Wealth Inequality in South Africa, 1993-2017

Aroop Chatterjee

Léo Czajka

Amory Gethin

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Abstract

This paper estimates the distribution of personal wealth in South Africa by combining microdata covering the universe of income tax returns, household surveys, and macroeconomic balance sheets statistics. We document unparalleled levels of wealth concentration. The top 10% own 86% of aggregate wealth and the top 0.1% close to one third. The top 0.01% of the distribution (3,500 individuals) concentrate 15% of household net worth, more than the bottom 90% as a whole. Such levels of inequality can be accounted for in all forms of assets at the top end, including housing, pension funds and financial assets. We find no sign of decreasing inequality since the end of apartheid.

1   Introduction

A growing number of studies have made significant progress in measuring the distribution of household income and consumption within countries and over time, yet still little is known on the dynamics of household wealth. This knowledge gap is particularly acute in the developing world, where available data sources are scarce, often insufficiently detailed and prone to important measurement error. Given the rise of global wealth concentration (Alvaredo et al., 2018; Zucman, 2019) and the policy challenges it poses in terms of tax evasion (Kleven et al., 2020; Londoño-Vélez & Ávila-Mahecha, 2021; Alstadsæter et al., 2019) and political equilibrium (Esteban & Ray, 2006; Bombardini & Trebbi, 2020; Bertrand et al., 2020) there is a pressing need to address this shortcoming and improve our knowledge of the wealth distribution.

This paper estimates the distribution of household wealth in South Africa from 1993 to 2017 by combining household survey data, tax microdata, and macroeconomic balance sheets statistics. A number of results emerge from our analysis.

First, we document unparalleled levels of wealth concentration. The top 10% of South African wealth holders own more than 85% of household wealth, while the top 1% wealth share reaches 55%. The top 0.01% (about 3,500 adults) own a higher share of wealth than the bottom 90% as a whole (about 32 million individuals). The average wealth of the bottom 50% is negative: the market value of their assets is lower than their liabilities. Such levels of wealth inequality are higher than in any other country for which comparable, high-quality estimates of the wealth distribution are available (namely France, the United Kingdom, the United States, Russia, China, and India).

Secondly, we show that wealth inequality has not decreased since the end of the apartheid regime. The top 10% wealth share has fluctuated between 80% and 90% between 1993 and 2017, largely as the result of the rise and fall of household debt before and after the 2007-2008 crisis, with no sign of long-run trend. If anything, the available evidence suggests that the share of wealth captured by the top 1% and the top 0.01% may even have increased. This result is particularly striking considering South Africa's recent history of positive growth (real average income and wealth per adult respectively increased by 19% and 33% from 1993 to 2017) and greater racial inclusiveness (all discriminatory laws against oppressed racial groups had been abolished by 1991).

Thirdly, we find that these inequalities are reproduced at the level of all asset classes. The top 10% of wealth holders own more than 55% of business assets and housing wealth, and over 99% of bonds and stock. Financial assets constitute the bulk of the assets of the top 0.1%, while owner-occupied housing and pension wealth are the main holdings of the bottom 90%. We find significant wealth accumulation over the life cycle, but levels of wealth concentration within each age group are almost perfectly similar to those measured for the full population. This suggests that individuals across the wealth distribution do accumulate at relatively similar paces but start from very different initial endowments, hence pointing to the importance of inheritance.

Previous studies on post-apartheid economic inequality have focused on income, but the literature on wealth remains extremely scarce. Two studies have attempted to measure the distribution of wealth in South Africa (Daniels & Augustine, 2016; Mbewe & Woolard, 2016), yet they suffer from two major limitations.[1] First, they cover only one (2015) or two years (2010, 2015) of data and therefore cannot assess any long-run trends in wealth inequality since the end of apartheid. Secondly, they rely exclusively on the National Income Dynamics Study, a wealth survey that greatly underestimates wealth concentration within the top 10% (we discuss this issue and its implications in more detail in section 5). This is in large part due to substantial under-reporting of financial assets by survey respondents, a limitation that has now been extensively documented in the inequality measurement literature (Alvaredo et al., 2016; Blanchet et al., 2017, 2018; Korinek et al., 2006), as well as by the authors of the previous studies themselves (Daniels & Augustine, 2016).

By contrast, following income capitalisation approaches recently applied in the United States (Saez & Zucman, 2016) and France (Garbinti et al., 2018), our methodology combines survey and tax microdata with macrodata on household wealth totals. Unlike previous studies, it ensures that average wealth and the portfolio composition of assets across the distribution are fully consistent with the household balance sheets statistics published by the South African Reserve Bank. It allows us to obtain a much more reliable picture of wealth inequality within the top 10% and especially within the top 1%, which is key to understanding wealth dynamics in countries such as South Africa where wealth concentration is extreme. Importantly, it allows us to cover the entire 1993-2017 period, as well as to compare wealth inequality in South Africa to other countries where similar exercises have been performed.

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[1] See Chatterjee (2019) for a broader review. Orthofer (2016) is sometimes cited as an additional study, exploiting tax micro-data. However, given the method applied, the resulting estimates correspond to the distribution of financial incomes, not to the distribution of household wealth.

Finally, this paper also contributes to the methodological literature on the measurement of wealth inequality in developing countries. By comparing estimates of the wealth distribution obtained with three different methodologies—direct measurement of net worth, rescaling of reported wealth components to balance sheets totals, and capitalisation of income flows—we show that capitalising reported income flows to match macroeconomic wealth totals can yield relatively good results, even in the absence of income tax microdata. Crucially, these estimates appear to be much more reliable than those solely relying on survey-based self-reported wealth, which omit the bulk of financial wealth. In other words, bridging the micro-macro gap in wealth measurement appears to be an essential step to accurately measure the wealth distribution. This opens new avenues for estimating the dynamics of wealth inequality in low- and middle-income countries, where wealth microdata are unavailable or unreliable, yet where macroeconomic balance sheet statistics can be usefully combined with surveys collecting data on household income. In that respect, we hope that this paper can serve as a useful guide for future studies aiming to measure wealth inequality in countries with limited data such as South Africa.

The rest of the paper is organized as follows. Section 2 defines the key concepts and presents the different data sources we use. Section 3 explains the methods we apply to combine these data sources. Section 4 presents our main results and compares our estimates with that of other countries. Section 5 contrasts our results with those obtained from alternative methodologies.

2   Concepts and Data Sources

Following the United Nations System of National Accounts (UN SNA) guidelines (United Nations, 2009), we define household wealth as the total market value of the assets and liabilities held by the household sector. Using this concept is central to produce comparable estimates over time and across countries. Assets can be classified into eight broad categories: owner-occupied housing, tenant-occupied housing, unincorporated business assets, pensions, life insurance, bonds, equity, and currency (deposits, notes and coins). Liabilities can be divided into mortgage debt and all other debts (including consumer credits, credit cards, and informal loans).[2] As with most countries in the world, there exists no unified administrative database in South Africa measuring wealth at the micro level for the full population.[3] In

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[2] This classification is the most precise common decomposition we could achieve after harmonisation of all the data sources. Notice that land directly owned by the household sector is classified in housing (owner- or tenant-occupied), not in business assets. Liabilities include all debts contracted with both formal (e.g. commercial banks) and informal creditors.

[3] The few countries still collecting direct information on wealth include Switzerland, Spain, France, Norway, and Colombia. These countries are the only ones still enforcing a tax on net wealth. For other countries in the world, most of what we know

the absence of such information, we measure the distribution of household wealth in South Africa by combining several complementary data sources.

Macroeconomic data   In South Africa, the first comprehensive attempt to estimate the value of total household wealth in the economy goes back to Muellbauer and Aron (1999), who collect and combine a number of data sources to provide figures on the assets and liabilities of the household sector since 1975. The South African Reserve Bank (SARB) has since then updated and revised these figures on a yearly basis. The only alternative data source that would allow to approximate total household wealth are waves 4 (2015) and 5 (2017) of the National Income Dynamics Study.[4] As it covers only two years, this survey offers little scope to study the evolution of wealth inequality in the long run. Moreover, it suffers from several limitations (internal inconsistencies, measurement errors, implausibly low aggregates), which we document in section 5 (see also appendix section 2). For these reasons, we prefer not to rely on this source. Throughout our series, all wealth totals thus come from macroeconomic balance sheets published by the SARB. We then combine diverse microdata sources to estimate how these aggregates are distributed.

Personal Income Tax data   We exploit Personal Income Tax (PIT) data compiled by the South African Revenue Service (SARS) to measure the distribution of wages, pension income, pension contributions, mixed income, and capital income (rents, interest, and dividends) for the top 30% of the population. This individual panel covers two types of tax statements over the 2010-2017 period: IRP5 forms, which are submitted to SARS by employers on behalf of their employees and cover wages and pension contributions, and ITR12 forms, which are self-assessed by all taxpayers who need to disclose information on mixed, rental, interest, and dividend incomes.[5] Due to its administrative nature, this data covers the full tax paying population, including individual observations at the very top of the distribution, which greatly increases the granularity of measured income flows. This is an advantage over surveys, which often suffer from sample biases and higher non-response rates among the wealthiest.

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about wealth either comes from wealth surveys, estate duty data, or, as in this study, via the income capitalisation method applied on income surveys or personal income tax data.

[4] Other surveys collecting information on income and consumption sometimes include some information on some wealth components (mostly house value or debt), but never encompass total wealth.

[5] The IRP5 and ITR12 data are presented in the form of source codes corresponding to specific taxable income concepts, exemptions and deductions. See the data appendix for more details about our classification and Ebrahim and Axelson (2019) for an overview and discussion of the dataset.

Household surveys Finally, we combine a number of household surveys to cover individuals and income or wealth concepts not captured by the tax data. We use surveys for three main purposes: to measure the distribution of key income variables for the bottom 70% of the population; to estimate the distribution of debts and assets that do not generate income flows and hence cannot be capitalised (owner-occupied housing, currency); and to extrapolate our 2010-2017 series back to 1993. These include two main types of surveys: seven "income surveys"[6] covering all forms of incomes received by individuals (as well as certain wealth components such as housing and debts), and fifty-four "labour force surveys"[7] conducted on a more regular basis since 2000 and mainly covering wages and mixed income.

3 Methodology

We now present our methodology to estimate the distribution of household wealth in South Africa since 1993. First, we build a harmonized survey microfile by merging existing household surveys. We then combine surveys with tax data to better capture the top end of the distribution. Finally, we derive measures of net worth by capitalising relevant income flows and rescaling other assets and liabilities to macro totals.

Harmonization of household surveys We begin by combining household surveys to estimate the distribution of available income and wealth components, on a yearly basis, throughout the 1993-2017 period. Starting from available income surveys (1993, 1995, 2000, 2005, 2008, 2010, 2015), we first interpolate missing years from 1993 to 2017 by creating new datasets resulting from the combination and proportional reweighting of the two adjacent surveys. We then correct yearly distributions of gross wages and mixed incomes to make them match those reported in the Labour Force Survey series since 2000. In broad strokes, this process allows us to obtain a harmonized survey microfile covering every year from 1993 to 2017, in which the distribution of available income and wealth components are fully consistent with information reported in both income surveys (for all income concepts excluding wages and mixed income) and labour force surveys (for wages and mixed income). We provide more details on these methodological steps in appendix section 2.

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[6] The Project for Statistics on Living Standards and Development (PSLSD - 1993), the Income and Expenditure Surveys (IES - 1995, 2000, 2005, 2010) and the Living Conditions Surveys (LCS - 2008, 2015).

[7] The Labour Force Surveys (LFS - twice a year from 2000 to 2007) and the forty Quarterly Labour Force Surveys (QLFS - every three months since 2008).

Combination of household surveys with tax data   We correct the top of the survey distributions with the PIT data in two steps. First, we derive an income concept that is comparable between the survey and tax data, which we refer to as "merging income"[8], and we merge the two data sources based on the exact rank of merging income observed at the individual level. We then identify the quantile of the South African income distribution q above which reported merging incomes become higher in the tax data than in the survey data, and we assume that the tax data is more reliable than the survey data only above q. In practice, this implies keeping all variables from the survey data below q, and replacing all comparable variables from the tax data above q (wages, mixed income, rental income, interest, dividends, private pension income, and contributions to pension funds). Between 2010 and 2017, we find q to be consistently located between the 70th and the 75th percentiles, so that we use the tax microdata to cover the top 25-30% of the income distribution.[9]

Income capitalisation and rescaling   The income capitalisation method consists in using capital income flows (e.g. dividends) to approximate the distribution of households' assets and liabilities (e.g. shares). In our case, given that the SARB balance sheet is the best available data source to capture the level and composition of total household wealth in South Africa, this implies distributing each aggregate in proportion to its income flow measured at the micro level. The core assumption is that of constant rates of return by asset class. We capitalise six types of assets: tenant-occupied housing from the rental income received by individual landowners; unincorporated business assets from the mixed income received by self-employed individuals; pension assets from the pension contributions and pension income of formal wage earners and pensioners; life insurance assets from factor income; bonds and interest deposits from interest income; and corporate shares and equity from dividends.[10]

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[8] Defined as the sum of wages, mixed income, rental income, interest income, and pension income.

[9] See appendix Figures A8 and A9. Our choice of a merging point based on an income concept differs slightly from the approach of Hundenborn, Woolard, and Jellema (2018), who rather derive a taxable income concept from survey data, and then keep the tax data above the filing threshold of taxable income. The main reason for merging our two datasets based on a broad income concept is twofold. First, our IRP5-ITR12 panel covers a large number of individuals who are below the filing threshold, given that all employers in South Africa are now required to file an IRP5 tax form for all their employees, regardless of their level of remuneration. However, as is emphasised in the SARS' Tax Statistics, this rule was not followed strictly by all employers, so that the tax data cannot be considered to be representative of the universe of formal wage earners. In other words, our data covers relatively well the top of the distribution up to a certain point, below which it contains a mix of low- and middle-income wage earners. It seems therefore most useful to keep as many individuals as possible from the tax data, while removing those whose location in the distribution of income cannot be identified precisely, which is what our method does in a simple way. Secondly, defining taxable income remains a complex task, and it remains unclear whether this can be done with a sufficient level of precision and consistency, in particular given that surveys tend to not properly capture the top of the distribution.

[10]In the case of pension assets, we follow the approach proposed by Saez and Zucman (2016) and allocate them to wage earners and pensioners so as to match their distribution recorded in the NIDS. In our case, this implies distributing 75% of pension assets to formal wage earners proportionally to pension contributions paid, and 25% to pensioners proportionally to pension income received. As we show in the appendix (figure A6), this capitalisation technique applied to the NIDS data yields results

The capitalisation method cannot be applied to liabilities nor to owner-occupied housing and currency, as these components of wealth do not generate any income flow. We therefore measure these components directly from available household surveys and rescale them proportionally to match SARB totals. To mitigate measurement issues and the risk of creating outliers with excessively negative net worth,[11] however, we do not directly rescale debts: we assume instead that mortgage debt is distributed proportionally to the value of the house of mortgagors, and that other forms of debts are distributed proportionally to the consumption of those declaring having contracted debts. These are conservative assumptions, as mortgages and other forms of debt are likely to be more unequally distributed than house values and consumption respectively. We refer to this combination of rescaling and income capitalisation as a "mixed approach" (see table 1).

Finally, to extrapolate our series backwards to 1993, we first apply our methodology to the years 2010-2017, with and without PIT data. We then compare the wealth distribution resulting from these alternative specifications to extract average correction coefficients at the quantile level, and use these coefficients to adjust the wealth distributions estimated from survey data over the 1993-2010 period (see appendix section 2.4).

[Table 1 about here.]

4   The distribution of wealth in South Africa: key results and comparative perspectives

This section presents our main results on wealth inequality in South Africa. We first provide an overview of aggregate household wealth and how it is distributed across broad wealth groups. We then present figures on the concentration of specific assets and on the dynamics of wealth accumulation over the life cycle. Finally, we discuss how wealth inequality in South Africa has evolved since 1993, and how it compares to other countries.

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which are very similar to those obtained from direct measurement. Similarly, we assume that 50% of life insurance assets belong to wage earners proportionally to factor income—the sum of wages, mixed income and pension income—and that 50% belong to all other adults proportionally to factor income. This again reproduces well the distribution of life insurance assets reported in the NIDS (see appendix Figure A7).

[11]Mortgage debt and other forms of debts have been recorded in surveys but the coverage is often partial and inconsistent. As a result, rescaling debts to balance sheets totals results in seriously overestimating the number of individuals with negative net worth and generating implausibly high debt values.

The level and composition of aggregate wealth in South Africa, 1993-2018

Before presenting figures on the distribution of wealth, it is useful to provide basic facts on the level and composition of household net worth in South Africa and its evolution since 1993 (see Figure 1). Before the early 2000s, real average wealth per adult stagnated at around 240,000 Rand. It then rapidly increased by about 30%, before stabilizing at some 320,000 Rand after the 2008 financial crisis. The net wealth to national income ratio has remained relatively stable since 1993, ranging from 2.5 (before 2003) to 2.8 (after 2008).

[Figure 1 about here.]

In 2018, financial and non-financial assets respectively amounted to two years and one year of national income. Pension assets represented the biggest component of financial assets (73% of national income), closely followed by equities and fund shares (51%), bonds and interest deposits (45%), and life insurance assets (35%). Meanwhile, the bulk of non-financial assets consisted of owner-occupied housing (75% of national income), followed by tenant-occupied housing (24%) and business assets (12%). The total liabilities of the household sector amounted to about 54% of national income, divided into mortgage debt (25%) and non-mortgage debt (28%). Household debt rose significantly between 2000 and 2008, in large part due to a boom in mortgage advances (see appendix Figure A5).

Finally, based on the estimation made by Alstadsæter, Johannesen, and Zucman (2018), we assume that 11.8% of South African GDP was held offshore in 2007, and, in the absence of data on the evolution of wealth held in offshore tax havens, that this share has remained constant throughout the period. This is a conservative assumption, given that global offshore wealth is known to have steadily risen in the past decades. Given the relative stability of wealth-income ratios, this implies that offshore wealth represented about 5% of net wealth throughout the period of interest (see appendix section 1).

The distribution of wealth in South Africa in 2017

Table 2 provides information on the number of adults (above 20 years old), the entry thresholds, the average wealth and the share of wealth of various groups of the wealth distribution in 2017.

[Table 2 about here.]

Average wealth varies hugely across the distribution. The bottom 50% of the South African population have negative net worth: the levels of the debts that they owe exceeds the market value of the assets

they own. The middle 40% of the distribution—individuals located between the median and the 90th percentile—have a net worth more than twice lower than the national average. Together, the bottom 90% of the South African adult population own about 14% of total personal wealth in the economy, while the remaining 86% belong to the top decile. The average wealth of the bottom 90% of the population is about four times lower than the national average, compared to nine times higher among the top 10%.

Ownership is not only polarised between top and bottom wealth groups, it is also extremely concentrated within the top 10%. The top 1% of the South African adult population (350,000 individuals) own 55% of aggregate personal wealth, and the top 0.1 % alone (35,000 individuals) own almost a third of wealth. The top 0.01% of the distribution, amounting to some 3,500 individuals, own about 15% of household wealth, greater than the share of wealth owned by the bottom 90% as a whole (32 million individuals). Their average wealth is more than 1,500 times greater than the national average, and 6,000 times greater than the average of the bottom 90%.

The composition of personal wealth across the distribution

The extreme degree of wealth inequality that we observe is in large part driven by the relative exclusion of poorer wealth groups from any form of wealth accumulation, and by the concentration of all forms of assets at the top end. Table 3 provides some insights into this polarisation by showing the share of different types of assets held by wealth groups across the distribution. The top 10% own more than 55% of all forms of assets, including pension assets, housing wealth, unincorporated business assets and currency, notes and coins. They own virtually all (99.8%) bonds and stock in the economy. The top 1% alone holds more than a tenth of all forms of assets and a bit more than 95% of all bonds and stocks. Currency and housing wealth are the least concentrated forms of wealth, yet low wealth groups only possess a small share of them: the bottom 50% of the wealth distribution own about 10% of currency, notes and coins, and less than 15% of housing assets.

[Table 3 about here.]

Figure 2 provides another view of the link between asset types and wealth groups by representing the portfolio composition of percentiles of the wealth distribution in 2017. Currency, notes and coins are the main form of assets held by poorest South African adults, while owner-occupied housing, pensions and life insurance form the majority of assets for most of the distribution within the bottom 90%. Un-incorporated business assets represent a small share of portfolios for the upper-middle class. Bonds and

stocks, finally, represent a large share of wealth for the top 1% and the bulk of assets held within the top 0.1%.

[Figure 2 about here.]

Wealth and age

Based on available information on age from the PIT data, we can document to what extent wealth accumulation through the life cycle contributes to reducing or exacerbating inequalities.[12] Figure 3 shows a stable relationship between age and average wealth over the 2012-2017 period. Average net worth rises significantly and linearly between ages 20 and 55: individuals aged between 20 and 25 have an average net worth lower than 25% of the national average, while those aged between 50 and 55 are between 50% and two times wealthier than the average adult. Average wealth then stabilises between ages 50 and 65 and decreases slightly for older individuals, but still remains more than 50% higher than the national average for individuals older than 75. Interestingly, this pattern is almost perfectly similar to that found in the case of France (see Garbinti, Goupille-Lebret, & Piketty, 2017, figure 5).

[Figure 3 about here.]

Although average wealth does vary significantly across age groups, age differences cannot account for observed wealth disparities. Indeed, levels of wealth concentration within each age group are almost perfectly similar to those measured among the full population. The share of wealth held by the top 10% exceeds 85%, and the top 1% share is higher than 55%, whether one restricts the analysis to those aged between 20 and 39, between 40 and 59, or older than 60 (figure 4). Altogether, this implies that individuals across the wealth distribution do accumulate at relatively similar paces but start from very different initial endowments. This suggests that inherited wealth could play a central role in explaining levels of wealth concentration observed in South Africa.[13]

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[12]There are many other important categories to investigate in the context of wealth inequality in South Africa. Unfortunately, the only relevant covariate present in PIT data is age. We leave the study of other dimensions of wealth inequality (race, gender, geography, etc.) for future research.

[13]Notice that the estimates presented here correspond to individual series, rather than to "equal-split" series where wealth would be split equally among household adult members. In practice, splitting wealth among household members would imply redistributing wealth to younger individuals, thereby making the wealth-age profile less steep. This would reinforce our argument that age is not a primary determinant of wealth inequality in South Africa.

Long-run trends and comparative perspectives

We conclude this section by highlighting the most notable facts arising from the comparison of our results over time and across countries. Figure 5 plots the evolution of the share of wealth accruing to the top 10% in South Africa (our estimates), together with that from all other countries where a similar method could be applied: China, Russia, India, the United Kingdom, France and the United States. In the long run, and despite a 30% growth in real average wealth per adult, wealth concentration has remained remarkably stable in South Africa, increasing between 2005 and 2010 before gradually stabilizing back to its pre-2000 level. Notwithstanding these short-term fluctuations and the fact that wealth concentration has increased in all other countries, South Africa has remained significantly more unequal than all these countries throughout the entire period. The South African top 10% wealth share has fluctuated between 80% and 90% during the 1993-2017 period, while it has remained below 75% in the US, 70% in Russia and China, 65% in India and 55% in France or the United Kingdom. The same result holds for the top end of the distribution: the top 1% wealth share was 55% in South Africa in 2017, compared to 43% in Russia, 39% in the United States, 31% in India, 30% in China and less than 25% in France and the UK (figure 6).

Having a closer look at our series, we can bring out two additional observations. First, the rapid increase in wealth concentration between 2005 and 2008 was in large part due to a strong fall in the bottom 90% share driven by the boom and bust in mortgage advances in the 2000s, which temporarily drove a higher share of households into negative net worth. Between 2004 and 2008, in particular, mortgage debt increased from 9% of net household wealth to almost 15%, before decreasing back to 9% in 2018 (see appendix Figure A5). This temporary fall in bottom wealth shares driven by expanding debts mirrors that observed in the US at about the same period (see appendix Figure A4).

Secondly, it is worth noticing that while the top 10% share has remained broadly stable, there seems to have been an increase in wealth concentration within the top 10%. Between 1993 and 2017, the top 1% share grew from 54% to 57% and the top 0.1% share from 22% to 31% (see appendix Figure A3). This is likely due to the combination of two factors: the rise in the share of non-pension financial assets, from 19% to 24% of net household wealth between 1992 and 2018, and the increase in wage inequality in South Africa during this period, which indirectly affected the distribution of pension assets.

Overall, it is particularly striking that wealth inequality has remained at extreme and stable levels in South Africa in spite of the many progressive policies that have been pursued since the early 1990s. All

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discriminatory laws were abolished by 1991 and a new constitution was adopted in 1994. Since then, South Africa's successive governments endorsed several ambitious socio-economic policy frameworks whose primary objectives consistently included reducing economic inequality inherited from colonial and apartheid regimes.[14] Yet, wealth inequality has remained remarkably stable over the past three decades. In line with our observations on the role of inheritance in explaining constant wealth disparities within age groups, our long-term series suggest that asset allocations before 1993 may still contribute to shape wealth inequality in recent years, despite the many reforms to address these lasting disparities.

[Figure 4 about here.]

5   Robustness checks

In this section, we contrast our results with those obtained using alternative methodologies. We then discuss how sensitive our estimates are to different assumptions regarding the distribution of debts, the measurement of housing wealth, and equivalence scales.

Comparing methodologies: direct measurement, rescaling, and survey-based mixed approaches

In our baseline "mixed approach" to estimate wealth inequality in South Africa, we have combined surveys and exhaustive tax microdata to capitalise income flows and match wealth aggregates to macroeconomic balance sheets. To shed light on the contributions of these various data sources and methodological steps, it is useful to compare our benchmark series with three alternative specifications: one in which we estimate wealth inequality from self-reported assets and liabilities in household surveys ("direct measurement"), one in which we rescale these reported assets and liabilities to macro totals ("rescaling"), and one in which we apply our mixed approach directly to surveys, without combining them with tax data.

Direct measurement In South Africa, the only publicly available data source allowing direct measurement for the entire spectrum of household wealth components is the NIDS survey. The direct measurement approach implies that figures are not consistent with macroeconomic statistics, both in terms of levels and composition of household wealth. In the case of the NIDS, this implies overstating the total

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[14]Including the Reconstruction and Development Programme (RDP - 1994); Growth, Employment and Redistribution (GEAR - 1996); Accelerated and Shared Growth Initiative for South Africa (ASGISA - 2005); New Growth Path (NGP - 2010); and National Development Plan (NDP - 2013).

value of housing assets and understating the significance of non-pension financial assets (see appendix section 2.2).

Rescaling A second way of measuring the distribution of wealth consists in assuming that the distribution of recorded wealth components and their correlation is relatively well measured by the household survey, but that it is mainly their average amounts that are understated or overstated. In this case, one can obtain an estimate of the wealth distribution by effectively scaling up individual-level assets and liabilities in the NIDS surveys to match the totals recorded in the national balance sheets. This has the advantage of ensuring consistency with macroeconomic aggregates, as in our mixed approach. The drawback is that self-reported wealth components may be more prone to measurement error than self-reported income flows, potentially creating a number of outliers and yielding implausible levels of wealth inequality.

Survey-based mixed approach A third way of measuring wealth inequality, in the absence of tax microdata, is to directly apply our mixed methodology to household surveys, capitalising relevant income flows and rescaling assets that do not generate income flows to macro totals. To the extent that household surveys tend to underestimate top income inequality (albeit much less than top wealth inequality), we may expect estimated wealth inequality to be lower when relying solely on surveys than when combining surveys with tax data.

Results Table 4 compares estimates of the share of wealth held by the bottom 50%, the middle 40%, the top 10%, the top 1% and the top 0.1% derived from these different methodologies. Wave 4 and 5 of the NIDS are the only surveys collecting direct data on wealth and thus for which estimates from the three methodologies can be compared. Three main results stand out from these figures.

[Table 4 about here.]

First, all approaches converge in revealing an extreme degree of wealth concentration. Regardless of the methodology, the share of wealth held by the bottom 50% is estimated to be consistently negative, while the top 10% is higher than 80%. The fact that wealth inequality in South Africa is substantially larger than in any other country for which a similar measurement method has been applied is therefore robust to alternative methodologies.

Secondly, while methodologies converge when it comes to large groups (e.g. the top 10% and the bottom 90%), they yield much more variable results when it comes to measuring wealth concentration at the

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top of the distribution. Direct measurement in the NIDS surveys implies a top 0.1% share below 10%, i.e. more than twice lower than most of the results obtained from rescaling or the mixed approach. This is due to the extremely poor coverage of non-pension financial assets in the NIDS: the total reported value of bonds and stock, two types of assets that are overwhelmingly concentrated at the top end of the wealth distribution, does not exceed 4% of macro totals in both waves of the survey (see appendix table A2). Rescaling financial assets to balance sheets totals or capitalising income flows corrects for this micro-macro discrepancy, moving the estimates closer to those obtained with our benchmark methodology.[15]

Thirdly, the survey-based mixed approach yields relatively close results across years and data sources: the top 10% share lies between 85% and 90%, and the top 1% is estimated to be between 50% and 60% in most cases. Most importantly, these estimates are very close to those obtained when combining surveys with PIT data: despite their tendency to underestimate top income inequality, surveys can still be usefully exploited to estimate wealth concentration using the mixed approach. A careful look at the particular structure of capital income concentration can help solve this apparent paradox. The relative consistency between the two sources is mainly due to the fact that both in the surveys and the tax data, financial incomes (interest, dividends and rental income) are extremely concentrated, so that both sources imply attributing a substantial share of wealth—and in particular of tenant-occupied housing, bonds and shares—to the top 0.1% of the distribution.

In summary, our results point to the key significance of bridging the micro-macro gap. Because surveys tend to omit the bulk of financial assets, studies solely relying on self-reported household wealth are likely to very strongly underestimate top wealth inequality. By contrast, capitalising income flows to match macro totals can prove to be a more reliable methodology, even in the absence of income tax microdata. This opens new avenues for estimating wealth inequality in other emerging countries, where tax microdata might not be available yet where surveys collecting data on income can be usefully combined with data from national accounts.

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[15]Also notice that wealth inequality between the top 10% and the bottom 90% is significantly larger under the rescaling approach than when relying on the mixed approach. This is essentially due to the fact that scaling up debts to balance sheets totals creates a large number of households with strongly negative net worth (the bottom 50% goes down by several percentage points), especially in the NIDS where assets and liabilities suffer from important underreporting issues.

Debts, housing wealth and equivalent scales

We conclude this paper by briefly discussing three sources of concern related to the mismeasurement of household debt, the underestimation of total housing wealth, and the distribution of wealth within households.

Mismeasurement of household debt One concern with our estimates is that debt is self-reported in household surveys. By rescaling reported debts to macro totals, we might overestimate the number of households with negative net worth, especially given that surveys tend to only capture a small fraction of private debt (see appendix Table A3). In order to evaluate the potential significance of this bias, we compare the evolution of household net worth inequality with that of household assets inequality (excluding debts) in appendix Figure A14.

Two key results emerge from this comparison. First, excluding debt systematically reduces wealth inequality, but only moderately: the top 10% have owned a consistent 80% of assets and the top 1% about 45% of assets since 1993. Secondly, debt dynamics appear to drive virtually all fluctuations in wealth inequality over time: wealth concentration has followed ups and downs, while the concentration of assets has remained remarkably stable. This points to the role of credit dynamics in accounting for short-run trends in wealth disparities. The rise and fall of wealth inequality visible in our series before and after the 2007-2008 financial crisis, in particular, coincides with the mortgage credit boom and bust (see appendix Figure A5).

Underestimation of housing wealth A second concern relates to the aggregate value of housing wealth in South Africa. Indeed, housing appears to be the only asset class for which reported values in surveys are substantially *higher* than in balance sheets totals (see appendix table A2). Whether this inconsistency arises from survey respondents overestimating the value of their home or from the SARB underestimating housing wealth remains an open question.[16] For consistency and comparability with existing studies, we choose to rely on SARB statistics. However, we report in the appendix series in which we assume that total housing wealth is underestimated by a factor of 2 (see appendix Figures A12 and A13). Unsurprisingly, as housing is one of the least unequally distributed asset in South Africa, increasing its average value reduces wealth inequality. Yet, because all assets are strongly concentrated at the top end,

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[16]Notice that this issue is not one specific to South Africa—in the United States too, survey values have been found to be higher than in balance sheets. Which source of information provides the most accurate estimate of the market value of housing wealth remains debated (Blanchet, 2016; Henriques & Hsu, 2014; Dettling, Devlin-Foltz, Krimmel, Pack, & Thompson, 2015).

including housing (see table 3), it affects our main results only moderately, with the top 10% share still reaching about 80% and the top 1% about 40%.

Equivalence scales Lastly, one might be concerned that the equivalence scale used in this paper—allocating wealth components directly to individuals, and therefore not accounting for wealth sharing within households—may lead to overestimating wealth inequality. It might also lead to overstating wealth inequality more in South Africa than in countries such as France, given that multi-generational households and intra-familial sharing agreements might be more common in the former than in the latter.

We investigate this concern in appendix Figures A10 and A11, which compare our "individual" series to that obtained when splitting wealth equally among all household members ("per capita" series), or among all adult household members ("broad equal-split" series). We find that changes in equivalence scales only moderately affect wealth inequality, which is highest in the individual series and lowest in the broad equal-split series. The top 10% share exceeds 80%, and the top 1% share 45%, in all three specifications.

6   Conclusion

This paper systematically estimated the distribution of household wealth in South Africa since 1993 by combining all relevant macro and micro data sources. Our results have revealed unparalleled levels of wealth concentration, with the top 1% owning a higher share of wealth than the bottom 99%. These extreme inequalities have remained remarkably stable since the end of the apartheid regime, despite the significant economic growth and the major social transformations that the country has undergone since then. They extend to all forms of assets, from housing to financial capital, which are consistently held by individuals located at the top end.

Methodologically, our results point to the substantial limitations of wealth surveys, which vastly underestimate financial assets and are therefore incapable of properly measuring wealth inequality within the top 10%. Instead, we have shown that bridging the micro-macro gap by capitalising relevant income flows, even in the absence of tax microdata, can yield more consistent and meaningful estimates of the wealth distribution. This comes as good news for researchers aiming at tracking the dynamics of wealth concentration in countries where tax microdata might not be accessible, yet where household income surveys and macroeconomic balance sheets exist and can be combined.

We see at least two avenues for future research. First, our estimates of wealth inequality could be refined if better information on dividends and income received through unit trusts were made available to researchers (see the discussion in appendix section 3). Information on these forms of income are collected on a regular basis by the South African Revenue Service, but are not yet accessible. We hope that access to these data sources will enable future studies to have a more granular picture of the composition of wealth and its dynamics at the very top of the distribution.

Secondly, our findings on the stability of wealth inequality since 1993 call for further research on the dynamics and weight of inherited wealth relative to that of newly created and accumulated wealth in the post-apartheid era. This would likely require combining other complementary data sources—such as estate duty data, credit data or panel data on income and savings—and modelling the joint dynamics of savings, inter-generational transmission, and household debt.

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Figure 1: The evolution of household wealth in South Africa, 1993-2018
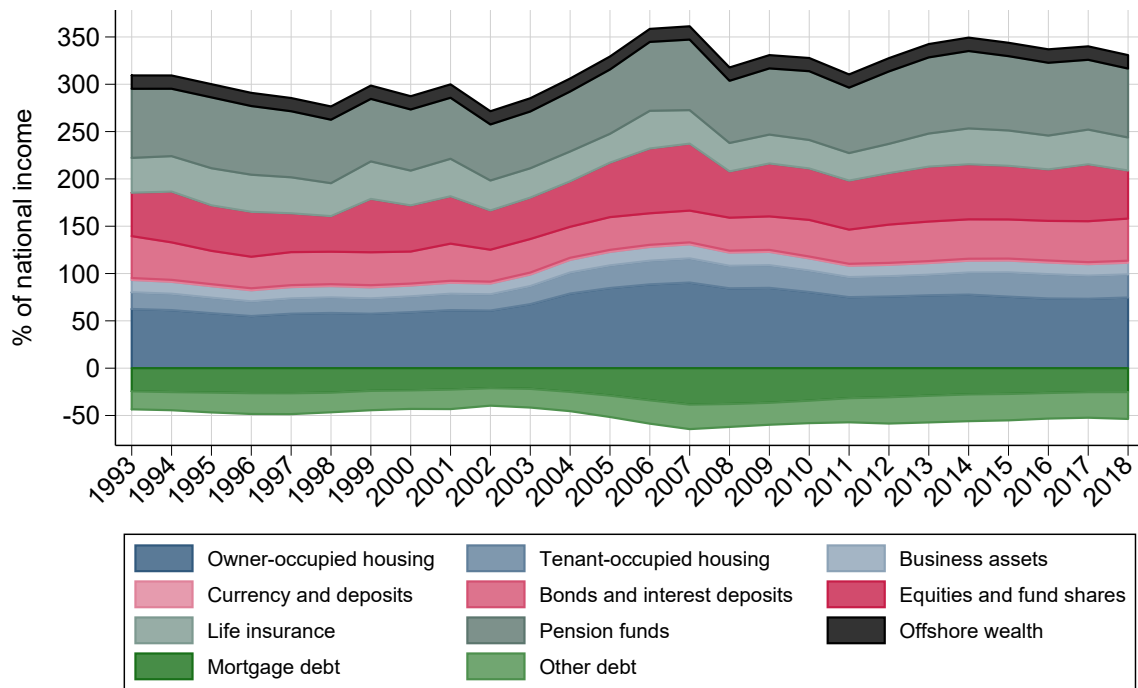
Notes: This figure shows the level and composition of household wealth in South Africa between 1993 and 2018, expressed as a share of the net national income.

Source: authors' compilation based on data from the South African Reserve Bank.

Figure 2: The composition of assets by wealth group in 2017
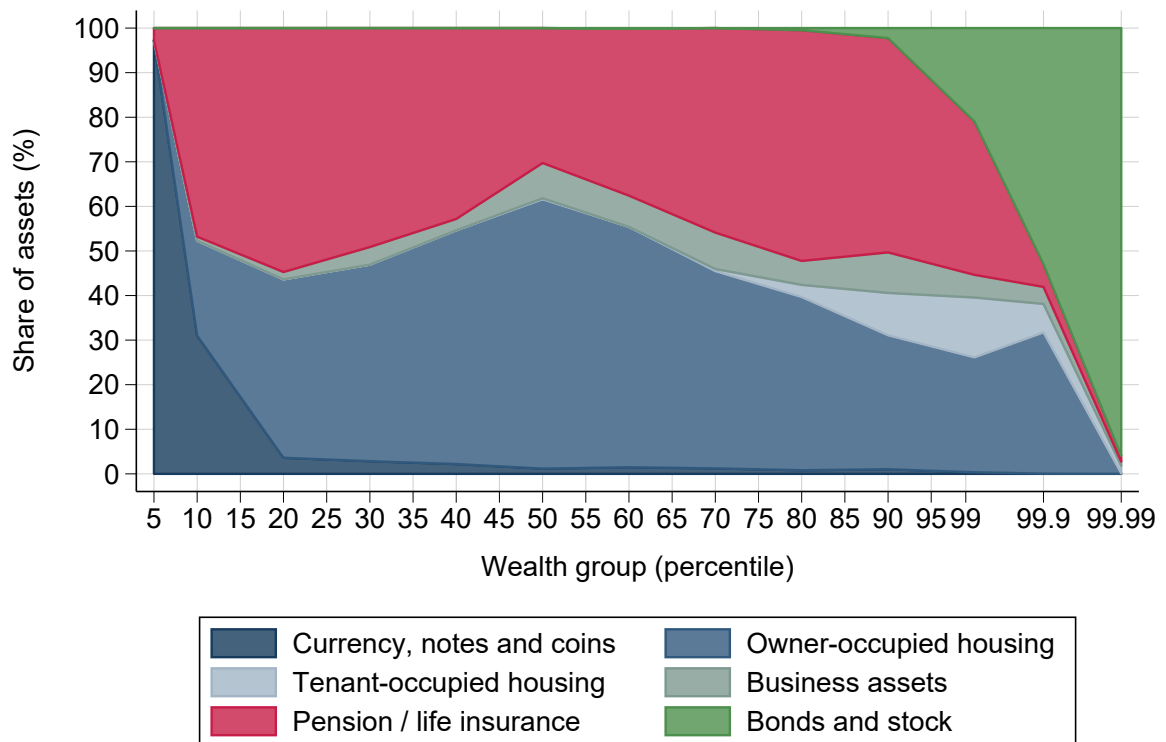
Notes: The figure shows the composition of assets of various groups in the distribution of household assets in South Africa in 2017. The unit of observation is the adult aged 20 or above. The results come from the harmonised survey data file, and wealth is split equally among adult members of the household, except for the top 1% and above for which the individual data built from the combined survey and tax microdata are used.

Source: authors' computations combining surveys, tax microdata and macroeconomic balance sheets statistics.

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Figure 3: Average wealth by age relative to average wealth per adult, 2012-2017
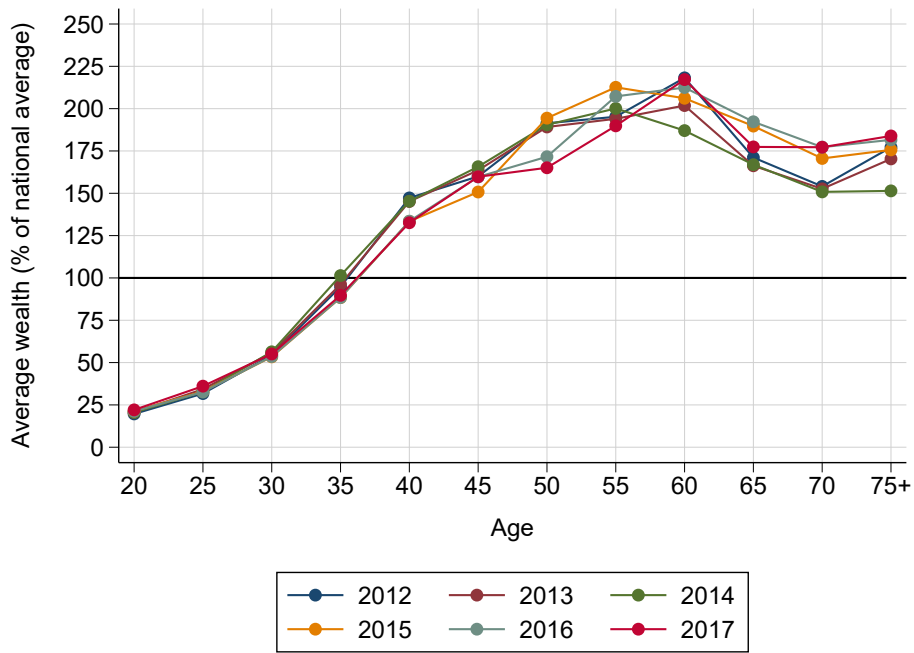
Notes: The figure shows the mean net worth of South African adults by age group relative to the national average. The unit of observation is the individual adult aged 20 or above.

Source: authors' computations combining surveys, tax microdata and macroeconomic balance sheets statistics.

Figure 4: Wealth inequality within age groups, 2010-2017

Notes: The figure shows top 10% wealth share and the top 1% wealth share estimated when splitting the South African population into three age groups (20-39 years old, 40-59 years old, and 60+ years old). The unit of observation is the individual adult aged 20 or above.

Source: authors' computations combining surveys, tax microdata and macroeconomic balance sheets statistics.

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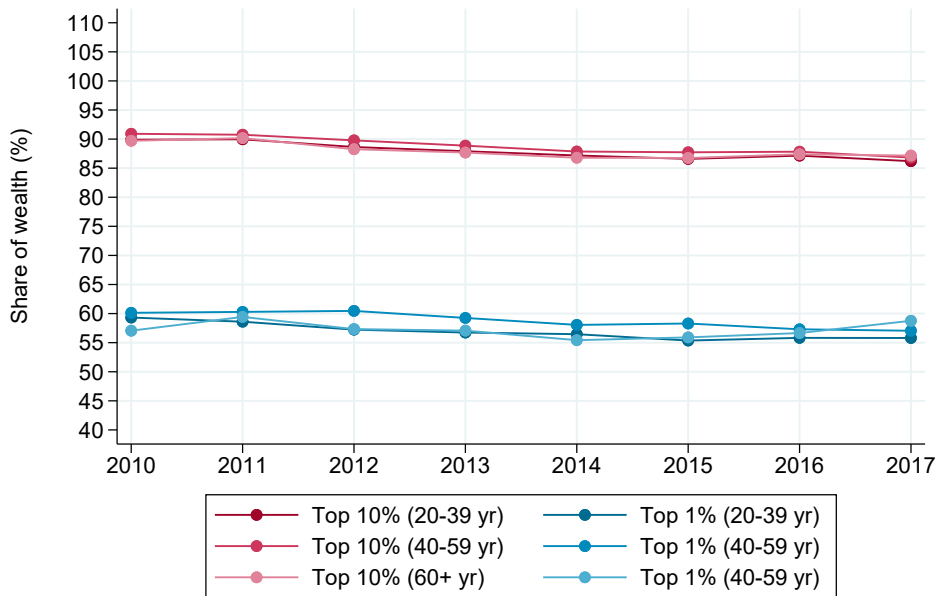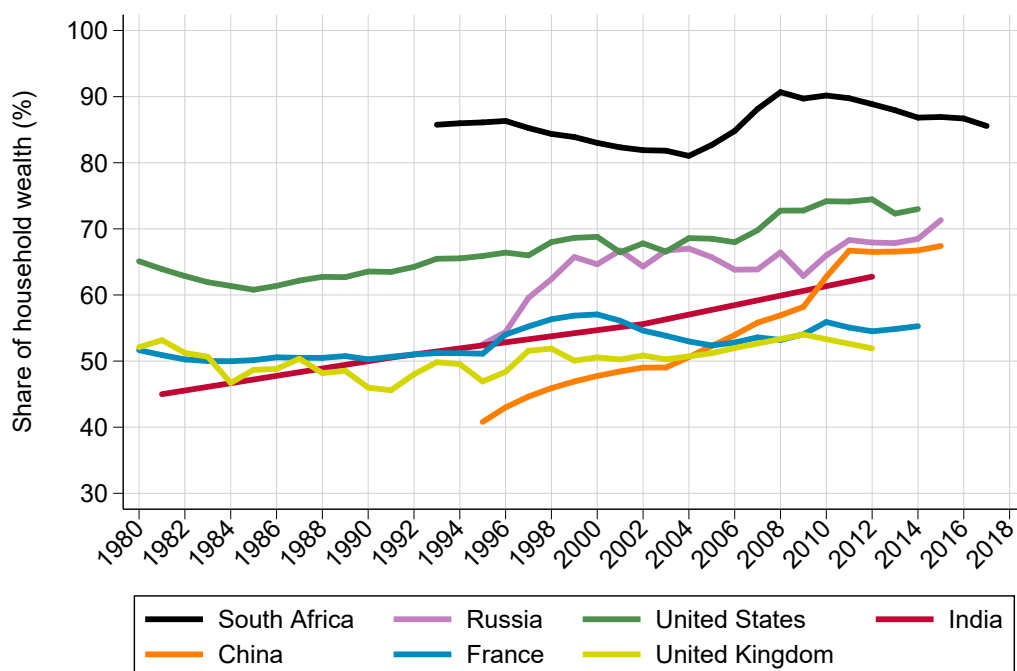Figure 5: South African wealth inequality in comparative perspective: Top 10% wealth share

Notes: The figure compares the top 10% wealth share in South Africa to that of other countries. The unit of observation is the individual adult aged 20 or above. Wealth is individualised (South Africa) or split equally among adult household members (other countries).

Source: authors' computations combining surveys, tax microdata and macroeconomic balance sheets statistics for South Africa; World Inequality Database (http://wid.world) for other countries.

Figure 6: South African wealth inequality in comparative perspective: Top 1% wealth share

Notes: The figure compares the top 1% wealth share in South Africa to that of other countries. The unit of observation is the individual adult aged 20 or above. Wealth is individualised (South Africa) or split equally among adult household members (other countries).

Source: authors' computations combining surveys, tax microdata and macroeconomic balance sheets statistics for South Africa; World Inequality Database (http://wid.world) for other countries.
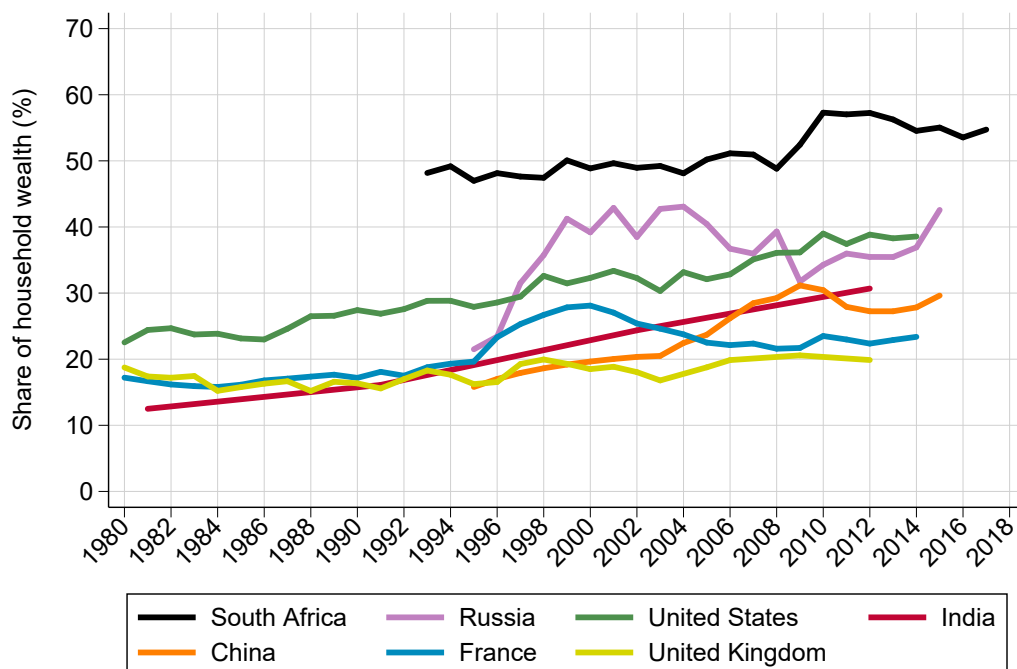
Table 1: Estimating the distribution of personal wealth in South Africa: a mixed approach

Asset / liability	Variable	Measurement method
Non-financial assets		
Owner-occupied dwellings	Value of home	Rescaling
Tenant-occupied dwellings	Rental income	Capitalisation
Business assets	Business income	Capitalisation
Financial assets		
Pension assets	Pension contributions and pension income	Mixed method
Life insurance assets	Factor income	Mixed method
Currency, notes and coins	Bank account balance	Rescaling
Bonds and interest deposits	Interest income	Capitalisation
Corporate shares and equity	Dividends	Capitalisation
Liabilities		
Mortgage debt	Reported debt and house value	Mixed method
Other debts	Reported debts and consumption	Mixed method

Notes: the table shows the methodological approach used to estimate the distribution of the different assets and liabilities reported in the household balance sheets. Direct measurement corresponds to reported data on the market value of assets or liabilities in household surveys. Capitalisation corresponds to assuming that the distribution of an asset follows that of one or several corresponding income flows.

Source: authors' elaboration.

Table 2: The distribution of personal wealth in South Africa in 2017

	Number of adults	Wealth threshold	Average (2018 R)	Average (2018 PPP $)	Wealth Share
Full population	35,400,000		R 326,000	$ 52,200	100%
Bottom 90% (p0p90)	31,860,000		R 94,100	$ 15,100	14.4%
Bottom 50% (p0p50)	17,700,000		R -16,000	$ -2,600	-2.5%
Middle 40% (p50p90)	14,160,000	R 27,700	R 138,000	$ 22,000	16.9%
Top 10% (p90p100)	3,540,000	R 496,000	R 2,790,000	$ 447,000	85.6%
Top 1% (p99p100)	354,000	R 3,820,000	R 17,830,000	$ 2,860,000	54.7%
Top 0.1% (p99.9p100)	35,400	R 30,350,000	R 96,970,000	$ 15,540,000	29.8%
Top 0.01% (p99.99p100)	3,540	R 146,890,000	R 486,200,000	$ 77,920,000	14.9%

Notes: The table shows the distribution of household wealth in South Africa in 2017. The unit of observation is the individual adult aged 20 or above. Wealth thresholds are in 2018 Rands.

Source: authors' computations combining surveys, tax microdata, and macroeconomic balance sheets statistics.

Table 3: Share of total assets held by wealth group by asset class, 2017

	Currency	Business assets	Housing	Pensions / life insurance	Bonds & Stock
Bottom 90% (p0p90)	37.3%	40.4%	41.2%	36.2%	0.2%
Bottom 50% (p0p50)	9.7%	1.4%	14.0%	5.3%	0.0%
Middle 40% (p50p90)	27.7%	39.1%	27.2%	30.9%	0.2%
Top 10% (p90p100)	62.7%	59.6%	58.8%	63.8%	99.8%
Top 1% (p99p100)	10.6%	41.9%	27.8%	14.1%	95.2%
Top 0.01% (p99.99p100)	1.5%	13.4%	8.5%	2.1%	62.7%
% of total assets	0.6%	3.6%	28.8%	32.5%	34.6%

Notes: The table shows the shares of different types of assets held by specific wealth groups in 2017. The unit of observation is the individual adult aged 20 or above. In 2017, the top 1% of South Africans in terms of net worth owned 95% of the bonds and corporate shares in the economy. Bonds and shares represented 34.1% of total household assets in the economy at this date. Figures may not add up due to rounding.

Source: authors' computations combining surveys, tax microdata, and macroeconomic balance sheets statistics.

Table 4: Shares of household wealth held by groups in South Africa: survey-based results

	Bottom 50%	Middle 40%	Top 10%	Top 1%	Top 0.1%
Direct measurement					
NIDS, wave 4	-3.3 %	18.4 %	84.9 %	41.3 %	9.7 %
NIDS, wave 5	-0.5 %	16.9 %	83.6 %	40.2 %	8.6 %
Rescaling					
NIDS, wave 4	-8.2 %	10.9 %	97.3 %	58.3 %	24.6 %
NIDS, wave 5	-7.0 %	8.0 %	99.1 %	63.9 %	29.3 %
Mixed approach					
NIDS, wave 4	-4.5 %	14.5 %	90.0 %	58.5 %	25.2 %
NIDS, wave 5	-3.3 %	12.5 %	90.8 %	60.6 %	30.1 %
PSLSD, 1993	-1.3 %	12.0 %	89.3 %	51.7 %	20.6 %
IES, 1995	-5.1 %	15.3 %	89.8 %	50.6 %	23.7 %
IES, 2000	-1.8 %	14.9 %	86.9 %	52.8 %	26.0 %
IES, 2005	-0.2 %	13.6 %	86.6 %	54.2 %	28.6 %
LCS, 2008	-8.0 %	14.0 %	94.0 %	52.3 %	22.4 %
IES, 2010	-7.3 %	14.8 %	92.4 %	60.0 %	31.7 %
LCS, 2015	-3.2 %	14.0 %	89.2 %	51.1 %	20.0 %

Notes: The table compares estimates of the share of household wealth owned by the bottom 50% (p0p50), the middle 40% (p50p90), the top 10% (p90p100), the top 1% (p99p100 and the top 0.1% (p99.9p100) obtained from household surveys using different methodological approaches. The unit of observation is the individual adult aged 20 or above. PSLSD: Project for Statistics on Living Standards and Development. IES: Income and Expenditure Survey. LCS: Living Conditions Survey. NIDS: National Income Dynamics Study.
Source: authors' computations from survey microdata.

Wealth Inequality in South Africa, 1993-2017

Supplementary Appendix[*]

Aroop Chatterjee

Léo Czajka

Amory Gethin

February 2021

Abstract

This appendix supplements our article "Wealth Inequality in South Africa, 1993-2017". It provides additional methodological details, robustness checks, and additional figures and tables.

Contents

1   Harmonization of macrodata sources

The objective of our study is to estimate the distribution of household wealth by matching macrodata on wealth with microdata on reported assets and capital income flows. In order to improve our estimates of the wealth distribution and obtain a better mapping of macrodata and microdata components, we address five shortcomings of available household balance sheets published by the SARB: the decomposition of non-financial assets, the decomposition of housing wealth into tenant-occupied and owner-occupied, the decomposition of financial assets, the decomposition of pension and life insurance assets, and the inclusion of wealth held offshore in tax havens.

The SARB currently publishes decompositions of household wealth into its financial and non-financial components, along with broad decompositions by asset class and information on household debt (see figure A1). Non-financial assets are divided into two components: residential buildings (the market value of residential properties owned by household, excluding land) and other non-financial assets (including land and unincorporated business assets). Financial assets are divided into three components: interest in pension funds and long-term insurers, assets with monetary institutions, and other financial assets. Interest in pension funds and long-term insurers corresponds to all pension assets and life insurance holdings of the household sector.[1] Assets with monetary institutions include all forms of currency and

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[1] This corresponds to the sum of the total assets of official pension and provident funds (series KBP2215 in Capital Markets Statistics), the total liabilities of private self-administered pension and provident funds (KBP2339), and the liabilities of long-term insurers under unmatured policies from the pension business (KBP2215). Notice that the original estimates of the South African household balance sheets done by Muellbauer and Aron (1999) excluded life insurance assets and all other assets

deposits with banks, as well as notes and coins held by households. Other financial assets include investment in government and public entities stock, collective investment schemes, corporate bonds and equities, other long-term deposits and households' investment in foreign assets. Finally, the SARB decomposes household debt into two components: mortgage advances, corresponding to loans provided by the commercial banking sector, and other debt (including trade credit, personal bank loans, credit card debt, instalment sales and lease agreements, and other formal and informal loans).

Starting from these broad categories, we derive further decompositions of macroeconomic household balance sheets to match specific types of assets with their corresponding income flows.

Land underlying dwellings The "Other non-financial assets" category provided by the SARB includes both land underlying dwellings and business assets. These two components are arguably distributed very differently. In particular, it is reasonable to assume that land underlying dwellings is distributed similarly to residential buildings (therefore defining total housing assets as the sum of land and residential buildings), while the distribution of unincorporated business assets is better approximated by that of mixed income. Given our income capitalization methodology, we therefore need to split "Other non-financial assets" into the two sub-aggregates. Based on complementary evidence from SARB, we assume that 70% of other non-financial assets correspond to land underlying dwellings, the remaining 30% amounting to the assets held by unincorporated businesses. This implies that total housing wealth (including land) was equal to 38% of net wealth in 2018, while business assets (machinery and equipment, excluding land) amounted to about 5% of net wealth.

Tenant- versus owner-occupied housing Housing wealth can be decomposed into tenant-occupied housing and owner-occupied housing. Available studies combining surveys with tax microdata typically assume that the distribution of tenant-occupied housing can be well approximated by the distribution of rental income, while owner-occupied housing assets are better captured using direct measurement available from surveys or administrative data (Saez & Zucman, 2016; Garbinti, Goupille-Lebret, & Piketty, 2017). Unfortunately, the "Residential buildings" category published by the SARB does not provide this decomposition, so we choose to derive the proportions from survey data (General Household Survey). To the best of our knowledge, the only available surveys collecting information on housing values for both tenants and owner-occupiers are the IES and LCS (1995, 2005, 2008, 2010) as well as

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associated with the non-pension business of long-term insurers. However, these items are now included by the SARB in line with the SNA guidelines.

the GHS since 2008. These surveys suggest that the share of tenant-occupied housing assets in total housing assets amounts to about 20% in recent years, down from some 25% in 1995. Notice however that we are considering all housing assets, including those owned by the government, corporations and other institutions in the denominator, as well as houses which are rented for free. In order to reach an aggregate closer to households' housing assets, we exclude tenants living in their dwelling without paying rents, as well as those declaring that they are renting from entities other than individuals. This leaves us with a clear distinction between tenants paying income to individual landlords, and formal owners of their houses, which is the concept we are interested in. This decomposition only exists in the GHS from 2013 onwards. The results show a decrease in owner-occupied housing wealth from above 75% in 2008 to 71% in 2013. We extrapolate this share to earlier years and apply it to the total reported in the households balance sheets.

Non-pension financial wealth The "assets with monetary institutions" and "other financial assets" categories published by the SARB gather together very different forms of financial assets, with arguably very heterogeneous distributions at the micro level, and thus must be split as well. "Assets with monetary institutions" include both non-interest bearing deposits such as cheque accounts, which do not generate any income flow, and interest bearing deposits, which generate interest income. "Other financial assets" include both bonds and corporate shares, which generate interest and dividends respectively. We follow Orthofer (2015) and assume that the composition of other financial assets held by households is similar to that reported by unit trusts as per SARB capital markets statistics. This implies that between 80% and 95% of other financial assets consist in corporate shares over the 1975-2018 period, the remaining being classified as bonds.[2] Finally, we separate currency, notes and coins (0.8% of net wealth) from interest-bearing deposits (17% of net wealth) using SARB capital markets statistics.[3]

Pension assets and life insurance Pension assets correspond to the assets accumulated by wage earners through contributions to pension funds throughout their career, so they should in large part be distributed to wage earners and pensioners receiving pension income or annuities. Life insurance assets, by contrast, better correspond to a form of savings device, but they do not directly generate interest in-

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[2] More precisely, we estimate the share of corporate shares in other financial assets by comparing the market value of ordinary shares held by unit trusts (KBP 2412) to the sum of the market values of security holdings of public sector entities, stocks and debentures held by unit trusts (KBP 2410 + KBP 2411) in the capital market statistics published by the SARB.

[3] The variable "Monetary sector liabilities: banknotes and coins in circulation" (series KBP1312) corresponds to currency, notes and coins held by all institutions. We assume that 70% of the total can be attributed to households. Given the small share of this component in total wealth, especially at the top of the wealth distribution, our results are not affected by alternative scenarios.

come, so they cannot be categorised with interest deposits or bonds and have to be distributed differently. Accordingly, we use available SARB capital markets data to decompose the "Interest in pension funds and long-term insurers" item into these two components.[4] In 2018, pension and life insurance assets amounted to about 28% and 13% of net wealth respectively.

Offshore wealth   Offshore wealth corresponds to the assets held abroad by South African residents, mainly for tax avoidance purposes. By definition, these assets are not recorded in official records and are therefore not included in the household balance sheets. Alstadsæter, Johannesen, and Zucman (2018) combine a number of macroeconomic data sources to measure the total amount of financial assets held in offshore tax havens and distribute it to specific countries. They estimate that the equivalent of about 11.8% of South African GDP was held offshore in 2007, corresponding to about 5% of net wealth. We add this quantity to total household wealth in 2007 and extrapolate it to other years by assuming that it has remained a constant fraction of GDP.[5]

2   Harmonization of microdata sources

2.1   Harmonisation of household survey data, 1993-2018

Broadly speaking, two main types of nationally representative surveys covering the distribution of income and wealth have been conducted in South Africa since 1993: surveys covering all main types of income sources (such as wages, mixed income, rental income, interest, dividends or pension income) and labour force surveys covering only wages and mixed income. The first type of survey includes the 1993 Project for Statistics on Living Standards and Development (PSLSD); the Income Expenditure Surveys (IES) conducted in 1995, 2000, 2005, 2010; the Living Conditions Surveys (LCS) conducted in 2008 and 2015; and the National Income Dynamics Study (NIDS) conducted five times between 2008 and 2017. Labour force surveys include the October Household Surveys (OHS) conducted once a year between 1994 and 1999; the Labour Force Surveys (LFS) conducted twice a year between 2000 and 2007; and the Quarterly Labour Force Surveys (QLFS) conducted every three months since 2008.

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[4] The share of interest in pension funds and long-term insurers corresponding to assets held by long-term insurers is recorded in the Capital Markets Statistics published by the SARB under series KBP2215, "liabilities of long-term insurers under unmatured policies from the pension business".

[5] Given that offshore wealth is known to have grown globally, this is a relatively conservative assumption for the period after 2007. If anything, wealth inequality could have increased more since 1993 than what our series suggest, as offshore wealth is well-known for been concentrated at the very top end of the distribution (Alstadsæter, Johannesen, & Zucman, 2019).

In order to get yearly estimates of the wealth distribution between 1993 and 2018, we build a harmonised survey microfile by combining all these surveys in two steps. In a first step, we create a microfile covering the entire 1993-2017 period by combining income surveys (available in 1993, 1995, 2000, 2005, 2008, 2010, and 2015) in the following way: for a given year (for instance 1997), we create a new data set containing all observations from the two surveys available in surrounding years (1995 and 2000), and reweigh the data to give a weight to each survey that is proportional to the distance from the year considered. For 1997, for instance, we combine the 1995 IES survey and the 2000 IES survey, and we multiply existing sample weights by 1/2 for the former and 1/3 for the latter. This is similar to a linear interpolation strategy: it corresponds to considering that in 1997 the distribution of income was somewhere between that of 1995 and that of 2000, and was closer to that of 1995 if inequality evolved linearly. Given issues of comparability in income variables and sampling methods, we rely solely on the PSLSD, the IES and the LCS and we do not incorporate the NIDS into our harmonised file.

In a second step, we take advantage of the fact that while income surveys do provide information on the distribution of wages and mixed income, labour force surveys are more reliable for that very purpose and are available on a yearly basis. We therefore rank observations in the income surveys according to wages and mixed income and force the distribution of these two variables in our surveys (including interpolated years) to match that observed in the LFS or QLFS during the corresponding years by rescaling average incomes by rank. Due to difficulties in creating consistent inequality series from the OHS series, especially regarding mixed income, we choose to not exploit this data source and keep the PSLSD 1993 and the IES 1995 as our only survey data sources for the 1990s.

Finally, we extract yearly data on the distribution of the South African population by age, gender, province and population groups from the PALMS dataset and use simple linear calibration to calibrate the survey weights on the distribution of these sociodemographic variables. This ensures that the entire dataset is representative of the South Africa population in terms of these variables throughout the 1993-2017 period.

2.2 Comparing survey wealth aggregates to macroeconomic balance sheet totals

In this section, we briefly compare estimates of total wealth derived from existing surveys to macroeconomic balance sheets totals. The main finding that arises from this comparison is the existence of large differences between the two sources, due in particular to strong underreporting of financial assets

in surveys. This motivates our mixed method of mapping micro wealth components with macro sources and capitalizing relevant income flows.

The only available surveys to directly measure wealth inequality in South Africa are waves 4 and 5 of the National Income Dynamics Study (NIDS). The comparison of household assets and liabilities reported in the NIDS surveys to macroeconomic statistics shows important inconsistencies (see table A2). The market value of owner-occupied housing wealth is between 50% and 120% higher in the NIDS surveys than in the balance sheets, while tenant-occupied housing is closer to the macro aggregate. This most likely reflects the different methods in measuring market values.[6] Business assets are covered very differently in the two waves: they are overestimated in wave 4 and underestimated in wave 5. Pension and life insurance assets, after correction[7], seem to be relatively close to balance sheets figures, and they even slightly overestimate them. Other financial assets are extremely badly covered: the total reported in the NIDS surveys does not exceed 4% of households' bonds and stock reported in the balance sheets by the SARB. Considering that the underlying sources of SARB's series consist of financial statements submitted by all financial intermediaries[8] and several capital markets data, we interpret these discrepancies as a sign of the weakness of the NIDS surveys resulting from the difficulty to survey the wealthiest individuals. Household debts are slightly better covered, but still fall significantly below macroeconomic statistics.

The other surveys we use in this study (PSLSD, IES, and LCS) also contain some information on owner-occupied housing and debts. Owner-occupied housing seems to be over-stated relative to the balance sheets in these surveys as in the NIDS surveys (see table A3). Debts are always below balance sheets totals, but with important fluctuations across surveys. All these limitations justify our approach to correct for discrepancies between micro and macro totals. Indeed, the households balance sheets have the advantage of tracking the evolution of aggregate wealth consistently, in contrast with surveys, which

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[6] It is beyond the scope of this paper to discuss and evaluate these methods. However, this issue is not one specific to South Africa - in the US, survey values have also been found to be higher than in balance sheets figures, and which source of information provides the more accurate estimate of market values is contested (Blanchet, 2016; Henriques & Hsu, 2014; Dettling, Devlin-Foltz, Krimmel, Pack, & Thompson, 2015). Another potential issue is how to treat RDP housing, a government-funded social housing project in South Africa, due to complexities around ownership. However, given the typical low market value of these properties, it is unlikely to affect our distributional estimates.

[7] There are important inconsistencies in data on pensions and other retirement funds in the NIDS survey. For example, in wave 5 of the survey, 61% of individuals declaring contributions to pensions funds declare having no "pension or retirement annuity", while 77% of individuals declaring income from a pension or provident fund declare no "pension or retirement annuity". We correct for these gaps by imputing all missing values using predictive mean matching.

[8] Monetary authority, banks, insurers, retirement funds, trusts and other types of finance companies. For more details about how the Flow of Funds data is compiled, see de Beer, Nhlapo, Nhleko, et al. (2010)

show much greater fluctuations in reported aggregates. By mapping the surveys with macroeconomic statistics, we are at least able to get estimates of the wealth distribution that are consistent with what we know of the level of aggregate wealth and its composition over time.

2.3 Comparing survey income aggregates to national accounts totals

As more surveys and available tax microdata deal with incomes, and generally income reporting is seen as more credible, capital related income provides alternate sources of information for the wealth distribution. In this section, we compare incomes from surveys to the corresponding totals recorded in the national accounts. For our purposes, the components we consider are gross wages (to capitalise pension wealth), mixed income (income from unincorporated enterprises, to capitalise unincorporated business assets), rental income (to capitalise tenant-occupied housing) and interest and dividends (for equity and bonds). The surveys we consider were designed to capture information about consumption, expenditure and earnings: these are the Project for Statistics on Living Standards and Development (PSLSD) conducted in 1993, the Income and Expenditure Surveys (IES) from 1995 to 2010, the Living Conditions Surveys (LCS) of 2008 and 2015, and the NIDS surveys.

As table A4 shows, gross wages and mixed income are much better covered than capital incomes, and are better covered in the PSLSD, IES, and LCS than in the NIDS surveys. Rental income, interest and dividends are unfortunately poorly covered in all household surveys. This is due to this sort of income being concentrated by those at the upper end of the income distribution, who are typically underrepresented in surveys due to issues of sampling and non-response. This motivates our use of the tax microdata to better cover top incomes.

2.4 Extrapolation of tax data series back to 1993

Our wealth inequality series based on tax data cover the 2010-2017 period, while we can go back to 1993 by capitalising the income flows reported in household surveys. Series based on tax data typically show slightly higher levels of wealth concentration at the very top, so one meaningful way to extrapolate the tax data series back to 1993 is to assume that the underrepresentation of top wealth groups in surveys has remained constant before 2010.

We correct the survey series before 2010 by following the methodology developed by Blanchet, Chancel, and Gethin (2019) to correct a distribution based on observed relationships between quantile functions covering different concepts and data sources. Formally, consider for a given quantile $p \in [0; 1]$ the

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quantile function of the wealth survey series $Q_S(p)$ and the quantile function of the tax data series $Q_T(p)$. To impute the tax data series from the survey series, one can write:

$$Q_T(p) = Q_S(p) \times \beta(p)$$

Where $\beta(p) = Q_T(p)/Q_S(p)$. Therefore, it suffices in our case to estimate $\hat{\beta}(p)$ over the 2010-2017 period (where both survey and tax data series are available) and to then multiply $Q_S(p)$ by $\hat{\beta}(p)$ before 2011 to get a corrected survey series. This will be an efficient method, however, only in the case where both $Q_T(p)$ and $Q_S(p)$ are strictly positive, which is not true in our case since our wealth quantile functions include a significant share of zero and negative values. Blanchet et al. (2019) show that a good way of accounting for zeros and negative values is instead to work with the following transformation:

$$Q_T(p) = sinh\big(asinh[Q_S(p)] + \beta'(p)\big)$$

With $\beta'(p) = asinh(Q_T(p)) - asinh(Q_S(p))$, and where *sinh* is the hyperbolic sine and *asinh* is the inverse hyperbolic sine. We apply this method to get consistent series covering the 1993-2017 period.

3 Other issues

3.1 Negative net worth and the measurement of household wealth at the bottom end

Household debts are among the most difficult components of personal wealth to estimate, in part due to the difficulty for survey respondents to properly assess their remaining debt balances. The coverage of debt is very erratic in South African surveys, who cover from 14% to 87% of mortgage debt, and from 17% to 57% of other forms of debt. These difficulties are not specific to South Africa: in France, for instance, Garbinti et al. (2017) choose to set negative net wealth values to zero, given the unavailability of proper information on the net worth of poorest households. Other recent comparable studies on India (Bharti, 2018), China (Piketty, Yang, & Zucman, 2019), Russia (Novokmet, Piketty, & Zucman, 2018) or the United States (Saez & Zucman, 2016) have generally found negative net worth to be restricted to the bottom 5% or 10% of the population, with the exception of the United States where households are highly leveraged.

In South Africa, in spite of the lack of high-quality data, there is considerable evidence that a substantial share of households have either zero or negative net worth. The National Income Dynamics Survey, for instance, asks specifically to adults: "Suppose you (and your household members living here) were to sell off everything that you have (including your home and vehicles), cash in your investments and pay all your debts, would you have money left over, breakeven or be in debt?" In 2017, 50% of households declared they would have something left over, 24% declared they would more or less break even, and 4% declared that they would still be in debt. The remaining 22% declared not knowing whether they would still have something left, which is a relatively clear indication of net wealth being very close to zero. Notice in particular that this question includes household durables, which are excluded from our SNA definitions of household wealth, so that the share of negative-net-worth households is clearly underestimated in this question. In any case, the evidence is suggestive of a substantial share of the population (at least between 30% and 50%) having either negative wealth, or wealth very close to zero.

Other evidence points to the concentration of debts among the bottom of the wealth distribution, and the lack of assets covering these debts. According to the 2019 Eighty 20 and XDS Credit Stress Report, the number of unsecured credit products – that is, debt which is not backed by any form of asset – far outweighed those holding secured accounts (Eighty 20 & XDS, 2019). In terms of values, unsecured debts amounted to 28% of total consumer credit products in South Africa in the third quarter of 2019. At the same period, the default rate was as high as 20% among consumers aged 18 to 24. These figures clearly indicate that a very large share of the South African population is highly leveraged, contracting consumer credits with no corresponding assets to back them – which means that they are by definition in negative net worth.

Our benchmark method for allocating debt to households is to rely on the share of households declaring debt and on a proxy variable of ability to pay rather than on direct measurement of debt balances. This avoids having too many households with unsustainable debt levels, while at the same time allowing us to fully close the micro-macro gap and distribute all debts recorded in households' balance sheets. For mortgages, we rely on the reported market value of the house, which is arguably a reasonable proxy for the average size of the mortgage balance across the wealth distribution. This method is comparable to that used by Saez and Zucman (2016), who distribute US mortgages proportionally to reported mortgage payments. For other debts, given the lack of other data, we rely on consumption, which is less unequally distributed than incomes and therefore evens out debts across the wealth distribution. After splitting wealth equally among adult members of the household, our estimates imply that 10% of the

adult population has negative net worth; the entry thresholds for the next deciles are R 0, R 1700, R 10,000 and R 18,000. Median wealth amounts to R 30,000 (about 4800 dollars at purchasing power parity, or about a quarter of the average national income per adult). These low levels are consistent with the descriptive evidence above suggesting that some 30% to 50% of South Africans have close to zero wealth. In any case, as we show in figure A14, top wealth shares are only moderately affected by the exclusion of debts from our framework: assets are extremely concentrated, with the top 10% owning 80% of the total.

That being said, it is important to note that durable goods are not included in the SNA definition of wealth, but that debts associated to the purchase of durable goods are. Given the importance of consumer credits and their use to buy cars or furniture among poorer households in South Africa, this may explain in large part why wealth is so negative at the bottom of the distribution. Whether durable goods should be included in wealth or not is a subject of debate. On the one hand, one might argue that the goods purchased with household debt should be included in households' net worth for consistency with individuals' experiences of what they own. On the other hand, debts are a form of stock generating an income flow, while consumer durables are not - they are consumed in a relatively short time, or depreciate at a comparatively high rate, and they do not generally generate any income flow -, so that one could argue that all consumer credits should be included in net worth, while consumer durables should not. Finally, let us also stress that survey data does not allow us to capture other forms of collective ownership – such as rights to land or cattle, which are particularly important in rural areas, both economically and symbolically – as surveys are restricted to wealth held at the household level. The inclusion of these components in household wealth can also be debated and should in any case be the subject of future research.

3.2   Limitations of the personal income tax data

General Comments

The fact that the ITR12 forms are self-assessed implies that there may be tax evasion or under-reporting of income flows, especially if the likelihood of being controlled by tax authorities is low. More importantly, tax microdata only covers forms of incomes which are useful for tax collection and deductions purposes, which implies that other forms of non-taxable incomes are not reported in the data. This, as we show below, is particular problematic for the measurement of capital incomes.

Table A7 shows that when looking specifically at capital incomes in the tax data, the reported totals fall significantly below the national accounts. Interest income is better measured than rental income and dividends, reaching between 25 % and 30 % of total interest received by households in the national accounts. Rental income and dividends are significantly lower and inconsistent, covering between 2% and 25% of national accounts totals. [9]

This under-representation of capital incomes in the tax data is due to three main factors. First, the taxable incomes are different from incomes reported in the national accounts, due to filing rules and tax base. This is particularly problematic for dividends, which in the ITR12 relate to dividends from equities that form part of compensation packages, such as equity share plans. These sort of dividends are subject to income tax, and so part of this data set, whereas dividends from regular ownership of equity is subject to a separate dividend tax. Approximately 80 % of dividend information would be recorded through this dividend tax returns (DTR01/2 forms), and this information would be useful to make our estimate more reliable.

Secondly, there may be issues of misreporting of incomes by individual taxpayers. Interest income seems to be poorly covered as a result of incomplete tax filing by taxpayers. In principle, the South African Reserve Bank receives direct information from banks and financial services that they provide about interest. Banks and financial service providers separately supply customers with a tax certificate (IT3(b) certificate), which is meant to inform the interest income declared by the taxpayer. At the same time, the bank sends the South African Revenue Service a third-party submission about incomes its customers' receive. However, given that interest income is typically low relative to total taxable income, it is possible that small interest income received go unreported. The misreporting of rental income received by individual taxpayers is likely to be more significant, given that rental income is self-reported and that there may be a significant amount of informal letting of fixed property. [10]

Despite of all this, tax microdata remains much better at capturing dividend and interest income than household surveys.

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[9] The particularly low figures obtained in 2017 (fiscal year 2018) are mainly due to the fact that assessment was incomplete at the time of writing.

[10] Notice here that total rental income paid to individuals in the economy is estimated by the authors based on data from the PSLSD, the IES and the GHS surveys on total rental income paid by households to individual landlords. Therefore, this includes informal rents paid, which may explain why the rental income the tax data is so low compared to the macro aggregate.

Trust income

The most important issue regarding the coverage of capital incomes in the tax microdata is likely to be due to the definition of the taxpayer. The tax data covers only individuals and does not account forms of capital incomes received through units trusts or investment funds. This is particularly problematic in the case of South Africa, both because wealth is highly concentrated at the top of the distribution and because top wealth groups rely extensively on unit trusts. As shown in figure A18, the share of financial assets held through trusts exploded around the time of, politically, the end of apartheid, and economically, liberalisation and financialisation. Over half of specifically interest bearing and dividend earnings financial assets are held in trusts. Trusts in South Africa are used more extensively, including housing mutual funds, as well as tax avoidance vehicles, and one mechanism of several to protect against wealth dilation (wealth loss across generations) (Ytterberg & Weller, 2010). There is therefore a clear need to access data on trusts to gain more complete and precise information on the distribution of capital incomes (and their corresponding assets) at the top of the distribution, as well as to understand the mechanisms that results in the persistence of wealth concentration. However, the fact that we could not have access to sufficiently detailed data on trust does not imply that we did not distribute wealth held by households through trusts. Indeed, our methodology takes this share of wealth into account as it is by definition included into the macro aggregate we distribute over our microfiles. Access to better micro data on trust would only have allowed more precise allocation of wealth at the extreme top of the wealth distribution. In the following paragraphs we further document our exploration of the issue.

Just like individuals, all unit trusts in South Africa are required to file an ITR12T form covering all non-dividend sources of income, as well as a dividends tax form separately. The ITR12T form also contains information on taxpayer reference numbers and passport numbers of the beneficiary to whom income, capital or assets were distributed or vested with the highest monetary value. In parallel, individuals filing ITR12 returns are asked to provide detailed information on all forms of income distributed or vested to them as a beneficiary of a trust, as well as the trust name, the trust registration number and the trust tax reference number. In theory, this provides largely sufficient information to link trusts to their beneficiaries and accordingly distribute trust income and trust wealth. Unfortunately, the tax microdata provided by SARS does not include these entries, which were not extracted during the process of making the data accessible to researchers. In the ITR12 data, there is no trust information at all. SARS does provide researchers with the ITR12T data, but available variables are very limited, being restricted to the sources of income received by the different trusts, without any information on who owns them. This

makes it impossible to distribute non-dividend trust income in any meaningful way, since individuals may have accounts in multiple trusts, and accounts may belong to multiple individuals. Furthermore, given that about 90% of trust assets correspond to corporate shares, the ITR12T data is only of very limited use at it excludes dividends from ownership of regular shares.

Table A6 shows descriptive statistics computed from the ITR12T data. The number of tax returns has decreased from about 140,000 to 94,000 between 2014 and 2018, probably due to incomplete assessments at the time of writing. This implies that there was one trust for about 2400 adults in South Africa in 2014, which shows how the use of trusts is widespread in the country. When it comes to sources of incomes assessed however, the quantities observed appear to be extremely low compared to macro figures, in particular knowing that trusts hold a substantial share of financial wealth. Interest income received by trusts amounts to only 3% of total interest received by households in the national accounts. The corresponding figures are 2% of rental income and less than 2% of business income. Less than 0.5% of dividends are covered, which is consistent with the fact that only very specific types of dividends are covered in this data, the bulk of them being filed separately through the dividends tax form. Capital gains are among the biggest components of trust income, amounting to between 1% and 2% of total property income received by households (the sum of interest, rental income and dividends). Overall, summing up all forms of trust income – including other receipts and accruals, and excluding losses –, we only reach between 4.5% and 6% of total property income received by households, or 0.3% to 0.45% of the national income. This is very puzzling, and points to potentially large under-reporting, evasion or exemptions.

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4 Additional figures and tables

Figure A1: The evolution of household wealth in South Africa, 1975-2018
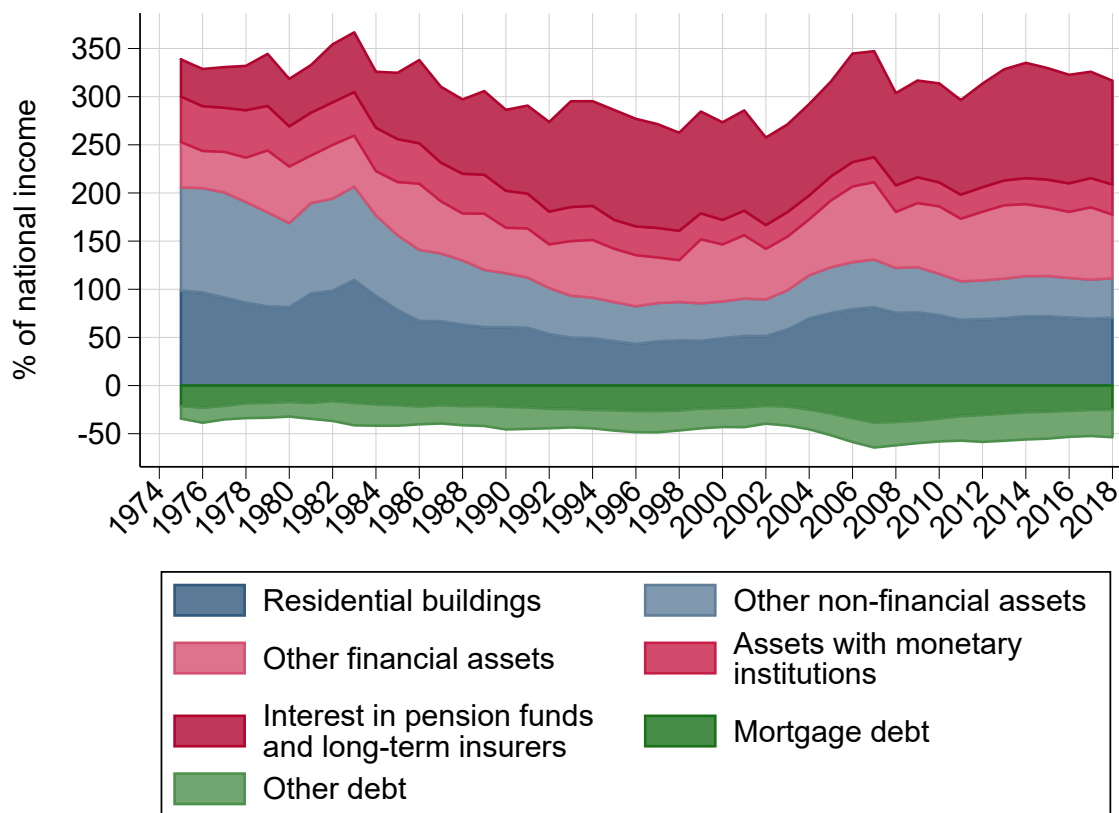
Notes: This figure shows the level and composition of household wealth in South Africa between 1975 and 2018, expressed as a share of the net national income.

Source: authors' compilation based on data from the South African Reserve Bank.

Figure A2: South African wealth inequality in comparative perspective: Middle 40% wealth share
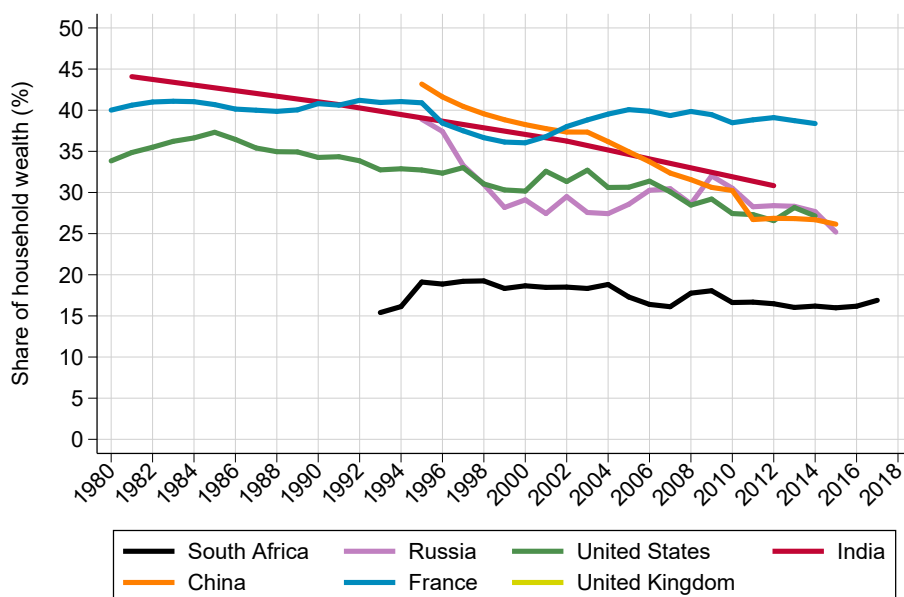
Notes: The figure compares the middle 40% wealth share in South Africa to that of other countries. The unit of observation is the individual adult aged 20 or above. Wealth is individualised (South Africa) or split equally among adult household members (other countries).

Source: authors' computations based on data for South Africa; World Inequality Database (http://wid.world) for other countries.

Figure A3: South African wealth inequality in comparative perspective: Top 0.1% wealth share
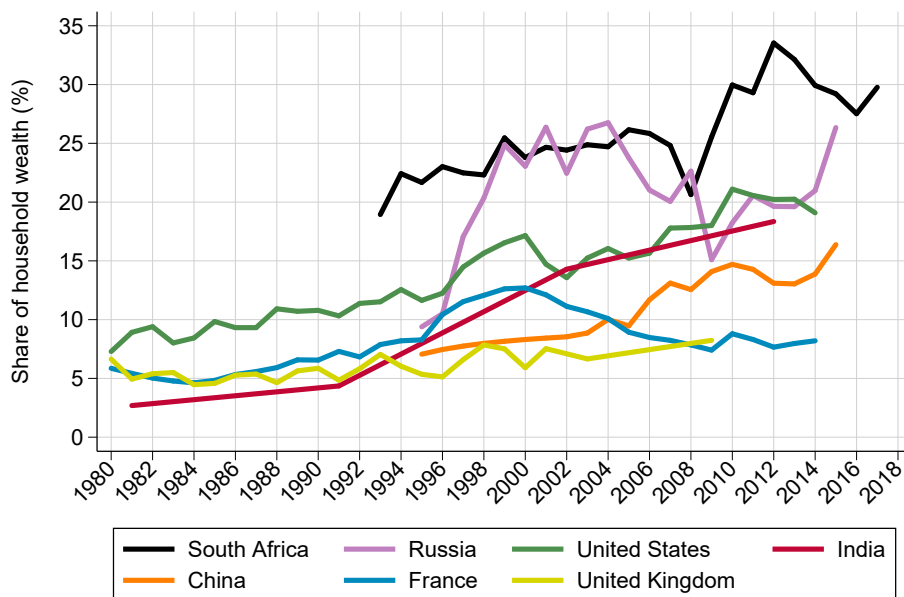
Notes: The figure compares the top 0.1% wealth share in South Africa to that of other countries. The unit of observation is the individual adult aged 20 or above. Wealth is individualised (South Africa) or split equally among adult household members (other countries).

Source: authors' computations based on data for South Africa; World Inequality Database (http://wid.world) for other countries.

Figure A4: South African wealth inequality in comparative perspective: Bottom 50% wealth share
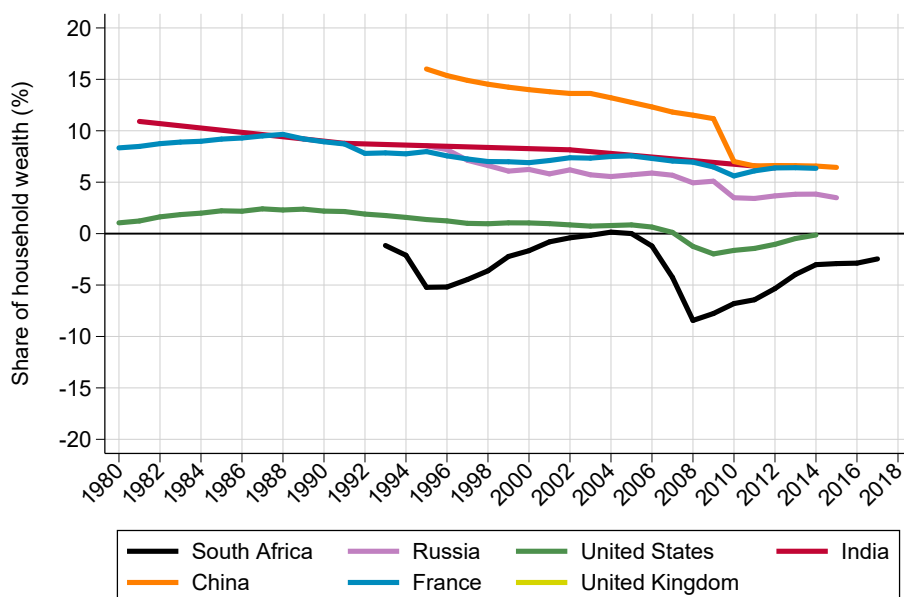
Notes: The figure compares the bottom 50% wealth share in South Africa to that of other countries. The unit of observation is the individual adult aged 20 or above. Wealth is individualised (South Africa) or split equally among adult household members (other countries).

Source: authors' computations based on data for South Africa; World Inequality Database (http://wid.world) for other countries.

Figure A5: The evolution of household debt in South Africa, 1992-2018: the boom and bust of mortgage debt
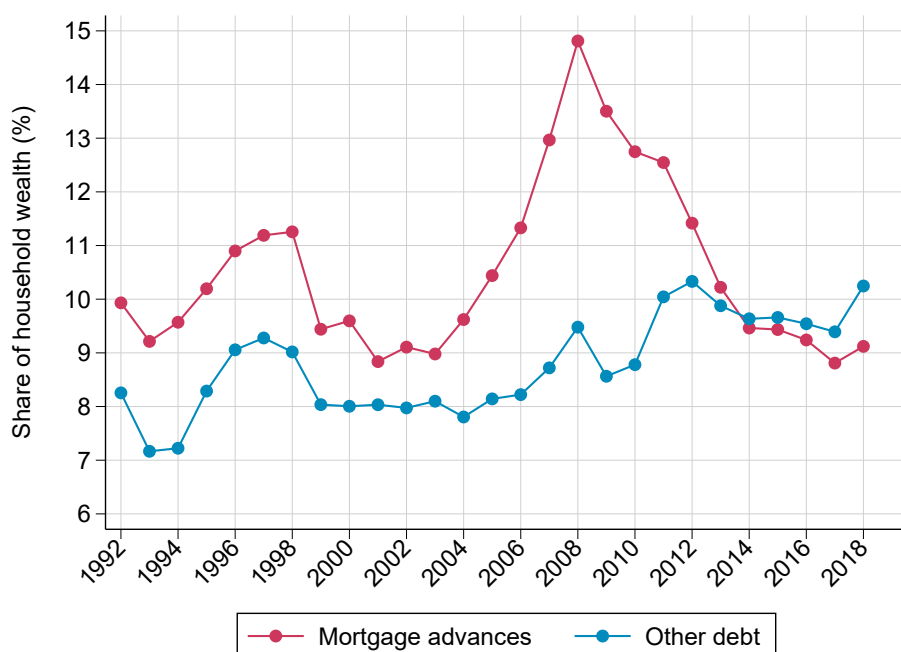
Notes: The figure shows the evolution of total household mortgage advances and total other household debts between 1992 and 2018, expressed as a share of household net wealth.

Source: authors' computations based on data from the SARB.

Figure A6: Wealth inequality in NIDS: reported vs. capitalised pension wealth
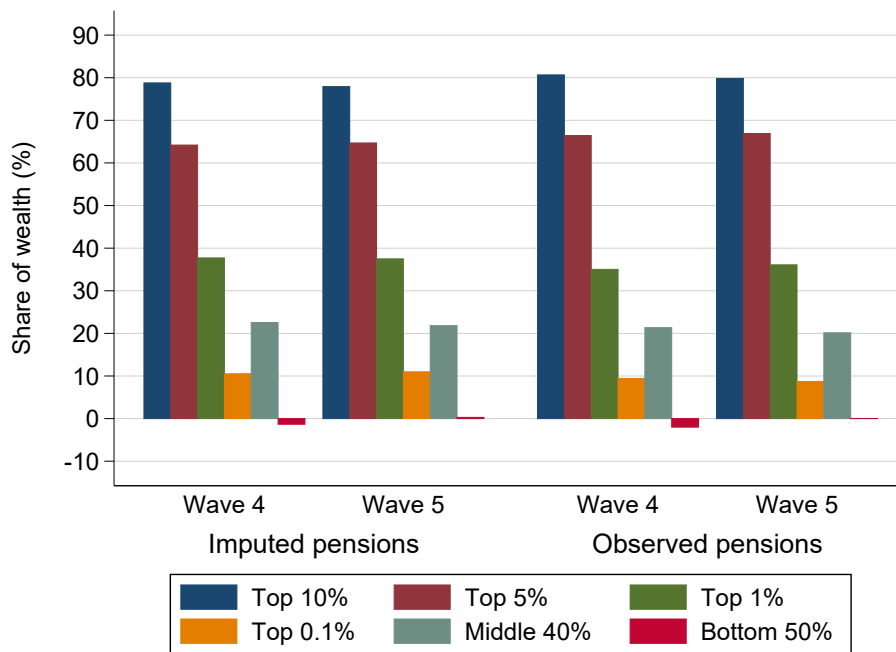
Notes: The figure compares the wealth shares estimated after capitalising pension wealth in NIDS (assuming that 75% of pension assets go to wage earners proportionally to pension contributions, and 25% belong to pensioners proportionally to pension income) to the wealth shares estimated by direct measurement of pension assets in NIDS.

Source: authors' computations based on data.

Figure A7: Wealth inequality in NIDS: reported vs. capitalised life insurance assets
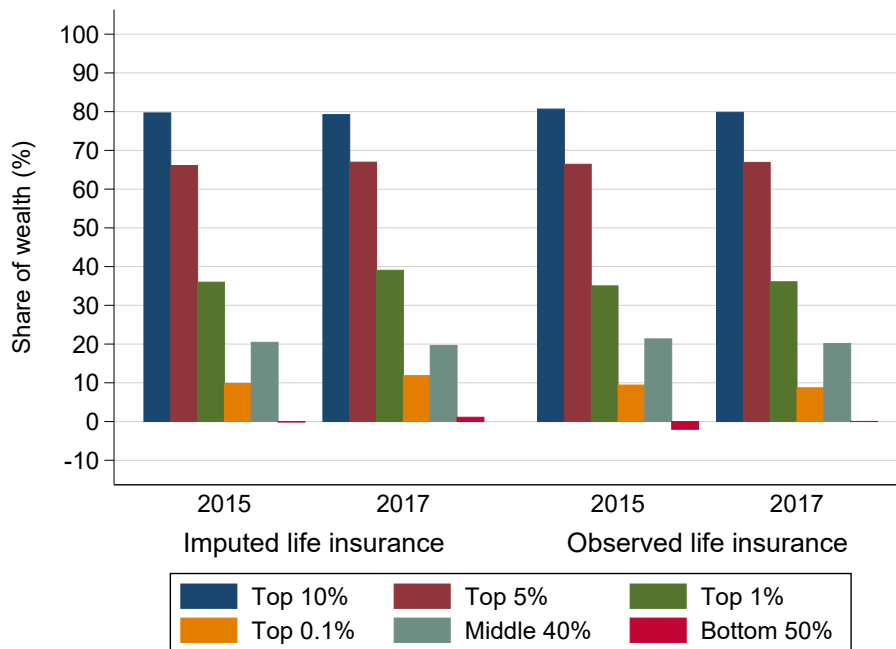
Notes: The figure compares the wealth shares estimated after capitalising life insurance assets in NIDS (assuming that 50% go to wage earners proportionally to factor income, and 50% to other earners proportionally to factor income) to the wealth shares estimated by direct measurement of life insurance assets in NIDS.

Source: authors' computations based on data.

Figure A8: Combination of survey and tax data: quantile functions of merging income, 2017
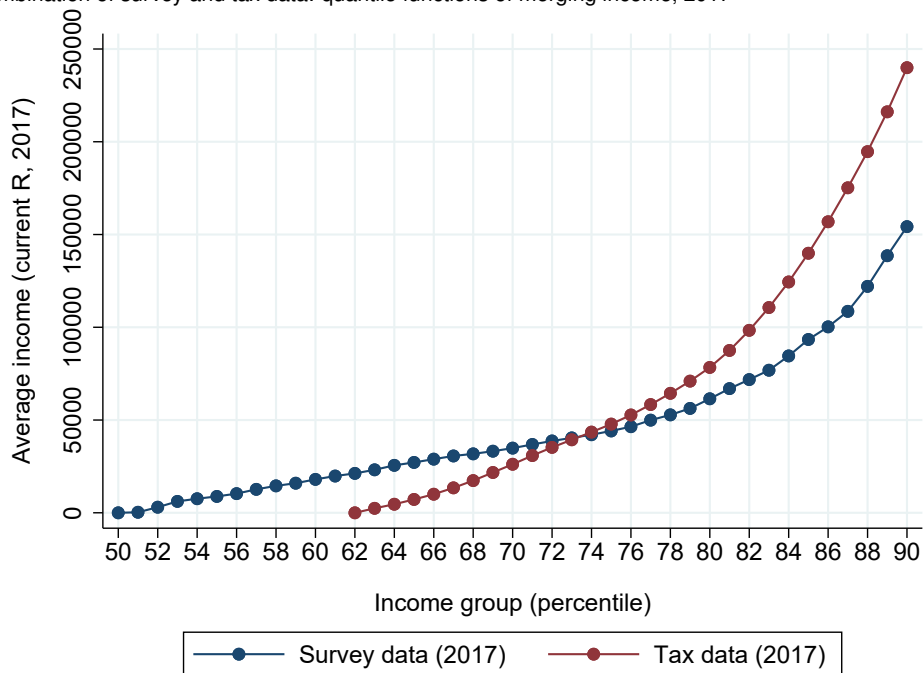
Notes: The figure compares the average merging income by percentile in the survey and in the tax microdata in 2017. Merging income is the sum of gross wages, business income, rental income, interest income and private pension income.

Source: authors' computations based on data.

Figure A9: Combination of survey and tax data: ratio of quantile functions of merging income, 2010-2017
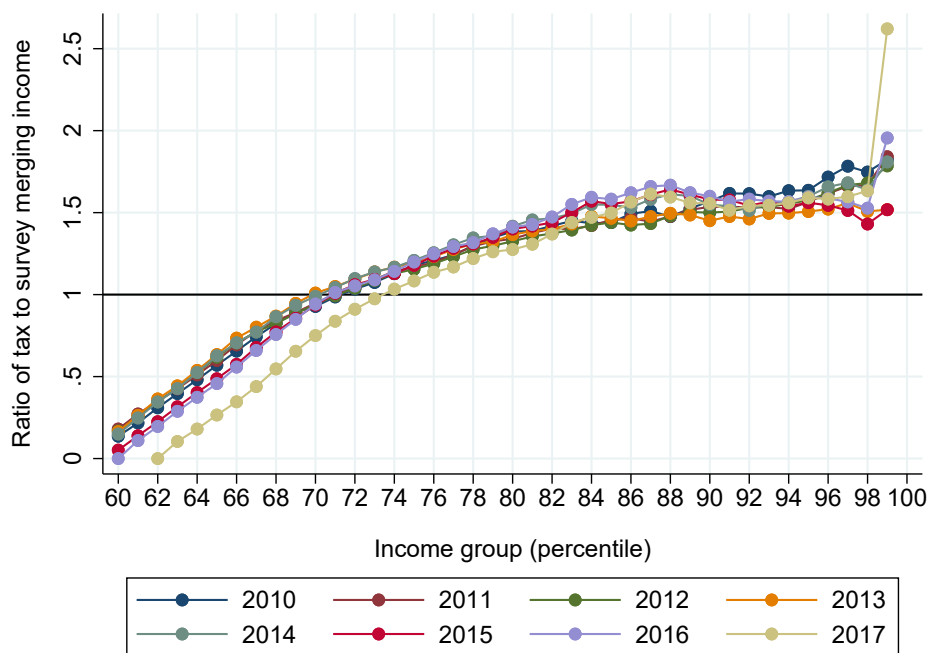
Notes: The figure plots the ratio of average merging income by percentile in the tax microdata to the harmonised survey data between 2010 and 2017. Merging income is the sum of gross wages, business income, rental income, interest income and private pension income.

Source: authors' computations based on data.

Figure A10: Impact of changes in equivalence scales on wealth inequality: Top 10% and Top 1% shares
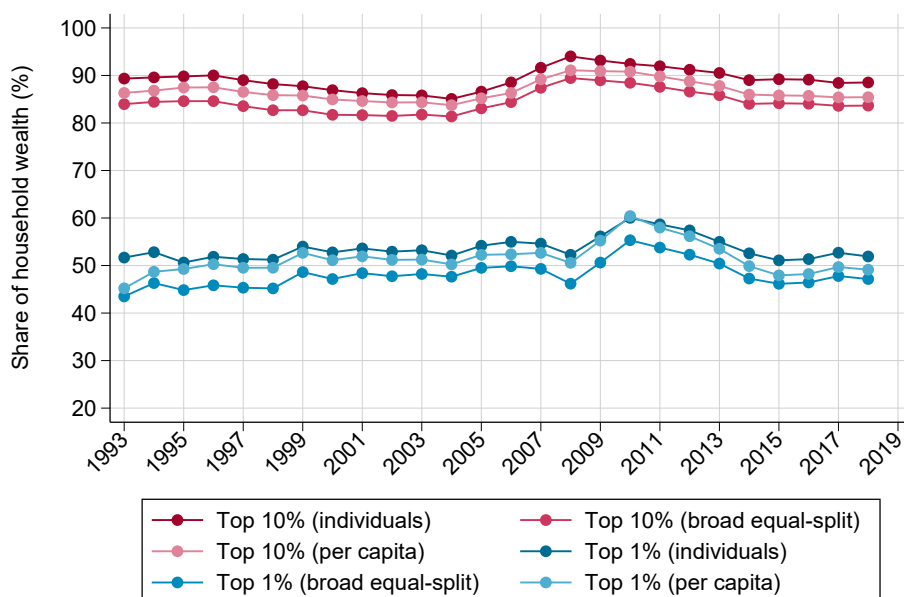
Notes: The figure compares the wealth shares estimated from the mixed method applied to household surveys depending on three different equivalence scales: individual series, broad equal-split series and per capita series.

Source: authors' computations based on data.

Figure A11: Impact of changes in equivalence scales on wealth inequality: Middle 40% and Bottom 50% wealth shares

Notes: The figure compares the wealth shares estimated from the mixed method applied to household surveys depending on three different equivalence scales: individual series, broad equal-split series and per capita series.

Source: authors' computations based on data.

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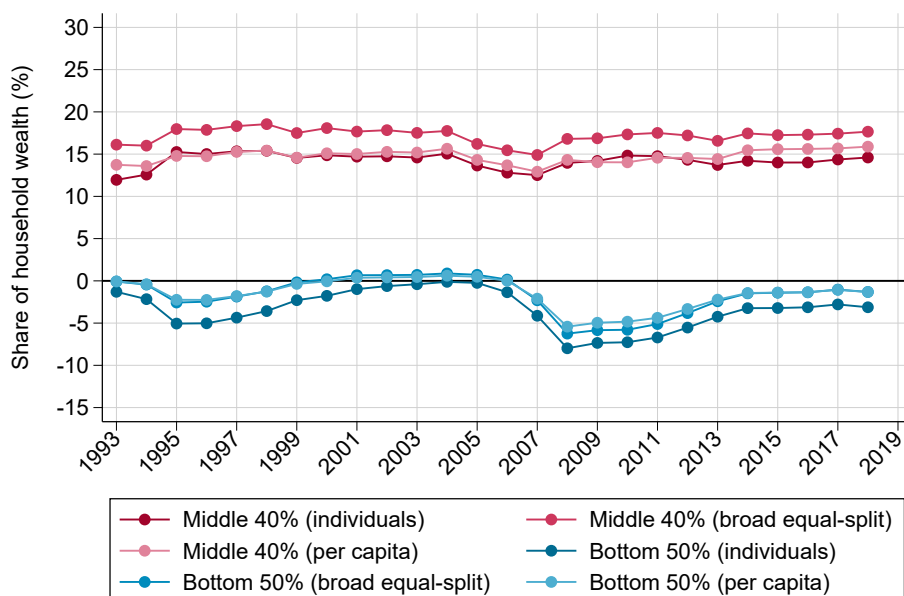
Figure A12: Impact of changes in aggregate housing wealth on wealth inequality: Top 10% and top 1% wealth shares
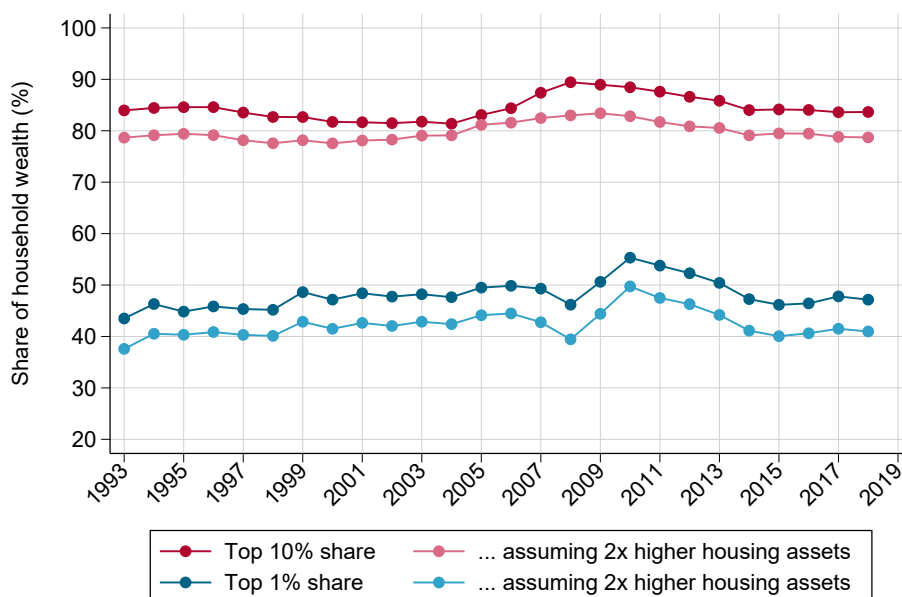
Notes: The figure compares the wealth shares estimated from the mixed method applied to household surveys under two scenarios: one in which total aggregated housing wealth corresponds to official balance sheets figures, and one in which it is estimated to be twice that amount.

Source: authors' computations based on data.

Figure A13: Impact of changes in aggregate housing wealth on wealth inequality: Middle 40% and bottom 50% wealth shares
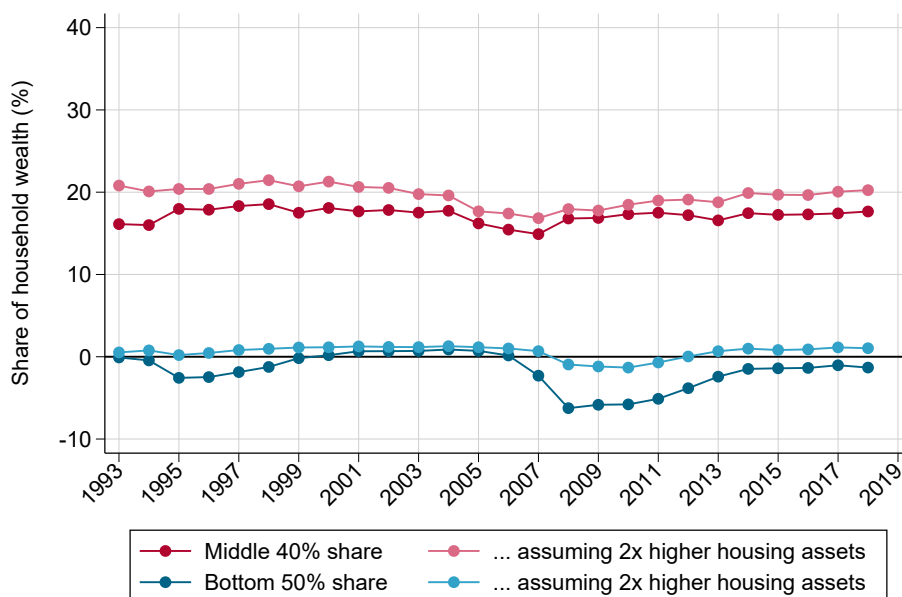
Notes: The figure compares the wealth shares estimated from the mixed method applied to household surveys under two scenarios: one in which total aggregated housing wealth corresponds to official balance sheets figures, and one in which it is estimated to be twice that amount.

Source: authors' computations based on data.

Figure A14: Distribution of wealth vs. distribution of assets: top 10% and top 1% shares
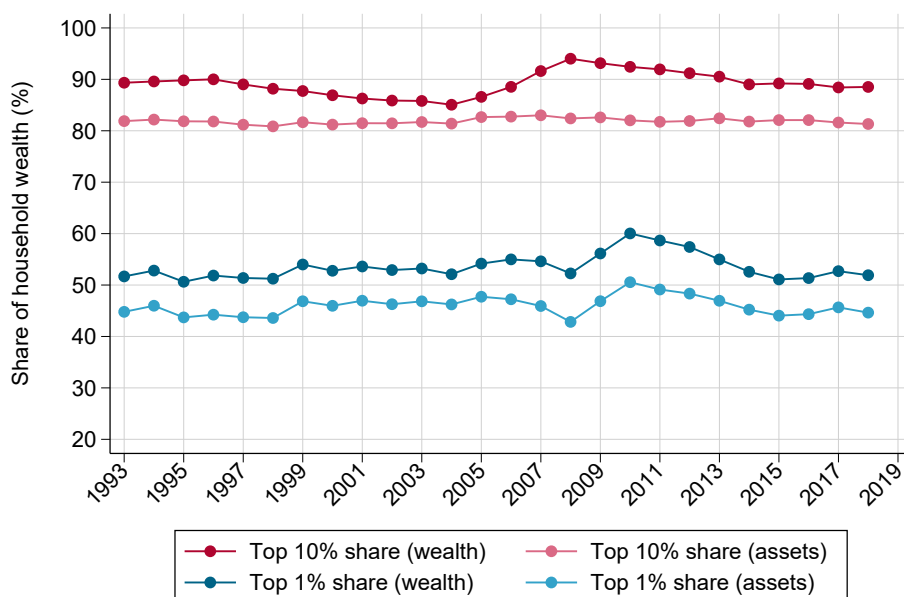
Notes: The figure compares the distribution of wealth and the distribution of assets (that is, excluding debt) in South Africa, estimated from surveys using the mixed method.

Source: authors' computations based on data.

Figure A15: Comparison of methodologies: top 10% share
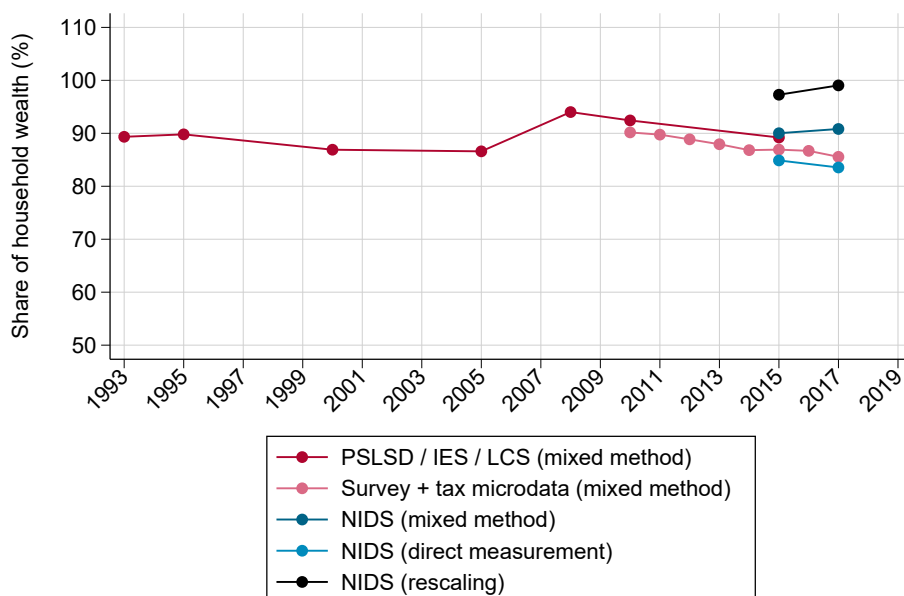
Notes: The figure compares the wealth shares estimated from the mixed method, direct measurement and rescaling of reported wealth components.

Source: authors' computations based on data.

Figure A16: Comparison of methodologies: top 1% share
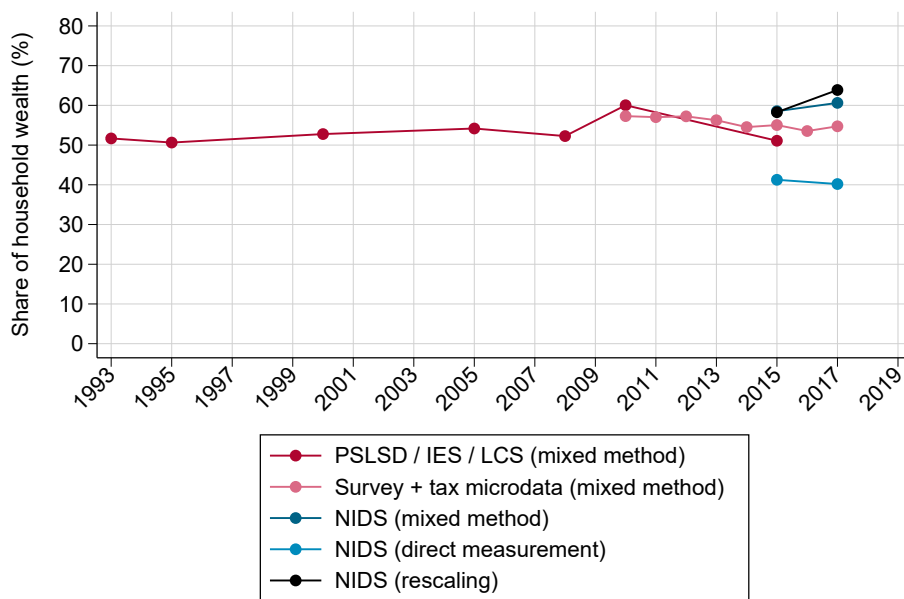
Notes: The figure compares the wealth shares estimated from the mixed method, direct measurement and rescaling of reported wealth components.

Source: authors' computations based on data.

Figure A17: Comparison of methodologies: top 0.1% share
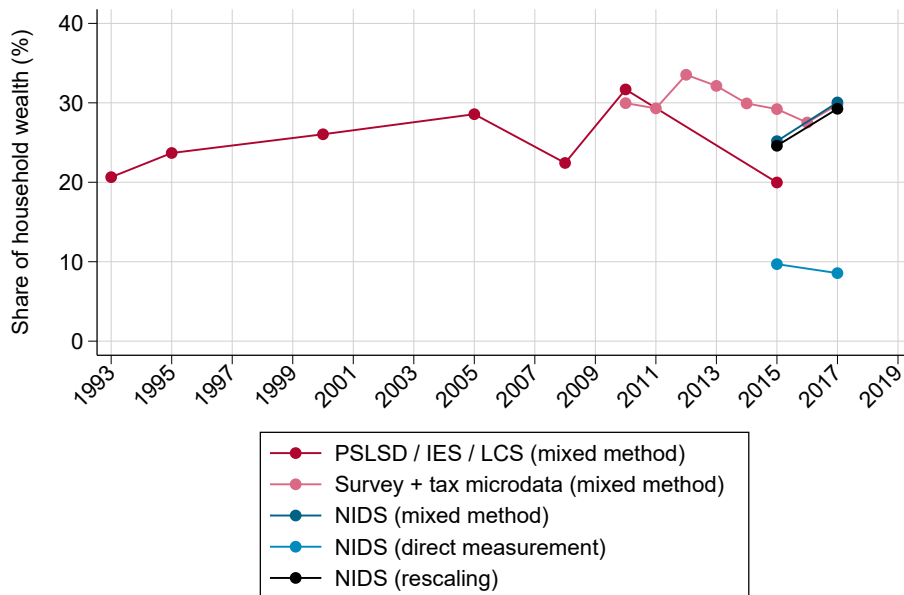
Notes: The figure compares the wealth shares estimated from the mixed method, direct measurement and rescaling of reported wealth components.

Source: authors' computations based on data.

Figure A18: Share of financial assets held through trusts, 1975-2018
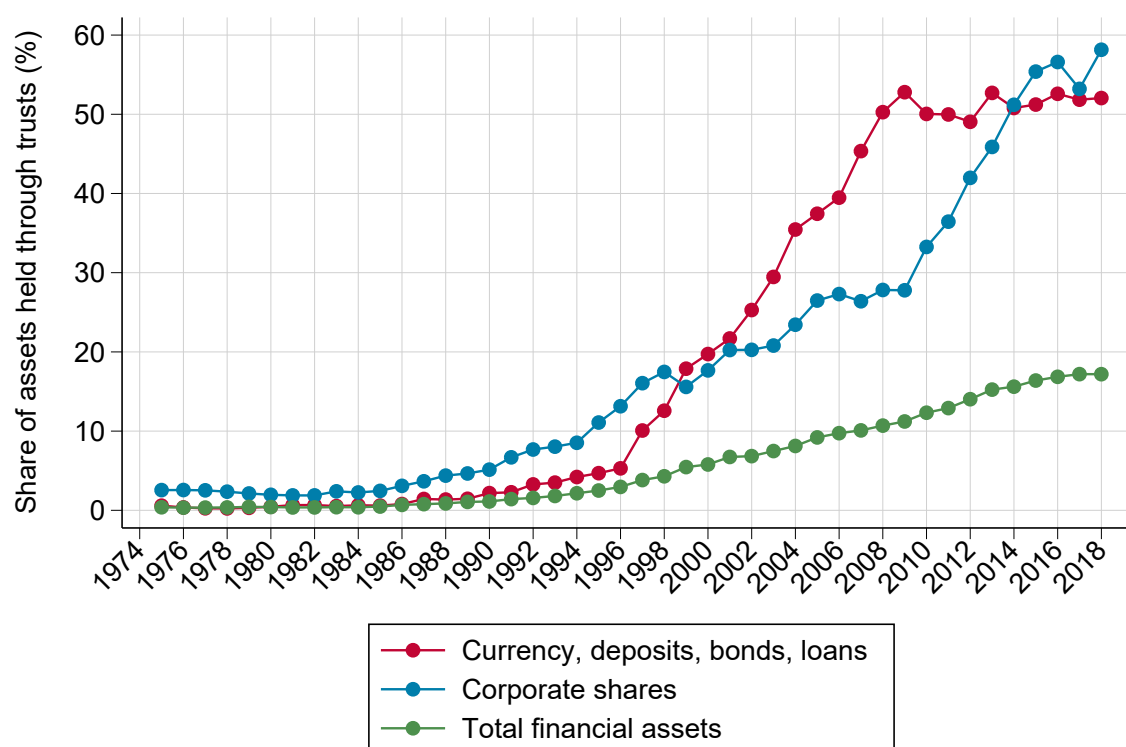
Notes: The figure shows the share of total household assets in the economy held by unit trusts.
Source: authors' compilation based on data from the SARB.

Table A1: The level and composition of household wealth in South Africa in 2018

	Market value (R billion)	% of national income	% of net wealth
Non-financial assets	4504	111.4 %	42.4 %
Owner-occupied housing	3020	74.7 %	28.4 %
Tenant-occupied housing	988	24.4 %	9.3 %
Business assets	497	12.3 %	4.7 %
Financial assets	8294	205.1 %	78.0 %
Pension assets	2944	72.8 %	27.7 %
Life insurance assets	1412	34.9 %	13.3 %
Bonds and interest deposits	1798	44.5 %	16.9 %
Currency, notes and coins	87	2.2 %	0.8 %
Corporate shares	2053	50.8 %	19.3 %
Total liabilities	2170	53.7 %	20.4 %
Mortgage debt	1022	25.3 %	9.6 %
Non-mortgage debt	1148	28.4 %	10.8 %
Net household wealth	10629	262.9 %	100.0 %
Offshore wealth	575	14.2 %	5.4 %
Net wealth incl. offshore wealth	11204	277.1 %	105.4 %

Notes: The table shows the level and composition of household wealth in South Africa in 2018. The market value of each component is expressed in current billion rands.
Source: Own estimates combining available data sources from the SARB.

Table A2: Ownership rates and coverage of household balance sheets by asset class in NIDS

	% of adults with asset or debt		% of balance sheets covered	
	Wave 4	Wave 5	Wave 4	Wave 5
Household assets				
Owner-occupied housing	72.3 %	65.2 %	151.7 %	220.8 %
Tenant-occupied housing	3.3 %	3.5 %	122.4 %	97.2 %
Business assets	5.6 %	5.0 %	135.4 %	59.6 %
Pension and life insurance	25.7 %	24.4 %	110.0 %	104.3 %
Bonds and stock	1.5 %	1.3 %	3.9 %	3.8 %
Household debts				
Mortgage debt	8.0 %	7.0 %	71.0 %	56.8 %
Other debts	36.3 %	33.7 %	54.5 %	37.0 %

Notes: The table shows the share of South Africans who declare having a particular type of asset or debt, along with the share of the total value of this asset or debt in the economy captured by the NIDS survey.

Source: authors' computations based on data. The unit of observation is the adult individual aged 20 or above. Calculations based on weighted sample using design weights.

Table A3: The coverage of owner-occupied housing, mortgage debt and other debt in South African surveys

	Owner-occupied housing	Mortgage debt	Other debt
PSLSD, 1993	143.5 %	86.5 %	37.4 %
IES, 1995	121.7 %	27.2 %	16.5 %
IES, 2000		40.3 %	34.9 %
IES, 2005	105.9 %	67.9 %	41.5 %
IES, 2010	193.9 %	16.4 %	20.5 %
LCS, 2008	145.4 %	13.9 %	18.4 %
LCS, 2015	179.5 %	51.0 %	22.2 %
NIDS, wave 4	122.3 %	74.3 %	57.4 %
NIDS, wave 5	258.8 %	56.8 %	37.0 %

Notes: The table shows the ratio of total assets or debts reported in surveys to the corresponding totals reported in the household balance sheets. PSLSD: Project for Statistics on Living Standards and Development. IES: Income and Expenditure Survey. LCS: Living Conditions Survey. NIDS: National Income Dynamics Study.

Source: authors' computations based on data. The unit of observation is the adult individual aged 20 or above. Calculations based on weighted samples using weights calibrated by the authors' (see appendix).

Table A4: The coverage of selected national accounts components in South African surveys

	Gross wages	Mixed income	Rental income	Interest and dividends
PSLSD, 1993	87.7 %	51.7 %	38.4 %	11.5 %
IES, 1995	76.9 %	55.0 %	9.9 %	8.8 %
IES, 2000	70.9 %	37.2 %	23.1 %	3.4 %
IES, 2005	80.5 %	64.2 %	21.7 %	3.8 %
IES, 2010	80.2 %	71.9 %	13.5 %	4.5 %
LCS, 2008	77.7 %	75.8 %	16.3 %	8.4 %
LCS, 2015	74.6 %	86.8 %	21.6 %	12.6 %
NIDS, wave 1	62.7 %	12.0 %	65.4 %	7.3 %
NIDS, wave 2	67.6 %	4.1 %	13.0 %	0.8 %
NIDS, wave 3	65.7 %	20.6 %	20.7 %	7.3 %
NIDS, wave 4	73.5 %	12.9 %	43.9 %	2.5 %
NIDS, wave 5	72.1 %	14.1 %	41.0 %	5.5 %

Notes: The table shows the ratio of total income reported in surveys to the total corresponding income reported in the national accounts published by the SARB. PSLSD: Project for Statistics on Living Standards and Development. IES: Income and Expenditure Survey. LCS: Living Conditions Survey. NIDS: National Income Dynamics Study.

Source: authors' computations based on data. The unit of observation is the adult individual aged 20 or above. Calculations based on weighted samples using weights calibrated by the authors' (see appendix).

Table A5: Shares of household wealth held by groups in South Africa: results from tax microdata and survey combined

	Bottom 50%	Middle 40%	Top 10%	Top 1%	Top 0.1%
2010	-6.8 %	16.6 %	90.2 %	57.3 %	30.0 %
2011	-6.4 %	16.7 %	89.8 %	57.0 %	29.3 %
2012	-5.3 %	16.5 %	88.9 %	57.2 %	33.5 %
2013	-4.0 %	16.0 %	87.9 %	56.3 %	32.1 %
2014	-3.0 %	16.2 %	86.8 %	54.5 %	29.9 %
2015	-2.9 %	16.0 %	86.9 %	55.0 %	29.2 %
2016	-2.9 %	16.2 %	86.7 %	53.5 %	27.5 %
2017	-2.5 %	16.9 %	85.6 %	54.7 %	29.8 %

Notes: The table shows estimates of the share of household wealth owned by the bottom 50% (p0p50), the middle 40% (p50p90), the top 10% (p90p100), the top 1% (p99p100 and the top 0.1% (p99.9p100) obtained from the income capitalisation method combining surveys and tax microdata. The unit of observation is the individual adult aged 20 or above.
Source: authors' computations based on data.

Table A6: Trust data (ITR12T) descriptive statistics

	2014	2015	2016	2017	2018
Number of trusts	138859	134106	127457	115825	93379
Dividends (% of household dividends)	0.0%	0.3%	0.5%	0.5%	0.3%
Interest income (% of household interest)	3.1%	2.9%	2.5%	2.6%	1.7%
Capital gain (% of property income)	1.3%	1.6%	2.4%	1.4%	0.6%
Rental income (% of household rental income)	2.4%	2.4%	2.1%	1.9%	1.4%
Business income (% of mixed income)	1.7%	1.6%	1.6%	1.4%	1.0%
Total trust income (% of property income)	4.6%	5.2%	5.9%	4.7%	2.9%

Notes: The table provides information on the number of trusts filing ITR12T forms in South Africa, as well as coverage of selected national income components.
Source: authors' computations based on data.

Table A7: The coverage of capital income in the tax microdata

	Rental income	Interest income	Dividends
2010	9.5 %	25.4 %	2.4 %
2011	11.7 %	25.0 %	5.3 %
2012	12.3 %	28.3 %	3.9 %
2013	13.4 %	28.8 %	5.2 %
2014	12.1 %	27.8 %	25.1 %
2015	12.3 %	27.8 %	10.6 %
2016	13.7 %	31.0 %	13.1 %
2017	6.9 %	18.3 %	15.8 %

Notes: The table shows the ratio of total income reported in the tax microdata to the corresponding total reported in the national accounts published by the SARB.
Source: authors' computations based on data.

Data Appendix: Tax Microdata

The tax microdata used in this paper refers to the "Individual Panel" dataset (see Ebrahim & Axelson 2019). The data was accessed from August 2019 to March 2020. The version of the dataset used in this paper is 2019_1. The table below shows all the source codes used, along with the corresponding income category attributed to each source code.

Table A8: Source codes categories used in tax microdata

Income concept	Source code	Description
Gross wage	3601	Income (subject to PAYE)
Gross wage	3602	Income (non-taxable)
Gross wage	3605	Annual payment (subject to PAYE)
Gross wage	3606	Commission (subject to PAYE)
Gross wage	3607	Overtime (subject to PAYE)
Gross wage	3608	Arbitration award (subject to PAYE)
Gross wage	3609	Arbitration award (non-taxable)
Gross wage	3611	Purchased annuity (subject to PAYE)
Gross wage	3612	Purchased annuity (non-taxable)
Gross wage	3613	Restraint of trade (subject to PAYE)
Gross wage	3615	Director's remuneration (subject to PAYE)
Gross wage	3616	Independent contractors (subject to PAYE)
Gross wage	3617	Labour Brokers (subject to PAYE)

Table A8: Source codes categories used in tax microdata

Income concept	Source code	Description
Gross wage	3619	Labour Brokers (IT)
Gross wage	3620	Directors fees RSA resident
Gross wage	3621	Directors fees non-resident
Gross wage	3651	Foreign income (subject to paye)
Gross wage	3652	Foreign income (non-taxable)
Gross wage	3655	Foreign annual payment (subject to paye)
Gross wage	3656	Foreign commission (subject to paye)
Gross wage	3657	Foreign overtime (subject to paye)
Gross wage	3658	Foreign arbitration award (subject to paye)
Gross wage	3659	Foreign arbitration award (non-taxable)
Gross wage	3661	Foreign purchased annuity (subject to paye)
Gross wage	3662	Foreign purchased annuity (non-taxable)
Gross wage	3663	Foreign restraint of trade (subject to paye)
Gross wage	3665	Foreign director's remuneration (subject to paye)
Gross wage	3666	Foreign independent contractors (subject to paye)
Gross wage	3667	Foreign labour brokers (subject to paye)
Gross wage	3669	Foreign labour brokers (it)

Table A8: Source codes categories used in tax microdata

Income concept	Source code	Description
Gross wage	3670	Foreign directors fees rsa resident
Gross wage	3701	Travel allowance (subject to PAYE)
Gross wage	3702	Reimbursive travel allowance (IT)
Gross wage	3703	Reimbursive travel allowance (non-taxable)
Gross wage	3704	Subsistence allowance local travel (IT)
Gross wage	3705	Subsistence allowance local travel (non-taxable)
Gross wage	3706	Entertainment allowance (subject to PAYE)
Gross wage	3707	Share options exercised (subject to PAYE)
Gross wage	3708	Public office allowance (subject to PAYE)
Gross wage	3709	Uniform allowance (non-taxable)
Gross wage	3710	Tool allowance (subject to PAYE)
Gross wage	3711	Computer allowance (subject to PAYE)
Gross wage	3712	Telephone allowance (subject to PAYE)
Gross wage	3713	Other allowances (subject to PAYE)
Gross wage	3714	Other allowances (non-taxable)
Gross wage	3715	Subsistence allowance foreign travel (IT)
Gross wage	3716	Subsistence allowance foreign travel (non-taxable)

Table A8: Source codes categories used in tax microdata

Income concept	Source code	Description
Gross wage	3722	Reimbursive travel allowance
Gross wage	3751	Foreign travel allowance (subject to paye)
Gross wage	3752	Foreign reimbursive travel allowance (it)
Gross wage	3753	Foreign reimbursive travel allowance (non-taxable)
Gross wage	3754	Foreign subsistence allowance local travel (it)
Gross wage	3755	Foreign subsistence allowance local travel (non-taxable)
Gross wage	3756	Foreign entertainment allowance (subject to paye)
Gross wage	3757	Foreign share options exercised (subject to paye)
Gross wage	3758	Foreign public office allowance (subject to paye)
Gross wage	3759	Foreign uniform allowance (non-taxable)
Gross wage	3760	Foreign tool allowance (subject to paye)
Gross wage	3761	Foreign computer allowance (subject to paye)
Gross wage	3762	Foreign telephone allowance (subject to paye)
Gross wage	3763	Foreign other allowances (subject to paye)
Gross wage	3764	Foreign other allowances (non-taxable)
Gross wage	3765	Foreign subsistence allowance foreign travel (it)
Gross wage	3766	Foreign subsistence allowance foreign travel (non-taxable)

Table A8: Source codes categories used in tax microdata

Income concept	Source code	Description
Gross wage	3772	Foreign reimbursive travel allowance
Gross wage	3801	General fringe benefits (subject to PAYE)
Gross wage	3802	Use of motor acquired by employer not via operating lease (subject to PAYE)
Gross wage	3803	Use of asset (subject to PAYE)
Gross wage	3804	Meals etc (subject to PAYE)
Gross wage	3805	Accomodation (subject to PAYE)
Gross wage	3806	Services (subject to PAYE)
Gross wage	3807	Loans or subsidy (subject to PAYE)
Gross wage	3809	Taxable bursaries or scholarships to a non-disabled person basic education (subject to PAYE)
Gross wage	3810	Medical aid contributions (subject to PAYE)
Gross wage	3813	Medical services costs (subject to PAYE)
Gross wage	3815	Non-taxable bursaries or scholarships to non-disabled person basic education
Gross wage	3816	Use of motor vehicle acquired by employers via operating lease (subject to PAYE)
Gross wage	3820	Taxable bursaries or scholarships to a non-disabled person further education (subject to PAYE)
Gross wage	3821	Non-taxable bursaries or scholarships to non-disabled person further education
Gross wage	3822	Non-taxable benefit on acquisition of immovable property
Gross wage	3829	Taxable bursaries or scholarships to a disabled person basic education (subject to PAYE)

Table A8: Source codes categories used in tax microdata

Income concept	Source code	Description
Gross wage	3830	Non-taxable bursaries or scholarships to a disabled person basic education
Gross wage	3831	Taxable bursaries or scholarships to a disabled person further education (subject to PAYE)
Gross wage	3832	Non-taxable bursaries or scholarships to a disabled person further education
Gross wage	3851	Foreign general fringe benefits (subject to paye)
Gross wage	3852	Foreign use of motor acquired by employer not via operating lease (subject to paye)
Gross wage	3853	Foreign use of asset (subject to paye)
Gross wage	3854	Foreign meals etc (subject to paye)
Gross wage	3855	Foreign accomodation (subject to paye)
Gross wage	3856	Foreign services (subject to paye)
Gross wage	3857	Foreign loans or subsidy (subject to paye)
Gross wage	3859	Foreign taxable bursaries or scholarships to a non-disabled person basic education (subject to paye)
Gross wage	3860	Foreign medical aid contributions (subject to paye)
Gross wage	3863	Foreign medical services costs (subject to paye)
Gross wage	3865	Foreign non-taxable bursaries or scholarships to non-disabled person basic education
Gross wage	3866	Foreign use of motor vehicle acquired by employers via operating lease (subject to paye)
Gross wage	3870	Foreign taxable bursaries or scholarships to a non-disabled person further education (subject to paye)
Gross wage	3871	Foreign non-taxable bursaries or scholarships to non-disabled person further education

Table A8: Source codes categories used in tax microdata

Income concept	Source code	Description
Gross wage	3872	Foreign non-taxable benefit on acquisition of immovable property
Gross wage	3879	Foreign taxable bursaries or scholarships to a disabled person basic education (subject to paye)
Gross wage	3880	Foreign non-taxable bursaries or scholarships to a disabled person basic education
Gross wage	3881	Foreign taxable bursaries or scholarships to a disabled person further education (subject to paye)
Gross wage	3882	Foreign non-taxable bursaries or scholarships to a disabled person further education
Gross wage	4236	Remuneration from foreign employer for services rendered in South Africa
Business income	102-4222	Business income (gains and losses)
Pension contributions	4001	Total pension fund contributions paid and deemed paid by employee
Pension contributions	4002	Arrear pension fund contributions paid by employee
Pension contributions	4003	Total provident fund contributions paid and deemed paid by employee
Pension contributions	4004	Arrear provident fund contributions paid by employee
Pension contributions	4006	Total retirement annuity fund contributions paid and deemed paid by employee
Pension contributions	4007	Arrear retirement annuity fund contributions paid by employee
Pension income	3603	Pension (subject to PAYE)
Pension income	3604	Pension (non-taxable)
Pension income	3610	Annuity from a RAF (subject to PAYE)
Pension income	3614	Other retirement lump sums (subject to PAYE)

Table A8: Source codes categories used in tax microdata

Income concept	Source code	Description
Pension income	3653	Foreign pension (subject to paye)
Pension income	3654	Foreign pension (non-taxable)
Pension income	3660	Foreign annuity from a raf (subject to paye)
Pension income	3664	Foreign other retirement lump sums (subject to paye)
Pension income	3902	Pension or RAF in respect of withdrawal (subject to PAYE)
Pension income	3903	Pension or RAF in respect of retirement (subject to PAYE)
Pension income	3904	Provident in respect of withdrawal (subject to PAYE)
Pension income	3905	Provident in respect of retirement (subject to PAYE)
Pension income	3908	Surplus apportionments and exempt policy proceeds (non-taxable)
Pension income	3909	Unclaimed benefits
Pension income	3915	Retirement or termination of employment lump sum benefits or commutation of annuities
Pension income	3920	Lump sum withdrawal benefits (subject to PAYE)
Pension income	3921	Living annuity and section 15C of the pension funds act, surplus apportionments (subject to PAYE)
Pension income	3923	Transfer of unclaimed benefits
Pension income	3924	Transfer on retirement (subject to PAYE)
Pension income	3952	Foreign pension or raf in respect of withdrawal (subject to paye)
Pension income	3953	Foreign pension or raf in respect of retirement (subject to paye)

Table A8: Source codes categories used in tax microdata

Income concept	Source code	Description
Pension income	3954	Foreign provident in respect of withdrawal (subject to paye)
Pension income	3955	Foreign provident in respect of retirement (subject to paye)
Interest income	4201	Local interest excluding SARS
Interest income	4218	Foreign interest
Interest income	4237	SARS interest received
Interest income	4241	Tax free investment account interest
Rental income	2532	Business income component: property letting income, residential accomodation
Rental income	2533	Business income component: property letting loss, residential accomodation
Rental income	4210	Local rental from letting of fixed property
Rental income	4288	Foreign rental gain
Dividends	3717	Broad-based employee share plan (subject to PAYE)
Dividends	3718	Vesting of equity instruments or return of capital iro restricted instruments (PAYE)
Dividends	3719	Dividends not exempt ito para (dd) of the proviso to s10(1)(k)(i) (PAYE)
Dividends	3720	Dividends not exempt ito para (ii) of the proviso to s10(1)(k)(i) (PAYE)
Dividends	3721	Dividends not exempt ito para (jj) of the proviso to s10(1)(k)(i) (PAYE)
Dividends	3723	Dividends not exempt ito para (kk) of the proviso to s10(1)(k)(i) (PAYE)
Dividends	3767	Foreign broad-based employee share plan (subject to paye)

Table A8: Source codes categories used in tax microdata

Income concept	Source code	Description
Dividends	3768	Foreign vesting of equity instruments or return of capital iro restricted instruments (paye)
Dividends	3769	Foreign dividends not exempt ito para (dd) of the proviso to s10(1)(k)(i) (paye)
Dividends	3770	Foreign dividends not exempt ito para (ii) of the proviso to s10(1)(k)(i) (paye)
Dividends	3771	Foreign dividends not exempt ito para (jj) of the proviso to s10(1)(k)(i) (paye)
Dividends	3773	Foreign dividends not exempt ito para (kk) of the proviso to s10(1)(k)(i) (paye)
Dividends	4216	Foreign dividends
Dividends	4230	Controlled foreign company share of profit
Dividends	4238	Taxable local dividends ie REIT
Dividends	4242	Tax free investment account dividends
Dividends	4257	Tax free investments other
Dividends	4292	Dividends deemed to be income in terms of s8E and s8EA
Not used	3618	Misclassification or undefined
Not used	3695	Misclassification or undefined
Not used	3696	Gross non-taxable income
Not used	3697	Gross retirement funding employment income
Not used	3698	Gross non-retirement funding employment income
Not used	3699	Gross employment income taxable

Table A8: Source codes categories used in tax microdata

Income concept	Source code	Description
Not used	3808	Employee's debt (subject to PAYE)
Not used	3817	Benefit employer pension fund contributions (subject to PAYE)
Not used	3818	Misclassification or undefined
Not used	3819	Misclassification or undefined
Not used	3825	Benefit employer provident fund contributions (subject to PAYE)
Not used	3826	Misclassification or undefined
Not used	3827	Misclassification or undefined
Not used	3828	Benefit retirement annuity fund contributions (subject to PAYE)
Not used	3858	Foreign employee's debt (subject to paye)
Not used	3867	Foreign benefit employer pension fund contributions (subject to paye)
Not used	3875	Foreign benefit employer provident fund contributions (subject to paye)
Not used	3876	Misclassification or undefined
Not used	3877	Misclassification or undefined
Not used	3878	Foreign benefit retirement annuity fund contributions (subject to paye)
Not used	3901	Gratuities and severance benefits (subject to PAYE)
Not used	3906	Special remuneration (subject to PAYE)
Not used	3907	Other lump sums (subject to PAYE)

Table A8: Source codes categories used in tax microdata

Income concept	Source code	Description
Not used	3922	Compensation iro of death during employment (non-taxable)
Not used	3951	Foreign gratuities and severance benefits (subject to paye)
Not used	3956	Foreign special remuneration (subject to paye)
Not used	3957	Foreign other lump sums (subject to paye)
Not used	4005	Medical scheme fees paid and deemed paid by employee
Not used	4008	Misclassification or undefined
Not used	4009	Misclassification or undefined
Not used	4011	Donations allowable in terms of section 18a to an approved public benefit organisation
Not used	4014	Misclassification or undefined
Not used	4015	Travel expenses (no allowance, commission income)
Not used	4016	Other deductions
Not used	4017	Expenses against local taxable subsistence allowance
Not used	4018	Premiums paid for loss of income policies
Not used	4019	Expenses against foreign taxable subsistence allowance
Not used	4024	Medical services costs deemed to be paid by the employee
Not used	4025	Medical contribution paid by employee allowed as a deduction for employees tax purposes
Not used	4026	Arrear pension fund contributions non-statutory forces

Table A8: Source codes categories used in tax microdata

Income concept	Source code	Description
Not used	4027	Depreciation
Not used	4028	Home office expenses
Not used	4029	Retirement fund contributions total
Not used	4030	Donations deducted from the employee remuneration and paid by employer to organisation
Not used	4031	Section 8C losses
Not used	4032	Remuneration (s8A/8C gains) taxed on IRP5 but comply with exemption in terms of s10(i)(o)(ii)
Not used	4033	Remuneration taxed on IRP5 but comply with exemption in terms of s10(1)(o)(i)
Not used	4041	Remuneration taxed on IRP5 but comply with exemption in terms of s10(1)(o)(ii) (excluding s 8A/8C gains)
Not used	4042	Amounts refunded ito section 11(nA) and 11(nB)
Not used	4043	Allowable accountancy or administration expenses
Not used	4044	Legal expenses
Not used	4045	Bad debt
Not used	4046	Use of motor vehicle
Not used	4047	Holders of public office deduction
Not used	4048	Misclassification or undefined
Not used	4050	Misclassification or undefined
Not used	4051	Misclassification or undefined

Table A8: Source codes categories used in tax microdata

Income concept	Source code	Description
Not used	4101	SITE
Not used	4102	PAYE
Not used	4103	Misclassification or undefined
Not used	4104	Misclassification or undefined
Not used	4110	Misclassification or undefined
Not used	4111	Other foreign tax credits individuals
Not used	4112	Foreign tax credits on such foreign dividends
Not used	4113	Foreign tax credits on foreign interest
Not used	4114	Foreign tax credits in respect of foreign capital gain or loss
Not used	4115	Tax on retirement lump sum and severance benefits
Not used	4116	Medical scheme fees tax credit
Not used	4117	Foreign tax credits in respect of S6quin
Not used	4118	Sum of ETI amounts
Not used	4120	Additional medical expenses tax credit
Not used	4121	Foreign tax credits on foreign rental income
Not used	4141	UIF contribution
Not used	4142	SDL contribution

Table A8: Source codes categories used in tax microdata

Income concept	Source code	Description
Not used	4149	Total tax
Not used	4150	Metadata
Not used	4211	Local rental loss from letting of fixed property
Not used	4212	Royalties
Not used	4213	Loss royalties
Not used	4214	Other receipts and accruals
Not used	4215	Misclassification or undefined
Not used	4219	Tax free investment account contribution
Not used	4220	Misclassification or undefined
Not used	4221	Misclassification or undefined
Not used	4223	Loss foreign business or trading
Not used	4228	Other foreign income
Not used	4229	Loss other foreign income
Not used	4235	Income reflected on a South African IRP5 or IT3a that was subject to tax outside SA
Not used	4239	Tax free investment account net return on investment profit
Not used	4240	Tax free investment account net return on investment loss
Not used	4243	Tax free investment account capital gain

Table A8: Source codes categories used in tax microdata

Income concept	Source code	Description
Not used	4244	Tax free investment account capital loss
Not used	4245	Misclassification or undefined
Not used	4246	Tax free investment account transfer in
Not used	4247	Tax free investment account transfer out
Not used	4248	Tax free investment account withdrawal
Not used	4249	Foreign tax credits refunded or discharged in terms of S6quat(1C)
Not used	4250	Local capital gain
Not used	4251	Loss local capital
Not used	4252	Foreign capital gain
Not used	4253	Loss foreign capital
Not used	4278	Foreign royalties
Not used	4279	Loss foreign royalties
Not used	4280	Sporting
Not used	4281	Loss sporting
Not used	4282	Collectables
Not used	4283	Loss collectables
Not used	4284	Animal showing

Table A8: Source codes categories used in tax microdata

Income concept	Source code	Description
Not used	4285	Loss animal showing
Not used	4286	Gambling
Not used	4287	Loss gambling
Not used	4289	Foreign rental loss
Not used	4291	Foreign income in terms of s6quat(1C)
Not used	4301	Misclassification or undefined
Not used	4302	Misclassification or undefined
Not used	4472	Employer pension fund contributions paid for the benefit of employee
Not used	4473	Employer provident fund contributions paid for the benefit of employee
Not used	4474	Employer medical scheme fees paid for the benefit of employee
Not used	4475	Employer retirement annuity fund contributions paid for the benefit of employee
Not used	4476	Misclassification or undefined
Not used	4485	Medical services costs deemed to be paid by the employee for other relatives
Not used	4486	Capped amount determined by employer in terms of section 18(2)(c)(i)
Not used	4487	No value benefits in respect of medical services provided or incurred by the employer
Not used	4493	Employer's medical scheme fees paid for the benefit of a retired/former of the Seventh Schedule
Not used	4497	Total deductions and contributions

Table A8: Source codes categories used in tax microdata

Income concept	Source code	Description
Not used	4582	The portion of the allowances and benefits which represents remuneration
Not used	4583	The portion of other allowances and benefits which represents remuneration

Source. Authors' elaboration.