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WHERE DOES WEALTH COME FROM?

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ABSTRACT

Much attention has been given to rising wealth inequality in recent decades. However, understanding inequality requires an understanding of how wealth relates to the potential wealth an individual could accumulate and where this wealth comes from. Using administrative data from Norway, we create measures of potential wealth that abstract from differential consumption and spending behavior. We then examine how these measures relate to observed net wealth of individuals at a point in time and the role played by different sources of wealth in the distribution of potential wealth. We find that net wealth is a reasonable proxy for potential wealth, particularly in the tails of the distribution. Importantly, people in different parts of the potential wealth (or actual net wealth) distribution get their wealth from very different sources. Labor income is the most important determinant of wealth, except among the top 1%, where capital income and capital gains on financial assets become important. Inheritances and gifts are not an important determinant of wealth, even at the top of the wealth distribution. Finally, although inheritances are not important, parental wealth does influence child's wealth; children of wealthy parents accumulate wealth from very different sources than children of less wealthy parents.

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An online appendix is available at http://www.nber.org/data-appendix/w28239

1. Introduction

Much attention has been given to the recent dramatic increases in wealth inequality in the United States and other countries.[2] At the same time, we observe substantial intergenerational persistence in wealth, suggesting that these inequities will persist into future generations, and ongoing research seeks to identify the underlying causes of these patterns.[3] However, an important first step is to think carefully about what we mean by wealth, and where it comes from. In this paper, we consider the lifecycle origins of wealth and how these vary throughout the wealth distribution.

Wealth is a problematic outcome to analyze—more so than education or even income. Unlike income, wealth is a stock, and results both from actions to increase the flow of money to a household—through, for example, income from labor—as well as from decisions on how to use the money that comes in—for example, whether individuals choose to consume or save, and which assets they choose to invest in. As a result, individuals may have similar wealth but very different sources of that wealth (for example, some may have inherited their wealth while others earned it through working), and individuals with the same income may ultimately have different wealth because of differing consumption or investment patterns. If two individuals had the same wealth at age 65 but one had a large inheritance from parents and resulting capital gains from investments, while the second received no inheritance but worked hard and saved their labor income, would we say this is a very equal society? Similarly, if two individuals had the same sources of wealth but one consumed much more, so at age 65 they had very different net wealth, would we say this is a very unequal society?

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[2] See, for example, Kopczuk and Saez (2004), Saez and Zucman (2016, 2020a, 2020b), and Smith, Yagan, Zidar, and Zwick (2019) for the U.S.

[3] For work documenting the intergenerational persistence in wealth, see, for example, work by Charles and Hurst (2003) for the U.S and, more recently, Boserup, Kopczuk, and Kreiner (2017) and Adermon, Lindahl, and Waldenström (2018) for Denmark and Sweden, respectively. For work on the underlying causes of this persistence, see, for example, work by Cronqvist and Siegel (2015), Calvet and Sodini (2014), and Black et al (2020).

Understanding wealth inequality at any age requires an understanding of where wealth inequality originates. What is the most important determinant of wealth differences? Is it differences in lifetime labor income? How much is due to differences in inheritances received? In this paper, we try to answer these types of questions using a comprehensive dataset on wealth and income over the lifecycle.

As we describe below, while many papers examine different components of wealth—such as savings, financial assets, wealth held in private businesses, inheritance, and homeownership—we are interested in understanding the whole picture. To do so, we use administrative data on the population of Norway, with annual measures of wealth starting in 1994. Unlike much of the previous literature, we can track sources of wealth over a long period of time (20 years) and can look at the accumulation of wealth for the whole population, including those at the very top. Moreover, financial data are collected primarily by third parties (reported to the tax authorities by financial intermediaries and banks), reducing the problem of underreporting and measurement error present in survey data.

We create a sample of individuals who are aged between 26 and 46 in 1994 and record their net wealth in 1994 as well as all the income received from various sources every year from 1995 to 2013 (when they are aged 45 to 65). We focus on this age range as we believe that wealth from youth into middle age (compared to wealth acquired at older ages) is particularly important for quality of life, residential choice, and human capital investment in children.[4]

To better understand differences in wealth across individuals, we would ideally like to abstract from differences in consumption and spending behavior and compare the *opportunity* to accumulate wealth across individuals. To do so, we create two measures of potential wealth in 2013. We refer to the first one simply as Potential Wealth (PW) and the second one

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[4] We also provide some results using a broader range of ages.

as Deep Potential Wealth (DPW). Potential Wealth (PW) is calculated as net wealth in 1994 plus the sum of income received from all sources from 1995 to 2013, while DPW is the capitalized sum of inflows from 1995 to 2013 of net labor income, government transfers, gifts and inheritances, and pre-existing net wealth in 1994. We then evaluate the importance of each source for these potential wealth distributions with a focus on heterogeneity by age and by decile.

This work contributes to many literatures on the determinants of wealth inequality. One strand of the literature has emphasized the role of gifts and inheritances, highlighting heterogeneity across both age and percentile in the pre-inheritance wealth distribution.[5] Other studies have emphasized the role of labor earnings for wealth accumulation, even at the top of the distribution.[6] In addition, research using Scandinavian data has emphasized the role of heterogeneity in savings rates and investment returns in wealth inequality.[7] Finally, recent work has highlighted the role of differential asset holdings across the wealth distribution.[8]

Our goal is to think more broadly about all the determinants of potential wealth and examine the relative importance of various sources of wealth as people move from youth to

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[5] Piketty (2014) and Feiveson and Sabelhaus (2019), using data from France and the U.S., respectively, find that intergenerational transfers (in the form of in-life gifts or inheritances) are highly skewed towards those at the top of the wealth distribution. Additionally, several studies using Scandinavian register data have used event-study designs to explore the effects of inheritances on wealth inequality. Using Swedish data, Nekoei and Seim (2019) find that inheritances reduce wealth inequality in the short run, but not in the long run (as poorer people are more likely to spend the inheritance). Druedahl and Martinello (2018) reach a similar conclusion using Danish data. In contrast, using Danish and Swedish data respectively, Boserup et al. (2016) and Elinder et al. (2018) show some evidence that bequests reduce wealth inequality even in the long run.

[6] Using cross-sectional data from the 2010 and 2016 Survey of Consumer Finances, Kaymak et al. (2020) show that even the top 1% of the wealth distribution have a large proportion of their income coming from labor earnings. Hurst, Luoh, Stafford (1998) demonstrate a strong relationship between permanent income and wealth. However, using survey data from the U.S., Venti and Wise (2001) and Hendricks (2007) both find that there are large cross-sectional differences in wealth at retirement even across families that have similar lifetime earnings. This highlights the importance of having a more comprehensive understanding of wealth accumulation over the life cycle.

[7] Papers have highlighted the importance of greater saving by wealthier households (Bach, Calvet, and Sodini, 2018; Fagereng, Holm, Moll, and Natvik, 2019). In addition, research has demonstrated that the return to investment is heterogeneous and typically higher for high-wealth individuals (Fagereng et al., 2020).

[8] Kuhn et al. (2018) show that, in the U.S., increasing house prices have increased the wealth of the middle class while increasing stock prices have been important for increasing the wealth of the wealthy.

middle age. While analyses of wealth have generally either used aggregate data from national accounts or cross-sectional data from wealth surveys, our data allow us to observe wealth for a balanced population panel over a 20-year period. Also, because we have individual-level data, we can observe how components of wealth vary based on a variety of individual characteristics. For example, we can examine how the components of potential wealth differ by age, which is impossible using aggregate data but is important as, for example, a gift received at age 30 will have much different implications for life opportunities than one received at age 60. These data allow us to answer many important questions: Is it common to acquire large stocks of wealth without inheritance? Do many people get rich based largely on income earned in the labor market? Or are large capital gains on real and financial assets a feature of the top of the wealth distribution?

We first examine how correlated potential wealth is to net wealth, since data sets typically do not allow for the creation of potential wealth measures and, thus, researchers are limited to analyzing observed net wealth. We find that potential wealth is highly correlated with actual wealth, with a correlation ranging from .56 to .78, depending on the measure of potential wealth. However, this high correlation is driven in part by the tails of the distribution, where net wealth is a better proxy for potential wealth relative to the middle of the distribution.

We find that people from different parts of the wealth distribution—measured by either net wealth or potential wealth--get their wealth from very different sources. Labor income is the most important determinant of wealth, except in the top 1%, where capital income and capital gains on financial assets become more important. Interestingly, inheritances and gifts are not an important determinant of wealth, even at the top of the wealth distribution. Our conclusions are robust to a variety of specification checks, including allowing for different assumptions about the calculation of returns on assets and matching the data to national accounts, as well as to different methods of trimming the data.

We also examine what the potential wealth distribution would look like under a variety of different counterfactual scenarios. What if everyone had the same labor earnings? What if everyone received the same inheritance? We show that disparities in labor earnings widen the potential wealth distribution, so equalizing wages would compress it. Labor earnings also have a significant role in determining an individual's rank in the potential wealth distribution. In contrast, other components, such as returns on real assets (such as houses) and returns on risky financial assets, also widen the distribution but do not have much effect on an individual's rank. Government transfers compress the potential wealth distribution while gifts and inheritances have little effect on the distribution.

Although we find that inheritances are not a large share of potential wealth, parental wealth may influence a child's wealth through other channels. To investigate this, we examine whether children of wealthy parents accumulate wealth differently than children from less wealthy families. There is a well-established correlation in net wealth across generations, but little is known about how parental wealth affects the sources of wealth of their children. We find that children of the top 1% have higher initial wealth in 1994 and receive greater inheritances than others. They then invest these resources so that they receive a disproportionate amount of their wealth from returns on financial investments and capital income. Overall, we conclude that, not only do children with wealthy parents end up with greater wealth, they accumulate their wealth in very different ways compared to most members of society.

2. Institutional Setting

International Comparability

It is difficult to compare wealth in Norway to other countries, as the administrative wealth tax-based register data from Norway are quite different from the survey data available in

most countries. In terms of wealth levels and inequality, Appendix Table C1 shows deciles

of the distribution of household net wealth in 2014, calculated for Norway using the register

data and for other countries using Household Finance and Consumption Survey (HFCS)

survey data. (Unfortunately, Norway is not included in the HFCS.) While Norway looks

somewhat different at the very bottom and very top of the distribution—which is consistent

with the fact that our administrative-based measures of net wealth are likely better than the

HFCS survey data at the extremes of the distribution—the overall distributions look quite

similar across countries.

Other measures of wealth inequality are the Gini coefficient for the household net

wealth distribution and the share of total net wealth held by the top wealth holders. Based on

the 2014 HFCS data, the Gini coefficient of net wealth for the Euro Area as a whole was .69.

For Germany and Austria it was .76 and .73, respectively, and for France and Italy it was .68

and .60 respectively. Using the register data, the household net wealth Gini was .68 in

Norway at that time.[9] Similarly, the fraction of wealth held by the top 10% of households was

as follows: Euro Area, 42.4%; Germany 59.8%; Austria 55.5%; France 50.7%; and Italy

42.8%.[10] In our Norwegian administrative data, the fraction of wealth held by the top 10% of

households was 51.4% in 2014.[11] Although there are issues with comparing register data to

survey data, Norway appears to be similar to other European countries in terms of wealth

inequality.

The picture is slightly different when we compare Norway to other countries using data

based on national accounts.[12] The World Inequality Database, which is based on imputations

from national accounts, showed average individual private net wealth in 2013 (in €2019) of

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[9] Wolff (2016) calculates the Gini coefficient for the U.S. to be 0.87 in 2013.
[10] Source: HFCS Statistical Tables, Table J4.
[11] The equivalent figure for the US is 78% (Balestra and Tonkin, 2018). See also Roine and Waldenstrøm
(2015) for comparisons of wealth inequality across all Nordic countries, France, the UK, and the US.
[12] As a robustness check, we later show our results when we adjust our data to match the aggregate statistics in
the national accounts. This is in Section 6E.

€101,026 for Norway, €127,357 for Germany, €155,754 for France, €125,871 for Sweden, €91,573 for Finland, and €177,394 for Italy.[13] This suggests that Norway has a relatively low level of private wealth, similar to countries such as Sweden and Finland.

The World Inequality Database also uses national accounts to provide comparable estimates of private wealth to household income ratios across countries. For Norway, the ratio was 5.38 in 2013, similar to Finland (5.11), Germany (6.16), and the U.S. (5.66). However, the Norwegian ratio was lower than the UK (6.84), Denmark (7.59), Sweden (6.85), and especially France (8.15), and Italy (9.39).[14]

In terms of the income distribution, Norway ranks among the countries with the most compressed distribution of labor income. Based on OECD data, the Gini coefficient of income was 0.26 in 2018—one of the lowest within the OECD but similar to that in other Nordic countries and some central European countries like the Czech Republic (OECD, 2020).[15] Additionally, trends in Norway for house price appreciation and returns to risky financial assets were broadly similar over the 1994-2013 period to those in many other European countries (Jorda et al., 2019).[16]

Institutional Detail

Norway has a wealth tax that is assessed annually and is based on net wealth including financial assets, housing wealth, cars, and bank deposits. Net wealth exceeding an exemption threshold is taxed at a flat rate of around 1% during our sample period. The

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[13] These data include pension wealth and are thus not directly comparable to our data. Using our administrative data, we find that average individual private net wealth in 2013 (in €2019) was €70,044.

[14] These ratios imply that the importance of inheritances relative to other income sources is likely to be lower in Norway than, say, in France.

[15] In contrast, the UK Gini coefficient for income is over 0.3 and that for the US is about 0.4.

[16] In terms of home ownership rates, Norway is right at the mean of the Euro Area. In our data, 64.1% of households owned their main residence in 2014. The comparable number in the Euro area in the HFCS was 61.0%. The home ownership rate in 2014 was 44.3% in Germany, 47.7% in Austria, 58.7% in France, and 68.2% in Italy.

exemption threshold has been increasing over time and was around NOK 1.5 million for a

married couple (and half that for a single person) at the end of our sample period.[17]

Until it was eliminated in January 2014, Norway had a unified inheritance and gift

tax, called Arveavgift (IHT). Bequests or gifts were normally valued at fair market value at

the time when the beneficiary took possession, and the inheritance/gift tax was paid by the

heirs/recipients. Transfers to spouses were exempt from this tax and the tax rates varied

depending on the relationship of the donor to the recipient.[18]

Labor income, most benefits, and pensions are all taxed at a flat tax rate, divided

between the central and the local government.[19] There was an additional tax on gross income

for incomes above certain levels.[20] From 1992 to 2013, capital income was taxed at a flat rate

of 28%. In Norway, information on individual taxable income and wealth and taxes paid is

publicly available information; this feature likely leads to more accurate reporting to the tax

authorities.

Like other European countries, Norway has a strong welfare state that may mitigate

the perceived need to accumulate wealth. Public primary, secondary, and post-secondary

education are free, and university students are provided with government stipends and loans.

When they retire, Norwegians may receive pensions from a variety of sources. Each

Norwegian is entitled to a basic pension that depends on years of residence in Norway but not

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[17] Municipalities in Norway are also entitled to impose a tax on real estate property located in their jurisdiction. The tax is levied at the assessed value of the property, which is about 20% to 50% of the property´s market value. Property tax rates range from 0.2% to 0.7%, depending on the municipality.

[18] For the closest relatives (parents and children), the 2013 tax rate was 0% for the first NOK470,000, 6% from NOK470,000 to NOK800,000 and 10% for NOK800,000 and above. For other relatives, the rates were 0%, 8% and 15%, respectively. The exemption thresholds refer to the total amount transferred even if it is transferred over many years. The tax rates and exemption thresholds have varied over the 1994-2013 period. See Appendix Table C2 for more details.

[19] During our data period, the flat rate on net income was 28%, with a portion going to the central government and somewhat more going to the local government. The first NOK 100,000 (approx.) was tax exempt, and, in addition, mortgage payments were deductible against the central government tax. The values and thresholds for the different tax rates changed marginally over the period we study, but there were no major reforms of the system.

[20] For instance, in 2008, this tax rate was 9% for incomes of NOK 550,000 up to NOK 885,000, and 12% of incomes above that. The mean income was about NOK 400,000 in 2008.

on earnings history; there is an additional pension that depends on the number of years worked and the amount earned. Public sector workers also have occupational pensions, as do many workers in the private sector. Individual private pensions, akin to individual IRAs in the US, are not widely used and constitute a very small proportion of retirement wealth (Fagereng et al., 2020).[21]

3. Methods

A. Measures of Potential Wealth in 2013

To better understand differences in wealth across individuals, we would ideally like to abstract from differences in consumption and spending behavior and compare the *opportunity* to accumulate wealth across individuals. To do so, we create two measures of potential wealth in 2013. We refer to the first one simply as Potential Wealth (PW) and the second one as Deep Potential Wealth (DPW).

Potential Wealth (PW) in 2013

Potential Wealth is calculated by aggregating the annual components of wealth (including income from all sources and changes in asset values, realized and unrealized) over the full period for which we observe individuals.

We begin with a basic accounting exercise, defining net wealth in any year, t, as the previous year's net wealth plus income inflows minus income outflows:

$$NW_{it} = L_{ii} + G_{it} + K_{it} + I_{it} + LG_{it} + CGR_{it} + CGF_{it} - WT_{it} - C_{it} + NW_{it-1}$$

The sources of income we consider are net labor income (L_{it}), net government transfers (G_{it}), net capital income (K_{it}), net inheritances and gifts received (I_{it}), lottery gains (LG_{it}),

capital gains on real assets (CGR_{it}), capital gains on financial assets (CGF_{it}), and the outflows are the wealth tax paid (WT_{it}) and Consumption (C_{it}).

We can then define Net Wealth in 2013 as the net wealth from our baseline period, 1994, plus all the cumulated income inflows into the household during the intervening 19 years (1995-2013), minus the cumulated wealth tax paid and cumulated consumption.

$$NW_{i,2013} = \left(\sum_{t=199}^{2013} L_{it} + \sum_{t=19}^{2013} G_{it} + \sum_{t=199}^{2013} K_{it} + \sum_{t=1995}^{2013} I_{it} + \sum_{t=199}^{2013} LG_{it} + \sum_{t=199}^{2013} CGR_{it} \right.$$

$$\left. + \sum_{t=19}^{2013} CGF_{it} - \sum_{t=199}^{2013} WT_{it} - \sum_{t=199}^{2013} C_{it} \right) + NW_{i,1994}$$

This provides the framework for our first measure of potential wealth. Potential Wealth in 2013 is Net Wealth in 2013 taking out the cumulative consumption component. That is,

$$PW_{i,2013} = \left(\sum_{t=1995}^{2013} L_{it} + \sum_{t=1995}^{2013} G_{it} + \sum_{t=1995}^{2013} K_{it} + \sum_{t=1995}^{2013} I_{it} + \sum_{t=1995}^{2013} LG_{it} + \sum_{t=1995}^{2013} CGR_{it} \right.$$

$$\left. + \sum_{t=199}^{2013} CGF_{it} - \sum_{t=199}^{2013} WT_{it} \right) + NW_{i,1994}$$

This measure represents an accounting of the total income inflows (net of taxes) from all sources between 1995 and 2013, added to the baseline measure of net wealth in 1994. Although we are technically netting out consumption, there is still some slippage; income that is used for consumption is not invested, so we will miss the returns that would have been gained on those investments.

Deep Potential Wealth (DPW) in 2013

Another measure of potential wealth is what we call Deep Potential Wealth (DPW). Here, we consider just the primary sources of income--net labor income, government transfers, and gifts and inheritances-- and cumulate these over time, allowing them to grow at a specified interest rate that varies based on an individual's decile of net wealth in each year.

This measure represents what wealth would be in 2013 if there was zero consumption and all wealth was invested at a typical rate of return.

$$DPW_{i,2013} = \sum_{t=19}^{2013} \left(L_{it} * \left(1 + \sum_{k=t}^{2013} r_{ik} \right) \right) + \sum_{t=1}^{2013} \left(G_{it} * \left(1 + \sum_{k=t}^{2013} r_{ik} \right) \right)$$

$$+ \sum_{t=1995}^{2013} \left(I_{it} * \left(1 + \sum_{k=t}^{2013} r_{ik} \right) \right) + \left(W_{i,1994} * \left(1 + \sum_{k=1994}^{2013} r_{ik} \right) \right)$$

Ideally, we would observe the potential rate of return available to each individual and use this to capitalize income components, as this would measure their potential wealth in 2013 conditional on receipt of these income sources. Because rates of return on wealth are likely to vary by wealth level (Fagereng et al., 2020) and potential returns are probably similar for persons with similar levels of wealth, we allow the rate of return in each year to vary by the net wealth decile of the individual in that year. For each decile of the net wealth distribution at the beginning of the year (with the top 1% as a separate category), we estimate the yearly rate of return on wealth, allowing for both capital gains and income flow returns from assets.[22] We then use these yearly rates of return to capitalize income received in each year to 2013. (Our findings are similar if we impose the same rate of return for all individuals.)

A key advantage of Deep Potential Wealth over Potential Wealth is that we are more effectively able to remove differential consumption and spending behavior by focusing on just these basic components. Deep Potential Wealth is also less sensitive to measurement error, as its construction does not require us to know wealth in each year, just wealth in 1994 (which is generally small and relatively unimportant to our analysis), and the other components used to calculate DPW are generally well measured. However, a key disadvantage is that, because we are considering fewer components, we cannot use it to

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[22] To do so, we sum the aggregate value of capital gains on real assets, the aggregate value of capital gains on risky financial assets and the total value of net capital income realized in a given year, and then divide this sum by the total value of net wealth at the beginning of the year (over all persons in the net wealth decile).

provide a full accounting of the various sources of wealth, such as the roles of capital gains or returns on assets. We believe that, taken together, Potential Wealth and Deep Potential Wealth provide a useful summary of where wealth comes from.

4. Data

We use several administrative registers to construct our dataset. We begin with the Norwegian population register, which includes demographics and detailed family information. To construct various sources of income and wealth, we combine that with information from Norwegian tax records, which are available from 1993 until 2014.

We define gross wealth as financial wealth plus the value of real assets, and net wealth is defined as gross wealth minus debts. Because of the existence of a wealth tax in Norway, we have detailed information on financial wealth, including physical capital held in private businesses, asset values, and debts, for everyone in the tax records. Most reporting is by third parties--employers report employee earnings to the tax authorities, and bank and financial intermediaries report assets such as savings, stock values, and bonds--so usual measurement issues in survey data are greatly reduced.[23] Notably, the dataset encompasses the population of Norway, including all taxpayers, and there is no top coding. Because wealth is highly concentrated at the top, this is an important feature of our data. Another advantage of the Norwegian data is that our wealth measure includes private business wealth that entrepreneurs report to the tax authorities as the assessed value of their shares in a private business.[24]

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[23] One potential problem is wealth held in tax havens abroad and unreported to the Norwegian tax authorities (Alstadsæther et al., 2019). Very few people hold wealth abroad, and a Norwegian tax amnesty in the early 2000s for holdings of assets abroad revealed that such behavior was concentrated among the very wealthy. Of those who disclosed holdings, half were among the 400 wealthiest, and very few hold wealth abroad (Zucman 2015).

[24] Unlike listed shares, which are more transparent, owners have incentive to under-report these shares to avoid taxes. However, the tax authorities have control routines to identify and check firms that may be underreporting. Importantly, Fagereng et al. (2019) examined whether reported values correspond to the book

Our wealth data include all types of non-pension wealth of individuals and households — we have no information on wealth held in pension funds. For our analysis, we believe the appropriate measure of net wealth should be based on the resources available to the individual at a given point in time. These may be illiquid but should, in principle, be transferrable to other people or available for use to purchase economic or non-economic services. As a result, we believe the appropriate measure of net wealth should not include pension wealth.[25] Throughout the paper, we measure wealth and income variables in nominal Norwegian Krona.

Traditionally, wealth is measured at the individual or household level. Because we are tracking individuals over time—during periods of family formation and possibly dissolution—we use a hybrid measure to calculate our wealth and income variables. For each year, we consider the wealth and income of each family and then divide by the number of adult members in the family.[26] This metric enables us to allocate individual income to both members of a couple and to do the analysis at the individual level.

Our measures of aggregate income over the 1995-2013 period are constructed as follows:

Net Labor Income (L)

Net Labor Income is gross labor income (from employment and self-employment) less taxes and deductions. The Norwegian registry data contain information on gross labor income and total income taxes paid during the calendar year. We use this information to distinguish between taxes paid on capital income and taxes paid on labor income and

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value of the firms, and found that they are highly correlated, with a correlation of 0.88. Firms with sales above 5 million NOK have to have a professional auditing firm audit their balance sheets.

[25] The exclusion of pension wealth is consistent with other studies, such as Charles and Hurst (2003) for the US and Boserup, Kopczuk, and Kreiner (2017) for Denmark. Note that the inclusion of pension wealth, which comes almost entirely from labor income, would magnify the importance of labor income in our conclusions.

[26] In practice, for each year, we match individuals in our sample to their spouse (defined as married spouse, registered partner, or cohabitant). Then, we define individualized household measures of potential wealth, all its components, and net wealth, as the average across spouses for non-single individuals (to allocate individual income to both members of a couple). Thus, by construction, we have a measure of wealth for each individual and the measure is the same for both spouses in any couple.

transfers, thereby imputing taxes paid on labor income.[27] To calculate net labor income (L), we subtract taxes paid on labor income from gross labor income.

Net Transfer Income (G)

Net Transfer Income is income from government transfers net of any taxes. We have separate information on taxable and non-taxable transfer income.[28] As described above, we estimate the amount of taxes paid on taxable transfers and subtract this amount from the sum of taxable and tax-free government transfers to define government transfers net of taxes.

Net Capital Income (K)

Net Capital Income includes interest from bank deposits, treasuries, mutual funds and bonds, dividends, rents from property, and imputed rental income from owner-occupied housing, less taxes paid. We have separate information on interest received from Norwegian bank deposits, interest payments to Norwegian and foreign claimants, dividends received during the calendar year, and for other capital income (rents, returns on life insurance, income from abroad and other unspecified capital income).[29] We include imputed rental income in capital income, as it provides a flow return to home ownership by obviating the need to pay rent.[30]

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[27] We do so by using the fact that there is a flat tax rate on capital income. To do this, we pull together all sources of taxable capital income (interest received from banks, dividends, net gains from the sale of assets, and other capital income) and we impute capital taxes by multiplying this sum by the flat tax rate. We then subtract total taxes paid on capital income and property taxes from total taxes paid by the individual to get a measure of taxes paid on labor income and on taxable transfers and then allocate the residual tax amount proportionately between labor income and taxable transfers. This approach is reasonable, as labor earnings and taxable transfers are treated the same way by the tax system.

[28] Taxable transfer income includes pensions (including old age, disability, and service pensions), unemployment benefits and sickness benefits. Non-taxable transfer income includes housing support, social assistance, scholarships, and child support benefits.

[29] We also have information on taxable profit and tax-deductible losses from the sale of fixed capital and financial assets during the calendar year. We do not include these in capital income as we create separate measures of capital gains (realized or unrealized) on real assets and on financial assets.

[30] We calculate imputed rental income as follows: Each year, Statistics Norway estimates the value of owner-occupied housing services (i.e. the value of rents for owners who occupy their own houses) and reports this aggregate value (R_t) in the National Accounts. R_t is estimated by Statistics Norway as the rental price (net of expenses for maintenance and insurance) for all owner-occupied residences, based on a representative sample of renter-occupied housing units (Eika, Mogstad, and Vestad, 2020). For each year, we compute the aggregate value of owner-occupied primary houses in Norway H_t, and for each individual the value of his/her primary house H_{it}. We calculate imputed rental income as $H_{it}*(R_t/H_t)$.

We define gross capital income as the sum of interest received from banks, plus dividends, plus other capital income, plus imputed rents from owner occupancy, minus interest paid on debts. We then define net capital income as gross capital income less taxes paid on capital income, excluding taxes paid on the sale of real or financial assets (which are included in the calculation of capital gains), plus the tax deduction on interest paid (interest paid on debts is deductible from capital income for tax purposes).

Inheritances and Gifts Net of Taxes (I)

Information on inheritances and gifts is taken from administrative registers and is available from 1995 to 2013. Prior to January 2014, both inheritances and gifts were subject to taxation in Norway and had to be reported to the tax authorities. Taxes were paid on amounts received at inheritance and on all gifts received from living donors. For these years, we know whether individuals received inheritances or gifts as well as the amounts received. We also know the taxes they paid, when they took possession of the inheritances or gifts, and who the giver was. Inheritances are reported even if they are below the tax thresholds.[31] Also, with minor exceptions, all gifts are reported and taxed. Both donor and recipient are legally required to report all gifts above the very low threshold.[32]

We use the information on gross inheritances and gifts received and information on taxes paid to calculate the total amount of gifts and inheritances received, net of taxes. Some individuals may evade taxes by not reporting inheritances and gifts to the tax authorities. This is unlikely for bequests, but it is plausible for gifts. However, given that the tax rates are relatively low and non-reporting is illegal, the incentives to report are reasonably strong.

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[31] Inheritance above 100,000 NOK are taxed during the tax periods 1993-1998, above 200,000 NOK during 1999-2002, 250,000 NOK for 2003-2008, and inheritance above 470,000 NOK are taxed during the tax periods 2009-2014. If a person receives two separate gifts from their parent, the tax paid depends on the total amount of the two gifts rather than on the amount of each individual gift. This is true even if the gifts are given in different years.

[32] Until January 1. 2008, the exceptions were small gifts for birthdays, Christmas etc. From 2008 this rule changed to require reporting of gifts of above NOK 30,000 per annum (Inheritance law §4). In addition, for administrative reasons, gifts or inheritance amounts below NOK 5000 were not digitized.

Even when reported, gifts and bequests may be undervalued, which would again result in undercounting.[33] To evaluate whether this is likely to be an issue, we have plotted gross and net wealth growth around the timing of an inheritance or gift for all individuals in our sample who received their first observed inheritance or gift between 2001 and 2008 (Appendix Figure C1). The year the gift or inheritance is received is denoted as time 0. We see that the average observed increases in net or gross wealth are very close to the average net inheritance or gift received, suggesting a very limited role for mismeasurement. We have also compared bequests to the wealth of the last surviving parent in the year before their death and found that they match up very well (Appendix Figure C2).[34] Overall, we conclude that our data on gifts and inheritances are unlikely to suffer from serious error.

Lottery Gains (LG)

Lottery Gains come from an administrative register that has information on all large lottery winnings; small sums—amounts below 10,000 or 100,000 NOK depending on the tax period—are not reported in the register. While lottery wins are rare, winners can receive large sums that may influence wealth accumulation; we therefore include lottery winnings in our calculations. These winnings are not subject to taxation.

Capital Gains on Real Assets (CGR)

From 2010, we have information on the estimated market value of the individual components of real assets. However, before 2010, the information reported is the tax value of total real assets. To calculate the return on real assets, we thus need to impute the market value of the individual components pre-2010.

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[33] The rule for almost all transfers is that they are reported at market value with expert valuations used for non-cash items such as houses, but there still may be some degree of under-estimation of value. One exception is that non-listed stocks are reported at 30 percent of the market value. Non-listed stocks, however, constitute a very small percentage of gifts and inheritances (Thoresen, Fredriksen, and Pedersen, 2001).

[34] When making this comparison, the sample includes all individuals who died in Norway between 1995 and 2013 who did not have a living spouse at time of death and who left an inheritance. These individuals are not necessarily the parents of individuals in our sample.

We impute the market value of real assets pre-2010 by assuming that, for each individual or household, the relative shares of wealth in a primary residence, secondary residence, and other real assets are the same in prior years as it was in 2013, and we scale from tax value to market value using the relevant inflation factors.[35] We have also used several other approaches to impute the market value of real assets prior to 2010 and find that the conclusions are not sensitive to the method used.[36]

To calculate Capital Gains on Real Assets, in each year, we multiply the value of each real asset at the beginning of the year by the estimated percentage capital gain on that asset and then sum over all real assets owned by the individual in that year. To calculate the percentage capital gain in housing, we assume that primary and secondary houses appreciate in value at a rate equal to the percentage increase in house prices in the region of residence in that year.[37] Note that we estimate capital gains on real assets whether or not the gains are realized. We do not subtract taxes from real capital gains, as capital gains on primary houses are not subject to tax and capital gains on secondary houses are not subject to taxes if the property has been owned for at least 5 years. We assume there is no capital appreciation for non-housing real wealth.

Capital Gains on Risky Financial Assets (CGF)

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[35] For primary residences, the tax value is notionally equal to 25% of market value. This rises to 40% for secondary residences, and to 100% for other real assets. In practice, reported housing valuations have been found to be lower than the national percentages, so we adjust to estimated market values using information from Statistics Norway on the ratio of tax to market value for houses sold during these years, by region and price intervals. In 1999, 2004, 2005, 2006, and 2007 we know the ratio of tax to market value for houses sold during these years, by region and price intervals. For each region and each price interval, we define an overall ratio for the period 1994-2010, equal to its average during the years 2004-2007, which we then average with its value in 1999. See https://www.ssb.no/a/english/publikasjoner/pdf/rapp_201235_en/rapp_201235_en.pdf.

[36] We have also tried to impute the market value of real assets prior to 2010 assuming that, for each individual or household, the relative shares of wealth in a primary residence, secondary residence, and other real assets is equal to its average among the Norwegian population in 2013, or to its average by age and taxable real wealth groups. As noted, the conclusions are insensitive to the various imputations.

[37] We use tables from Statistics Norway on the price of dwellings by region and year. (See https://www.ssb.no/en/statbank/table/07230/.) We have information on where people live rather than on the location of houses, so we are assuming that individuals' real assets are located in their area of residence. Taking the value of houses owned by person i in area j at time t as $H_{ij(t)}$ and the level of the house price index for area j at time t as $H_{j(t)}$, we estimate the capital gain on real assets for person i between $t-1$ and t as $H_{ij(t-1)} * [H_{j(t)} - H_{j(t-1)}]/H_{j(t-1)}$.

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The capital gains on risky financial assets are calculated for each year as the total value of risky financial assets (total financial assets minus bank deposits) at the beginning of the year multiplied by the percentage annual return of the OBX index (the main stock market index in Norway).[38] Capital gains on financial assets are subject to taxes, so we subtract an estimate of accumulated tax liabilities on capital gains from estimated capital gains.

Wealth Tax (WT)

The Wealth Tax paid each year is available in the data.

Sample and Descriptive Statistics

We restrict our sample to include a balanced panel of all adults born between 1948 and 1968, registered as Norwegian residents in each year between 1994 and 2013, and living in an independent household (i.e., not living with their parents) in 2013. Thus, the sample ranges in age from 26 to 46 in 1994 and from 45 to 65 in 2013.

Table 1 shows descriptive statistics for our sample. The average age of the sample is 36 in 1994 and 55 in 2013. The sample is equally divided by gender. All financial amounts are expressed in nominal Norwegian Krona, so the average Potential Wealth of about 7m NOK is the sum of the nominal value of all sources of income from 1995 to 2013.[39] Net wealth in 1994 is typically low – the median net wealth in 1994 is 100,000 NOK, or about 14,000 dollars. Median net wealth in 2013 is over 10 times larger than net wealth in 1994; if we consider constant dollars and express the 1994 net wealth in 2013 NOK (using the Consumer Price Index), then median net wealth in 2013 becomes 7 times larger than net wealth in 1994. This all suggests that we are starting early enough in the lifecycle, before the

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[38] Prior to 1997, listed shares are reported at 70% of their market value. During 1998-2004, they are reported at full value; during 2005-2006, they are reported at 65%; in 2007 they are reported at 85%; and during 2008-2014 they are reported at full value. Prior to 1997, unlisted shares are reported in tax records at 30% of their market value. During 1998-2006, they are reported at 65% of their market value; in 2007 they are reported at 85%; and during 2008-2014 they are reported at full value. We therefore adjust reported share values to take account of the year-specific discount, assuming that individuals own the same proportion of listed shares, unlisted shares and other risky financial assets as the national averages in 2012. As we show later, the aggregate values of risky financial assets match well with the national accounts.

[39] In 2013, 1000 krona was worth approximately $166 and €127.

major years of wealth accumulation have begun, and are examining a period of substantial growth in wealth.

5. Potential Wealth, Deep Potential Wealth, and Actual Net Wealth in 2013

Figure 1 plots the distributions of actual net wealth in 2013, Potential Wealth, and Deep Potential Wealth. Given the presence of some extreme values, we have trimmed the top 1% and the bottom 0.1% of each distribution. Because Potential Wealth and Deep Potential Wealth take out consumption and spending, the means of these wealth measures are much larger than the mean of actual net wealth. While Potential Wealth and Deep Potential Wealth are almost always positive, a significant proportion of people have negative net wealth in 2013.[40] The net wealth distribution has a large spike at zero, reflecting the fact that many people consume much of their income and have zero or very small amounts of wealth. The distribution of Deep Potential Wealth is to the right of that of Potential Wealth, reflecting the slippage in terms of consumption/spending in Potential Wealth described earlier. In Table 2, we see that, winsorizing the top and bottom 0.1% of each distribution, the correlation between Potential Wealth and Deep Potential Wealth is 0.77 so, unsurprisingly, these two measures of potential wealth are quite highly correlated (the rank correlation between these variables is 0.83).

A key question is how well net wealth approximates these measures of potential wealth, given that most datasets only contain measures of net wealth even though we may want a measure of potential wealth. If net wealth and the measures of potential wealth are highly correlated, this suggests that differences in spending and consumption patterns are not a large component of differences in wealth across individuals, and having a measure of net wealth at a point in time provides useful insight into the underlying distribution of potential

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[40] Potential Wealth is negative for 0.02% of our sample. For these few individuals, the negative capital income or returns on assets exceeds the positive inflow. Deep Potential Wealth is negative for about 0.5% of the sample because of negative rates of return, negative self-employment income, or negative net wealth in 1994.

wealth. In contrast, if they are not highly correlated, this suggests that the observed wealth distribution is heavily influenced by differences in consumption patterns, and any inferences about the wealth distribution should be viewed through this lens.

When we correlate net wealth and Potential Wealth in 2013, winsorizing the top and bottom 0.1% of each distribution, the correlation is 0.78 and the rank correlation is 0.65. (See Table 2). However, some of this very high correlation is an artifact of the nonlinearity in the relationship at the highest wealth levels, which makes the correlation quite sensitive to our choice of winsorizing at the top of the distribution.[41]

When we correlate net wealth in 2013 and Deep Potential Wealth, winsorizing the top and bottom 0.1% of each distribution, the correlation is lower than that of net wealth with Potential Wealth, at .56 (See Table 2). This is not surprising, giving that not only does DPW remove any consumption behavior, it also does not allow for individual-specific investment behavior/decisions (although it does allow for the returns in each year to vary by the net wealth decile of the individual in that year). The rank correlation between net wealth in 2013 and Deep Potential Wealth is 0.60. Overall, while the correlation and rank correlation of net wealth with DPW are lower than that of net wealth with PW, the general relationships appear similar.[42]

To examine who has the largest differences between Potential and actual net wealth, for whom net wealth may be a particularly poor proxy for Potential Wealth, we break individuals into Potential Wealth quintiles and examine those with above- and below- the quintile median differences between PW and net wealth. (See Appendix Table C3.) As one might expect given the high costs of raising children, individuals with a larger gap have more

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[41] When we winsorize the top 1% instead of the top 0.1%, the correlation between Potential Wealth and Net Wealth in 2013 drops to 0.74. When examining individuals between the 10th and 90th percentile of Potential Wealth, the correlation between Potential Wealth and observed net wealth is 0.68.
[42] Appendix A discusses the relationships between net wealth, Potential Wealth, and Deep Potential Wealth in more detail.

children on average, with the difference being approximately a quarter of a child (2.0 versus

2.25). They also tend to be slightly younger, with a difference of about a year. Interestingly,

those with the larger gap tend to have more labor income, less capital income, and less

inheritance, on average. This suggests that people tend to consume relatively more from

labor income than from capital income or inheritance.

6. Where Does Wealth Come From?

A. Components of Potential Wealth

We next examine where wealth comes from. More specifically, what particular

income sources (aggregated over the 1995-2013 period) are the largest components of

Potential Wealth, and how does it vary across the Potential Wealth distribution? Figure 2

presents the breakdown of Potential Wealth when we pool all individuals. In this figure,

blocks below zero represent negative income (i.e. outflows), while blocks above zero

represent positive sources of income. The size of each block reflects the proportion of

Potential Wealth attributable to that source and, by construction, the totals add up to 1. In

aggregate, we see that Potential Wealth is disproportionately composed of labor income, with

net capital gains on real assets (generally housing) also a large component. Importantly,

inheritance and gifts represent a very small share of Potential Wealth on average. This

finding for inheritances and gifts is somewhat surprising given the emphasis placed on

inheritances in the literature.

However, this type of aggregation may mask substantial variation in the components

across the distribution of Potential Wealth. To examine this, we break the sample into deciles

of Potential Wealth and conduct a similar analysis by decile. Figure 3 presents this

breakdown. Because of the skewed distribution, we have separated the top decile into the top

2-10% of Potential Wealth and the top 1%. Here, we can see substantial heterogeneity in sources of Potential Wealth by decile.

At the bottom of the Potential Wealth distribution, we see a larger role for government transfers, with capital income very low or even negative (due to interest payments on debt). As we move along the Potential Wealth distribution, we see that government transfers becomes a smaller share while capital gains on real assets (largely due to homeownership) become a larger share. Similarly, capital income becomes increasingly important, and net capital gains on risky financial assets only become significant at the top of the distribution.

Importantly, we find a small role for inheritances, even at the top of the distribution. This may be surprising, given the large fraction of individuals who receive inheritances; during the 1995-2013 period, 56% of individuals in our sample received inheritances or gifts.[43] When we examine how that varies across the Potential Wealth distribution (Figure 4), we see that, while individuals in our sample who are in the top decile are the most likely to have received an inheritance or gift (over 70%), even those at the bottom receive inheritances, with about 40% in the bottom deciles receiving them.

Not surprisingly, the value of inheritances and gifts varies substantially across the Potential Wealth distribution; Figure 5 shows the average amount an individual receives, conditional on receiving an inheritance. It is interesting to note that the average amount is relatively constant for those up to the median of Potential Wealth and slowly increases until the top 1%, at which point we observe a sharp increase. Despite the large values for some of these percentiles, the fraction of Potential Wealth coming from inheritances is very small on average.

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[43] Because we divide all components between spouses, when one spouse receives an inheritance or gift, we consider that both spouses have received an inheritance. Not taking into account spouses, 39% of individuals in our sample received inheritances or gifts.

One issue might be that these individuals are, for the most part, too young to have experienced large inheritances (although gifts are included). When we break the analysis by age and Potential Wealth decile (Figure 6), we see quite similar breakdowns by age groups— and there is still very little role for inheritances, even at the top of the distribution and even for persons aged 55-65 in 2013. Again, we will revisit this issue, expanding to a broader set of ages, in later sections.[44]

Relating this back to observed net wealth, Figure 7 also shows the components of Potential Wealth across deciles of actual net wealth in 2013. With the exception of the bottom decile — government transfers are a much larger component of Potential Wealth for the bottom decile of the Potential Wealth distribution than the bottom decile of the net wealth distribution — the role of the components is almost identical across deciles of potential and actual net wealth in 2013 (comparing Figure 3 and Figure 7), suggesting again that net wealth might be a reasonable proxy for Potential Wealth.

Given that much attention has focused on the top of the distribution, where wealth has grown disproportionately over recent decades, we further examine the sources of wealth for the top 1%. When we look at inheritances among the top 1% of the Potential Wealth distribution in 2013 (Appendix Figure C3), we see that 26% received no inheritances and gifts, and 63% percent received less than 500,000 NOK (about €64,000 or $85,000 in 2013) in inheritances/gifts, suggesting extreme wealth is not necessarily driven by inheritances. We see that the wealthiest individuals in terms of Potential Wealth rely much more on capital income and capital gains than the rest of the population. However, their wealth does not appear to be driven by inheritance, and a large share have substantial labor income.

B. Components of Deep Potential Wealth

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[44] Appendix B also provides a more thorough discussion of the role of gifts and inheritances and how our work fits into the existing literature.

When we break Deep Potential Wealth into its components (Figure 8), we see that, as with Potential Wealth, labor income is a large share of Deep Potential Wealth.[45] Figure 9 then breaks Deep Potential Wealth into deciles (again treating the top percentile separately); we see that the relative roles of labor income and inheritances are similar to that in our figures for Potential Wealth. Inheritance still appears to play a relatively small role, even at the very top of the wealth distribution.

C. Counterfactual Distributions

Another way assess the importance of different sources of wealth in terms of overall wealth inequality is to consider what the Potential Wealth distribution would look like in the absence of any one component. For example, what would the Potential Wealth distribution look like if no one received any inheritances? Because Potential Wealth is just the sum of the components over the entire time period, it is easy to "turn off" any component and see how the Potential Wealth distribution changes.

We can do these counterfactuals with both Potential Wealth and Deep Potential Wealth. An advantage of using Potential Wealth is that we can analyze the effects of changing a variety of components, including capital income and capital gains. However, a limitation is that these counterfactuals ignore spillover effects—changing one component could lead to changes in other components (for example, changing labor income may change investment behavior and hence returns from assets). Because of these omitted spillover effects, we are likely underestimating the effect of a change in any one component on the overall distribution. Deep Potential Wealth does not have this limitation to the same extent, although it is less versatile in that we can only analyze a limited number of components.

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[45] The ratio of net labor income to net inheritances in Potential Wealth and in Deep Potential Wealth will only differ due to differences in the timing of receipt over the 1995-2013 period. Therefore, it is unsurprising that the ratios are similar. The role of wealth in 1994 is somewhat larger in Deep Potential Wealth than in Potential Wealth as it has longer to capitalize compared to labor income and inheritances.

Figures 10-15 do these counterfactual analyses using Potential Wealth, showing the

full distribution of actual Potential Wealth (in purple) overlaid with what the distribution

would look like under different counterfactuals (in yellow). To enable us to focus on the

variation (as distinct from the location) of the Potential Wealth distribution, our

counterfactual distributions replace the actual value of the component for each person with

the median value of that component, so it is the counterfactual distribution if everyone had

the same amount (the median value) for a particular component.[46] (The median values of

each component are reported in Table 1.)

Table 3 then summarizes the differences between the Potential Wealth distribution

and the counterfactual distribution by showing the Gini coefficients under both scenarios, the

rank correlation between Potential Wealth and the counterfactual Potential Wealth, and the

percentage of wealth in each of several percentile groups under the different scenarios.[47]

Net labor income (Figure 10) is the largest component of Potential Wealth throughout

the distribution (with the exception of the very top), and we see that netting it out makes the

Potential Wealth distribution much more compressed. The Gini coefficient goes down from

.27 to .21, suggesting that labor income differences play a large role in creating variation in

Potential Wealth. This effect is particularly large at the bottom of the distribution, with the

percentage of PW held by the bottom 40% increasing from .24 to .28. In addition, the rank

correlation between the actual Potential Wealth distribution and the counterfactual

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[46] Additionally, to make the pictures tractable, we winsorize the top 1% and bottom 0.1%, where these quantiles are defined based on Potential Wealth rather than on counterfactual Potential Wealth.

[47] The Gini coefficient for net wealth in 2013 (0.57), while slightly lower than other estimates due to our sample restrictions (primarily age), is significantly greater than that for Potential Wealth (0.27) or Deep Potential Wealth (0.25). The main reason for this disparity is variation in consumption – some people spend most or all of their Potential Wealth and so have little net wealth while others save more of their Potential Wealth. Thus, it is unsurprising that variation in net wealth far exceeds variation in Potential Wealth. The similarity of the Ginis for PW and DPW suggests that differences in investment behavior are not a large factor in determining wealth inequality. Note that we set negative values of wealth equal to zero when calculating the Gini coefficient, consistent with OECD practice.

distribution is only .69, suggesting that labor income has a substantial effect on where one stands in the distribution. The large effects of labor income on the Potential Wealth distribution are particularly noteworthy given how compressed the income distribution is in Norway compared to other countries (OECD, 2020).

For net capital income (Figure 11), we see a qualitatively similar effect—a reduction in the variance of the Potential Wealth distribution when we give everyone the median net capital income—but it is much smaller in magnitude for most of the distribution. Here, the Gini coefficient declines from .27 to .23. However, it has substantially larger effects at the very top of the distribution; the fraction of individuals with Potential Wealth above the top 1% of the PW distribution goes down to below 0.6% (from 1%) when we give everyone the median net capital income. In addition, the rank correlation of .98 between Potential Wealth and the counterfactual Potential Wealth suggests that this component has little effect on the rank order.

In contrast, government transfers (Figure 12) compress the Potential Wealth distribution, and their effect is concentrated at the bottom. The Gini coefficient increases to .31 when we give everyone the median government transfers, though the rank ordering is largely preserved (with a rank correlation between Potential Wealth and the counterfactual distribution of .97).

The counterfactual distribution for Potential Wealth when we give everyone the median value of inheritances and gifts—only about NOK 35,000, or $6,000 in 2013-- is very similar to the actual Potential Wealth distribution (Figure 13), implying that this component has little effect on the overall variation in Potential Wealth. The Gini coefficient is virtually unchanged—declining from .27 to .268, and the rank correlation between the two distributions is .99—suggesting that inheritances are not changing the rank order of the

distributions. This all suggests little role for inheritances and gifts in the Potential Wealth distribution.[48]

Net capital gains on real assets (Figure 14) increase the variance of the Potential Wealth distribution—both at the top and the bottom—so setting them equal to the median value reduces the variance of the distribution; the Gini coefficient declines from .27 to .22. However, the rank correlation between Potential Wealth and this counterfactual Potential Wealth is high—.97—so setting them equal to the median value does not change the rank ordering of the distribution. In contrast, net capital gains on risky financial assets (Figure 15) increase variation in Potential Wealth only towards the top of the distribution and have a particularly large effect on the top 1%. Because most of the change is at the very top of the distribution, the rank correlation is quite high—.995, although the Gini coefficient declines from .27 to .22.[49]

With the exception of net labor income, few individual components meaningfully affect the rank ordering of the Potential Wealth distribution. However, they do affect the variance of the distribution, with government transfers, net labor income, and net capital gains on real assets affecting the bottom of the distribution while net labor income, net capital income, net capital gains on real assets, and net capital gains on financial assets affect the spread at the top of the Potential Wealth distribution.

These counterfactuals for Potential Wealth are purely descriptive, as they do not allow for the fact that, for example, a reduction in labor income will lead to lower savings and, hence, lower capital income. However, when we do the same exercises for DPW—albeit for

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[48] As another exercise, we simulated what the PW distribution would look like in the absence of the inheritance tax. As described above, Norway had an inheritance tax up to 2014. We examined the elimination of this tax for the period (and, importantly, assume no behavioral responses). Given that inheritances do not play a large role in the Potential Wealth distribution, it is not surprising that we found that an inheritance tax (or absence thereof) changes very little.

[49] Unsurprisingly, given their rarity, lottery gains have no discernable effect on the Potential Wealth distribution (with a rank correlation of .999 and an identical Gini coefficient).

fewer components—the conclusions are quite similar. Table 4 reports the Gini coefficients

and rank correlations for the DPW counterfactuals. Figure 16 shows the counterfactual

distribution when we give all individuals the median capitalized labor income; the DPW

distribution becomes much more compressed. The Gini coefficient declines from 0.25 to

0.13, and the rank correlation between the two distributions is 0.38. Figure 17 shows the

counterfactual when we give everyone the median capitalized government transfer. The Gini

coefficient goes from 0.25 to 0.29 and the rank correlation between the two distributions is

0.96. Not surprisingly, the top of the distribution is virtually unchanged, while the bottom of

the distribution is much worse off; however, the ranking of the individuals within the

distribution remains mostly unchanged. Finally, Figure 18 shows what happens when we

give everyone the median value of capitalized inheritances and gifts; the distribution changes

very little, with some movement to the left; the Gini is virtually unchanged at 0.25 and the

rank correlation between the two distributions is 0.99.

D. Looking Across the Age Distribution

Our focus has been on following persons aged 26-46 in 1994 until they are aged 45-

65 in 2013; we consider these to be important ages to study, as they encompass early

adulthood to middle age. However, our approach can be used for any set of age groups and,

in this section, we expand the ages considered and use more detailed age groups--from 26-30

in 1994 (45 – 49 in 2013) to 61-66 in 1994 (80 – 85 in 2013). Appendix Figure C4 shows the

components of PW by age group. The importance of labor income declines with age while

capital income and, especially, transfer income (which includes pension income) play a larger

role. Not surprisingly, net wealth at the beginning of the period also becomes more important

with age.

Gifts and inheritances become more important with age over the first 4 age groups

(the age groups in our main analysis) and then become less important with age, reflecting the

fact that these are generally received around middle age; this suggests our choice of age groups for our main analysis is unlikely to lead us to understate the role of gifts and inheritances.[50] Appendix Figure C6 shows the equivalent information for DPW. Once again, we see the decline with age in the importance of labor income and rise in importance of transfers and net wealth in 1994. Also, we see the clear decline in the importance of inheritances at older ages.

E. Matching to Aggregates from the National Accounts

Our measures of wealth are imperfect and, due to legal tax exemptions and underreporting, we may underestimate the individual components of wealth. To account for this potential mismeasurement, as a robustness check, we reproduce our main analysis using individual wealth information adjusted to match aggregates from the National Accounts. For each wealth component (housing wealth, wealth held in private businesses and other non-housing real wealth, deposits, financial wealth held outside of deposits, and debt) we compute its total average value as recorded in the tax records for each year. We then adjust each component by a factor that is the same for each household but differs across years so that the average value of each component in each year across the Norwegian population matches the relevant national accounts information (taken from the World Inequality Database (WID)). We use a similar procedure to account for possible underreporting of inheritances and gifts, matching reported inheritances to the total net wealth of deceased individuals.[51]

Appendix Figure C7 shows the initial aggregates recorded in the tax records, and the values from the national accounts we match them to. The two series match up well for

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[50] Appendix Figure C5 shows the fraction of individuals between 1995 and 2013 who receive gifts or inheritances at each age. What we see is that inheritances peak around age 55 with a distribution around that age. Importantly, only 5 percent of gifts or inheritances are received after age 65 (and 5 percent before age 25).
[51] For each year, we compute the total value of inheritances as recorded in our data, and the total net wealth of the deceased (after removing negative values and adjusting wealth components to the National Accounts) excluding those with a living spouse at time of death. Then, we adjust inheritances so that the two aggregates match in each year. Note that we also adjust the value of gifts using the same yearly ratio.

financial assets, debt, and inheritance but a substantial adjustment is required in some years to match housing wealth and business wealth to the national accounts. In Appendix Figures C8 and C9, we show components of PW and DPW by decile after making the adjustments described above. Reassuringly, the roles of the various components are similar with and without the adjustments.

7. Intergenerational Relationships

While inheritance does not appear to be an important factor in wealth accumulation on average, parents may influence their child's wealth accumulation in other ways, which could lead to differences in wealth accumulation by parental wealth. There is a well-established correlation in net wealth across generations, but little is known about how parental wealth affects the sources of wealth of their children. Do children of wealthy parents accumulate wealth differently than children from less wealthy families?

To answer this, we examine the components of Potential Wealth for children whose parents are at various points of the net wealth distribution in 1994. We measure parental wealth as the sum of both parents' wealth in 1994 (whether or not both parents are in the same household); if only one parent is alive in 1994, we measure parental wealth as the wealth of that parent.[52] The correlation between parental net wealth and their child's PW is 0.29 (0.28 in ranks); the analogous correlation between parental net wealth and their child's DPW is 0.25 (0.28 in ranks). These are similar in magnitude to the correlation between parental net wealth in 1994 and child net wealth in 2013 (0.26 and 0.25 in ranks).[53] Thus, we

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[52] We do not have information on parental net wealth for about 13% of the sample, either because both parents died before 1994 or because they were not living in Norway in 1994. We drop these individuals from our sample for the intergenerational analysis.

[53] Fagereng et al (forthcoming) estimate an intergenerational net wealth rank correlation of .24 for their sample of Norwegian non-adoptees, which is quite similar to our rank correlation of .25. More recently, Boserup *et al.* (2017) and Black *et al.* (2020) have used register data and found intergenerational rank correlations of 0.27 in Denmark and 0.34 in Sweden, respectively.

see similar intergenerational correlations between parental net wealth and the measures of child potential wealth as we see for child net wealth. In about 30% of cases, the last surviving parent dies between 1994 and 2013 so, in the majority of cases, children have not received inheritances from their parents (but may have received gifts from their parents or an inheritance from their spouse's parents) by 2013.

In Figures 19 and 20, we split the sample by decile of parental net wealth in 1994 to determine how the relative importance of the components of PW and DPW differs by parental wealth.[54] We see that individuals with rich parents get their wealth disproportionately from capital income and returns on financial wealth. Taking our PW and DPW results together, children of the top 1% have higher initial wealth in 1994 and receive greater inheritances than others, and they invest these resources so that they receive a disproportionate amount of their wealth from returns on financial investments and capital income. Overall, we conclude that, not only do children with wealthy parents end up with greater wealth, they accumulate their wealth in very different ways compared to most members of society.

8. Conclusions

In this paper, we have studied the determinants of wealth using information on the Norwegian population over a 20-year period. To do so, we have created a measure of Potential Wealth (PW) that largely abstracts from consumption and spending decisions and focuses on the various sources of income that enable individuals to accumulate wealth. We

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[54] The rank correlation between parental wealth and PW falls from 0.29 to 0.20 when we do the counterfactual where all individuals are given the median labor income and to 0.27 when we do the same for gifts and inheritances (other components of PW have little impact on the rank correlation). For DPW, the rank falls from 0.28 to 0.12 when we median out labor income and to 0.25 when we median out gifts and inheritances.

have augmented this with a measure (Deep Potential Wealth) that provides less information about components of wealth but more fully abstracts from consumption and spending.

We have several major findings. First, net wealth appears to be a reasonable proxy for potential wealth, which is reassuring as other data sets typically do not allow the creation of potential wealth measures like ours and are limited to observed net wealth. Second, persons in different parts of the potential wealth (and actual net wealth) distributions get their wealth from very different sources. Labor income is the most important determinant of wealth, except in the top 1% where capital income and capital gains on financial assets become important. Inheritances and gifts are not an important determinant of wealth, even at the top of the wealth distribution.

This finding differs from Piketty (2014), and there are several possible explanations for our different findings. Our lower estimates of the role of inheritances and gifts are consistent with the lower wealth/income ratio in Norway compared to France. While Norway has a relatively low wealth/income ratio (comparable to that of the U.S. for example), France has a one of the highest wealth/income ratios. Our data are also quite different, as we have access to administrative information on income sources by individual over many years, while Piketty (2014) uses more limited tax estate information and aggregate data. Importantly, our different findings do not seem to be driven by mismeasurements of bequests in our data, or by the fact that we focus on a specific age range.

Our result that inheritances and gifts are not an important determinant of wealth may also appear surprising in view of recent work on the importance of bequests in the intergenerational transmission of wealth (See Adermon et al., 2018; Black et al 2020). However, while bequests may be a substantial part of the correlation across generations, the intergenerational component itself is only a small part of individual wealth accumulation across the lifecycle. Importantly, while we find that inheritances are not a large component

of potential wealth, we do find that parents can influence child wealth accumulation, particularly at the top of the parental net wealth distribution.

While our results are based on data from Norway, there is reason to believe that Norway is representative of other European countries. The level of wealth as well as the inequality in wealth are similar to that in many other European countries, despite having a more compressed distribution of labor income.

Our findings have implications for policy, suggesting that an inheritance tax would do little to mitigate the extreme wealth inequality in society. Importantly, the fact that labor income is a primary driver of potential wealth inequality suggests that increasing equality of opportunity beginning in early childhood might play an important role in equalizing the distribution of wealth. Human capital—a key determinant of labor income—may be a critical factor for understanding the large wealth inequalities that exist in the modern world.

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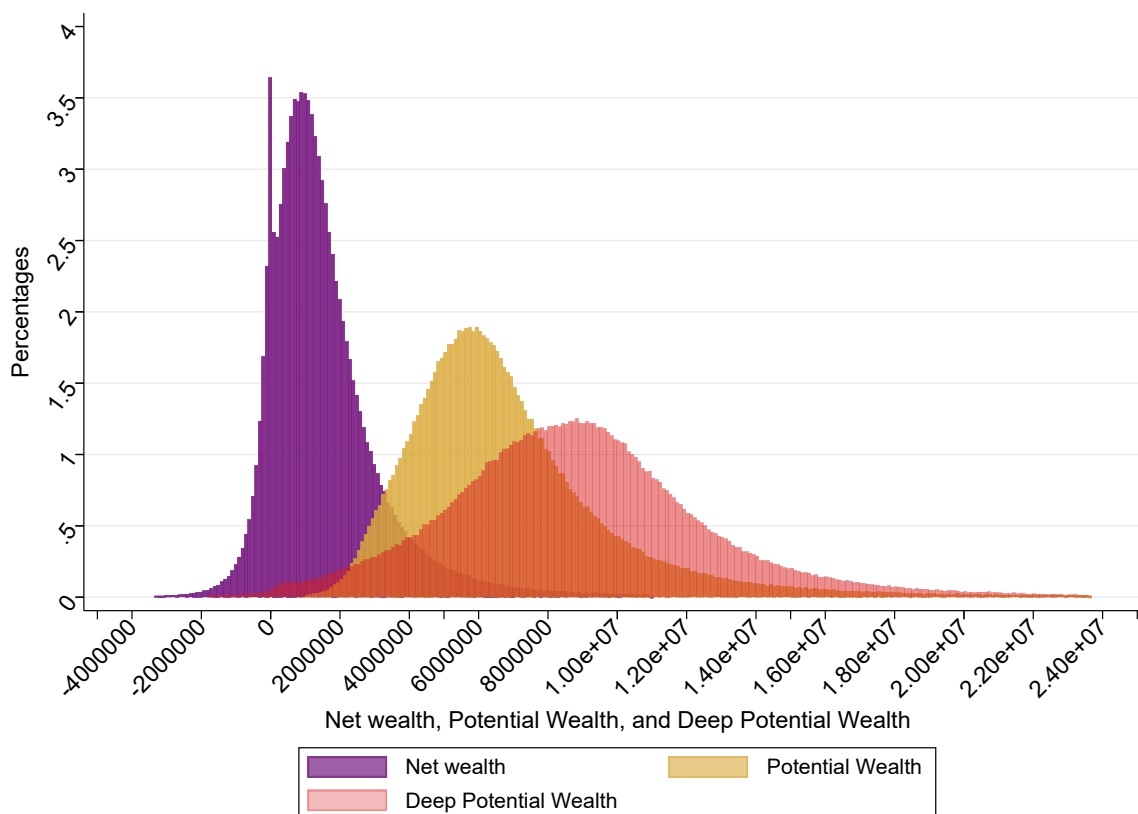
Figure 1 – Distributions of Potential Wealth, Deep Potential Wealth, and net wealth in 2013

Notes: The figure refers to a balanced panel of all adults born between 1948 and 1968, registered as Norwegian residents in each year between 1994 and 2013, and living in an independent household (i.e., not living with their parents) in 2013. The figure shows the distributions of Potential Wealth, Deep Potential Wealth, and net wealth in 2013.

The top 1% and bottom 0.1% of net wealth, Potential Wealth, and Deep Potential Wealth are trimmed.
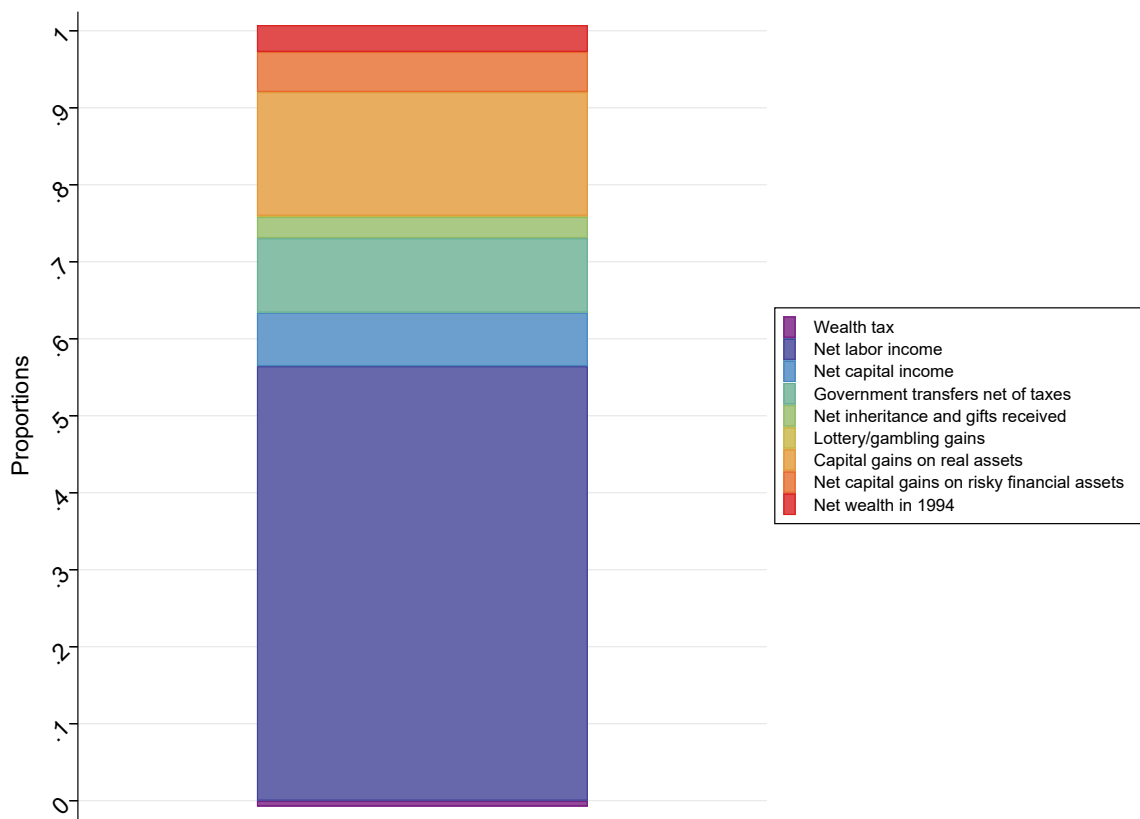
Figure 2 – Components of Potential Wealth

<u>Notes</u>: The figure refers to the same sample as Figure 1, and shows the components of Potential Wealth. For each component, the corresponding colored bar represents the average share of that component in Potential Wealth. The shares sum to 1.
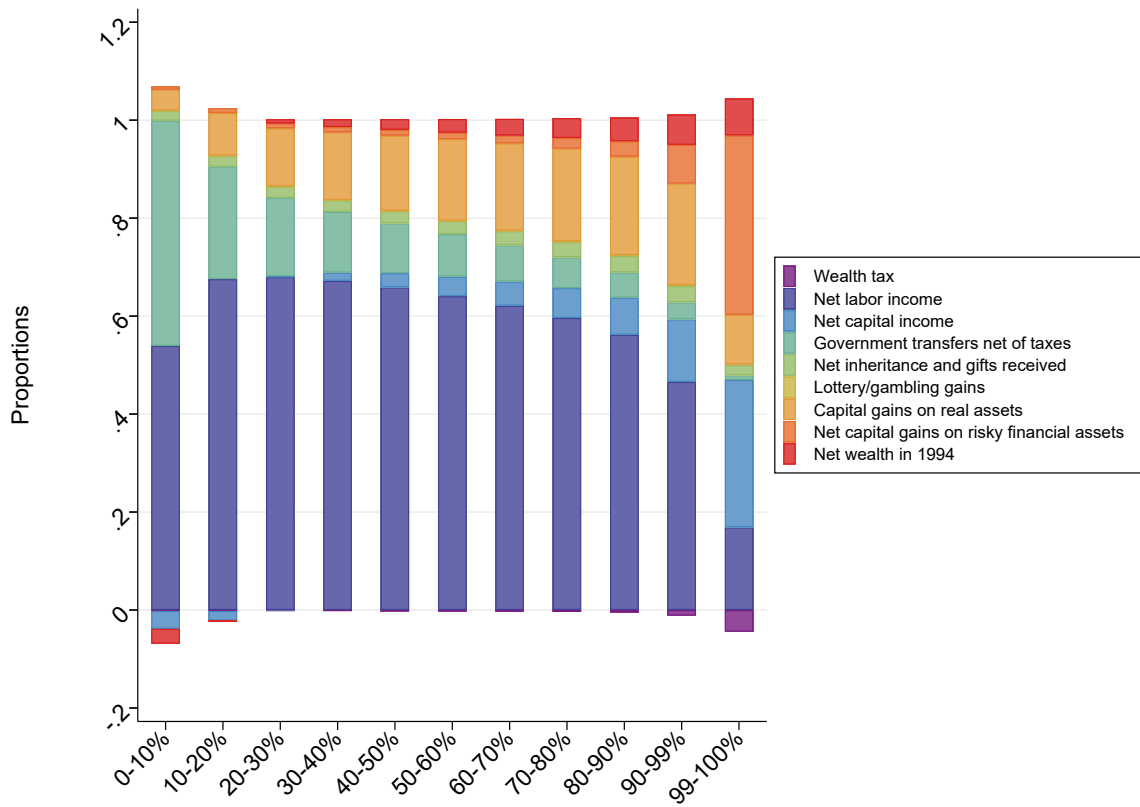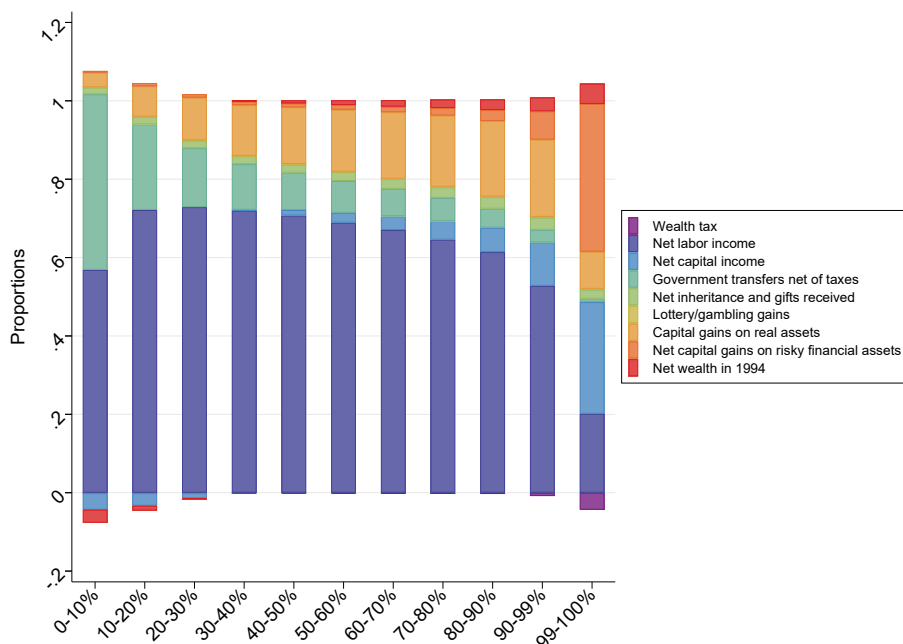
Figure 3 – Components of Potential Wealth by deciles of Potential Wealth

Notes: The figure refers to the same sample as Figure 1, and shows the components of Potential Wealth by deciles of Potential Wealth, with the top 1% as a separate category. For each component, the corresponding colored bars represent the average share of that component in Potential Wealth for each decile of Potential Wealth. The shares sum to 1.
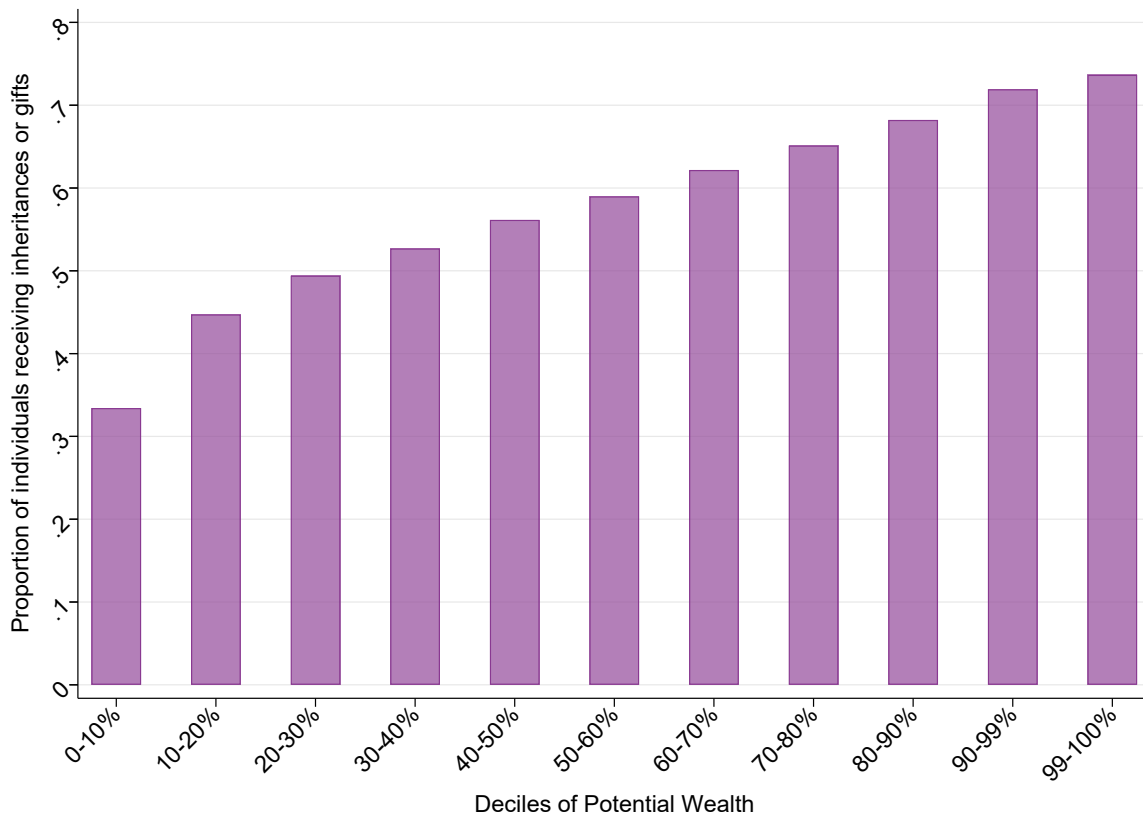
Figure 4 – Proportion of individuals receiving inheritances or gifts by deciles of Potential Wealth

Notes: The figure refers to the same sample as Figure 1. For each decile of Potential Wealth, with the top 1% as a separate category, the figure shows the proportion of individuals who received an inheritance or gift, either directly or through their spouse, during the period 1995-2013.
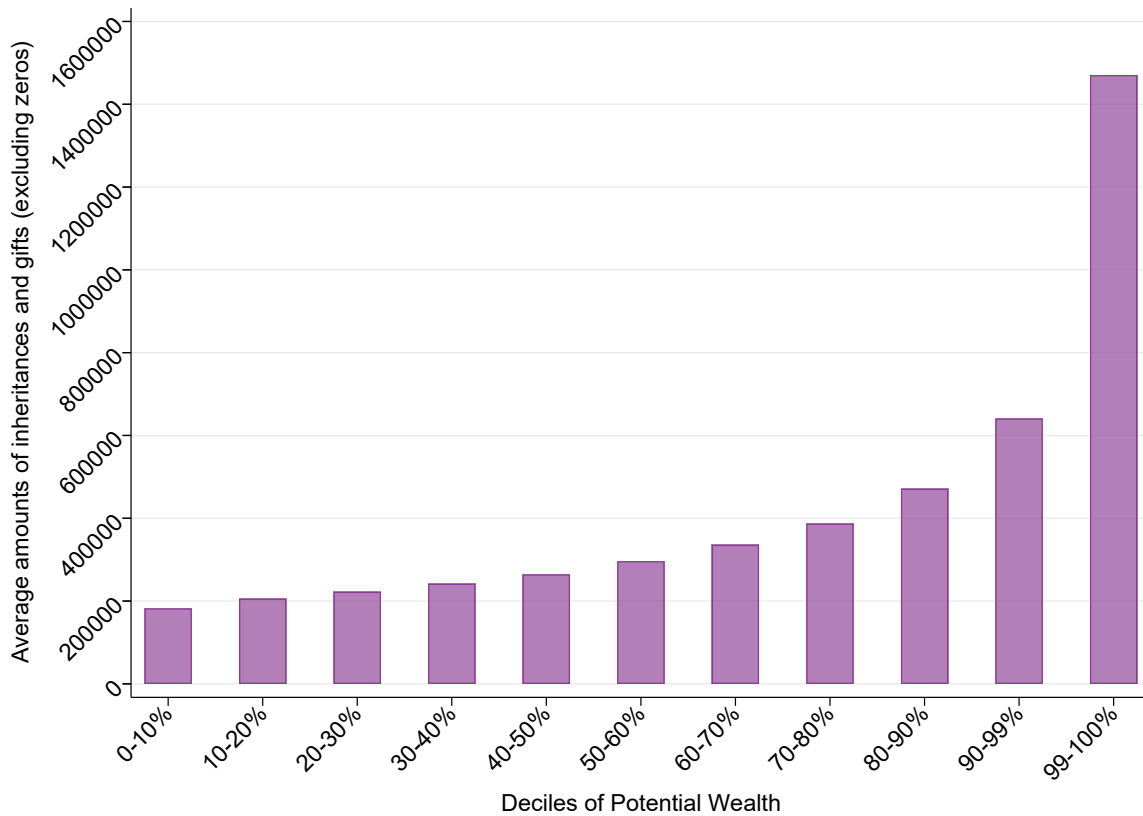
Figure 5 – Average amounts of inheritances or gifts received by deciles of Potential Wealth

Notes: The figure refers to the same sample as Figure 1, restricted to individuals who received an inheritance or gift, either directly or through their spouse, during the period 1995-2013. For each decile of Potential Wealth, with the top 1% as a separate category, the figure shows the average total amount of inheritances and gifts received during 1995-2013.

(a) 55-65 in 2013
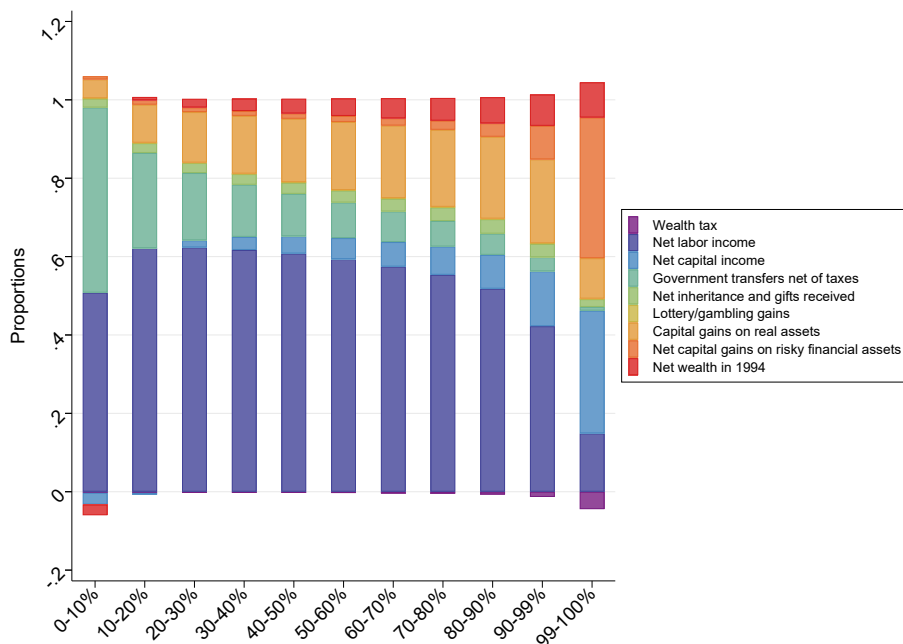
(b) 45-54 in 2013

Figure 6 – Components of Potential Wealth by deciles of Potential Wealth and age groups

Notes: The figure refers to the same sample as Figure 1 and shows the components of Potential Wealth by deciles of Potential Wealth, with the top 1% as a separate category. Figure 6a focuses on the subsample of individuals born between 1948 and 1958, and Figure 6b focuses on the subsample of individuals born during 1959 and 1968. For each component, the corresponding colored bars represent the average share of that component in Potential Wealth for each decile of Potential Wealth. The shares sum to 1.
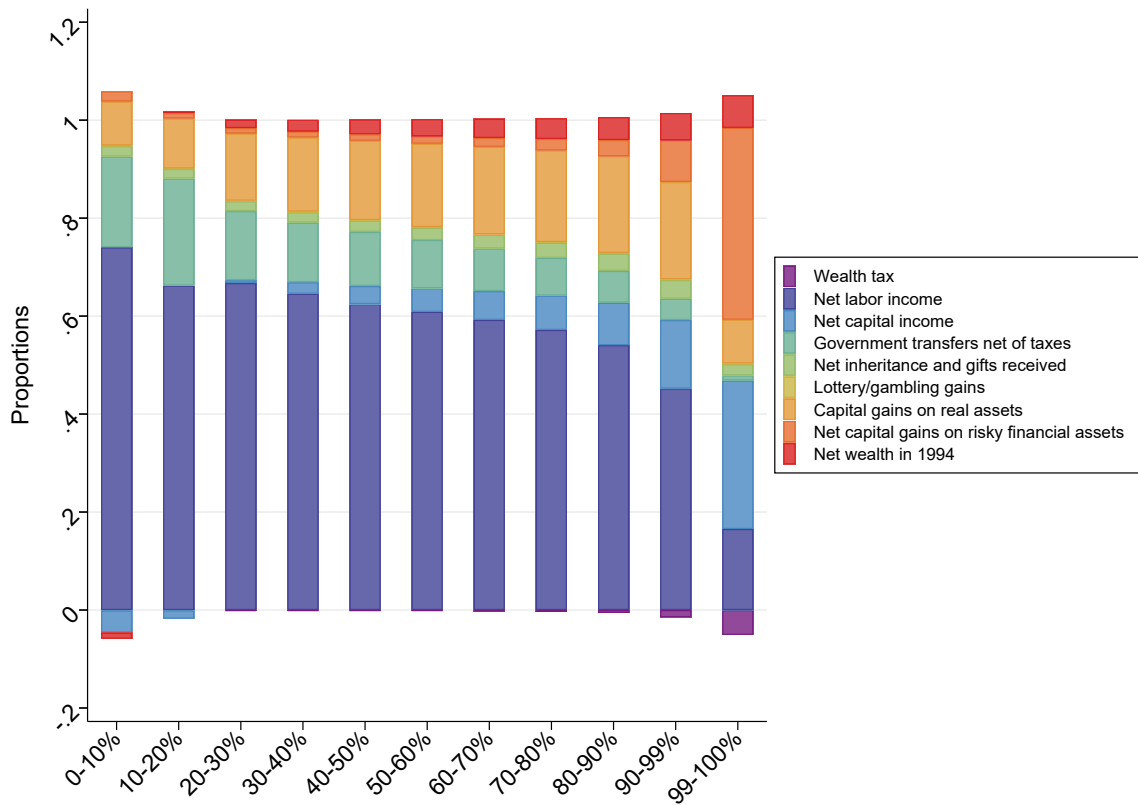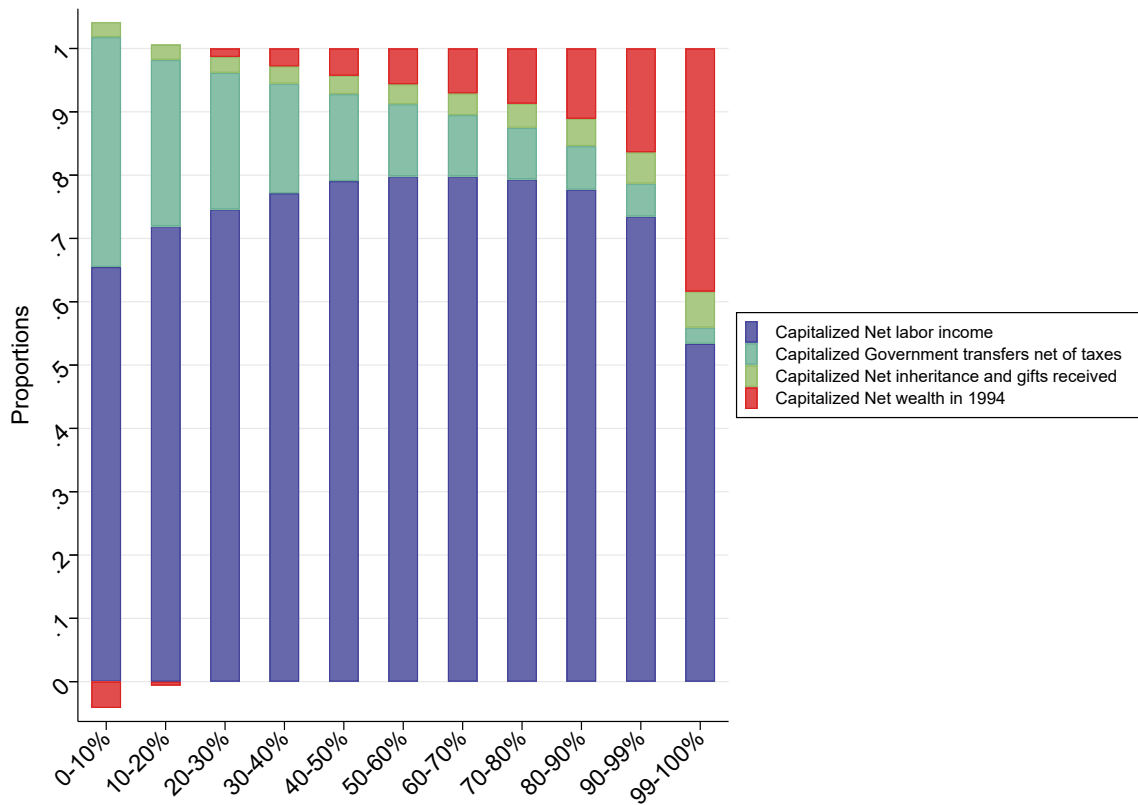
Figure 7 – Components of Potential Wealth by deciles of net wealth in 2013

Notes: The figure refers to the same sample as Figure 1 and shows the components of Potential Wealth by deciles of net wealth in 2013, with the top 1% as a separate category. For each component, the corresponding colored bars represent the average share of that component in Potential Wealth for each decile of net wealth in 2013. The shares sum to 1.
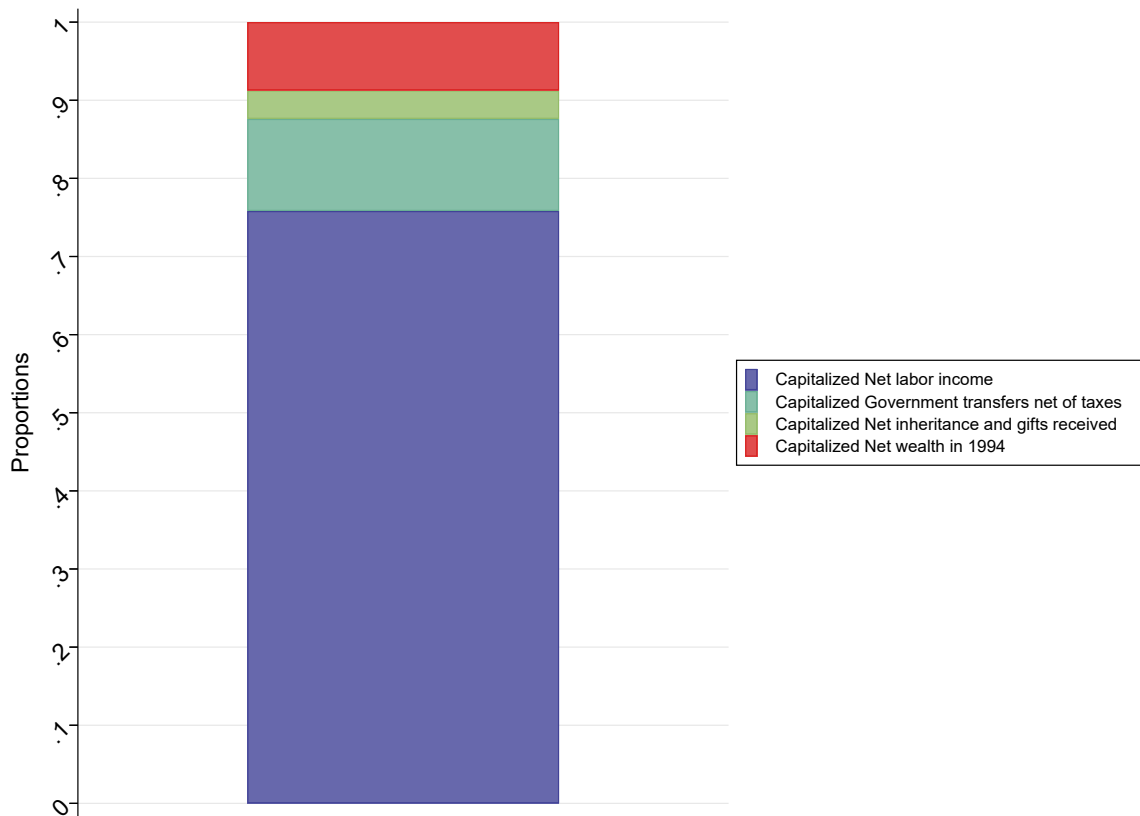
Figure 8 – Components of Deep Potential Wealth

Notes: The figure refers to the same sample as Figure 1 and shows the components of Deep Potential Wealth. For each component, the corresponding colored bar represents the average share of that component in Deep Potential Wealth. The shares sum to 1.

Figure 9 – Components of Deep Potential Wealth by deciles of Deep Potential Wealth

Notes: The figure refers to the same sample as Figure 1 and shows the components of Deep Potential Wealth by deciles of Deep Potential Wealth, with the top 1% as a separate category. For each component, the corresponding colored bars represent the average share of that component in Deep Potential Wealth for each decile of Deep Potential Wealth. The shares sum to 1.
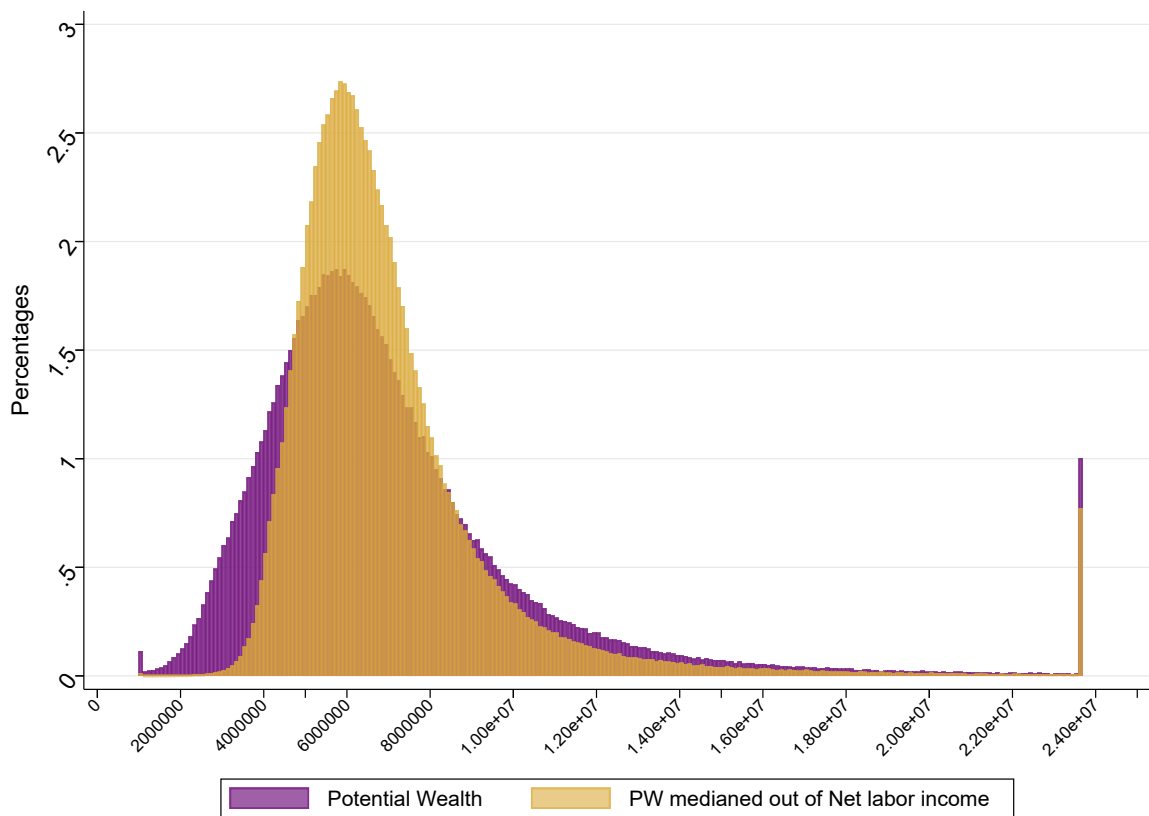
Figure 10 – Distribution of Potential Wealth and its counterfactual medianed out of net labor income

Notes: The figure refers to the same sample as Figure 1. The figure shows the distribution of Potential Wealth, and its counterfactual distribution, replacing each individuals' net labor income with the median value in the sample.
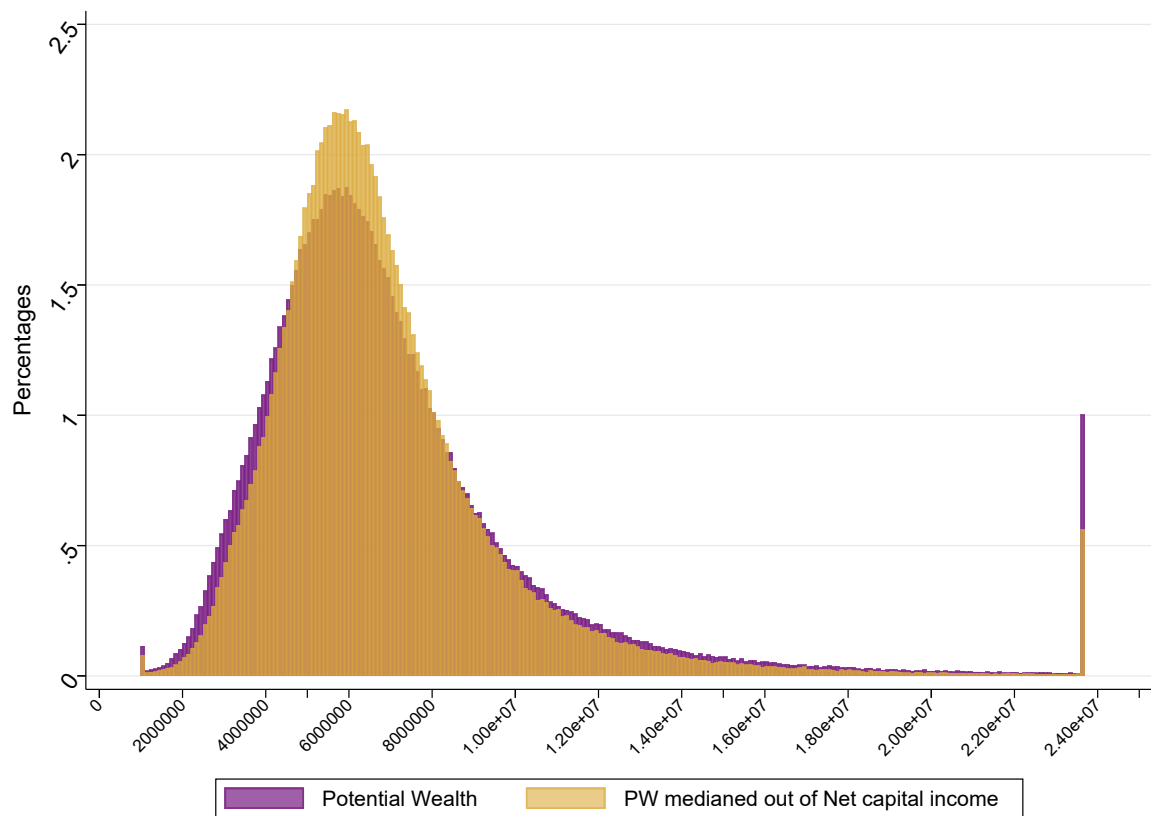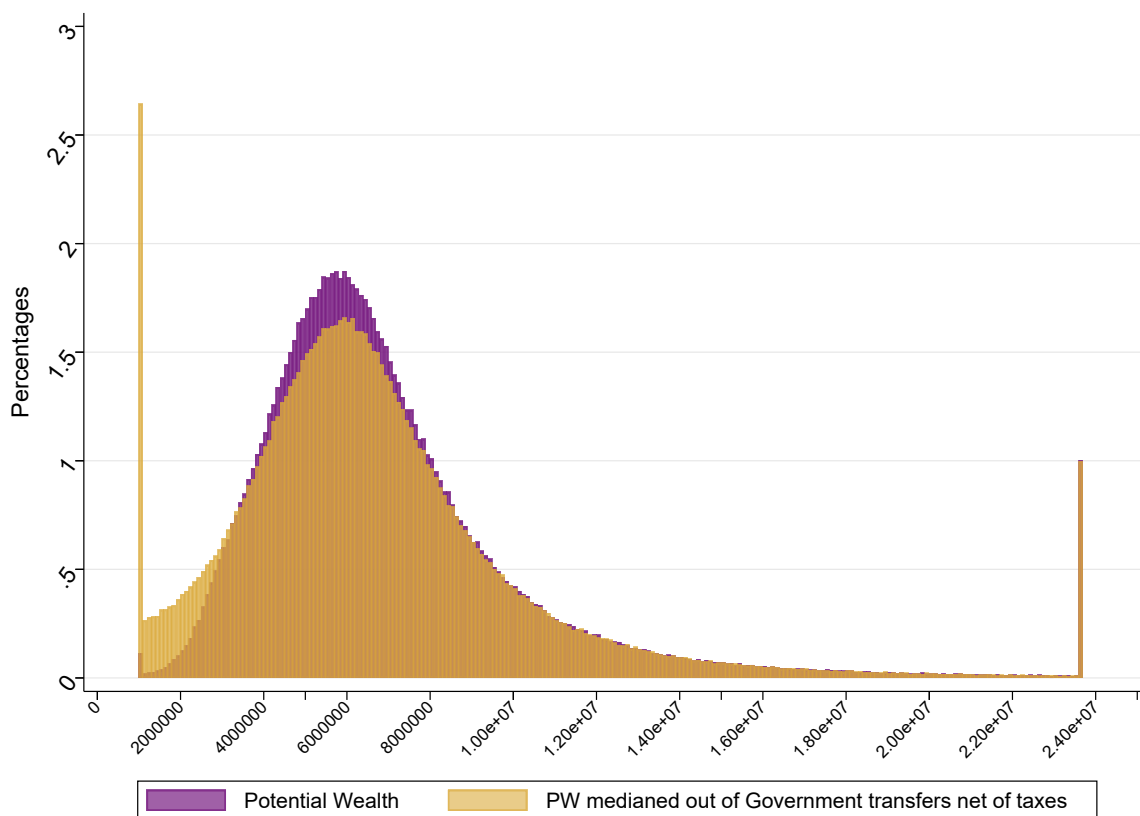
Figure 11 – Distribution of Potential Wealth and its counterfactual medianed out of net capital income

<u>Notes</u>: The figure refers to the same sample as Figure 1. The figure shows the distribution of Potential Wealth, and its counterfactual distribution, replacing each individuals' net capital income with the median value in the sample.

Figure 12 – Distribution of Potential Wealth and its counterfactual medianed out of government transfers

Notes: The figure refers to the same sample as Figure 1. The figure shows the distribution of Potential Wealth, and its counterfactual distribution, replacing each individuals' government transfers net of taxes with the median value in the sample.
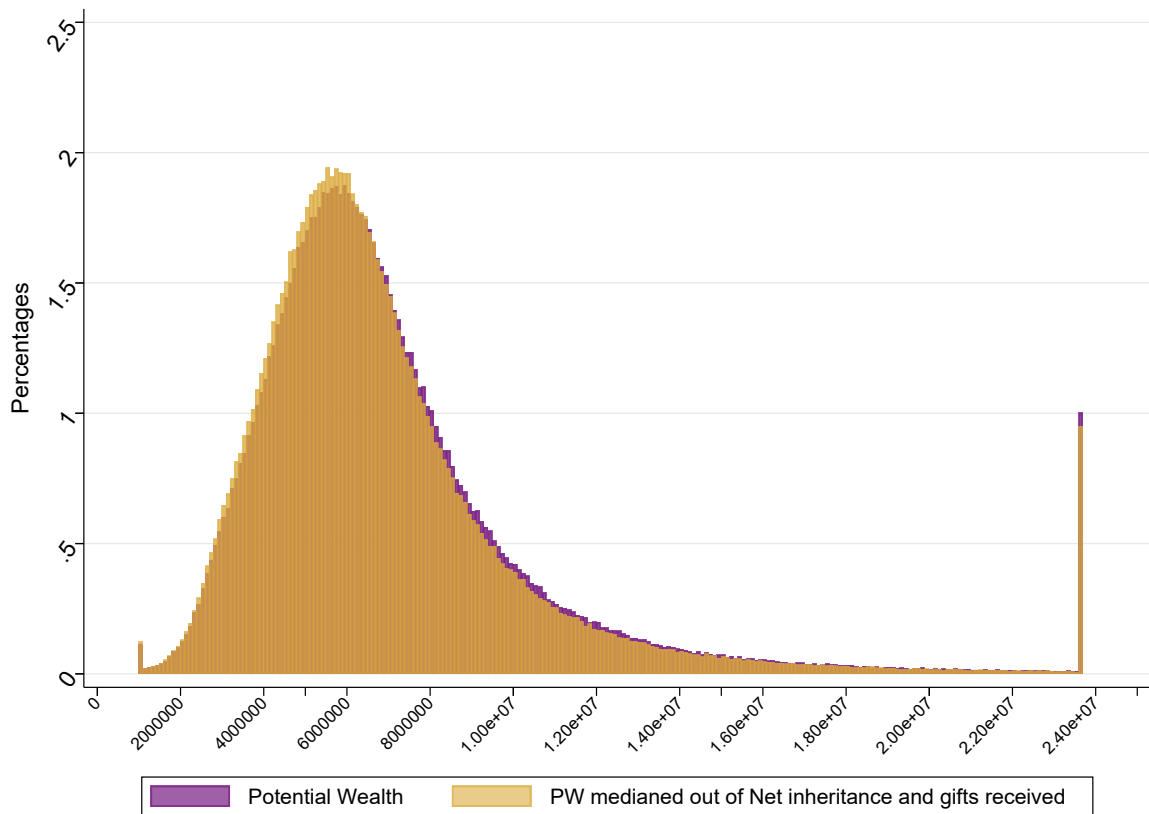
Figure 13 – Distribution of Potential Wealth and its counterfactual medianed out of net inheritance and gifts

Notes: The figure refers to the same sample as Figure 1. The figure shows the distribution of Potential Wealth, and its counterfactual distribution, replacing each individuals' net inheritance and gifts with the median value in the sample.
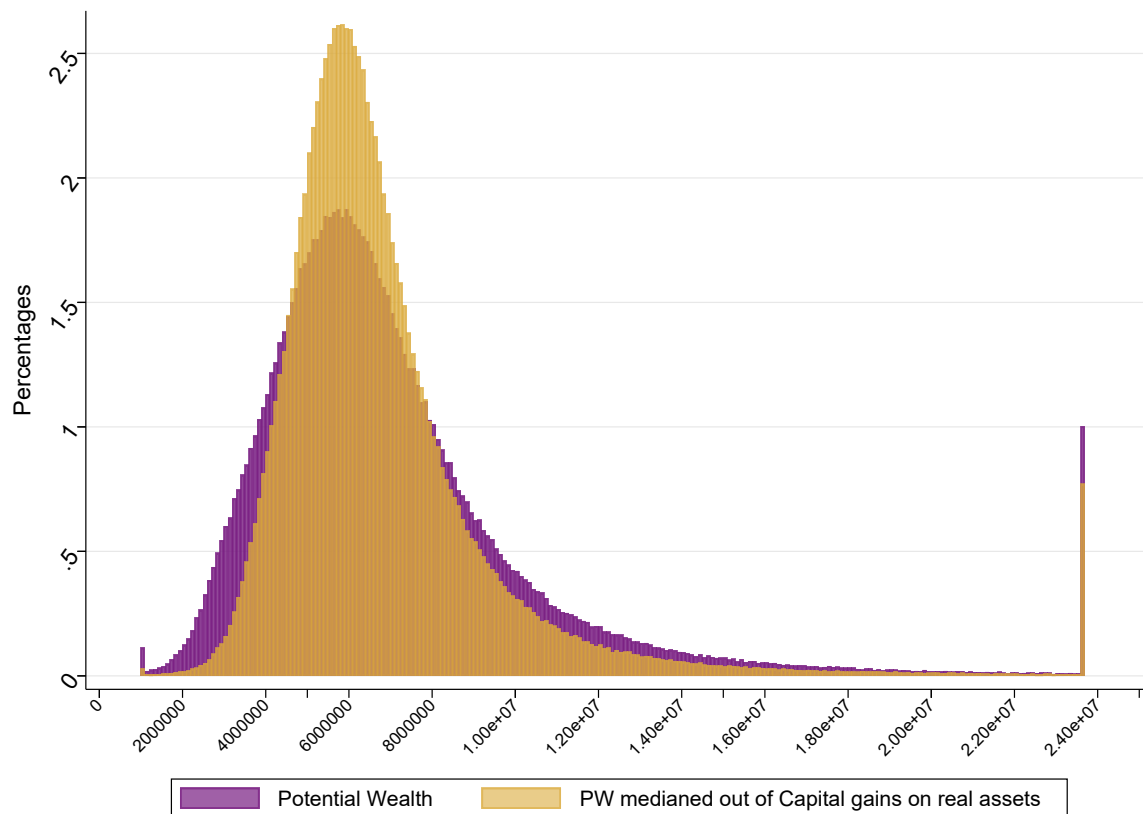
Figure 14 – Distribution of Potential Wealth and its counterfactual medianed out of capital gains on real assets

Notes: The figure refers to the same sample as Figure 1. The figure shows the distribution of Potential Wealth, and its counterfactual distribution, replacing each individuals' capital gains on real assets with the median value in the sample.
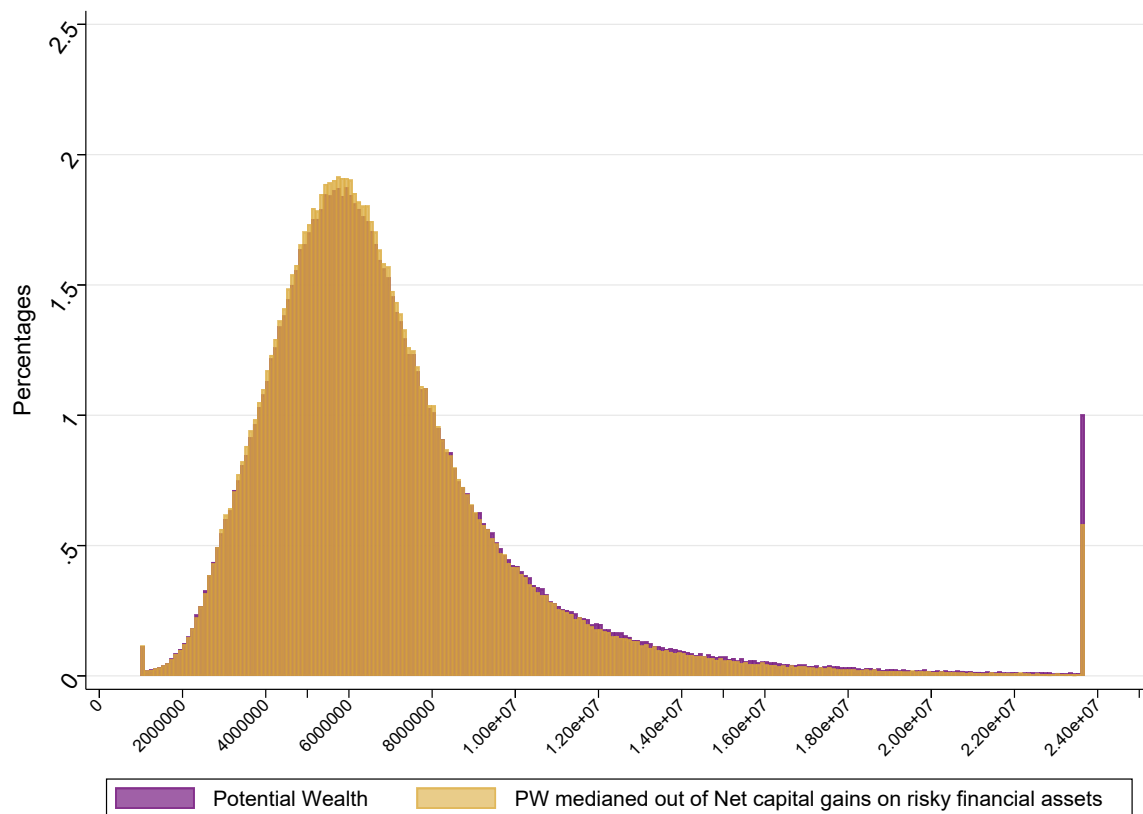
Figure 15 – Distribution of Potential Wealth and its counterfactual medianed out of capital gains on risky financial assets

<u>Notes</u>: The figure refers to the same sample as Figure 1. The figure shows the distribution of Potential Wealth, and its counterfactual distribution, replacing each individuals' net capital gains on risky financial assets with the median value in the sample.
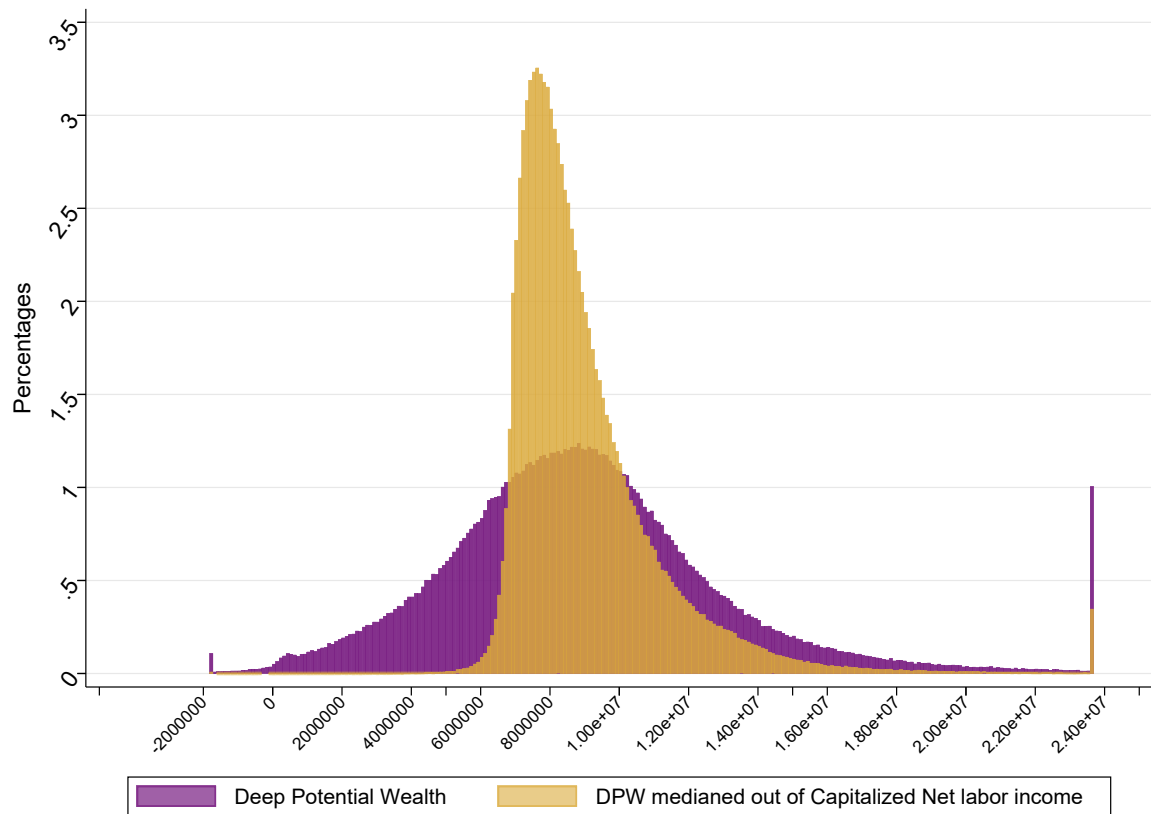
Figure 16 – Distribution of Deep Potential Wealth and its counterfactual medianed out of capitalized net labor income

Notes: The figure refers to the same sample as Figure 1. The figure shows the distribution of Deep Potential Wealth, and its counterfactual distribution, replacing each individuals' capitalized net labor income with the median value in the sample.
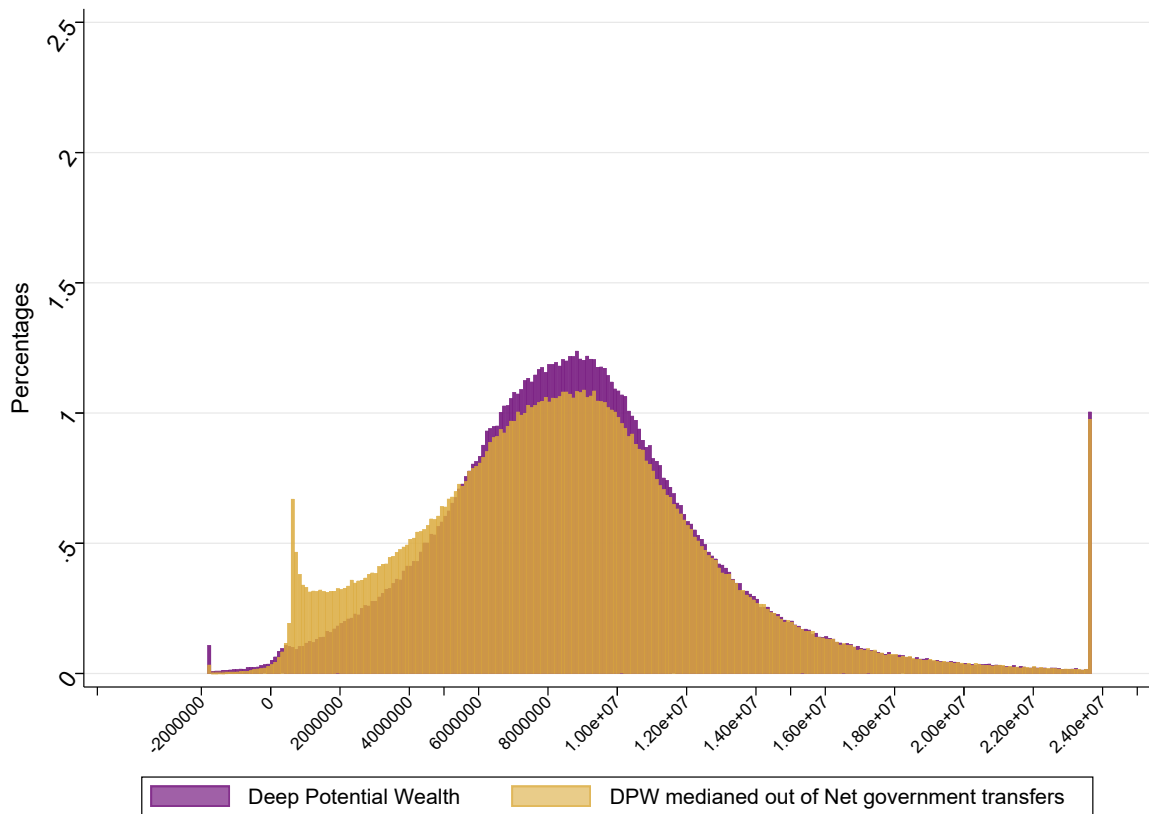
Figure 17 – Distribution of Deep Potential Wealth and its counterfactual medianed out of capitalized government transfers

Notes: The figure refers to the same sample as Figure 1. The figure shows the distribution of Deep Potential Wealth, and its counterfactual distribution, replacing each individuals' capitalized government transfers net of taxes with the median value in the sample.
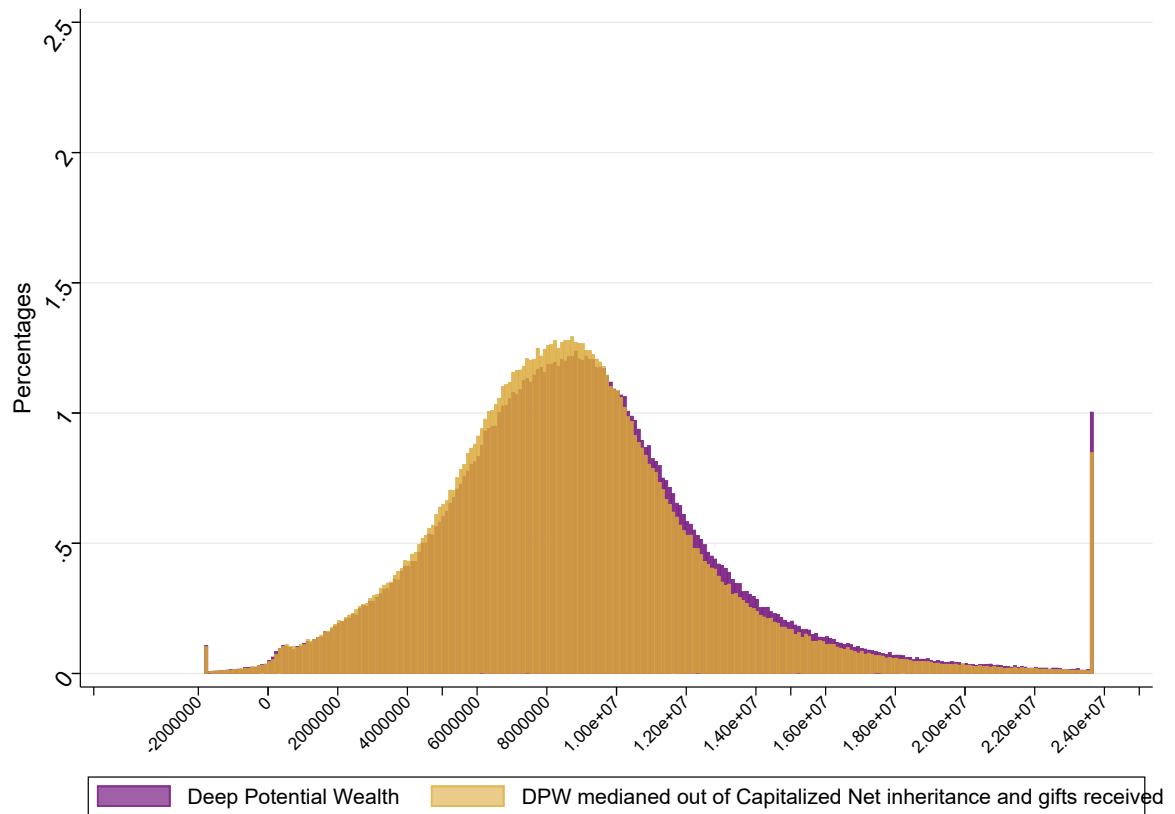
Figure 18 – Distribution of Deep Potential Wealth and its counterfactual medianed out of capitalized net inheritance and gifts

Notes: The figure refers to the same sample as Figure 1. The figure shows the distribution of Deep Potential Wealth, and its counterfactual distribution, replacing each individuals' capitalized net inheritance and gifts with the median value in the sample.
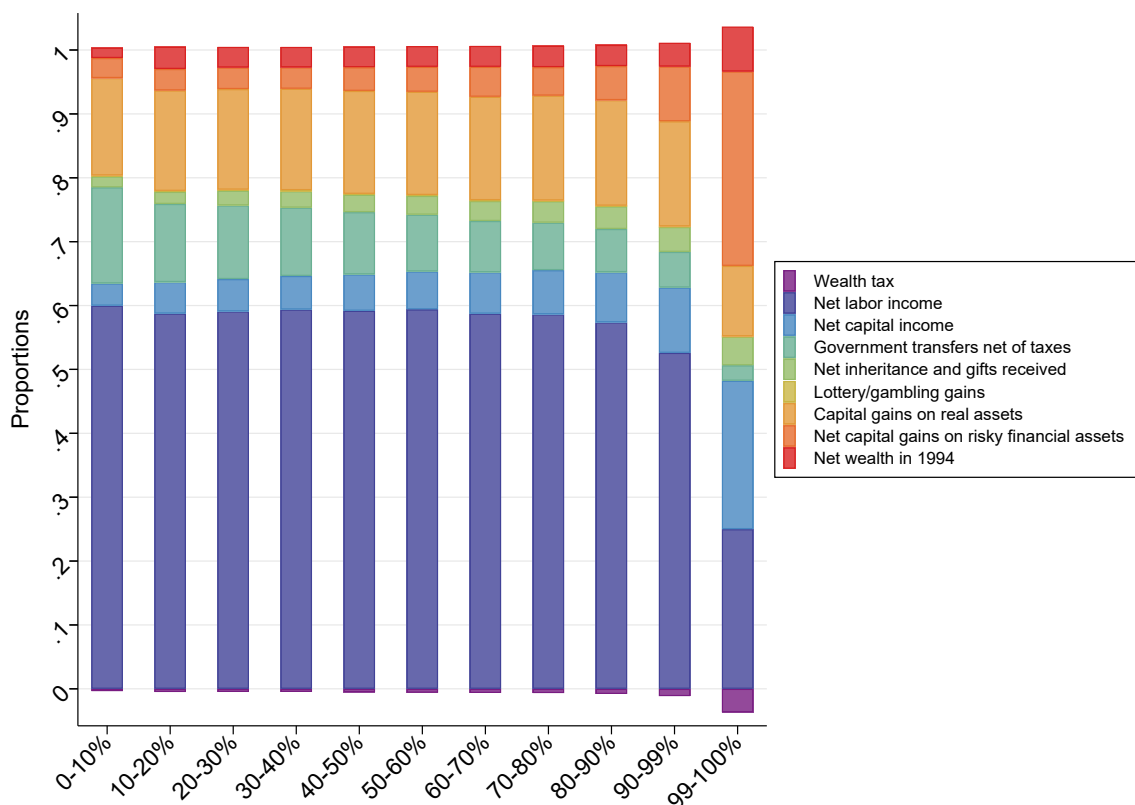
Figure 19 – Components of Potential Wealth by deciles of parental net wealth in 1994

Notes: The figure refers to the same sample as Figure 1, excluding individuals with missing information on parental net wealth, either because both parents died before 1994 or because they were not living in Norway in 1994. The figure shows the components of Potential Wealth by deciles of parental net wealth in 1994, with the top 1% as a separate category. For each component, the corresponding colored bars represent the average share of that component in Potential Wealth for each decile of parental net wealth in 1994. The shares sum to 1.
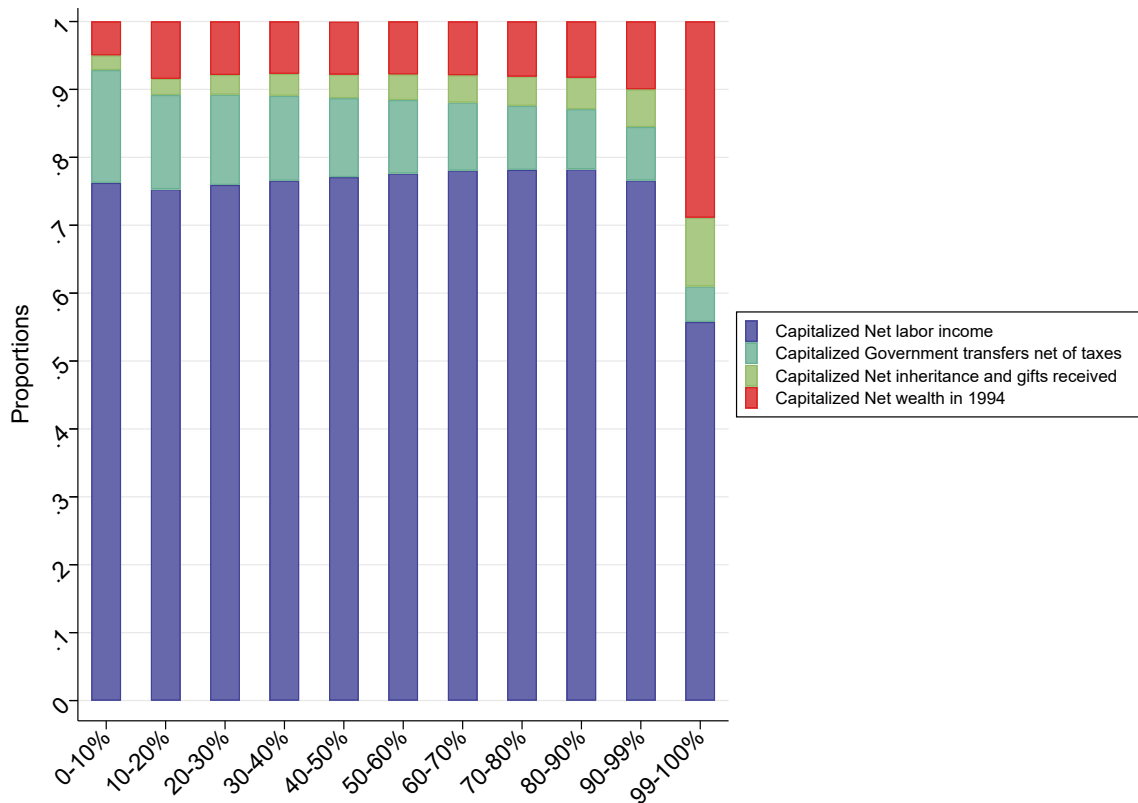
Figure 20 – Components of Deep Potential Wealth by deciles of parental net wealth in 1994

Notes: The figure refers to the same sample as Figure 1, excluding individuals with missing information on parental net wealth, either because both parents died before 1994 or because they were not living in Norway in 1994. The figure shows the components of Deep Potential Wealth by deciles of parental net wealth in 1994, with the top 1% as a separate category. For each component, the corresponding colored bars represent the average share of that component in Deep Potential Wealth for each decile of parental net wealth in 1994. The shares sum to 1.

Table 1 – Descriptive statistics

	Mean	Mean (winsorized)	Median
Potential Wealth, Deep Potential Wealth, and net wealth			
Potential Wealth	7295850	7178440	6304976
Deep Potential Wealth	9103568	9050868	8688898
Net wealth in 2013	1764439	1693094	1198181
Components of PW			
Net wealth in 1994	253948	241546	99784
Net labor income	4117740	4108933	4110899
Net capital income	506795	463513	216994
Government transfers net of taxes	706521	705858	404335
Net inheritances and gifts received	201907	197466	34894
Lottery/gambling gains	9748	7686	0
Capital gains on real assets	1173207	1167472	959288
Net capital gains on risky financial assets	379611	309242	30141
Wealth tax	53627	44934	1578
Components of DPW			
Capitalized Net wealth in 1994	795567	752141	241433
Capitalized Net labor income	6902669	6883818	6898412
Capitalized Government transfers net of taxes	1073120	1071877	651723
Capitalized Net inheritance and gifts received	332213	324079	53588
Demographic characteristics			
Age in 1994	36		
Non Norwegian background	0.10		
Female	0.50		
Higher education degree	0.30		
Nb. of children in 2013	2.08		
Parents with a HE degree	0.13		
Parents in the top quartile of net wealth	0.25		

Notes: The table refers to the same sample as Figure 1. Each row corresponds to a specific variable. The first three rows correspond to individuals' Potential Wealth (row 1), Deep Potential Wealth (row 2), and net wealth in 2013 (row 3). Rows 4 to 12 correspond to the components of Potential Wealth, namely net wealth in 1994 (row 4), total net labor income received between 1995 and 2013 (row 5), total net capital income (row 6), total government transfers net of taxes (row 7), total net inheritances and gifts (row 8), total lottery and gambling gains (row 9), total capital gains on real assets (row 10), total net capital gains on financial assets (row 11), and total wealth tax (row 12). Rows 12 to 15 correspond to the components of Deep Potential Wealth, namely net wealth in 1994 capitalized up to 2013 (row 12), total net labor income received between 1995 and 2013 and capitalized up to 2013 (row 13), total government transfers net of taxes and capitalized up to 2013 (row 14), and total net inheritances and gifts capitalized up to 2013 (row 15). Rows 16 to 22 describe individuals' demographic characteristics, that is their age in 1994 (row 16), whether they have an immigrant background (row 17), their gender (row 18), whether they hold a higher education degree in 2013 (row 19), how many children they have in 2013 (row 20), whether one of their parents has a higher education degree (row 21), and whether their parents belong to the top quartile of parental net wealth in 1994 (row 22). For each variable, column (1) reports the average of the left hand side variable. Column 2 reports similar averages for row 1 to 15, where the top and bottom 0.1% are winsorized for Potential Wealth, Deep Potential Wealth, net wealth in 2013 and 1994, net capital income, capital gains on real assets, and net capital gains on risky financial assets; and the top 0.1% is winsorized for net labor income, governement transfers net of taxes, net inheritance and gifts, lottery/gambling gains, and the wealth tax. Column 3 reports the median of Potential Wealth, Deep Potential Wealth, net wealth in 2013, of each component of Potential Wealth, and of each component of Deep Potential Wealth.

Table 2 – Correlation between Potential Wealth, Deep Potential Wealth, and net wealth in 2013

	Potential Wealth	Deep Potential Wealth	Net wealth
Potential Wealth	1.000	0.766	0.784
Deep Potential Wealth		1.000	0.560
Net wealth in 2013			1.000

Notes: The table refers to the same sample as Figure 1. The table shows the correlations between Potential Wealth, Deep Potential Wealth, and net wealth in 2013. The top and bottom 0.1% is winsorized for all variables.

Table 3 – Inequality indexes for the distribution of Potential Wealth, and Potential Wealth medianed out of its components

	PW	PW medianed out of LI.	PW medianed out of CI.	PW medianed out of Gvt. transfers	PW medianed out of Inhe./gifts	PW medianed out of lottery gains	PW medianed out of NGR	PW medianed out of NGF
Panel A: Gini coefficients								
	0.270	0.205	0.227	0.308	0.268	0.270	0.219	0.241
Panel B: Rank correlations between PW and PW medianed out of each component								
	1.000	0.688	0.984	0.970	0.991	0.999	0.966	0.995
Panel C: P-shares of PW and PW medianed out of each component								
0-40	0.243	0.284	0.265	0.216	0.244	0.243	0.275	0.254
40-80	0.384	0.380	0.394	0.395	0.384	0.384	0.381	0.398
80-90	0.131	0.120	0.130	0.137	0.131	0.131	0.122	0.134
90-95	0.081	0.072	0.078	0.084	0.081	0.081	0.073	0.081
95-99	0.090	0.078	0.081	0.094	0.090	0.090	0.080	0.085
99-100	0.071	0.066	0.053	0.074	0.071	0.071	0.067	0.048

Table 4 – Inequality indexes for the distribution of Deep Potential Wealth, and Deep Potential Wealth medianed out of its components

	DPW	DPW medianed out of Cap. LI.	DPW medianed out of Cap. Gvt. transfers	DPW medianed out of Cap. Inhe./gifts
Panel A: Gini coefficients				
	0.253	0.126	0.287	0.249
Panel B: Rank correlations between DPW and DPW medianed out of each component				
	1.000	0.382	0.956	0.987
Panel C: P-shares of DPW and DPW medianed out of each component				
0-40	0.238	0.325	0.213	0.240
40-80	0.421	0.394	0.431	0.421
80-90	0.138	0.119	0.143	0.137
90-95	0.081	0.067	0.084	0.080
95-99	0.081	0.064	0.085	0.080
99-100	0.042	0.031	0.043	0.041

Notes: Table 3 and 4 refers to the same sample as Figure 1. For each table, each column corresponds to one variable, namely Potential Wealth (Table 3, column 1), Deep Potential Wealth (Table 4, column 1), Potential Wealth medianed out of each component (Table 3, column 2-8), and Deep Potential Wealth medianed out of each component (Table 3, column 2-5). For each component of Potential Wealth, we define Potential Wealth medianed out of this component by taking individual Potential Wealth and replacing their own component with the median value in the sample. Similarly, for each component of Deep Potential Wealth, we define Deep Potential Wealth medianed out of this component by taking individual Deep Potential Wealth and replacing their own component with the median value in the sample. For each column in each table, Panel A reports the Gini coefficient under the different counterfactual scenarios. Panel B reports the rank correlation between Potential Wealth and each counterfactual scenario (Table 3), and the rank correlation between Deep Potential Wealth and each counterfactual scenario (Table 4). Panel C reports the percentage of wealth in each of several percentile groups under the different counterfactual scenarios.

Appendix A: The Relationships Between Net Wealth, Potential Wealth, and Deep Potential Wealth

When we examine the relationship between the means of Potential Wealth and net wealth in 2013 for each percentile of the Potential Wealth distribution (Appendix Figure A1), where both variables are winsorized at the top and bottom 0.1%, it is clear that there is a strong correlation between the two variables, again suggesting net wealth may be reasonable proxy for Potential Wealth; this is particularly true for individuals at the top of the distribution.[55]

When we examine the rank correlation, which is less sensitive to the extremes of the distribution, we get a correlation of 0.65. Figure A2 shows this graphically, plotting the average net wealth percentile ranking for each percentile of Potential Wealth. While this relationship seems close to linear, there is still a steeper slope at the very bottom and, even more notably, at the top of the distribution.[56]

To provide another perspective, we break individuals by decile of 2013 Potential Wealth and see which deciles they occupy in the 2013 net wealth distribution. Figure A3 shows this, graphing the proportion of individuals in the different deciles of net wealth for each decile of Potential Wealth. We include the bottom 9 deciles and, because of the importance of the top 1% of wealth-holders, we split the top decile into two groups – the 90th to 98th percentiles and the top 1%. Once again, this figure shows the strong correlation between the two variables, particularly at the bottom and top end of the Potential Wealth distribution – over 90% of people in the top 1% of Potential Wealth are in the top 10% of actual net wealth in 2013 and over 60% of this group are in the top 1% of 2013 net wealth. However, net wealth is less informative about Potential Wealth for those outside the top and bottom of the distribution; this is in part because fairly small changes in wealth can lead to quite large changes in wealth rank around the middle of the distribution.

When we do a similar exercise for Deep Potential Wealth, we draw similar conclusions. Appendix Figure A4 shows the relationship between the means of Deep Potential wealth and net wealth in 2013 for each percentile of the Deep Potential Wealth distribution, where both variables are winsorized at the top and bottom 0.1%. Appendix Figure A5 then shows the rank correlation between net wealth and Deep Potential Wealth, plotting the average net wealth percentile ranking for each percentile of Deep Potential Wealth. Both figures show an upward sloping relationship that is similar to that between net wealth

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[55]When we break the sample by the median of Potential Wealth in 2013, we see a correlation between Potential Wealth and net wealth of only .40 for the bottom half of the distribution, while the correlation is .77 for the top half.

[56]We also examine whether the relationship between actual and Potential Wealth varies based on individual characteristics and find little evidence for this. When we break the sample along a variety of dimensions, such as family size, age, and education, the correlation is surprisingly consistent across the range of characteristics. When we break samples by family size (number of children), we see correlations of .78 for individuals with no children, .78 for individuals with 1 child, .79 with 2 children, and .79 with three or more children. When we break by educational attainment, the coefficients are again almost identical, with those who are more educated (defined as having a higher education degree) have a correlation of .80 while less educated individuals have a correlation of .76. Interestingly, when we break by two age categories (45-54 in 2013 and 55-65 in 2013), we see, again, that the correlations are quite similar, .77 and .80, respectively.

and Potential Wealth. Appendix Figure A6 graphs the proportion of individuals in the different deciles of net wealth for each decile of Deep Potential Wealth. As we saw for Potential Wealth, net wealth and Deep Potential Wealth are most strongly correlated at the top and bottom of the Deep Potential Wealth distribution; people in the middle of the DPW distribution represent a wide range of net wealth percentiles.
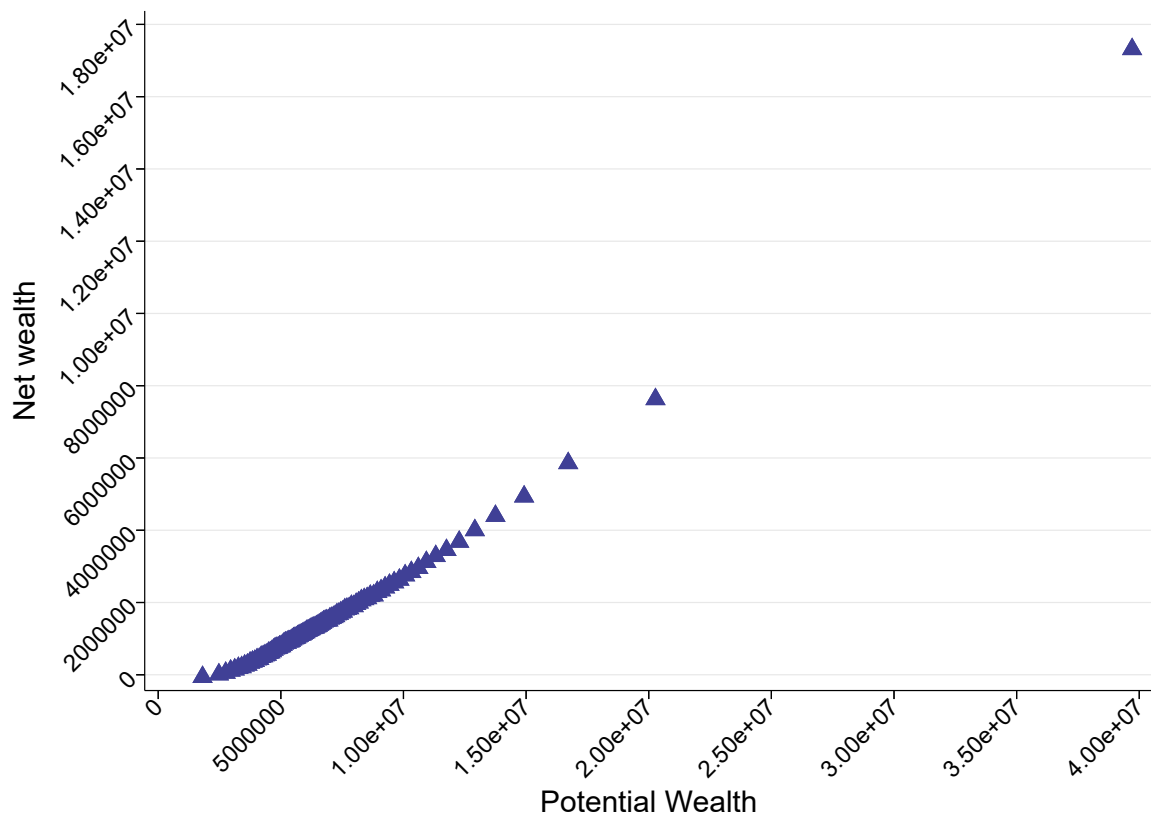
Figure A1 – Correlation between Potential Wealth and net wealth in 2013

Notes: The figure refers to the same sample as Figure 1, and plots the means of Potential Wealth and net wealth in 2013 for each percentile of the Potential Wealth distribution.
The top and bottom 0.1% of Potential Wealth and net wealth are winsorized.
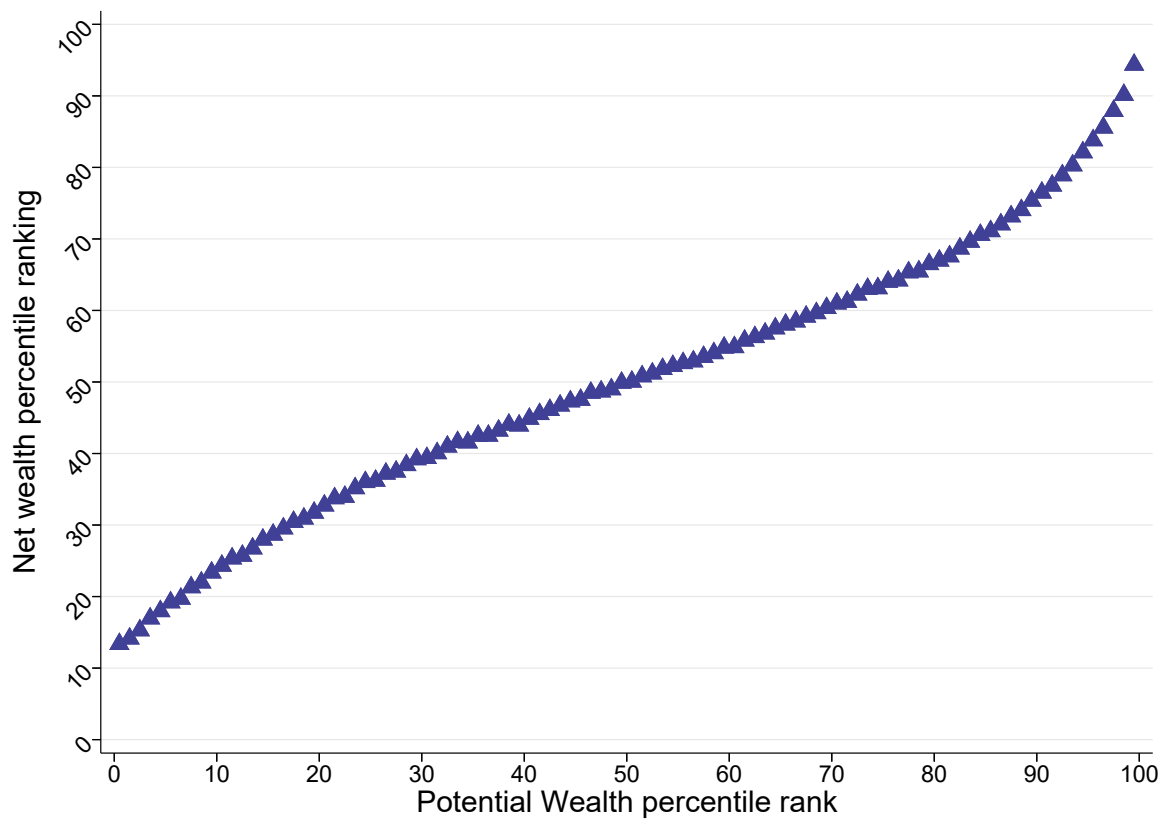
Figure A2 – Correlation between Potential Wealth rank and rank of net wealth in 2013

<u>Notes</u>: The figure refers to the same sample as Figure 1, and plots the average net wealth percentile ranking for each percentile of Potential Wealth.
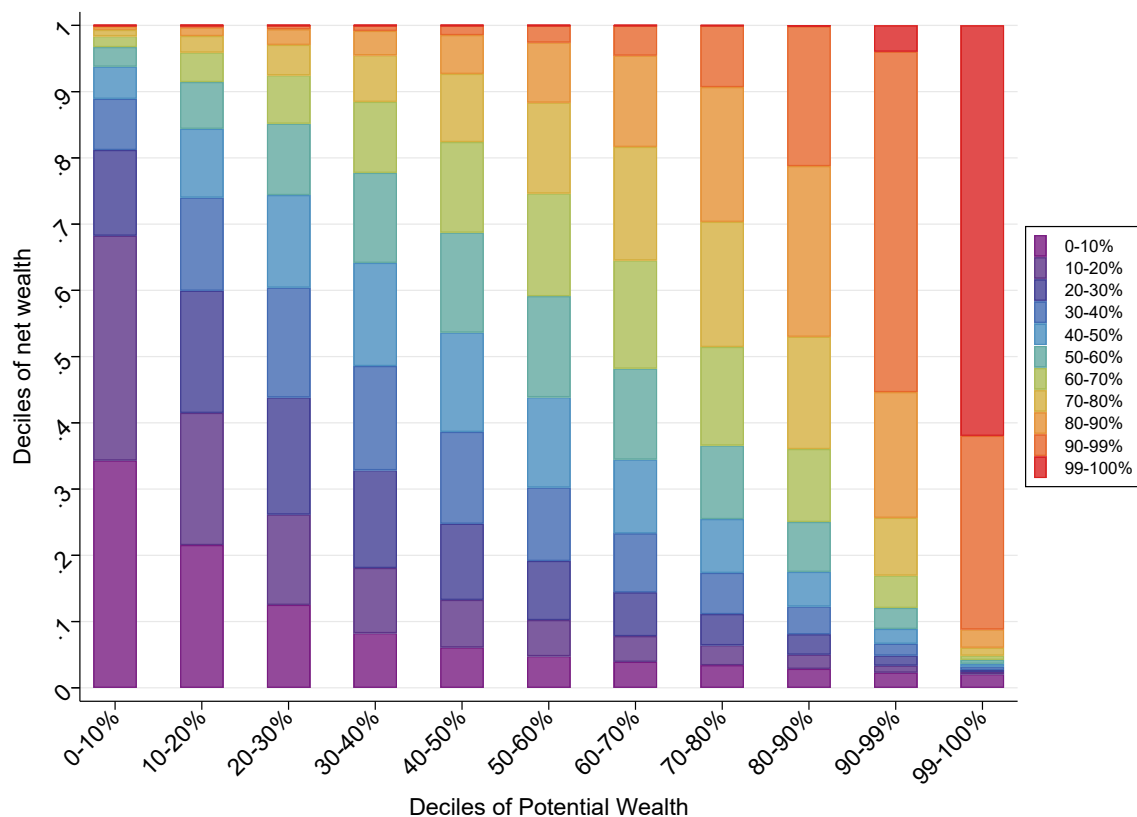
Figure A3 – Proportion of individuals belonging to the different deciles of net wealth by deciles of Potential Wealth

Notes: The figure refers to the same sample as Figure 1, and shows the proportion of individuals belonging to the different deciles of net wealth in 2013 by deciles of Potential Wealth, with the top 1% as a separate category. For each decile, the corresponding colored bars represent the average share of individuals belonging to this decile of net wealth, for each decile of Potential Wealth. The shares sum to 1.
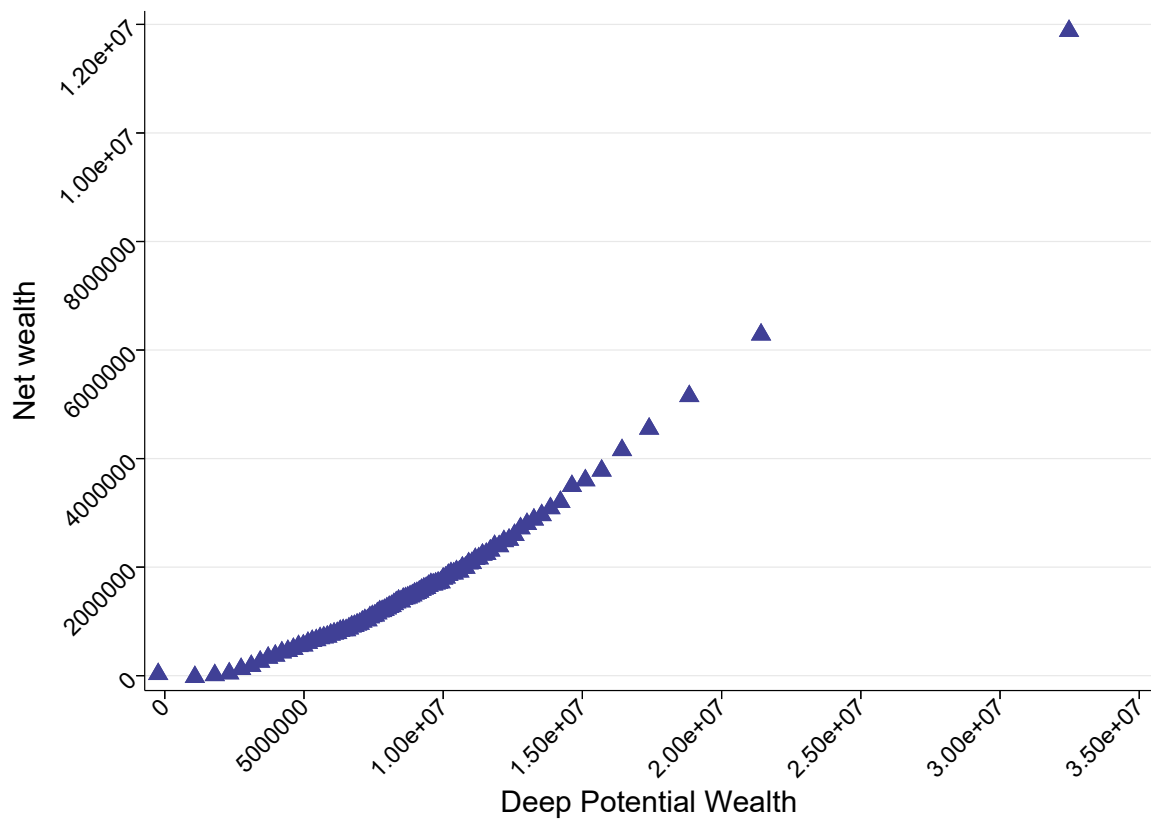
Figure A4 – Correlation between Deep Potential Wealth and net wealth in 2013

<u>Notes</u>: The figure refers to the same sample as Figure 1, and plots the means of Deep Potential Wealth and net wealth in 2013 for each percentile of the Deep Potential Wealth distribution.
The top and bottom 0.1% of Deep Potential Wealth and net wealth are winsorized.
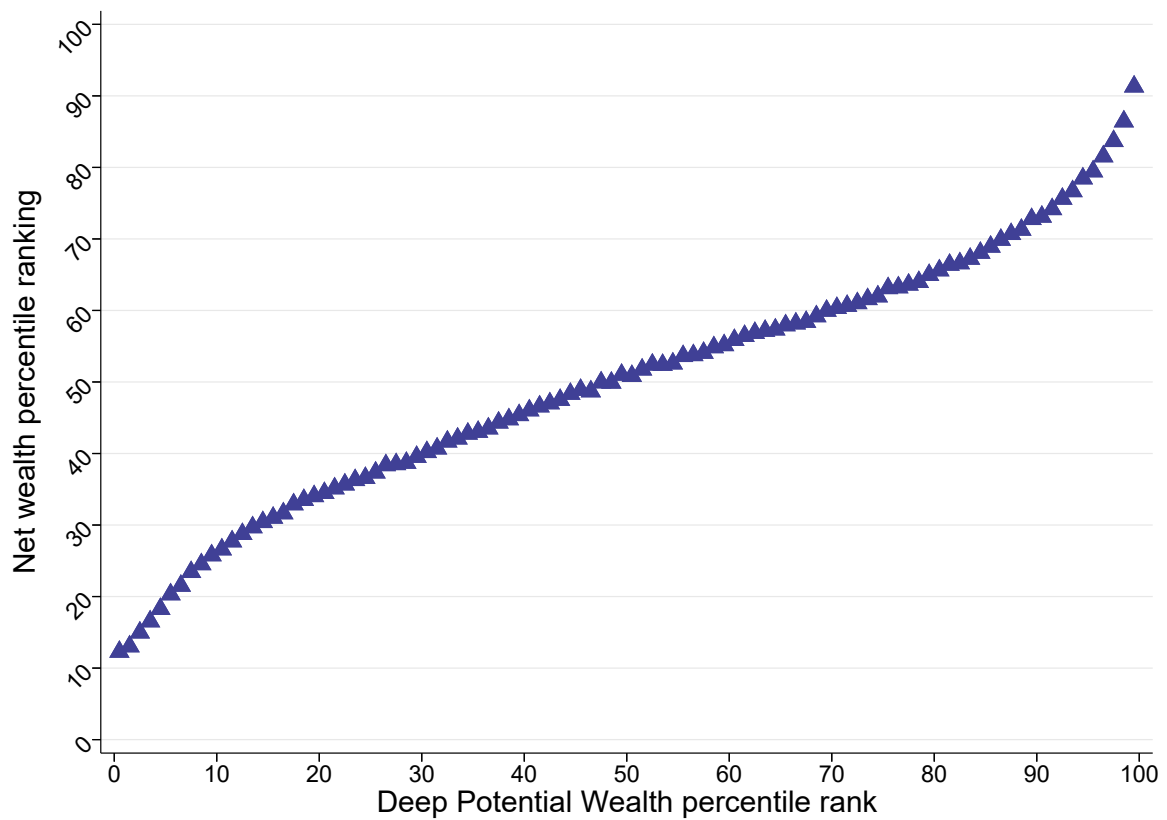
Figure A5 – Correlation between Deep Potential Wealth rank and rank of net wealth in 2013

<u>Notes</u>: The figure refers to the same sample as Figure 1, and plots the average net wealth percentile ranking for each percentile of Deep Potential Wealth.
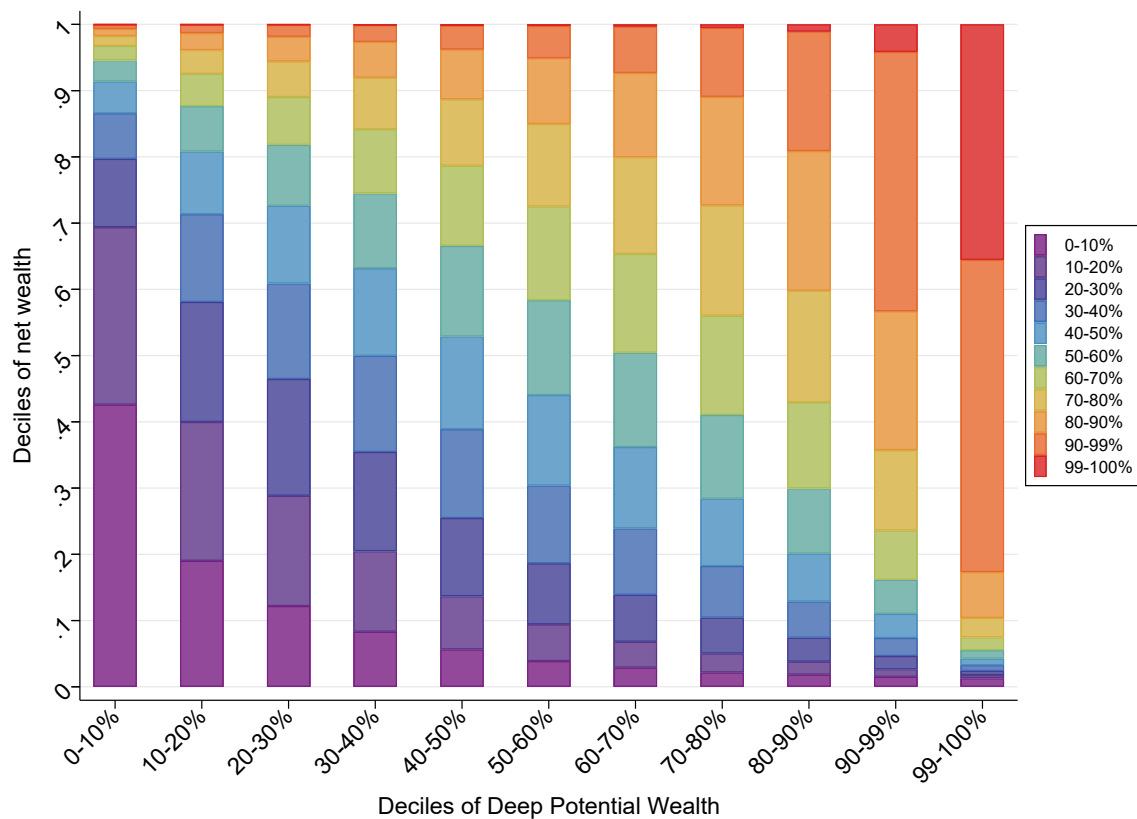
Figure A6 – Proportion of individuals belonging to the different deciles of net wealth by deciles of Deep Potential Wealth

Notes: The figure refers to the same sample as Figure 1, and shows the proportion of individuals belonging to the different deciles of net wealth in 2013 by deciles of Deep Potential Wealth, with the top 1% as a separate category. For each decile, the corresponding colored bars represent the average share of individuals belonging to this decile of net wealth, for each decile of Deep Potential Wealth. The shares sum to 1.

Appendix B: Gifts and Inheritances

To date, the literature has taken various approaches to analyzing the role of inheritances in wealth accumulation. One approach is to estimate the ratio of total inheritances received—either capitalized or not—to total net wealth at a point in time.[57] A weakness of these measures is that they can give a misleading impression of the importance of inheritances relative to other sources of wealth, which are not treated symmetrically. Because the denominator only includes the wealth that remains after consumption, inheritances will always tend to be a larger proportion of net wealth than of Potential Wealth. It may be more appropriate to consider inheritances and other sources of income as a proportion of total available resources, abstracting from consumption and spending behavior.

Piketty (2014) uses estate tax information as well as aggregate data and calculates the ratio of inheritances to the sum of labor earnings, transfers, and gifts and inheritances in lifetime resources (similar in spirit to our measure of Deep Potential Wealth) and capitalizes to age 50. He finds that, in modern-day France, inheritances and gifts account for about 15-20% of lifetime resources on average for persons born between 1950 and 1970. He also estimates that, for cohorts born in the 1970s in France, inherited wealth will be as important as labor earnings for people in the top 1% of the wealth distribution.[58]

When we conduct a similar calculation with our sample, we find that inheritances and gifts account for less than 5% of Deep Potential Wealth overall and less than 11% in the top decile of DPW.[59] There are several possible explanations for our different findings. The first is that these estimates differ across time and countries. In France, the estimates vary greatly across time and by birth cohort, and the French estimates tend to be higher than those from other countries such as the UK.[60] Our lower estimates for the role of inheritances and gifts are consistent with the lower wealth/income ratio in Norway compared to France.

A second reason why our findings may differ from the French findings of Piketty (2014) is that our data are very different, as we have access to administrative information on income sources by individual

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[57]Modigliani (1986, 1988) defined the inheritance share as the ratio of aggregate un-capitalized bequests received at any time to aggregate wealth for individuals still alive, while Kotlikoff and Summers (1981) and Kotlikoff (1988) calculate the inheritance share as the ratio of capitalized bequests to aggregate wealth. In the U.S., using aggregate data, the methods led to estimates of 20% and 80% respectively using data from the 1960s and 1970s. In contrast, Piketty et al. (2014) use data from Paris records on every decedent who left an estate for a set of years between 1872 and 1927. They calculate the ratio of capitalized inheritances to wealth at death, taking advantage of the individual-level data to avoid capitalized inheritances exceeding total wealth for any individual. They find that about 74% of net wealth comes from inheritances.

[58]In related work, several studies have used aggregate data to compare the value of aggregate inheritances in a given year to the total national income in that year (Piketty, 2011, 2014; Atkinson, 2018; Ohlsson et al., 2020). Piketty (2014, p399) reports that gifts and inheritances accounted for about 8% of French national income in 1990 and 15% in 2010. Atkinson (2018) and Ohlsson et al. (2020) find an equivalent percentage of about 8% in the UK and Sweden, respectively, in the 2000-2010 period.

[59]This partly reflects the presence of net wealth in 1994 in the denominator but, even excluding it, inheritances are still much less important than labor income, even in the top percentile.

[60]Piketty (2014) finds that annual inheritances flows account for about 20% of disposable income on average over his time-period. However, it falls to below 8% in 1980 and is about 12% in 2010 (fig 11.1, p. 380).

over many years. Third, we are considering wealth at different ages; we focus on sources of wealth accumulated by 2013 when subjects are aged between 45 and 65, with a mean age of 55—middle to late-middle age—while Piketty (2014) is focusing on wealth at death. However, as we showed earlier, inheritances are a less important source of Potential Wealth for persons aged 65+ in 2013 than they are for persons in our sample. Finally, we only consider sources of wealth in the 19 years preceding 2013 rather than income over the entire lifespan.[61] However, we estimate that a relatively small proportion of our sample receive gifts and inheritances outside this time period and, given that they also accumulate income from labor, transfers, and other sources, it is not clear that we are disproportionately missing out on inheritances for this group.[62]

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[61]Note that, in contrast to us, Piketty (2014) uses aggregate data from estate records and the national accounts rather than microdata and so implicitly includes inheritance flows at all ages.

[62]Of individuals aged between 26 and 46 in 2013, about 25% received an inheritance or gift previously so it may be reasonable to assume that a similar percentage of those aged 26-46 in 1994 had previously received a gift or inheritance. Based on a sample of persons aged 45-65 in 1994, we predict that about 34% of individuals aged between 45 and 65 in 2013 will receive an inheritance later.