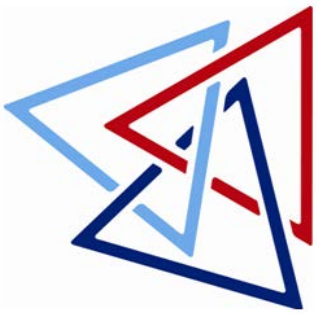

Exclusive growth: Rapidly increasing top incomes amidst low national growth in South Africa

Ihsaan Bassier and Ingrid Woolard

Abstract

We investigate top percentile incomes in South Africa using tax data. We find that top incomes increased rapidly between 2003-2016, growing on average by 5% per year. In particular, the country's low aggregate growth rate over the post-recession period masks the divergence in prosperity across the income distribution. A pattern of growth has persisted, where nearly 60% of the adult population has no labour market income, the 60-75th percentiles experience some growth, the 75-90th percentiles maintain relatively stagnant real incomes, and the top percentiles grow rapidly. The labour market remains the most important contributor to these high incomes. Salary and bonuses account for 80% of total income at the 95th percentile, and still make up 50% of total income at the 99.99th percentile. However, part of the growth does appear to be driven by non-labour market sources of income. Income recorded from shares has grown at an astonishing 10-15% per year between 2003-2015 across the 95-100th percentiles. Despite South Africa's need for inclusive economic growth as one of the most unequal countries in the world, these patterns suggest that the income trajectories of the rich continue to diverge from the rest of the distribution.

The **Research Project on Employment, Income Distribution and Inclusive Growth** is based at SALDRU at the University of Cape Town and supported by the National Treasury. Views expressed in REDI3x3 Working Papers are those of the authors and are not to be attributed to any of these institutions.

Exclusive growth: Rapidly increasing top incomes amidst low national growth in South Africa

Ihsaan Bassier and Ingrid Woolard

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1. Introduction

This paper investigates how top percentile incomes in South Africa have grown over 2003-2016, with emphasis on the period of low national growth following the global recession of 2008. Growth has been a major concern since 2010, as income has grown less than 2% per year on average (compared to nearly 6% over 2003-2007) while unemployment increased from 23% to 27% (SARB, 2017). Yet, we know very little about growth across the income distribution, particularly the growth of top percentile incomes in a country that is one of the most unequal in the world. We find that top incomes increased rapidly over 2003-2016, growing on average over 5% per year.

We contribute by focusing on top income percentiles in over 2003-2016. First, we extend Alvaredo and Atkinson's (2010) work which details South African top income percentiles for 1903-2007. Of particular interest is the evolution of top incomes post the 2008 recession, given that during the period 1928-1931 coinciding with the Great Depression large decreases in top percentile incomes occurred in a number of countries, including USA, UK and France (Atkinson and Piketty, 2010:686). Secondly, we compare the growth of top incomes to the growth of the rest of the distribution during the same period. Has South Africa's low growth since 2010 been low for all? Thirdly, we decompose the top percentiles in search of an explanation of the trends.

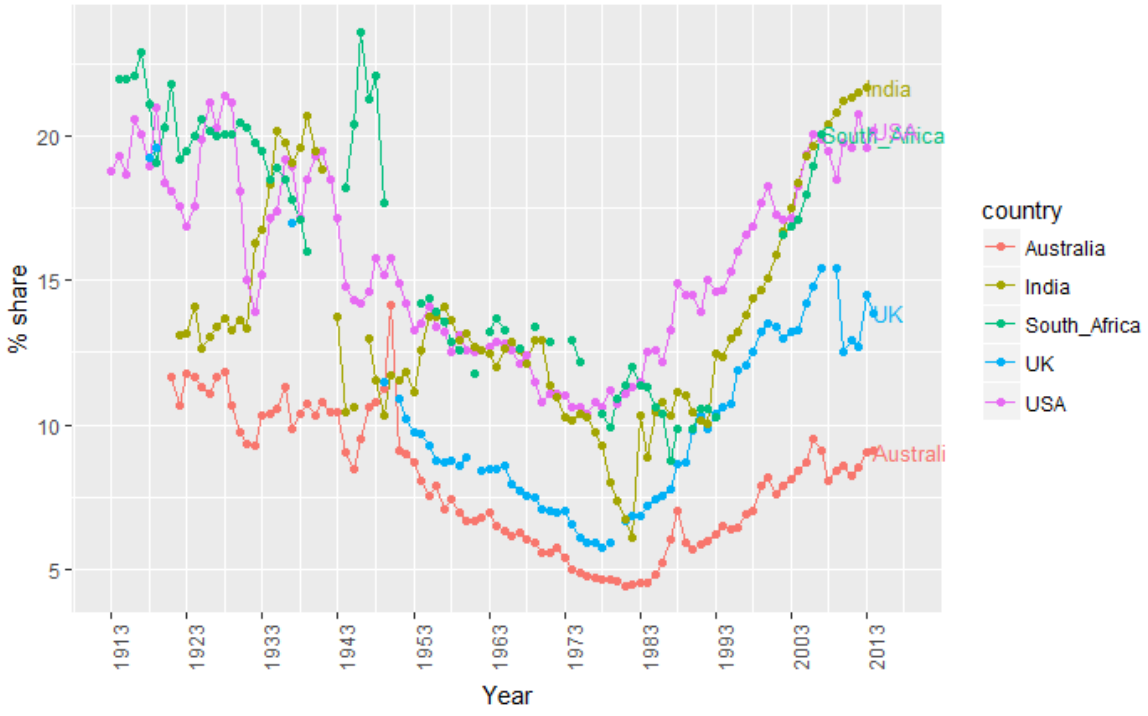
We find that a pattern of growth has persisted, where nearly 60% of the adult population has no labour market income, the 60-75th percentiles experience some growth, the 75-90th percentiles maintain relatively stagnant real incomes, and the top percentiles grow rapidly. Between 2010 and 2016, the income share of the top 1% increased from 10.5% to 13% of GNI. Surprisingly, labour income remains important even at the very top. Salary and bonuses account for 80% of total income at the 95th percentile, and still make up 50% of total income at the 99.99th percentile. However, part of the growth does appear to be driven by non-labour market sources of income. For example, income recorded from shares has grown at an astonishing 10-15% per annum across

the 95-100th percentiles, and income from capital sources as a proportion of total income grew substantially over 2011-2014. While the literature on inequality in South Africa has documented the wide disparity between the poor and rich, this paper reveals how divergent the trajectories of these groups has been over time.

2. Literature review

The remarkable and steep increase in global top income percentile shares, particularly in the Anglosphere, has been well-documented by Atkinson, Piketty, Saez and others. Atkinson and Piketty (2010) discuss a collection of papers surveying top incomes across 22 countries. Following a period of decline after World War 2, the upward trend for the richest 1% share of national income in a number of countries begins in about 1980. It is associated with new institutions of the period, such as the increased rewards for top percentiles resulting from globalization, "winner take all" pay-off structures, and the removal of trade barriers (Atkinson and Piketty, 2010:700). For example, in the USA the share of national income accruing to the top 1% increased from 9% in 1980 to 24% in 2007 (Piketty and Saez, 2013).

Figure 1: Historical trends of top 1% income share for selected countries



Source: World Inequality Database (Alvaredo et al, 2017), Authors' plots

The World Inequality Database or 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] Figure 1 shows the evolution of top 1% incomes for selected countries, including the rapid uptick in South Africa's top 1% 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 in the level of percentile shares across countries. We see that the top 1% share in Australia is far less than in the USA or South Africa. Secondly, there is also wide variation in *trends*. In France since 2002, percentile shares appear stable; in China, the top 1% appears to be decreasing (Alvaredo et al., 2017). Thirdly, while it seems that the recession caused a brief shock to top percentile shares, it is unclear whether it altered any of the trends. Data for the USA presents a dramatic shock in 2008, but the top 1% share had "recovered" by 2015. Piketty and Saez (2013) argue, regarding "what is probably the most spectacular result coming from the WTID [dataset], namely, the very pronounced U-shaped evolution of top income shares in the United States over the past century", that "the Great Recession of 2008-09 seems unlikely to reverse the long-run trend". They use this as support for their view that policies and institutions hold a decisive influence over the evolution of income shares, arguing that the drop in top percentile shares following the Great Depression was due to the drastic shift in policies rather than a consequence of the economic downturn.

The main analysis of top incomes in South Africa is given by Alvaredo and Atkinson (2010), who show that South Africa followed a similar trend over the 20th century to the countries in figure 1 above.[2] For South Africa, the period of increasing top 1 percentile shares was characterised by acute skills-biased technical change, the decline of industries that demand lower skills, and an increase in the supply of unskilled labour (Banerjee et al., 2006). These trends reinforced the historical structures of inequality that ensured a small prosperous elite amidst mass poverty.

Aside from Alvaredo and Atkinson (2010), only Orthofer (2016) uses tax data to explore the top of the distribution. She focuses on wealth inequality, but briefly refers to some income calculations. For example, she shows that the top 1% of the employed population earns 12% of

[1] The data given by WID for South Africa are slightly different to the results in this paper, as one may expect from differences in methodology. For example, many of the WID datasets divide through by 80% of GNI reported in the country's national accounts, which would inflate the share in relative terms (Alvaredo and Piketter, 2010:670). See Alvaredo and Atkinson (2013) for more details on the methodology used in their estimates of South Africa.
[2] The data in figure 1 is an updated series of Alvaredo and Atkinson (2010).

labour market income.[3] The broader literature on inequality in South Africa is well-developed, using survey data to focus on poverty, employment and growth for the bulk of the distribution (e.g. Leibbrandt et al., 2010; Bhorat and Khan, 2018). Surveys capture top incomes poorly, however, making analysis of top percentiles in surveys less credible (Wittenberg, 2017).

3. Data

We use two separate datasets in our main analysis, namely the aggregate personal income statistics which are released in tabular form as part of the national tax authority's annual report on Tax Statistics (South African Revenue Service, 2017) and the Post-Apartheid Labour Market Series, or PALMS, microdata (Kerr, Lam and Wittenberg, 2016). The decision to use two different datasets is informed by the knowledge that, while tax statistics do a fairly good job at capturing information about the incomes at the top end of the income distribution, they cannot sufficiently capture information about the those with incomes below the tax threshold. Conversely, survey data such as PALMS is considered a reliable source of labour market data (Kerr and Wittenberg, 2016) and therefore captures information well 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 dataset which fully and accurately captures both the top and bottom end of the income distribution, such a dataset is not currently available for South Africa. Hence, the next best solution is to use the two separate datasets with the caveat that they will not always be comparable. The next two sub-sections describe and discuss some of the advantages and challenges, associated with the two datasets.

3.1 Top incomes: South African Revenue Service's annual Tax Statistics

Aggregate personal income tax statistics are released annually as part of the South African Revenue Service's Tax Statistics report (2017). 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 given). These tables should capture all residents who receive incomes above a threshold, allowing for analysis of top income percentiles for the years 2003-2016. For example, in 2011 there were nearly 6 million tax filers, 3 million of whom had taxable incomes above the compulsory filing threshold

3 This is consistent with our estimates below.

of R120 000. In other words, only the highest earning 10% 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 legal checks (since tax evasion is a criminal offence), lack of choice (as employers pay income on salaries over to the revenue authorities on behalf of 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 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 have shortcomings. Only assessed filers are recorded, meaning that only tax filers with income above the compulsory threshold are obliged to submit. We exclude all data below the threshold of each year. Tax filers also often submit late; for example, the 2014 tax tables show that 80% of expected tax filers for 2013 had been assessed at that time, and this increased to 87% by 2016 due to late tax filers. To resolve this issue, we scale up the aggregate statistics by the estimate provided of the expected filers. However, if late filing is correlated with income this approach may result in biased estimates of top incomes. 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. Still, we can only hope that the estimates provided in the tax tables are not systematically biased over time.

Another limitation of tax data is that those who illegally hide incomes (tax evaders) are not captured, and the extent to which tax avoidance (those who legally structure incomes to pay less tax) biases the data is unclear. The latter is highlighted by the Davis Tax Committee (2016) who note that the divergences between top PIT and CIT rates in South Africa results in arbitrage opportunities since high income individuals can divert their income 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 even more severe using other sources 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 March to February of the following year. In calculating percentiles, the full South African adult income distribution including zero incomes is considered, where an adult is defined as age 18 years and older.

3.2 Top incomes in 2011 and 2014: South African Revenue Service tax micro-files

In addition to the publicly available tax tables, we use confidential, anonymized micro-files of assessed tax records for the years 2011 and 2014 provided to us by the South African Revenue Service (2015). The main differences between the micro-files and the tax tables is (a) it contains individual records rather than aggregate data, allowing us to decompose the data, and (b) it contains a 20% randomly drawn sample of all records, resulting in some sampling error. For example, after excluding incomes below the compulsory tax filing threshold, we are left with 330 000 records in 2014, which represents 1.65 million individuals, or the highest earning 5% of the South African adult population.

3.3 The rest of the income distribution: Post-Apartheid Labour Market Series

For statistics on the rest of the distribution, constituted of non-tax filing South African adults, we use the Post-Apartheid Labour Market Series or PALMS (Kerr, Lam and Wittenberg, 2017). PALMS stacks microdata from 62 nationally representative surveys across the period 1993-2017, 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 dataset and is discussed by Kerr and Wittenberg (2017) in detail.

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

4 For example, PALMS uses the "Q54a_monthly" variable from the QLFS surveys, which corresponds to the survey question: "What is your (choose one) annual/monthly/weekly/daily/hourly wage or salary before deductions? (Include tips and commissions)" A respondent may not include bonus in her monthly wage.

PALMS top income data. Secondly, there is no income information for the years 2008-2009 and 2016-2017; 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 dataset, and 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 as unemployed or not economically active, and report no earnings. This gives 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 like the Gini coefficient (see, for instance, Leibbrandt et al., 2012). 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 by samples. This point is important for inequality and income measurement. Piketty and Saez (2013) 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 starts at just above the 90th percentile of the distribution.

Table 1: Threshold incomes in R1000s for percentiles of the adult population in 2011

Percentile	50	58	90.65	95	97.5	99	99.9	99.99
Tax	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.
Sources: National Income Dynamics Survey wave 2 (SALDRU, 2012), Income and Expenditure Survey 2010/11 (StatSA, 2015), Post-Apartheid Labour Market Series for the year 2011 (2017), and Tax microfiles for 2011 (South African Revenue Service, 2015).

5 They 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 given earnings amounts through a similar process.

The Income and Expenditure Survey (IES) of 2010/11 is a cross-sectional survey carried out by the national statistics agency StatsSA (2015) every 5 years. It contains over 95 000 observations, making it the largest national survey with income data. In calculating incomes, I add all income from work and other sources not associated with government transfers such as grants, [6] and use the cross-sectional weights provided in the dataset. Incomes in this dataset sum to 46% of 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 2010/11 is wave 2 of a panel series (Southern Africa Labour and Development Research Unit, 2012), with about 30 000 observations. To calculate incomes, I restrict to the panel by using the "pweight" weights, add non-grant incomes, and convert to pre-tax income.[7] NIDS incomes only sum to 37% of GNI and the percentiles perform much worse than the IES. Interestingly, it underestimates incomes consistently by about 30% compared to the tax data from the 91st percentile upwards, though it appears to pick up a few large incomes at the very top.

Finally, the relevant wave from the PALMS dataset described above is QLFS quarter 4 of 2010, containing about 30 000 observations. Similar to NIDS, incomes in this survey sum to 37% of GNI. It 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 to tax data. He estimates that this results in estimates based on this survey data of the Gini on earnings income that is three percentage points lower than in reality (from about 0.57 to 0.60).

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6 Specifically: "income from work" includes wages, overtime, bonus and profit over the last 12 months (COICOP code 50100000) and "other income" includes all other sources of income aside from grants, such as remittances, royalties, investments. Ideally, we would like 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 I 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 shown by Leibbrandt et al. (2010), and will therefore be inaccurate for non-taxable income or items that are taxed differently such as interest.

In all three datasets, 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 to the tax data. As table 1 shows, it does not perform much worse than other commonly used income datasets, even at the top of the distribution where it is missing non-labour market income.

4. Methodology

Our method for finding exact percentiles from the given tax tables follows the Pareto interpolation method outlined by Piketty and Saez (2001). The tax tables give tax brackets with the number of tax payers in each. We choose the tax bracket with cumulative taxpayers closest to the desired percentile, then interpolate any gap assuming a Pareto distribution. In practice, the tax brackets are so close together that barely any interpolation is needed. For example, the table below shows that the closest tax bracket to the 95th percentile gives the exact income for individuals totaling on average 95.033% of the population income distribution.

Table 2: Average empirical and interpolated percentile

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: South African Revenue Service (2017), Authors' calculations.

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 R60 000, increasing to R350 000 by 2015. For the years 2015 and 2016, the income level of the 95th percentile of the distribution falls below the threshold, hence Table

2 reports only 12 years as valid for analysis in 2015. Similarly, the threshold is above the 96th percentile in 2016. Otherwise, the data covers all legal income for the top percentiles over the period.

Lastly, the calculations of top percentiles and their shares rely crucially on aggregate population and gross national income (GNI) statistics. We use the national statistical agency's midyear estimates for population totals (Stats SA, 2015) and online tables from the South African Reserve Bank for GNI (SARB, 2017). This follows the top incomes literature (Alvaredo and Piketty, 2010:670).

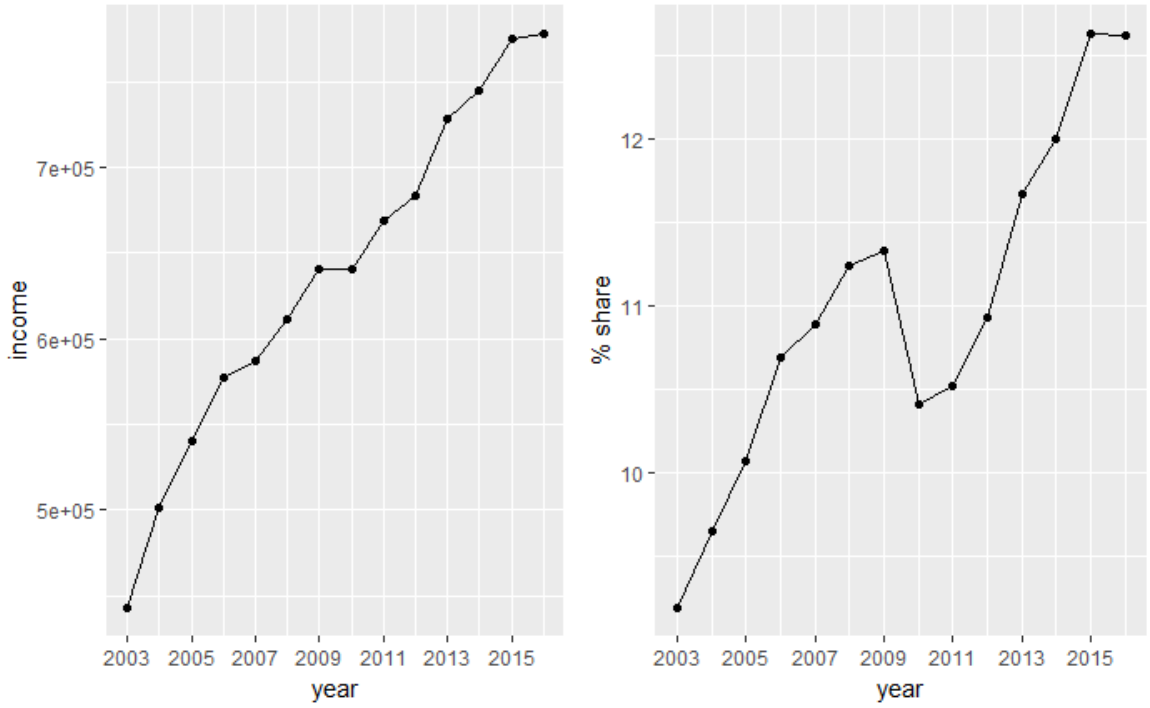
5. Results

5.1 Top incomes have grown phenomenally

Top incomes and the income shares of the top 1% have increased substantially between 2003 and 2016, as seen in figure 2. While the effects of the 2008 global recession are briefly observed, top incomes and shares quickly bounce back at rapid growth rates. Table 3 shows that, by 2016, a person at the 99th percentile had a taxable income of nearly R800 000 per year. The top 1% held 12.6% of GNI, and the top 5% held 27.4% of GNI. The top 1% trend in figure 2 is illustrative of all top percentiles[8]: they experienced a phenomenal real compounded average growth rate (CAGR) of about 4.5%, with real income nearly *doubling* over the 13-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 of the appendix.

Figure 2: Top 1% income trends of South African adults



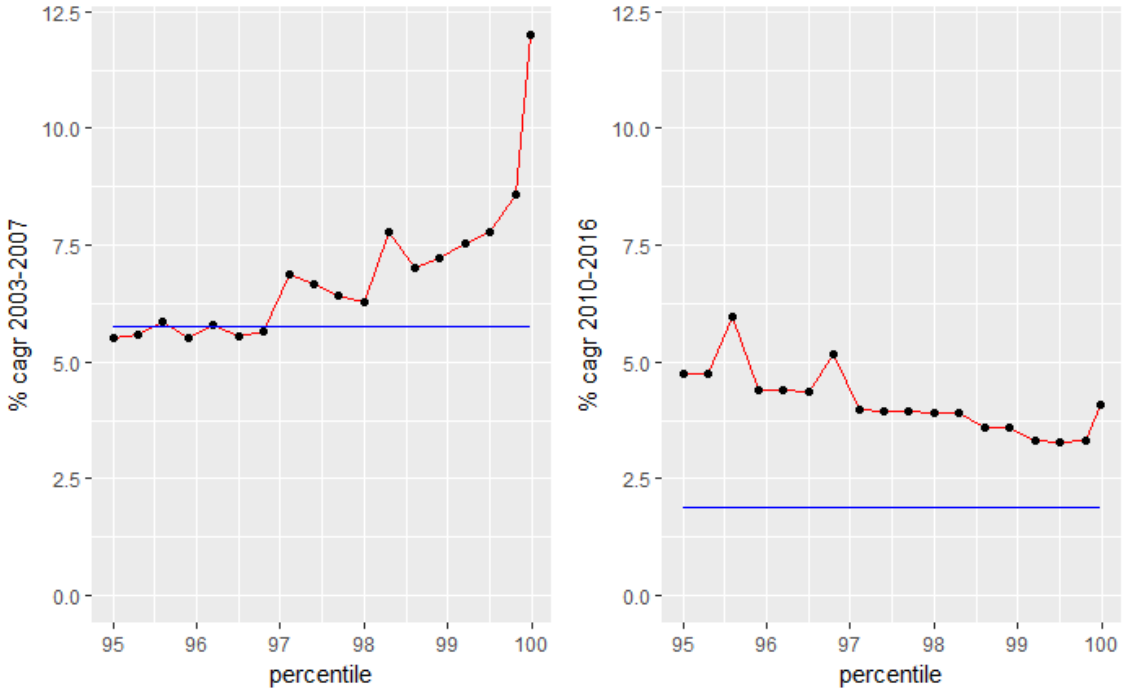
Notes: Income reported in real 2016 Rands. As discussed above, the difference in shares reported here compared to figure 2 is likely due to differences in the GNI denominator.
Source: South African Revenue Service (2017), Authors' calculations.

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

Percentile	Year	Threshold Income	Share (%)	CAGR (%)
95	2014	R309, 917	27.4	5.07
96	2016	R374, 531	25.9	4.73
97	2016	R453, 689	22.4	4.92
98	2016	R551, 472	18.2	4.59
99	2016	R777, 820	12.6	4.43
99.9	2016	R2, 288, 927	3.88	4.38
99.99	2016	R7, 230, 804	1.2	4.80

Notes: Incomes inflation-adjusted to 2016 Rands. Threshold income given for the corresponding year. Compounded Average Growth Rate (CAGR) calculated since 2003.
Source: South African Revenue Service (2017), Authors' calculations.

Figure 3: Growth incidence curves pre- and post- global recession



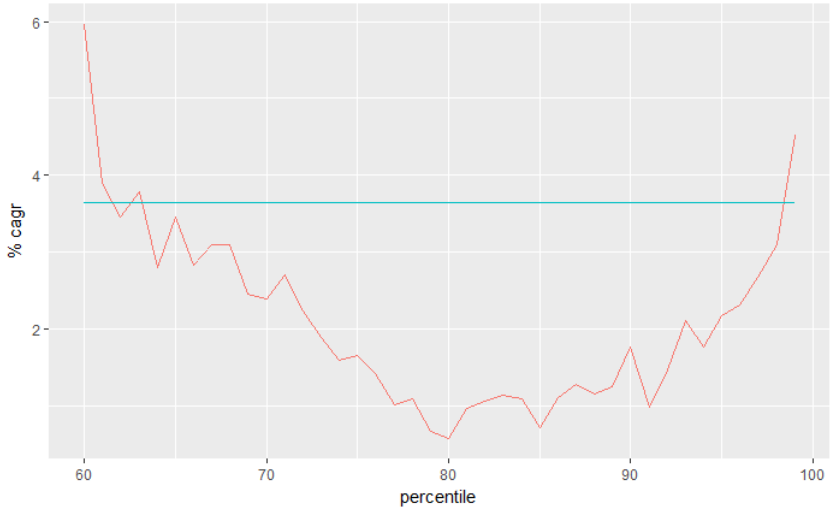
Notes: Income reported in real 2016 Rands. Blue lines indicate GNI growth over the period.
Source: South African Revenue Service (2017), Authors' calculations.

We can divide the 2003-2016 period into before and after the recession, which correspond to periods of high and low national income growth in South Africa. The growth incidence curves (GICs) in figure 3 show the compounded average growth rate for each percentile over the last 13 years. In South Africa's high growth period over 2003-2007, growth in top incomes tracked the average GNI growth rate of 5.74% until about the 98th percentile. This changed after the global recession. Although both top percentile and national income growth rates dropped substantially, the growth paths of the two diverge early and clearly, with incomes from the 95th percentile onwards growing at over double the average GNI growth rate of 1.89% per annum. This worrying trend is indicative of rapidly increasing inequality from the top of the distribution. It highlights the stark contrast between South African policy aims of inclusive growth and actual growth in incomes across the distribution.

5.2 Incomes over the rest of the population have stagnated

The growth incidence curve for the whole distribution, as 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, of between R200 and R1000 per month (in 2016 Rands). This drops off quickly, and we find the 75th to 90th percentiles stagnate with a CAGR of 1-2%, far below GNI growth over the period. The same story emerges when we track shares of percentiles over time: shares, calculated over total income in PALMS, decrease slightly for the 75-90th percentiles and are unchanged for lower percentiles (see figure A3 in the appendix).

Figure 4: Growth Incidence Curve 2003-2015 using PALMS



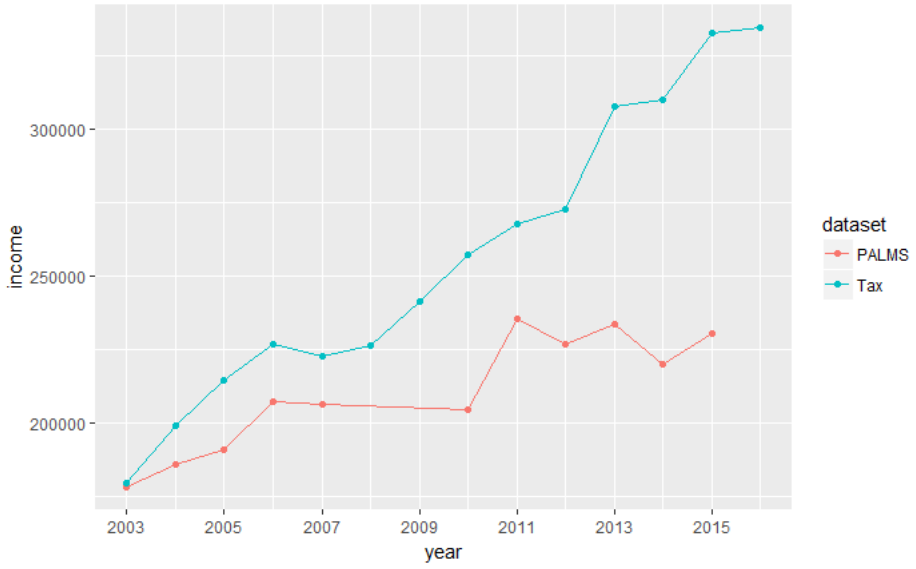
Notes: The blue line indicates GNI growth over the period. The 59th percentile has been omitted because it likely reflects noise at the bottom of the distribution.
Source: Post-Apartheid Labour Market Series (2017), Authors' calculations.

We break up the GICs into two periods as we did for the top incomes using the tax data (see figure A4 in the appendix). The period 2002-2007 follows a flattened U-shape but the bottom income growth rates are even higher than before, with the 60-70th decile growing at 10-25% per year in real income. This is explained by the combination of a low base and job growth: the unemployment rate decreased from 27% to 22% over this period (SARB 2017), 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 completely in the 2010-2014 period, where 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 5. 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 LFS ends. However, for incomes collected under the QLFS data, the trend for the survey data is flat compared to the trend of the tax data. A similar story emerges for other top percentile incomes and shares. Kerr and Wittenberg (2017) note that "labour income data in the QLFS from 2010-2015 is substantially different" to prior waves, due to differing imputation procedures used by StatsSA. It is possible that the problem could lie with the tax data, but this is unlikely given the discussion in section 3 and other indications consistent with high top percentile growth presented in the next section. A possible explanation for the divergence between tax and PALMS data is that PALMS data excludes non-labour market income, and the next section shows how income from capital grew substantially over the period. However, this is unsatisfactory as labour market income also grew.

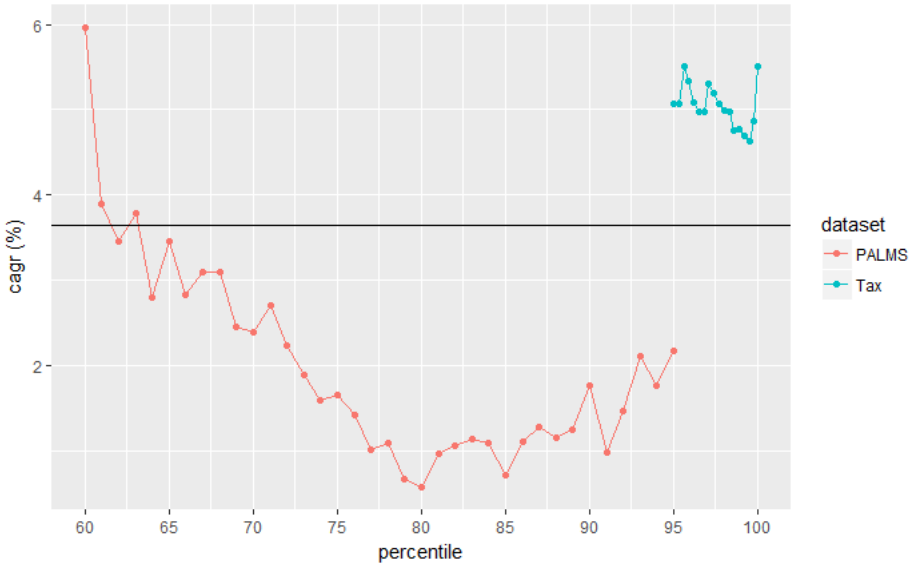
The PALMS data does not pick up the diverging incomes at the top of the distribution. Figure 6 combines the two sources for a picture of growth across the distribution. The narrative that emerges is one of high growth for top percentiles after 2010 and low growth elsewhere.

Figure 5: Incomes of top 5%, PALMS vs Tax data



Notes: Income inflation adjusted to 2016 Rands.
Source: Tax data from South African Revenue Service (2017), survey data from Post-Apartheid Labour Market Series (2017). Authors' calculations.

Figure 6: Growth incidence curve 2003-2015 from combined survey and tax data



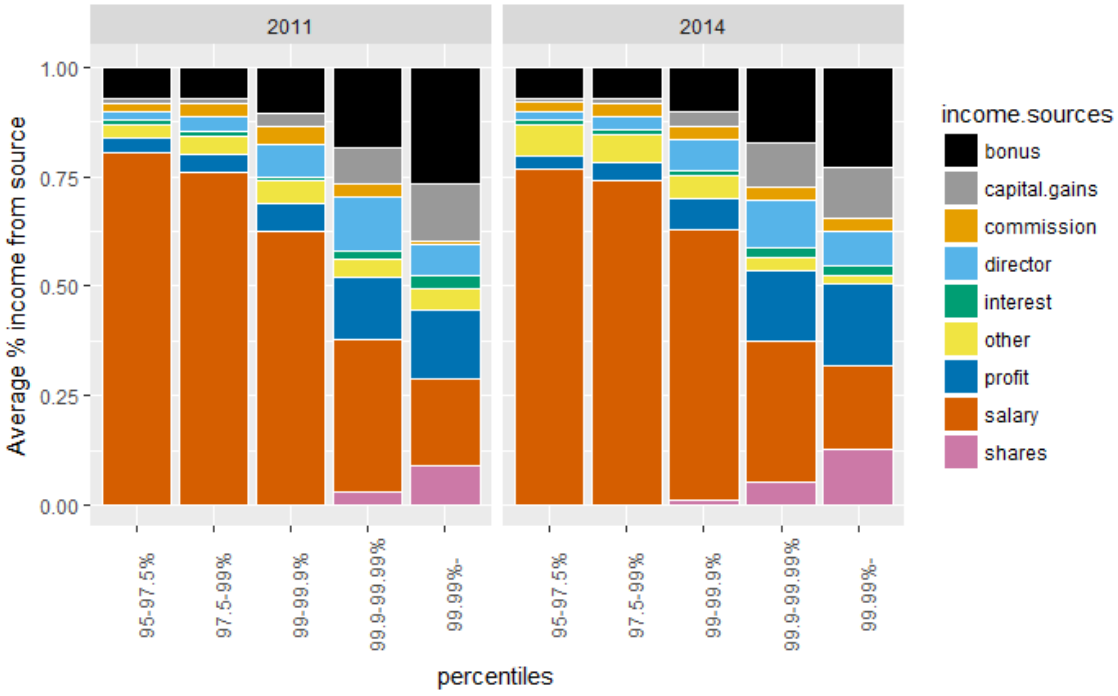
Notes: Horizontal line indicates GNI growth over the period.
Source: Tax data from South African Revenue Service (2017), survey data from Post-Apartheid Labour Market Series (2017). Authors' calculations.

6. Discussion

6.1 Decomposition of top incomes

While the tax tables are useful for establishing trends, closer analysis requires micro-files. We begin by using these micro-files to check the income and share estimates above. 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). The top income trends can be checked using case studies of top income pay. For example, consultancy company Deloitte (Yull, 2017) tracked the remuneration of CEOs of the JSE top 100 companies. The lower quartile remuneration of a mid-tier company CEO earns over R6 million in total annual pay which by our estimates above is at about the 99.99th percentile. Over 2011-2016, Yull (2017) reports an average growth rate in pay for this position of above 10%, which exceeds our estimate for growth of this percentile above.

Figure 7: Sources of income by percentile and year



Source: South African Revenue Service (2015), Authors' calculations.

The micro-files allow us to disaggregate incomes into their sources. Salaries and bonuses on average make up over 80% of income until the 99th percentile, when salary rapidly diminishes as a proportion of the total. Income from shares, profit, capital gains and bonuses become 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 1%. Here we find that income sources also shift dramatically over this narrow range of the top 1%. This is hardly surprising, given that the top 1% in South Africa begins at about R800 000, which includes occupations from university professors and general medical practitioners to CEOs.

Returning to the tax tables, SARS provides a few breakdowns by taxable income bracket in the public-release tabulations. Gross income is equal to taxable income plus deductions, such as medical aid or pension contributions. This is arguably a better indicator of income and certainly more reflective of income share since GNI includes these contributions. The trend in gross income and share follows the trends in taxable income presented above very closely, as expected. The top 1% share based on gross income is about 2% higher than the estimate based on taxable income (see figure A5 in the appendix).

The decomposition of income sources/deductions must be interpreted with a little care. Taxpayers are categorised by *total* taxable income bracket, which hides that individuals in the same category may draw from very different income sources. The correlation across the top 5% between income from shares or interest compared to income from the labour market (salary, bonus, commission and director) is about 0.15 in 2011 and 0.17 in 2014, which is low and gives some indication that these percentiles may consist of different groups of people.

The tax tables give some aggregate breakdowns of income sources. Tax collection on this level of aggregation may reflect changes in policy or collection. With this caveat in mind, table 4 highlights some astonishing trends. Income from share options has grown since 2003 at a CAGR of over 15% for the top 1% (real terms). Medical aid contributions are also increasing rapidly, corresponding to the broader narrative of rising private healthcare costs in South Africa. For example, the Council for Medical Schemes reports an average increase in contributions of 8% over this period (CMS, 2015). Pension contributions, on the other hand, have stagnated, with low average real growth of 1-3% 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 1%, but at the 95th percentile the gender composition is much more equal.

Table 4: Average income and growth by source and percentile

Source	Percentile	Income	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	12079.90	13.11
	99	21172.57	12.80

Notes: "Income" gives the average over 2015, and growth is calculated over 2003-2015 after inflation adjustment. Medical Aid refers to contributions, not income.
Sources: South African Revenue Service (2017), Authors' calculations.

Table 5: Gender composition by percentile for 2014

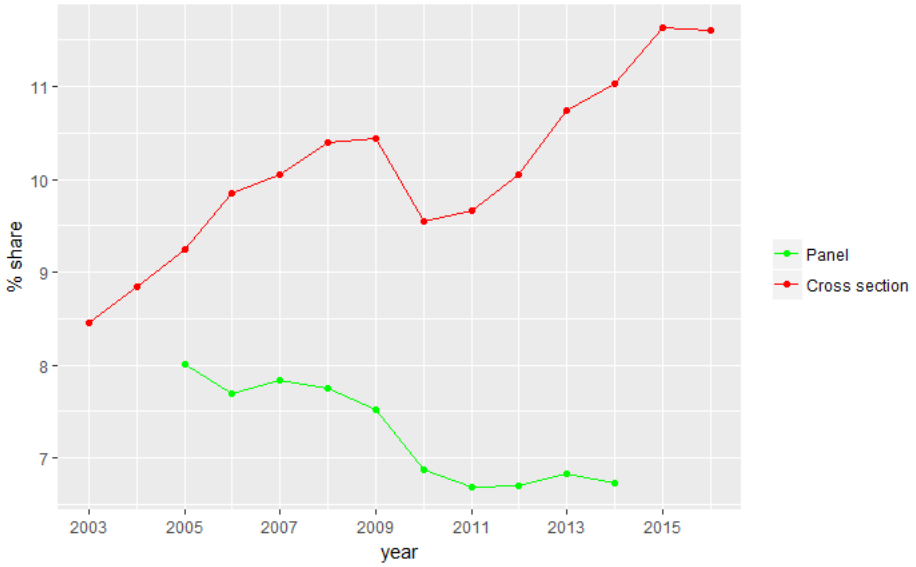
Percentile	Gender	Average Income	Total Number	Composition
95-97.5	F	372,832	303,030	43%
	M	377,030	401,780	57%
97.5-99	F	569,006	137,730	33%
	M	580,140	283,480	67%
99-99.9	F	1,036,908	61,645	25%
	M	1,094,540	188,605	75%
99.9-99.99	F	3,187,891	3,375	14%
	M	3,270,260	20,180	86%
99.99 -	F	8,265,060	235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

Notes: "Number" represents the full absolute number of tax filers by gender. Incomes adjusted to 2016 Rands. Breakdown of average income by gender unavailable for "Top" category.
Source: South African Revenue Service (2015), Authors' calculations.

6.2 Panel of taxpayers

SARS releases an annually updated "panel" of taxpayers. For the 2016 panel, they categorise the 2005 tax filers by tax bracket and track those who submitted returns for the following ten years until 2014. We include only taxpayers that were above the highest threshold for compulsory submission of tax returns over the period (R250 000) in 2005 to guard against selection in the panel. We are left with 265 000 tax payers out of about 400 000 original taxpayers above the threshold in 2005. This corresponds to the "top" 0.85% 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 overestimated.

Figure 8: Cross-section vs panel of top 0.85% share of income



Source: South African Revenue Service (2017), Authors' calculations.

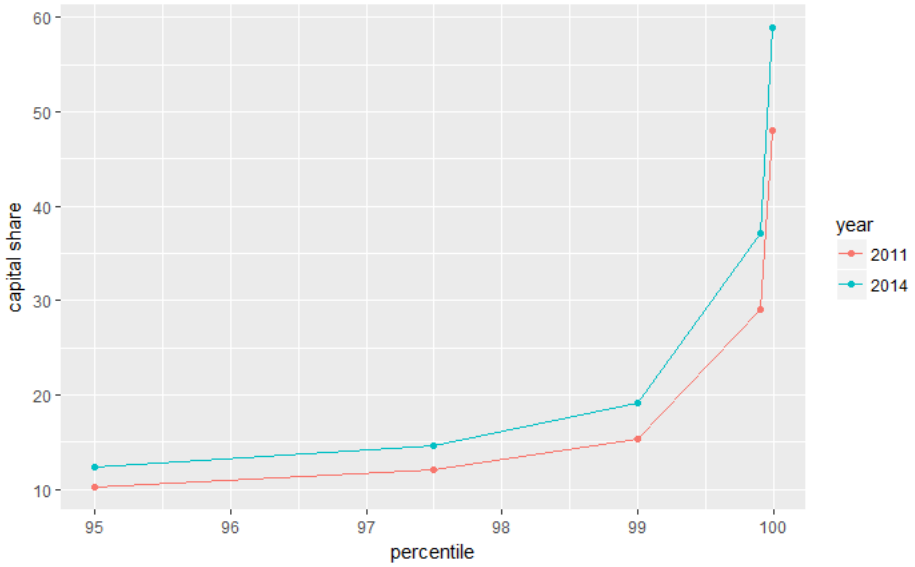
In the data, the estimated panel incomes are substantially higher than the "cross-sectional" estimates, as expected. A stark contrast emerges in figure 8, which shows the divergent evolution of shares. Aside from the recession when both shares dip, the panel is stable or decreasing while the cross section is always increasing. Thus the compound average growth rate over the ten years for the panel is much lower than the cross-sectional growth, 1.4% compared to 3.8%. While the "2005 rich" did indeed grow their incomes, this indicates that the top percentiles' growth in income and shares come primarily from individuals outside of the panel - a newly rich and/or a younger rich. This warrants further investigation and may contain clues of the political economy of growth over the post-recession period.

6.3 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, "r>g": when 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 2010-2015 as shown above. The growth incidence curves 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).

Figure 9: Share of income from capital



Source: South African Revenue Service (2015), Authors' calculations.

However, this does not explain the high growth rates of the 95th-99th percentiles which derive most of their income from the labour market (figure 7). 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 technical change (see for example Banerjee et al., 2006) 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 ordinary workers whose salary increases are simply based on CPI 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.

We can shed some light on these explanations by tracking the share of income from capital sources, shown in Figure 9. We use the detail provided in the tax microfiles for 2011 and 2014

and designate income sources into capital[9] and labour market[10].The capital share increases with the percentiles. For 2011, it rises slowly from 10-20% between the 95-99th percentiles, before rapidly increasing to nearly half of total income on average. The 2014 distribution dominates this everywhere, and by a large proportion too: 20-30% higher proportionally than in 2011. Capital income grew at a compounded average growth rate of 10-20%, similar to the growth of share income observed in table 4. Indeed, 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 9% per year.

This gives strong support to the *r>g* explanation. Secondly, labour market income grew at a compounded average growth rate of 2-3% (Tax microfiles, Authors' calculations). Compared to the GNI growth over the period of 1.5%, this is still high and therefore this still keeps a compelling space open for the bargaining power explanation. A final possible explanation is that top percentiles were involved with small sectors that grew much faster than other sectors. This is consistent with the diverging trend between the tax data cross sections and panel given in figure 8. Perhaps the cross-sectional data are masking high growth in only a portion of the top percentiles. These explanations require further investigation.

6.4 South Africa's growth path 2003-2015

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

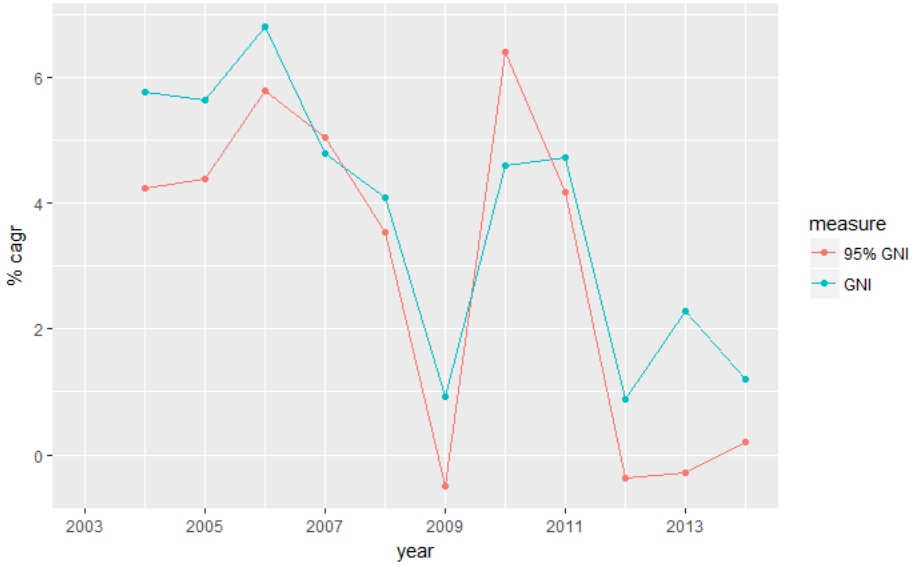
Who are the winners and losers of this growth pattern? Table A3 profiles adults by income category for 2015. The results are unsurprising. Lower percentiles have more women and Africans. Whites are grossly over-represented in the fast-growing top percentiles. Age is relatively similar across the categories, indicating that retired workers do not seem to be driving the results. Interestingly, education is similar across the zero-income category and the 60-75th percentiles

9 Specifically income from: shares, interest, capital gains, profits broadly associated with capital (e.g. royalities, rent), and lump sums (e.g. pension, benefits).
10 Specifically income from: salary, bonus, commission, director, profits broadly associated with sales, foreign payments, pension, and travel allowance.

who experienced some income growth. Most in the 75-90th percentiles, those employed who experienced very little real income growth, worked in elementary occupations, skilled agricultural/fisheries work or machine operations. Even more worryingly, the growth incidence curves in figure A4 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 has observed 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 complicated by intra-household bargaining arrangements (for example, those who report zero income but are supported by high-percentile partners) and grant transfers from the government, which supports a large percentage proportion at the bottom of the distribution (see Leibbrandt et al. 2010). However, pre-transfer incomes indicate the market distribution of rents from production. One insight from this paper is that it is misleading to report GNI growth as a shorthand indicator of development in South Africa, as commonly discussed in the media. Given that the tax statistics are published annually, a relatively simple complement is to subtract the incomes of the top 5% (as reported in the tax tables) from the GNI reported by the South African Reserve Bank (2017) to find a “95% GNI” growth rate. Figure 10 shows that the “95% GNI” growth rate is almost everywhere below reported GNI growth, i.e. growth has almost never been pro-poor. By this measure, the country experienced a recession (negative growth) in 2012 and 2013.

Figure 10: GNI growth rate for the bottom 95% of the income distribution



Source: South African Reserve Bank (2017) and South African Revenue Service (2017), Authors’ calculations.

7. Concluding remarks

The extraordinary growth of the incomes of the top percentiles at up to three times the growth rate of national income in the post-recession period is alarming in one of the most unequal countries in the world. For 95% of the population, 2012-2014 were years of near 0 growth. Over the same period, incomes of the top percentiles were growing at over 5% per year and their income from capital was growing at 10-20% per year.

The South African literature on growth and inequality has typically relied on survey data. This paper contributes by primarily making use of publicly available annual tax statistics. This is a rich source of data that helps to address weaknesses in survey data, particularly (a) at the top of the income distribution, where survey participants under-report or refuse to answer, and (b) for analysing income from capital sources. In the case of the QLFS survey, these weaknesses may have contributed to the severe underestimation in the growth rate of top incomes when compared to tax data (figure 5).

While this paper focuses on top percentile income, the estimation of top percentile wealth is similarly important for measures of inequality. Orthofer (2016) shows that wealth inequality is far worse than income inequality in South Africa; for example, she calculates a Gini coefficient for income of 0.6 and for wealth of 0.95. The ratio between wealth and income increases with income. To illustrate, we estimate from wave 4 of the National Incomes Dynamics Study (SALDRU, 2017) that the top 1% of adults have a wealth to income ratio of median 12 compared to the rest of the earning adult distribution where the median ratio is 6. Table 4 and figure 9 give some evidence that part of the divergence in income growth rates is driven by income from capital, which is closely related to wealth inequality. Incidentally, this also suggests that estimates of the number of high net worth individuals in South Africa are far too low. For example, Credit Suisse (2016) estimates that there are 45,000 dollar-millionaires, whereas we estimate there are about 182,000 dollar-millionaires in the country.[11]

An expanded focus on inequality is the natural response to the puzzles outlined in this paper. What are the processes explaining South Africa's persistent and arguably predictable growth path over the last 20 years, *i.e.,* U-shaped growth in income with non-decreasing inequality? What are

11 The top 0.5% have an income threshold of R1,061,478 (South African Revenue Service, 2017, authors' calculations), and a wealth:income ratio of at least 12 (using our NIDS estimate above). Using an exchange rate of R13 to the dollar, the top 0.5% are all dollar-millionaires. This corresponds to 182,000 adults.

the consequences of such a strong and sustained divergence between capital and labour income growth? Does the growth of a new elite, as suggested by Figure 8, correspond to the narrative of a political economy compromise at the end of Apartheid, where "white capital" continues growing on condition that it supports a small emerging black elite? 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 of the majority of people in South Africa.

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Appendix

Table A1: Example of tax tables data

Year	Bracket Threshold (Rands)	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: South African Revenue Service (2017), Authors' calculations.

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

		Micro-files		Tax Tables	
Year	**percentile**	**Real income**	**share (%)**	**Real income**	**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

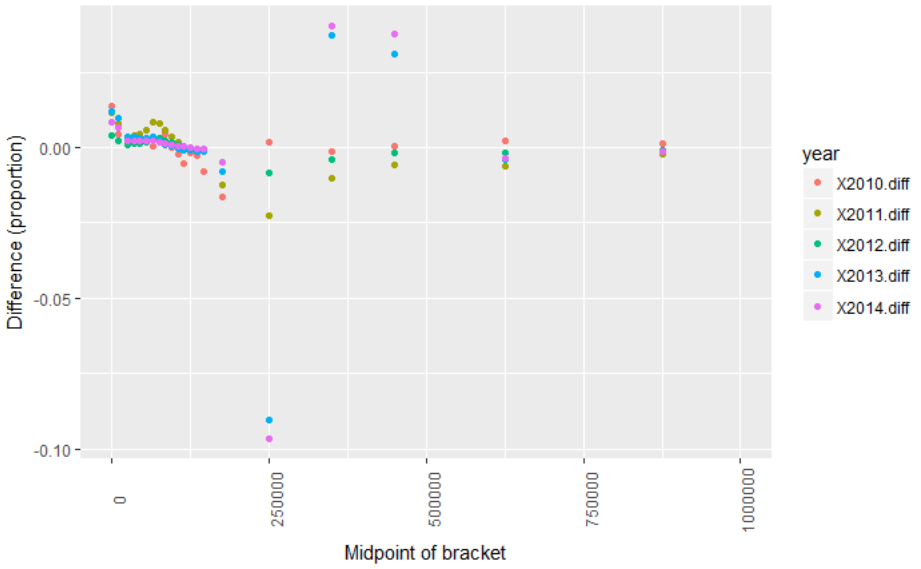
Source: Micro-files from South African Revenue Service (2015), Tax Tables from South African Revenue Service (2017). Authors' calculations.

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

Percentile	Income Threshold	CAGR (%)	Age (mean years)	Female (%)	African (%)	Coloured (%)	White (%)	Education (median years)
0-56	0	NA	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

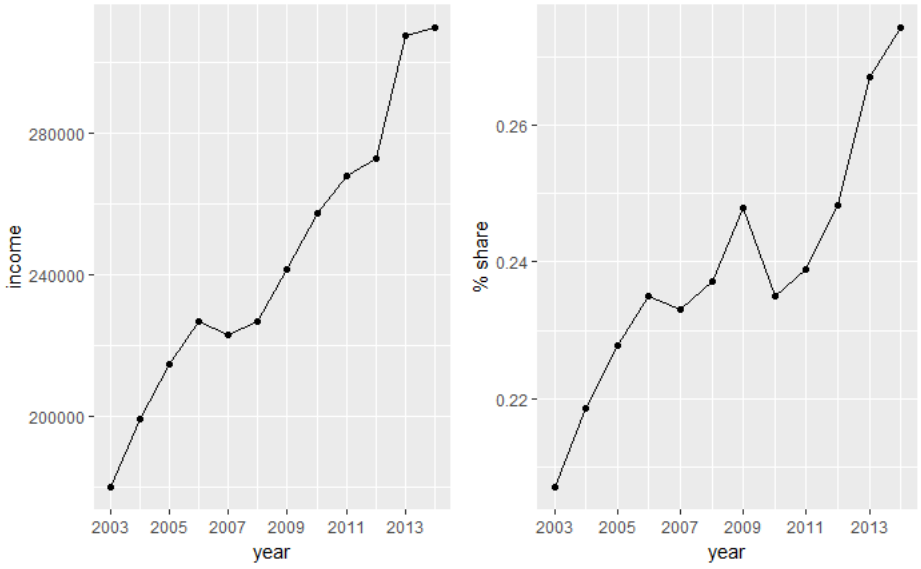
Notes: Compounded Average Growth Rate (CAGR) given over 2003-2015. CAGR for percentiles 95-100 from tax data is 5.07 (see table 3). Percentiles 57-59 have been omitted because they likely reflect noise at the bottom of the distribution.
Source: Post-Apartheid Labour Market Series (2017)), Authors' calculations

Figure A1: Late tax filers by income tax bracket



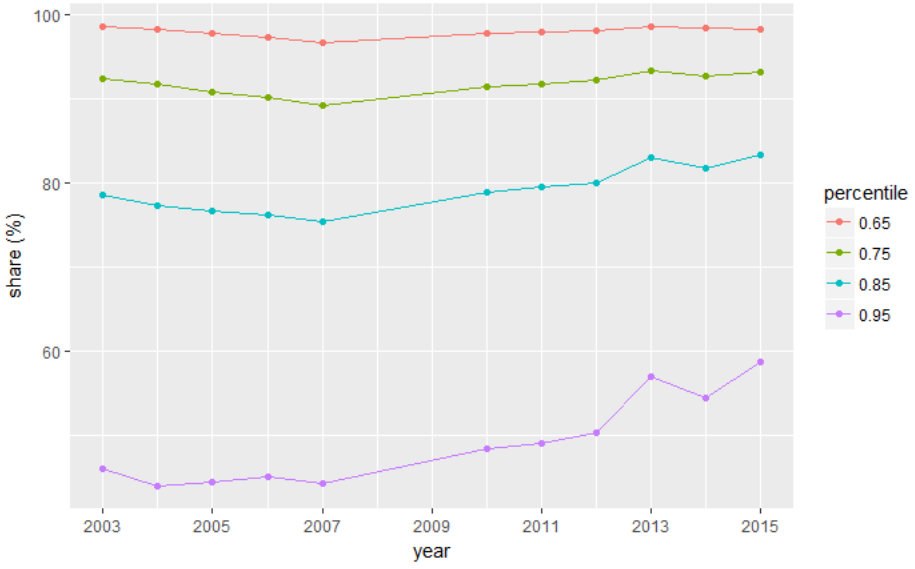
Notes: A positive proportional difference (y axis) indicates relatively more late filers.
Source: South African Revenue Service (2017), Authors' calculations

Figure A2: Top 5% income trends of South African adults



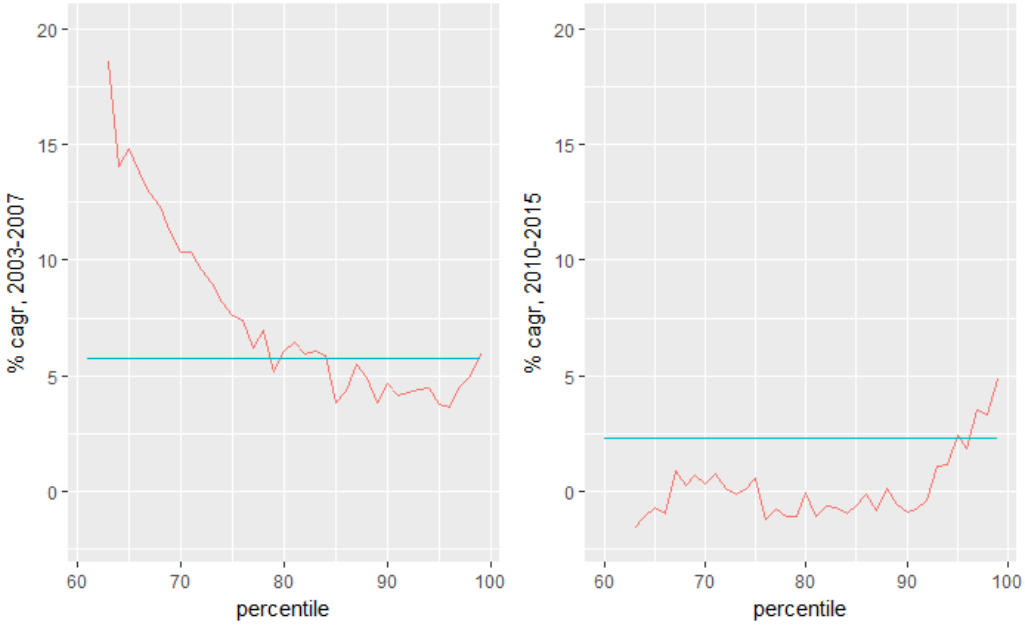
Notes: Income reported in real 2016 Rands. As discussed above, the difference in shares reported here compared to figure 2 is likely due to differences in the GNI denominator.
Source: South African Revenue Service (2017), Authors' calculations

Figure A3: Percentile share trends, survey data



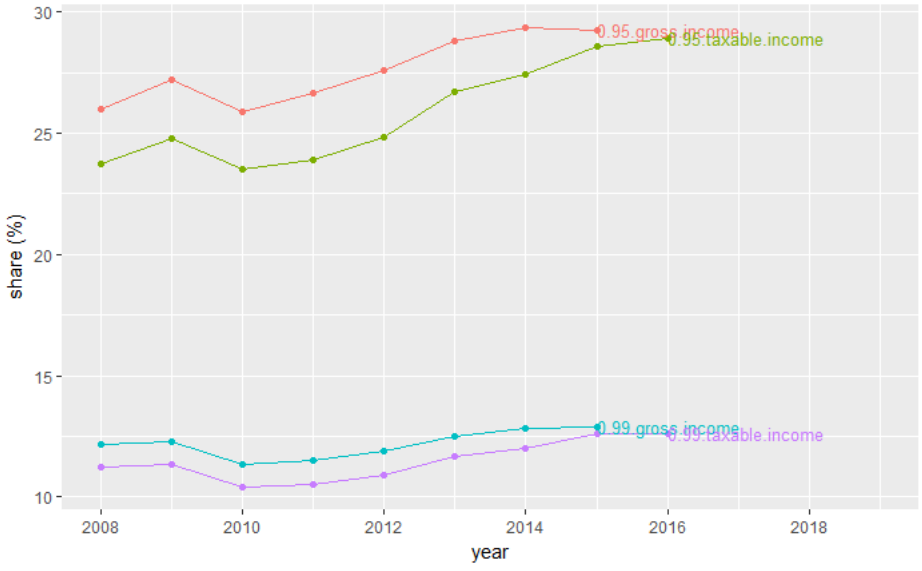
Source: Post-Apartheid Labour Market Series (2017), Authors' calculations.

Figure A4: Growth incidence curves pre- and post-recession



Source: Post-Apartheid Labour Market Series (2017), Authors' calculations.

Figure A5: Gross vs taxable percentile shares



Source: South African Revenue Service (2017), Authors' calculations.

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It is aimed at deepening understanding of the dynamics of employment, incomes and economic growth trends, in particular by focusing on the interconnections between these three areas.

The project is designed to promote dialogue across disciplines and paradigms and to forge a stronger engagement between research and policy making. By generating an independent, rich and nuanced knowledge base and expert network, it intends to contribute to integrated and consistent policies and development strategies that will address these three critical problem areas effectively.

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