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Global Wealth Inequality

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Abstract

This article reviews the recent literature on the dynamics of global wealth inequality. I first reconcile available estimates of wealth inequality in the United States. Both surveys and tax data show that wealth inequality has increased dramatically since the 1980s, with a top 1% wealth share of approximately 40% in 2016 versus 25–30% in the 1980s. Second, I discuss the fast-growing literature on wealth inequality across the world. Evidence points toward a rise in global wealth concentration: For China, Europe, and the United States combined, the top 1% wealth share has increased from 28% in 1980 to 33% today, while the bottom 75% share hovered around 10%. Recent studies, however, may underestimate the level and rise of inequality, as financial globalization makes it increasingly hard to measure wealth at the top. I discuss how new data sources (leaks from financial institutions, tax amnesties, and macroeconomic statistics of tax havens) can be leveraged to better capture the wealth of the rich.

1. INTRODUCTION

Over the past few years, there has been an explosion of research on wealth inequality. Following the publication of Piketty's (2014) book, a number of studies have attempted to produce new estimates of long-run trends in wealth concentration. This literature has developed new techniques to better capture the distribution of wealth by combining different data sources in a consistent manner. In the United States, Saez & Zucman (2016) combine income tax returns with survey data and macroeconomic balance sheets to estimate wealth inequality back to 1913. This method has subsequently been used in several countries to provide comparable estimates of wealth concentration. The evidence collected to date suggests that wealth inequality has increased in many countries over the past decades, although at different speeds, highlighting the critical role played by domestic institutions (Alvaredo et al. 2018b). These findings have received attention among academics, policy makers, and the broader public and have contributed to a renewal of interest in theories of wealth distribution, surveyed by Benhabib & Bisin (2018).

Despite the growing attention to wealth inequality, however, we still face significant limitations in our ability to measure it. Because few countries have a wealth tax, there is typically little administrative data on wealth. One has to use either survey data or indirect methods (such as capitalizing incomes), and both of these approaches present difficulties. As a result, a robust discussion has emerged about the reliability of the various techniques used to measure concentration, in particular in the United States (Kopczuk 2015, Bricker et al. 2016). Moreover, measuring the wealth of rich households is getting increasingly difficult in a globalized world. Since the 1980s, a large off-shore wealth management industry has developed that makes some forms wealth (namely, financial portfolios) harder to capture. Zucman (2013) estimates that 8% of the world's household financial wealth is held offshore. Lastly, as the world becomes more integrated, it is becoming increasingly important to measure wealth not only at the country level but also at the global level. Yet, although there is a large literature on global income inequality (e.g., Lakner & Milanovic 2017), relatively little is currently known about the level and trends in global wealth concentration. It is unclear, in particular, whether global wealth inequality is rising or falling.

This review summarizes the methodological and substantive advances of the recent literature that attempts to measure wealth inequality, discusses the current uncertainties and controversies, and attempts to piece together and reconcile the existing evidence about the evolution of wealth inequality in the United States and globally. By doing so, it contributes to advancing knowledge on the dynamic of global wealth concentration. I also discuss how, looking forward, new data sources such as leaks from financial institutions, tax amnesties, and macroeconomic statistics of tax havens could be leveraged to better capture the wealth of the rich.[1]

I start in Section 2 by defining wealth and reviewing the various methods used to measure its distribution. Following Saez & Zucman (2016), several papers implement the capitalization method to estimate wealth inequality, conduct tests for its reliability, and compare the results to alternative methodologies. I survey what has been learned methodologically and substantively from this literature and discuss the areas where more research is needed.

Section 3 focuses on the case of the United States. I show that the three sources of data available in the United States today paint a consistent picture. Survey data [the US Survey of Consumer Finances (SCF)], capitalized income data, and Forbes rankings of the 400 richest Americans all show that wealth concentration is high and has increased sharply since the 1980s. The most

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[1]This review is focused on the empirics of wealth inequality. It complements the work of Benhabib & Bisin (2018), who survey the economic theories of wealth inequality (see also Davies & Shorrocks 1999). I do not discuss the large literature on the relative role of inheritance versus self-made wealth (surveyed in Piketty & Zucman 2015).

up-to-date versions of the SCF and capitalized income estimates have the exact same level for the top 1% wealth share in 2016 (40%) and show similarly rising trends since the late 1980s. There are slight differences of timing: The SCF shows a relatively modest increase in wealth concentration in the 2000s and a large rise since 2010, while capitalized incomes find a large increase between 2000 and 2010 and a stabilization since then. However, the medium-term evolutions in both data sets are strikingly similar: In both data sources, the top 1% share has increased more than 10 points since the beginning of the 1990s. This finding is confirmed by Forbes rankings, which show that the share of national wealth owned by the top 0.00025% (roughly the 400 richest Americans) has been multiplied by four since the early 1980s, in line with the rise in the very top wealth shares recorded in capitalized income statistics. In sum, a body of independent data sources paint the same picture of sharply rising concentration at the top end.

Section 4 discusses the fast-growing literature on wealth inequality across the world. Over the past years, several papers have attempted to produce distributional national accounts, i.e., estimates of wealth (and income) inequality that are comprehensive, are internationally comparable, and cover the entire distribution from the bottom groups up to the very top.[2] New estimates for China, Russia, and several European countries (France, the United Kingdom, and Scandinavian countries) reveal a diversity of national trajectories. In Russia, wealth concentration boomed after the transition to capitalism, and inequality appears to be extremely high, on par with or even higher than in the United States. In China—and several European ex-communist countries— wealth inequality has also increased, but in a more gradual manner than in Russia, reflecting the different privatization strategies followed in the different ex-communist countries. In continental Europe, wealth concentration is rising, but less than in the United States, China, or Russia. At the global level, there are two conflicting forces: In many emerging economies (most prominently China), aggregate private wealth is booming (it is rising even faster than aggregate income), pushing global wealth inequality down. However, within each country, wealth concentration is on the rise, pushing wealth concentration up. Overall, evidence points toward a mild increase in global wealth concentration since the 1980s: For China, Europe, and the United States combined, the top 1% wealth share has increased from 28% in 1980 to 33% today, while the bottom 75% share hovered around 10%. However, the recent history of global wealth is more complicated than that: Global wealth growth rates vary a lot across the distribution. The bottom has been growing fast (approximately 5% per year since 1987), while the global wealth middle class was squeezed (with growth of approximately 2.5% per year on average), and the top boomed (with growth rates as high as 7–8% per year for Forbes billionaires).

Recent studies may underestimate the level and rise of inequality, however, because financial globalization makes it increasingly hard to measure wealth at the top. Statistics recently released by the central banks of several prominent tax havens suggest that the equivalent of 10% of world GDP is held in tax havens globally, and that this average masks a great deal of heterogeneity— from a few percent of GDP in Scandinavia to approximately 15% in continental Europe and 60% in Gulf countries and some Latin American economies (Alstadsæter et al. 2018). Furthermore, recent leaks from offshore financial institutions (such as the Panama Papers in 2016 or the Swiss Leaks from HSBC Switzerland) and data from tax amnesties suggest that offshore wealth is highly concentrated among the rich (Alstadsæter et al. 2017). I discuss in Section 5 how combining this new type of evidence with existing estimates of the distribution of observable wealth can improve knowledge about wealth inequality. Accounting for the wealth held in tax havens increases the top 0.01% wealth share substantially in Europe, even in countries that do not use tax havens

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[2]The series made available online in the World Inequality Database (**https://WID.world**) follows this methodology.

extensively. Accounting for this wealth has considerable effects in Russia, where the vast majority of wealth at the top is held offshore.

In sum, it is not enough to study wealth concentration using self-reported survey data or tax return data. Because the wealthy have access to many opportunities for tax avoidance and tax evasion—and because the available evidence suggests that the tax planning industry has grown since the 1980s as it became globalized—traditional data sources are likely to underestimate the level and rise of wealth concentration. To capture the true wealth of the rich in today's world, it is key to look beyond administrative tax and survey microdata and to take instead a global perspective that attempts to capture all forms of wealth, domestic and foreign.

Before starting the discussion of these various issues, let us pause for a second and ask: Why should we care about wealth inequality? To the extent that wealth is accumulated out of past earnings, studying its distribution is a way of getting at the distribution of lifetime income, which is typically hard to study with available income data (most of which are cross-sectional only). Moreover, wealth itself generates income (interest, dividends, capital gains, rents), and thus the distribution of wealth shapes the distribution of current income (and therefore of current consumption). More broadly, wealth serves two purposes. For everybody except the rich, its main function is to provide security. It enables individuals to smooth shocks (what is known as the precautionary saving motive) and to maintain consumption during retirement (the life-cycle saving motive). For the rich, wealth begets power. A large political science literature stresses the role played by the wealthy in the political process (see Hacker & Pierson 2010, Gilens 2012, Bonica et al. 2013, Gilens & Page 2014, Kuhner 2014, Bertrand et al. 2018; for a critical survey of the evidence on the interplay between wealth and democracy, see also Scheve & Stasavage 2017). A body of recent work examines the hypothesis that wealth concentration may help explain the lack of redistributive responses to the rise of inequality observed since the 1980s (e.g., Bonica et al. 2013). This can rationalize why the public seems to care strongly about the distribution of wealth in democratic societies [as illustrated, for instance, by the commercial success of a lengthy academic tome such as Piketty's (2014) book]. In that context, I stress the need for better democratic transparency on wealth and describe how better access to data sources could contribute to improving the public discussion and the design of tax policies.

2. WHAT IS WEALTH? DEFINITION AND MEASUREMENT

2.1. What Is Wealth?

To make meaningful comparisons of wealth inequality across countries and over time, it is critical to adopt a common, consistent, and comprehensive definition of wealth. In this article, I follow the definition codified in the System of National Accounts (UN 2009) and by Piketty & Zucman (2014) and Alvaredo et al. (2016a): Household net wealth includes all the nonfinancial assets— real estate, land, buildings, etc.—and financial assets—equities, bonds, bank deposits, life insurance, pensions funds, etc.—over which households can enforce ownership rights and that provide economic benefits to their owners, net of any debts. As a general rule, all assets and liabilities are valued at their prevailing market prices. This definition of wealth includes all funded pension wealth—whether held in individual retirement accounts or through pension funds and life insurance companies. This is the definition followed by all of the wealth inequality series published in the World Inequality Database (**http://WID.world**).

This definition is comprehensive in the sense that it includes all forms of marketable wealth. However, it excludes several components that are sometimes thought of as being part of wealth. First, it excludes durable goods and valuables, such as cars and furniture. Durables and valuables are small compared to the forms of wealth that I consider, and measuring their distribution raises

practical difficulties—particularly because there is no information about them in income tax returns (as they do not generate taxable income). In practice, including them would only modestly affect the level of wealth concentration and would not significantly alter any of the trends.[3] Second, the definition of wealth used in this review excludes the present value of future Social Security benefits and, more broadly, all future government transfer payments.

Should Social Security wealth be counted as wealth? Feldstein (1974) argues that it should, as, more recently, does Weil (2015). Social insurance programs—such as pay-as-you-go Social Security systems—provide security to their beneficiaries and, from that perspective, are analogous to wealth. Social Security might interact with private saving decisions (e.g., more generous pay-as-you-go Social Security systems may depress private wealth accumulation), and thus one may want to analyze them altogether. Feldstein (1974) finds that including Social Security makes wealth significantly more equally distributed. However, there are several major conceptual and empirical reasons for excluding Social Security from wealth. First, although Social Security certainly matters for saving decisions, the same is true for all promises of future government transfers. Including Social Security in wealth would thus call for including the present value of future health benefits (such as Medicare benefits in the United States), future government education spending for one's children, etc., net of future taxes. It is not clear where to stop, and such computations are inherently fragile because of the lack of observable market prices for these types of assets. Second, in contrast to marketable wealth, Social Security (and other future government transfers) cannot be used to finance consumption today and absorb shocks. This is the key difference between Social Security and the forms of pension wealth that I include in my computations, namely all funded pension accounts, such as 401(k)s and IRAs in the United States, which (subject to restrictions and regulations) can be used before retirement.[4]

Rather than including it into wealth, a more promising way to study how Social Security (and government taxes and transfers more generally) affects inequality is to contrast income inequality before and after Social Security (and other government taxes and transfers). Because in many cases the value of social insurance contributions, social insurance benefits, and other government taxes and transfers is directly observable, this approach provides a more robust and transparent way to assess the equalizing effects of government intervention in the economy than does the approach favored by Feldstein (1974), which lumps together marketable wealth with the present discounted value of future government transfers. Piketty et al. (2018) compute pre–tax and transfer versus post–tax and transfer income inequality in the United States. Unsurprisingly, income is more equally distributed after government intervention than before. Even after government transfers are taken into account, however, income inequality appears to have increased significantly since the early 1980s.

The wealth concept used in this article (and in the World Inequality Database) also excludes human capital, which, contrary to nonhuman wealth, cannot be sold on markets. Because the distributions of human and nonhuman capital are shaped by different economic forces (savings, inheritance, and rates of returns matter for nonhuman capital; technology and education, among

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[3]The macroeconomic series by Piketty & Zucman (2014) shows that the value of durable goods has been relatively small and stable over time (approximately 30–50% of national income, i.e., the equivalent of approximately 5–10% of net household wealth). In the SCF, cars—which represent the majority of durables—are relatively equally distributed (Kennickell 2009). Thus, adding durables would slightly reduce the level of wealth disparity but would probably not have much impact on trends.

[4]The definition of wealth used in this article also excludes unfunded defined benefit pensions, i.e., promises of future payments that are not backed by actual wealth. In the United States, the vast majority (more than 90%) of unfunded pension entitlements are for government employees (federal and local); they thus are conceptually similar to promises of future government transfers and, like those, are better excluded from wealth.

others, matter for human capital), it is necessary to start by studying the two of them separately. We also exclude the wealth of nonprofit institutions, mostly for data availability reasons. Conceptually, it would be desirable to include at least part of nonprofits' wealth: It is somewhat arbitrary to include the assets owned by Bill Gates in his own name, but to exclude the assets of the Bill and Melinda Gates Foundation entirely. The problem is that allocating the wealth of foundations cannot be easily done (especially in the case of foundations created long ago, like the Ford Foundation). In a country like the United States, the wealth of foundations is growing fast (from 0.8% of total household wealth in 1985 to 1.2% in 2012; see Saez & Zucman 2016). Looking forward, designing methods to impute the wealth of foundations (and certain other nonprofits) to specific groups of the distribution would be valuable.

2.2. Measuring Wealth Inequality

There are several ways to estimate how wealth is distributed, depending on data availability.

2.2.1. Using wealth tax data. The ideal data source to measure wealth inequality is population-wide administrative data on all forms of wealth at market value. Scandinavian countries come closest to this ideal: Because they have (Norway) or used to have (Denmark, Sweden) broad-based wealth taxes, administrations in these countries collect detailed microlevel data on wealth from third parties (banks, other financial institutions, real estate registers, etc.).[5] These data sources were recently exploited by Jakobsen et al. (2018) and Alstadsæter et al. (2017) to construct comprehensive estimates of the distribution of wealth in Denmark, Norway, and Sweden for recent decades. Several countries (such as France and Spain) also have or used to have wealth taxes covering the top of the distribution; recent research has exploited these data to shed light on wealth concentration at the top (Garbinti et al. 2016, Martínez-Toledano 2017).

In practice, wealth tax data never cover all forms of wealth, so these data need to be combined with other data sources to provide a comprehensive estimate of wealth concentration. In Denmark, all forms of wealth—with the exception of private funded pension wealth—used to be taxable, with no or limited valuation discounts, and data on the distribution of private pension wealth have recently become available, making it possible to compute a particularly reliable estimate of wealth concentration. More frequently, however, some (sometimes many) asset classes are legally exempted from the wealth tax, and/or assets are only taxable for a fraction of their market value, requiring careful adjustments. Another traditional issue with wealth tax data is the valuation of unlisted businesses, for which regular price information is lacking. One appealing solution involves valuing unlisted business equity based on valuation multiples of listed firms in the same industrial sector, as Bach et al. (2017) do in Sweden.

2.2.2. Estate multiplier. The main source traditionally used to study wealth inequality in countries with no wealth tax has been inheritance and estate tax returns. By definition, estates and inheritance returns only provide information about wealth at death. To generate estimates for the distribution of wealth among the living, one needs to weight wealth at death by the inverse of the mortality rate—what is known as the estate multiplier technique. In the United Kingdom, this approach was followed by Atkinson & Harrison (1978), who exploit inheritance tax data covering the 1922–1976 period, and was recently applied by Alvaredo et al. (2018a) to estimate wealth inequality from 1895 to the present. In the United States, Lampman (1962) uses estate tax data to

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[5]Sweden stopped collecting data after its wealth tax was abolished in 2007, while Denmark continued doing so after its wealth tax was abolished in 1997.

study wealth inequality over the 1916–1956 period, and the estate multiplier technique was sub-sequently applied by many other researchers—including in the official personal wealth estimates from the Statistics of Income (for a collection of these studies, see Johnson 2011) and by Kopczuk & Saez (2004), who produce top wealth shares for the 1916–2000 period. In France, it was applied by Piketty et al. (2006) and more recently by Garbinti et al. (2016).

A key advantage of the estate multiplier method is that it makes it possible to produce long-run series of wealth concentration, since many countries have had an estate or inheritance tax since the beginning of the twentieth century or earlier. In contrast, survey data only cover post-World War II decades at best and, most of the time, only start in the 1980s.

Recent research, however, has highlighted major pitfalls with the estate multiplier technique in the United States. By matching estate tax returns to income tax returns, Saez & Zucman (2016) conduct a first direct test of this method. They compute the distribution of capital income at death and weight each observation by the age × gender inverse mortality rates used by Kopczuk & Saez (2004), which factor in a correction to take into account that the wealthy live longer than the average population. If the estate multiplier technique worked well, then the distribution of capital income in the weighted decedent sample would be similar to that in the living population. However, it is not. According to the estate multiplier method, the concentration of taxable capital income has barely increased since 1976, while in actual fact it has surged. A researcher who only had access to estate tax returns (with information on taxable income the year before death) and who chose to use this information to study income inequality would mistakenly conclude that taxable capital income inequality has not increased in the United States. Unsurprisingly, since the estate multiplier estimates suggest that the concentration of capital income has been stable, they also suggest that the concentration of wealth has been stable.

Why does the estate multiplier technique fail in the United States? There are two key issues. The first is that the approach of death affects behavior. People who will die soon may become un-able to manage their wealth well, consume more, spend large amounts on health care services, or organize their wealth so as to shelter it from the estate tax, for example, by transferring it to foun-dations or children. Because behavior changes just before death, some people with high lifetime earnings will tend to die with little wealth and taxable income. In the US context, Kopczuk (2007) finds evidence that the onset of a terminal illness leads to a large reduction in the value of estates reported on tax returns. Moreover, the way that death affects behavior has probably varied over time, particularly because of changes in estate tax enforcement. In the United States, the estate tax has been considerably scaled back since the 1970s. While estate and gift tax revenue amounted to 0.20% of household net wealth in the early 1970s, since 2010, they have amounted to only 0.03–0.04% each year. While this dramatic fall is partly due to to rate cuts and increases in the ex-emption level, it may also be due to to an increase in tax avoidance and financial engineering, such as a more widespread use of valuation discounts for closely held businesses and more sophisticated estate tax planning. There has always been estate tax avoidance, but there is no reason to presume that this avoidance has been constant over time: The incentives for the IRS to enforce the estate tax (and the political will to do so) may well have declined over the past decades as rates were cut and exemption thresholds increased. More research on changes in estate tax avoidance would be valu-able to correct the estate multiplier technique and reconcile it with the other data sources on US wealth concentration, which all show a sharp increase in inequality since the 1980s (see Section 3).

The second issue is the following. The estate multiplier method weights estate tax returns by the inverse probability of death based on mortality tables by age and gender. Because the wealthy typically live longer than the rest of population, mortality rates need to be corrected for differential mortality by wealth group. Kopczuk & Saez (2004) use the same correction factors for all years, thereby assuming that the mortality gradient by wealth has not changed over time. However,

several recent studies document that differential mortality by socioeconomic status has grown (e.g., Waldron 2007, Chetty et al. 2016). Growing mortality differentials introduce mechanical biases in the estate multiplier method. This problem is not insuperable, however. In the United Kingdom, Alvaredo et al. (2018a) do not assume a constant wealth–mortality gradient over time: Their adjustment varies over the years. They also consider a range of robustness tests showing how varying the mortality gradient affects the top 1% wealth share. They find that, if one reduces the relative mortality of the richest males aged 65–75 from 60% (as in their benchmark estimates) to 40% in recent years, then the top 1% wealth share would be as high today as in 1960 (while it is significantly lower in their benchmark estimate; see **Figure 4** below). Looking forward, more research is needed on the evolution of differential mortality across wealth groups.

2.2.3. Income capitalization.

To measure the distribution of wealth, one can capitalize the dividends, interest, rents, and other forms of capital income declared on income tax returns. This capitalization technique was pioneered by King (1927), Stewart (1939), Atkinson & Harrison (1978), Wolff (1980), and Greenwood (1983), who used it to estimate the distribution of wealth in the United Kingdom and in the United States for some years in isolation.[6] Saez & Zucman (2016) use it to estimate the distribution of US wealth annually since 1913. In recent years, this method has become more popular and has been applied, alone or in conjunction with other methods, to estimate the distribution of wealth in Australia (Galiana 2016), South Africa (Orthofer 2016), France (Garbinti et al. 2016), and the United Kingdom (Alvaredo et al. 2018a).[7]

The general idea behind the income capitalization method is to recover the distribution of wealth from the distribution of capital income flows. In its simplest form, the method relies on the assumption of fixed rates of return by asset class. In more sophisticated versions, one can introduce different rates of return within each asset class, e.g., due to idiosyncratic variations in rates of return, or because the rate of return varies with the level of asset holding. Saez & Zucman (2016) provide evidence that the simple method with uniform rates of returns within asset class seems to perform reasonably well in the US context. It works in the SCF (i.e., one finds the same distribution of wealth when capitalizing the taxable income reported in the SCF and when looking at the self-reported wealth values), in matched estates–income tax data (i.e., rates of returns the year before death do not seem to vary with wealth within asset class), and for US foundations (i.e., one finds the same distribution of wealth when capitalizing the investment income of foundations and when looking at their wealth, which they report to the IRS).

However, it is clear that the simple capitalization method has no reason to work universally. A lot depends on the specificities of the tax system. In the United States, the tax code has historically been designed such that capital income flows to individual returns for a wide variety of ownership structures, and thus a large amount of wealth generates taxable income.[8] However, in other countries, it can be easier for wealthy individuals to earn nonreportable capital income. A striking case in point that has been recently studied is Norway, where, following the introduction of a new tax in 2005, dividend distributions collapsed, and retained earnings surged, leading to extremely

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[6]Kuznets (1953) pioneered the use of tax data to study income inequality, but he did not attempt to use these data to study wealth inequality.

[7]Mian et al. (2013) use the capitalization method and ZIP-Code-level income tax statistics to measure wealth by ZIP Code.

[8]In particular, dividends and interest earned through mutual funds, S-corporations, partnerships, holding companies, and some trusts end up being included in the interest and dividends lines of the ultimate individual owner's tax return, just as does income from directly owned stocks and bonds. Several provisions in the tax code prevent individuals from avoiding the income tax through the use of wealth-holding intermediaries, such as the accumulated earnings tax—in force since 1921—levied on the undistributed corporate profits deemed to be retained for tax avoidance purposes (see Saez & Zucman 2016).

low realized rates of return on equity (Alstadsæter et al. 2016). If the wealthy have access to more tax avoidance opportunities—i.e., are able to report relatively little taxable capital income for any dollar of wealth that they own—then the capitalization method will tend to underestimate wealth concentration. Moreover, if access to such avoidance opportunities changes over time, then the simple capitalization will deliver biased estimates of the trends in wealth concentration.

Another known issue with the capitalization method is that returns are heterogeneous, even within a given asset class. This problem was first discussed conceptually by Atkinson & Harrison (1978). Recent studies that leverage detailed population-wide Scandinavian administrative data with information on both income and wealth allow us to quantify this issue. In Norway, Fagereng et al. (2016, 2018) find that returns on bank deposits, for instance, are heterogeneous across individuals (with a standard deviation of 2.6%), despite the fact that these instruments entail no risk. Similar findings are obtained by Lundberg & Waldenström (2018) in Sweden. Such heterogeneity in returns implies that capitalized income estimates are biased. However, they do not imply that the bias is economically significant, and in fact, both numerical explorations (Saez & Zucman 2016, section IV.A) and the available evidence collected to date suggest that it is not very large. One simple way to see this is to consider the following fact. When one includes realized capital gains, the return on equities is dispersed—much more so than when one excludes realized capital gains. Yet, as shown by Saez & Zucman (2016), the distribution of US wealth is similar whether one capitalizes only dividends or dividends plus capital gains.[9]

Another potential pitfall of the capitalization method noted in the literature is that returns may be correlated with wealth. Fagereng et al. (2018) and Bach et al. (2017) find compelling evidence that rates of return rise with wealth in Norway and Sweden, respectively. Such a correlation does not imply that the capitalization method necessarily delivers significantly biased results, however. A lot of the correlation between returns and wealth comes from portfolio composition effects: The wealthy invest more of their wealth in equities, which tend to have higher rates of returns than bank deposits and houses. For the capitalization method to be biased, returns must be correlated with wealth within asset class. As the number of asset classes used in the analysis grows, this concern is alleviated. If one uses too few asset classes, however, then the capitalization method may overestimate wealth concentration. Again, the specificity of the tax system—whether capital income is broken into many different categories on tax forms or lumped together in a few boxes—is key. The series collected in the World Inequality Database use a minimum of four different asset categories (housing assets, business assets, financial assets, and debts) and as many as 13 in the United States (eight that are captured by capitalizing income—corporate equities excluding S-corporations, taxable fixed income claims, tax-exempt bonds, tenant-occupied housing, mortgages, sole proprietorships, partnerships, and equities in S-corporations—plus five that do not generate taxable income and that are captured using survey data—owner-occupied housing, nonmortgage debt, non-interest-bearing deposits and currency, pensions, and life insurance).

2.2.4. Combining the various data sources. Neither the capitalization method nor the estate multiplier method alone can deliver comprehensive estimates of wealth inequality. Estate and income tax data always need to be combined with other data sources. At a minimum, they need to be combined with macroeconomic household balance sheets that contain estimates of the total amount of wealth. A growing number of countries publish national balance sheets that report on the market value of all the nonfinancial and financial assets and liabilities held by each sector of

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[9]Top wealth shares are only slightly higher when capital gains are capitalized. For instance, in the United States, the share of wealth owned by the top 1% richest tax units rises from 38.8% to 40.6% in 2016 when capitalizing realized capital gains.

the economy, including households. These balance sheets were first exploited by Goldsmith (1985, 1991) and subsequently by Piketty & Zucman (2014) to study the long-run evolution of wealth-to-income and capital-to-output ratios. Because these balance sheets follow similar, internationally agreed concepts and methods, anchoring wealth inequality estimates to the total amount of wealth recorded in these balance sheets helps improve the comparability of inequality statistics across countries.

Survey data also need to be mobilized to measure the forms of wealth that cannot be captured by capitalizing incomes or using the estate multiplier method. Several important asset categories do not generate taxable capital income flows, particularly owner-occupied housing, zero-interest bank deposits, and investments held in tax-exempt pension accounts. Similarly, nonbequeathable forms of wealth are invisible in estate tax returns, including annuitized pensions and life insurance. To capture these forms of wealth, one has to rely on surveys. In their study of wealth inequality, Saez & Zucman (2016) apply such a mixed method: Some wealth components are estimated by capitalizing incomes, while others (most prominently housing and pensions) are estimated using the SCF.

A symmetric approach involves starting with survey data and supplementing surveys with estimates of wealth at the top coming from named lists of wealthy individuals, as do Blanchet (2016), Bach et al. (2018), and Vermeulen (2018). Because of sampling and nonsampling errors, surveys are typically not well suited to capturing rich individuals. This problem is particularly acute for wealth given that wealth is always very concentrated (much more than labor income, due to the multiplicative and cumulative processes that govern wealth accumulation). Vermeulen (2018) shows that supplementing surveys with named lists of wealthy individuals can go a long way toward reducing the bias in top wealth shares estimated from survey data.

The series published in the World Inequality Database favor the approach that starts from fiscal sources (income and inheritance tax data) and supplements these sources with surveys (and sometimes billionaire lists). Starting with tax data seems preferable because these data are generally more reliable than surveys at the top and more comprehensive than billionaire rankings (which by definition only include a limited number of individuals). In countries where only tabulated tax or survey data are available, such as China (Piketty et al. 2017), Russia (Novokmet et al. 2018b), and Lebanon (Assouad 2017), the distribution of income or wealth is interpolated using generalized Pareto curves (Blanchet et al. 2017).[10] In countries where no fiscal data is available, one cannot do better than starting with surveys and making a correction for the top using, e.g., lists of rich individuals. Alvaredo et al. (2016a) present guidelines to estimate wealth depending on the raw data available. To improve the cross-country comparability of inequality statistics, it is necessary to use a common unit of observation. In the World Inequality Database, the benchmark unit of observation is the adult individual, and wealth is split equally between married spouses. One advantage of this procedure is that it does not require one to collect data on property regimes, i.e., on how wealth is split in couples (which, in many cases, is hard to obtain). One drawback is that it may underestimate the rise of inequality if there is a process of individualization of wealth, as found in France by Frémeaux & Leturcq (2016).

One general conclusion of recent work on estimating wealth concentration is that the available data sources on wealth are often limited [as stressed, for instance, in the UK context by Alvaredo et al. (2016b)]. To approximate wealth inequality, recent research has focused on trying to combine the available evidence in a pragmatic manner and reconciling the results of the different methodologies that can be applied given the available data.

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[10]That is, instead of estimating a single Pareto coefficient at the top of the wealth distribution, a curve of Pareto coefficients $b(p)$ varying with the percentile p is estimated.
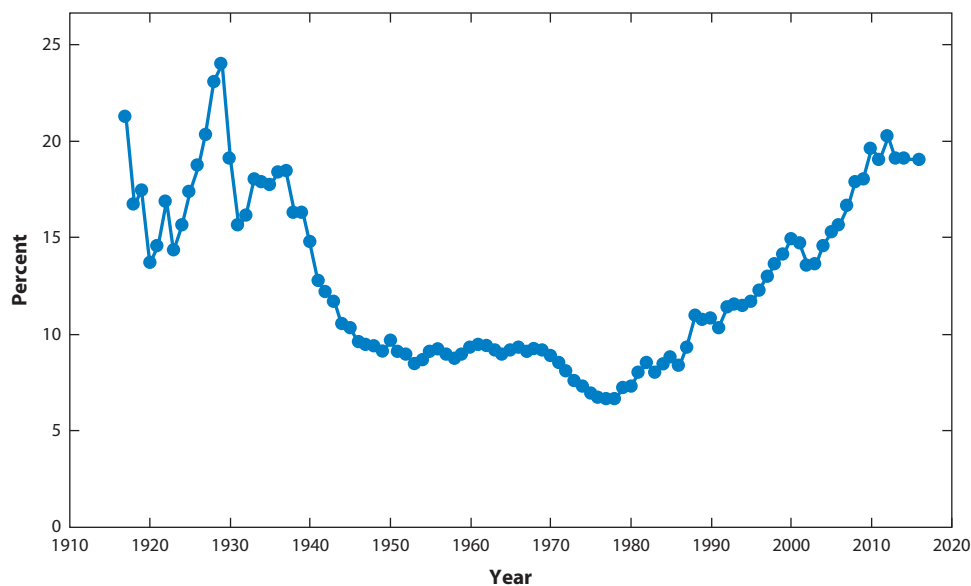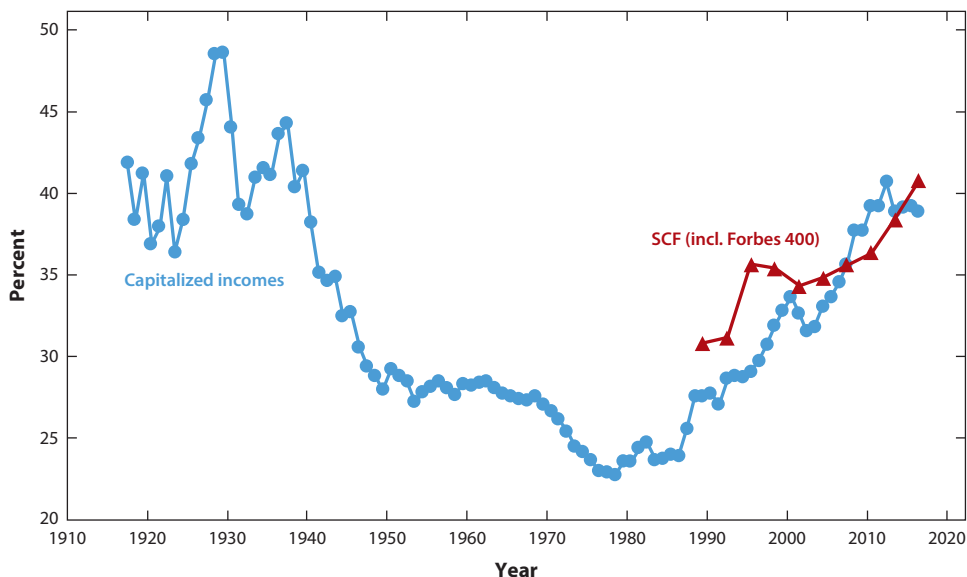
Figure 1

Top 0.1% wealth share in the United States (capitalized incomes, equal-split adults). This figure shows the share of total household wealth owned by the top 0.1% richest adults (individuals aged 20 and above) in the United States, with wealth equally split between married spouses. Figure constructed using series from Saez & Zucman (2016), updated to 2016.

3. WEALTH INEQUALITY IN THE UNITED STATES

3.1. The Rise of US Wealth Inequality

What do we know about wealth inequality in the United States? **Figure 1** shows the evolution of the top 0.1% wealth share obtained by capitalizing income. The data are based on the series of Saez & Zucman (2016), but updated to 2016, and the time series is revised to include methodological improvements. First, the series is updated to reflect the latest version of the the macroeconomic household balance sheet published in the Financial Accounts of the United States. The Financial Accounts are regularly improved, and the Saez & Zucman (2016) estimates are, by construction, benchmarked to these totals. Second, the series shown in **Figure 1** includes a better treatment of wealth that does not generate taxable income, based on a more systematic exploitation of the SCF. Third, it fixes an error in the computation of top wealth shares in the early 1930s; the new estimates show that wealth concentration fell more rapidly in the early 1930s than was originally reported.[11] Last, I use the adult individual as the unit of observation [instead of tax units as in the original Saez & Zucman (2016) series], with wealth equally split between married spouses. This slightly reduces the level of wealth concentration throughout the period and ensures consistency with other countries.

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[11]The original Saez & Zucman (2016) series showed a gradual decline of top wealth shares in the early 1930s, with a rapid decline only in the late 1930s. As noted by Kopczuk (2015), this was not consistent with estimates based on the estate multiplier technique, which show a rapid drop of wealth concentration in the aftermath of the Great Depression (Kopczuk & Saez 2004). Once the mistake in the original Saez & Zucman (2016) series is fixed, the dynamic of top wealth shares in the early 1930s is very similar in both data sources (see Supplemental Figure A.1). The error is also corrected in the series made available online at **http://WID.world**.

Figure 2

Top 1% wealth share in the United States (capitalized incomes versus SCF). This figure compares the US top 1% wealth share obtained by capitalizing incomes versus wealth share obtained in the Survey of Consumer Finances (SCF). The wealth of the Forbes 400 (which by design are excluded from the SCF) is added to the wealth of the top 1% in the SCF. The unit of observation is tax units for capitalized incomes and households for the SCF. Figure constructed using data from Bricker et al. (2017) and series from Saez & Zucman (2016), updated to 2016.

As shown by **Figure 1**, US wealth concentration has followed a marked U-shaped evolution over the past century. It was high in the 1910s and 1920s, with a particularly fast increase in the second half of the 1920s. The top 0.1% wealth share peaked at close to 25% in 1929. It then fell abruptly in the early 1930s (in the context of the Great Depression) and continued to fall gradually from the late 1930s to the late 1940s (in the context of the New Deal and the war economy). After a period of remarkable stability in the 1950s and 1960s, the top 0.1% wealth share reached its low-water mark in the 1970s, and since the early 1980s, it has been gradually rising to close to 20% in recent years. US wealth concentration seems to have returned to levels last seen during the Roaring Twenties.[12]

How do capitalized income estimates compare to other data sources? **Figure 2** compares the top 1% wealth share obtained by capitalizing income with the top 1% wealth share recorded in the SCF (Bricker et al. 2017). The unit of observation in the SCF is the household; to make the estimates more comparable, I report capitalized income estimates using tax units (instead of equal-split adults) as units of observation. Moreover, I make one adjustment to the official SCF results. To make sure that no observation is publicly identifiable, the SCF excludes the Forbes 400 richest individuals; I add the wealth of the Forbes 400 back. Two key results emerge from **Figure 2**.

First, and most importantly, the top 1% wealth share is virtually identical whether one looks at capitalized incomes or at the SCF in 2016. The two sources currently available to measure wealth inequality in the United States find that the top 1% owns approximately 40% of total

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[12]Another striking dimension of wealth inequality in the United States is the disparities across races, studied recently by Dettling et al. (2017).

household wealth.[13] To be precise, the share of wealth owned by the top 1% richest tax units estimated by capitalizing incomes is 38.9% in 2016. The official SCF estimate for that same year, which excludes the Forbes 400, is 38.8% (Bricker et al. 2017). It reaches 40.8% when including the Forbes 400. Whether one looks at capitalized incomes or at the SCF, the top 1% richest US tax units (or families) own 40 times the average wealth. In capitalized income estates, the top 1% richest tax units (approximately 1,700,000 tax units) own $17.6 million on average (close to 40 times the average wealth per tax unit of $453,000 at year end). In the SCF, the top 1% richest families (approximately 1,260,000 families), excluding the Forbes 400, own $26.8 million on average (close to 40 times the average wealth per family of $692,000).[14] As detailed below, no country (apart from Russia) for which estimates of wealth inequality are available has similarly high recorded levels of wealth inequality.

Second, both the SCF and capitalized income estimates show a similarly large increase in wealth concentration since 1989—the first wave of the modern SCF. In the SCF, the share of total wealth owned by the top 1% has increased by 9 points since 1989 and by 10 points when including the Forbes 400; in capitalized income estimates, it has increased by 11 points. The share of wealth owned by the bottom 90% has collapsed in similar proportions in the two data sets (−10 points in both the SCF and capitalized income data). The official SCF does not allow one to go before 1989. Surveys were conducted in 1983 and 1986 but are not directly comparable due to differences in sampling; Kennickell (2011) provides a description of these differences, and Wolff (2016) provides a recent analysis of the SCF data including the 1983 and 1986 survey waves. Historical waves of the SCF, however, were conducted by the Economic Behavior Program of the Survey Research Center at the University of Michigan from 1948 to 1977; in contrast to the modern SCF, these earlier surveys did not oversample rich households. Kuhn et al. (2017) harmonize the historical and modern surveys to create a long-run microlevel data set spanning nearly 70 years. They find that the top 10% wealth share in this data set has followed the same evolution since 1950 as the one obtained by Saez & Zucman (2016).[15] In sum, the SCF and capitalized income series, although based on entirely different data sources and methodologies, both show that wealth inequality has increased sharply in the United States, with the top 1% wealth share rising from 25–30% in the 1980s to approximately 40% in 2016.

A direct implication of this finding is that overall income inequality must have also increased significantly. The distribution of income y depends on the distribution of labor income y_L (itself shaped by factors such as education and technology, unions, minimum wage, etc.), the distribution of capital income y_K (itself the product of the distribution of wealth and the distribution of rates

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[13]The estate multiplier method cannot be used to estimate the top 1% wealth share in recent years because the exemption threshold is too high.

[14]Total wealth is higher in the SCF ($87 trillion) than in the Financial Accounts ($77 trillion) at the end of 2016. This is due to a number of reasons: The SCF includes durables (most prominently cars) in wealth, in contrast to the Financial Accounts totals, and housing values are higher in the SCF than in the Financial Accounts; however, the SCF excludes defined benefit pensions (in contrast to the Financial Accounts totals). For the purpose of conducting international comparisons, it seems slightly preferable to use the Financial Accounts totals, since the Financial Accounts are based on harmonized, internationally agreed statistics concepts and methods. However, looking forward, it would be valuable for the Federal Reserve to publish a single harmonized benchmark estimate of total household wealth for both the Financial Accounts and the SCF.

[15]At least two other survey data sources exist to study the history of US wealth inequality. In 1962, a precursor to the SCF—the Survey of Financial Characteristics of Consumers—was conducted by the Federal Reserve Board of Washington. This was a stratified sample that oversampled high-income households. In 1969, a synthetic data set constructed from income tax returns and information provided in the 1970 Census of Population was assembled in the Measurement of Economic and Social Performance database; wealth was estimated by capitalizing income flows in the tax data. Wolff (2017) provides an analysis of these data sets and links them with the modern SCF.

of return), the relative importance of labor and capital income in the economy (i.e., the share $\alpha = Y_K/Y$ and $1 - \alpha$ of capital and labor in national income Y, respectively), and the joint distribution of labor and capital income. By Sklar's theorem, the joint distribution h of labor and capital income can be expressed as a product of the marginal distributions $f(y_L)$ and $g(y_K)$ of labor and capital income times the copula c (i.e., the joint distribution of percentile ranks):

$$h(y_L, y_K) = f(y_L) \cdot g(y_K) \cdot c(F(y_L), G(y_K)).$$

All of these components appear to have moved since the 1980s in such a way as to push toward more income concentration. A large body of evidence (for a summary, see, e.g., Autor 2014) shows that labor income inequality has increased since the 1980s, with, in particular, a dramatic increase in CEO pay (Gabaix & Landier 2008). Both the SCF and income tax data show that wealth inequality is on the rise—suggesting that the inequality of capital income has increased, too.[16] National accounts data show that the capital share of national income has grown, both within the corporate sector (see, e.g., Tørsløv et al. 2018) and in the entire economy—an unequalizing force because capital income is more unequally distributed than labor income. Evidence from tax returns shows that the association between labor and capital income at the top has grown (Atkinson & Lakner 2017).

3.2. Reconciling Survey of Consumer Finances and Capitalized Income Tax Data

Despite the similarity in the level and trend in wealth concentration in the SCF and capitalized income estimates, there are slight differences between the two sources. First, although the medium-term evolutions are similar, the increase in the top 1% wealth share does not take place at exactly the same time: The SCF shows a relatively modest increase in wealth concentration in the 2000s and a large rise since 2010, while capitalized incomes find a large increase between 2000 and 2010 and a more muted increase since then. Second, the SCF and capitalized income series diverge when it comes to wealth concentration within the top 1%: The SCF shows less wealth going to the top 0.1% and more going to the next 0.9% than do capitalized income series.

How can we reconcile these differences? As discussed by Bricker et al. (2016), several technical factors can explain the discrepancies between the SCF and the capitalized income estimates. First, the SCF is based on a sample of approximately 6,000 families. As a result, estimates of top wealth shares come with confidence intervals reflecting the fact that, although the top is oversampled, relatively few rich families end up being included in the survey. Generally speaking, surveys—even high-quality surveys like the SCF—are underpowered to study changes at the very top of the wealth distribution, such as the evolution of the shares of wealth owned by the top 0.1% or 0.01%—tiny groups for which only a small number of individuals are sampled each year. Saez & Zucman (2016) show that, after adjusting the SCF to account for the Forbes 400, changing the unit of observation from families to tax units, and adjusting asset values such that total wealth in

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[16]There are few studies on the distribution of rates of returns. It is possible to imagine that, if anything, financial innovation and globalization may have increased the inequality in rates of returns. One example is private equity. Wealthy households may be more able to pick the stocks of companies that will grow fast by investing in non–publicly traded stocks through private equity funds. If private equity funds tend to spot good investment opportunities such as the future Googles or Facebooks, then they will generate large capital gains for their investors. The broader public can invest in such companies only after they go public, at which time premium price effects may have run their course. If inequality in rates of returns has increased, then capital income inequality may have increased even more than wealth inequality. In any case, it is a known fact (Saez & Zucman 2016) that the inequality of taxable capital income has increased enormously (more than the distribution of wealth). For instance, the top 0.01% interest income earners had 2.6% of all taxable interest in 1980; in 2012, they had 10 times more, that is, 27.3%.
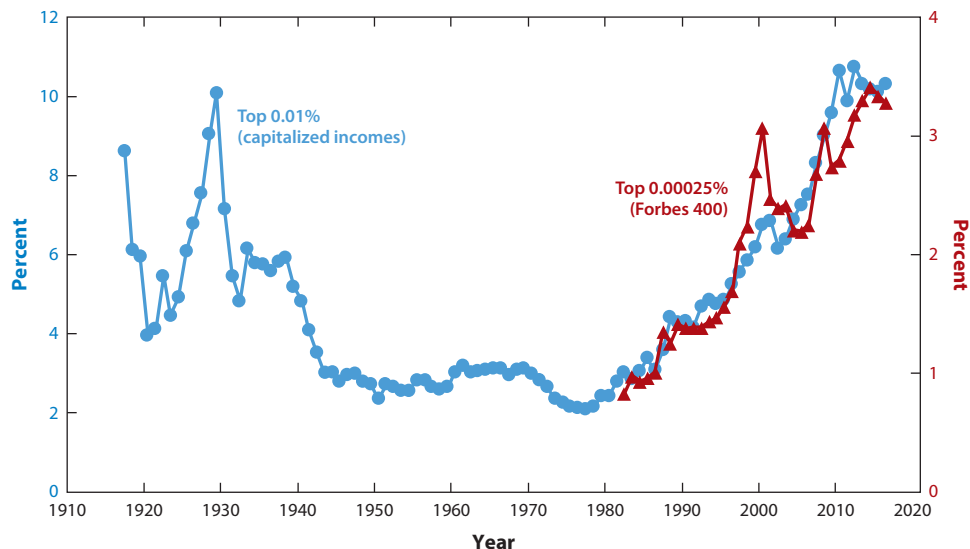
Figure 3

Very top wealth shares in the United States (capitalized incomes versus Forbes). This figure compares the US top 0.01% wealth share obtained by capitalizing incomes with the share of wealth owned by the top 0.00025% as estimated from the Forbes 400 list of the richest Americans. The unit of observation is tax units for capitalized incomes. Figure constructed using series from Saez & Zucman (2016), updated to 2016.

the SCF matches the total amount of household wealth recorded in the Financial Accounts asset class by asset class, the top 0.1% wealth share in capitalized income series is in the confidence interval of the SCF top 0.1% wealth share.

One indication that capitalized income series correctly capture the dynamic of the very top wealth shares is that they are very consistent with the independent Forbes data. **Figure 3** compares the evolution of the wealth share of the top 400 richest Americans (normalized for population growth) to the evolution of the top 0.01% wealth share obtained by capitalizing incomes. According to Forbes, the share of wealth owned by the top 0.00025% (roughly the 400 richest Americans) has increased from 1% in the early 1980s to over 3% in recent years, on par with the estimated tripling of the top 0.01%. The year-to-year evolution in these two series, which are based on fully independent data sources and techniques (as Forbes does not have access to individual income tax returns), is strikingly similar.

To be sure, capitalized income series also involve uncertainties, as noted in Section 2. Saez & Zucman (2016) apply the simple capitalization method, where the same rate of return is applied for each asset class. This assumption is unlikely to be true for each asset class each year. In years when the wealthy have higher interest rates on bonds and deposits, for instance, the capitalization method may tend to overestimate wealth concentration. Kopczuk (2015) suggests that the capitalization method may overestimate wealth concentration in periods of low interest rates. However, wealth concentration has increased even more in the SCF than in capitalized income series over the 2010–2016 period, during which interest rates were very low. Moreover, Bourne et al. (2018, figure 4) find evidence that interest rates seem to actually fall with wealth at the very top, so that the capitalization method may actually understate wealth inequality in recent years. The marginal differences that exist between the SCF and capitalized income series should not obscure the fact that both sources reveal the same level of wealth concentration and

strikingly similar medium-run trends. Both sources have limitations, but together—and with the Forbes data—they paint a consistent picture.

4. GLOBAL WEALTH INEQUALITY

This section presents estimates of wealth inequality in countries other than the United States, as well as tentative estimates of global wealth concentration. Generally speaking, the estimates discussed below are based on series available in the World Inequality Database, and they update earlier results presented by Alvaredo et al. (2017, 2018b).[17] These series have the advantage of following a common and consistent methodology: They are constructed by distributing the total amount of household wealth recorded in official household balance sheets, using a combination of survey data and tax data (either capitalized income tax returns or estate tax data), sometimes supplemented by named lists of wealthy individuals for the very top. Despite this harmonization effort, it is worth stressing that, given the enormous challenges involved in measuring wealth in many parts of the world, these series should still be viewed as imperfect, provisional, and subject to revision.

4.1. Wealth Inequality Across Countries

Figures 4 and **5** show the evolution of the top 1% and top 10% wealth shares in five countries: the United States, the United Kingdom, France, China, and Russia. We can observe a large rise of wealth concentration in the United States, China, and Russia in recent decades and a more moderate rise in France and the United Kingdom.
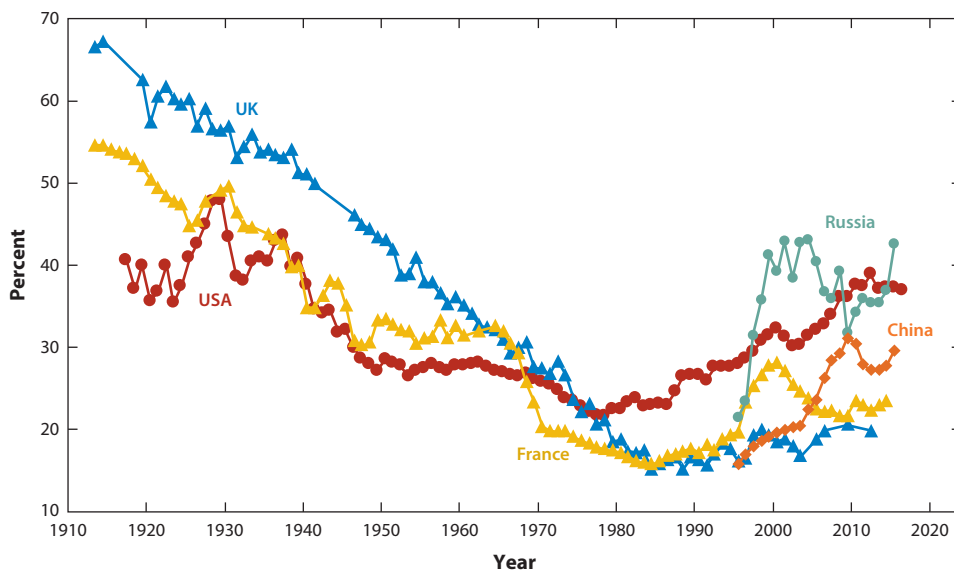
Figure 4

Top 1% wealth share in emerging and rich countries. This figure compares the top 1% wealth share across countries. Estimates are obtained by combining tax data, survey data, and household balance sheets. The unit of observation is the adult individual with wealth equally split among married couples. Figure constructed using data from the World Inequality Database (Alvaredo et al. 2018b).

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[17]For a review of studies based on survey data only, the reader is referred to Cowell & Van Kerm (2015), who review the evidence from European surveys. For a survey of studies based on tax data (instead of distributional national accounts), the reader is referred to Roine & Waldenström (2015).
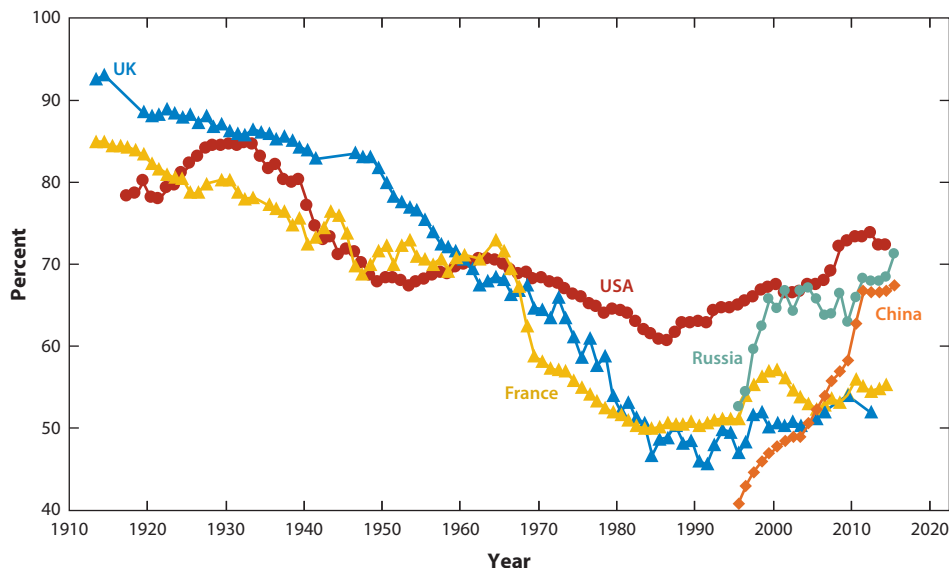
Figure 5

Top 10% wealth share in emerging and rich countries. This figure compares the top 10% wealth share across countries. Estimates are obtained by combining tax data, survey data, and household balance sheets. The unit of observation is the adult individual with wealth equally split among married couples. Figure constructed using data from the World Inequality Database (Alvaredo et al. 2018b).

In China and Russia, the available evidence reveals a huge increase in wealth inequality over the past two decades. The top 1% wealth share almost doubled in both countries, in China from just over 15% in 1995 to 30% in 2015 (Piketty et al. 2017), and in Russia from below 22% to approximately 43% (Piketty et al. 2018). Interestingly, while the top 1% share is much higher in Russia than in China, the top 10% share is similar in the two countries (67% in China and 71% in Russia in 2015), suggesting that Russia's transition strategy has favored its most wealthy citizens more than has China's. Wealth inequality appears to be about as high in Russia as in the United States, while China's wealth inequality appears to be roughly between that of France and that of the United States.

Novokmet et al. (2018a) discuss the differences among China, Russia, and other ex-communist countries. China and Russia followed different strategies for privatizing housing and state-owned enterprises. In Russia, state-owned businesses were transferred to the private sector through a quick voucher privatization process. Citizens were given a book of vouchers that represented potential shares in former state-owned enterprises and that could be traded or sold. This voucher privatization strategy led to a rapid and huge reduction in net public wealth, from approximately 300% of national income in 1990 to 70% in 2000. Privatization occurred more slowly in China. The quicker and more chaotic privatization process in Russia may have favored a small group of the population (the oligarchs), explaining the larger increase in wealth concentration there than in other ex-communist countries.

In France and the United Kingdom, wealth inequality seems to have increased more modestly than in the United States, Russia, and China over the past decades. The literature emphasizes the role that housing and real estate prices have had in mitigating inequality (Garbinti et al. 2016, Alvaredo et al. 2018a). In both countries, real estate prices rose significantly in the 2000s. This has tended to boost the wealth share of the middle class, since most of its wealth is invested in housing,

while upper groups mostly own financial assets. Martínez-Toledano (2017) shows that property prices similarly played an equalizing role in Spain, leading wealth concentration to remain broadly stable (although with large short-run variations due to the chaotic evolution of real estate prices). High housing prices, however, have ambiguous effects on wealth inequality: Although they tend to increase the wealth share of the middle class, they also make it harder for the poor to become property owners, thus exacerbating inequality between the poor (the bottom 50%) and the middle class (the next 40%).

The key difference between Europe and many other parts of the world (including Russia and the United States) is that wealth inequality is significantly lower in Europe today than it was a century ago. While wealth inequality appears to have returned to its level of a century ago in both the United States and Russia, European countries have a more developed patrimonial middle class that did not exist on the eve of World War 1. The high share of wealth owned by the middle class is largely the product of a number of policies adopted in the post–World War II decades, including nationalizations, rent control, and tax policies, which led to a historical compression of wealth inequality during the mixed-economy regime of the 1950s, 1960s, and 1970s.

Recent research also emphasizes the role that private pensions—and automatic enrollment into such pensions—have played in equalizing the distribution of private wealth in several countries in recent decades. Jakobsen et al. (2018) find that the abolition of the Danish wealth tax in 1997 significantly boosted wealth accumulation at the top. However, this increase was offset by an increase in private pension wealth owned by the middle class. On aggregate, private pensions rose from approximately 50% of national income in the late 1980s to 178% in 2014. Like housing, pension wealth is relatively equally distributed, and thus rising pension wealth tends to reduce top wealth shares. As shown by Chetty et al. (2014), automatic employer contributions to retirement accounts increase saving, pension wealth, and total wealth substantially for middle-class Danish households. Saving encouragement for the middle class in the form of default options or nudges appears to be a powerful way to boost wealth accumulation and equalize the distribution of wealth. More broadly, domestic institutional features (such as regulations of the housing and mortgage markets and pension policies) appear to be an important determinant of wealth inequality—albeit one that is typically overlooked in standard models of wealth accumulation.
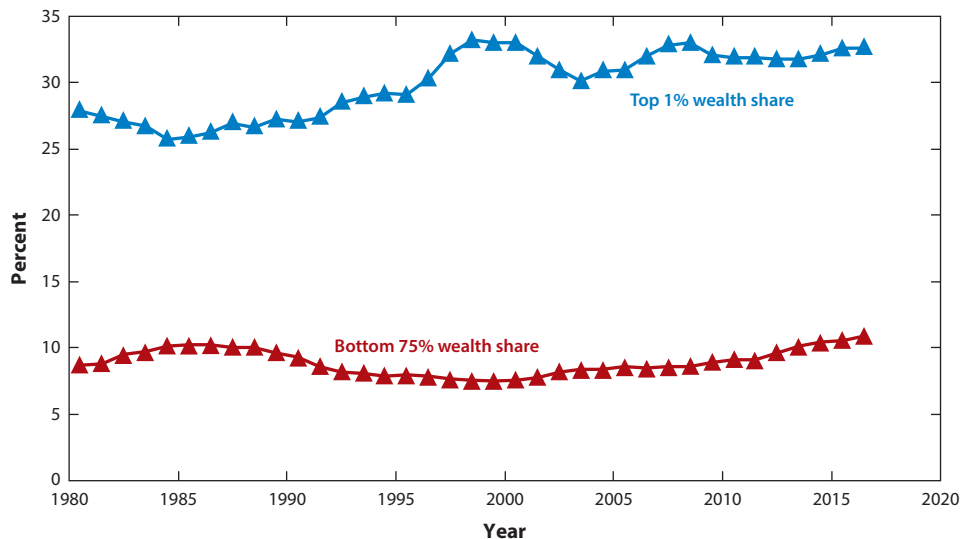
4.2. Global Wealth Inequality

Following Alvaredo et al. (2018b), I present tentative estimates of global wealth concentration where the world is proxied by China, the United States, and Europe, and Europe itself is represented by three countries (France, Spain, and the United Kingdom), which, on the basis of other countries for which wealth inequality data exist (in particular Scandinavian countries and Germany), appear to be broadly representative. The rationale for this is that the data collected to date in the World Inequality Database do not make it possible yet to construct a full global wealth distribution. One basic problem is that there are large areas of the world—particularly in Africa, Latin America, and Asia—where no good measures of aggregate private wealth currently exist. Fortunately, available research on key regions already provides valuable insights into global wealth dynamics.[18] Several results are worth noting.

First, at the global level, wealth is highly concentrated: The top 10% owns more than 70% of the total wealth in China, Europe, and the United States combined; the bottom 50% owns less

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[18]A complementary approach is followed by Davies et al. (2017), who estimate the level and distribution of world wealth by combining household balance sheets and survey data, extending the work of Davies et al. (2010). This data effort underlies the Global Wealth Report published annually by Credit Suisse.
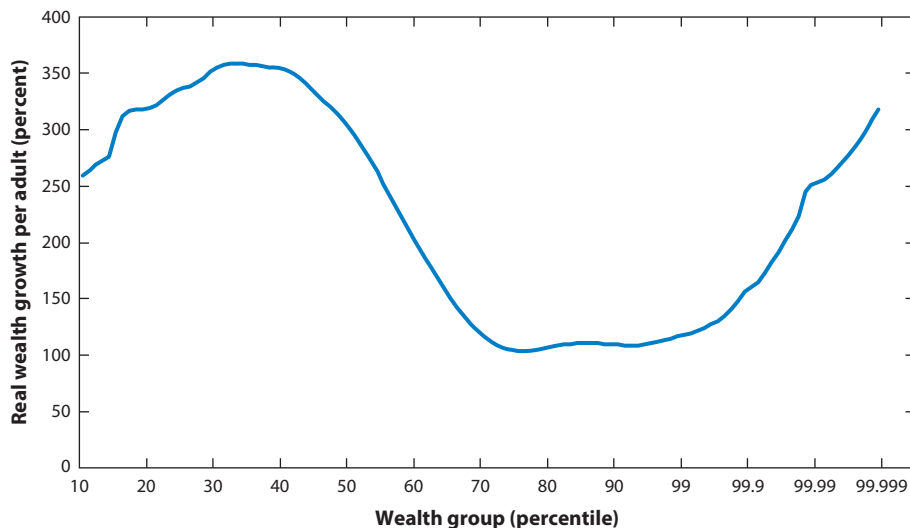
Figure 6

The world distribution of wealth (in China plus Europe plus the United States). This figure shows the evolution of global wealth inequality, proxied by wealth inequality in China plus Europe plus the United States. The wealth threshold for an individual to be part of the top 1% richest in China plus Europe plus the United States is 1,125,000 euros. Figure constructed using data from the World Inequality Database (Alvaredo et al. 2018b).

than 2%; and the middle 40% (which could be described as the global wealth middle class) owns less than 30%. Wealth concentration would probably be even higher if Latin America, Africa, and the rest of Asia were included in the analysis, as most people in these regions would be in the poorer parts of the distribution. Wealth is substantially more concentrated than income. This result comes from both tails of the distribution. In most countries, the share of wealth owned by the bottom 50% is close to 0% (while the share of income earned by the bottom 50% is usually approximately 15–25%). That is, on aggregate, total assets for the bottom 50% are typically about as large as total debts. At the top end, by contrast, the wealthiest individuals own fortunes that are very large compared to average wealth (within country, the average wealth of the top 0.1% is typically 100 to 200 times larger than average wealth in the entire population today).

Second, evidence points toward a mild rise in global wealth inequality over the past decades. For China, Europe, and the United States combined, the top 1% wealth share appears to have increased from 28% in 1980 to 33% today, while the bottom 75% share hovered around 10% (**Figure 6**). Global wealth dynamics are driven by both between- and within-country forces. The rise of private wealth has been faster in large emerging economies than in rich countries, a trend driven by high economic growth and large-scale privatization in transition economies. This has tended to reduce global wealth inequality. This effect was more than offset at the top, however, by the rise in wealth inequality within countries. Rising wealth inequality within countries is itself due to a number of factors, including rising income inequality amplified by inequality of savings rates and of rates of return.

Figure 7 reports estimates of the real growth rate of wealth for each quantile of the world wealth distribution. The top 1% average wealth in the United States, Europe, and China has risen at 3.5% per year between 1987 and 2017 (versus 2.8% for per-adult average wealth and 1.9% for average income). The higher we go in the distribution, the faster is the growth: The top 0.1%

Figure 7

Global wealth growth by percentile, 1987–2017 (in China plus Europe plus the United States). This figure shows the growth of wealth per adult by quantile of the global wealth distribution over the period 1987–2017. Global wealth inequality is proxied by wealth inequality in China plus Europe plus the United States. Figure constructed using data from the World Inequality Database (Alvaredo et al. 2018b).

average wealth has increased by 4.4% per year, and the top 0.01% average wealth has increased by 5.6% per year. Starting from 1987, these growth rates can be compared with the growth rate of wealth in the global Forbes billionaire ranking—which has the advantage of covering all countries, but the drawback of only covering a tiny part of the population. According to Forbes, the average wealth of the top 1/20 million has grown 5.3% a year on average since 1987, and the average wealth of the top 1/100 million has grown 6.4%.[19]

Third, the bottom of the distribution has also experienced a significant increase of its wealth, driven by rapid growth in China. This pattern is reminiscent of the elephant curve of global income growth (Lakner & Milanovic 2017). That is, the global wealth distribution seems to have evolved in ways qualitatively similar to income. The bottom three-quarters of the distribution saw its wealth increase by a sizable amount (at roughly the same pace as global wealth), although less than wealth at the very top. Between those two groups, wealth growth was at its lowest for the middle class in developed countries. The global wealth middle class has been squeezed.

It is important to stress that currently available statistical information on the distribution of wealth is highly imperfect in today's global economy. More transparency and better access to administrative data sources are sorely needed.

5. OFFSHORE WEALTH

One key limitation of available wealth inequality statistics is that they usually do not include estimates of offshore wealth. Since the 1980s, a large offshore wealth management industry has

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[19]These billionaire data have two limitations: First, it is not entirely clear how Forbes estimates the wealth of billionaires; second, and most importantly, it is not clear at all whether this pattern of very fast growth holds only for billionaires, or whether it can be extended to multimillionaires. This is critically important because there are many more individuals who own $5 million, $20 million, or $100 million than there are billionaires, and the former command a potentially much larger fraction of world wealth than the latter.

developed in Switzerland, Hong Kong, the Bahamas, and similar offshore financial centers. Banks located in these countries cater to wealthy individuals from around the world. They provide a variety of financial services to these individuals, many of which are legal and legitimate, but most of which make wealth harder to observe in the data sets used to estimate wealth inequality—national accounts and tax records. Over the past four decades, a growing number of offshore centers have entered the market for cross-border wealth management, and information technology and financial innovation have made it simpler to move funds overseas, suggesting that recent available estimates may underestimate not only the level of but also the rise in global wealth concentration. What do we know about the magnitude of these biases, and how could they be overcome in the future?

5.1. How Much Wealth Is Held in Tax Havens?

Let us first start by reviewing the available evidence on the macroeconomic amount of wealth held in tax havens. By using direct statistics published by the central bank of Switzerland—a key offshore wealth management center—and systematic anomalies in the international investment positions of countries, Zucman (2013, 2014) estimates that 8% of the world's household financial wealth—the equivalent of 10% of world GDP—is held offshore; this would be equivalent to $5.6 trillion on the eve of the world financial crisis in 2007. Pellegrini et al. (2016) obtain a similar estimate. This order of magnitude is at the low end of the scale of available estimates. The Organisation for Economic Co-operation and Development calculates that households owned a total of $5 to $7 trillion offshore in 2007 (Owens 2007); based on interviews with wealth managers, the Boston Consulting Group (Boston Consult. Group 2008) finds $7.3 trillion held offshore that same year; Capgemini & Merrill Lynch (2002) make an $8.5 trillion estimate for 2002; Palan et al. (2010, p. 5) write that "the global rich held in 2007 approximately $12 trillion of their wealth in tax havens;" and Henry (2012) finds $21 to $32 trillion held offshore as of 2010. One limitation of Zucman's (2013) methodology is that it only captures financial wealth, disregarding valuables, works of art, real estate, and other nonfinancial assets, which may explain part of the gap between it and other studies.

Until recently it was difficult to break down these global aggregates of offshore wealth by country. However, in 2016, several prominent offshore financial centers—including Switzerland, Luxembourg, the Channel Islands, and Hong Kong—started disclosing bilateral data on the amount of bank deposits that foreigners own in their banks. These data have been collected for several decades by the Bank for International Settlements (BIS), but until 2016, the BIS only disclosed statistics aggregated at the country level (such as the total amount of foreign-owned bank deposits in Hong Kong) rather than at the bilateral level (such as the amount of bank deposits owned by Indian residents in Hong Kong). In 2016, most offshore centers authorized the BIS to disseminate bilateral data. These series are retrospective and go back in most cases to the early 2000s or even earlier. As a result, we now have access to time series for the value of the bank deposits owned by, say, Russian residents in Switzerland or Germans in Jersey.

Using these data, Alstadsæter et al. (2018) allocate the global amount of offshore wealth across source countries. They find that the global average of approximately 10% of world GDP held offshore masks significant heterogeneity. Scandinavian countries appear to own the equivalent of only a few percent of GDP in offshore wealth, but this figure rises to approximately 15% in Continental Europe, and to as much as 60% in Russia, Gulf countries, and many Latin American countries. The size of offshore wealth is not easily explained by tax or institutional factors. Among countries with a large stock of offshore assets, one finds autocracies (Saudi Arabia,

Russia) and countries with a recent history of autocratic rule (Argentina, Greece) alongside old democracies (United Kingdom, France). Among those with the lowest stock of offshore assets, one finds relatively low-tax countries (Korea, Japan) alongside the world's highest-tax countries (Denmark, Norway). Instead, geography and specific national trajectories seem to matter a great deal. Proximity to Switzerland—the first country that developed a cross-border wealth management industry in the 1920s—is associated with higher offshore wealth, as are the presence of natural resources and political and economic instability post–World War II.

5.2. Who Owns the Wealth in Tax Havens?

Until recently, there was very little information about who owns wealth in tax havens. In the absence of such microdata, none of the macro studies described above was able to assess the implications of tax havens for the measurement of wealth inequality.

New data now make it possible to shed some light on who owns wealth offshore. These data come from massive leaks from offshore financial institutions—HSBC Switzerland (the Swiss Leaks) and Mossack Fonseca (the Panama Papers)—and tax amnesties conducted in the aftermath of the financial crisis of 2008–2009. In 2007, an HSBC Switzerland employee extracted the complete internal records of the 30,412 clients of this bank, a large fraction of whom were evading taxes. In 2016, another leak revealed the identity of some of the shareholders of the shell companies created by the Panamanian law firm Mossack Fonseca, a prominent provider of offshore incorporation services. Moreover, in recent years, many governments throughout the world have resorted to tax amnesties to encourage tax evaders to declare unreported assets. In the United States, for example, beginning in 2009, the IRS has established a series of voluntary disclosure programs under which cooperating tax evaders pay reduced penalties and can avoid criminal sanctions. Alstadsæter et al. (2017) analyze the leaked HSBC and Panama Papers data (as well as amnesty microdata) matched to population-wide administrative income and wealth records in Norway, Sweden, and Denmark. Ávila-Mahecha & Londoño-Vélez (2018) analyze the Panama Papers data and amnesty data matched to wealth tax records in Colombia. Johannesen et al. (2018) analyze amnesty data in the United States—what is known as the offshore voluntary disclosure programs—matched to individual income tax returns.

These sources reveal that offshore wealth is extremely concentrated. In Scandinavia, the top 0.01% of the wealth distribution appears to own approximately 50% of the wealth hidden at HSBC and of the wealth disclosed in the tax amnesties conducted since the financial crisis; the top 0.1% owns approximately 80% of this wealth. In both Scandinavian countries and Colombia, the probability of hiding wealth offshore rises strongly with wealth. At first sight, this is somewhat surprising: According to the canonical Allingham & Sandmo (1972) model of tax evasion, wealthier evaders should evade less than less wealthy individuals because they are more likely to be audited.[20] However, this can be explained by a model where there is a supply of tax evasion services that serves

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[20]Note that it is not illegal per se to own shell corporations in Panama or bank accounts in Switzerland: Not all of the wealth held offshore evades taxes. The evidence discussed above is for unreported assets only (i.e., tax evasion—not tax avoidance), as revealed in tax amnesties and random leaks matched to tax returns. As discussed by Alstadsæter et al. (2017), in Denmark and Norway, the tax authorities, after detailed investigations, found that 90–95% of all HSBC account holders had failed to report the income earned on their account (and the wealth held there in the case of Norway, where a wealth tax exists) and were thus evading taxes. This result is consistent with a body of evidence suggesting that more than 90% of Swiss accounts were undeclared around 2007; this includes two US Senate (2008, 2014) reports finding that 85–95% of US-owned accounts at UBS and Credit Suisse were undeclared in 2007–2008; the work of Roussille (2015), who estimates that more than

wealthy clients in priority (e.g., because the probability that a leak occurs rises with the numbers of clients served), as in the work of Alstadsæter et al. (2017).

5.3. Accounting for the Wealth Held Offshore

What are the implications for wealth inequality of accounting for hidden wealth? Roine & Waldenström (2008, 2009) provide the first studies to explicitly investigate this issue. They use an indirect method—residual flows in the balance of payments and financial accounts—to estimate the amount of wealth hidden by Swedish residents and assume that this wealth primarily belongs to the top. The share of wealth owned by the top 1% rises from approximately 20% in the 2000s to a range of 25–30% depending on the methodology. Roine & Waldenström (2008, p. 376) conclude that "the quantitative importance suggested by our tentative treatment indicates that the role of offshore wealth may be something that is worthwhile examining more closely in future research."[21]

Based on the new BIS macrodata and leaked data now available, Alstadsæter et al. (2017) find that 90–95% of all offshore wealth indeed belongs to the top 1% wealthiest taxpayers in Scandinavia. Alstadsæter et al. (2018) investigate the implications of hidden wealth for inequality in ten countries, which account for close to half of world GDP, assuming that offshore wealth is as concentrated in the other countries as it is in Scandinavia. In a country like Norway, factoring in hidden wealth increases the top 0.1% wealth share significantly: from 8.4% to 9.8% on average over the 2000–2009 period. For the top 0.01%—a group that includes approximately 300 Norwegian households in 2010—reported wealth increases by more than 25%. That is, these households place more than 20% of their wealth in tax havens.

In an international perspective, Scandinavians place a relatively small fraction of their wealth offshore; the effects of accounting for offshore wealth are therefore larger in the United Kingdom, Spain, and France, where approximately 30–40% of all the (hidden plus nonhidden) wealth of the 0.01% richest households appears to be concealed abroad (**Figure 8**). In the United States, offshore wealth also increases inequality significantly. The effect is more muted than in Europe because US top wealth shares are very high, even disregarding tax havens. Although more research is needed to have fully accurate estimates of the size and distribution of the wealth held in tax havens, these results highlight the importance of looking beyond tax data to study wealth accumulation among the rich in a globalized world.

It is also informative to estimate how offshore wealth may affect long-run trends in wealth concentration. In **Figure 9**, I use Norway—where consistent, long-run time series of top wealth shares exist—as an illustration. Norway has been levying a wealth tax throughout most of the twentieth century. Based on published tabulated tax statistics, Roine & Waldenström (2015) estimate long-run top wealth shares; from 2001 on, Alstadsæter et al. (2017) estimate wealth inequality by distributing the total amount of household wealth using microlevel estimates of wealth for each Norwegian individual based on reports by third parties (Norwegian banks, mutual funds, depositories, etc.). The overall long-run evolution of observable wealth is pretty clear. Wealth concentration—as seen from administrative data—was relatively high in the early twentieth century: The top 0.1% richest households owned approximately 12–14% of total wealth. Wealth

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90% of the wealth held by Europeans in Switzerland was undeclared before 2010; and the work of Johannesen & Zucman (2014), who obtain a similar estimate.

[21]Relatedly, Larudee (2016) investigates the extent to which capital flight to Switzerland can explain the decline in the French top 1% income share between the two world wars.
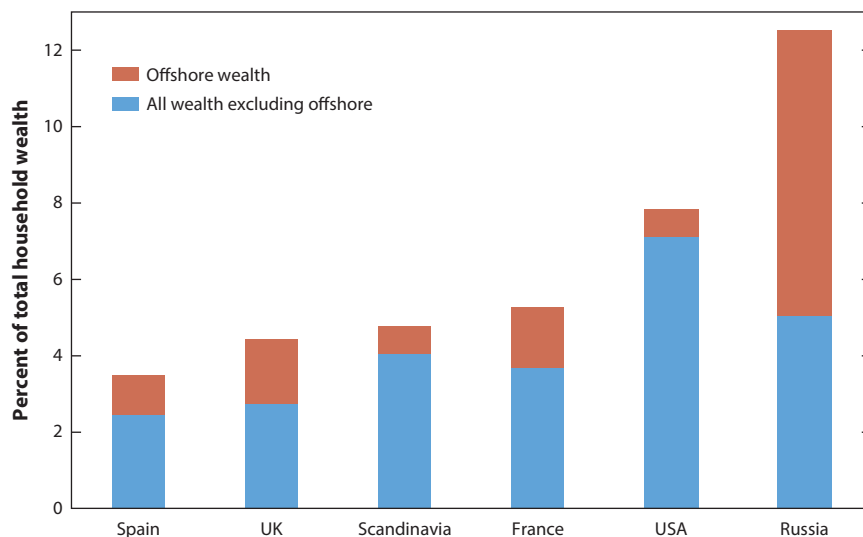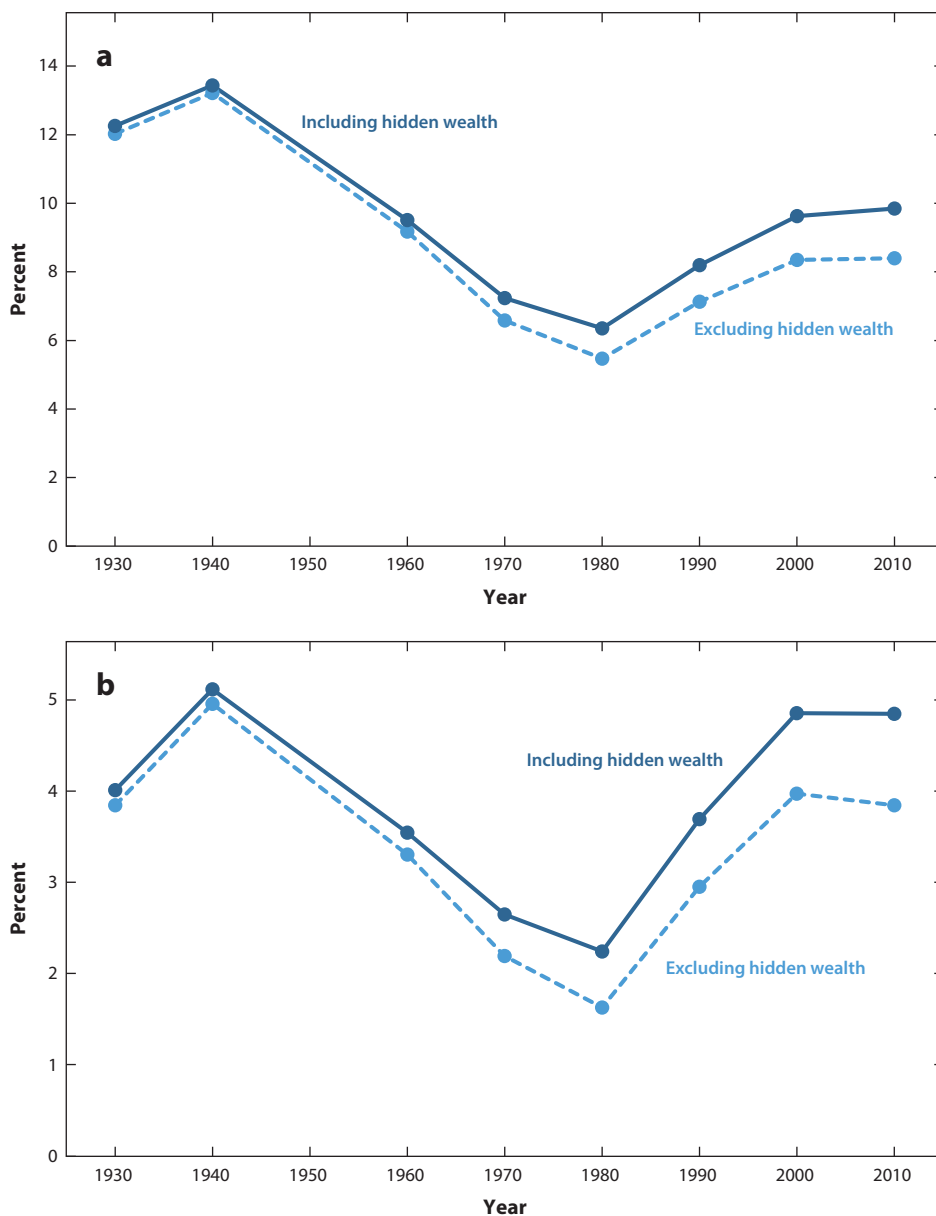
Figure 8

The top 0.01% wealth share and its composition. This figure plots the level and composition of the top 0.01% wealth share on average over the 2000–2009 period. Figure constructed using data from Alstadsæter et al. (2018a).

concentration then declined from the 1940s to the 1970s: Over these four decades, the top 0.1% wealth appears to have been more than halved, reaching a low-water mark of approximately 6% in the 1980s. Since then, it seems to have rebounded to approximately 8%.

To correct Norwegian top wealth share back to the 1930s, I use available estimates of the macroeconomic evolution of offshore wealth throughout the 20th century. In the 1990s, two international commissions got access to the archives of Swiss banks. The first—presided over by Paul Volcker, former chairman of the US Federal Reserve—aimed at identifying the dormant accounts belonging to victims of Nazi persecutions and their heirs; the second—chaired by the historian Jean-François Bergier—aimed at better understanding the role played by Switzerland during World War II. Drawing on the work of these commissions, Zucman (2015, chapter 1) constructs historical series for the amount of foreign wealth managed by Swiss banks back to the early twentieth century. I assume that Norway's offshore wealth has followed the same evolution as the foreign wealth in Swiss banks, and that hidden wealth was as concentrated in the past as it is today. Although a sizable margin of error is involved in this case, the broad patterns are likely to be robust: All of the available evidence suggests that, although the wealth held by foreigners in Switzerland was not insignificant in the 1930s, it is in the 1980s and 1990s that it grew the most. As a result, accounting for hidden assets erases almost half of the decline in the top 0.1% wealth share observed in tax data since the 1930s. The top 0.01% appears to have now recovered from the decline in wealth concentration caused by World War II and the policy changes of the postwar decades. This finding suggests that the historical decline of European inequality over the past century, one of the core findings in the literature on the long-run distribution of income and wealth (e.g., Piketty 2014, chapter 10), may be less spectacular than suggested by tax data—even in a country like Norway, where aggregate offshore wealth and tax evasion are relatively small.

Figure 9

Top wealth share in Norway, including hidden wealth. This graph compares (*a*) the top 0.1% wealth share and (*b*) the top 0.01% wealth share, as estimated from administrative data versus data corrected by including offshore wealth. In both cases, top shares are expressed as a percentage of total household wealth. For series excluding hidden wealth, total household wealth is the total recorded in the national accounts. For corrected series, total household wealth is the total recorded in the national accounts plus the estimated total offshore wealth of Norwegians. Figure constructed using data from Alstadsæter et al. (2017).

6. CONCLUSION

Recent research has made progress in estimating wealth concentration in a growing number of rich and emerging economies. It has developed techniques to leverage administrative tax data and combine them with surveys and macroeconomic balance sheets. In many ways, however, it is not enough to study wealth concentration using self-reported survey data or even tax return data. Because the wealthy have access to many opportunities for tax avoidance and tax evasion—and because the available evidence suggests that the tax planning industry has grown since the 1980s as it became globalized—traditional data sources may underestimate inequality. To capture the true wealth of the rich in today's world, it is key to look beyond administrative tax and survey microdata and to take instead a global perspective that attempts to capture all forms of wealth, domestic and foreign.

In a country like Norway, accounting for hidden assets increases the wealth of the top 0.01% by more than 25%. Because most Latin American and many Asian and European economies own much more wealth offshore than does Norway, the results found in Norway are likely to be lower bound for most of the world's countries. Fortunately, in a growing number of countries, new data are making it possible to fill in some of the gaps in existing estimates of wealth concentration. Although the HSBC Switzerland list is not public, it was shared by the French tax authority with foreign countries' administrations in 2009. The Panama Papers database is publicly accessible (**https://panamapapers.icij.org**). Other leaks have occurred in recent years from majors providers of offshore financial services, for instance, from the Swiss bank Credit Suisse, whose offices in London, Paris, and Amsterdam were searched in March 2017 in the context of a multicountry criminal investigation of 55,000 suspect Swiss bank accounts (see Garside 2017). Moreover, tax amnesty data are widely available in many countries, and recent research suggests that they can yield valuable insight into the distribution of tax evasion. Looking forward, combining this type of evidence with existing evidence on wealth concentration would enable us to paint a more accurate picture of the level and dynamic of global wealth inequality.

DISCLOSURE STATEMENT

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