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Exclusive growth?

Rapidly increasing top incomes amid low national growth in South Africa

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Abstract: Despite South Africa's need for inclusive economic growth, we find that the income trajectories of the rich continue to diverge from the rest of the income distribution. We combine household survey data and tax data (which, unlike household survey data, includes accurate data for the very rich) to investigate the patterns of income growth over the period 2003 to 2017. We find that the gap between the stagnant middle and the top end of the income distribution widened between 2003 and 2017. We also show that the divergence was partly driven by high returns to capital for those with top incomes.

Key words: top incomes, income distribution, tax data

JEL classification: D31, H24

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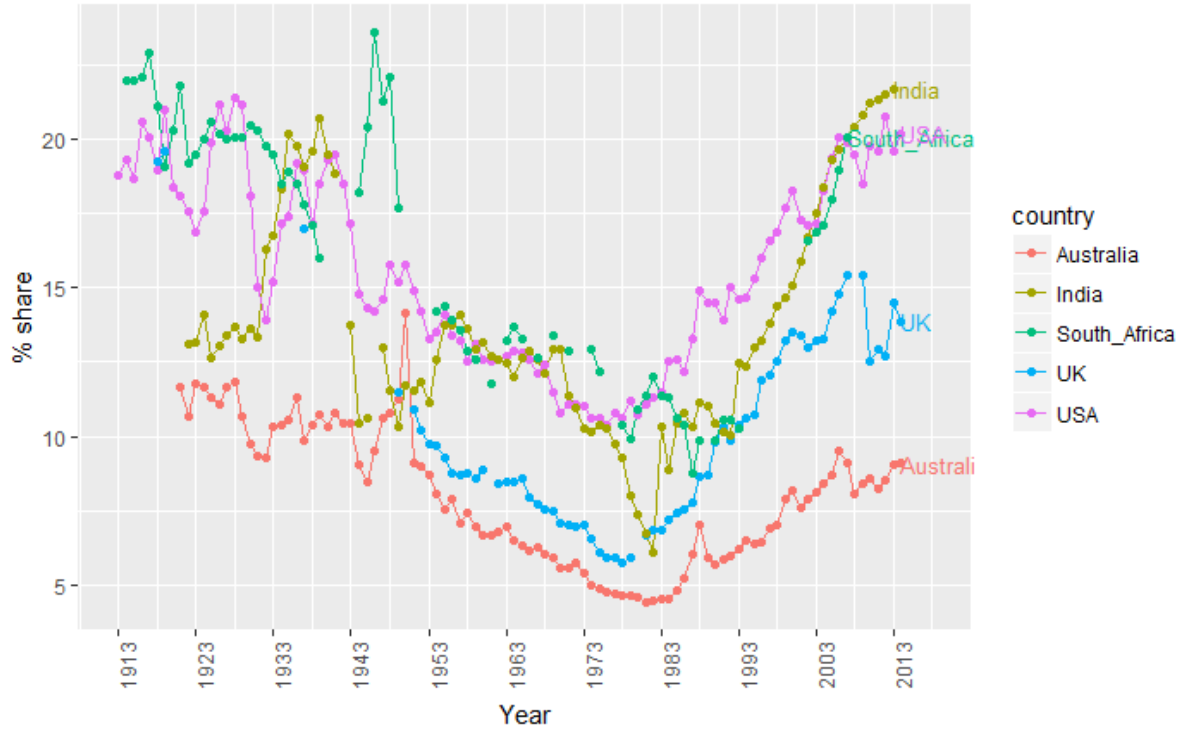
1 Introduction

Despite the much-used term 'inclusive growth' in South African policy documents and discussions, there is limited empirical evidence as to whether economic policies have achieved the desired goal of growing the incomes of the poor at least as fast as (and preferably faster than) the incomes of the rich.

Globally, the steep increase in top income percentile shares over the 20th and early 21st centuries, particularly in English-speaking countries, has been well documented (Atkinson and Piketty 2010; Piketty and Saez 2013). Atkinson and Piketty (2010) discuss a collection of papers surveying top incomes across 22 countries. Following a period of decline after World War II, the upward trend for the richest one per cent share of national income in a number of countries began in about 1980. For example, in the USA the share of national income accruing to the top one per cent increased from nine per cent in 1980 to 24 per cent in 2007 (Piketty and Saez 2013). This increase was associated with the increased rewards for top percentiles resulting from globalization, the appearance of 'winner-take-all' pay-off structures, and the removal of trade barriers (Atkinson and Piketty 2010: 700).

Figure 1: Historical trends of top one per cent income share for selected countries



Source: authors' illustration based on data from Alvaredo et al. (2017).

The World Inequality Database (WID) (Alvaredo et al. 2017) provides data on top incomes and shares for several countries, based on imputation methods described in Alvaredo et al. (2016).[1]

[1] The data included in the WID for South Africa is slightly different from the results in this paper, as one would expect from the differences in methodology. For example, many of the WID data sets divide through by 80 per cent of gross national income reported in the country's national accounts, which would inflate the share in relative terms (Atkinson

Figure 1 shows the evolution of the incomes for the top one per cent in selected countries, including the rapid uptick in South Africa's top one per cent share between 2002 and 2007.

A few insights can be drawn from the substantial literature that has developed around top percentile incomes. Firstly, there is strong variation across countries: for example, the share accruing to the top one per cent in Australia is far smaller than in the USA or South Africa. Secondly, there is also considerable variation in the trends. For example, percentile shares in France have appeared stable since 2002, whereas in China the share accruing to the top one per cent appears to be decreasing (Alvaredo et al. 2017). Thirdly, while it seems that the global financial recession caused a brief negative shock to top percentile shares, it is unclear whether it altered any of the longer-run trends. Data for the USA presents a dramatic shock in 2008, but the top one per cent share had regained lost ground by 2015. Piketty and Saez (2013: 458) argue that 'probably the most spectacular result coming from the WTID [World Top Income Database[2] is] the very pronounced U-shaped evolution of top income shares in the United States over the past century[, which] the Great Recession of 2008–09 seems unlikely to reverse'. They use this result as support for their view that policies and institutions hold a decisive influence over the evolution of income shares, and they argue that the drop in top percentile shares following the 2008 recession was due to the dramatic shift in policies rather than being a consequence of the economic downturn.

Limited research has been done on the evolution of top incomes in South Africa. While the broader literature on inequality in South Africa is well developed, it relies largely on household survey data, which captures top incomes quite poorly (Wittenberg 2017). The most significant study of top incomes was conducted by Alvaredo and Atkinson (2010), who showed that South Africa followed a similar trend over the 20th century to the other countries in Figure 1.[3] For South Africa, the period of increasing top one percentile shares was characterized by acute skills-biased technological change, the decline of industries that demanded lower skills, and an increase in the supply of unskilled labour (Banerjee et al. 2008), which reinforced the historical structures of inequality that had ensured a small, prosperous elite amid mass poverty. In a more recent study, Orthofer (2016) uses tax data to explore the top of the distribution. She focuses primarily on wealth inequality, but briefly discusses income inequality. She shows that the top one per cent of the employed population earns 12 per cent of labour market income, a result that accords with our own findings later in this paper.

This paper investigates how South African incomes grew over the period 2003 to 2017, with an emphasis on the period following the global financial crisis of 2008. We use personal income tax data from the South African Revenue Service (SARS) as a supplement to traditional household survey data to create a comprehensive picture of income growth across the income distribution. Specifically, the tax data provides information on the very rich, who are under-represented and inadequately captured in the household survey data.

We set out to do three things. Firstly, we build on the work of Alvaredo and Atkinson (2010), who compiled information on South African top income percentiles for the period 1903 to 2007, to investigate whether the trends continued after 2007. It is particularly interesting to extend this work to the period following the global financial crisis, given the historical evidence of sharp declines in top income shares in the USA, United Kingdom, and France following the Great

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and Piketty 2010: 670). See Alvaredo and Atkinson (2010) for more detail on the methodology used in their estimates for South Africa.

[2] In December 2015, the WTID was subsumed into the WID.

[3] The data series in Figure 1 is an updated version of Alvaredo and Atkinson's (2010) data series.

Depression of 1929 to 1939 (Atkinson and Piketty 2010). Secondly, we compare the growth of top incomes with the growth of the rest of the distribution during the same period, to establish whether South Africa's low growth since 2010 affected all income groups in a similar way. Thirdly, we look at whether there were particular income sources that contributed to the pattern of income growth that we observe among top earners.

2 Data

We primarily use two data sets in our analysis: aggregated personal income statistics, which are released in tabular form as part of the national tax authority's annual report on tax statistics (SARS 2018); and the Post-Apartheid Labour Market Series (PALMS) microdata (Kerr et al. 2017). The decision to use two different data sets is informed by the knowledge that while tax statistics do a fairly good job of capturing information about the incomes at the top end of the income distribution, they cannot sufficiently capture information about those with incomes below the tax threshold. Conversely, PALMS surveys are considered a reliable source of labour market data (Kerr and Wittenberg 2017), and therefore adequately capture information about the rest of the income distribution, where labour market income is the dominant source. While we would ideally have liked to use a single data set which fully and accurately captured both the top and bottom ends of the income distribution, no such data set is currently available for South Africa. Hence, the next best solution is to use the two separate data sets with the caveat that they will not always be comparable. The advantages and challenges associated with the two data sets are described and discussed next.

2.1 Top incomes: SARS annual tax statistics

Aggregated personal income tax statistics are released annually as part of the SARS tax statistics report (SARS 2018). The report includes data on incomes, sources, and tax deductions for tax filers (see Table A1 in the Appendix for an example of the data provided). These tables should capture all residents who receive incomes above the tax-filing threshold, enabling analysis of top income percentiles for the years 2003 to 2017. For example, in 2011 there were nearly six million tax filers, three million of whom had taxable incomes above the compulsory filing threshold of 120,000 ZAR in that year. In other words, only the highest-earning 10 per cent of adults were required to file tax returns.

Unlike survey data, tax data does not rely on the willingness of income recipients to disclose their incomes, or on their ability to recall incomes accurately. A combination of regulatory mechanisms (since tax evasion is a criminal offence), lack of choice (as employers are responsible for paying income tax to the revenue authorities on behalf of their employees), and strong incentives for the revenue authorities to track down non-disclosure (since tax is the primary income source for the state) results in much more accurate estimates of top incomes. A second advantage of tax data is the lack of sampling error: while surveys are designed to represent the population through a relatively small subsample, tax data typically cover the entire tax-filing population (Atkinson and Piketty 2010: 669).

Tax data has shortcomings, however. As explained above, only a small percentage of individuals are obliged to submit tax returns. While some individuals below the filing threshold choose to submit returns for a variety of reasons, this data is for an incomplete, non-random subgroup of individuals, and thus of limited use. Tax filers also often submit late: for example, the 2014 tax tables show that 80 per cent of the expected tax filers for 2013 had been assessed at the time of compilation, and this had increased to only 87 per cent (for the 2013 tax year) by 2016. To mitigate

this, we scale up the aggregate statistics based on the SARS estimate of the percentage of taxpayers awaiting assessment. However, if late filing is correlated with income, this approach may result in biased estimates of top incomes. Encouragingly, Figure A1 in the Appendix shows the difference between the first and last years observed by tax bracket, with little apparent correlation between late filing and income.

Another limitation of tax data is that those who illegally hide incomes (tax evaders) are not captured, and the extent to which tax avoidance (by those who legally structure incomes to pay less tax) biases the data is unclear. The latter is highlighted by the Davis Tax Committee (2016), which points out that the divergences between the top personal income tax and corporate income tax rates result in arbitrage opportunities, as high-income individuals can divert their incomes through lower-taxed companies or trusts. The final transfer to personal accounts could be timed to coincide with a decrease in marginal tax rates years later, or permanently deferred through a trust for an alternative purpose. Unfortunately for the focus of this paper, the severity of these problems probably increases with income. Nevertheless, missing data problems are likely to be even more severe when other sources are used, such as survey data.

The main measure analysed in this paper is taxable income, which consists of all income after deductions (for example, medical aid payments, travel expenses, and pension contributions) but before taxes or transfers such as remittances or government grants. The South African tax year runs from 1 March to 28 February. In calculating percentiles, the full South African adult income distribution including zero incomes is considered, where an adult is defined as an individual aged 18 years or older.

2.2 Top incomes in 2011 and 2014: SARS tax micro-files

In addition to the publicly available tax tables, we use confidential, anonymized micro-files based on a 20 per cent sample of assessed tax records for the years 2011 and 2014. This data was provided to us by SARS (2015). The main differences between the micro-files and the tax tables are: (i) they contain individual records rather than aggregate data, allowing us to decompose the data; (ii) they are a (large) sample of all records, and thus there is some (small) sampling error; (iii) individuals earning more than 10 million ZAR are excluded from the data set for anonymity. After excluding incomes below the compulsory tax-filing threshold, we are left with 318,000 records in 2011 and 332,000 records in 2014, which represents roughly 1.6 million individuals, or the highest-earning five per cent of the South African adult population.

2.3 The rest of the income distribution: PALMS

For statistics on the rest of the distribution, which comprises non-tax-filing South African adults, we use PALMS (Kerr et al. 2017). PALMS stacks microdata from 62 nationally representative surveys across the period 1993 to 2017, with the aim of enabling earnings comparisons across different surveys and years. Income is the main variable used in this paper, which corresponds to the 'realearnings' variable in the data set and is discussed by Kerr and Wittenberg (2017) in detail.

There are a number of important shortcomings of this variable. Most importantly, it is a measure of earnings rather than income, and it therefore excludes income from capital sources such as interest or shares. It is also unclear how well the variable accounts for aspects of earnings outside of 'usual' salary, such as a bonus or 13th cheque.[4] As one may expect (and as we show later), these

[4] For example, PALMS uses the 'Q54a_monthly' variable from the South African Quarterly Labour Force Surveys, which corresponds to the survey question 'What is your (choose one) annual/monthly/weekly/daily/hourly wage or

aspects of income become more important higher in the income distribution, decreasing the quality of PALMS top income data. Secondly, as there is no income information for the years 2008 to 2009 and 2016 to 2017, this data is missing from our analysis. Thirdly, many respondents do not give income information. We have followed Kerr and Wittenberg (2017) in using the multiply imputed incomes provided in PALMS in place of missing incomes and income bracket responses.[5]

We exclude the outliers identified by the 'outlier' variable in the data set, and we weight by the 'ceweight2' variable. We limit analysis to the adult population (18 years of age and above), and assign a zero income to those who identify themselves as unemployed or not economically active and report no earnings. This provides our estimated distribution of income across the full adult population.

It is worth taking a short detour to compare the accuracy of available surveys in measuring top percentile incomes. Table 1 compares three nationally representative household surveys, commonly used to calculate inequality measures such as the Gini coefficient (e.g., Leibbrandt et al. 2010). The Gini coefficient is sensitive to changes in top incomes, yet survey data tends to underestimate these incomes, because richer people are more likely to refuse to answer, under-report, or are simply too rare to be picked up in sample surveys. This point is important for inequality and income measurement. Piketty and Saez (2013: 459) note that 'with standard surveys based on limited sample size and self-reported income […] one cannot measure properly incomes above the 90th percentile, and therefore one largely misses the magnitude of the trend that has been going on'. As a standard against which to assess the accuracy of top incomes reported in surveys, we use the 2011 tax micro-files described above, which start at just above the 90th percentile of the distribution.

The Income and Expenditure Survey (IES) is a cross-sectional survey carried out by the national statistics agency Statistics South Africa (StatsSA) every five years. It contains over 95,000 observations, making it the largest national survey containing household income data. In calculating incomes, we add all income from work and other sources not associated with government transfers such as grants,[6] and we use the cross-sectional weights provided in the data set. Incomes in this data set sum to 46 per cent of gross national income (GNI). The top percentiles track the tax estimates reasonably well up to the 99th percentile, before underestimating the remainder quite severely.

The National Income Dynamics Study (NIDS) for 2010 to 2011 is Wave 2 of a panel series (SALDRU 2012) with about 30,000 observations. To calculate incomes, we combine labour market income and non-grant income, and then calculate estimated pre-tax income.[7] NIDS

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salary before deductions? (Include tips and commissions)'. A respondent might not include her bonus in her monthly wage.

[5] Kerr and Wittenberg (2017) impute a bracket for employed respondents with missing earnings information by assigning the bracket of those with similar province, age, gender, occupation, and race (in a logit regression). All bracket responses are then assigned earnings amounts through a similar process.

[6] Specifically, 'income from work' includes wages, overtime, bonus, and profit over the last 12 months (Classification of Individual Consumption According to Purpose code 50100000), and 'other income' includes all other sources of income aside from grants, such as remittances, royalties, and investments. Ideally, we would have liked to exclude remittances.

[7] Specifically, income from primary and secondary job, casual work, self-employment, 13th cheque, profit share, extra piece-rate work, bonus, 'other sources', helping friends, subsistence farming, interest and dividends, inheritance, rent, retrenchment payments, bridal payments, gifts, and loans. Salaries are reported as take-home pay, so we use the 2011 income tax schedule to back out pre-tax incomes. This assumes that the bulk of pay is from labour market income, as

incomes only sum to 37 per cent of GNI, and the percentiles perform much worse than the IES. Interestingly, NIDS underestimates incomes consistently by about 30 per cent compared with the tax data from the 91st percentile upwards, although it appears to pick up a few large incomes at the very top.

Finally, the relevant wave from the PALMS data set described above is the Quarterly Labour Force Survey (QLFS) for the fourth quarter of 2010, containing about 30,000 observations. Similarly to NIDS, incomes in this survey sum to 37 per cent of GNI. PALMS generally performs better than NIDS but worse than IES in tracking income percentiles. As with IES, the estimates become less accurate higher in the distribution. Note that the QLFS is at a disadvantage in this comparison because it excludes non-labour market earnings and so is necessarily an underestimate. Wittenberg (2017) compares the QLFS against tax data in detail, finding among other things that high incomes in the QLFS are under-reported or missing compared with tax data. He estimates that this results in estimates based on this survey data of the Gini on earnings income being three percentage points lower than they should be (from about 0.57 to 0.60).

In all three data sets, individuals only start earning income at about the 58th percentile of the full adult income distribution. This reflects South Africa's high unemployment rate and low rate of labour force participation (Bhorat and Khan 2018). Despite the shortcomings listed above, we use PALMS data in this paper primarily because it gives a consistent series across all years that can be compared with the tax data. As Table 1 shows, it does not perform much worse than other commonly used income data sets, even at the top of the distribution, where it is missing non-labour market income.

Table 1: Threshold incomes in thousands of ZAR for percentiles of the adult population in 2011

Percentile	50	58	90.65	95	97.5	99	99.9	99.99
Tax data	N/A	N/A	120	199	303	493	1,440	4,357
IES	0	8	114	180	276	480	990	1,834
NIDS	0	0	75	134	230	298	1,443	9,648
PALMS	0	5	102	153	212	354	1,073	2,553

Note: all incomes are inflation-adjusted to 2010.

Source: authors' compilation based on data from NIDS Wave 2 (SALDRU 2012), IES 2010–11 (StatsSA 2015a), PALMS 2011 (Kerr et al. 2017), and tax micro-files 2011 (SARS 2015).

3 Methodology

Our method for finding exact percentiles from the given tax tables follows the Pareto interpolation method outlined by Piketty and Saez (2003). The tax tables give tax brackets with the number of taxpayers in each tax bracket. We choose the tax bracket with a cumulative number of taxpayers closest to the desired percentile and then interpolate the gap assuming a Pareto distribution. In practice, the tax brackets are so close together that almost no interpolation is needed. For example,

shown by Leibbrandt et al. (2010), and will therefore be inaccurate for non-taxable income or items that are taxed differently, such as interest.

Table 2 shows that the closest tax bracket to the 95th percentile gives the exact income for individuals, totalling on average 95.033 per cent of the population income distribution.

Table 2: Average empirical and interpolated percentiles

Percentile	Empirical percentile	Years valid
95	95.033	12
96	96.137	13
97	97.000	14
98	97.925	14
99	99.048	14
99.99	99.990	14

Source: authors' calculations based on data from SARS (2018).

Since the tax tables give statistics on tax filers, the threshold for compulsory submission of tax returns is important for the assumption that all top earners are captured. The filing threshold was instituted in 2006 at 60,000 ZAR, increasing to 350,000 ZAR in 2015. For the years 2015 to 2017, the income level of the 95th percentile of the distribution fell below the threshold; hence Table 2 reports only 12 years of data as valid for analysis up to 2014. Similarly, the threshold was above the 96th percentile in 2016. Otherwise, the data covers all legal income for the top percentiles over the period.

We check the estimates in Table 2 of the percentile incomes from the tax tables by using the micro-files. We expect minor differences deriving from the interpolation of the tax tables and from the random sampling in the micro-files. The two estimates turn out to be reassuringly close (see Table A2 in the Appendix).

Lastly, the calculations of top percentiles and their shares rely crucially on aggregate population and GNI statistics. We use the national statistical agency's mid-year estimates for population totals (StatsSA 2015b) and online tables from the South African Reserve Bank (SARB) for GNI (SARB 2019). This follows the top incomes literature (Atkinson and Piketty 2010: 670).

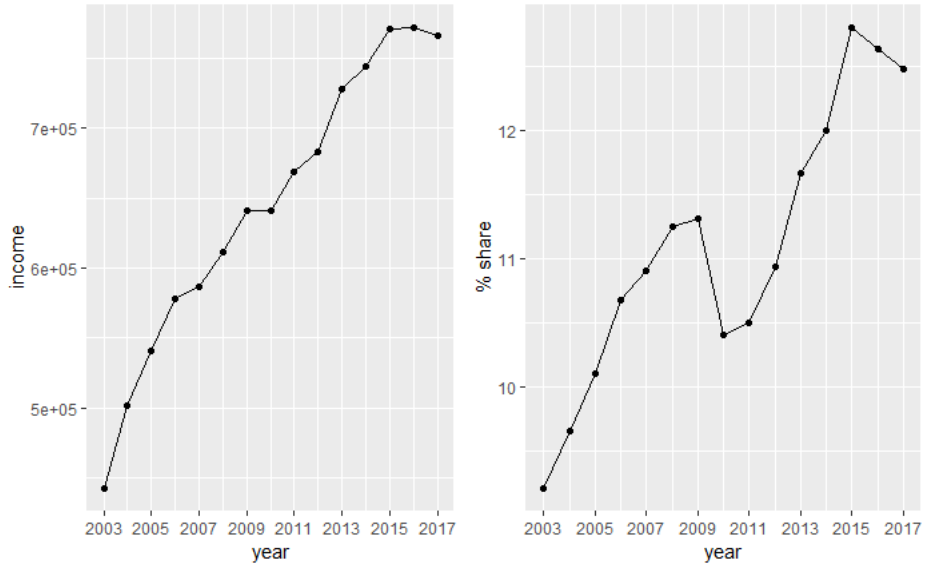
4 Results

4.1 Top incomes have grown phenomenally

Top incomes and the income shares of the top one per cent increased substantially between 2003 and 2017, as seen in Figure 2. While the effects of the 2008 global recession are briefly observed, top incomes and shares quickly recover. Table 3 shows that by 2016, a person in the 99th percentile had a taxable income of nearly 800,000 ZAR per year. The top one per cent held 12.5 per cent of GNI, and the top five per cent held 27.4 per cent of GNI. The top one per cent trend in Figure 2 is illustrative of all percentiles above the 95th percentile[8]: they experienced a large real compounded average growth rate (CAGR) of four to five per cent, with real income nearly doubling over the 14-year period and income shares increasing steadily, aside from a dip corresponding to the recession.

[8] The trends for the 95th percentile are shown in Figure A2 in the Appendix.

Figure 2: Top one per cent income trends of South African adults



Note: income reported in real 2016 ZAR.

Source: authors' calculations based on data from SARS (2018).

Table 3: Top percentile shares and incomes in most recent year

Percentile	Year	Threshold income	Share (%)	CAGR (%)		
				2003–17	2003–08	2010–15
0.95	2014	309,917	27.4	5.07	5.03	4.75
0.96	2017	369,210	25.4	4.28	5.71	5.89
0.97	2017	443,832	22.0	4.39	5.47	3.63
0.98	2017	541,060	17.9	4.12	6.22	4.60
0.99	2017	765,678	12.5	3.99	6.36	3.77
0.999	2017	2,296,208	4.0	4.08	7.48	4.46
0.9999	2017	7,482,657	1.2	4.71	8.33	6.61

Notes: incomes inflation-adjusted to 2016 ZAR. Threshold income given for the corresponding year. CAGR calculated since 2003.

Source: authors' calculations based on data from SARS (2018).

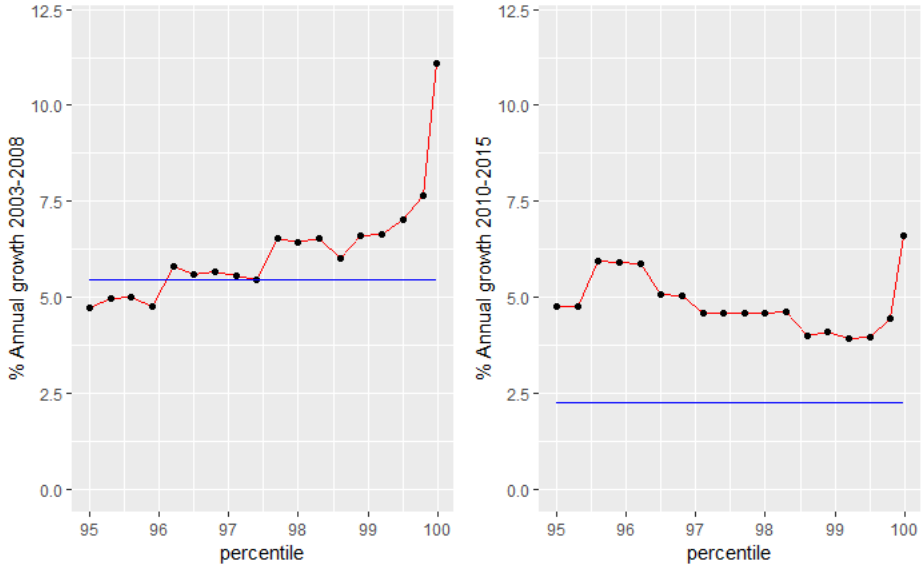
When we use gross income instead of taxable income (which excludes deductions such as medical aid or pension contributions), the trend tracks Figure 2 very closely. This is arguably a better indicator of income, and is certainly more reflective of income share, since GNI includes these contributions. The top one per cent share based on gross income is about two per cent higher than the estimate based on taxable income (see Figure A3 in the Appendix).

We can divide the period from 2003 to 2017 into the periods before and after the recession, which correspond to periods of high and low national income growth in South Africa.[9] The growth incidence curves (GICs) in Figure 3 show the CAGR for each percentile by period. In South Africa's high growth period over 2003 to 2007, growth in top incomes track the average GNI growth rate of 5.74 per cent until about the 98th percentile, such that only growth at the very top

[9] To illustrate these patterns, we exclude the 2008 to 2009 recession years. We also stop short before 2016 to 2017, which may follow a different trend—see the conclusion section for more discussion.

diverges. This changes for the period following the global recession, 2010 to 2015. Although both top percentile and national income growth rates drop substantially, the growth paths of the two diverge early and markedly, with incomes from the 95th percentile onwards growing at more than double the average GNI growth rate of 1.89 per cent per annum.

Figure 3: GICs pre- and post-global recession



Notes: income reported in real 2016 ZAR. Blue lines indicate GNI growth over the period.

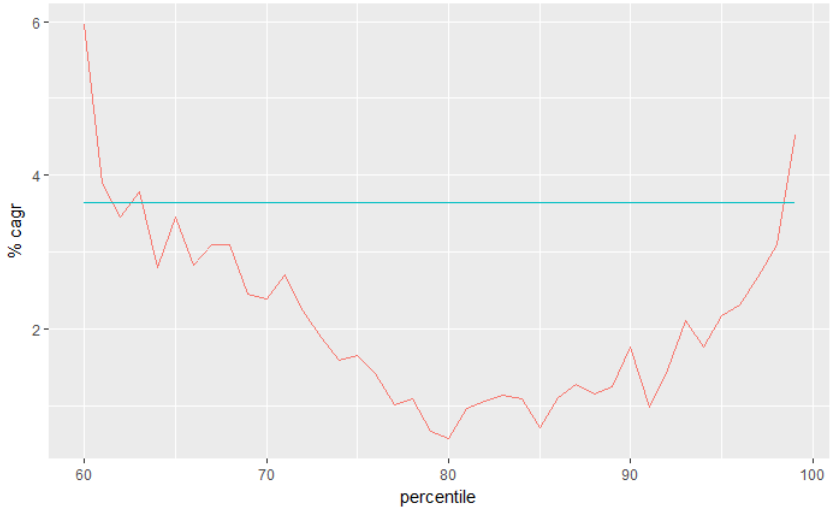
Source: authors' calculations based on data from SARS (2018).

The top income trends can be checked using case studies of top income pay. For example, consultancy company Deloitte (Yuill 2017) tracks the remuneration of the chief executive officers (CEOs) of the Johannesburg Stock Exchange top 100 companies. The lower quartile remuneration of a mid-tier company CEO is over six million ZAR in total annual pay, which by our estimates is in about the 99.99th percentile. Over 2011 to 2016, Yuill (2017) reports an average growth rate in pay for this position of above 10 per cent, which exceeds our estimate for growth of this percentile. These diverging trends by percentile indicate the rapidly increasing inequality arising from changes at the top end of the income distribution. It highlights the stark contrast between South Africa's policy aims of inclusive growth and the actual growth in incomes across the distribution.

4.2 Incomes over the rest of the population have stagnated

The GIC for the whole distribution, seen in Figure 4, shows a U-shape. Non-zero earnings begin at the 59th percentile of the adult income distribution. Growth rates until the 65th percentile are comparable to growth in overall GNI: these are the lowest wages, between 200 ZAR and 1,000 ZAR per month (in 2016 ZAR). This growth drops off quickly, and we find the 75th to 90th percentiles stagnate with a CAGR of one to two per cent, far below GNI growth over the period. The same picture emerges when we track shares of percentiles over time: shares, calculated over total income in PALMS, decrease slightly for the 75th to 90th percentiles, and are unchanged for lower percentiles (see Figure A4 in the Appendix).

Figure 4: GIC 2003 to 2015 using PALMS



Note: the blue line indicates GNI growth over the period.

Source: authors' calculations based on PALMS data (Kerr et al. 2017).

We break up the GICs into two periods, as we did for the top incomes using the tax data (see Figure A5 in the Appendix). The period 2003 to 2007 follows a flattened U-shape, but the bottom income growth rates are even higher than before, with the 60th to 70th deciles growing at between 10 and 25 per cent per year in real income. This may be explained by the combination of a low base and job growth: the unemployment rate decreased from 27 per cent to 22 per cent over this period (SARB 2019), likely meaning that those at the bottom received a boost from very little income (perhaps casual intermittent work) to some form of regular employment, albeit at low wages. This picture changes dramatically in the 2010 to 2015 period, when growth rates are mostly negative until the 95th percentile, after which growth picks up.

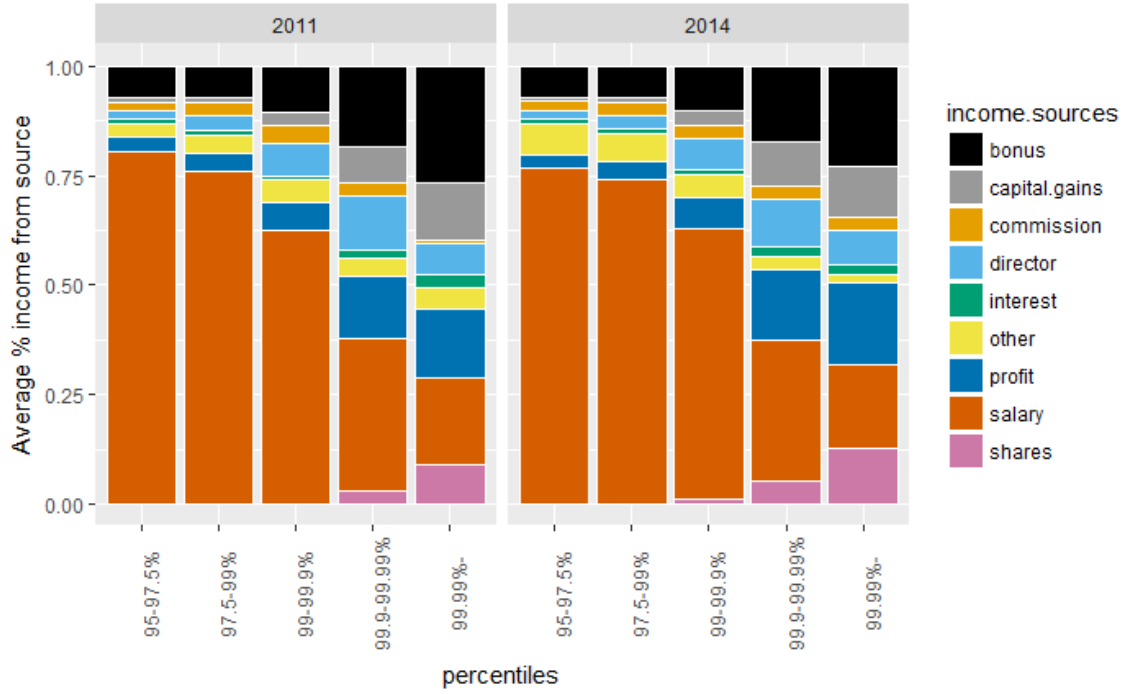
While this supports the narrative that emerged from the tax data, the PALMS estimates of top percentile growth rates are below the tax data estimates. We resolve this puzzle by picking up a divergence when comparing the PALMS and tax data, shown in Figure A6. In 2003, the 95th percentile using the PALMS data is at the same level as the 95th percentile using the tax data. Although the PALMS estimate increases more slowly, the trends match reasonably well until 2007, when the Labour Force Survey ends. However, for incomes collected under the new QLFS methodology, the trend for the survey data is flat compared with the rising trend in the tax data. A similar story emerges for other top percentile incomes and shares. It is possible that the problem might lie with the tax data, but this is unlikely given the discussion in section 2.1 regarding the superior measurement of income in tax data. The next section also gives further indications consistent with high top percentile growth. Rather, Kerr and Wittenberg (2017: 5) note that 'labour income data in the QLFS from 2010 to 2015 is substantially different' from prior waves, due to differing imputation procedures used by StatsSA. Another possible partial explanation for the divergence between tax and PALMS data is that PALMS data excludes non-labour market income, and the next section suggests that some of the top percentile growth is driven by growth in income from capital.

Finally, Figure A7 in the Appendix shows growth over all percentiles by combining the two data sources. Given that the top income growth appears to be mismeasured in the survey data, the GICs using the survey and tax data do not fit well together. Nevertheless, overall the data strongly suggests high growth for top percentiles after 2010 and low growth elsewhere.

4.3 Decomposition of top incomes

The tax micro-files allow us to disaggregate incomes into their sources (Figure 5). Salaries and bonuses on average make up over 80 per cent of income until the 99th percentile, when salary rapidly diminishes as a proportion of the total. Income from shares, profit, capital gains, and bonuses becomes more important as incomes increase. The average number of sources per person also rises. The GICs in Figure 3 already showed considerable differences in growth rates within the top one per cent. Here we find that income sources also shift dramatically over this narrow range of the top one per cent. This is hardly surprising, given that the top one per cent in South Africa begins at about 800,000 ZAR, which includes occupations ranging from university professors and general medical practitioners to large firms' CEOs.

Figure 5: Sources of income by percentile and year



Source: authors' calculations based on data from SARS (2015).

Returning to the tax tables, SARS provides a few breakdowns by taxable income bracket in the public-release tabulations. The decomposition of income sources/deductions must be interpreted with some care. Taxpayers are categorized by *total* taxable income into brackets, which hides that individuals in the same category may draw from very different income sources. To get a sense of whether this makes a difference, we can see in the micro-files that the correlation across the top five per cent between income from shares or interest compared with income from the labour market (salary, bonus, commission, and directorship) is about 0.15 in 2011 and 0.17 in 2014. This is low, and gives some indication that these percentiles may consist of different groups of people.

Bearing this in mind, Table 4 highlights some interesting trends. Income from share options grew since 2003 at a CAGR of over 15 per cent (in real terms) for the top one per cent. Medical aid contributions also increased rapidly at around 13 per cent per year, corresponding to the broader narrative of rising private healthcare costs in South Africa. For example, the Council for Medical Schemes (2015) reported an average increase in contributions of eight per cent over this period. Pension contributions, on the other hand, stagnated, with low average real growth indicating a decline in the proportion of total income allocated to pensions. Finally, Table 5 gives the gender

breakdown by percentile. Women are outnumbered seven to one in the top one per cent, but in the 95th percentile the gender composition is much more equal.

Table 4: Average income and growth by source and percentile

Source	Percentile	Income (ZAR per annum)	CAGR (%)
Pension	95	10,594	-0.04
	99	20,821	2.56
Shares	95	7,209	10.18
	99	52,383	15.97
Medical aid	95	12,079.90	13.11
	99	21,172.57	12.80

Notes: 'Income' gives the average amount in the relevant taxable income percentiles over 2015, and growth is calculated over 2003–15 in real terms. 'Medical aid' refers to employer contributions to medical aid schemes on behalf of employees.

Source: authors' calculations based on data from SARS (2018).

Table 5: Gender composition by percentile for 2014

Percentile	Gender	Average income	Total number	Composition
95–97.5	F	372,832	303,030	43%
	M	377,030	401,780	57%
97.5–99	F	569,006	137,730	33%
	M	580,140	283,480	67%
99–99.9	F	1,036,908	61,645	25%
	M	1,094,540	188,605	75%
99.9–99.99	F	3,187,891	3,375	14%
	M	3,270,260	20,180	86%
99.99–	F	8,265,060	235	14%
	M	8,458,516	1,445	86%
Top	F	17,240,795	138	12%
	M		1,007	88%

Notes: 'Number' represents the absolute number of tax filers by gender. Incomes adjusted to 2016 ZAR. Breakdown of average income by gender unavailable for top category.

Source: authors' calculations based on data from SARS (2015).

5 Discussion

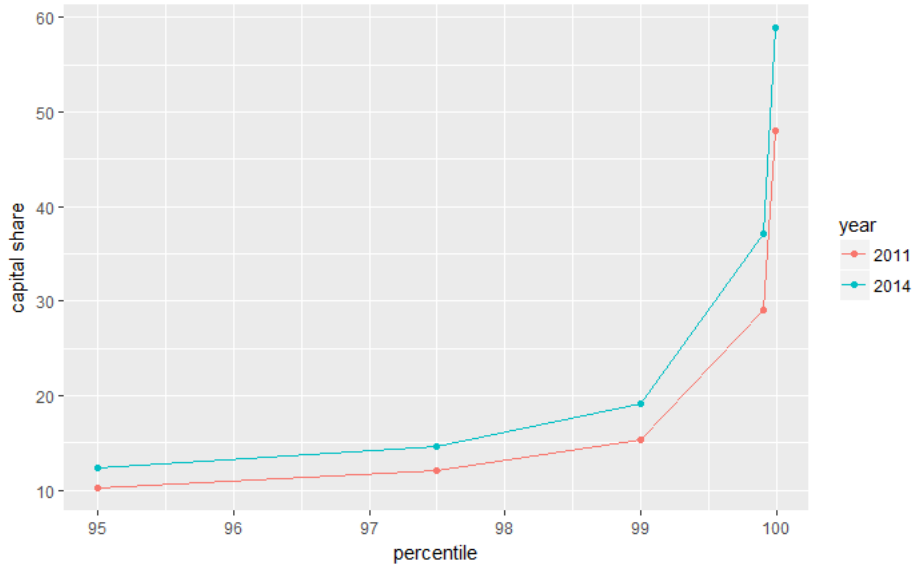
5.1 Possible explanations for top percentile growth in South Africa

How do we explain the persistent increase in top percentile incomes, particularly in relation to low growth in aggregate national income? Piketty (2013) proposes two forces that drive divergence between top incomes and income in the rest of the distribution. Firstly, if capital returns (r) are greater than economic growth rates (g), then the incomes of those in possession of capital will grow at a faster pace. The divergence grows stronger as the difference between r and g decreases, for example in low growth periods such as 2010 to 2015 as shown above. The GICs for top

percentiles show steep growth at the very top, corresponding to those with more income derived from capital (see decomposition into income sources above).

However, this does not explain the high growth rates of individuals in the 95th to 99th percentiles who derive most of their income from the labour market (Figure 6). A second explanation looks at labour market dynamics. High-income skilled professionals have more bargaining power because they are less easily replaced, among other reasons. Continuing skills-biased technological change (see for example Banerjee et al. 2008) may have steadily increased this bargaining power, manifesting in rising top incomes and shares. In a low growth environment, perhaps managers are more likely to receive payment incentives in the hope of boosting performance than are ordinary workers, whose salary increases are simply based on the consumer price index or past average firm level performance. Table 4 shows high growth in income from shares, and perhaps this is linked to trends in managerial payment schemes.

Figure 6: Share of income from capital



Source: authors' calculations based on data from SARS (2015).

Related to these labour market dynamics is the role of the public sector. While neither the tax tables nor the micro-files allow a breakdown by private versus public sector employment, government records of public employee compensation growth suggest that the public sector may contribute to the top percentile trends (National Treasury 2017). In 2008, 50 per cent of public sector employees were paid an all-inclusive salary package above our estimated top five percentile threshold, corresponding in total numbers to 37 per cent of all top five percentile individuals. Salary growth corresponding to these positions was two per cent in real terms over 2008 to 2016, which is well below the growth estimated above of four to five per cent. However, there was also a substantial increase in total public sector employees, and an upward shift in the distribution of public employee salaries. Note that even if compositionally public sector wage growth explains a large part of the top percentile trend, we cannot make claims about causation—for example, public sector wages may have been responding to private sector wages in order to remain competitive.

We can shed some light on these explanations by tracking the share of income from capital sources, shown in Figure 6. We use the sources of income provided in the tax micro-files for 2011 and

2014 and designate the proportion by capital[10] and labour market[11] income. The capital share increases with the percentiles. For 2011, it rises slowly from 10 to 20 percent between the 95th and 99th percentiles, before rapidly increasing to nearly half of total income on average for the very top of the distribution. The 2014 distribution dominates the 2011 everywhere, meaning that a larger proportion of income came from capital sources, about 20 to 30 per cent higher proportionally than in 2011. Capital income grew at a CAGR of 10 to 20 per cent, similar to the growth of share income observed in Table 4. For comparison, simply passively investing in the Johannesburg Stock Exchange All Share Index over this period of tax years 2010 to 2015 would have given real returns of nearly nine per cent per year. If we perform a similar calculation using the micro-files, labour market income grew at a CAGR of two to three per cent over 2011 to 2014.

The explanations for diverging capital income and labour market dynamics may be complementary. The rapid growth of income from capital gives some support to the $r>g$ explanation. The growth in labour income of two to three per cent, both in the tax files and in the public sector employee records, suggests that dynamics around wage-bargaining, both private and public, may help to explain diverging income growth even where capital constitutes a small fraction of income, such as in the 95th percentile. Much further investigation is needed before we can make claims about the credibility of these explanations.

5.2 Panel of taxpayers

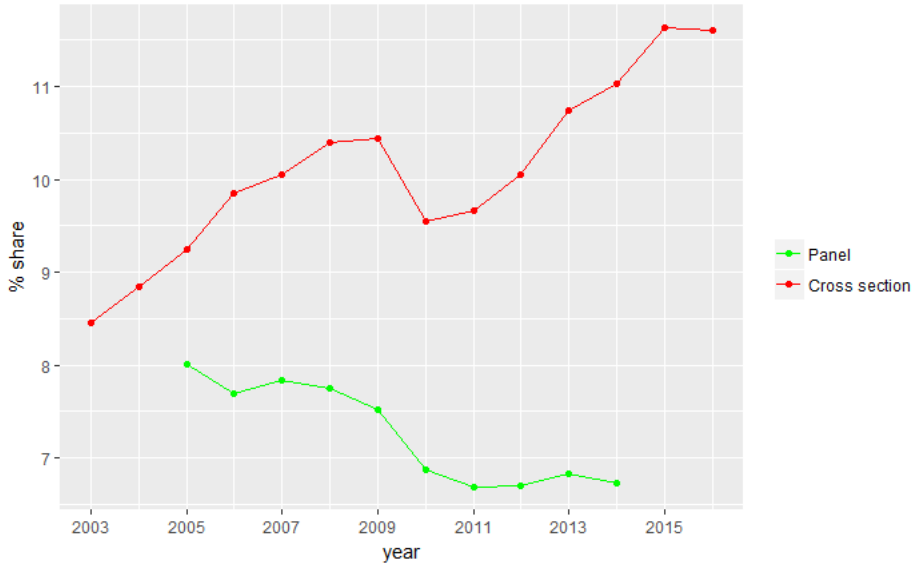
Aside from a cross-sectional increase in inequality indicated by diverging top percentile incomes, we may be interested in mobility. Are the same people part of those top percentiles year on year, permanently diverging from the rest of the population? SARS releases an annually updated panel of taxpayers. For the 2016 panel, SARS categorizes the 2005 tax filers by tax bracket, and tracks those who submitted returns for the following 10 years until 2014. We include only taxpayers that in 2005 were above the highest threshold for compulsory submission of tax returns over the entire period (that is, 250,000 ZAR), to guard against selection in the panel. We are left with 265,000 taxpayers out of about 400,000 original taxpayers above the (actual) tax-filing threshold in 2005. This corresponds to the top 0.85 per cent of the 2005 adult population. Note that there is still some selection, since those close to the threshold whose incomes dropped in nominal terms over the period were not legally required to submit returns, and so were less likely to be included in the panel. Therefore, the panel may on average contain higher incomes, and growth may be slightly overestimated.

In the data, the estimated panel incomes are substantially higher than the cross-sectional estimates, as expected. A stark contrast emerges in Figure 7, which shows the divergent evolution of trends in shares. Aside from the recession, when both sets of income shares dip, the panel is stable or decreasing, while the cross-section is always increasing. Thus the compound average growth rate over the 10 years for the panel is much lower than the cross-sectional growth rate: 1.4 per cent compared with 3.8 per cent. While the '2005 rich' did indeed grow their incomes, this indicates that the top percentiles' growth in income and shares came primarily from individuals outside the panel—the newly rich and/or the younger rich. This warrants further investigation, and may contain clues to the political economy of growth over the post-recession period.

[10] Specifically, income from shares, interest, capital gains, profits broadly associated with capital (e.g. royalties, rent), and lump sums (e.g. pensions, benefits).

[11] Specifically, income from salary, bonus, commission, directorship, profits broadly associated with sales, foreign payments, pension, and travel allowance.

Figure 7: Cross-section versus panel of top 0.85 per cent share of income



Source: authors' calculations based on data from SARS (2018).

5.3 South Africa's growth path, 2003 to 2015

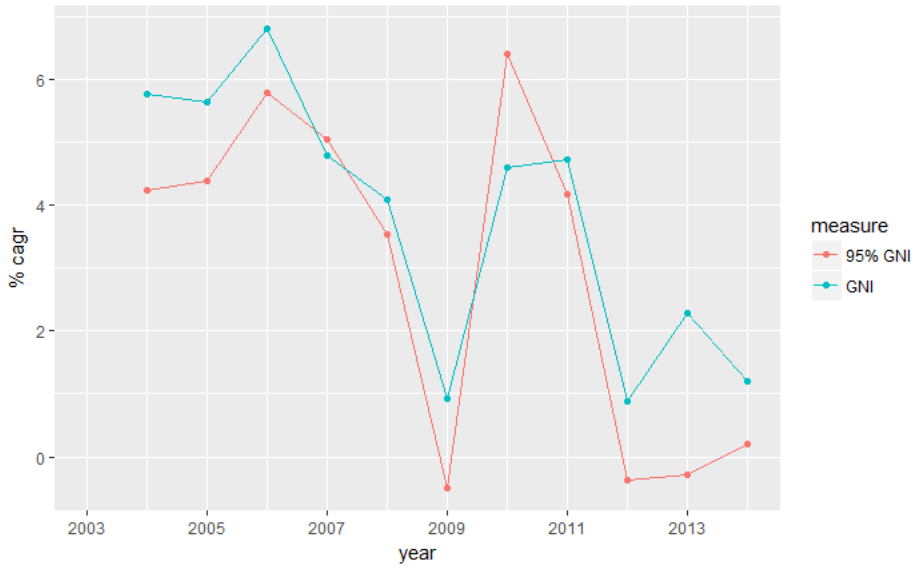
U-shaped growth has become characteristic of the South African income growth path. Bhorat and Khan (2018) present a GIC for 1994 to 2014, showing U-shaped growth in earnings similar to the patterns presented in this paper for 2003 to 2015. Nearly 60 per cent of the adult income distribution has remained at zero income. Positive gains are made at the bottom of the earning distribution off a low base; the 75th to 90th percentiles experience very little change; and growth rates increase rapidly at the very top.

Who are the winners and losers in this growth pattern? Table A3 profiles adults by income category for 2015 (see Appendix). The results are unsurprising. Lower percentiles have more women and Africans. Whites are grossly over-represented in the fast-growing top percentiles. Age is relatively similar across the categories, indicating that retired workers do not seem to be driving the results. Interestingly, education is similar across the zero-income category and the 60th to 75th percentiles, which experienced some income growth. Most of the people in the 75th to 90th percentiles (who were employed but experienced very little real income growth) worked in elementary occupations, did skilled agricultural/fisheries work, or were machine operators. Importantly, the GICs in Figure A7 show that growth decreased across the distribution after the 2008 recession, but much more so for the bottom than the top. The divergence between GNI and top percentile growth therefore grew. What little growth the country did observe over the latest period therefore seems to reflect high growth in top incomes rather than 'inclusive growth'.

The welfare implications of this growth pattern are unclear. Intra-household sharing and bargaining imply that some working-age adults may report zero income but be supported by income-earning partners. Taxable income also ignores grant transfers from the government, which support a large proportion of households at the lower end of the income distribution (see Leibbrandt et al. 2010). However, pre-transfer incomes do indicate the market distribution of rents from production. One insight from this paper is that it may be particularly misleading to report GNI growth as a shorthand indicator of development in South Africa. Given that the tax statistics are published annually, a relatively simple complement is to subtract the incomes of the top five per cent (as reported in the tax tables) from the GNI reported by SARB (2019) to find a '95 per cent GNI' growth rate. Figure 8 shows that the 95 per cent GNI growth rate is below the reported

GNI growth almost everywhere, i.e. growth has almost never been pro-poor. By this measure, the country experienced a recession (negative growth) in 2012 and 2013.

Figure 8: GNI growth rate for the bottom 95 per cent of the income distribution



Source: authors' calculations based on data from SARB (2017) and SARS (2017).

6 Concluding remarks

While the existing literature on inequality in South Africa has documented the wide disparity between the poor and the rich, in this paper we have presented new evidence that those at the very top of the income distribution have on average seen their incomes grow much more rapidly than the average South African, resulting in increased income inequality.

By focusing on top incomes, we make two main contributions. Firstly, using publicly available tax tables, we record that the incomes of the top percentiles grew at a rate of up to three times the growth rate of national income in the post-recession period, an alarming trend in one of the most unequal countries in the world. Secondly, using confidential tax micro-files, we decompose income by percentile to show that salaries and bonuses comprise over 80 per cent of income for up to the top one per cent, implying that wage growth is a substantial driver of this trend. Nevertheless, income from capital has grown at an astonishing rate of 10 to 15 per cent and so must be considered as a driver, despite comprising a relatively small fraction of income.

We consider some explanations for the trends, but ultimately cannot make any strong claims. An expanded focus on the underlying processes generating inequality is the natural response to the puzzles outlined in this paper. What explains South Africa's persistent growth path over the last 20 years, i.e. the U-shaped growth in income with non-decreasing inequality? What are the consequences of such a strong and sustained divergence between (i) capital and labour income growth and (ii) top percentile and average income growth? This paper presents income trends that paint an even bleaker picture than is implied by the low economic growth post-recession. Yet it is an important reminder that the burden of this low growth has not extended to the top percentiles, raising the urgency to interrogate the underlying economic processes in the project to improve living standards for the majority of people in South Africa.

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Appendix

Table A1: Example of tax tables data

Year	Bracket threshold (ZAR)	Number of taxpayers	Total income in bracket
2015	5,000,000	7,014	66,829,585,366
2015	2,000,000	34,903	99,871,500,000
2015	1,000,000	130,273	172,798,378,049
2015	750,000	150,498	128,830,573,171
2015	500,000	415,185	250,382,292,683
2015	350,000	637,892	264,224,573,171
2015	250,000	1,006,389	295,979,256,098
2015	200,000	742,004	166,697,841,463
2015	150,000	886,069	154,855,109,756
2015	140,000	187,231	27,149,024,390

Source: authors' calculations based on data from SARS (2018).

Table A2: Comparison of percentiles for tax brackets versus micro-files

		Micro-files		Tax tables	
Year	Percentile	Real income (ZAR per annum)	Share (%)	Real income (ZAR per annum)	Share (%)
2011	95	268,120	23.85	267,928	23.89
2011	97.5	408,842	16.97	407,993	17.01
2011	99	665,008	10.48	668,239	10.52
2011	99.9	1,940,670	3.05	1,987,535	3.06
2011	99.99	5,875,679	0.84	5,864,827	0.85
2014	95	311,826	27.06	309,917	27.43
2014	97.5	465,086	19.12	479,499	19.42
2014	99	741,478	11.80	744,292	11.99
2014	99.9	2,154,919	3.55	2,198,748	3.64
2014	99.99	6,725,894	1.05	6,844,843	1.09

Source: authors' calculations based on micro-files data from SARS (2015) and tax tables data from SARS (2018).

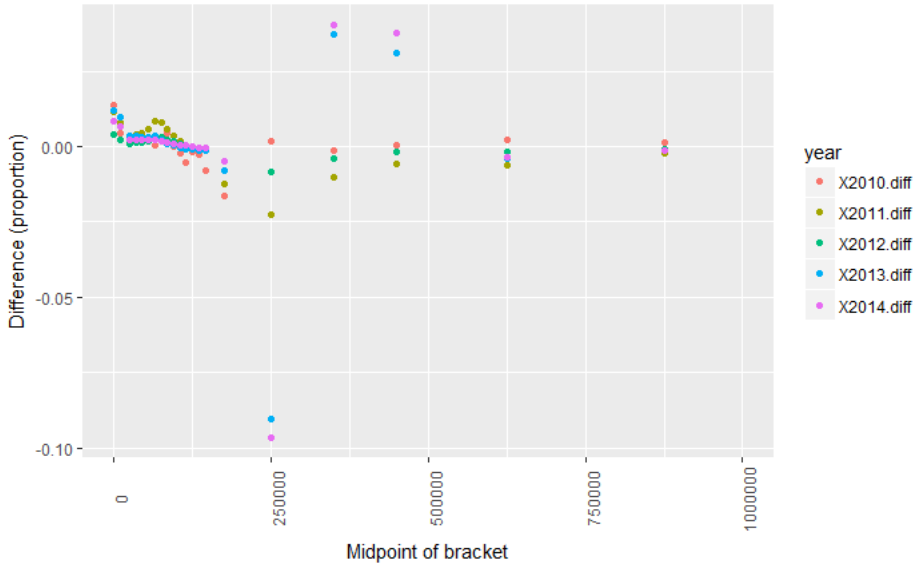
Table A3: Profile of adults by income percentile category in 2015

Percentile	Income threshold (ZAR per annum)	CAGR (%)	Age (mean years)	Female (%)	African (%)	Coloured (%)	White (%)	Education (median years)
0–56	0	Not applicable	38	59	82	8	7	9
60–75	10,249	2.95	38	51	83	11	5	9
75–90	38,551	1.03	38	38	74	12	11	10
90–95	128,116	2.19	41	44	58	10	27	12
95–100	230,609	3.67	42	37	45	8	43	13

Notes: CAGR given over 2003–15. CAGR for percentiles 95–100 from tax data is 5.07 (see Table 3). Percentiles 57–59 have been omitted because they likely reflect noise at the bottom of the distribution.

Source: authors' calculations based on PALMS data (Kerr et al. 2017).

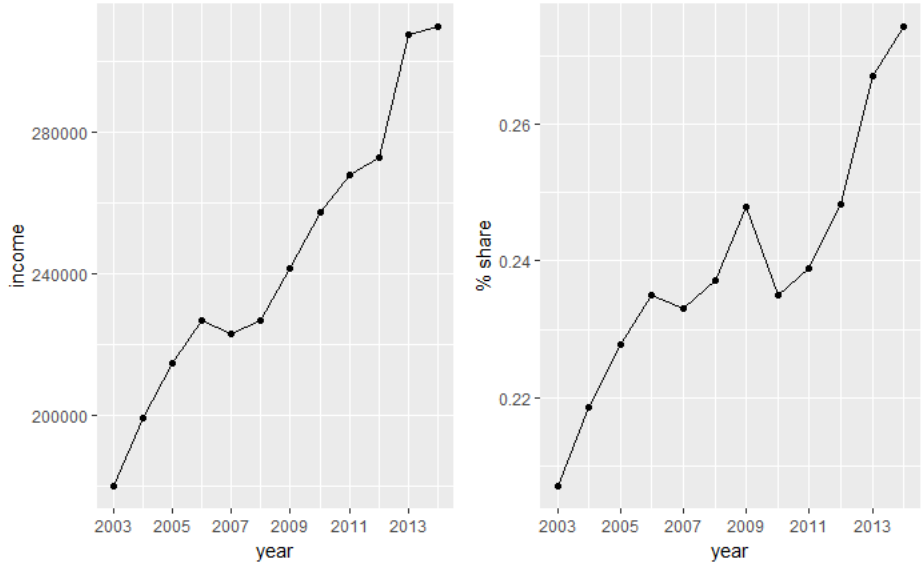
Figure A1: Late tax filers by income tax bracket



Note: a positive proportional difference (y axis) indicates relatively more late filers.

Source: authors' calculations based on data from SARS (2018).

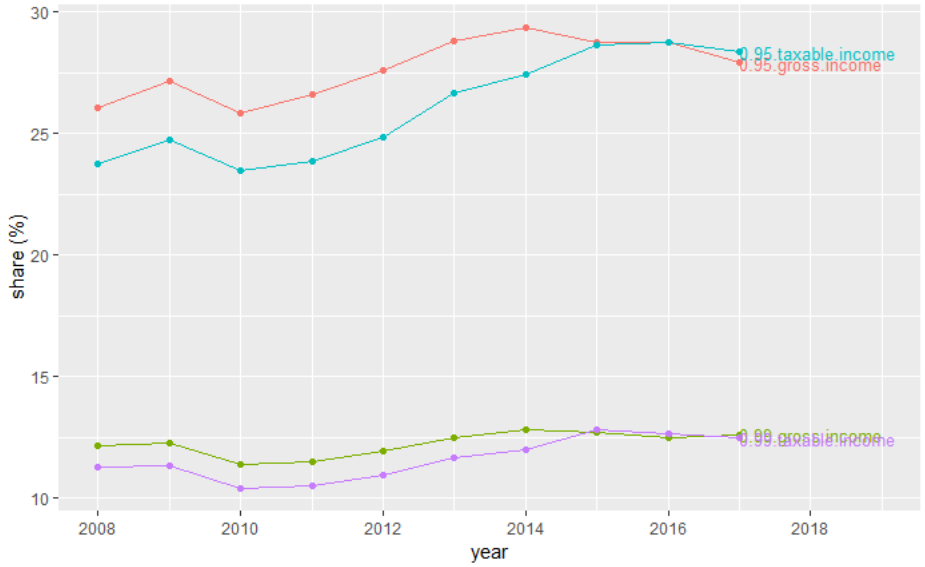
Figure A2: Top five per cent income trends of South African adults



Notes: income reported in real 2016 ZAR. The difference in shares reported here compared with Figure 2 is likely due to differences in the GNI denominator.

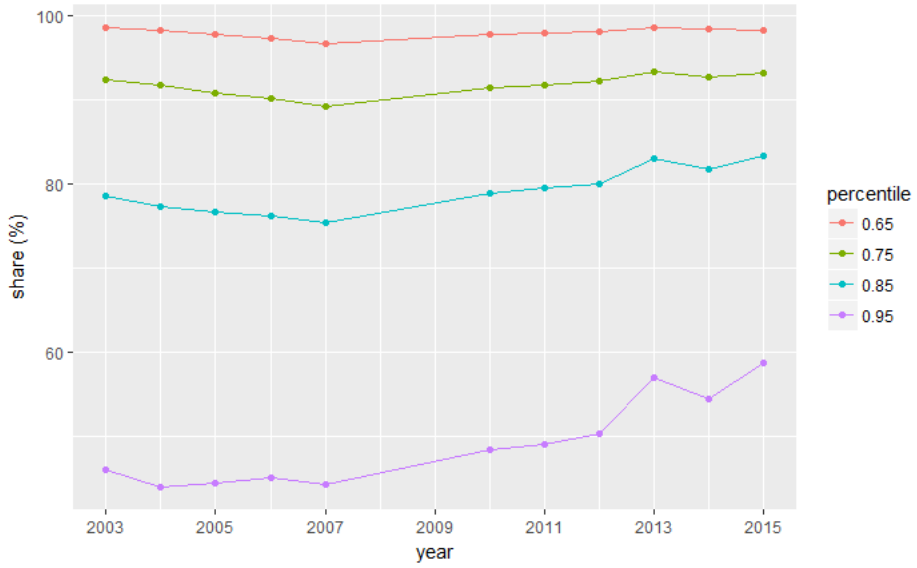
Source: authors' calculations based on data from SARS (2018).

Figure A3: Gross versus taxable percentile shares



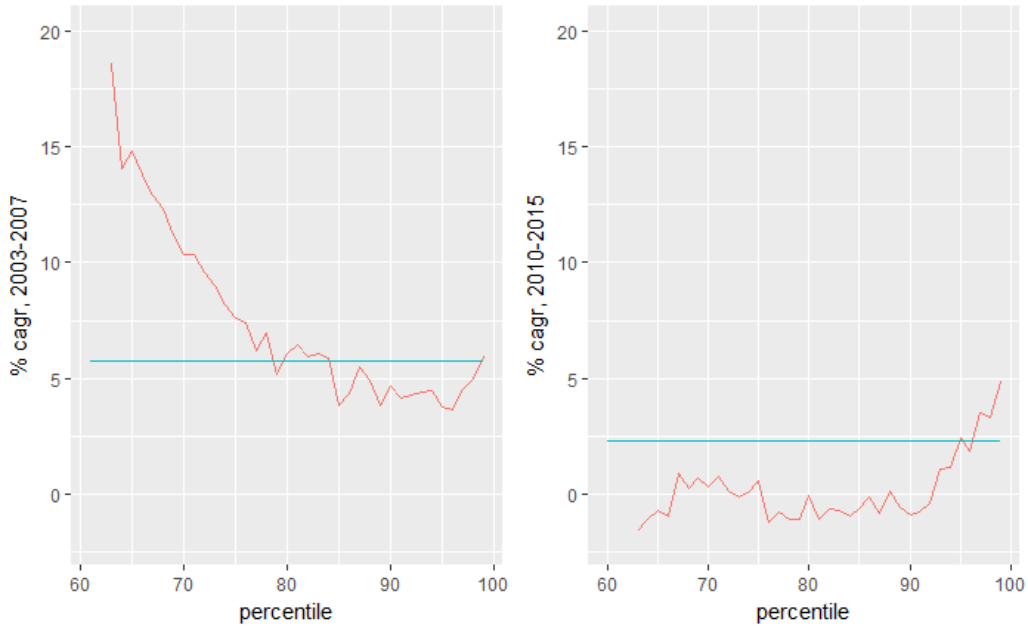
Source: authors' calculations based on data from SARS (2018).

Figure A4: Percentile share trends, survey data



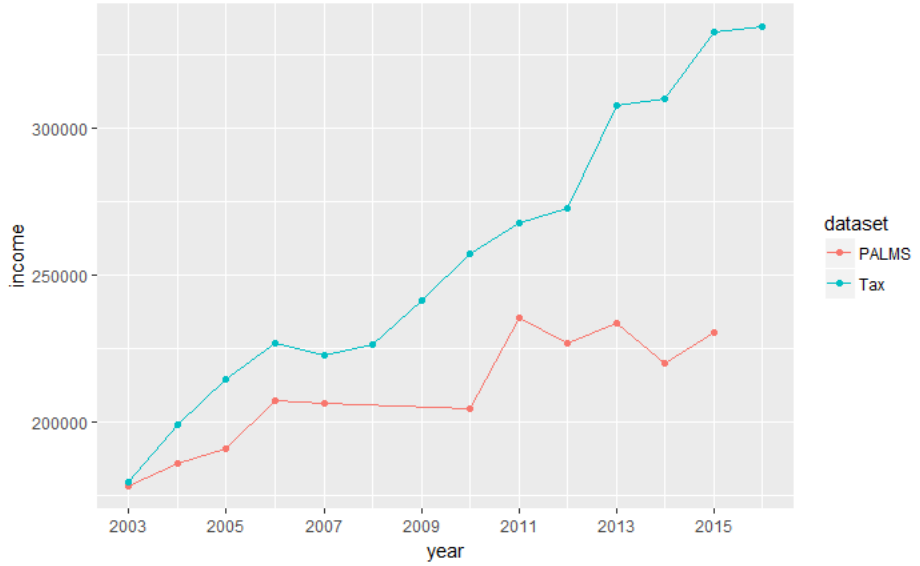
Source: authors' calculations based on PALMS data (Kerr et al. 2017).

Figure A5: GICs pre- and post-recession



Source: authors' calculations based on PALMS data (Kerr et al. 2017).

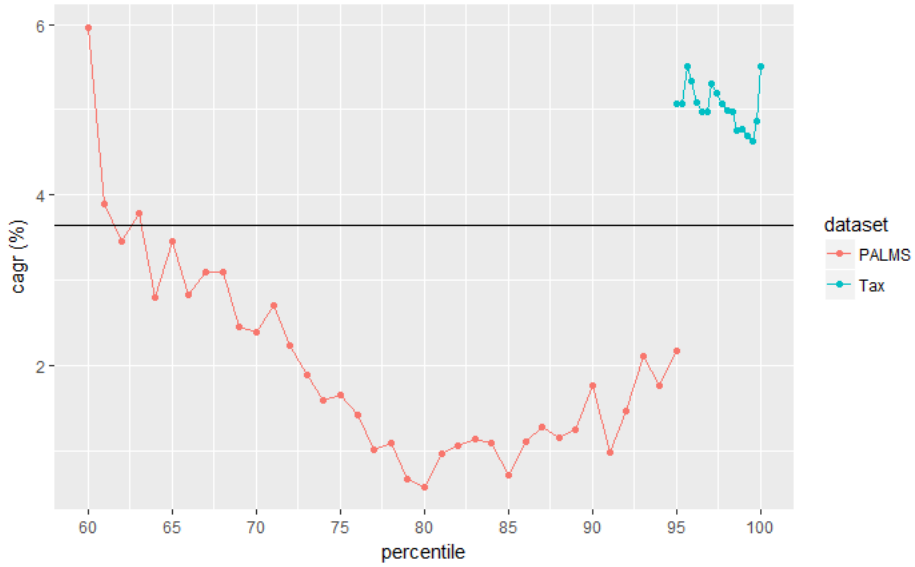
Figure A6: Incomes of top five per cent, PALMS versus tax data



Note: income inflation-adjusted to 2016 ZAR.

Source: authors' calculations based on tax data from SARS (2018) and survey data from PALMS (Kerr et al. 2017).

Figure A7: GIC 2003 to 2015 from combined survey and tax data



Note: horizontal line indicates GNI growth over the period.

Source: authors' calculations based on tax data from SARS (2018) and survey data from PALMS (Kerr et al. 2017).