

Inequality, Redistribution, and Growth: Evidence from South Africa, 1993-2019

Aroop Chatterjee¹ Léo Czajka^{2,3} Amory Gethin³

May 2021

¹Wits University

²Université catholique de Louvain

³World Inequality Lab



Introduction

- Many studies on the determinants of poverty in the developing world, yet still very little is known of the links between poverty, inequality, and growth.
 - Who gains from growth in the long run?
 - Do government investments in health, education, and infrastructure benefit the poor?
 - What share of these benefits are lost through increased tax burdens?
- This paper: shed new lights on these questions by constructing a new dataset on growth and redistribution in South Africa, 1993-2019.

A new dataset on growth and inequality in South Africa

- **Distribution of the entire net national income** to individuals
- **Allocation of all taxes and transfers** with unprecedented granularity
→ extremely detailed analysis of redistribution, including:
 - Expenditures in VAT-exempt goods / informal sector
 - Heterogeneity in the incidence of trade duties
 - Admin data on grant recipients
 - Education spending by geography and type of program
 - Intensity in the use of the public healthcare system
- **Preservation of all sociodemographic variables** in surveys.

Main results

- **Dramatic divergence of pretax incomes** since 1993.
 - Top 1% pretax income grew by 50% while bottom 50% pretax income decreased by a third
- **Rise of government redistribution** almost fully compensated the income losses of the poor, but not the surge of inequality
 - Large increase in transfers received by the bottom 50%
 - Financed by higher taxes on the top 1% and the bottom 50%.
- **Decline of racial inequality**, but fully driven by top Black incomes.
- **Enhanced redistribution to rural areas** has fully absorbed the rise of the rural-urban pretax income gap.

Related literature

- **Distributional National Accounts (DINA)**: framework adopted in this paper, following Alvaredo et al. (2020).
- **Fiscal incidence studies**: sometimes more precise in allocating taxes and transfers (e.g. Inchauste et al. 2015 for South Africa), but often focused on one year and restricted to survey income \neq macro growth.
- **This paper: take the best from these two strands of literature**
 - First DINA study incorporating redistribution outside of US/Europe.
 - Allocate taxes and in-kind government transfers with great detail.
- **Preliminary: suggestions welcome!**

Outline

1. Methodology
2. The distribution of factor national income
3. The distribution of taxes and transfers
4. Decomposing inequality: race and geography

1. Methodology

Conceptual framework: Distributional National Accounts

- Distribute the entire net national income:

$$NNI = GDP - CFC + NFI$$

- **Factor national income** = sum of all income flows accruing to individuals before any tax or transfer.
- **Pretax national income** = factor income after the operation of the unemployment and pension systems.
- **Posttax national income** = pretax income after allocation of all taxes and transfers (including indirect taxes, collective government expenditures, etc.).

Methodological steps

1. Combination of surveys and tax data to estimate the distribution of “reported” household income.
2. Rescaling of “reported” income flows and allocation of “unreported” income components
→ Factor national income
3. Distribution of the pension and unemployment systems
→ Pretax national income
4. Distribution of taxes and transfers
→ Posttax national income

Combination of surveys and tax data

- Harmonization of all available household surveys measuring income and expenditures in South Africa.
- Combination of surveys with personal income tax data (1993-2019):
 - Interpolation of tabulated tax returns using Generalized Pareto Interpolation (Blanchet et al. 2017).
 - Calibration of surveys on tax data using the Blanchet, Flores, and Morgan (2019) method.

From surveys and tax data to factor and pretax income

Top 10% share: surveys vs. DINA

Top 10% share: component by component

Top 10% share: factor vs. pretax income

Table 1: The distribution of factor and pretax national income

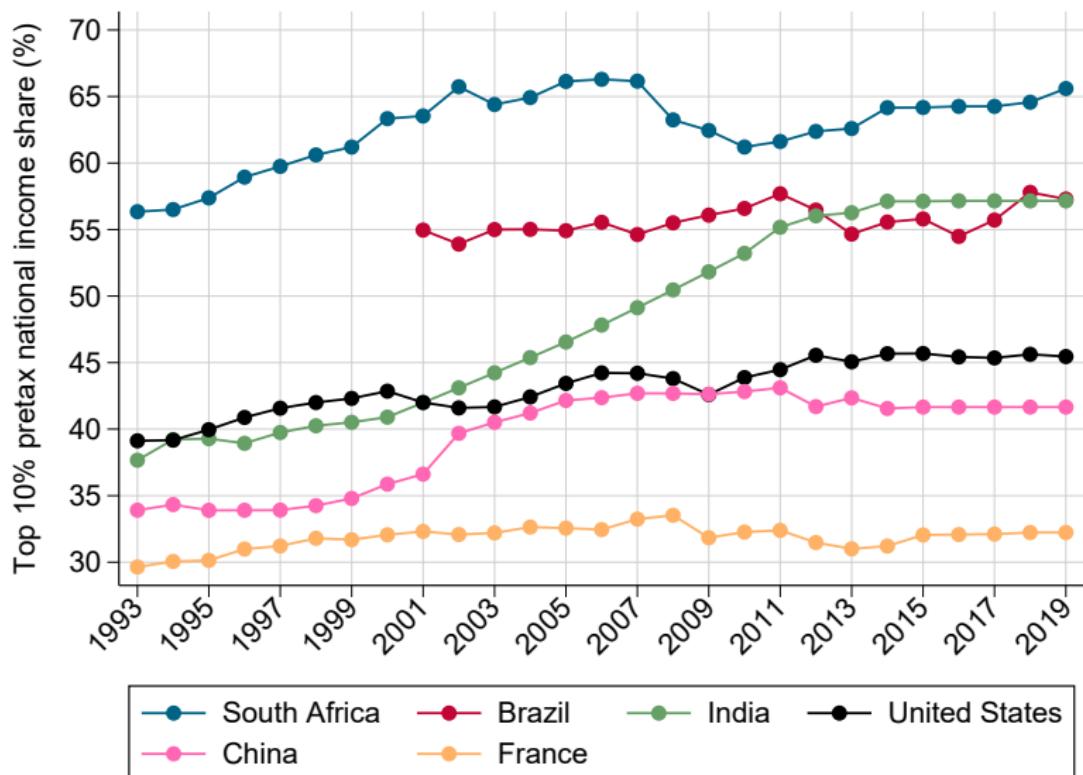
Item	Distribution method	% of NNI (2019)
Factor national income		100%
Compensation of employees	Proportional rescaling	57%
Mixed income	Proportional rescaling	9%
Property income, net		9%
Rents	Proportional rescaling	2%
Interest	Proportional rescaling	2%
Dividends	Proportional rescaling	4%
Other property income	Proportionally to pension and life insurance wealth	6%
Interest paid by households	Proportionally to factor income of debtors	-5%
Imputed rents of owner-occupiers	Proportionally to housing wealth of owner-occupiers	3%
Corporate undistributed profits	Proportionally to equity	8%
Taxes less subsidies on production and imports	Proportionally to factor income	11%
Remaining national income components	Proportionally to factor income	3%
Pretax national income		100%
Pension contributions	Observed	6%
Pension benefits	Observed	3%
Pension deficit or surplus	50% prop. to contributions, 50% prop. to benefits	3%
Unemployment insurance contributions	Rule-based imputation	0.5%
Unemployment insurance benefits	Observed	0.4%
Unemployment insurance fund deficit or surplus	50% prop. to contributions, 50% prop. to benefits	0.1%

Notes. The table reports the methodology used to distribute the various components of factor national income and pretax national income, along with the size of each component, expressed as a share of net national income (NNI), in 2019.

South African inequality in comparative perspective: top 10% pretax national income share

Top 1%

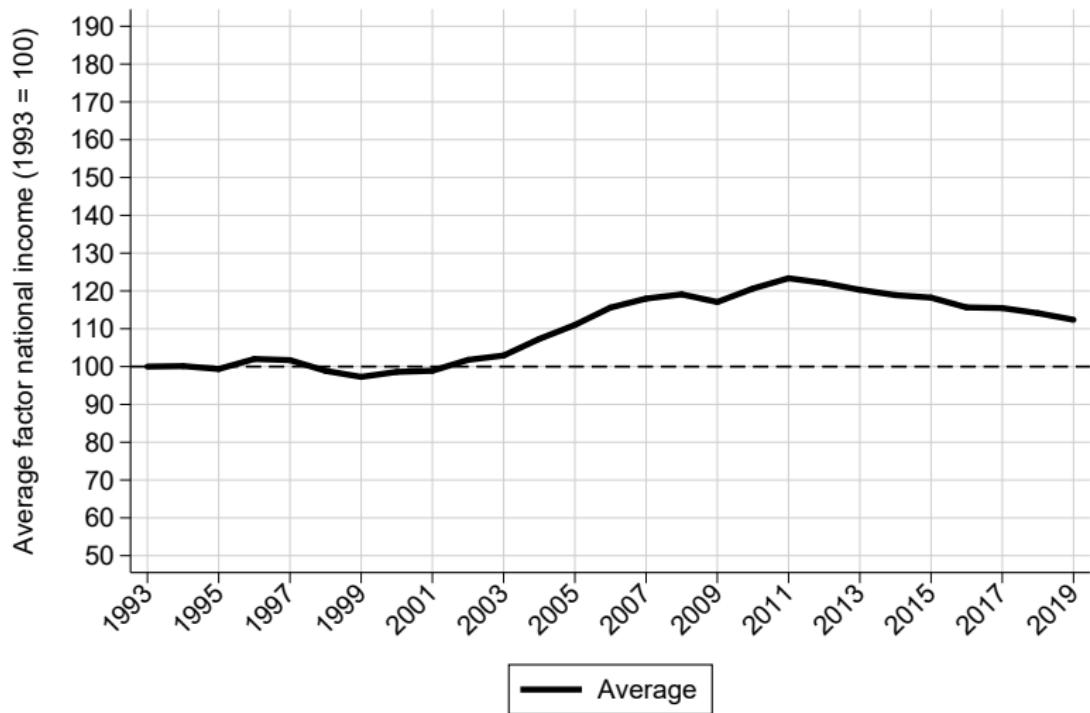
Bottom 50%



2. The distribution of factor national income

The distribution of factor national income growth

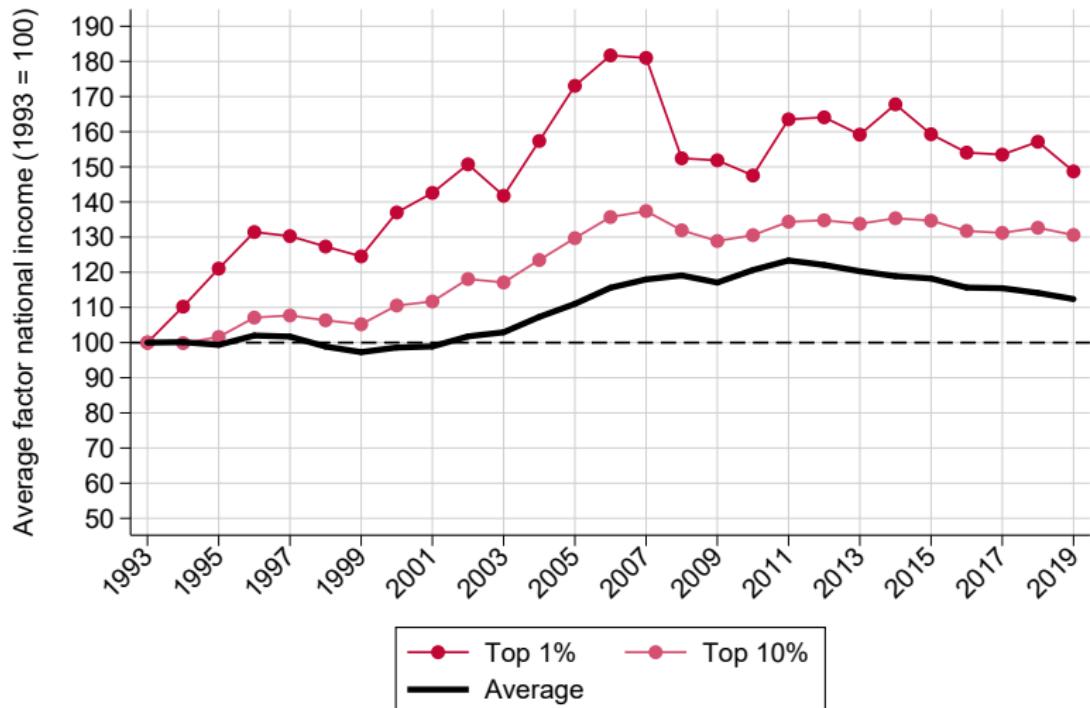
Composition of NNI



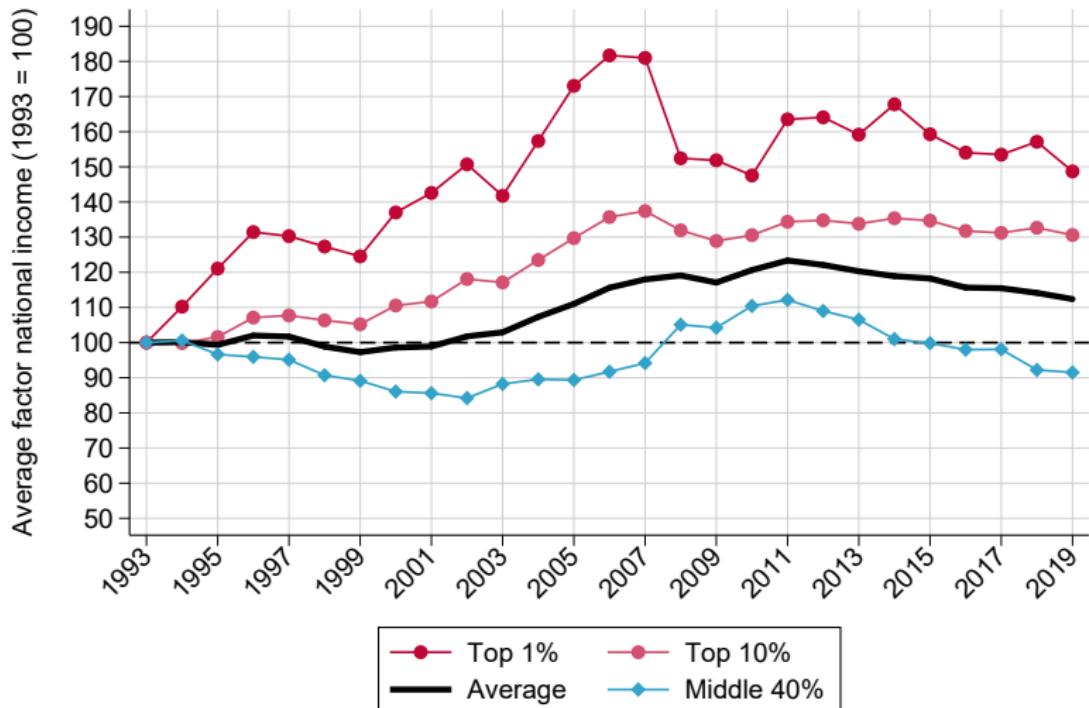
The distribution of factor national income growth



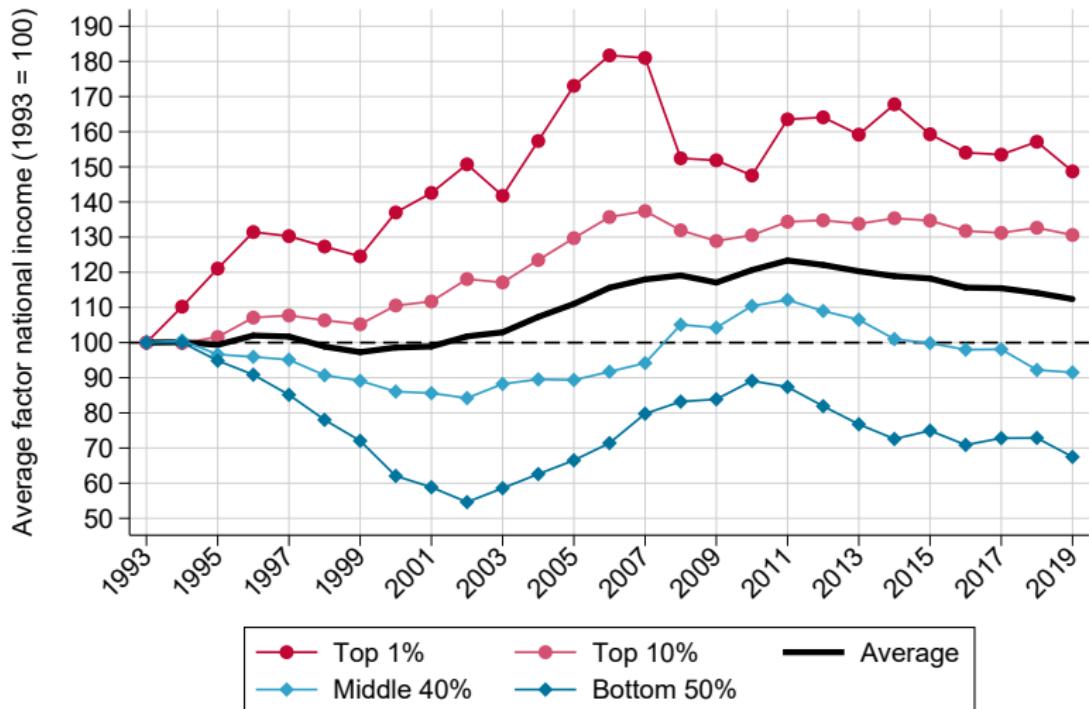
The distribution of factor national income growth



The distribution of factor national income growth



The distribution of factor national income growth



Factor income inequality in South Africa, 2019

Labor vs. capital

Table 2: The distribution of factor income in South Africa in 2019

	Number of adults	Income threshold	Average income	Income share
Full population	36,700,000	\$ 0	\$ 18,300	100%
Bottom 90% (p0p90)	33,030,000	\$ 0	\$ 6,800	33.6%
Bottom 50% (p0p50)	18,350,000	\$ 0	\$ 1,300	3.6%
Middle 40% (p50p90)	14,680,000	\$ 27,900	\$ 13,700	30.1%
Top 10% (p90p100)	3,670,000	\$ 262,000	\$ 121,000	66.4%
Top 1% (p99p100)	367,000	\$ 1,270,000	\$ 486,000	26.6%
Top 0.1% (p99.9p100)	36,700	\$ 4,030,000	\$ 2,020,000	11.1%
Top 0.01% (p99.99p100)	3,670	\$ 24,690,000	\$ 6,790,000	3.7%

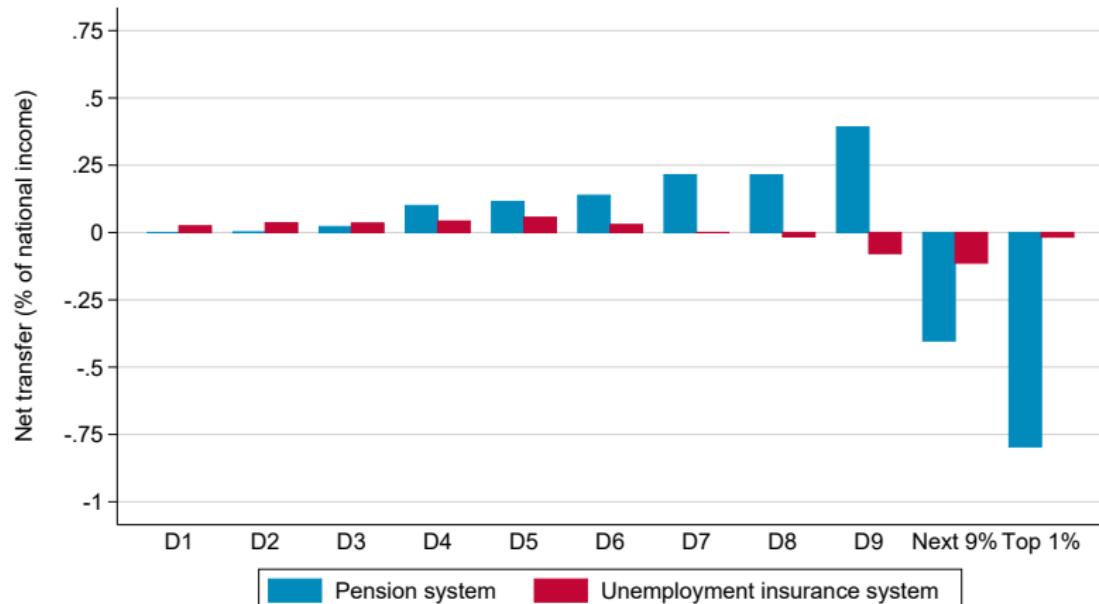
3. The distribution of taxes and transfers

From factor income to pretax income

- **Pension & unemployment systems in South Africa = very small.**
 - Pension system: private system redistributing $\approx 3\text{-}6\%$ of NNI from the top 10% to the middle class.
 - Unemployment Insurance Fund (UIF) system: $\approx 0.5\%$ of NNI, benefiting to about 2% of adults (vs. 25-30% unemployment rate).
- Distribution of factor income and pretax income virtually identical.

Net transfers operated between factor income groups by the pension and UIF systems

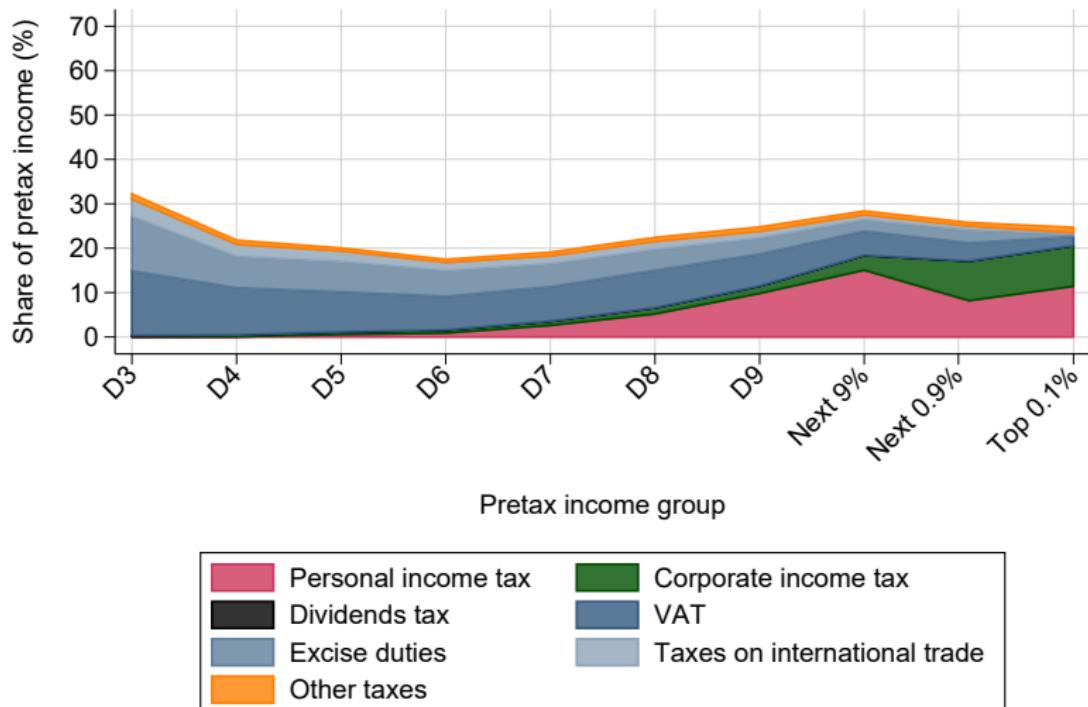
Top 10% share: factor vs. pretax income



- **Personal income tax (11% NNI)** = progressive.
- **Corporate income tax (6% NNI)** = progressive.
- **Other taxes on income and wealth (1.7% NNI)** = very small (SDL, estate duty, transfer duties, etc.).
- **Indirect taxes (12.6% NNI)** = regressive (VAT, general fuel levy, excise duties, trade duties).
- **Large increase in tax revenue** since 1993, from 29% to 37% of NNI.

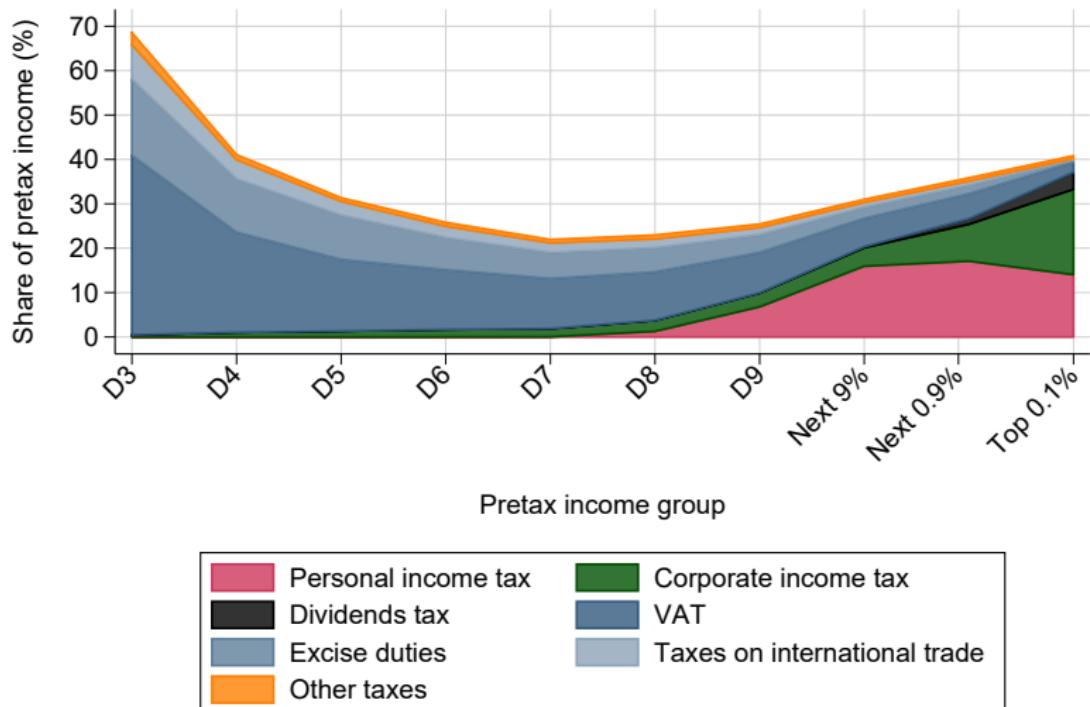
Taxes paid by pretax income group, 1993

By pretax, post-transfer group

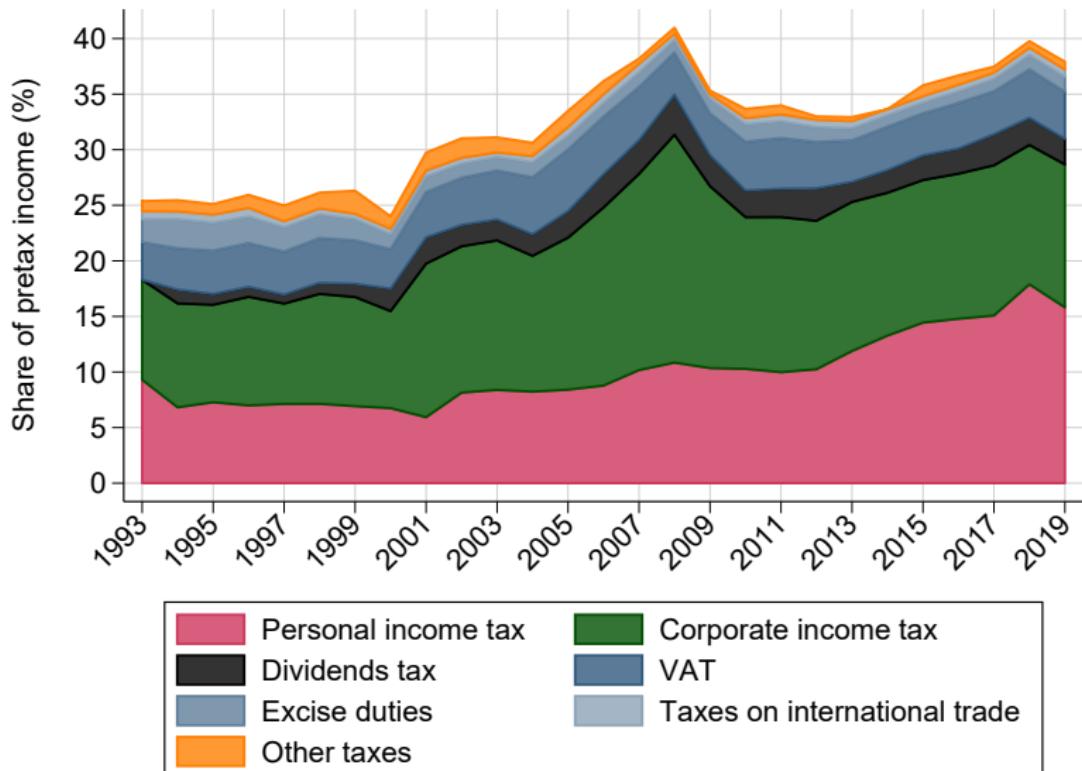


Taxes paid by pretax income group, 2019

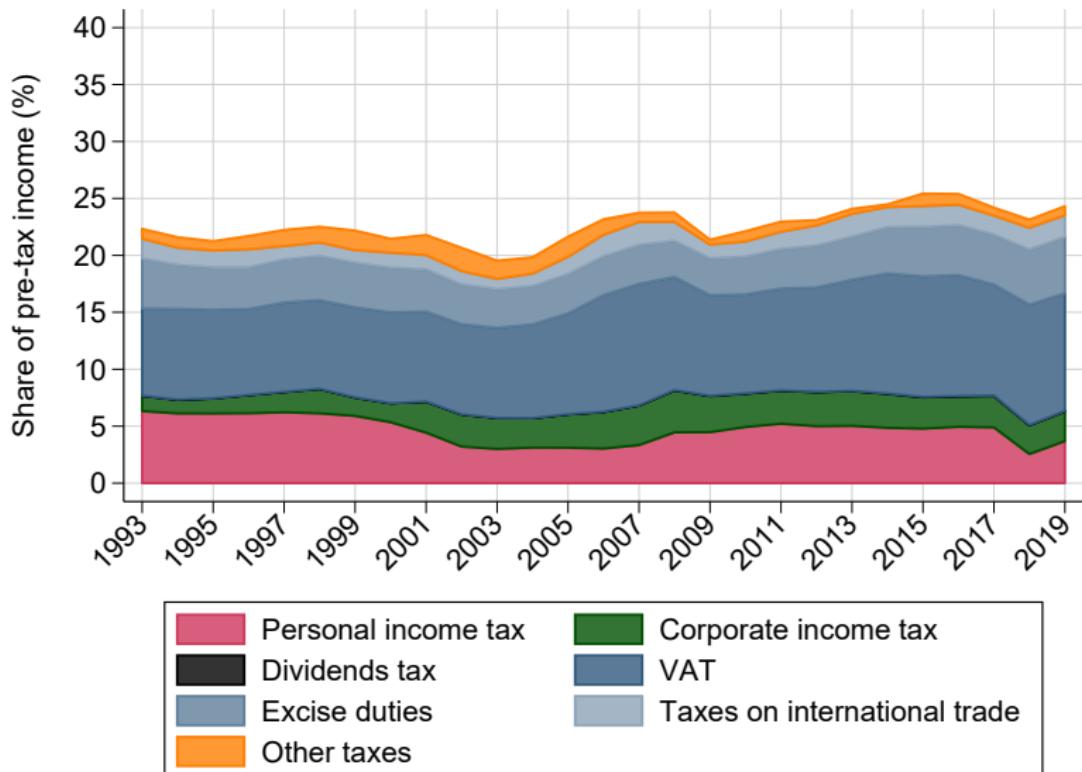
By pretax, post-transfer group



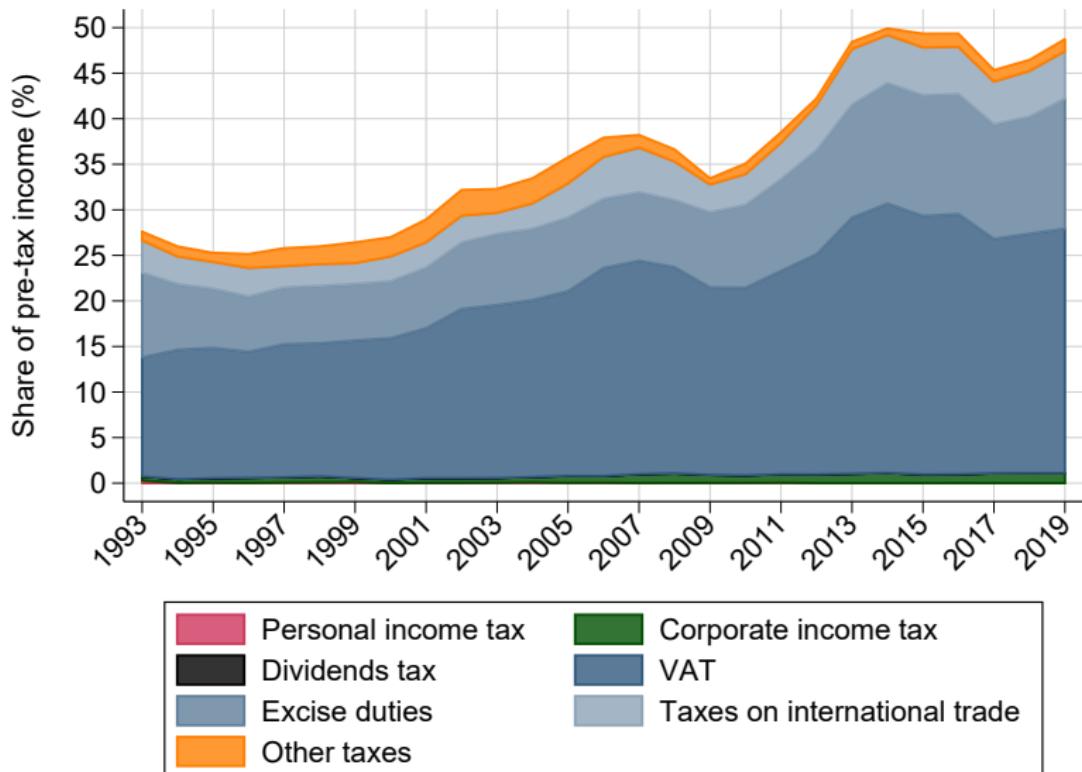
Taxes paid by the top 1%



Taxes paid by the middle 40%



Taxes paid by the bottom 50%



The puzzle of indirect taxes, consumption, and savings

- Effective tax rate faced by the bottom 50% exceeds the statutory rate of indirect taxes.
 - Less the case as a share of pretax post-transfer income. [Figure](#)
 - Large negative saving at the bottom of the distribution. [Figure](#)
- On the one hand, may be driven by **measurement error** (e.g., poor households underreporting income or overreporting consumption).
- On the other hand, suggestive evidence of **very high debt and steep saving profile** in South Africa:
 - Aggregate household saving rate is *negative*. [Figure](#)
 - 75% declare having "no saving in case of emergency". [Figure](#)
 - Total interest paid by households absorbs an astonishing 5% of NNI.
- How to disentangle the two / mitigate dissaving at the bottom?

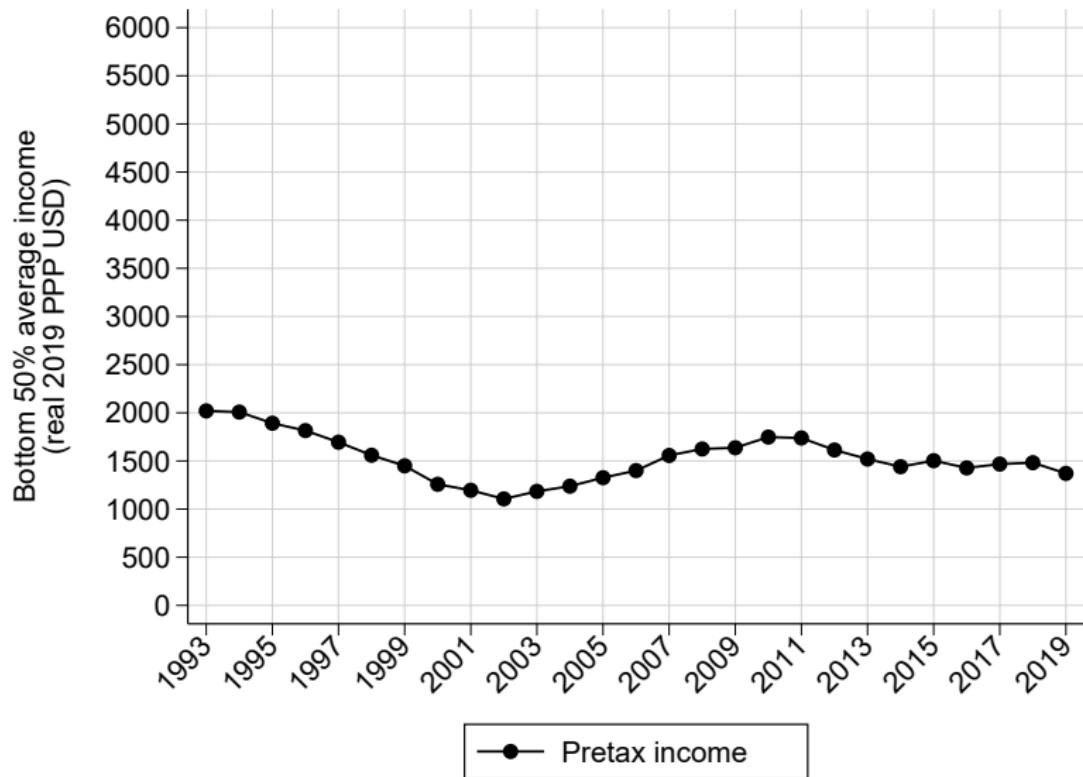
- **Social protection (5% NNI)**: means-tested cash transfers, mainly the old age grant, the child support grant, and the disability grant.

Number of recipients

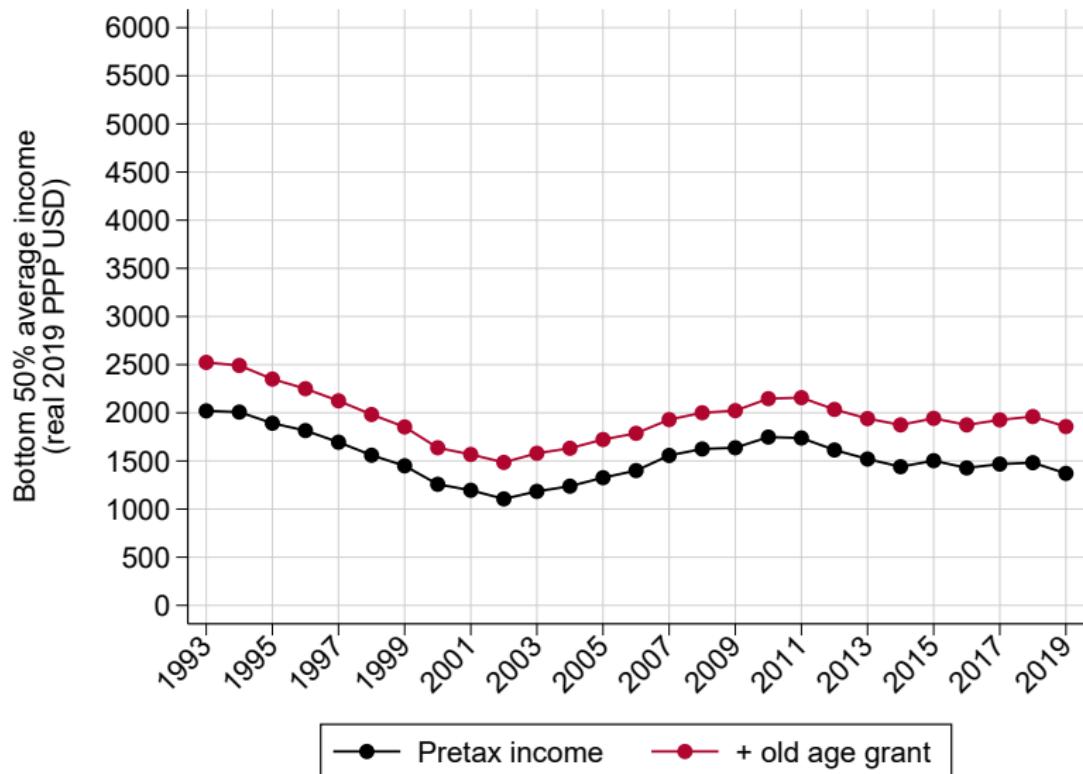
Real values of grants per month

- **Education (9% NNI)**: lump sum as a function of (1) the type of education followed and (2) province.
- **Health (5% NNI)**: lump sum as a function of (1) use of the public healthcare system (2) type of institution visited (clinic vs. hospital) and (3) province.
- **Other collective expenditures**: **forthcoming!** Mainly housing and community amenities, transport, and police.
- **Large increase in government expenditure** since 1993, from 32% to 41% of NNI.

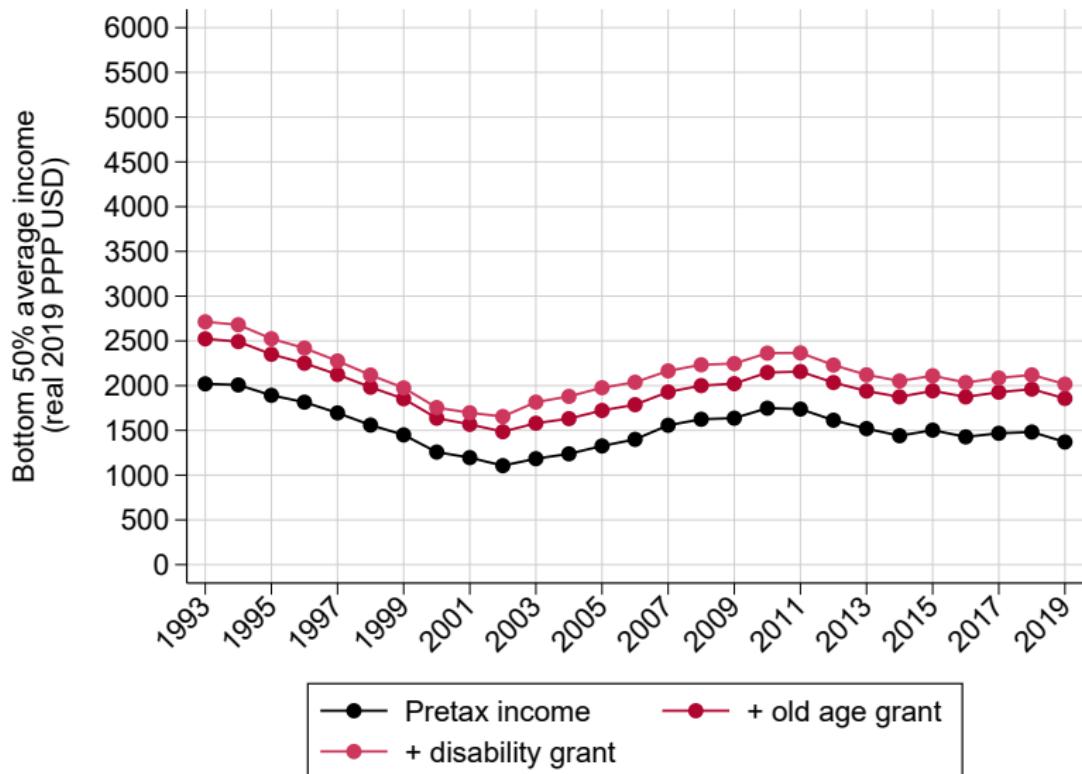
Bottom 50% average income: the role of social transfers



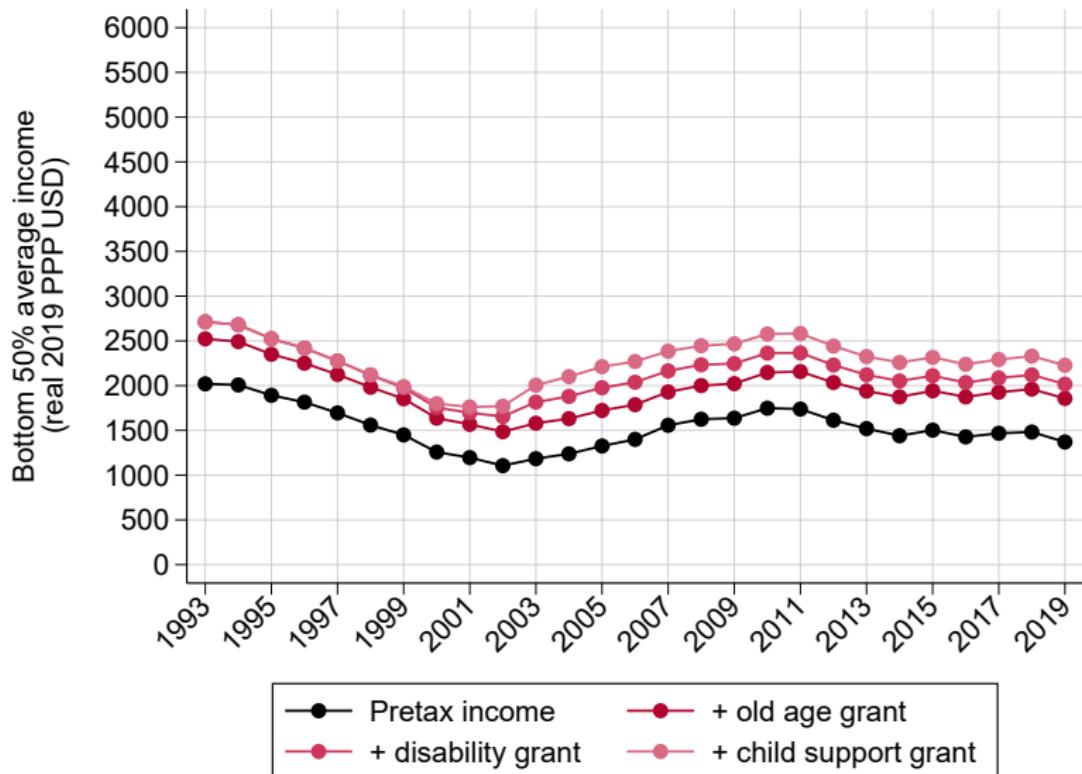
Bottom 50% average income: the role of social transfers



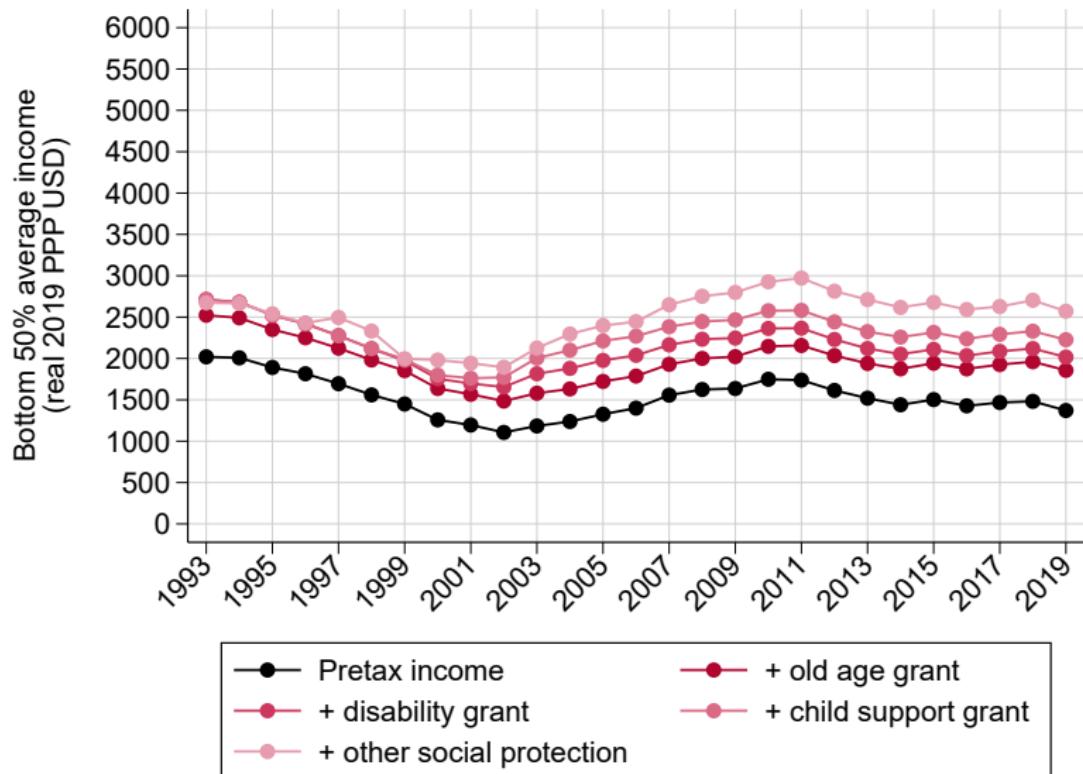
Bottom 50% average income: the role of social transfers



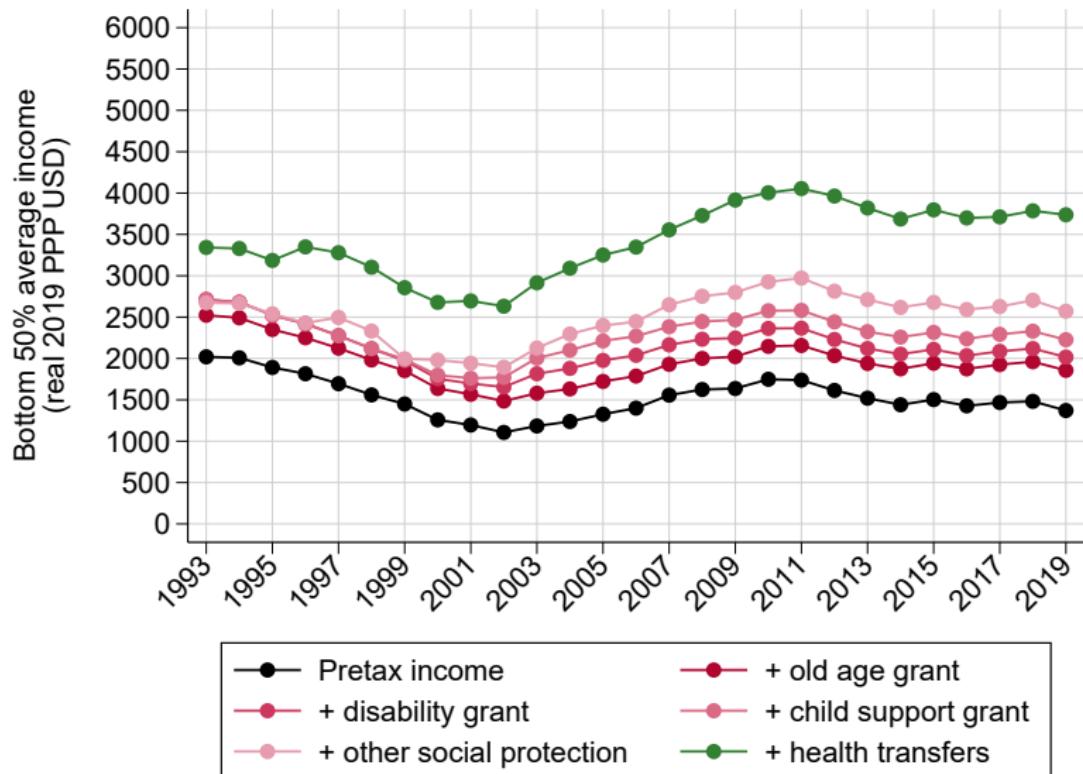
Bottom 50% average income: the role of social transfers



Bottom 50% average income: the role of social transfers

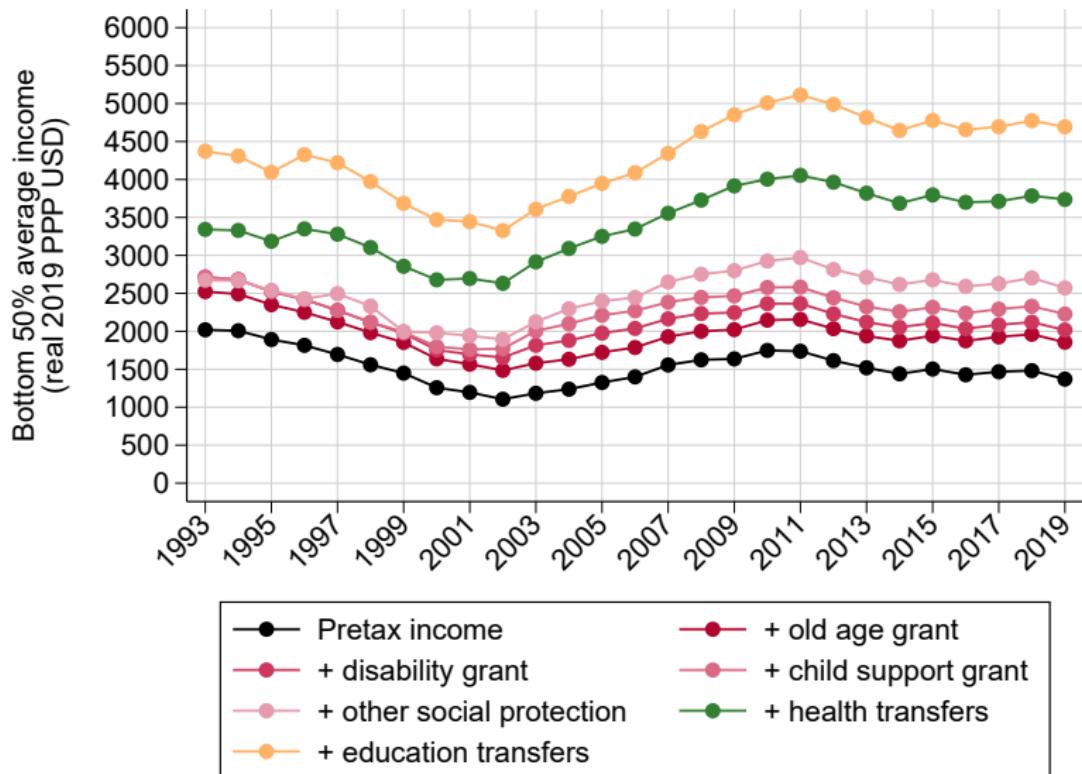


Bottom 50% average income: the role of social transfers

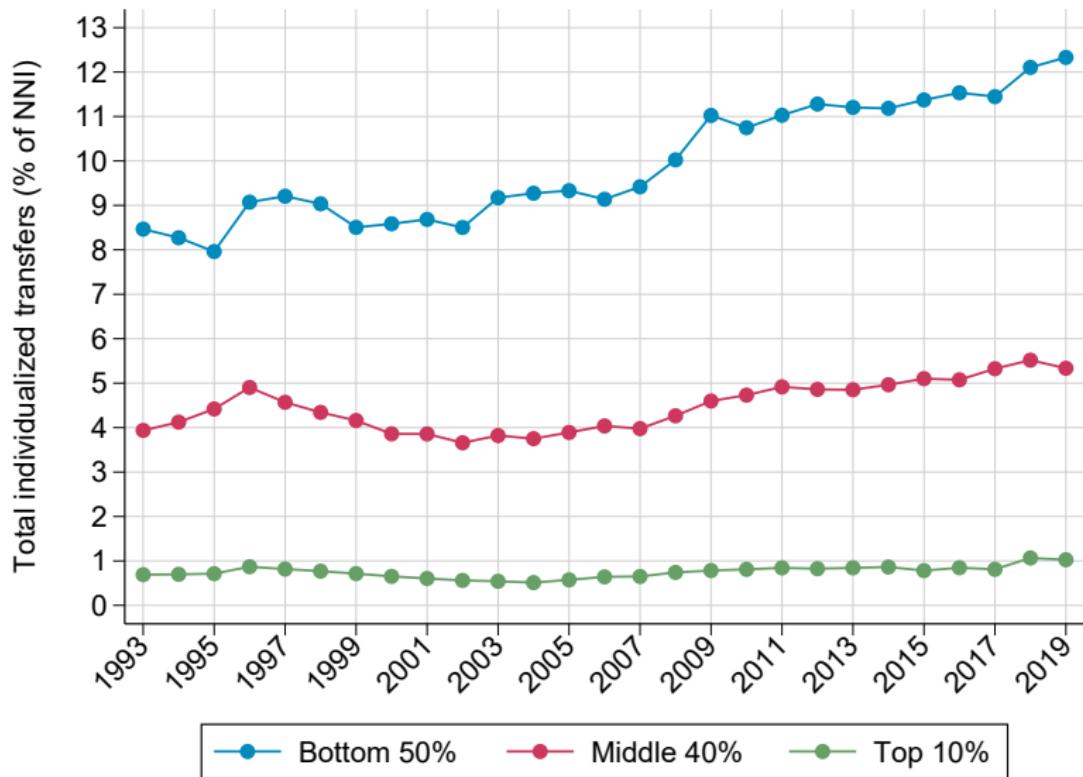


Bottom 50% average income: the role of social transfers

Growth



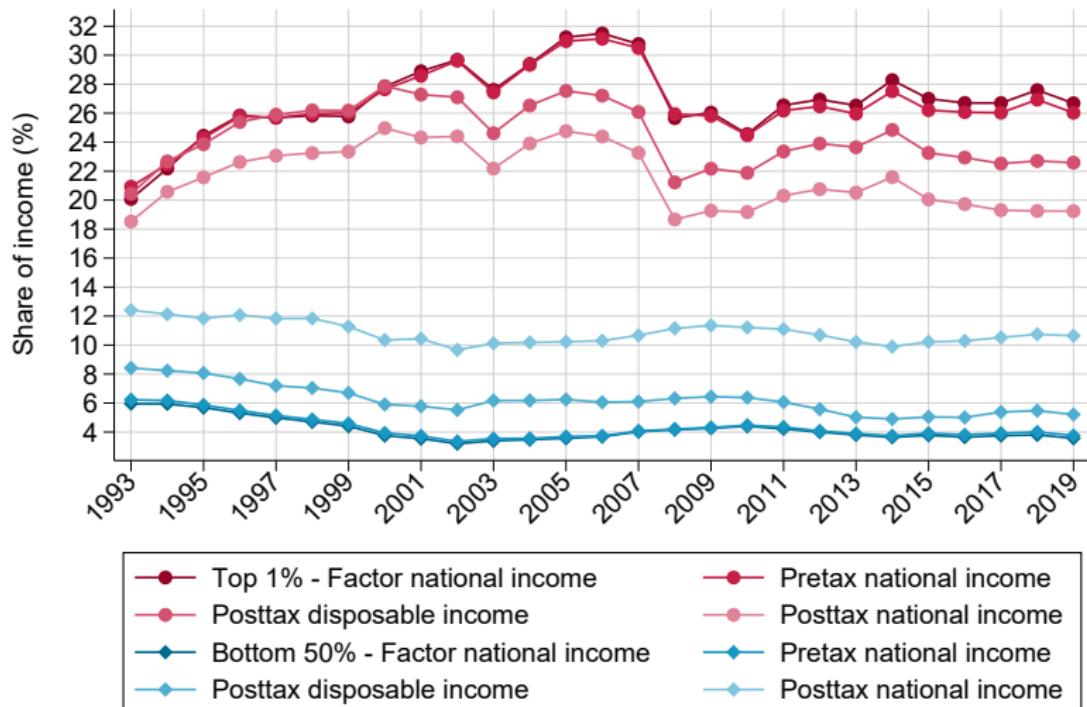
Total individualized transfers received by pretax income group



Joint impact of taxes and transfers

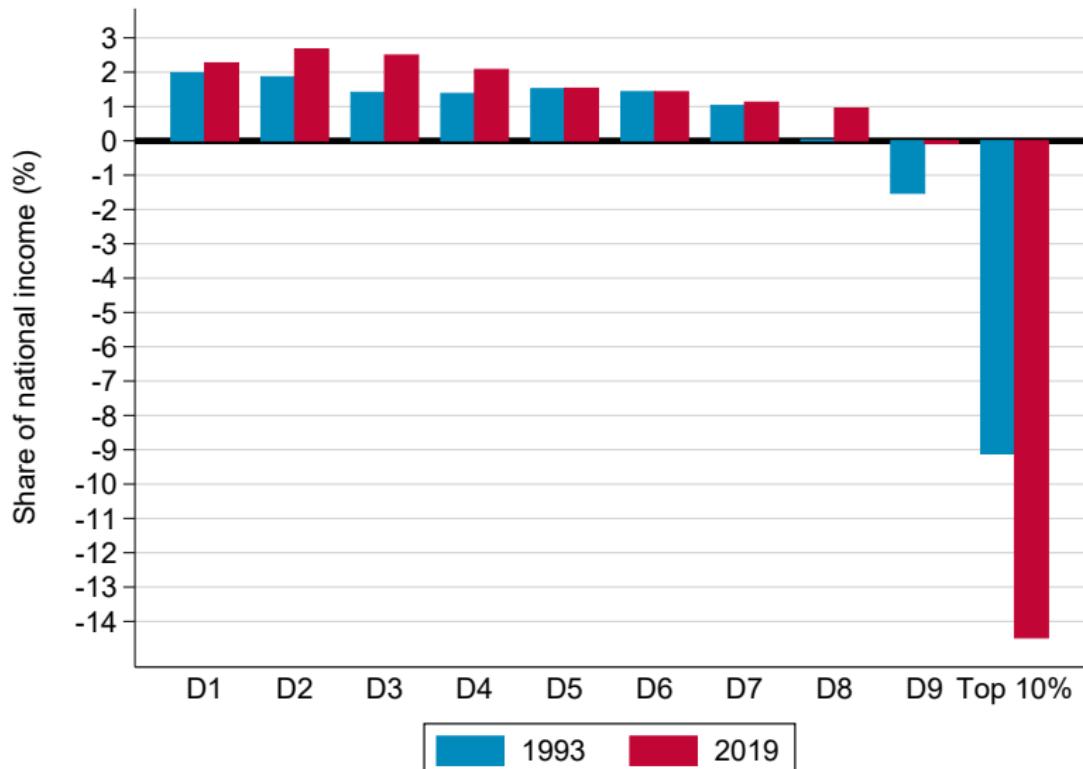
- Mixed picture until now on redistribution in South Africa:
 - Rising social transfers, well-targeted to bottom income groups.
 - Rising taxes at the top, but also at the bottom.
- Combining taxes and transfers, we find that the tax-and-transfer system has successfully limited the decline of real earnings at the bottom, but has not leveled the distribution of growth.

From factor to posttax income: top 1% vs. bottom 50%

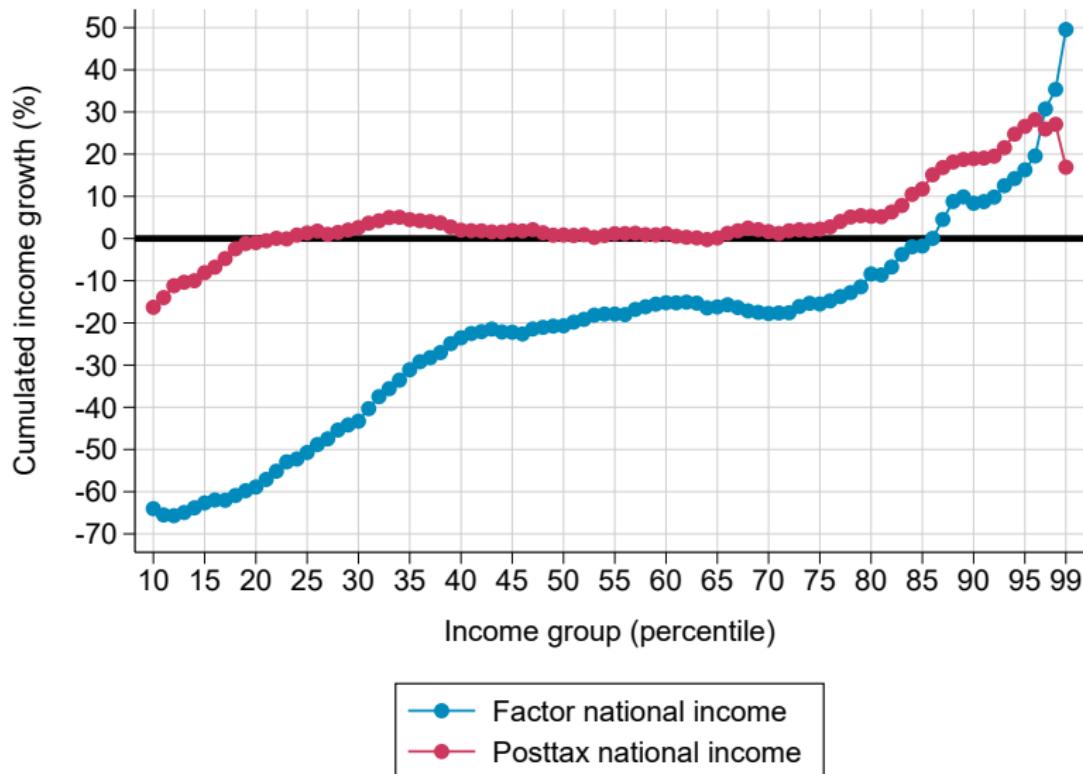


Net transfers operated by the tax-and-transfer system between factor income deciles: 1993 versus 2019

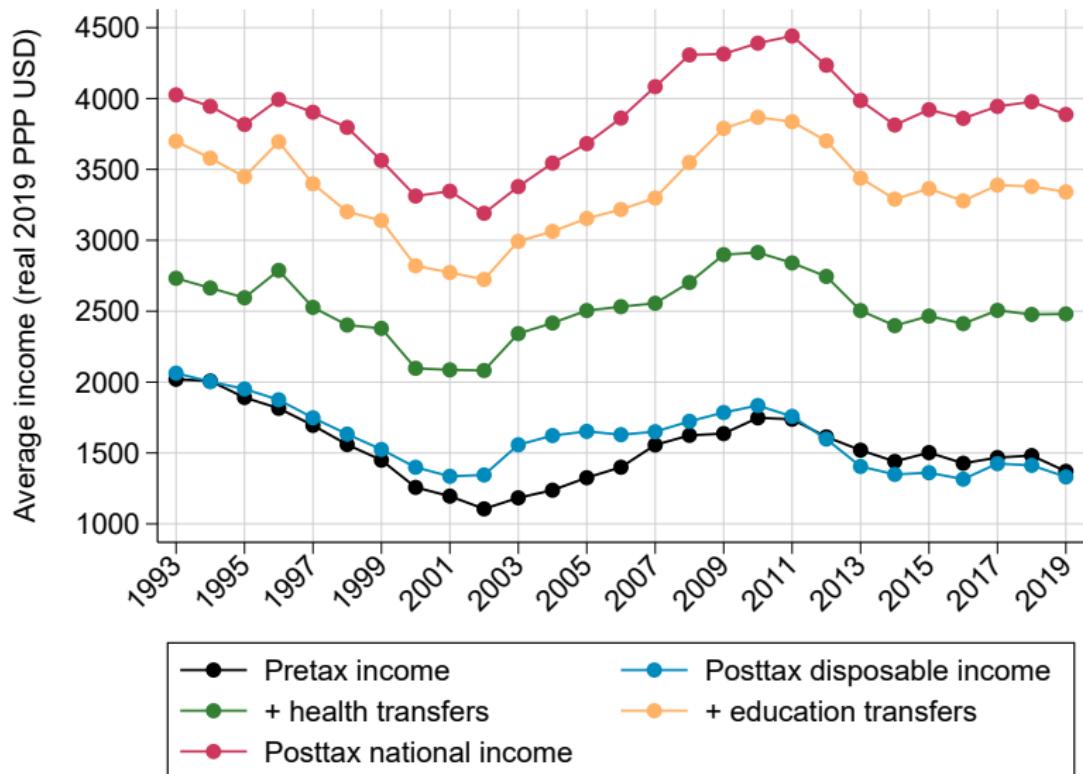
By key group



Cumulated income growth by percentile, 1993-2019



Real income of the bottom 50%, pretax vs. posttax

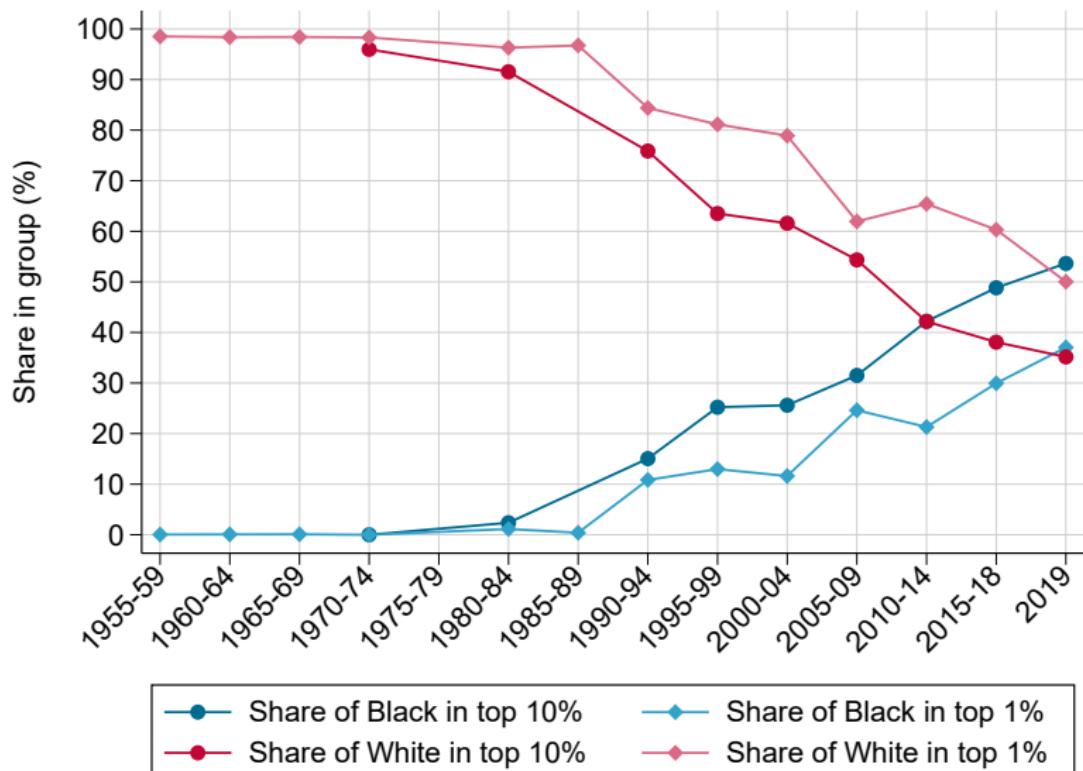


4. Decomposing inequality: race and geography

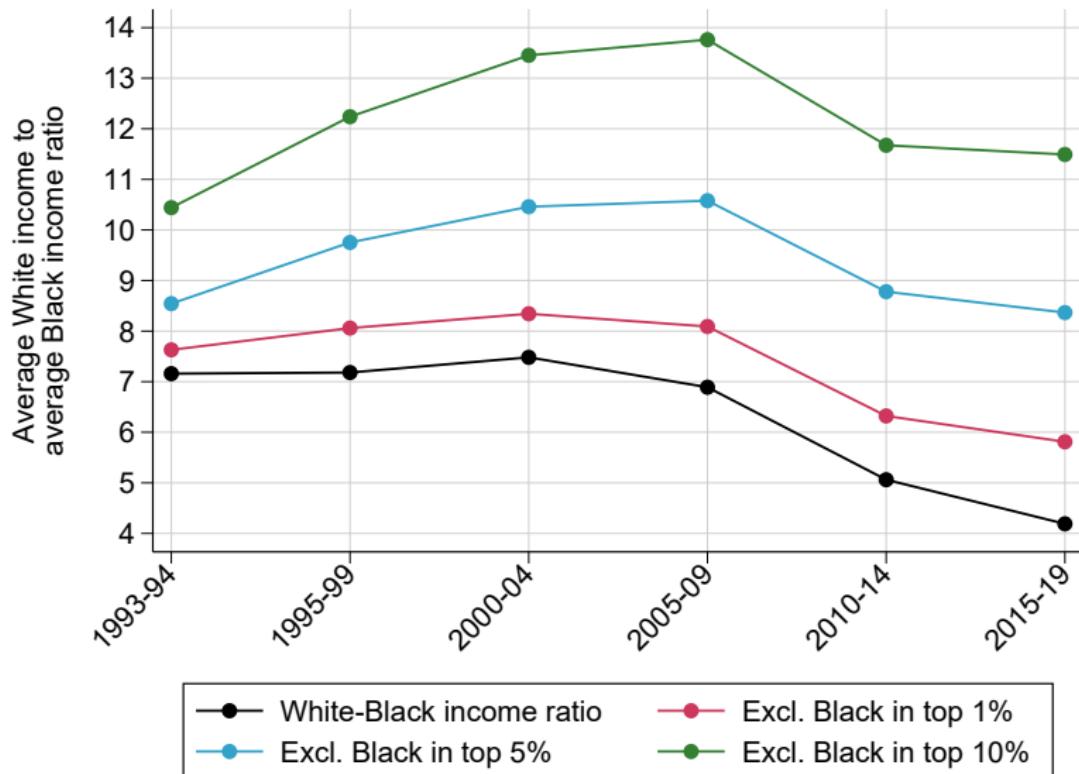
Racial inequality and top incomes: 1955-2019

Racial composition of adult population

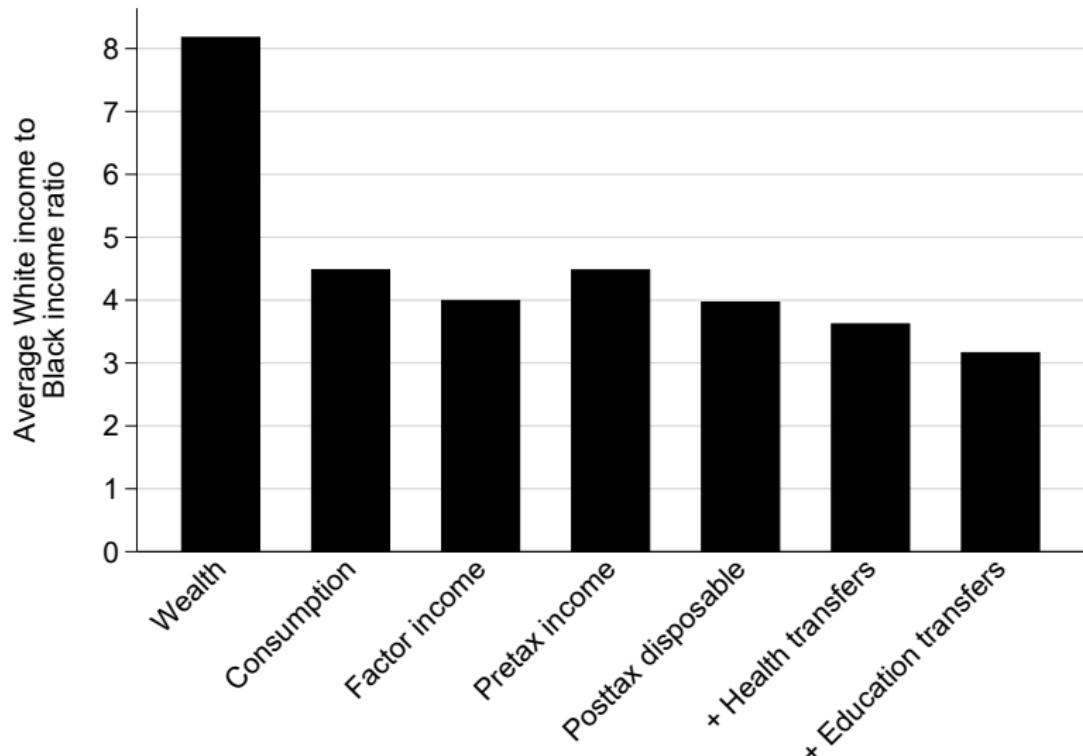
Share of Black earners in top groups versus overall population



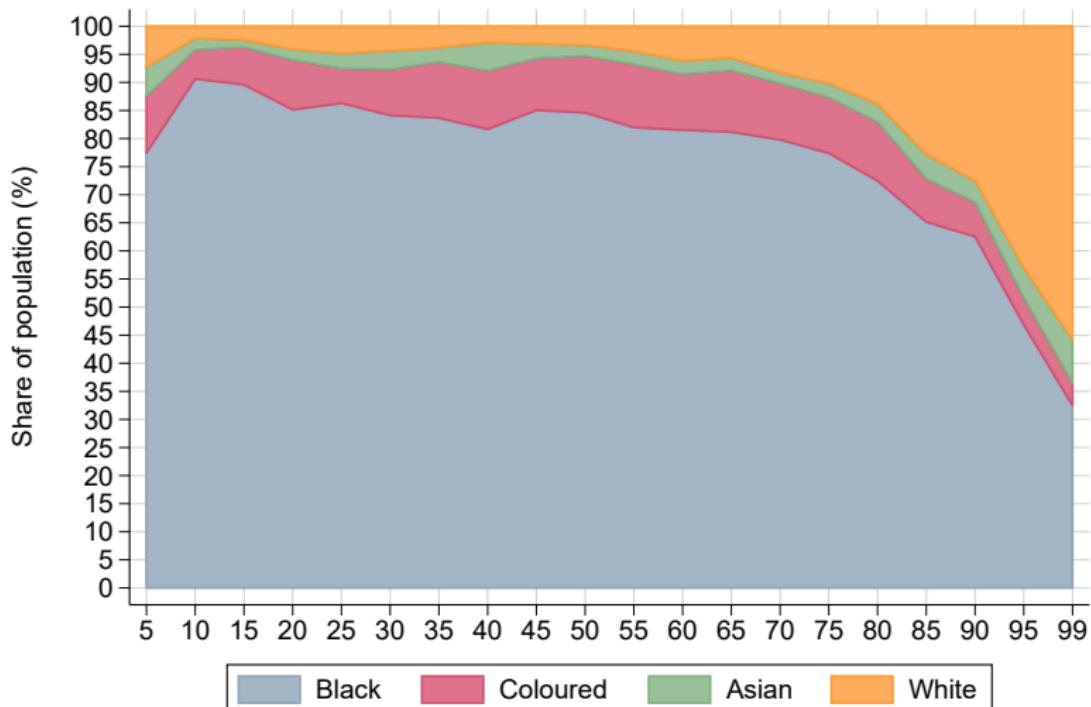
The role of top Black incomes in the decline of racial inequality



Racial inequality by economic concept, 2019

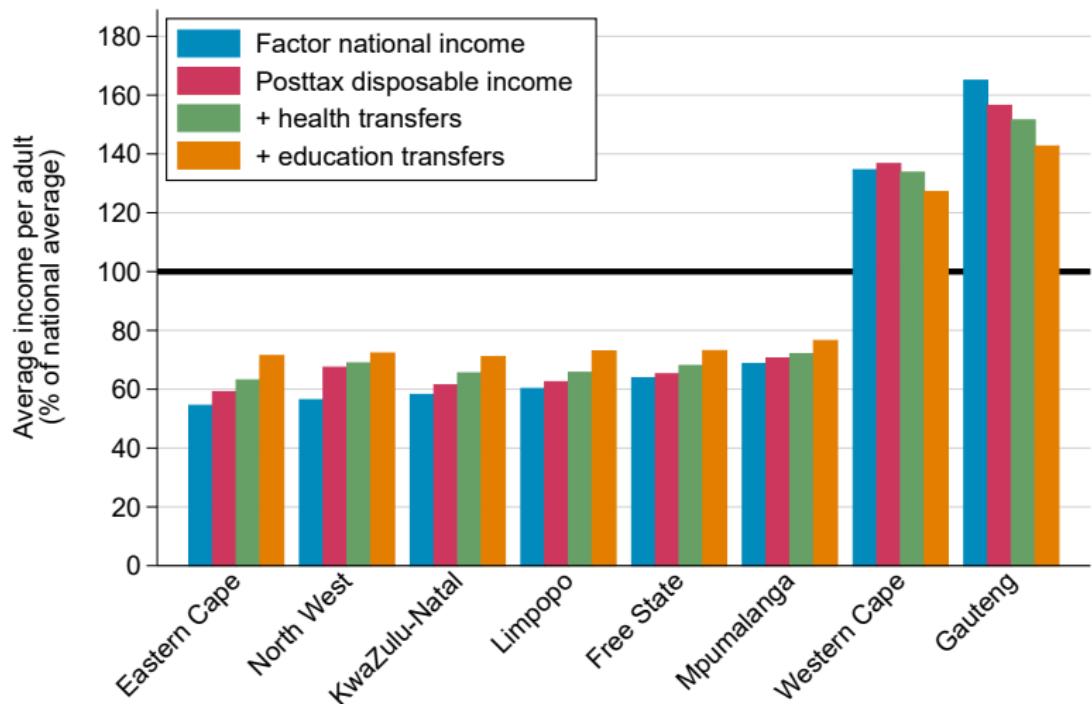


Racial composition of posttax income groups, 2019

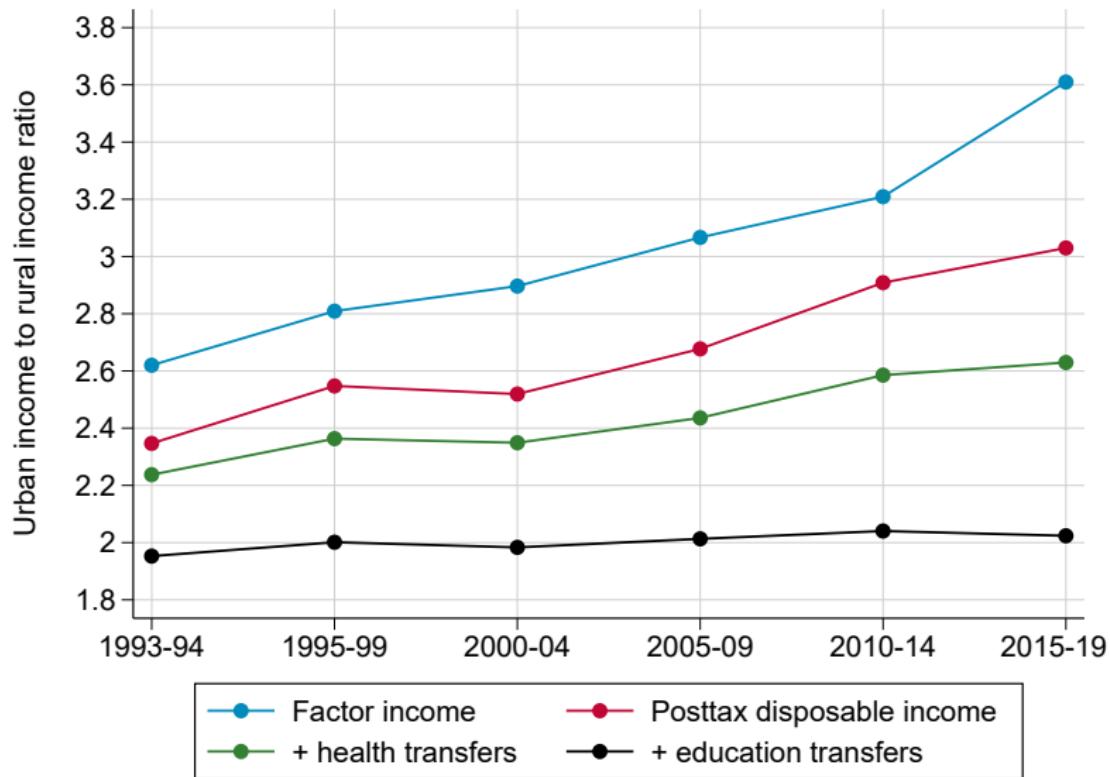


Average provincial income relative to national average, 2019: pretax vs. posttax

Evolution of spatial inequality



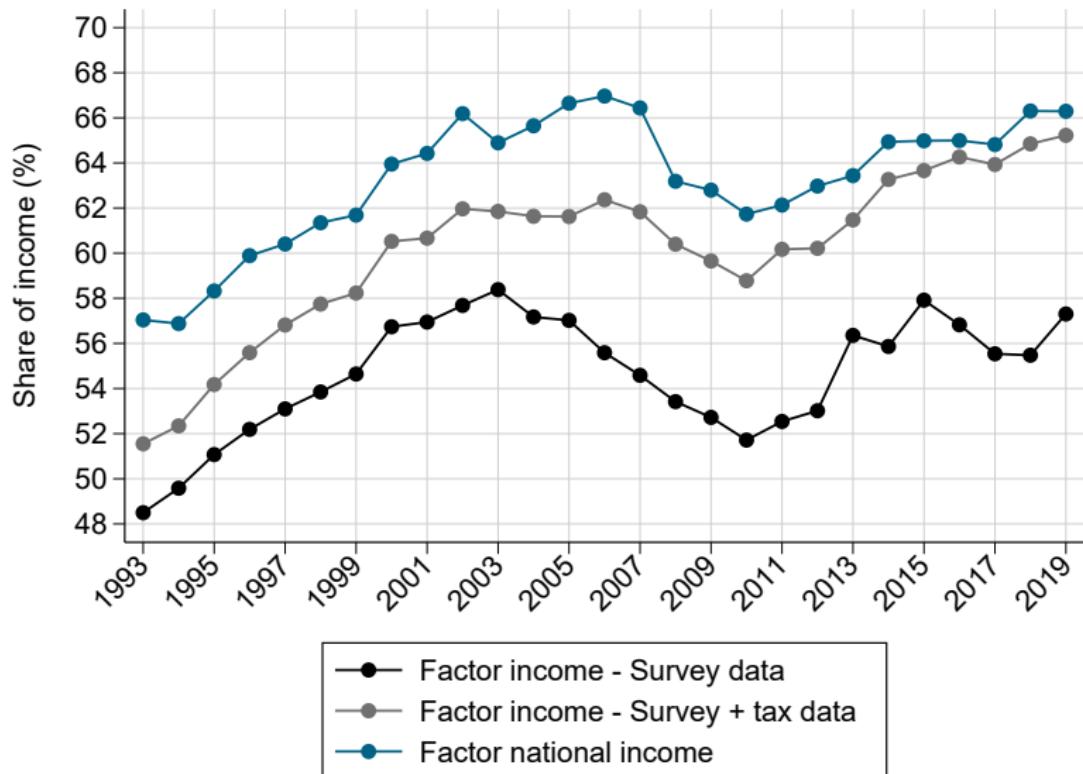
Social transfers and the rural-urban income gap



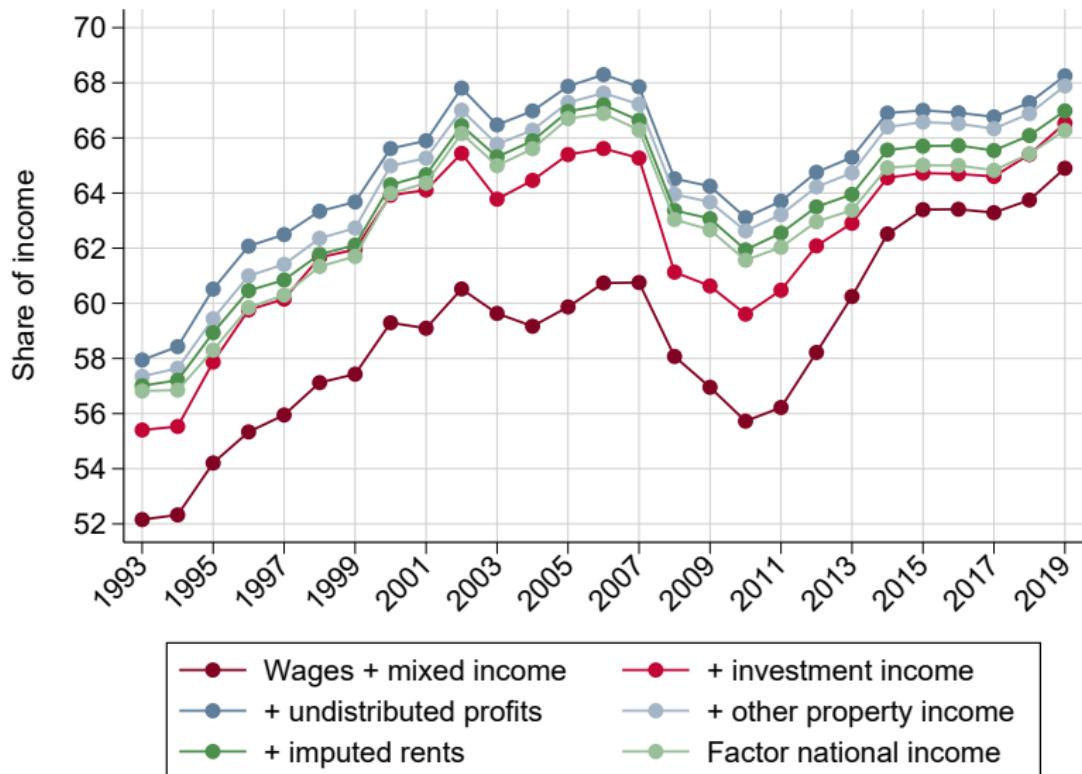
Thank you!

Appendix

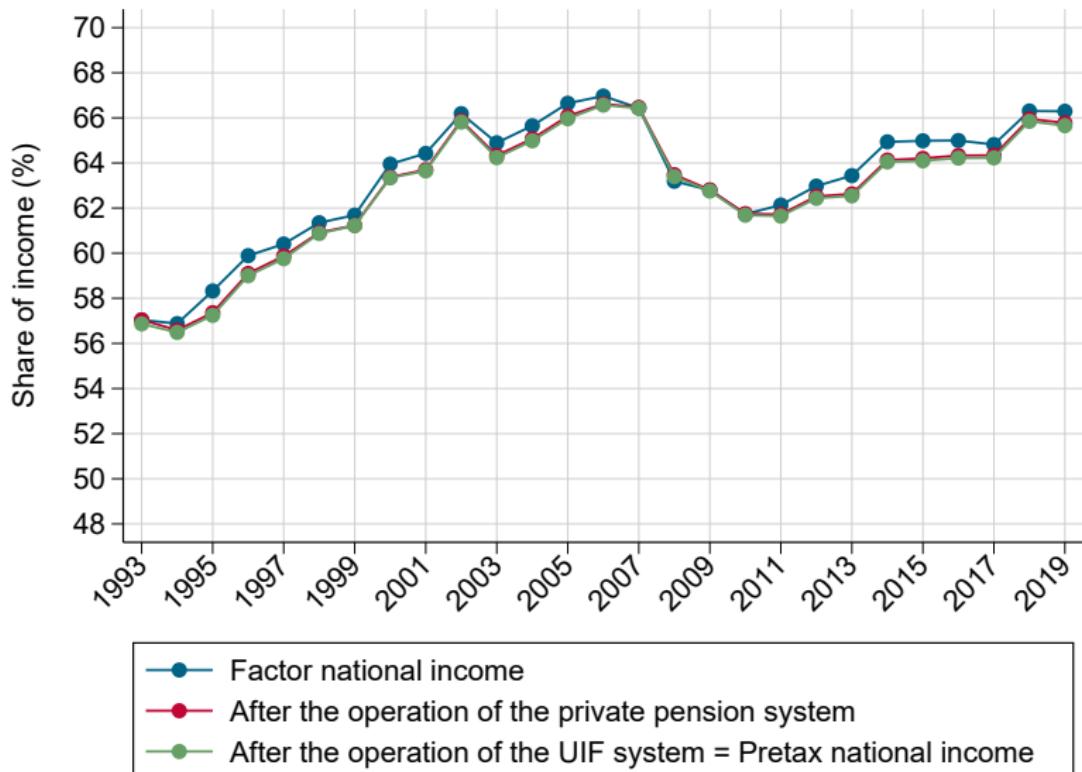
Top 10% income share: from surveys to DINA

[Go back](#)

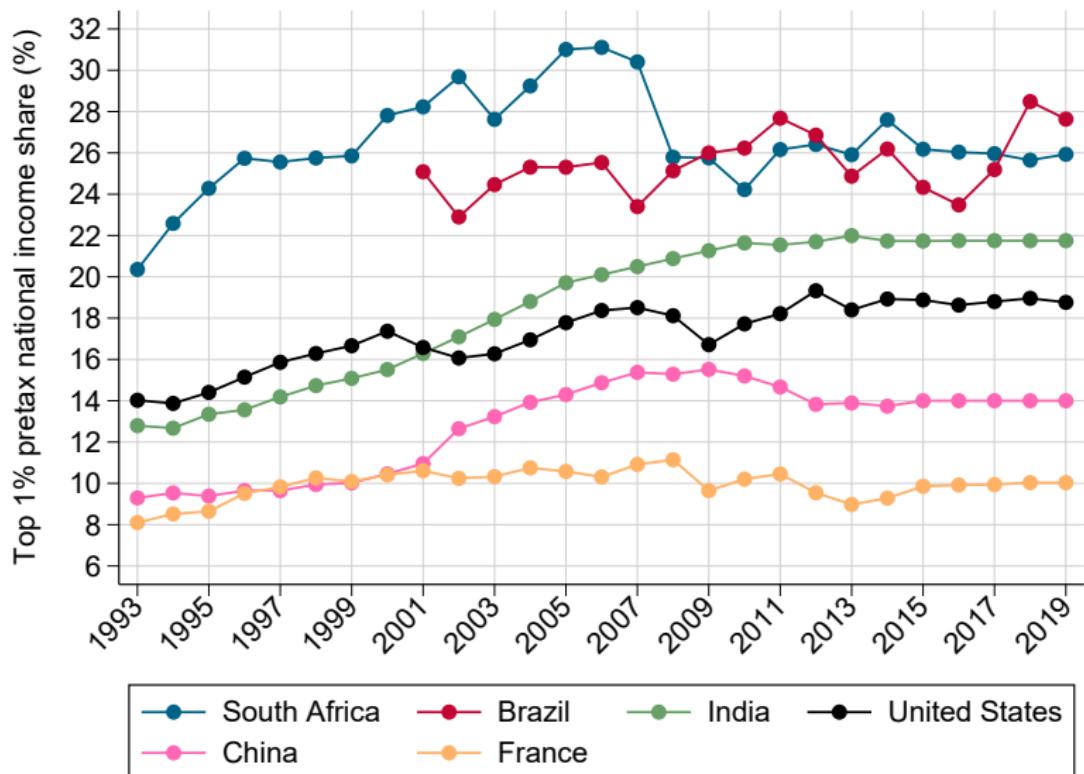
Top 10% income share: component by component

[Go back](#)

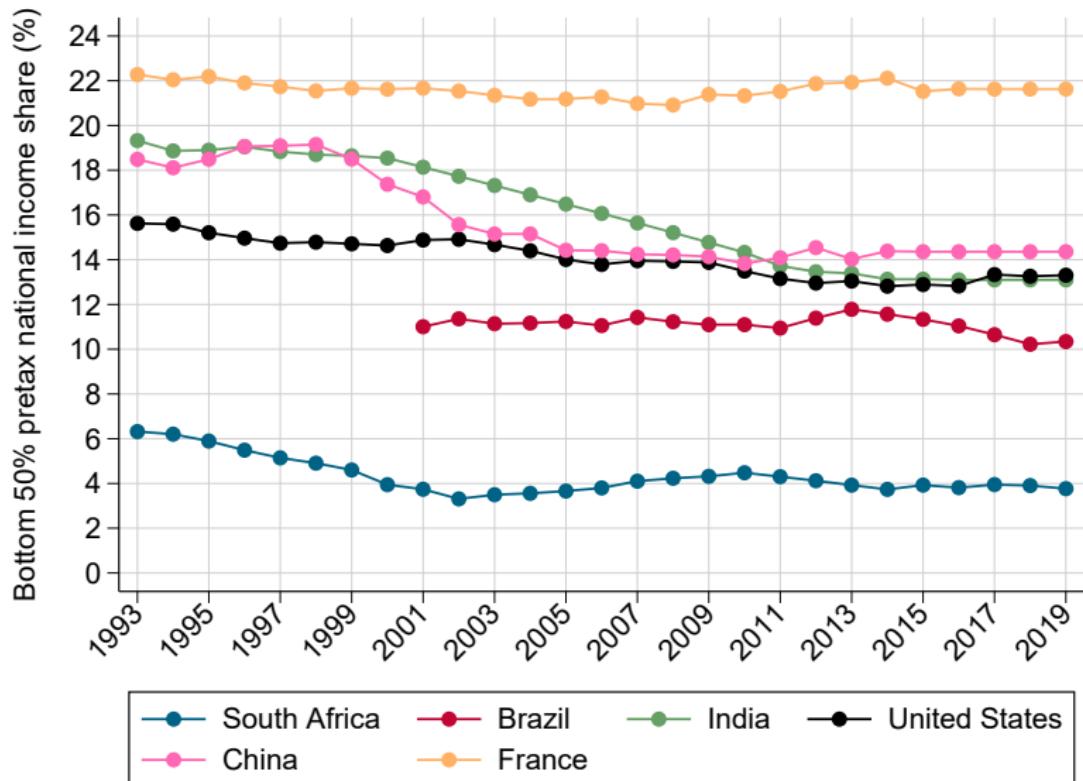
From factor to pretax income (top 10% share)

[Go back](#)

South African inequality in comparative perspective: top 1% pretax income share

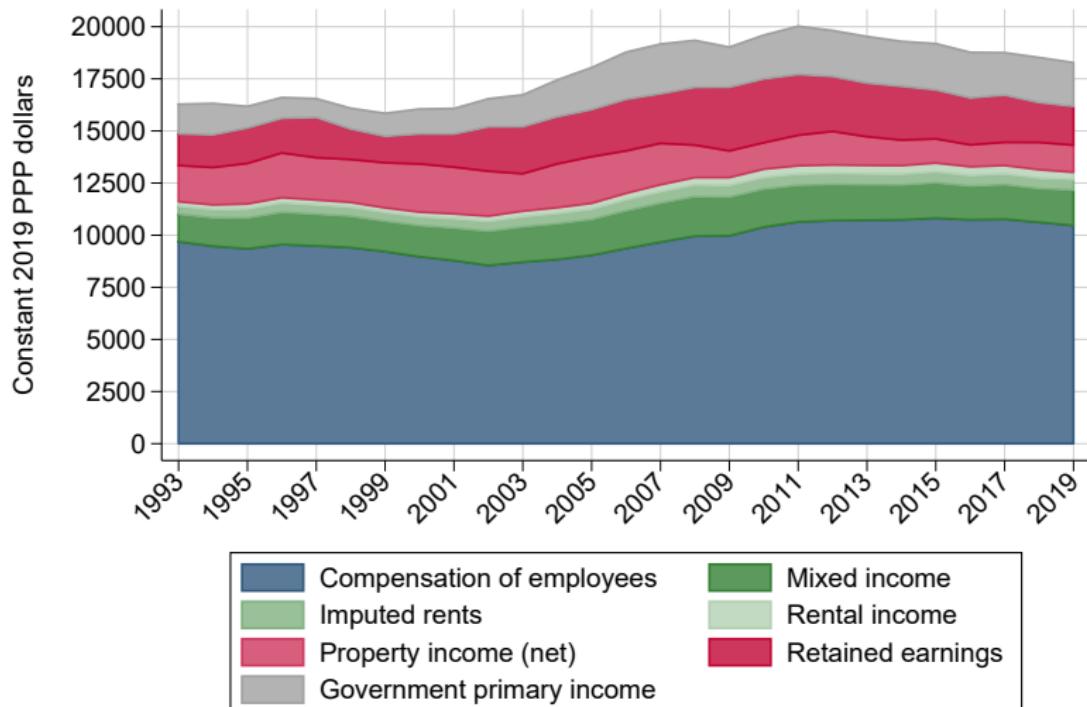
[Go back](#)

South African inequality in comparative perspective: bottom 50% pretax income share

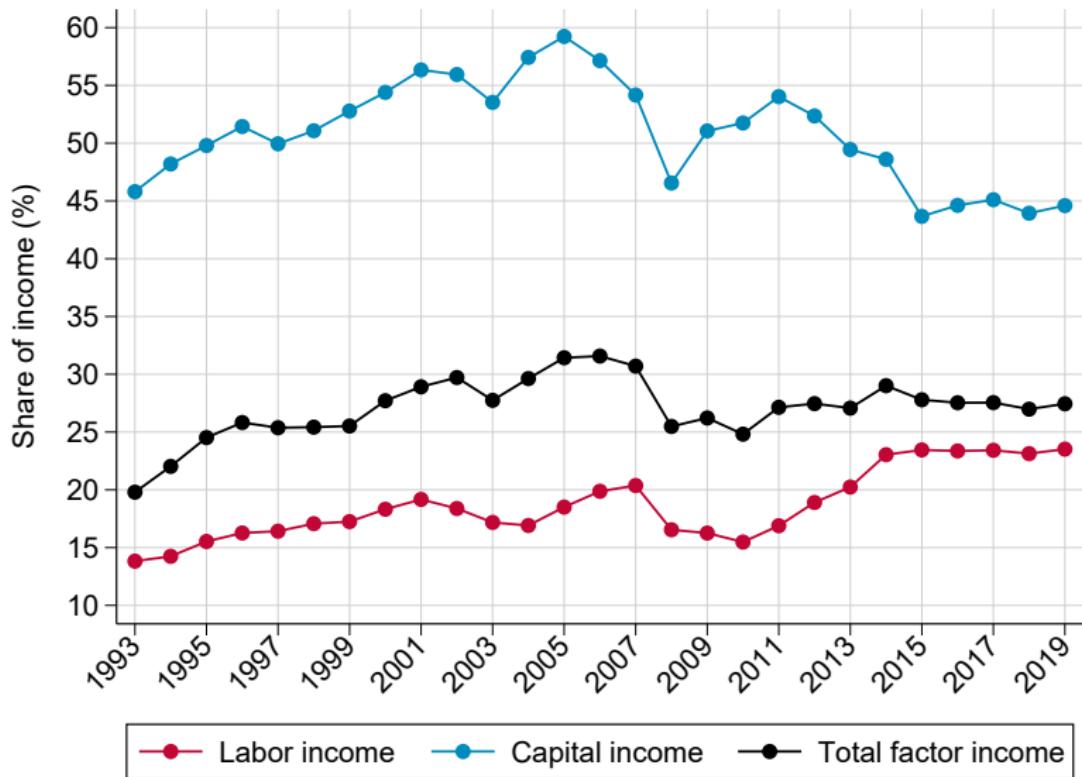
[Go back](#)

The national income per adult in South Africa

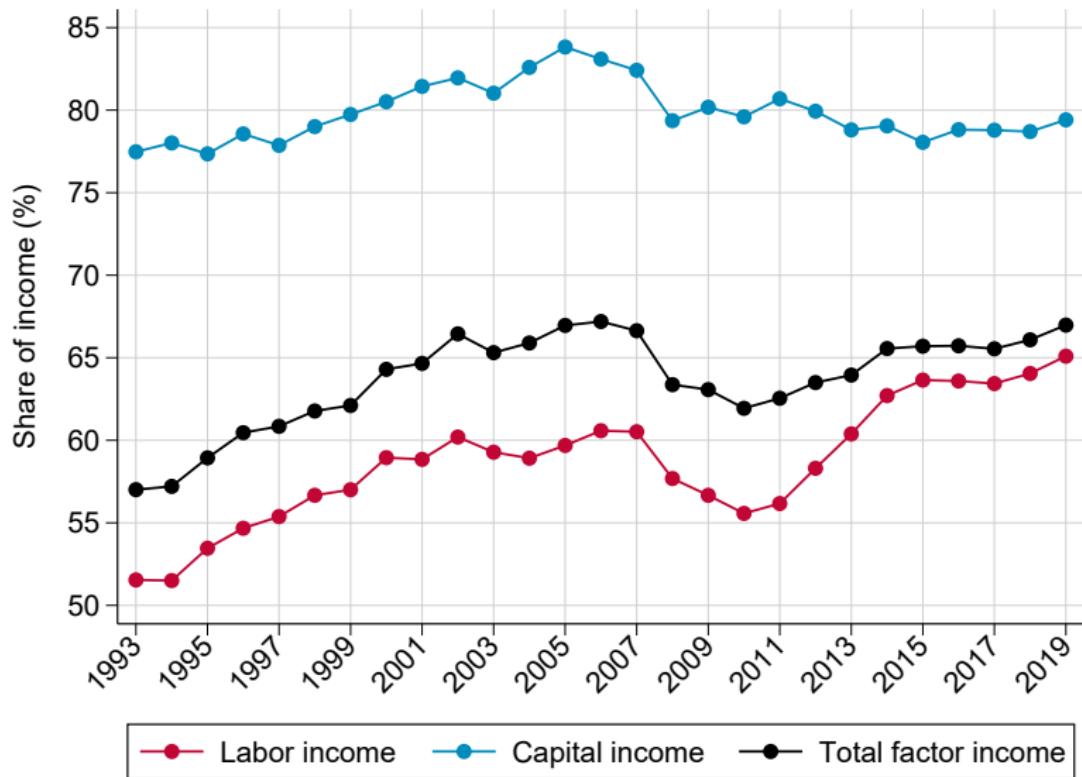
[Go back](#)



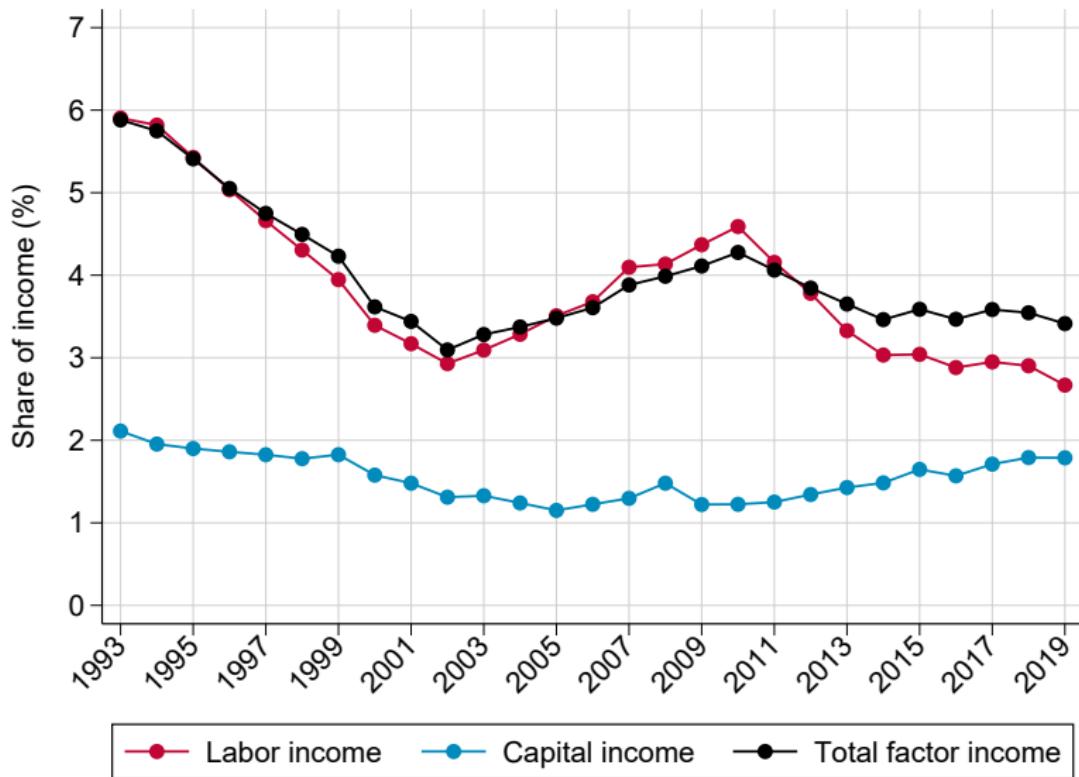
Top 1% income share: labor versus capital

[Go back](#)

Top 10% income share: labor versus capital

[Go back](#)

Bottom 50% income share: labor versus capital

[Go back](#)

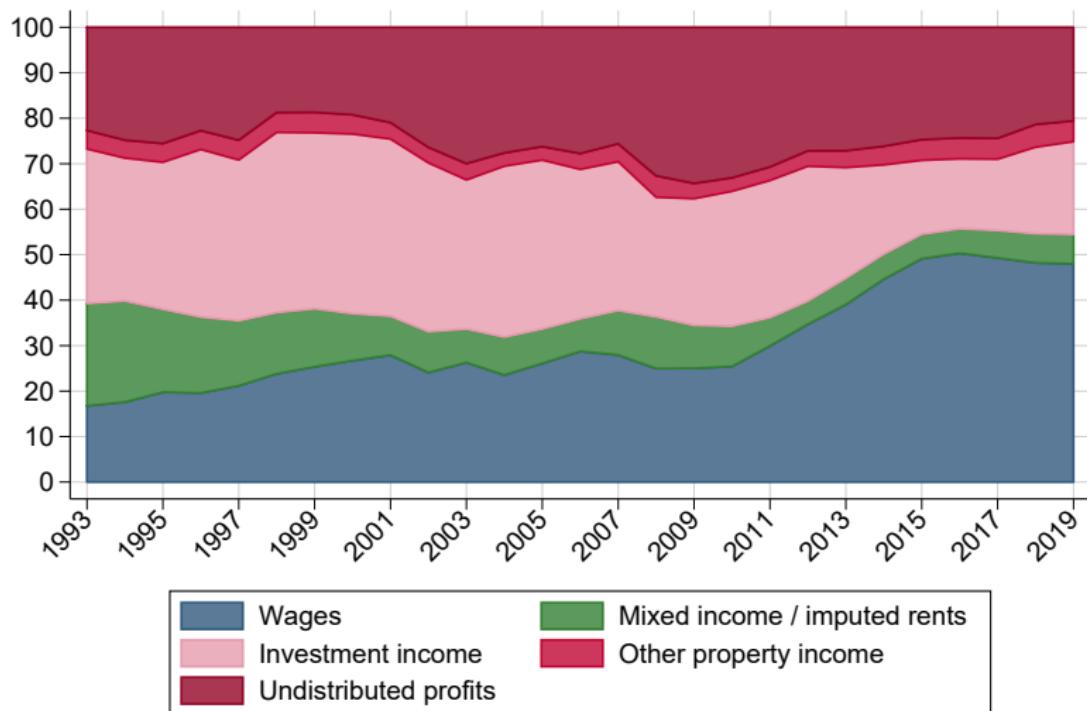
Composition of top 1% factor income, 1993-2019

Next 9%

Bottom 50%

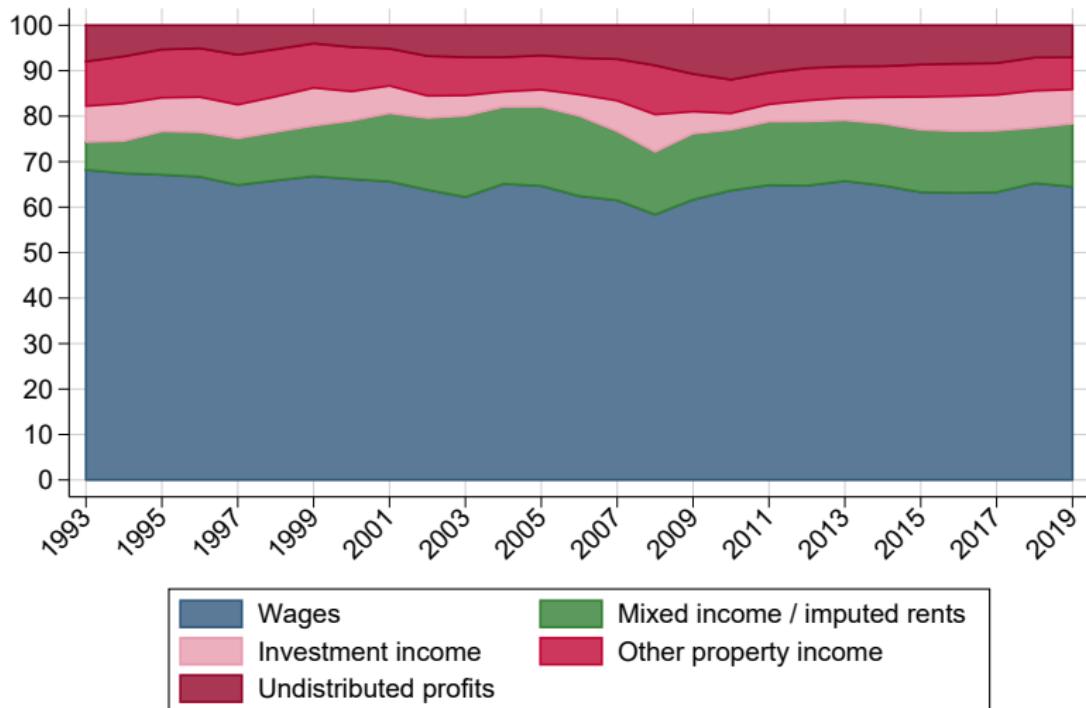
By percentile, 1993

By percentile, 2019



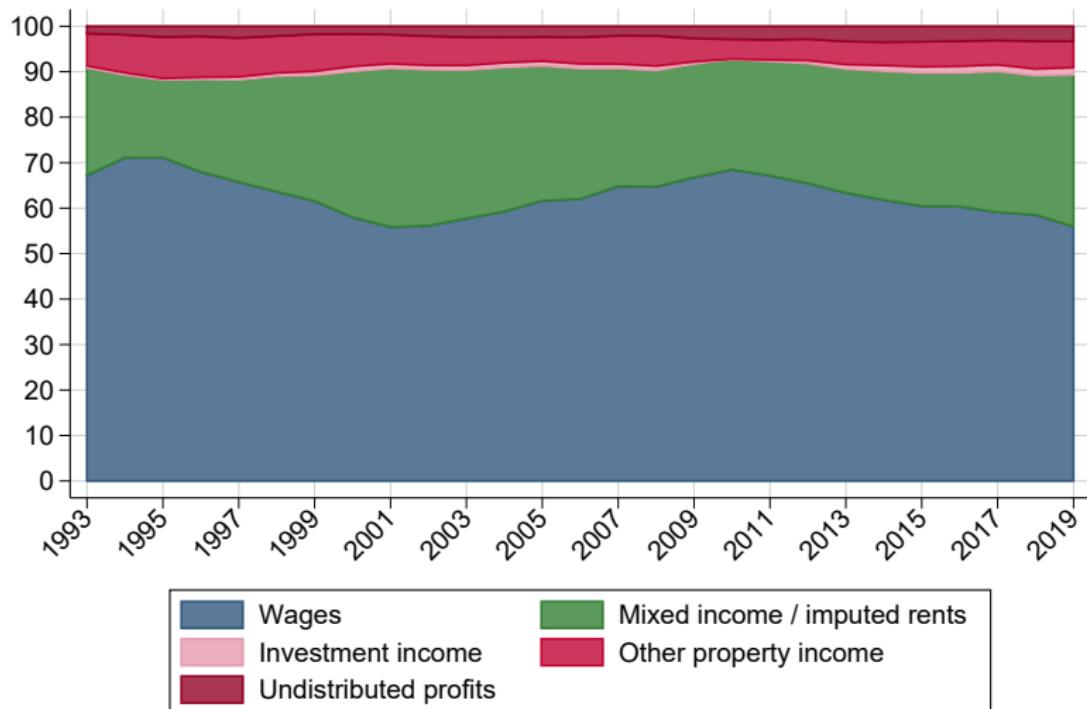
Composition of next 9% (p90p99) factor income

[Go back](#)



Composition of bottom 50% factor income

[Go back](#)



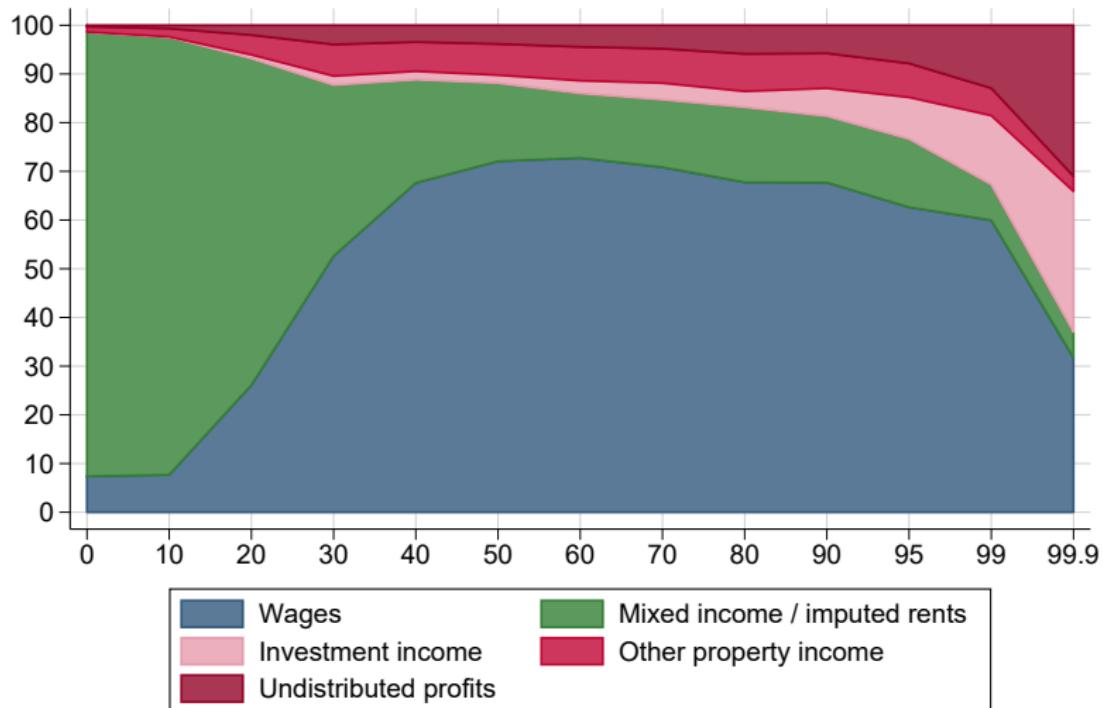
Composition of factor national income groups, 1993

[Go back](#)



Composition of factor national income groups, 2019

[Go back](#)



Government revenue in South Africa, 1993-2019

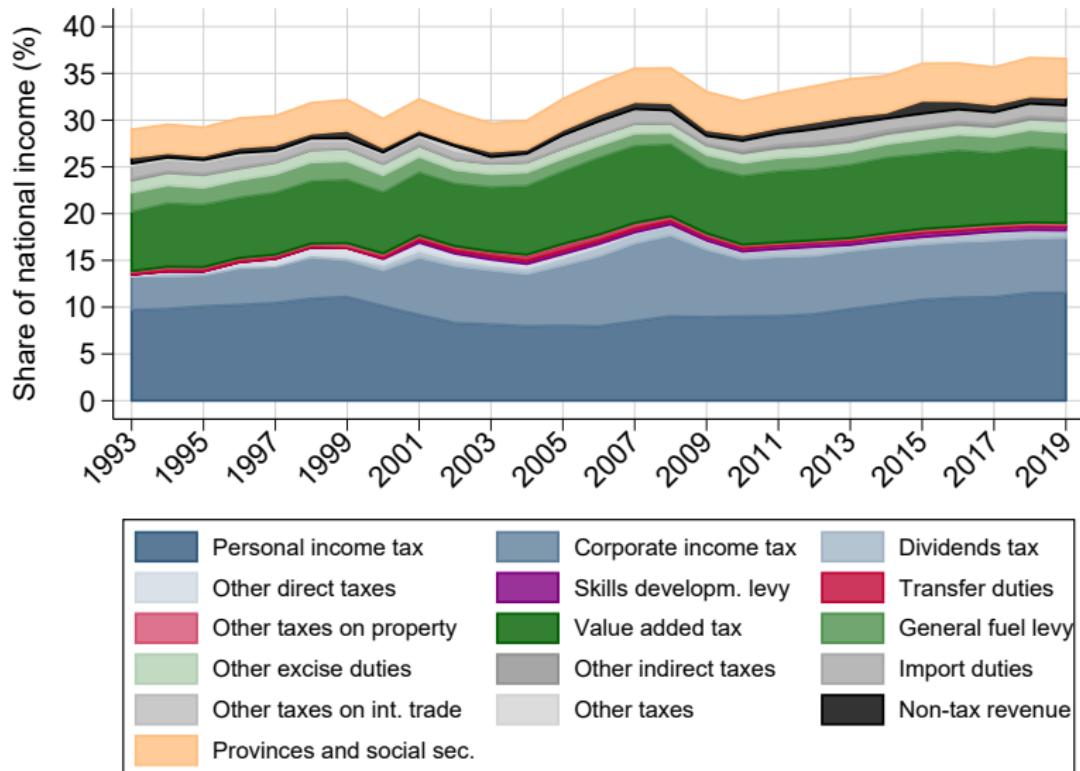
[Go back](#)

Table 3: Sources of government revenue (% of national income)

	1993	2000	2010	2019
Personal income tax	9.7%	10.1%	9.0%	11.6%
Corporate income tax	3.6%	3.8%	6.1%	5.8%
Other direct taxes	0.5%	1.8%	1.6%	1.6%
Value-Added Tax	6.3%	6.5%	7.3%	7.8%
Other indirect taxes	5.0%	4.1%	3.8%	4.8%
Other taxes, non-tax revenue	2.0%	1.8%	1.8%	2.0%
Total consolidated revenue	27.1%	28.1%	29.6%	33.5%

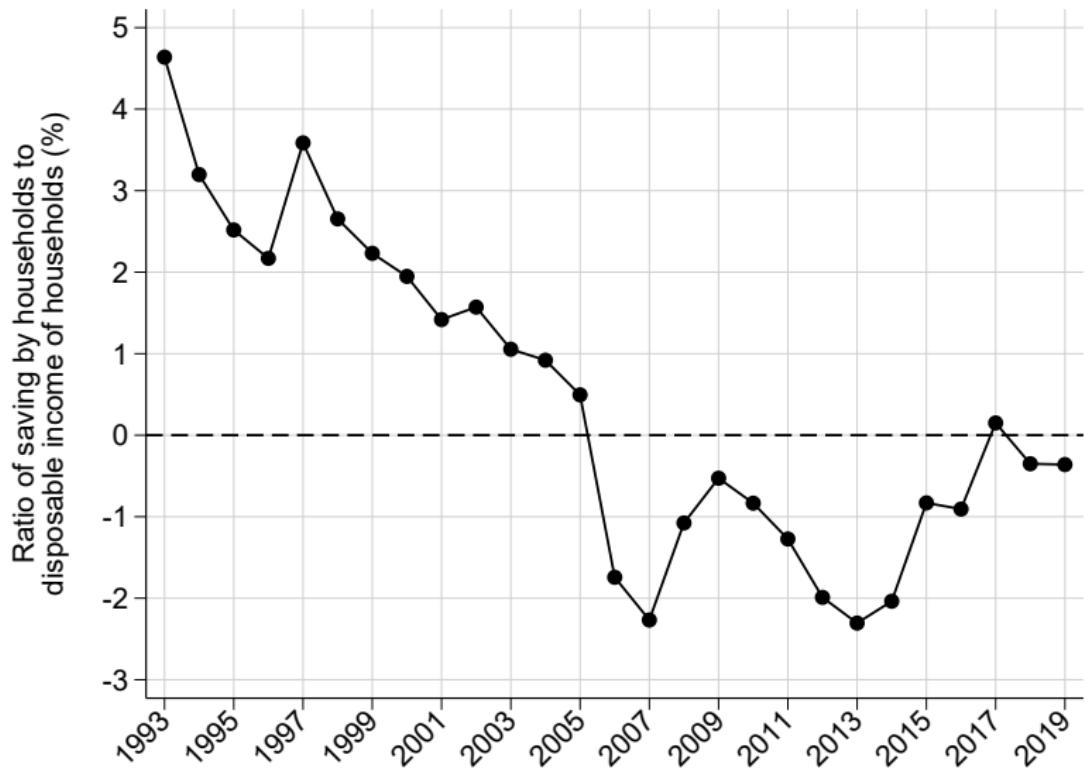
Table 4: The distribution of taxes

Item	Distribution method	% of NNI (2019)
Direct taxes		19.0%
Personal income tax	Rule-based imputation	11.2%
Corporate income tax	Proportionally to equity	6.1%
Dividends tax	Proportionally to dividends	0.8%
Skills development levy	Rule-based imputation	0.4%
Transfer duties	Proportionally to housing wealth	0.2%
Securities transfer tax	Proportionally to equity	0.1%
Estate duty	Proportionally to net wealth	0.1%
Donations tax	Proportionally to net wealth	0.0%
Other taxes on income	Proportionally to pretax income	0.1%
Indirect taxes		12.6%
Value added tax	Proportionally to expenditure (excl. zero-rated / informal market)	8.0%
General Fuel Levy	Proportionally to fuel and transport expenditure	1.8%
Other excise duties	Proportionally to tobacco and alcohol expenditure	1.1%
Other taxes on goods and services	Proportionally to total expenditure	0.3%
Taxes on international trade	Proportionally to import-density-corrected expenditure	1.4%
Other government revenue	Proportionally to pretax income	2.0%
Total consolidated revenue		33.6%

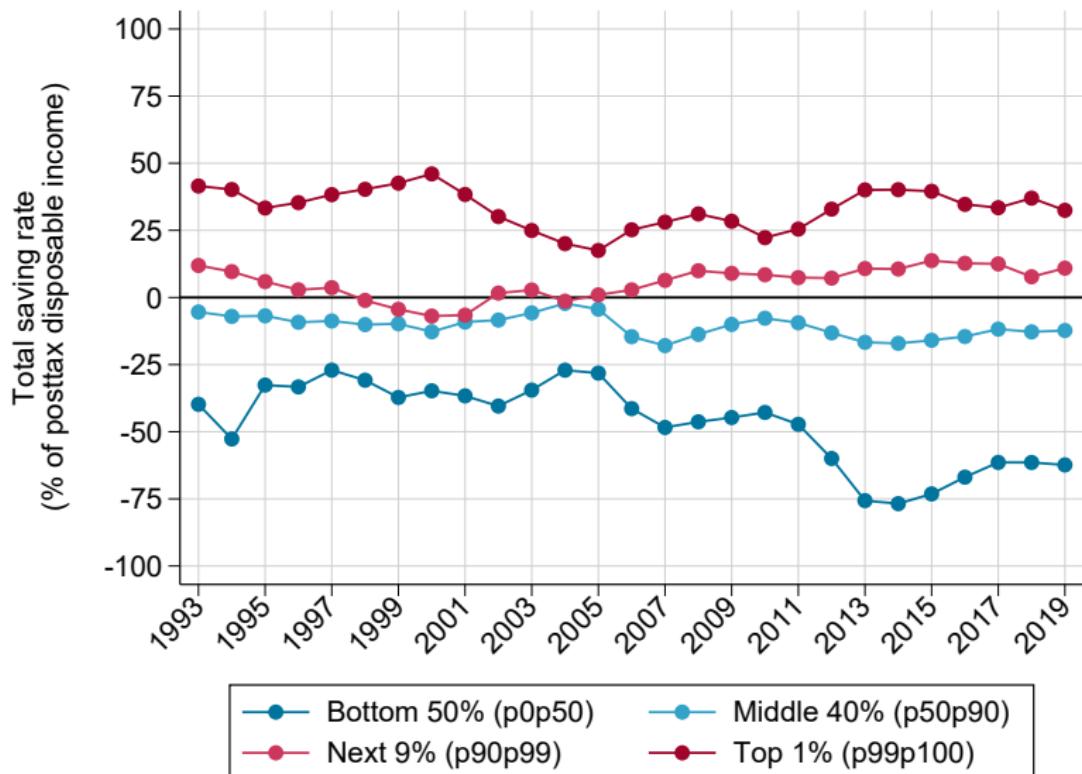
Notes. The table reports the methodology used to distribute all taxes in South Africa at the individual level, along with the size of each component, expressed as a share of net national income (NNI), in 2019.

Saving rate of households, 1993-2019

[Go back](#)

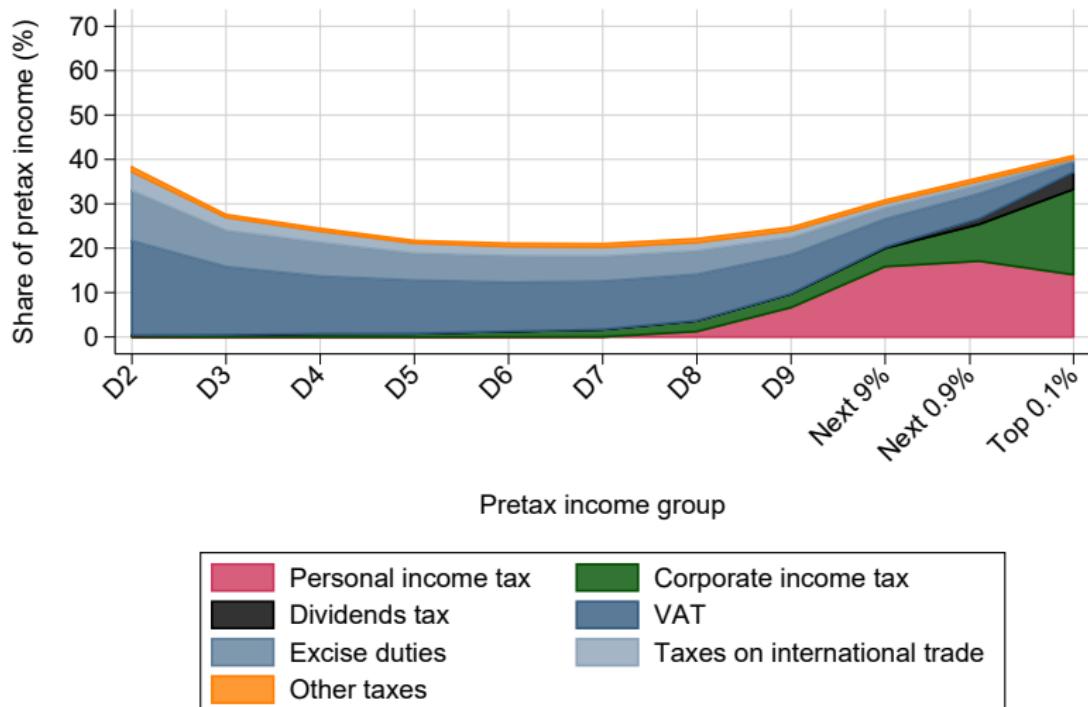


Total saving rate by posttax disposable income group (consistent with national accounts)

[Go back](#)

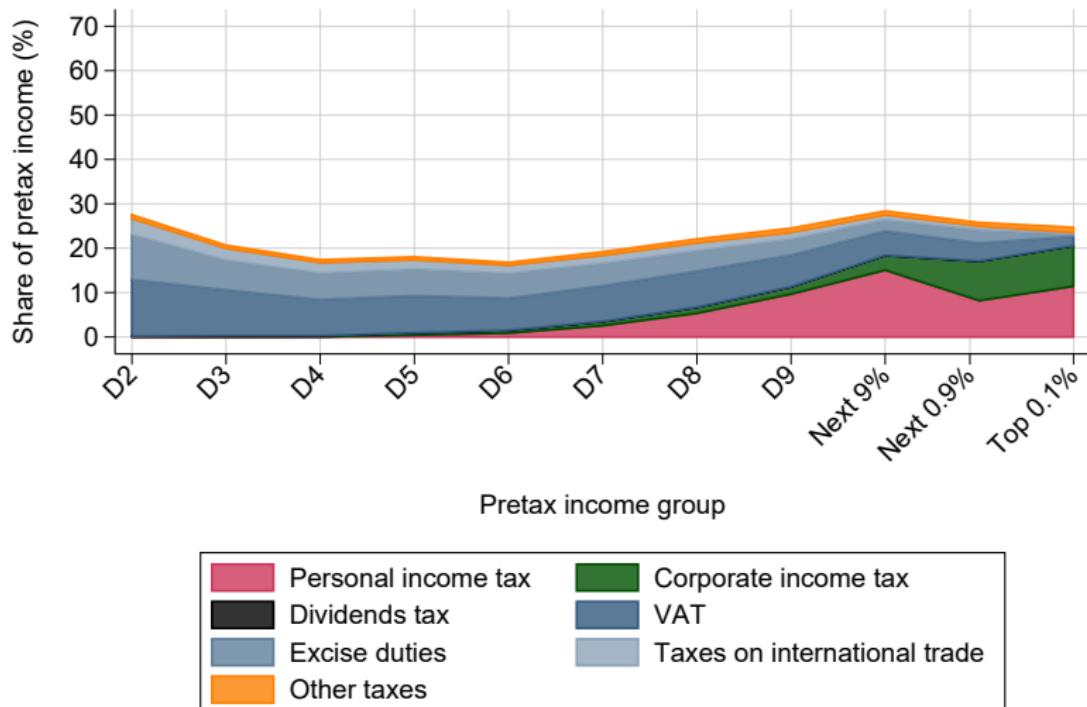
Taxes paid by pretax, post-transfer income group, 2019

[Go back](#)



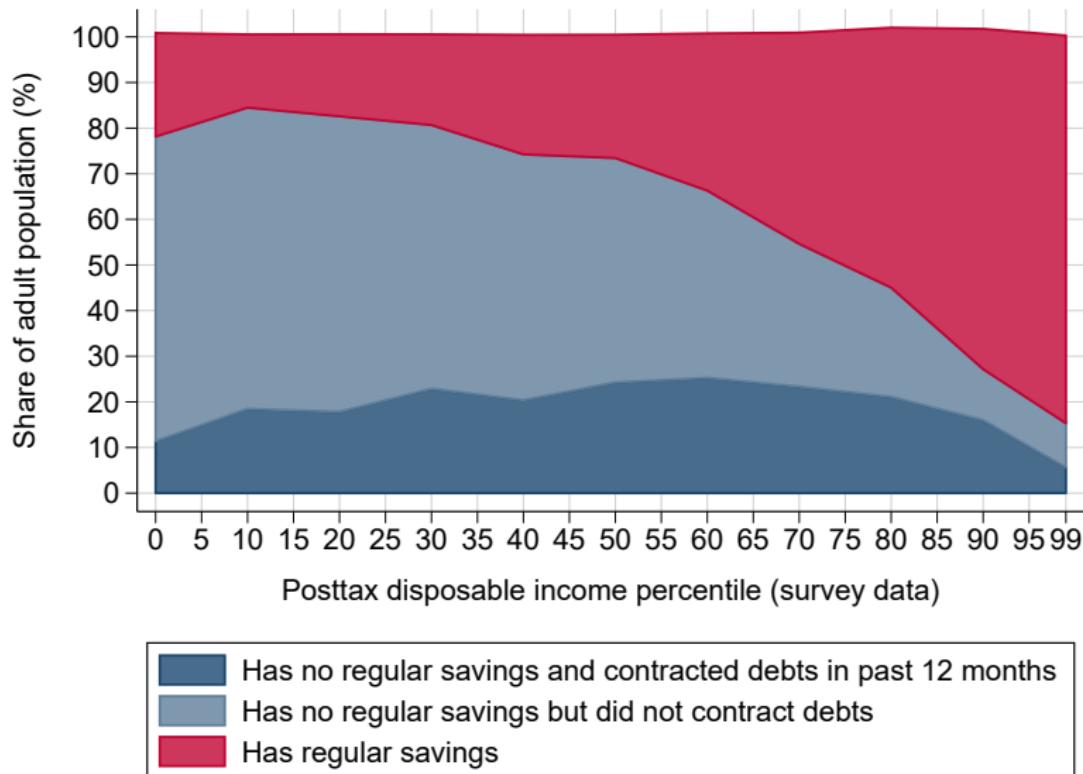
Taxes paid by pretax, post-transfer income group, 1993

[Go back](#)



Access to emergency savings in 2008

[Go back](#)



Median ratio of income to expenditure by posttax disposable income percentile (consistent with national accounts)

[Go back](#)

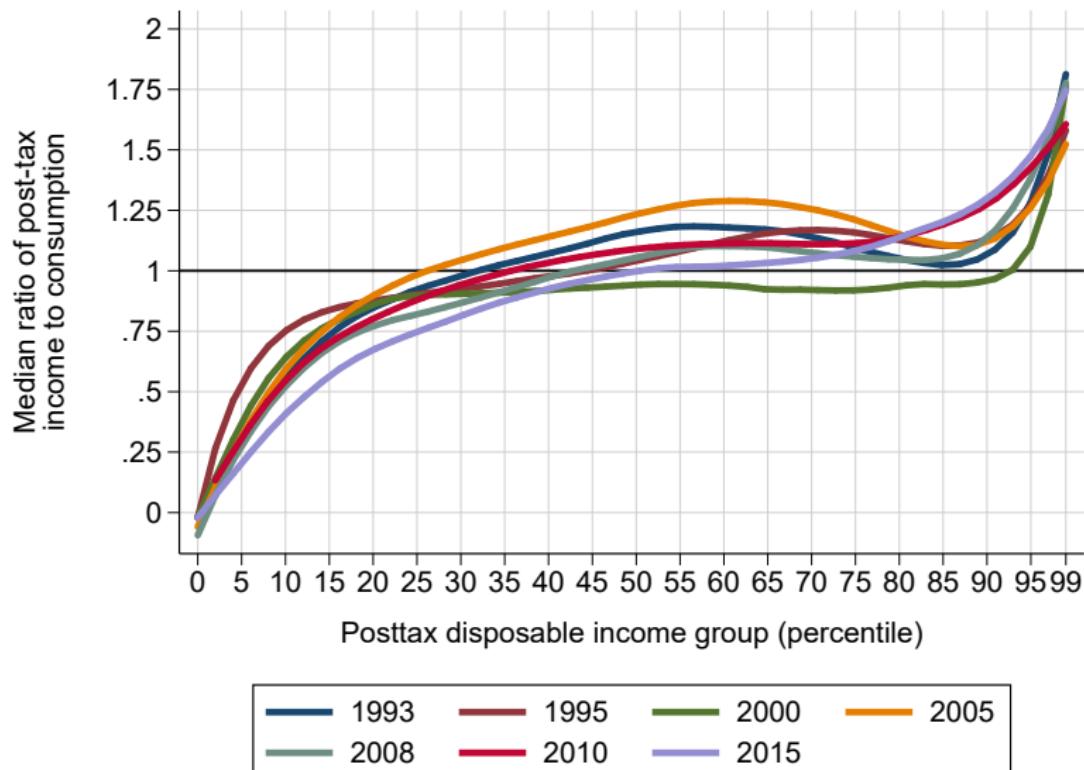
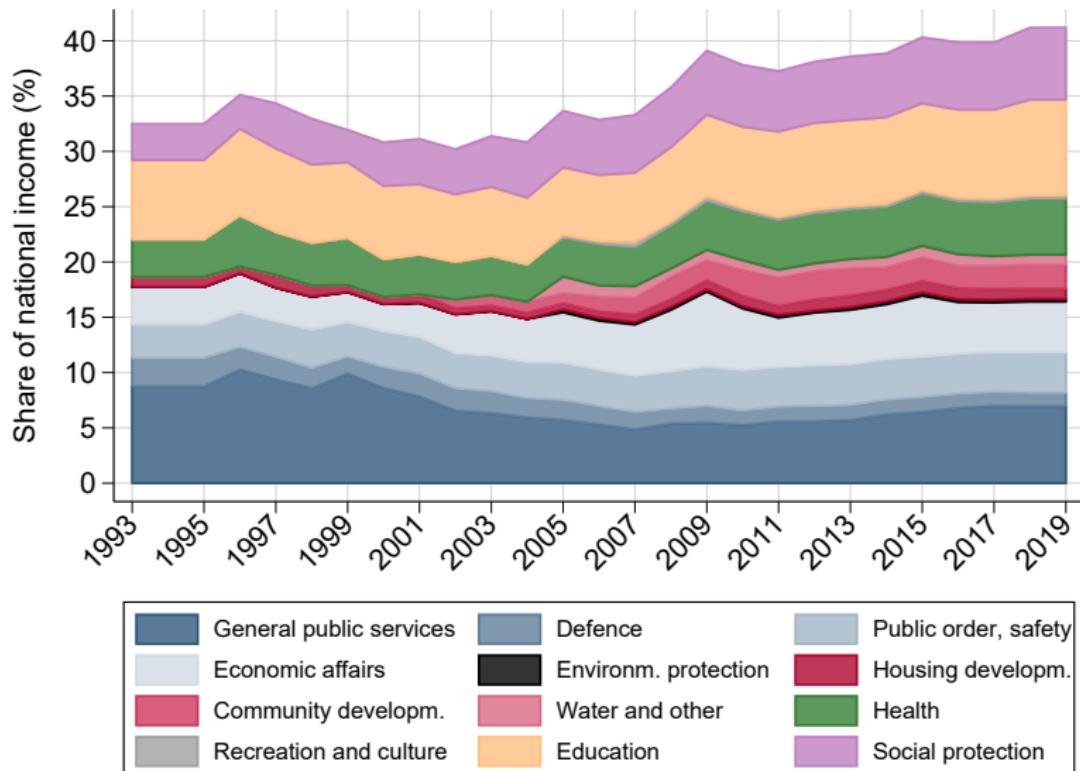


Table 5: The distribution of transfers

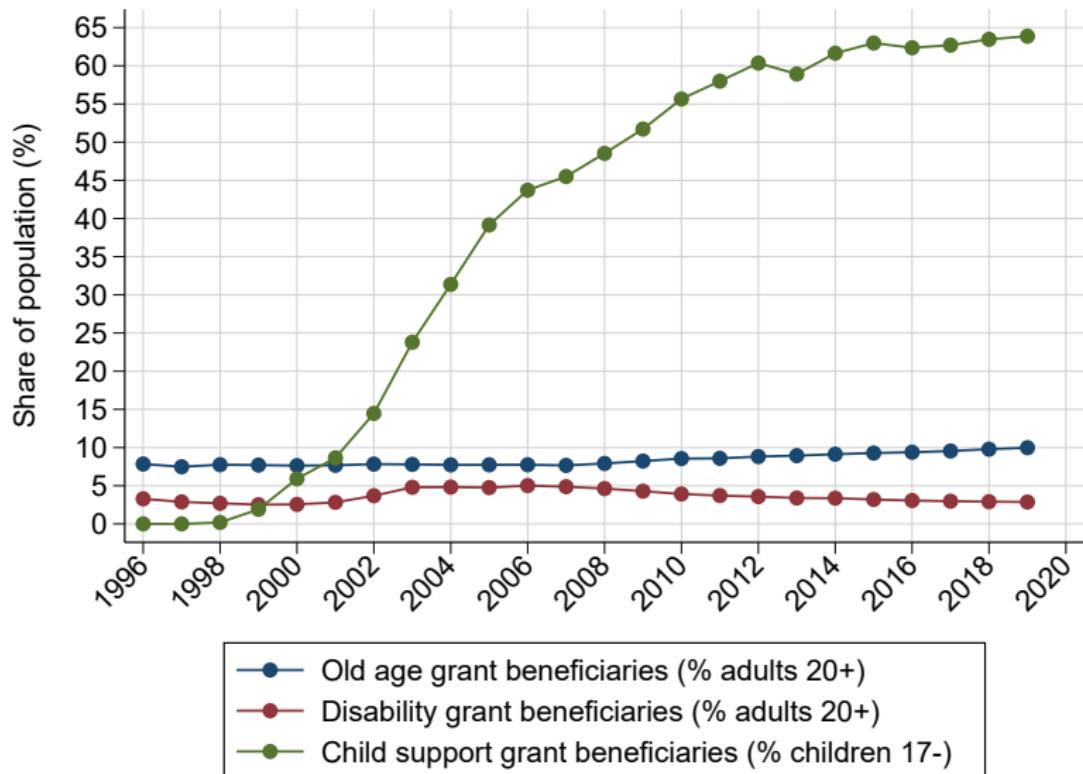
Item	Distribution method	% of NNI (2019)
Direct transfers		5.0%
Old age grant	Rule-based imputation	1.8%
Child support grant	Rule-based imputation	1.5%
Disability grant	Rule-based imputation	0.5%
Other social protection	Proportionally to other cash transfers	1.2%
In-kind transfers		13.8%
Education	Lump sum per kid (by province and type of education)	8.7%
Health	Lump sum per adult (by province and public healthcare use)	5.1%
Collective government expenditures		20.9%
Housing and community amenities	Proportionally to posttax disposable income	4.0%
General public services (incl. debt service)	Proportionally to posttax disposable income	7.0%
Economic affairs	Proportionally to posttax disposable income	4.6%
Public order and safety	Proportionally to posttax disposable income	3.6%
Defence	Proportionally to posttax disposable income	1.2%
Recreation and culture	Proportionally to posttax disposable income	0.3%
Environmental protection	Proportionally to posttax disposable income	0.3%
Total consolidated expenditure		39.6%

Notes. The table reports the methodology used to distribute all taxes in South Africa at the individual level, along with the size of each component, expressed as a share of net national income (NNI), in 2019.

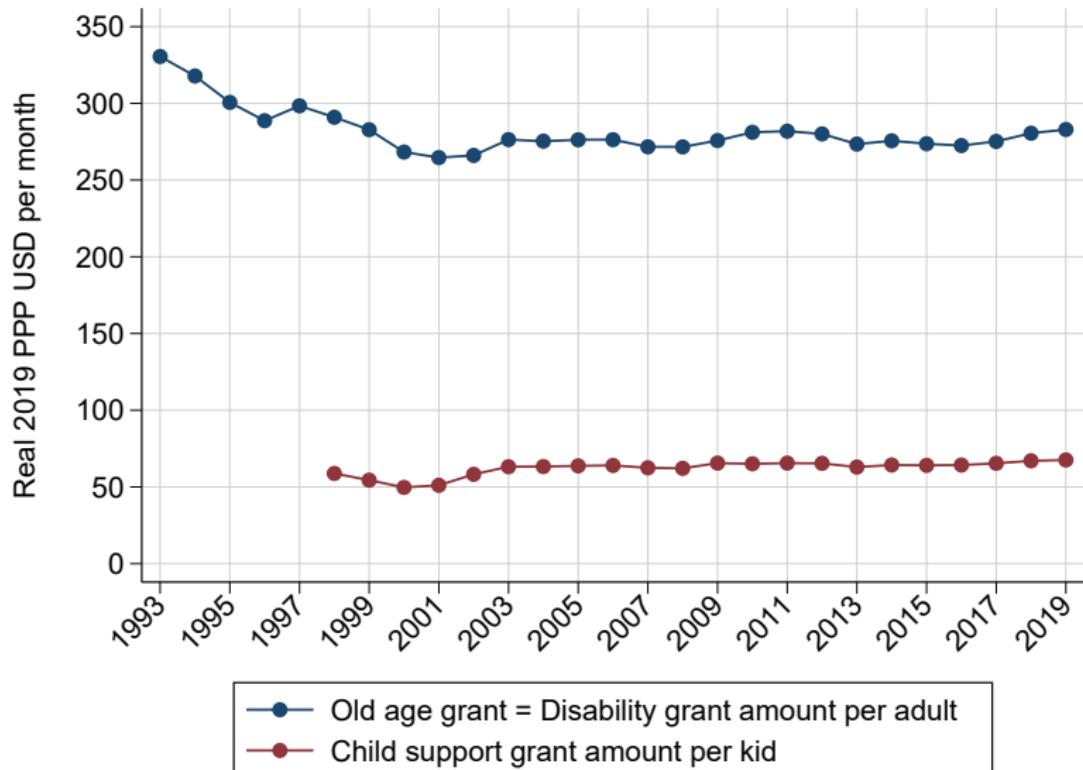
Government expenditure in South Africa

[Go back](#)

Number of recipients of social grants in South Africa

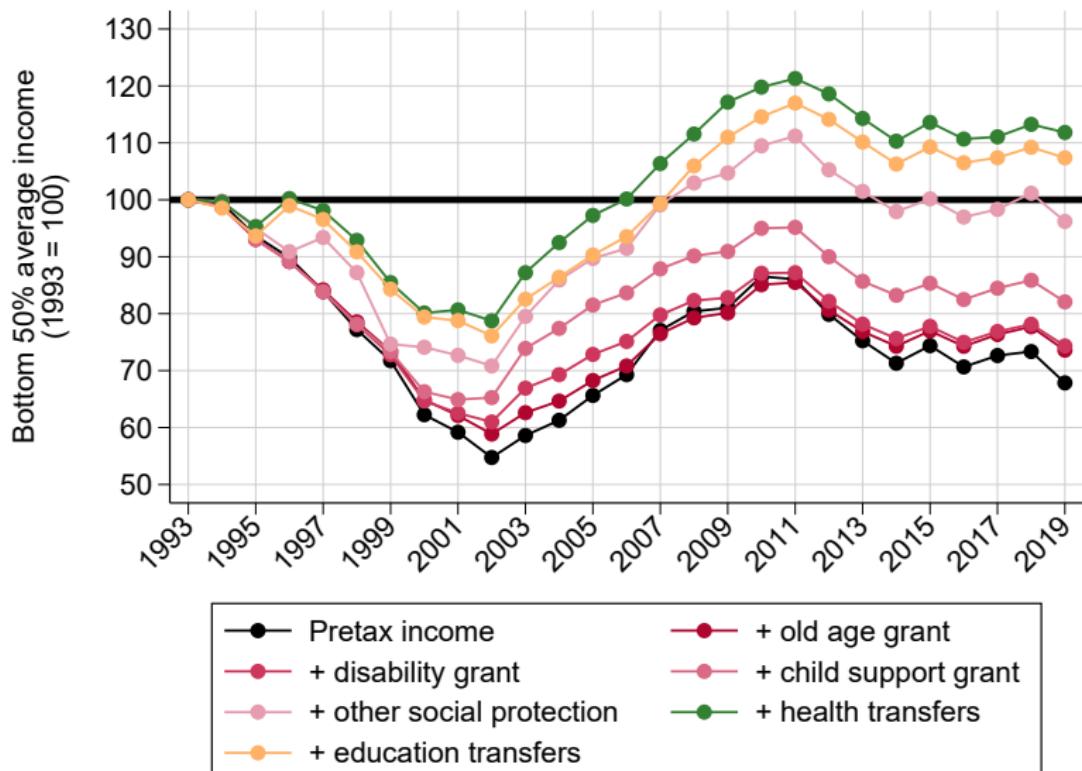
[Go back](#)

Real value of social grants in South Africa

[Go back](#)

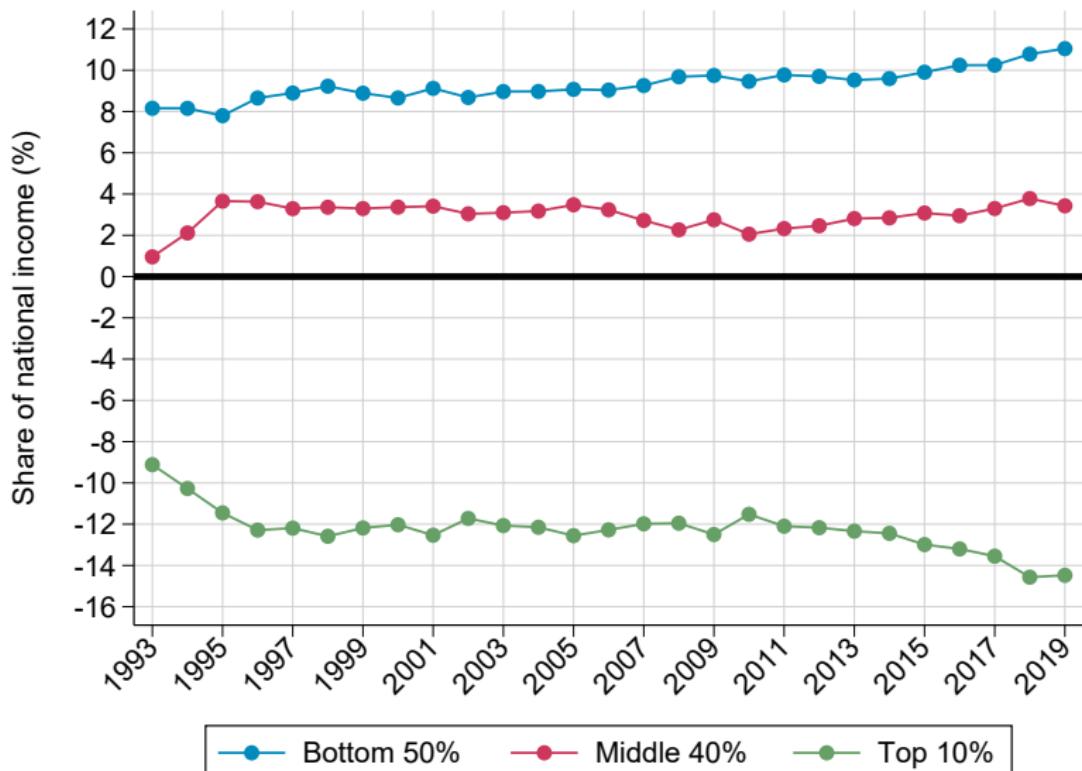
Cumulated income growth of the bottom 50%: the role of rising social transfers

[Go back](#)

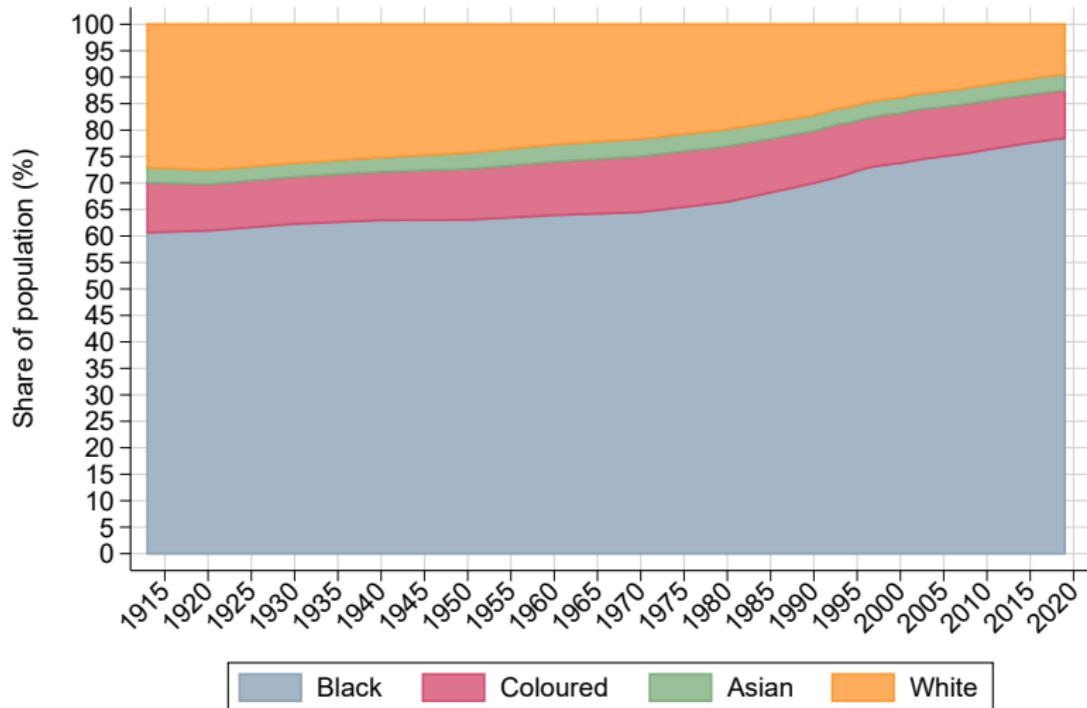


Net transfers operated by the tax-and-transfer system between factor income groups

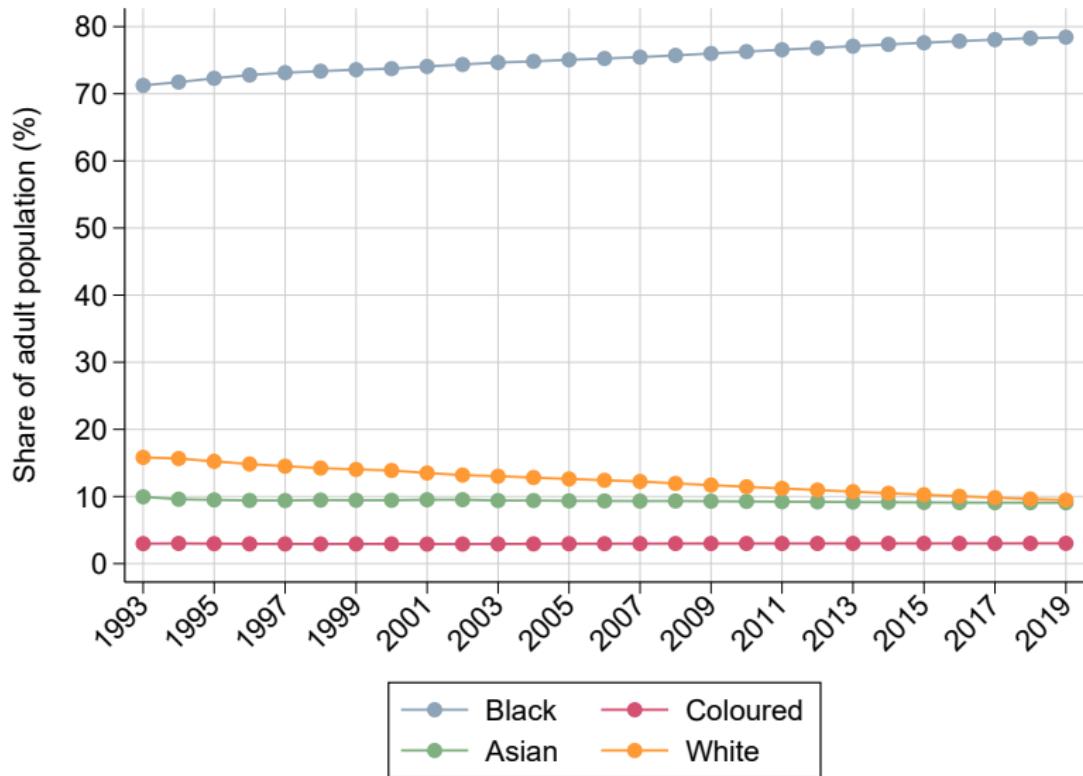
[Go back](#)



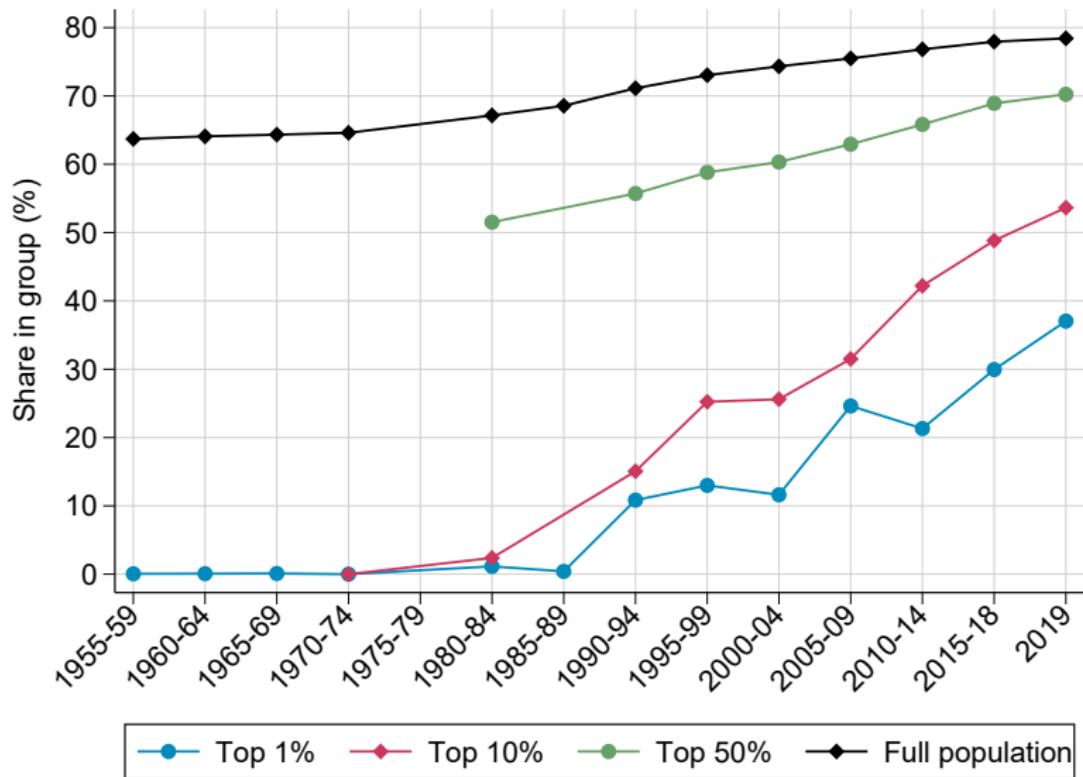
Racial composition of the South African population

[Go back](#)

Racial composition of the South African population

[Go back](#)

Racial inequality and top incomes: 1955-2019

[Go back](#)

Overall provincial inequality before and after transfers

[Go back](#)