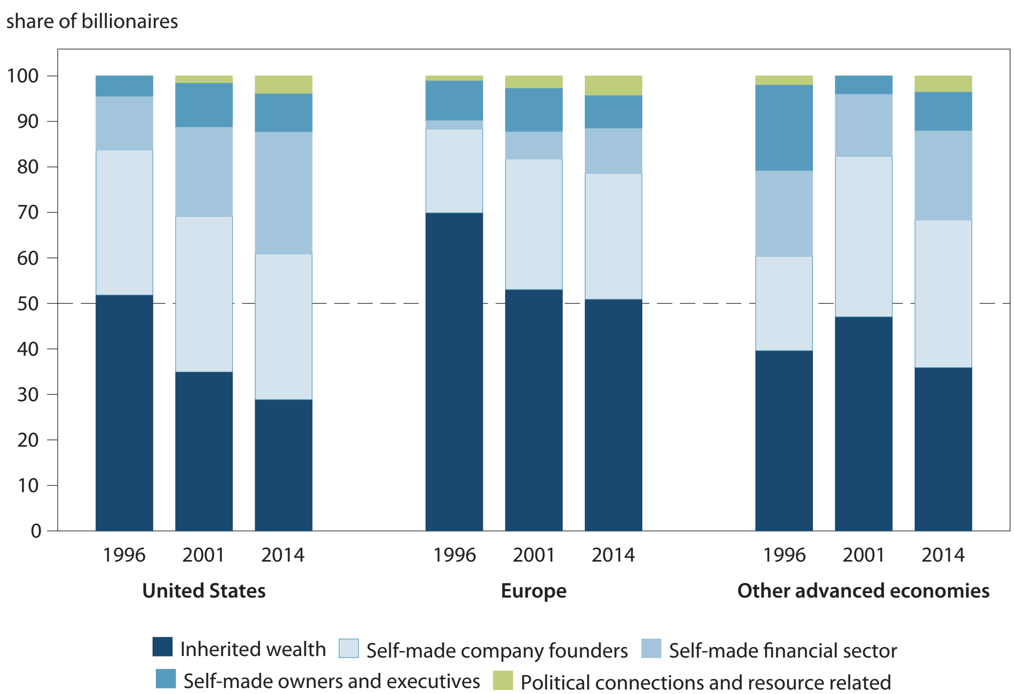
Source: Authors' calculations using Forbes World's Billionaires list.

Figure 4 Distribution of billionaires by source of wealth (percent)



Source: Authors' calculations using data from Forbes World's Billionaires list.

Figure 5 Distribution of billionaires by type, advanced economies



Sources: Authors' calculations using data from Forbes World's Billionaires list.

Table 4 Sector contribution to growth in wealth and number of billionaires, 1996–2014 (percent)

	Wealth growth			Growth in number of billionaires		
	United States	Europe	Other advanced economies	United States	Europe	Other advanced economies
Resource related	2.8	2.6	8.0	4.2	5.2	5.8
New sectors	22.1	7.8	33.5	19.0	12.7	31.9
Nontraded sectors	23.0	21.7	42.9	15.7	20.2	33.3
Financial sector	35.0	10.2	–1.3	41.6	13.5	11.6
Traded sectors	14.9	52.4	13.2	14.7	43.4	13.0
Other sectors	2.1	5.3	3.6	4.7	4.9	4.3

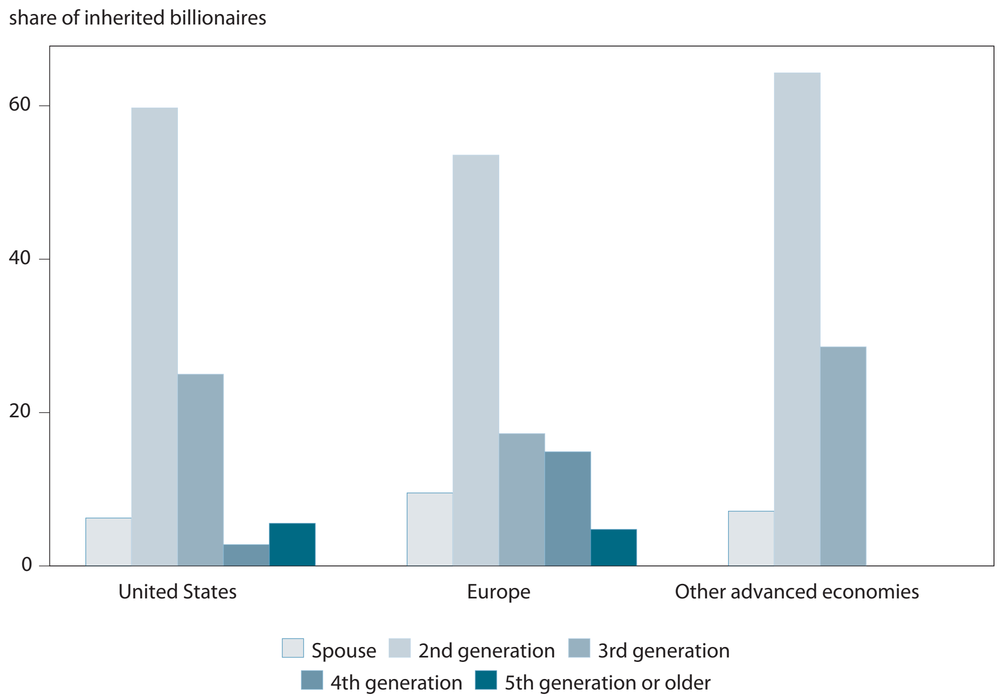
Sources: Authors' calculations using data from Forbes World's Billionaires list.

Figure 6 Growth in real net worth associated with hedge fund billionaires, United States versus other advanced economies, 1996–September 2015

billions of US dollars, 1996

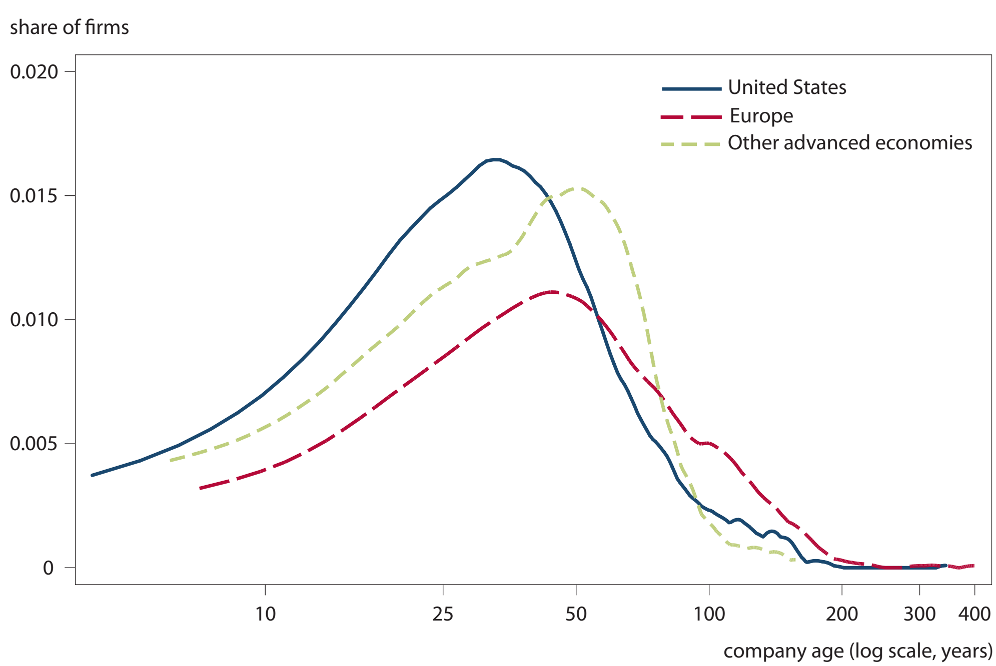
Sources: Authors' calculations using data from Forbes World's Billionaires list.

Figure 7 Inherited wealth distribution by generation, 2014



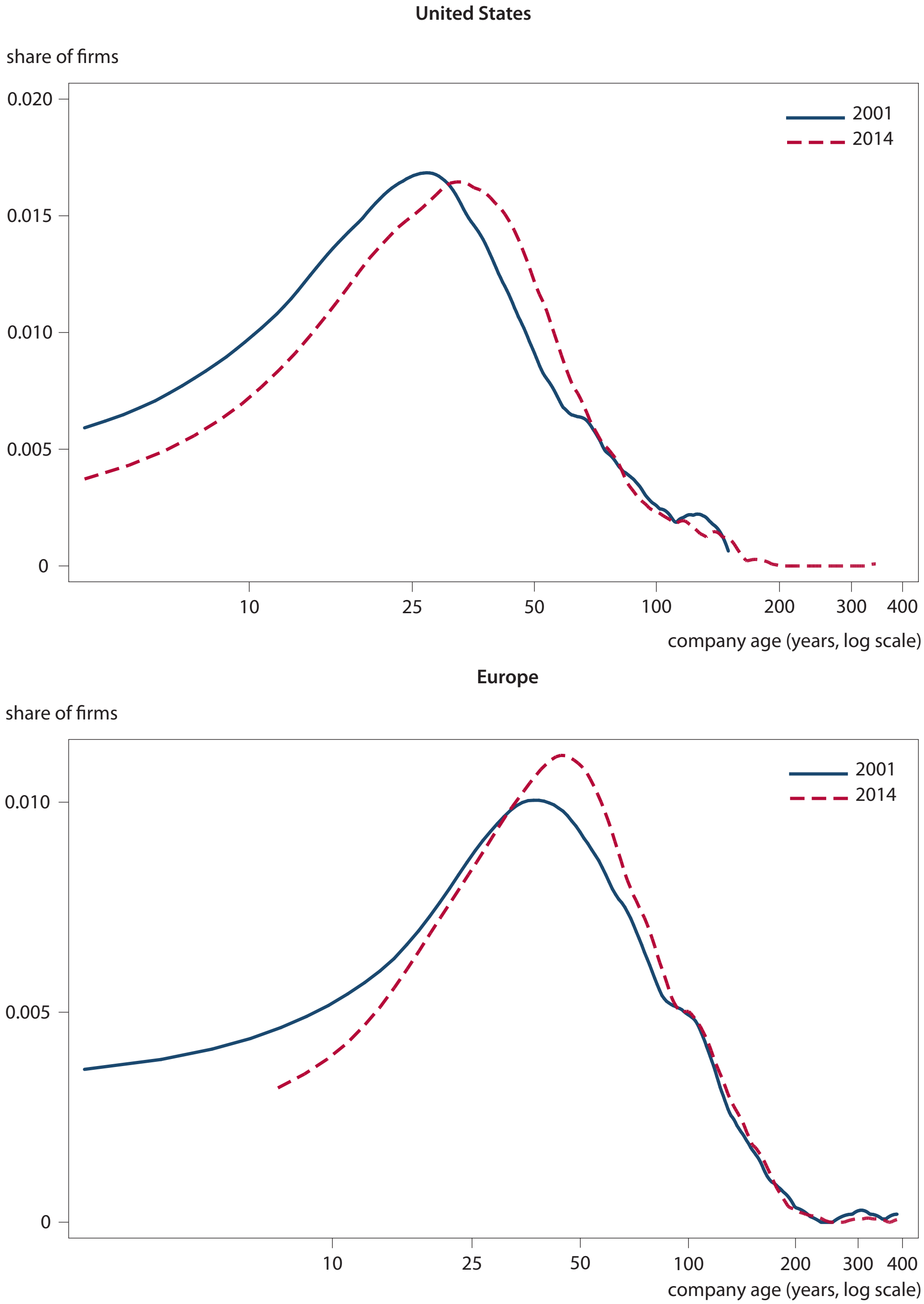
Sources: Authors' calculations using data from Forbes World's Billionaires list.

Figure 8 Distribution of firm age by region, 2014



Sources: Authors' calculations using data from Forbes World's Billionaires list.

Figure 9 Distribution of firm age over time, United States and Europe, 2001 and 2014



Sources: Authors' calculations using data from Forbes World's Billionaires list.

Table 5 Intensive and extensive margins for total real net worth, 1996, 2001–September 2015

	United States		Europe		Other advanced economies	
	ln (average size)	ln (number billionaires)	ln (average size)	ln (number billionaires)	ln (average size)	ln (number billionaires)
ln (total real net worth)	0.195***	0.805***	0.071	0.929***	–0.027	1.027***
	[0.060]	[0.060]	[0.047]	[0.047]	[0.068]	[0.068]
Observations	17	17	17	17	17	17
R-squared	0.411	0.922	0.131	0.963	0.011	0.939

*** p<0.01, ** p<0.05, * p<0.1

Notes: Standard errors in brackets, constants not reported. Regressions exclude 1997–2000 because of differences in Forbes methodology in these years.

Source: Authors' calculations using data from Forbes World's Billionaires list.

Table 6 Intensive and extensive margins for total real net worth, various sectors, 1996, 2001–September 2015

	Resource related		New		Nontraded		Financial		Traded	
	ln (average size)	ln (number billionaires)	ln (average size)	ln (number billionaires)	ln (average size)	ln (number billionaires)	ln (average size)	ln (number billionaires)	ln (average size)	ln (number billionaires)
United States										
ln (total real net worth)	0.386***	0.614***	0.085	0.915***	0.430***	0.570***	0.209***	0.791***	0.172	0.828***
	[0.034]	[0.034]	[0.067]	[0.067]	[0.044]	[0.044]	[0.049]	[0.049]	[0.125]	[0.125]
Observations	17	17	17	17	17	17	17	17	17	17
R-squared	0.898	0.957	0.096	0.925	0.862	0.916	0.55	0.946	0.112	0.745
Europe										
ln (total real net worth)	0.072	0.928***	–0.091	1.091***	0.187***	0.813***	0.058	0.942***	0.102	0.898***
	[0.053]	[0.053]	[0.083]	[0.083]	[0.054]	[0.054]	[0.065]	[0.065]	[0.079]	[0.079]
Observations	17	17	17	17	17	17	17	17	17	17
R-squared	0.108	0.953	0.074	0.92	0.441	0.937	0.05	0.933	0.1	0.895
Other advanced economies										
ln (total real net worth)	0.109	0.891***	0.066	0.934***	–0.106	1.106***	0.148	0.852***	0.156	0.844***
	[0.081]	[0.081]	[0.059]	[0.059]	[0.073]	[0.073]	[0.214]	[0.214]	[0.095]	[0.095]
Observations	17	17	17	17	17	17	17	17	17	17
R-squared	0.109	0.89	0.077	0.943	0.125	0.939	0.031	0.514	0.151	0.84

*** p<0.01, ** p<0.05, * p<0.1

Note: Standard errors in brackets.

Source: Authors' calculations using data from Forbes World's Billionaires list.

APPENDIX

Table A1 Variables in billionaire characteristics database

Variable name	Description	Available years	Source
name	name of individual or family on the billionaires list	1996–2015	Forbes
rank	rank of individual on the billionaires list, by year	1996–2015	Forbes
citizenship	billionaire country of citizenship	1996–2015	Forbes
networthusbillion	net worth of billionaire, current US dollars	1996–2015	Forbes
sourceofwealth	Forbes-reported source of billionaire wealth	2011–15	Forbes
age	billionaire age	2002–15	Forbes
deflator1996	deflator for US economy, using 2009 as base year adjusted to 1996 baseline	1996–2015	author's calculations using data from Federal Reserve, St. Louis
realnetworth	real net worth of billionaires, 1996 US dollars	1996–2015	author's calculations
realbillionaires	equals 1 where billionaire wealth is at least $1 billion in 1996 dollar terms	1996–2015	author's calculations
countrycode	3-digit ISO country code, which corresponds to billionaire's citizenship	1996–2015	author's calculations
industry	industry labels based on Kaplan and Rauh (2013)	1996–2015	author's calculations
IndustryAggregates	broad industry categories	1996–2015	author's calculations
region	categorical variable that divides billionaires into regions based on country of citizenship	1996–2015	author's calculations
north	equals 0 for emerging markets and 1 for advanced economies	1996–2015	author's calculations
gdpcurrentus	by country GDP, current US dollars	1996–2015	author's calculations
selfmade	binary variable that is 0 for inherited billionaires and 1 for self-made billionaires	1996, 2001, 2014	author's calculations
gender	binary variable that is 0 for male billionaires and 1 for female billionaires	1996, 2001, 2014	author's calculations
source2	sector of billionaire company	1996, 2001, 2014	author's calculations
company	company primarily associated with billionaire's wealth	1996, 2001, 2014	author's calculations
company type	indicates whether the company was new, acquired, or privatized when the billionaire or family members were first associated with it	1996, 2001, 2014	author's calculations
relationshiptocompany	describes the billionaire's relationship to the company primarily responsible for their wealth, such as founder, executive, relation, or shareholder	1996, 2001, 2014	author's calculations
founding date	founding date of company associated with the billionaire's wealth	1996, 2001, 2014	author's calculations
notes	extra information about individual billionaires	1996, 2001, 2014	author's calculations
sources variables (source–source5)	record of web pages used to compile information on individuals	1996, 2001, 2014	author's calculations
political connection	equals 1 where the billionaire is linked to a politician, privatized company, or questionable license (justification given in notes variables)	1996, 2001, 2014	author's calculations
founder	equals 1 where relationship to company is founder	1996, 2001, 2014	author's calculations
generationofinheritance	categorical variable that divides inherited billionaires by generation	1996, 2001, 2014	author's calculations
typeofwealth	categorical variable that divides billionaires into inherited, self-made founders, self-made executives, politically connected/resource-related, and self-made finance	1996, 2001, 2014	author's calculations

Reliability of the Data

There are some methodological concerns with the Forbes data. The first is that inherited wealth, which is not necessarily tied to a specific company, may be more likely to be diversified and thus may be overlooked by Forbes journalists, who use shareholder information to estimate wealth. Indeed, only 12 percent of the 2014 billionaires have wealth that Forbes classified as "diversified" (5 percent) or the result of "investments" (7 percent). The second is that many private companies may be overlooked because valuation is difficult, at least until the company goes public or the founder dies, and much of that wealth is likely to be self-made and excluded. For example, Twitter's three principals did not make the billionaires' list until their initial public offering in 2013. In other cases, private company fortunes first make the list when an inheritance is taxed, potentially making inheritors more likely to be on the list.

One way to estimate the potential magnitude of the first concern is to focus on the top of the billionaire distribution where inherited fortunes are unlikely to be missing, that is, the top 100 billionaires in each group. Since the billionaire ranked 100 in the rich world is worth $11.3 billion and in emerging markets $5 billion, in 2014, it is hard to imagine many billionaires in these groups falling below the Forbes' radar screen. Table A2 compares the shares of wealth and billionaires in the top 100 observations versus the entire sample of billionaires. Even with this metric, the same patterns hold. More than half of billionaires are self-made and more so in the South than the North. This method is, however, less likely to adequately address the concern about private companies, as valuation remains a problem, irrespective of the cutoff.

Table A2 Shares of billionaires and wealth among 100 richest individuals, 2014

	Rich world			Emerging markets		
	Share of billionaires (percent)	**Share of total wealth** (percent)	**Average net worth** (billions of US dollars)	**Share of billionaires** (percent)	**Share of total wealth** (percent)	**Average net worth** (billions of US dollars)
Top 100						
Inherited wealth	48.5	44.4	16.6	28.2	23.1	9.1
Self-made wealth	51.5	55.6	20.0	71.8	76.9	11.8
Full sample						
Inherited wealth	37.3	41.1	4.8	20.9	21.9	3.4
Self-made wealth	62.7	58.9	4.1	79.1	78.1	3.2

Source: Authors' calculations using data from Forbes World's Billionaires list.

Table A3 Distribution of billionaires by country and type, 2014 (percent)

	Inherited	Self-made: Company founders	Self-made: Owners and executives	Self-made: Political connections and resource related	Self-made: Financial sector	Share of world's billionaires
Anglo Countries	**28.7**	**31.3**	**8.7**	**4.1**	**27.2**	**34**
Australia	27.6	24.2	10.3	6.9	31	1.8
Canada	28.1	28.1	12.5	6.3	25	1.9
New Zealand	0	0	0	0	100	0.1
United States	28.9	32.1	8.4	3.8	26.8	30.2
Europe	**35.8**	**23.4**	**6.4**	**20.4**	**14**	**28.4**
Austria	40	30	30	0	0	0.6
Belgium	33.3	0	0	33.3	33.3	0.2
Cyprus	0	50	25	0	25	0.2
Czech Republic	0	0	16.7	50	33.3	0.4
Denmark	83.3	0	16.7	0	0	0.4
Finland	100	0	0	0	0	0.3
France	51.2	37.2	2.3	4.7	4.6	2.6
Georgia	0	0	0	100	0	0.1
Germany	64.7	25.9	5.9	2.3	1.2	5.1
Greece	66.7	0	0	33.3	0	0.2
Ireland	40	20	0	20	20	0.3
Italy	37.1	40	20	2.9	0	2.1
Lithuania	0	100	0	0	0	0.1
Monaco	33.3	66.7	0	0	0	0.2
Netherlands	42.9	42.9	0	14.3	0	0.4
Norway	22.2	33.3	11.1	0	33.3	0.5
Poland	0	20	0	20	60	0.3
Portugal	66.7	0	33.3	0	0	0.2
Romania	0	0	0	100	0	0.1
Russia	0	10.8	3.6	64	21.6	6.7
Spain	53.8	15.4	7.7	3.9	19.2	1.6
Sweden	63.2	15.8	0	5.2	15.8	1.1
Switzerland	72.7	18.2	0	4.5	4.6	1.3
Ukraine	0	11.1	0	55.6	33.3	0.5
United Kingdom	6.4	8.5	36.2	29.8	19.1	2.8
East Asia	**17.1**	**32.5**	**15.1**	**9.1**	**26.2**	**21.2**
China	2	40.1	25	9.2	23.7	9.2
Hong Kong SAR	33.3	13.3	11.1	2.2	40	2.7
Indonesia	10.5	21.1	5.3	26.3	36.8	1.1
Japan	18.5	63	7.4	0	11.1	1.6
Macau SAR	0	0	0	0	100	0.1

(table continues)

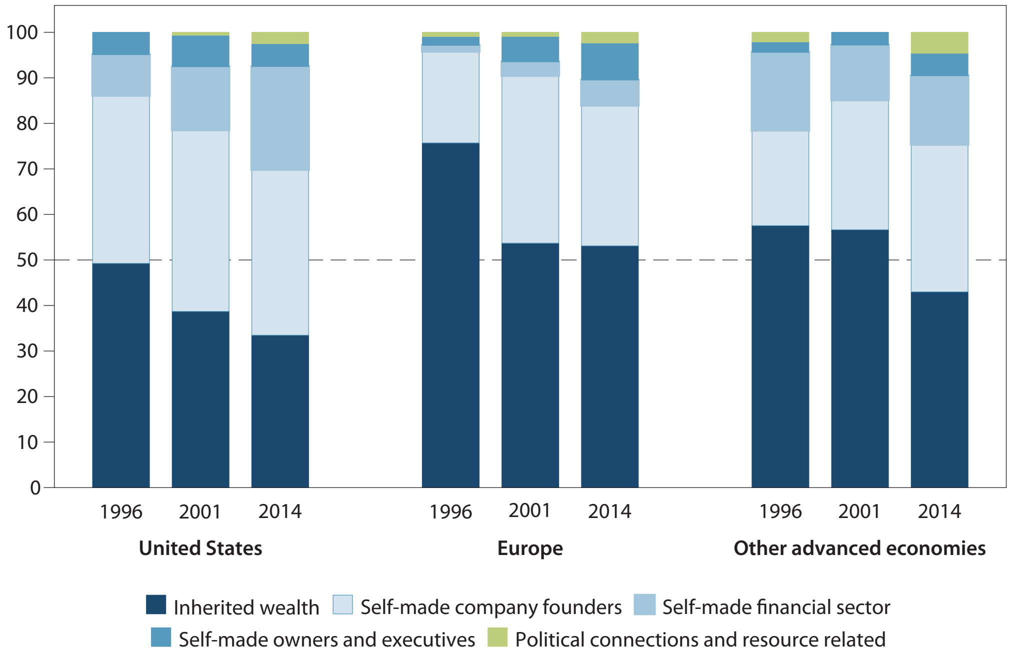
Table A3 Distribution of billionaires by country and type, 2014 (percent) *(continued)*

		Self-made				
	Inherited	Company founders	Owners and executives	Political connections and resource related	Financial sector	Share of world's billionaires
Malaysia	0	23.1	0	46.1	30.8	0.8
Philippines	20	20	0	10	50	0.6
Singapore	37.5	12.5	12.5	12.5	25	1
South Korea	74.1	18.5	3.7	0	3.7	1.6
Taiwan	17.9	42.8	10.7	3.6	25	1.7
Thailand	18.2	18.2	9.1	36.3	18.2	0.7
Vietnam	0	0	0	0	100	0.1
Latin America	**49.1**	**19.3**	**6.1**	**8.8**	**16.7**	**6.9**
Argentina	80	0	0	0	20	0.3
Brazil	47.7	21.5	7.7	4.6	18.5	3.9
Chile	66.7	8.3	0	16.7	8.3	0.7
Colombia	50	0	0	0	50	0.2
Mexico	37.5	12.5	12.5	25	12.5	1
Peru	37.5	50	0	12.5	0	0.5
Venezuela	66.7	0	0	0	33.3	0.2
Middle East/North Africa	**43.6**	**17.9**	**9**	**14.1**	**15.4**	**4.7**
Algeria	0	100	0	0	0	0.1
Egypt	71.4	14.3	14.3	0	0	0.4
Israel	22.2	27.8	16.7	16.7	16.7	1.1
Kuwait	100	0	0	0	0	0.3
Lebanon	66.7	0	0	33.3	0	0.4
Morocco	50	0	0	0	50	0.2
Oman	0	0	0	50	50	0.1
Saudi Arabia	0	0	14.3	42.9	42.9	0.4
Turkey	45.9	29.2	8.3	8.3	8.3	1.4
United Arab Emirates	75	0	0	0	25	0.2
South Asia	**30.6**	**30.7**	**6.5**	**17.7**	**14.5**	**3.8**
India	33.9	33.9	7.2	10.7	14.3	3.4
Kazakhstan	0	0	0	100	0	0.3
Nepal	0	0	0	0	100	0.1
Sub-Saharan Africa	**18.7**	**25**	**18.8**	**25**	**12.5**	**1**
Angola	0	0	0	100	0	0.1
Nigeria	0	50	0	50	0	0.3
South Africa	37.5	25	12.5	12.5	12.5	0.5
Swaziland	0	0	100	0	0	0.1
Tanzania	0	0	100	0	0	0.1
Uganda	0	0	0	0	100	0.1
Total	**30.4**	**27.7**	**9.3**	**11.3**	**21.3**	**100**

Source: Authors' calculations using data from Forbes World's Billionaires list.

Figure A1 Distribution of wealth by type of billionaire, advanced economies

share of total real net worth



Source: Authors' calculations using data from Forbes World's Billionaires list and the billionaire characteristics database.