Redistribution without Inclusion? Inequality in South Africa Since the End of Apartheid*

Aroop CHATTERJEE
Léo CZAJKA
Amory GETHIN

28th September, 2023

Abstract

This article sheds new light on the evolution of income inequality and government redistribution in post-apartheid South Africa. We combine survey, tax, and historical budget data to construct a new microdatabase on the distribution of labor and capital incomes, taxes, cash transfers, and public services since 1993. Pretax income inequality has increased, but this rise has been overcompensated by major expansions in government redistribution. After accounting for taxes and transfers, low-income households have benefited from the greatest real income gains. However, South Africa still stands out as one of the most unequal countries in the world. In 2019, the top 1% received almost 20% of posttax income, more than the bottom 50% as a whole. Racial inequalities have declined, but this decline has been entirely driven by the boom of top Black income groups. We highlight the role of taxes and transfers as powerful levers of inclusive growth yet insufficient tools to curb South Africa's extreme inequalities.

*Aroop Chatterjee: Southern Centre for Inequality Studies – University of Witwatersrand; Léo Czajka: Université catholique de Louvain (FNRS - FRESH Grant 33877166); Amory Gethin: Paris School of Economics – World Inequality Lab (Grant ANR-17-EURE-001). We thank Facundo Alvaredo, Pierre Bachas, Thomas Blanchet, Lucas Chancel, Ignacio Flores, Rosanne Logeart, Marc Morgan, Thomas Piketty, Tom Raster, David Splinter, Juliet-Nil Uraz, Ingrid Woolard, and Gabriel Zucman for comments and suggestions.

1. Introduction

Numerous studies have provided new insights into the determinants of economic deprivation in recent years, yet considerable challenges remain when it comes to accurately understanding the link between poverty, inequality, and growth. How inclusive has economic growth been in the developing world in the past decades? To what extent have cash transfers and government investments in health, education, and infrastructure development accrued to low-income groups, and what fraction of these benefits has been mitigated by an increased tax burden? Because of a critical lack of data on the joint distributions of income, consumption, taxes, and transfers, answering these questions has until today proved to be a remarkably challenging task. At the heart of this difficulty lies major differences in data sources, methods, and research communities. At the micro level, studies investigating poverty and inequality have almost exclusively relied on household surveys, often the only source at our disposal to observe the distributions of income, consumption, and wealth. At the macro level, researchers studying the determinants of growth have mostly worked with national accounts, which provide crucial information on key macroeconomic aggregates and the size of government intervention in the economy. The sometimes inconsistent and conflicting stories arising from these two sources have made it particularly difficult to understand how economic growth is shared over time and to what extent government redistribution in its various forms effectively benefits the poor.

This paper attempts to make progress in this direction by constructing a new micro dataset on the distribution of macroeconomic growth in South Africa from 1993 to 2019. Combining available data sources—surveys of various kinds, income tax data, national accounts, and historical administrative data on government taxes and expenditure from budget reports—we systematically allocate all components of the net national income, all government taxes, and all government expenditure to individuals. The resulting dataset is consistent with income, expenditure, and wealth aggregates reported in the national accounts. It is also consistent with what we know from administrative reports on various key parameters of government intervention, including the number of recipients of social grants, the total spending on each of these grants, the distribution of top taxable incomes reported in personal income tax data, and other key statistics on the size and targeting of taxes and transfers. Importantly, it covers in-kind transfers and public goods, which are particularly large and progressive in South Africa, drawing on recent related work (Gethin, 2023). It also incorporates all these key parameters while keeping the richness of the information reported in household surveys, allowing us to decompose the evolution of inequality, redistribution, and growth according to various economic variables such as consumption, labor income, capital income, and wealth, or sociodemographic

variables such as age, gender, race, and geography.

The case of South Africa is particularly revealing of the limitations we face in our understanding of the links between inequality, redistribution, and growth. On the one hand, the country is widely acknowledged as standing at the upper frontier of contemporary inequality today (Alvaredo et al., 2018). The richest 10% own a striking 85% of total household wealth, with an average net worth exceeding $440,000 at purchasing power parity (Chatterjee, Czajka, and Gethin, 2022), while 57% of the population lives with less than $5.5 per day (World Bank, 2020). These extreme disparities, despite the end of the apartheid regime of racial segregation and exclusion at the beginning of the 1990s, have been found to have increased significantly in the past decades, driven by the boom of top incomes, chronic unemployment, and persisting household indebtedness (Bassier and Woolard, 2018; Leibbrandt et al., 2010).

On the other hand, South Africa is often regarded as displaying one of the most ambitious and efficient welfare states of the developing world. It has developed a highly progressive personal income tax, which collects substantial revenue in comparison to the majority of other emerging and developing economies. It has invested growing resources in education, health, and social protection, and its relatively well-targeted social grants system has provided critical social relief to the poor and the elderly (Bassier et al., 2020; Duflo, 2000; Maboshe and Woolard, 2018; Tondini, 2021). The reductions in inequality and poverty operated by South Africa's tax-and-transfer system have even been found to be the largest achieved among all emerging economies with comparable data (Inchauste et al., 2015).

This contrasting trajectory, mixing rising pretax income inequality, low growth, and large and increasing government redistribution leaves us with a puzzling and unclear track record of South Africa's success in improving the living conditions of the poor since the end of apartheid. We do not know, for instance, whether the decline in absolute poverty observed in the 2000s, as measured by consumption expenditure reported in household surveys, was driven by higher market incomes, improved access to credit, or social transfers (such as the Child Support Grant introduced in 1998). Commonly used consumption or income aggregates do not account for in-kind transfers, such as education and healthcare, hence leaving aside crucial elements of government redistributive policy. We know even less of the distributional incidence of taxes, in particular indirect taxes (such as VAT or excise duties) and the corporate income tax, which are generally excluded from studies tracking the evolution of inequality and poverty over time. The objective of this paper is to make advances in filling these gaps by making the best of all the available data sources at our disposal (surveys, tax data, national accounts, and historical data on the structure of taxes and transfers) to get a more complete picture of the distribution of growth and redistribution over time. While we still face considerable challenges in measuring

these various components and our analysis is not devoid of limitations and uncertainties, we hope that it can contribute to improving our knowledge of how inequality, poverty, and redistribution interact in the long run.

Our analysis reveals a number of striking findings. National income per capita grew by about 35% from 1993 to 2019, yet this figure masks large heterogeneity across income groups. The average pretax income of the top 1% increased by almost 80%, while that of the poorest 20% declined. The share of pretax income accruing to the top 10% of the population thus shifted from about 64% to 69%, putting South African inequality levels much higher than anywhere else in the world, including countries such as Brazil (57%), India (57%), or the United States (45%). This dramatic rise of top incomes was driven by both capital and labor income, although labor income played a more decisive role after the 2007-2008 crisis.

Turning to the impact of taxes and transfers, we find that major increases in government redistribution more than compensated the rise of pretax inequality. This transformation was driven by both cash and in-kind transfers, which increased in size and became more progressive over time. The rise of redistribution was in part financed by higher taxes on the top 1%, who saw their effective tax rate shift from about 25% to 40%, mainly through expansions in the personal income tax and the corporate income tax. A significant part of this redistribution, however, was annulled by increases in taxes paid by the poorest 50% in the form of VAT, excise duties, and local taxes. In 2019, the profile of taxes paid by pretax income group was thus distinctly U-shaped, with higher tax rates paid by the bottom and the top of the distribution than by middle income groups, who saw their tax burden remain nearly unchanged in the past twenty-five years.

All in all, we find that growing redistribution generated substantial improvements in the living standards of South Africa's poorest individuals, but only had small effects on overall inequality. After accounting for taxes and transfers, the top 1% income share stood at nearly 20% in 2019, almost the exact same level as in 1993. The rise of South Africa's welfare state has thus succeeded at redistributing the fruits of economic growth, but it has been insufficient to curb the extreme inequalities inherited from apartheid.

Finally, we decompose inequality and redistribution into two key historical determinants of South Africa's extreme economic disparities: race and geography. We document a significant decline in the income gap between White and Black South Africans since the mid-2000s: the ratio of average White income to average Black income fell from 14 in 2005-2009 to 8 in 2015-2019. However, much of this decrease can be accounted for by the top 10% of Black earners, who witnessed exceptional income gains. When we exclude this group from the analysis, the racial income gap appears to have stood at about the same level in 2019 as since 1993. Racial

inequalities are substantially larger in terms of wealth than in terms of income or consumption and are only moderately reduced by the tax-and-transfer system. Turning to geography, we find that the South African state operates significant transfers from the two richest provinces, Gauteng and Western Cape, to the rest of the country, although posttax spatial inequalities remain large. Another dimension of inequality for which redistribution seems to have succeeded at fully absorbing the rise of pretax inequalities is the rural-urban gap, which grew dramatically in terms of pretax income but remained stable after accounting for taxes and transfers. This striking rise of redistribution from urban to rural areas is mostly attributable to higher in-kind transfers and public goods, which disproportionately improved in rural areas over the period considered.

This paper contributes to the growing literature attempting to bridge the micro-macro gap in poverty and inequality studies. Piketty, Saez, and Zucman, 2018 combine surveys, tax, and national accounts data to create Distributional National Accounts (DINA) allocating the entirety of national income growth to individuals in the United States since 1913. A number of studies following the DINA framework (see Alvaredo et al., 2018) have been conducted since then on other countries or regions of the world, with the objective of constructing comparable, yearly statistics on the long-run distribution of income and wealth.[1] The major innovation of DINA studies is their consistency with macroeconomic figures reported in the national accounts and their allocation of all taxes and transfers (including indirect taxes, in-kind transfers, and collective government expenditure) to individuals. One of their limitations, however, has been the degree of precision with which taxes and transfers are distributed. Piketty, Saez, and Zucman (2018), for instance, distribute education spending as a lump sum per child, leaving aside variations in expenditure across space and level of education. Blanchet, Chancel, and Gethin (2022) distribute health expenditure on a lump sum basis in the context of Europe, assuming that all adults benefit from the same amount of health investment regardless of age, location, or socioeconomic status. Similarly, Bozio et al. (2020) allocate all consumption taxes on value added, energy, or tobacco proportionally to overall consumption expenditure, regardless on the type of goods on which these taxes fall.

Several studies have made significant efforts to refine our understanding of the distribution of indirect taxes and in-kind transfers, but they have typically not done so in a way that is consistent with the national accounts. In the context of South Africa, Inchauste et al. (2015) exploit data from the Living Conditions Survey to allocate government taxes and social spending to individuals in a particularly granular way, combining for instance microdata on educational

[1] See for instance Blanchet, Chancel, and Gethin (2022) on Europe, Garbinti, Goupille-Lebret, and Piketty (2018) and Bozio et al. (2020) on France, or Piketty, Yang, and Zucman (2019) on China. The results of these studies have been compiled in the World Inequality Database (see http://wid.world).

attendance by program with figures on total expenditure on each of these programs by province to allocate total education spending. This allows the authors to derive a much more precise estimate of the distributional incidence of some of the elements of the tax-and-transfer system. However, this estimate covers only one year, is not consistent with national accounts, relies exclusively on surveys (which tend to underestimate income at the top end), and excludes key components of government revenue and spending (e.g., the corporate income tax).

In this paper, we attempt to take the best from all of these contributions to derive a comprehensive picture of the distribution of growth, taxes, and transfers in South Africa given the data at our disposal. We directly follow the Distributional National Accounts framework and distribute, component by component, the national income between 1993 and 2019. Our estimates account for incomes that are never directly received by individuals, such as imputed rents or corporate undistributed profits, yet are key components of macroeconomic growth figures. We allocate all taxes to individuals, accounting for key features of the tax system such as VAT-exempt goods, the types of expenditure facing excise taxes, the heterogeneous effects of trade duties through variations in import densities by type of good, expenditure made in the informal sector, and personal income tax exemptions. We distribute all government expenditure as precisely as possible, incorporating information on the value and the number of recipients of each social grant from historical budget reports, excluding individuals relying on private health insurance or going to private schools from public spending, and decomposing education and health transfers by province and function following recent work by Gethin (2023). Although our estimates are far from being perfect and could be improved as better data becomes available, we hope that these methodological insights can contribute to make new steps towards the much needed reconciliation between macro and micro sources in economics research.

Section 2 covers data sources and methodology. Section 3 presents results on the distribution of income before accounting for taxes and transfers. Section 4 studies the impact of taxes and transfers on inequality and the distribution of growth since 1993. Section 5 decomposes inequality and redistribution by race and geography.

2. Data and Methodology

This section presents the data sources and methodology used to estimate the distribution of pretax income, posttax income, consumption, and wealth in South Africa between 1993 and 2019. Section 2.1 outlines our conceptual framework. Section 2.2 explains how we distribute factor national income combining surveys, tax, and national accounts data. Section 2.3 details how we move from factor income to pretax income. Sections 2.4 and 2.5 cover the allocation

of taxes and transfers. Section 2.6 describes how we estimate the distribution of household final consumption expenditure and household wealth.

2.1. Conceptual Framework: Distributional National Accounts

We are interested in distributing the consumption, income, and wealth aggregates codified in the United Nations' System of National Accounts (UN SNA), which are routinely estimated by statistical institutes and used to estimate and decompose macroeconomic growth. These include net national income, household final consumption expenditure, and household net worth.

Net National Income. Our benchmark income concept is net national income. National income equals GDP minus capital depreciation plus net foreign income. It is the sum of the primary incomes of the different sectors of the economy: households, corporations, and the government (see Table 1). The primary income of households can itself be decomposed into four main components: compensation of employees, mixed income, net property income, and the imputed rents of owner-occupiers. The primary income of corporations corresponds to the net benefit that companies retain after having paid suppliers, employees, shareholders, and taxes, and that we refer to interchangeably as "retained earnings" or "undistributed profits". The primary income of the general government is the sum of taxes less subsidies on production and imports (i.e., indirect taxes collected during the production process) and of its net property income.

Distributional Income Concepts. Following the DINA framework (Alvaredo et al., 2020), we consider three main income concepts to distribute national income at the individual level. Factor national income is the sum of all income flows accruing to individuals before any tax or transfer. Pretax national income equals factor income after the operation of unemployment and pension systems, that is, after payment of social contributions and distribution of pension and unemployment benefits. Posttax national income equals pretax income after deduction of all taxes (including indirect taxes and the corporate income tax), payment of all kinds of transfers (including collective government expenditure in health, education, defense etc.), and allocation of the general government deficit of surplus. By definition, individual factor incomes, pretax incomes, and posttax incomes all add up to the net national income.

Distributional Consumption and Wealth Concepts. In addition to income, we also distribute consumption and wealth concepts consistent with national accounts definitions. Household

final consumption expenditure (HFCE) is the sum of all purchases made by resident households. The net saving of households is the difference between net disposable income (posttax income excluding collective government expenditure) and HFCE. Personal wealth is the net wealth of the households sector, that is, the sum of all financial and non-financial assets held by households, minus their financial liabilities.

2.2. From Reported Household Income to Factor National Income

We now outline our methodology to distribute factor national income. We first combine survey and tax data to measure the distribution of reported household income (wages, property income, and mixed income). We then allocate unreported income components (imputed rents, property income attributed to policy insurance holders, undistributed profits, and government primary income) to individuals. Table 1 outlines the methodology used to distribute each of these subcomponents of factor national income. We discuss in greater detail these methodological steps in appendix A.

Harmonization of Survey Data. Household surveys represent our main data source to distribute income at the individual level. Seven surveys collecting detailed information on all components of household income and expenditure have been conducted in South Africa since 1993. We combine these "income surveys" with labor force surveys, which provide more detailed data on wages and self-employment income on an annual basis, to build a microfile covering the distribution of "reported household income" every year since 1993.

Combination of Survey and Tax Data. Surveys can be well-suited to measure income and expenditure at the bottom of the distribution, yet they are well-known to underestimate inequality at the top end (e.g., Blanchet, Chancel, and Gethin, 2022). To better capture the levels and dynamics of top incomes, we combine our survey microfile with tabulated income tax returns available from the South African Revenue Service. The available tabulations report the number of taxpayers and total taxable income by income tax bracket every year since 2002. We correct the survey data with the tax data in four steps. First, we approximate full distributions from the tax tabulations using Generalized Pareto Interpolation (Blanchet, Fournier, and Piketty, 2017). Secondly, we define a "taxable income" concept in the survey data that is comparable to that observed in the tax data (excluding in particular dividends, which are not subject to personal income tax in South Africa). Thirdly, we calibrate the survey microdata on the tax tabulations using the algorithm developed by Blanchet, Flores, and Morgan (2018), which reweighs survey observations so as to match the distribution of top taxable incomes reported in the tax data.

This method has the major advantage of preserving the survey microdata and the dependency between its different variables (such as income components and sociodemographics), while enforcing that the survey becomes fully representative of top taxable incomes, in the same way that statistical institutes routinely adjust survey weights to make them more representative in terms of age or gender. Finally, we extrapolate the correction to the 1993-2001 period, for which no tax data is available, assuming that top incomes were underrepresented during this period to the same extent as in 2002.

Rescaling of Household Income Components to National Accounts Totals. Having combined survey and tax data, we now have a microfile covering reported household income for the full South African population since 1993. However, for various reasons linked to sampling, mismeasurement of income flows, and non-response, income aggregates reported in this microfile do not necessarily match those recorded in the national accounts. Following other DINA studies, we rescale proportionally each of the five income flows reported in survey and tax data—compensation of employees, mixed income, rental income, interest, and dividends—to their corresponding national accounts totals. This step only has minor distributional implications at the bottom of the distribution, but it leads to significantly increasing the income share of the top 1%. This is because capital incomes, in particular interest and dividends, are both massively underreported in household surveys and by construction mostly absent from South African income tax data (Chatterjee, Czajka, and Gethin, 2022).

Imputed Rents. The imputed rents of owner-occupiers represent about 3% of national income. Imputed rents are not recorded consistently in South African surveys as such, but income surveys have asked households to give an approximate value of the value of their home since 1993. We use this information to distribute imputed rents proportionally to the market value of owner-occupied housing wealth.

Other property income. Other property income, also referred to as property income attributed to insurance holders and pension entitlements, corresponds to investment income indirectly received by individuals through their ownership of unmatured insurance and pension assets. Accordingly, we assume that it is distributed proportionally to pension and life insurance assets, estimated by combining data on wages, social contributions, and self-reported wealth data from the National Income Dynamics Study (see Chatterjee, Czajka, and Gethin, 2022). This component represents a significant share of national income in South Africa (6% in 2018), where private pensions, life insurance policies, and investment funds are widespread and have been growing in the past decades.

Interest Paid by Households. Household debts in the form of mortgages and other loans are significant in South Africa (53% of national income in 2018), and particularly widespread at the bottom of the wealth distribution (Chatterjee, Czajka, and Gethin, 2022). Accordingly, interest paid by households represents a sizable component of national income, reaching 5% of NNI in 2018. Data on debt balances have been recorded in income surveys since 1993, but debt repayments are only partially and inconsistently measured. To avoid artificially creating too many households with negative income, we therefore choose to distribute interest paid proportionally to factor income among individuals who declare having unpaid debts.

Corporate Undistributed Profits. Undistributed profits correspond to profits that are kept within the company rather than distributed to shareholders as dividends. These income flows ultimately increase the wealth of shareholders and therefore represent a source of income to them. Accordingly, we allocate retained earnings proportionally to stock ownership, including both directly held shares and shares held indirectly through pension funds. We only distribute the share of retained earnings attributable to the private domestic sector, hence excluding that held by the government.

Taxes less Subsidies on Production and Imports. We allocate the primary income of the government proportionally to factor income, assuming this component of national income is distributionally neutral. This assumption is meaningful to the extent that one could replicate our entire analysis by relying on a definition of net national income at factor cost (instead of market prices), excluding indirect taxes and subsidies from the final measure of output. Our inequality series is thus insensitive to adopting one or the other of these approaches to national accounting.

Remaining components of factor national income. The remaining components of national income (3 % of NNI) mainly include government and foreign shares of corporate retained earnings, as well as other small income flows such as miscellaneous government transfers. In the absence of better information on the incidence in these items, we assume for simplicity that they are distributionally neutral and allocate them proportionally to factor income.

2.3. From Factor National Income to Pretax National Income

To recover pretax income from factor income, we remove all pension and unemployment contributions from individual income and we add all corresponding pension and unemployment

benefits. This has only minor distributional incidence in South Africa, given that private pension benefits are received by a small share of the population and that the unemployment insurance system only redistributes a tiny fraction of national income (see Table 1).

Pension Contributions. Contributions to private pension plans (6% of national income) are recorded in income surveys, so we directly deduct them from individual factor incomes.

Pension Benefits. Private pension benefits (3% of national income) are also recorded in income surveys. However, these surveys tend to significantly underestimate the share of adults receiving private pension income (2-3% in income surveys vs. 5-6% according to administrative data). We use predictive mean matching to impute incomes to individuals declaring no pension income but with characteristics similar to those who do, in such a way that the total number of pension income recipients becomes exactly equal to that observed in administrative data sources. This ensures that our microfile is representative of what we know about the actual number of recipients of pension benefits in South Africa, while preserving the observed relationships between pension income and the other covariates recorded in the surveys.

Unemployment Insurance Contributions. Unemployment insurance contributions are set at a fixed rate of 2% of gross wage in South Africa and capped at a maximum amount in Rand. About 25% of adults contribute to the Unemployment Insurance Fund (UIF), collecting some 0.4% of national income in 2018. UIF contributors are well identified in labor force surveys, so we directly impute contributions based on statutory rules.

Unemployment Insurance Benefits. Unemployment insurance benefits are only available to adults having previously made monthly contributions to the UIF. This explains why they only cover a small fraction of the population (1.9% in 2018) and represent only 0.4% of national income. Unemployment benefits and beneficiaries are recorded in income surveys but are typically underrepresented. As in the case of private pension income, we therefore impute UIF benefits to additional recipients and we proportionally rescale the value of these benefits, so as to perfectly match both the official number of recipients and total UIF expenditure recorded in administrative data sources.

Pension and Unemployment Deficits or Surpluses. To ensure that pretax national income equals factor national income, we have to distribute the surpluses or deficits of the pension and unemployment systems. Following other DINA studies, we distribute 50% of the gap between

contributions and benefits to contributors proportionally to contributions paid, and 50% to recipients proportionally to benefits received. This corresponds to assuming that the burden of the deficit (or the benefits of the surplus) will eventually be shared 50/50 by contributors and recipients.

2.4. From Pretax National Income to Posttax National Income: Taxes

To move from pretax income to posttax income, we start by deducting all taxes paid (see Table 2). These include all direct taxes (including the personal income tax and the corporate income tax) and all indirect taxes (including the Value Added Tax and excise duties).

Personal Income Tax. The personal income tax (PIT) is the tax collecting the highest share of government revenue in South Africa, amounting to 11% of national income in 2018. We microsimulate the income tax at the individual level, for each year since 1993, exploiting information on statutory rules, thresholds and marginal tax rates collected from historical administrative sources. As our microfile is calibrated on tabulated income tax returns, it is perfectly representative of taxable incomes at the top. It is therefore fully consistent with administrative data, both in terms of the number of taxpayers and total income tax receipts.

Corporate Income Tax. The corporate income tax (CIT) is the second biggest direct tax on income in South Africa (6% of national income in 2018). The CIT is paid on corporations' profits, so we distribute it similarly to retained earnings, that is, proportionally to directly and indirectly held shares.

Other Direct Taxes on Income and Wealth. Other direct taxes on individual income and wealth only represent a small fraction of national income (1.7% in 2018). We distribute the dividends tax (0.8% of NNI), a flat tax of 20% paid by individuals on dividends received from South African companies, proportionally to dividends received. The Skills Development Levy (0.4% of NNI) is a flat tax of 1% paid on the wages of employees registered with the UIF, so we impute it directly based on rules. We allocate the remaining direct taxes to their corresponding tax bases: transfer duties to housing wealth (0.2% of national income), the securities transfer tax to equity ownership (0.1%), the estate duty and the donations tax to net wealth (0.1%), and the remaining taxes on income to pretax income (0.1%).

Value Added Tax. The value added tax (VAT) is the largest indirect tax in South Africa, enforced at a standard rate of 15% and collecting 8% of national income in 2018. In line with DINA studies and with standard tax incidence analyses, we assume that the VAT is paid by consumers. However, we refine our VAT tax incidence model in two ways. First, we exclude 19 "basic food goods" , which are zero-rated and therefore not subject to VAT, as well as all other VAT-exempt goods and services (including housing rents, transport services, petrol products, educational expenditure, and financial services: see South African Reserve Bank, 2019). Household expenditure on each of these items has been recorded in all income surveys, so we can directly remove them from our consumption aggregate. Secondly, following Bachas, Gadenne, and Jensen (2020), we exclude goods and services bought on the informal market, approximated by the type of store in which purchases occur. These two steps significantly mitigate the regressive impact of VAT, although not sufficiently to make it progressive, given the particularly high gap between consumption and income at the bottom of the distribution and the small size of the informal sector in South Africa.

General Fuel Levy and Excise Duties. Other indirect taxes on domestic products include the general fuel levy (1.8% of NNI), other excise duties (1.1%), and other taxes on goods and services (0.3%). The general fuel levy is a tax on fuel consumption, so we distribute it proportionally to fuel and transport expenditure. Other excise duties correspond to taxes on tobacco and alcohol, paid at production, so we distribute them proportionally to spending on these two goods. Other taxes on goods and services include a number of other minor indirect taxes, which we distribute proportionally to overall household expenditure.

Taxes on International Trade. Import duties and other taxes on international trade together represent about 1.4% of national income. A simplified way to distribute these taxes would be to assume that they are borne by consumers as VAT. However, the nature of imported goods might differ significantly from that bought by a typical consumer, leading to biased estimates. To correct for heterogeneity in consumption of domestic vs. imported goods, we use input-output tables published by Statistics South Africa to derive an estimate of import density by COICOP category of household expenditure. We then distribute taxes on international trade proportionally to import-density-corrected consumption.

Local Taxes Local government revenue in South Africa consists mainly in property rates, service charges for the provision of electricity, water, and other services such as refuse removal, and transfers received from the central government. Since the latter are financed by central government revenue, we do not allocate them to individuals (doing so would lead to double

counting, as transfers to municipalities are indirectly financed by national taxes). Property rates, electricity charges, and water charges are directly reported by households in income surveys, so we allocate budget totals proportionally to these reported values. We distribute the remaining components of municipal operating revenue proportionally to the total municipal tax burden of each individual, so as to match total revenue reported in municipal budgets.

Other Tax and Non-Tax Revenue. To reach total consolidated government revenue, we distribute the remaining tax and non-tax revenue proportionally to pretax income (i.e., in a distributionally neutral way). These include all other taxes not previously mentioned (less than 0.1% of national income), payments to the Southern African Customs Union (-1.2%), non-tax revenue (0.8%), and revenue collected by provinces and other public entities (2.4%).

2.5. From Pretax National Income to Posttax National Income: Transfers

Having removed all taxes from pretax income, we now allocate all government expenditure—including both direct and in-kind transfers, as well as the government deficit—to individual incomes to reach posttax national income.

Direct Social Transfers. Social protection spending represents about 5% of the national income in South Africa, the majority of which consists in three social grants: the old age grant (1.8%), the child support grant (1.5%), and the disability grant (0.6%). The old age grant is a means-tested monthly benefit available to South Africans older than 60. The child support grant is granted to a child's primary caregiver whose income falls below a specific threshold. The disability grant is provided to workers suffering from a permanent disability. As in the case of pension and unemployment benefits, data on social grants is available in income surveys, but the number of self-reported recipients tends to be lower than in administrative data (although only slightly). For consistency, we attribute social grants to additional eligible beneficiaries using a linear probability model, and we impute the value of grants received based on statutory rules, each year since 1993 (see appendix A). This ensures that our microfile is fully consistent with both the number of grant beneficiaries and total government expenditure on grants.

Other In-Kind Transfers and Public Goods. We take the distribution of other government expenditure, including education, healthcare, transport infrastructure, police services, and other public goods from Gethin (2023). This related paper combines various surveys and historical budget data to identify beneficiaries of public services and the corresponding distribution of

public spending by function of government from 1993 to 2019.

Government Deficit. As in the case of the deficits of pension or unemployment systems, we assume that 50% of the general government deficit (6% of NNI in 2019) is borne by taxpayers proportionally to total taxes paid, and 50% proportionally to total transfers received.

2.6. Household Expenditure and Household Wealth

In addition to factor income, pretax income, and posttax income, we also distribute consumption and wealth concepts consistent with national accounts definitions.

Household Expenditure. Following our approach for income, we distribute household final consumption expenditure by proportionally rescaling subcomponents of consumption reported in income surveys to their corresponding totals recorded in the national accounts, for each of the 12 COICOP categories available in both micro and macro data. This allows us to document the joint dynamics of consumption and income at the individual level, as well as to derive estimates of net saving (net household disposable income minus HFCE) by income group that are consistent with macroeconomic figures.

Household Wealth. Finally, we combine survey data on income and wealth with households balance sheets statistics published by the South African Reserve Bank to add an estimate of household net worth and its composition to our microfile since 1993. We do so by applying a "mixed method" combining rescaling and income capitalization (following Saez and Zucman, 2016), whereby specific household wealth components from the balance sheets are distributed proportionally either to the corresponding income flows they generate, or to the market values of assets or liabilities reported by survey respondents. For more information on this methodology, we refer to our companion paper dedicated to the estimation of wealth inequality in South Africa (Chatterjee, Czajka, and Gethin, 2022).

3. The Distribution of Factor Income

In this section, we present results on the distribution of factor national income, that is, income arising from the use of production factors (capital and labor) before any form of government redistribution. This analysis serves as a basis for understanding the evolution and structure of income inequality in South Africa, which play a key role in determining the allocation of

taxes and transfers. Section 3.1 provides background information on macroeconomic growth in South Africa. Section 3.2 describes on the dynamics of factor income inequality. Section 3.3 decomposes the distribution of factor income into its labor and capital components.

3.1. National Income Growth in South Africa since 1993

Figure 1 plots the evolution and composition of real national income per capita in South Africa since 1993. Average national income was equal to $12,800 (80,000 Rand) at purchasing power parity in 2019, up by 37% from its 1993 level. Macroeconomic growth can be decomposed into three main phases: a phase of economic stagnation between 1993 and 2000, during which real national income remained relatively stable; a phase of fast growth between 2000 and 2011; and a phase of decline since 2012, characterized by a negative average annual growth rate.

Following the income approach to national accounting, the national income can be decomposed into its different income components. These components can be grouped into four main aggregates: compensation of employees (57% of NNI in 2019), mixed income and imputed rents (14%), household property income and corporate undistributed profits (17%), and government primary income (12%). Gross wages have followed a U-shaped curve over the period, dropping from about 60% of the national income to 50% in 2006, before bouncing back since then. The share of mixed income and imputed rents in national income has fluctuated with no clear trend. Conversely to wages, property income received by household and corporate undistributed profits have followed an inverted U-shaped curve, growing from 20% of NNI to about 25% from 1993 to the mid-2000s, before falling back to 17% in 2019.

3.2. The Distribution of Factor National Income

We now turn to documenting changes in the distribution of national income, before the operation of the pension, unemployment insurance, and tax-and-transfer systems. Table 3 reports data on the distribution of factor national income in 2019 across selected income groups, revealing extreme income disparities. About one third of total income accrued to the poorest 90% of the population in 2019, compared to two-thirds for the richest 10% and over 28% for the top 1% alone. The top 0.01% of the population (5,860 individuals) received about 2% of factor national income, almost as much as the poorest 50% as a whole (29 million individuals). The bottom 50% have an average income of $600 per year at purchasing power parity, which is 20 times lower than the national income per adult. Meanwhile, the top 10% received $80,000 (7 times the national average) and the top 0.1% almost 1 million PPP dollars (80 times the

national average).

In Figure 2a, we represent the evolution of income inequality in South Africa over time and compare it to that observed in other countries for which comparable distributional national accounts studies have been conducted. South Africa stands at the upper frontier of global income inequality today: the share of income accruing to the top 10% exceeded 65% in 2019, compared to 55-60% in Brazil and India, 40-45% in China and the United States, and below 35% in France. Furthermore, the top 10% share has increased significantly since 1993, moving up by almost ten percentage points between 1993 and the early 2000s, before stabilizing thereafter. The 2007-2008 crisis has been associated with a slight drop in top income inequality, as observed for instance in a number of European countries (see Blanchet, Chancel, and Gethin, 2022).

Figure 2b plots the cumulative income growth of the top 1%, the top 10%, the middle 40%, and the bottom 50%. A striking divergence in real factor incomes has taken place between the bottom and the top of the distribution since the end of apartheid. Between 1993 and 2019, the average national income grew by 37%, yet it rose by almost 50% for the top decile and by over 70% for the richest percentile. Meanwhile, the average factor income of the middle 40% grew by 20% and that of the bottom 50% almost stagnated. Coming back to the three phases of national income growth outlined above, we see that the stagnant decade of the 1990s was associated with dramatically different trajectories across income groups, as the boom of top incomes was almost perfectly compensated by income losses among the bottom 90%. Economic growth in the early 2000s benefited both the top and the bottom of the distribution, albeit significantly more the former than the latter. Finally, the drop in real incomes after 2011 was mostly driven by the top of the distribution, but this decline was insufficient to bring back inequality to its 1993 level.

3.3. Decomposing Factor Income Inequality: Labor versus Capital

To shed light on some of the factors behind the rise of income inequality, one can start by decomposing income into its labor and capital components. This decomposition also directly informs the tax incidence analysis conducted in section 4, given that the distribution of taxes is highly dependent on the distribution of the various income components on which taxes fall.

Figure 3a represents the evolution of the top 1% capital income, labor income, and total factor income shares since 1993. Three results stand out. First, in line with what we observe in the majority of countries with available data (e.g., Garbinti, Goupille-Lebret, and Piketty, 2018; Piketty, Saez, and Zucman, 2018), capital income inequality has remained substantially higher

than labor income inequality throughout the entire period. Second, the boom of top 1% incomes of the 1990s and 2000s was driven by both labor and capital income: the top 1% capital income share grew from 55% to 60-65% from 1993 to 2007 and the top 1% labor income share from 15% to 25%. Third, the stabilization of top incomes after 2007 masks a divergence between a continued increase in labor income concentration and a decline in top capital income inequality. This decline partly mirrors dynamics at the macro level, in particular the fall of household property income and the growing share of wages in the national income since the 2007-2008 crisis that we documented in section 3.1.

As shown in 3b, a direct consequence of these differential dynamics has been a significant increase in the labor share of income at the top. In 1993, investment income (interest, dividends, and rental income) and undistributed profits represented 60% of factor income of the top 1%, while labor income amounted to less than 30%. The share of wages in top 1% incomes has grown to nearly 50% in 2019, due in large part to the shrinking size of investment income since the early 2010s.

4. The Distribution of Taxes and Transfers

To what extent have taxes and transfers curbed the rise of inequality in South Africa? To answer this question, we now analyze the distribution of taxes and transfers and its impact on inequality and the real incomes of income groups throughout the distribution since 1993. Section 4.1 discusses the impact of the pension and unemployment system. Sections 4.2 and 4.3 respectively analyze the distributional incidences of taxes and transfers. Section 4.4 documents how the tax-and-transfer system as a whole has shaped the distribution of macroeconomic growth since the end of apartheid.

4.1. From Factor to Pretax Income

In most advanced economies, the pension and unemployment insurance systems redistribute a substantial share of the national income the elderly and the unemployed every year, leading to very large reductions in inequality when moving from factor income to pretax income (Blanchet, Chancel, and Gethin, 2022). This is not the case in South Africa, where the private pension system and unemployment insurance through the Unemployment Insurance Fund (UIF) only benefit to a small fraction of the population.

In 2019, about 20% of the population contributed a total of about 6% of the net national income to private pension and provident funds. Meanwhile, on the income side, about 6% of adults

received private pension income (about 3% of NNI). The size of the unemployment insurance system was even smaller: in 2019, about 25% of adults contributed a total of 0.5% of NNI to the fund, enabling some 2% of the population to benefit from unemployment benefits. This share stood in sharp contrast with the 29% unemployment rate, a gap that can be explained in large part by the relative stringent conditions required to benefit from unemployment insurance in South Africa (Bhorat, Goga, and Tseng, 2013).

Figure 4 represents the net transfers operated by the pension and UIF systems between income deciles, expressed as a share of NNI, in 2019. The private pension system appears to mostly redistribute small fractions of the national income from the top decile to the middle class. The top 1% are the main contributors to the system, losing 0.5% of NNI more in contributions than they receive in benefits, while the ninth decile (p80p90) receive a net transfer of about 0.2% of NNI. Redistribution operated through the UIF system is even smaller, with no group receiving more than 0.1% of NNI in unemployment benefits. Furthermore, while it is overall progressive, it is notably regressive at the top end of the distribution, with the top 1% contributing less than 0.02% of NNI in unemployment contributions. This can be explained both by the relatively lower share of labor income among top incomes and by the maximum cap set on UIF contributions (R178,464, or about $28,500 at PPP, in 2019), which effectively turn the contribution into a regressive tax at high wage levels.

In summary, moving from factor national income to pretax national income has almost no impact on inequality at all in South Africa (see also figure 10a below), given that the sums transferred are very small and mostly redistribute income from top to middle income groups.

4.2. The Distribution of Taxes

We now consider the distributional incidence of all taxes collected in South Africa throughout our period of interest. Figure 5 plots the level and composition of general government revenue, expressed as a share of national income, from 1993 to 2019. Total revenue has grown significantly in the past quarter of century, from 35% of national income in 1993 to 43% in 2019. This represents a 23% increase in the share of national income extracted from economic output every year by the general government. Of the three most important taxes in South Africa—the Personal Income Tax (PIT), the Corporate Income Tax (CIT), and the Value-Added Tax (VAT)—the CIT is the one whose revenue has grown most rapidly in relative terms, from 3.6% of NNI in 1993 to 5.8% in 2019, followed by VAT (6.3% to 7.8%) and finally by the PIT (9.7% to 11.6%). If one groups taxes in South Africa into three broad categories, direct taxes (including the PIT, the CIT, and other taxes on income and wealth), indirect taxes

(including VAT, other taxes on goods and services, and taxes on international trade), and other government revenue (including other taxes, non-tax revenue, and local government revenue), direct taxes appear to represent the largest and most rapidly growing component of government revenue. Direct taxes rose from 14% to 19% of NNI between 1993 and 2019, while indirect taxes expanded from 11% to 13% and other revenue from 10% to 12%.

How have these changes in the magnitude and structure of taxation affected the distribution of taxes paid by income group? Figures 6a and 6b provides a first answer to this question by decomposing total taxes paid by pretax national income group in 1993 and 2019. In 1993, the profile of taxation was relatively flat, except for the upper-middle of the income distribution, where effective taxation was slightly higher. Nearly all deciles transferred between 20% and 35% of their pretax incomes in taxes to the government. Bottom income groups paid almost all of their taxes in indirect and local taxes. Meanwhile, the personal income tax and the corporate income tax represented the bulk of the tax burden of the top decile. It is also interesting to note that the personal income tax was regressive at the very top, which is directly due to the fact that top income groups relied heavily on non-taxable capital incomes, in particular corporate undistributed profits held through stock ownership. The corporate income tax did not compensate sufficiently for this regressive aspect of the tax system, leading the top 0.1% to pay lower taxes than the rest of top 10% earners.

Moving to 2019, we see that the increase in taxation has been almost entirely concentrated at two parts of the distribution: the very bottom and the very top. At the top, taxation is no longer regressive, mostly due to the rise in the share of corporate income tax paid by the top 0.1% (from about 9% of its pretax income in 1993 to 19% in 2019). At the bottom, the share of income paid by low-income groups in indirect and local taxes has grown substantially, with the tax burden of the third decile more than doubling. This can be explained both by the increase in total revenue collected from indirect and local taxes and by the rising gap between income and consumption among the poor in the past decades, to which we come back below. Meanwhile, the effective tax rate faced by middle income groups has barely changed, with individuals located between the median and the 90th percentile still paying less than 35% of their pretax income in taxes.

Figures 7a and 7b provide another perspective on this transformation by representing the yearly evolution of total taxes paid by top 1% and bottom 50% pretax income earners since 1993. In 1993, the top 1% faced a slightly higher effective tax rate than the bottom 50%. By 2019, the tax burden of the top 1% had increased to 45%, while that of the bottom 50% had surged to 60% of their total pretax income. The increase in top income taxation has been driven by the corporate income tax (from 9% to 13% of pretax income), but also by the personal income

tax (from 9% to 16%). This latter evolution reflects both the fact that top taxable incomes have grown faster than the threshold required to enter top marginal income tax rates and the declining share of non-taxable capital income (dividends and undistributed profits) in top 1% pretax incomes. On the contrary, we see that the bottom 50% pay almost no personal income tax or corporate income tax at all, while local taxes, VAT, and excise duties have driven nearly all of the increase in their tax burden.

At this stage, let us discuss a bit further our results on the very high tax rates faced by bottom pretax income groups. It might look surprising and even unrealistic at first sight to observe such extremely high effective tax rates, given in particular that some of these rates are higher than the statutory rates of the taxes considered (for instance, the bottom 50% pay 20% of their pretax income in VAT while the statutory VAT rate is 15%). This is a mechanical result of our allocation strategy, which implies distributing indirect taxes proportionally to consumption (excluding exempted goods and the informal sector). Given that low-income groups have consumption levels that can greatly exceed their pretax incomes, the tax base on which these taxes are applied (consumption) may be substantially higher than the denominator considered for tax incidence analysis (pretax income). The presence of such a large discrepancy between the consumption and income distribution profiles, leading to extreme negative (respectively positive) savings at the bottom (respectively top) is not new (see Chancel et al., 2023; Czajka, 2017; Deaton, 1997), yet it is not fully understood.

If a large fraction of the poor are effectively consuming from their savings or from consumer debt, such tax rates may then not seem extraordinary. On the one hand, one cannot exclude that some measurement issues in household surveys (underreporting of income at the bottom of the distribution, overreporting of consumption at the bottom, or alternatively underreporting of consumption at the top) may lead to biased estimates of savings across income groups, implying an overestimation of the regressivity of indirect taxes. On the other hand, there is suggestive evidence of strongly negative and deteriorating savings rates among the poor in South Africa. According to national accounts published by the South Africa Reserve Bank, the ratio of households' saving to their disposable income has remained systematically negative since the mid-2000s, fluctuating between 0 and -2% after a sharp decline in the 1990s, so that households have, in aggregate, consumed more goods and services than their disposable income allows alone. In 2019, as much as 5.7% of the entire national income (or 8% of household disposable income) was absorbed in interest repayments by households on previously contracted loans (authors' computations using national accounts data). Chatterjee, Czajka, and Gethin (2022), combining microdata on income, assets, and debts with macrodata on households' balance sheets, estimate that the total net worth of the poorest 50% is negative, that is, the total

market value of the assets they own is lower than the debts they owe. This is consistent with data from the 2008 Living Conditions Survey, in which 72% of adults, and an overwhelming share of respondents at the bottom of the income distribution, declared having "no regular savings for emergencies."

4.3. The Distribution of Transfers

We now analyze how government expenditure has been distributed since 1993. We focus on the main stylized facts; an extended analysis of changes in the size and progressivity of government transfers, with a particular focus on in-kind transfers, can be found in Gethin (2023). As shown in Figure 8, the rise of public spending has mirrored that of revenue in the past decades: total consolidated government expenditure grew from 36% to 42% of NNI between 1993 and 2019. Even more so than in the case of taxes, this transformation has been accompanied by significant changes in the nature of government intervention. General public services and defense are the two only types of spending that have declined as a share of NNI, from 8.7% to 7.0% and from 2.6% to 1.2% respectively. Meanwhile, spending on social protection is the item that has grown the fastest, nearly doubling from 3.3% to 6.5%, followed by health, local government expenditure, public order and safety, and education.

Figure 9a plots the share of total transfers in grants, education, healthcare, and other public goods received by the top 10% and bottom 50% as a share of national income. Consistently with the fact that the South African government has invested a rising share of NNI in individualized transfers that primarily benefit the poor, the share of national income transferred to the bottom 50% has grown much faster than that received by the top 10%. The bottom 50% received almost 19% of national income in the form of cash and in-kind transfers in 2019, representing an increase of over 50% since 1993. Meanwhile, the share of national income redistributed to the top 10% has declined, from 14% of NNI in 1993 to 11% in 2019.

Figure 9b plots the cumulative growth rate of the bottom 50% before and after transfers. The rise of redistribution has generated substantial real income gains for low-income households. Bottom 50% average income growth is barely affected by the inclusion of the old age grant and the disability grant, mainly because these grants already existed in 1993 and have not increased significantly in real terms since then. In contrast, the introduction of the child support grant in 2002 and its progressive deployment over the course of the 2000s has strongly benefited the bottom 50%, whose total growth rate shifts from below 20% to over 50% when accounting for child support grants received. Finally, substantial increases in the size and progressivity of public services have further contributed to improvements in the living standards of low-income

households (see Gethin, 2023). Accounting for in-kind transfers and public goods—including in-kind social protection, education, healthcare, local government services, and other public services—bring bottom 50% real income growth to almost 100%.

4.4. The Overall Impact of the Tax-and-Transfer System

Our analysis of taxes and transfers has shown mixed results. On one hand, in-kind transfers have grown substantially since 1993, and this rise has primarily benefitted bottom income groups. On the other hand, the bottom 50% have faced increasing effective tax rates, driven by the rise of indirect and local taxes. Combining these two pictures, who has benefited most from the rise of South Africa's welfare state since the end of apartheid?

Figure 10a compares the top 1% and bottom 50% shares in terms of factor, pretax, posttax disposable, and posttax national income since 1993. South Africa's tax-and-transfer system is progressive overall and has become significantly more progressive over time. Between 1993 and 2019, the top 1% factor income share grew from 22% to 28%, while the top 1% posttax national income share first rose but then came back to its 1993 level, at about 18%. This result directly mirrors the rising tax burden of the top 1%, which has not come with greater transfers.

Turning to the bottom 50%, redistribution appears to have increasingly benefited this group, due in particular to the rising role of in-kind transfers and public goods. In 2019, moving from pretax to posttax disposable income (that is, removing all taxes but only adding back cash transfers) increases the bottom 50% share from about 3% to 5%, while moving from posttax disposable income to posttax national income (that is, adding in-kind transfers and all other government expenditure) raises it to 15%. In terms of pretax and posttax disposable income, the bottom 50% share first dropped from 1993 to the mid-2000s, before coming back to approximately the same level. In terms of posttax national income, in contrast, it declined from 11% in 1993 to 10% in 2005, but then rose steadily until reaching 15% in 2019. Rising redistribution in the form of education, healthcare, local government services, and other public goods has thus acted as a powerful equalizer since the end of apartheid, although inequality remains high even after accounting for taxes and transfers.

Figure 10b provides a more granular picture of redistribution in South Africa by representing the share of national income transferred by the tax-and-transfer system between income deciles in 1993 and 2019. Two results stand out. First, in 2019, all deciles within the bottom 80% were net beneficiaries, while the top 10% saw its pretax income reduced by a net total of 20% of national income. Redistribution in South Africa thus appears substantial, transferring about a fifth of the entire national income from the top decile to the rest of the population. Second,

redistribution operated by the tax-and-transfer system has intensified over time. At the top, the net transfer of the top 10% grew by over 50%. Meanwhile, all deciles within the bottom 80% received significantly higher net transfers in 2019 than in 1993. The net transfer received by the bottom 50% grew from 10% to 15% of national income.

Having considered the impact of taxes and transfers on overall inequality, let us focus more specifically on the evolution of real incomes. Figure 11 provides a granular picture of the distribution of growth throughout the South Africa population by representing the cumulative evolution of real income by percentile between 1993 and 2019. The dramatic rise of pretax income inequality, combined with low macroeconomic growth, have implied drastically different trajectories at the top and bottom of the distribution. The top 1% has grown at the fastest pace, experiencing an almost 80% increase in average pretax income, compared to about 20% for most percentiles at the middle of the income distribution and strongly negative growth rates within the bottom 25%. The rise of redistribution, however, has more than compensated increases in pretax inequality. Removing all taxes and adding all cash and in-kind transfers from individual incomes reduces top 1% real income growth to 40%, while it raises median growth to about 45% and growth for the poorest 25% to over 100%. The rise of the South African welfare state has thus turned the distribution of economic growth since the end of apartheid from very regressive to unambiguously progressive.

In summary, our analysis of inequality and growth has revealed a striking surge in both pretax income inequality and government redistribution in South Africa since the end of the apartheid regime. This "chase between inequality and redistribution" has to some extent been won by the latter, as substantial improvements in tax progressivity at the top of the distribution and rising cash and in-kind transfers have made the final distribution of growth strongly progressive. This positive assessment should not be exaggerated, however. Even after taxes and transfers, income inequality remains exceptionally high in comparative perspective, with the bottom 50% as a whole still receiving less income than the top 1% in 2019.

5. The Evolution of Racial and Spatial Inequality

Our new dataset does not only cover income, taxes and transfers, it also preserves all the richness of household surveys and thus allows us to decompose inequality and redistribution by a number of sociodemographic variables. In this section, we study the evolution of income concentration along two key dimensions of South African inequality: race and geography.

5.1. Racial Inequality

Race has always been at the heart of economic and political conflicts since the making of the South African state. Throughout the twentieth century, inequalities between racial groups stood at unparalleled levels. These inequalities were institutionalized through the political domination of the White minority, which culminated in the apartheid regime of strict racial segregation established in 1948. Between the early twentieth century and the late 1980s, the per capita income of African South Africans thus remained stable at a level reaching less than 10% of that of the White population (Leibbrandt et al., 2010). This represents some of the most extreme inequalities between racial or sociocultural groups observed in contemporary history. By comparison, the White-Black income gap has fluctuated between 50% and 60% in the United States between the 1950s and today (Piketty, 2019).

How have the end of apartheid and the transition to democracy in the mid-1990s, rising inequality, and enhanced redistribution reshaped South Africa's historical legacy of extreme racial disparities? To answer this question, we first provide a long-run view on racial inequality in figure 12a by representing the evolution of the share of White and Black South Africans in top income groups since 1955. The figure combines historical tabulated tax returns collected by Alvaredo and Atkinson (2022), census data (1970, 1980, 1990), and our distributional national accounts data after 1993. Under apartheid, Whites represented over 95% of top 1% earners and over 90% of the top 10%, while the share of Black South Africans in upper income groups was nearly zero. A remarkable transformation in the composition of top incomes has taken place since the early 1990s: the share of Africans in the top 10% jumped from 2% in 1980 to 15% in 1990-1994, and then increased monotonically until reaching about 45% in 2019. A similar evolution occurred within the top 1%, although racial inequalities continue to be higher in the top 1% than in the top 10%.

Figure 12b turns to the evolution of the overall White-to-Black income ratio, focusing on the role played by changes at the top of the distribution in the decline of racial inequality. As shown by the bottom line of the figure, White South Africans' average factor income was about 14 times higher than Black South Africans' in the early 1990s. This ratio remained stable until the 2010s, before declining to 8 in 2015-2019. However, the picture looks very different if one excludes top Black earners from the analysis: excluding Black earners belonging to the top 1% leads to a decline in the gap from 14 to 11, while removing all those in the top 5% of the factor income distribution leads to an even smaller change, from 15 to 13. If one excludes completely all Black South Africans belonging to the top 10% from the analysis, then the White-Black income ratio appears to have remained constant, at about 17. In other words, racial inequalities have decreased in South Africa, but this decrease is mostly attributable to the emergence of a

new Black elite, who has occupied a growing share of the top 10% of the income distribution.

Relatedly, figure 12c shows how factor income growth has been distributed within each population group from 1993 to 2019. Two results stand out. First, inequality has risen dramatically within each group. The top 10% of Asian, Black, Coloured, and White earners saw their average factor income grow by 70 to 220%, compared to growth rates of approximately 0 to 40% for the bottom 50%. Second, the average factor income of Black South Africans grew substantially faster than that of other groups: it rose by 150% over the period considered, compared to 50-80% for Asians, Coloureds, and Whites. However, much of this dynamic was driven by differential trajectories at the top of the distribution: the average factor income of top 10% Black earners increased much faster than that of the top 10% of other groups, while growth rates of the middle 40% and bottom 50% of each group are of the same order of magnitude.

Figure 13a provides more detail on the contemporary structure of racial inequality in South Africa by decomposing the White-Black gap by economic concept. Two results stand out. First, racial inequality remains substantially larger in terms of wealth than in terms of income or consumption: the White-Black income ratio reaches almost 14 in terms of personal net wealth versus 7-9 in terms of consumption, factor income, and pretax income. Second, the tax-and-transfer system strongly reduces racial inequalities, in particular in-kind transfers, yet posttax income gaps remain high. The ratio decreases from 9 to 8 when moving from pretax to posttax disposable income, and drops to 5 in terms of posttax national income. Taxes and transfers thus significantly reduce racial inequalities, but they do little to change the overall relationship between race and economic status. As shown in figure 13b, which represents the racial composition of posttax national income groups in 2019, White earners continue to be massively overrepresented at the top end of the distribution even after accounting for taxes and transfers. In 2019, they represented over 70% of the top 1% compared to less than 5% of all posttax income percentiles within the poorest half of the population. Put differently, taxes and transfers do not significantly alter the racial dimension of economic inequalities in South Africa. They primarily reduce inequality between population groups by reducing inequality between income groups, without substantially affecting their racial composition.

5.2. Spatial Inequality

To conclude this paper, we consider another dimension of inequality: geography. How large are spatial inequalities in South Africa and how are they affected by the tax-and-transfer system?

Figure 14a compares the relative average incomes of South Africa's provinces before and after accounting for government taxes and transfers. Regional inequalities are significant in South

Africa, and clearly separate the country into two groups: that of the richer provinces of Western Cape and Gauteng, whose average factor incomes exceed the average national income by 60-80%, and the rest of the country, with incomes falling between 40% and 60% of the national average. These regional disparities are larger, for instance, than inequalities between European countries, and substantially wider than differences in average incomes across US States (see Blanchet, Chancel, and Gethin (2022)). In line with our finding on the overall progressivity of the tax-and-transfer system, we find that the government also operates redistribution between provinces, although only to a moderate extent. Western Cape and Gauteng are net contributors, while all other provinces are net beneficiaries. The provinces that benefit most from the tax-and-transfer system are Limpopo, KwaZulu-Natal, and Eastern Cape, whose relative income increases by 30-50% after accounting for taxes and transfers. Meanwhile, Gauteng sees its relative average income decrease by over 15% between factor and posttax income.

In addition to regional inequality, the rural-urban income gap has been found to be significant in many countries throughout the world, often determining a substantial share of overall income inequality, migration patterns, and human capital accumulation (Young, 2013). South Africa is no exception to this general pattern, yet we find that rural-urban disparities have risen significantly since 1993. The average factor income of urban earners was almost 6 times higher than that of rural areas in 2015-2019, compared to about 4 in 1993-1994 (see figure 14b). However, the rise of government redistribution has prevented posttax inequality from increasing: the rural-urban gap grew from 3.6 to 4.8 in terms of posttax disposable income, while it stagnated at about 2.8 in terms of posttax national income. Growing spending on in-kind transfers and public services has thus disproportionately benefited rural areas since the end of apartheid, fully compensating the rise of rural-urban pretax income inequality.

6. Conclusion

By most contemporary measures, South Africa continues to stand out as the most unequal country in the world, yet this paper has documented dramatic changes in the structure of these inequalities since the end of the apartheid regime in the 1990s. The surge of pretax income inequality has implied radically different growth trajectories across income groups. The top 1% experienced an 80% increase in their average pretax income, while that of the bottom 20% declined. However, increasing government redistribution in the form of progressive taxation, cash grants, and public services has overcompensated the rise of pretax inequality, generating large real income gains for low-income households mostly at the expense of the richest decile. That being said, the expansion of South Africa's welfare state has been largely insufficient to

significantly alter the extreme disparities inherited from a century of racial discrimination and oppression. The share of posttax income accruing to the richest 1% was about the same in 2019 as in 1993, while the bottom 50% only received 15% of national income, even after accounting for all cash transfers, in-kind transfers, and public goods received. While racial inequalities have declined, this decrease has been entirely driven by the income gains of a few Black earners at the top end of the distribution, thereby excluding the majority of the poor. These inequalities continue to be much larger in terms of wealth than in terms of income and have not been substantially affected by the growing progressivity of the tax-and-transfer system.

We see at least two avenues for future research. First, this paper has demonstrated the crucial importance of allocating indirect taxes and in-kind transfers when estimating the impact of taxes and transfers on poverty, inequality, and the distribution of economic growth. Yet, while we believe we have made significant advances in facing this challenge, the data sources at our disposal to properly understand who pays government taxes, and who gains from spending in health, education, and other collective expenditure remain largely unsatisfactory. Who benefits from investments in infrastructure development, industrial policy, or housing programs at the macro level, and how has this changed over time? What kinds of government spending most effectively accrue to low-income groups and how? These are important questions on which our knowledge remains all too limited.

Second, while our results have shed new light on the interactions between taxes, transfers, and the distribution of growth, much remains to be understood when it comes to the behavioral and general equilibrium mechanisms underlying the persistence of extreme economic inequalities and the ability of government redistribution to reduce these inequalities in the long run. To what extent can progressive taxation contribute to limiting income and wealth concentration beyond their immediate impact on top pretax incomes? Can cash and in-kind transfers truly reduce poverty and inequality beyond the short-term relief they provide, especially in countries where the poor are highly leveraged and vulnerable to transitory income shocks as in South Africa? To what extent taxes and transfers shape future pretax incomes? Answering these questions requires going beyond the descriptive analysis conducted in this paper and modelling the joint relationships between income, wealth, savings, and household debt (for recent fruitful attempts, see for instance Blanchet, 2023; Mian, Straub, and Sufi, 2021). We hope that our new database and the stylized facts presented in this paper will contribute to research in these multiple directions.

References

Alvaredo, A., L. Chancel, T. Piketty, E. Saez, and G. Zucman (2018). *World Inequality Report 2018*. Harvard University Press.

Alvaredo, F., A. B. Atkinson, T. Blanchet, L. Chancel, L. Bauluz, M. Fisher-Post, I. Flores, B. Garbinti, J. Goupille-Lebret, C. Martínez-Toledano, M. Morgan, T. Neef, T. Piketty, A.-S. Robillard, E. Saez, L. Yang, and G. Zucman (2020). "Distributional National Accounts Guidelines: Methods and Concepts Used in the World Inequality Database". WID.world.

Alvaredo, F. and Anthony B. Atkinson (2022). "Top Incomes in South Africa in the Twentieth Century". In: *Cliometrica* 16.1, pp. 477–546.

Bachas, P., L. Gadenne, and A. Jensen (2020). "Informality, Consumption Taxes and Redistribution". NBER Working Paper No. 27429.

Bassier, I., J. Budlender, R. Zizzamia, M. Leibbrandt, and V. Ranchhod (2020). "Locked Down and Locked Out: Repurposing Social Assistance as Emergency Relief to Informal Workers". SALDRU Working Paper 261.

Bassier, I. and I. Woolard (2018). "Exclusive Growth: Rapidly Increasing Top Incomes Amidst Low National Growth in South Africa". REDI3x3 Working Paper 47.

Beer, B. de and M. Kock (2017). "The further development of sectoral financial balance sheets for South Africa's integrated economic accounts". In: *South African Reserve Bank Quarterly Bulletin*.

Bhorat, H., S. Goga, and D. Tseng (2013). "Unemployment Insurance in South Africa: A Descriptive Overview of Claimants and Claims". University of Cape Town Working Paper.

Blanchet, T. (2023). "Uncovering the Dynamics of the Wealth Distribution". Working Paper.

Blanchet, T., I. Flores, and M. Morgan (2018). "The Weight of the Rich: Improving Surveys Using Tax Data". WID.world Working Paper.

Blanchet, T., J. Fournier, and T. Piketty (2017). "Generalized Pareto Curves: Theory and Applications". WID.world Working Paper.

Blanchet, Thomas, Lucas Chancel, and Amory Gethin (2022). "Why Is Europe More Equal Than the United States?" In: *American Economic Journal: Applied Economics* 14.4, pp. 1–40.

Bozio, A., J. Goupille-Lebret, G. Malka, and T. Piketty (2020). "Predistribution vs. Redistribution: Evidence from France and the U.S." CEPR Working Paper.

Chancel, Lucas, Denis Cogneau, Amory Gethin, Alix Myczkowski, and Anne-Sophie Robilliard (2023). "Income Inequality in Africa, 1990-2019: Measurement, Patterns, Determinants". In: *World Development* 163.1, pp. 1061–1084.

Chatterjee, Aroop, Léo Czajka, and Amory Gethin (2022). "Wealth Inequality in South Africa, 1993-2017". In: *World Bank Economic Review* 36.1, pp. 19–36.

Czajka, Léo (2017). “Income Inequality in Côte d’Ivoire: 1985-2014”. WID.world Working Papers n°2017/8.

Deaton, A. (1997). *The Analysis of Household Surveys: A Microeconometric Approach to Development Policy*. World Bank Publications.

Duflo, E. (2000). “Child Health and Household Resources in South Africa: Evidence from the Old Age Pension Program”. In: *American Economic Review* 90.2, pp. 393–398.

Ebrahim, Amina and Chris Axelson (2019). “The creation of an individual level panel using administrative tax microdata in South Africa”. UNU-WIDER Working Paper 2019/27.

Garbinti, B., J. Goupille-Lebret, and T. Piketty (2018). “Income Inequality in France, 1900-2014: Evidence from Distributional National Accounts (DINA)”. In: *Journal of Public Economics* 162, pp. 63–77.

Gethin, Amory (2023). “Who Benefits from Public Goods? Evidence from South Africa”. Working Paper.

Inchauste, G., N. Lustig, M. Maboshe, C. Purfield, and I. Woolard (2015). “The Distributional Impact of Fiscal Policy in South Africa”. World Bank Policy Research Working Paper.

Leibbrandt, M., I. Woolard, A. Finn, and J. Argent (2010). *Trends in South African Income Distribution and Poverty since the Fall of Apartheid*. OECD Social, Employment and Migration Working Papers 101.

Maboshe, M. and I. Woolard (2018). “Revisiting the Impact of Direct Taxes and Transfers on Poverty and Inequality in South Africa”. WIDER Working Paper 2018/79.

Mian, A., L. Straub, and A. Sufi (2021). “Indebted Demand”. In: *The Quarterly Journal of Economics*.

Piketty, T. (2019). *Capital and Ideology*. Harvard University Press.

Piketty, T., E. Saez, and G. Zucman (2018). “Distributional National Accounts: Methods and Estimates for the United States”. In: *The Quarterly Journal of Economics* 133.2, pp. 553–609.

Piketty, T., L. Yang, and G. Zucman (2019). “Capital Accumulation, Private Property, and Rising Inequality in China, 1978–2015”. In: *American Economic Review* 109.7, pp. 2469–2496.

Saez, E. and G. Zucman (2016). “Wealth Inequality in the United States since 1913: Evidence from Capitalized Income Tax Data”. In: *The Quarterly Journal of Economics* 131.2, pp. 519–578.

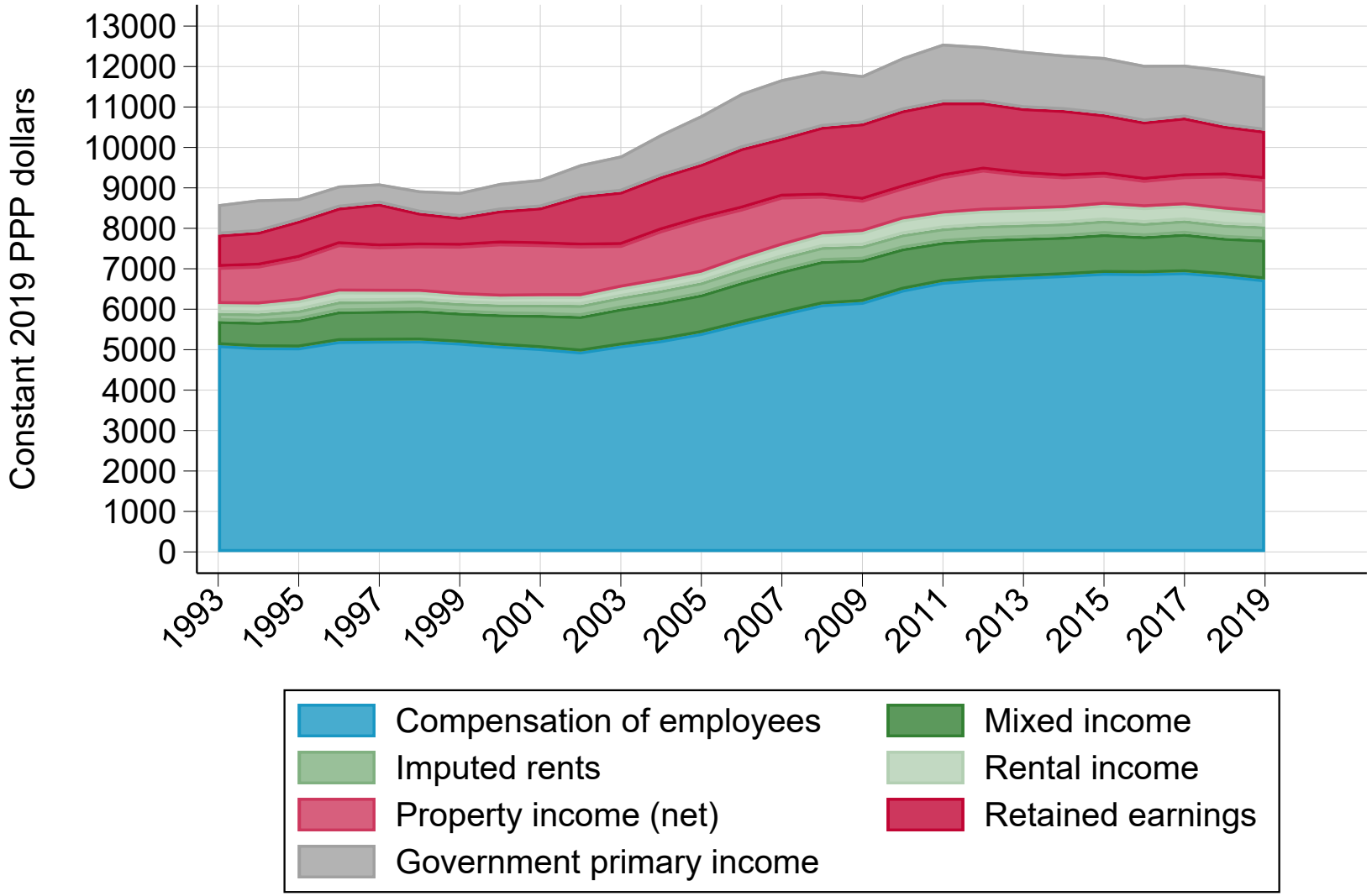
South African Reserve Bank (2019). *Tax Chronology of South Africa: 1979–2019*. Technical Report.

Tondini, A. (2021). “The Lasting Labor Market Effects of Cash Transfers: Evidence from South Africa’s Child Support Grant”. Working Paper.

World Bank (2020). *South Africa*. Poverty and Equity Brief.

Young, A. (2013). “Inequality, the Urban-Rural Gap, and Migration”. In: *The Quarterly Journal of Economics* 128.4, pp. 1727–1785.

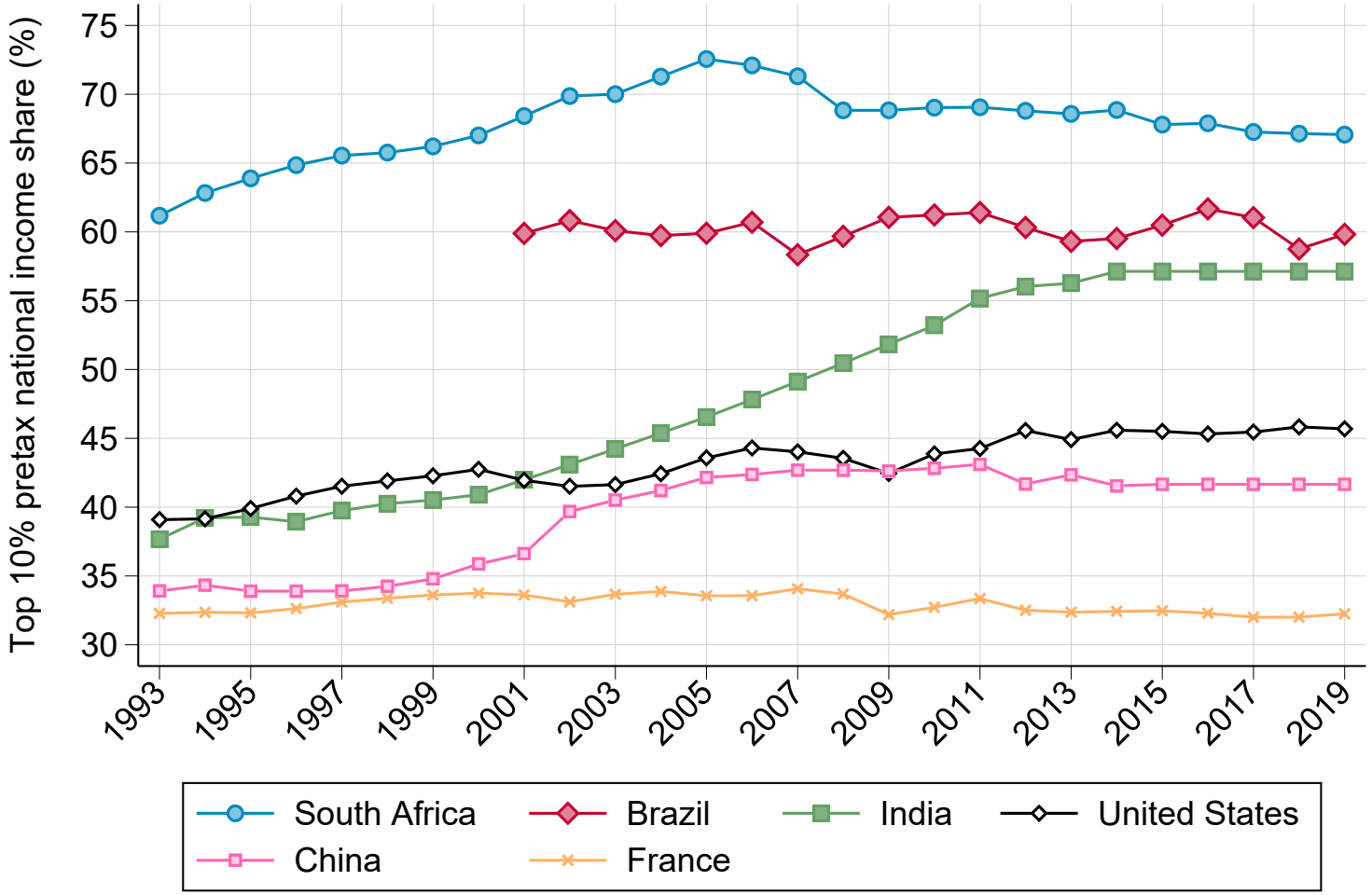
Figure 1 – Average national income per capita, 1993-2019



Notes. Authors' computations using national accounts series from the South African Reserve Bank Quarterly Bulletin.

Figure 2 – The distribution of factor national income, 1993-2019

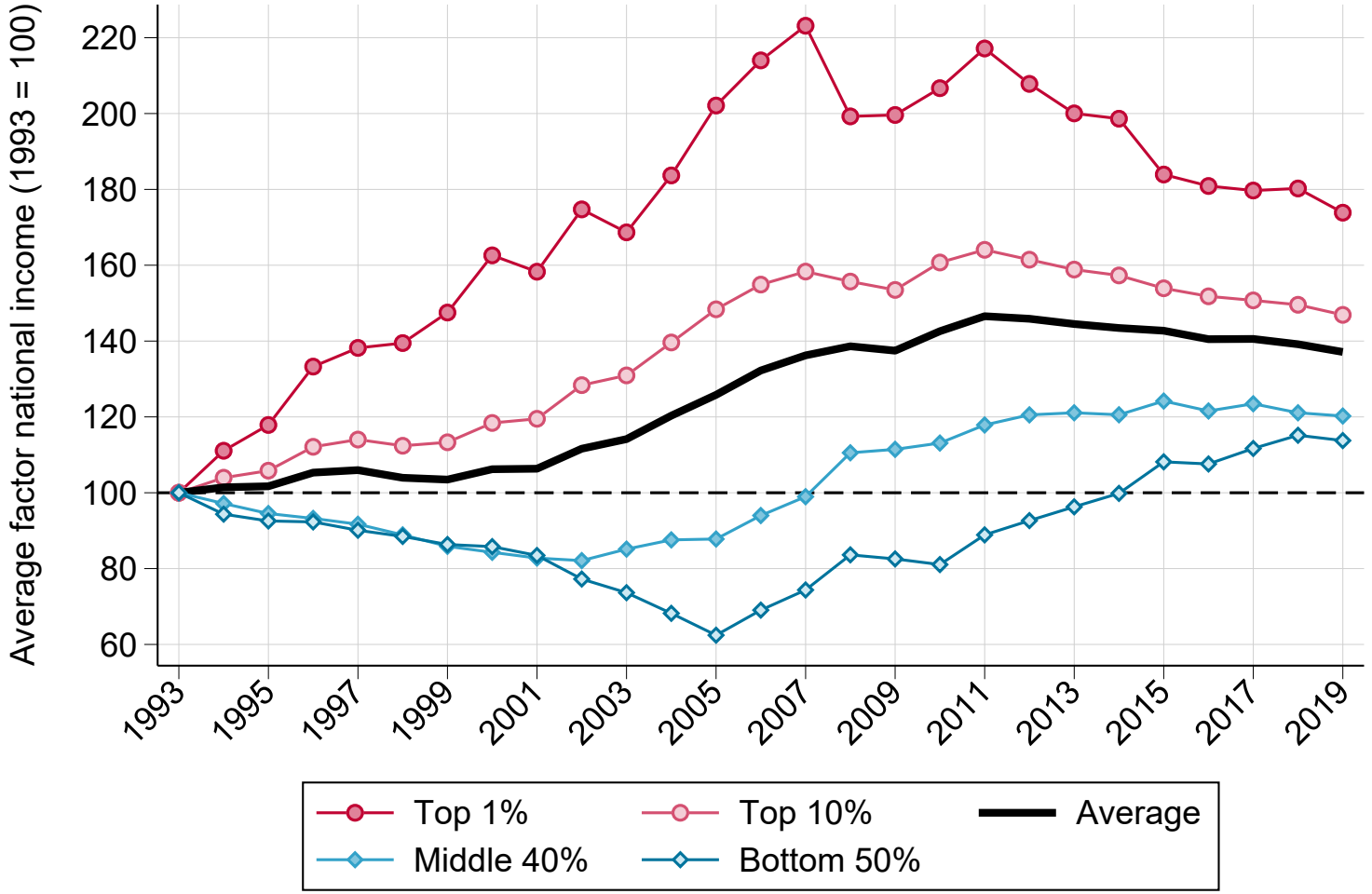
(a) South Africa in comparative perspective: top 10% pretax income share



Notes. Authors' computations combining survey, tax, and national accounts data (South Africa); World Inequality Database (other countries).

Figure 2 – The distribution of factor national income, 1993-2019

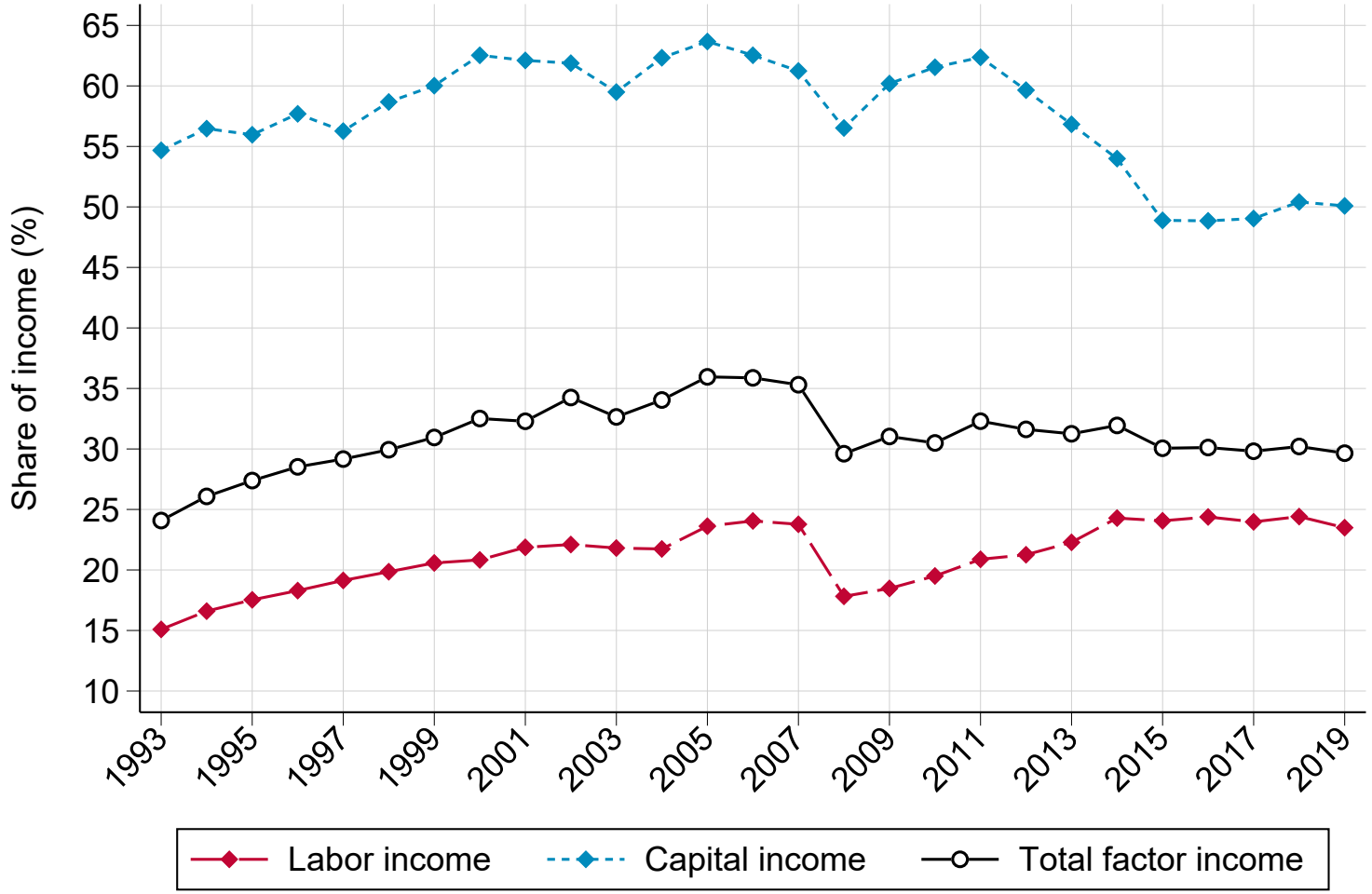
(b) Cumulated income growth by factor income group



Notes. Authors' computations combining survey, tax, and national accounts data.

Figure 3 – Decomposing top factor income inequality

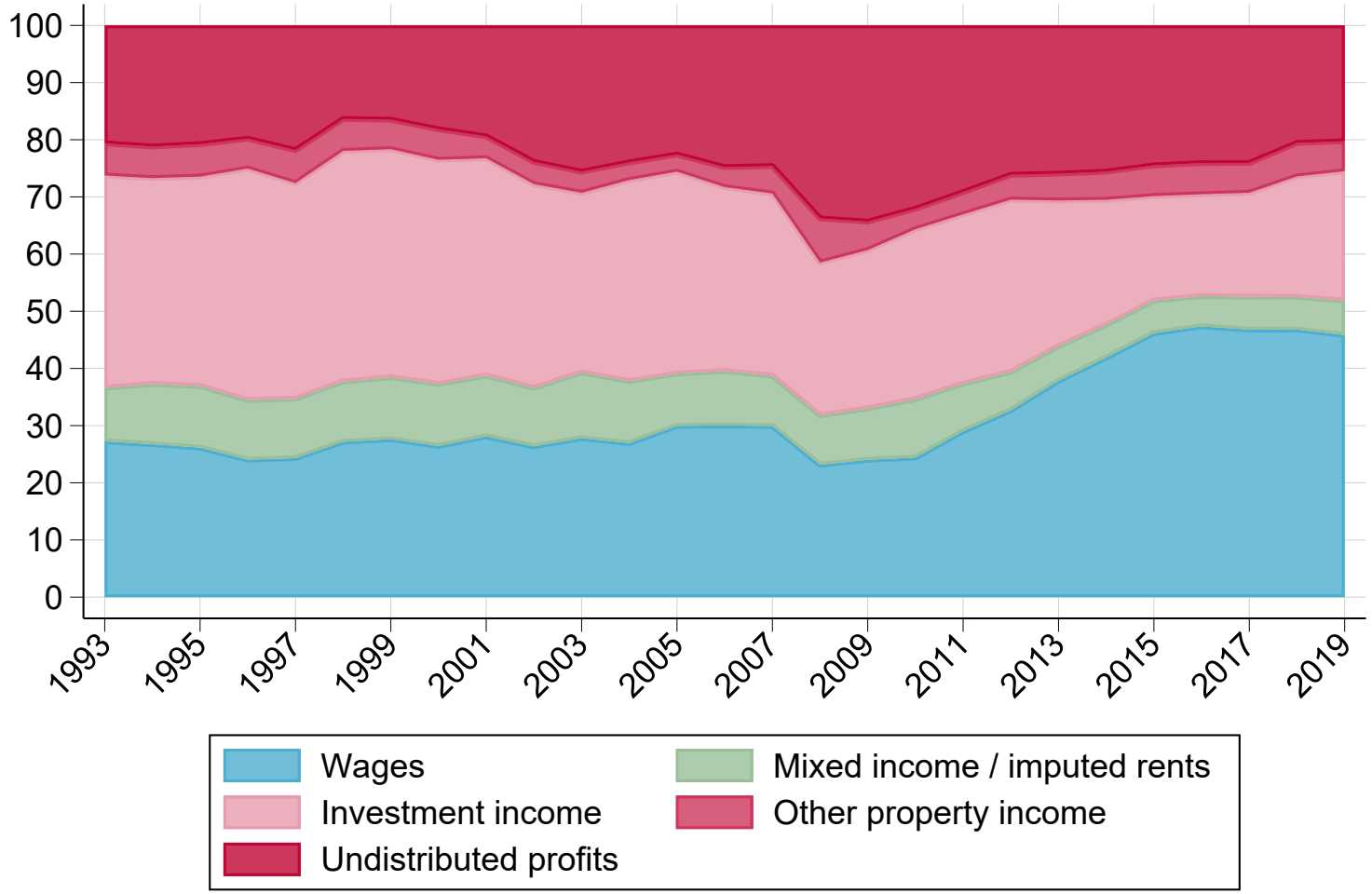
(a) Top 1% income share: labor versus capital



Notes. Authors' computations combining survey, tax, and national accounts data. Labor income is defined as the sum of compensation of employees and 70% of mixed income. Capital income is defined as the sum of 30% of mixed income, property income (rental income, interest, dividends, and other property income), and the private share of corporate undistributed profits.

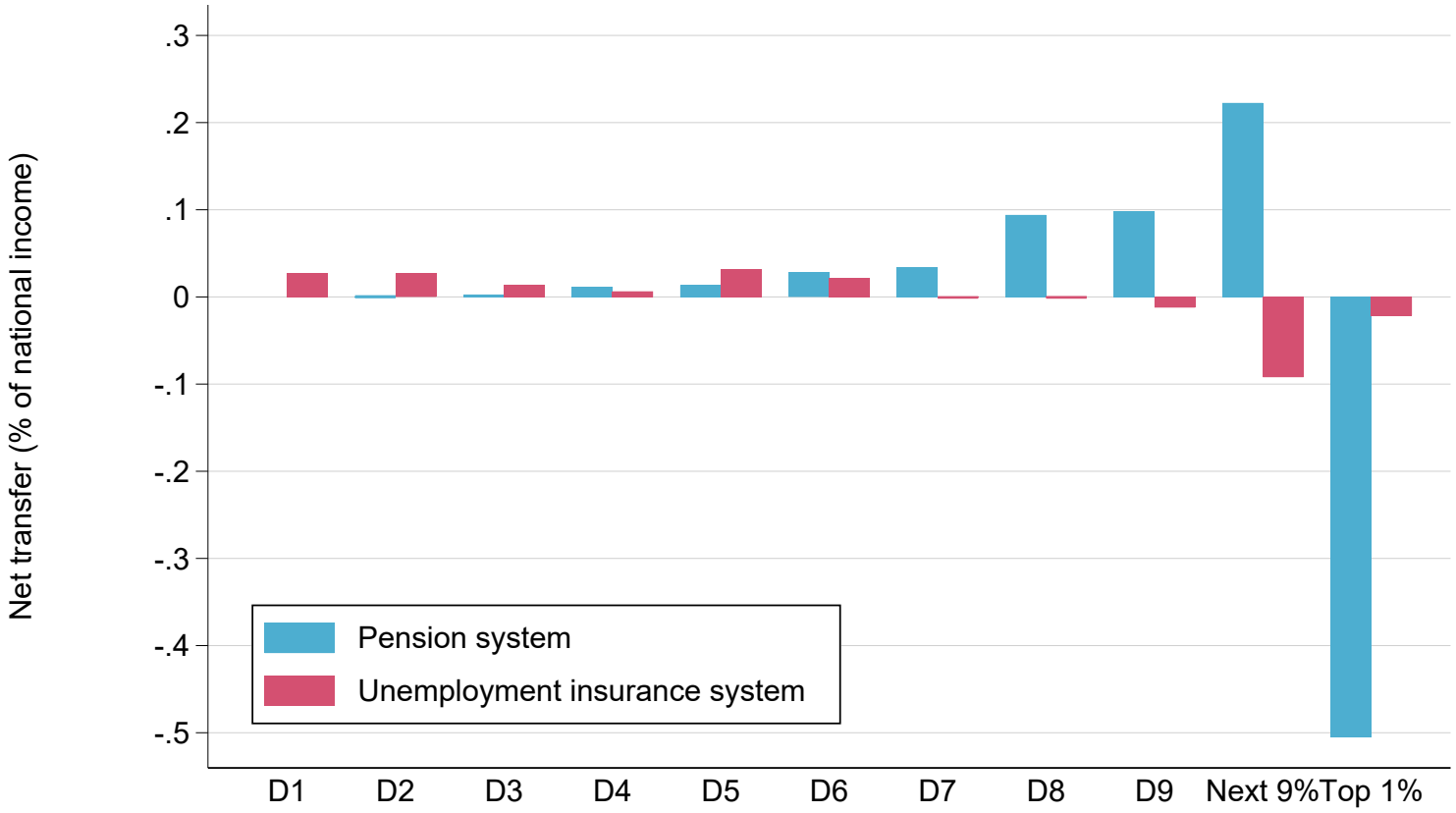
Figure 3 – Decomposing top factor income inequality

(b) Composition of top 1% factor income



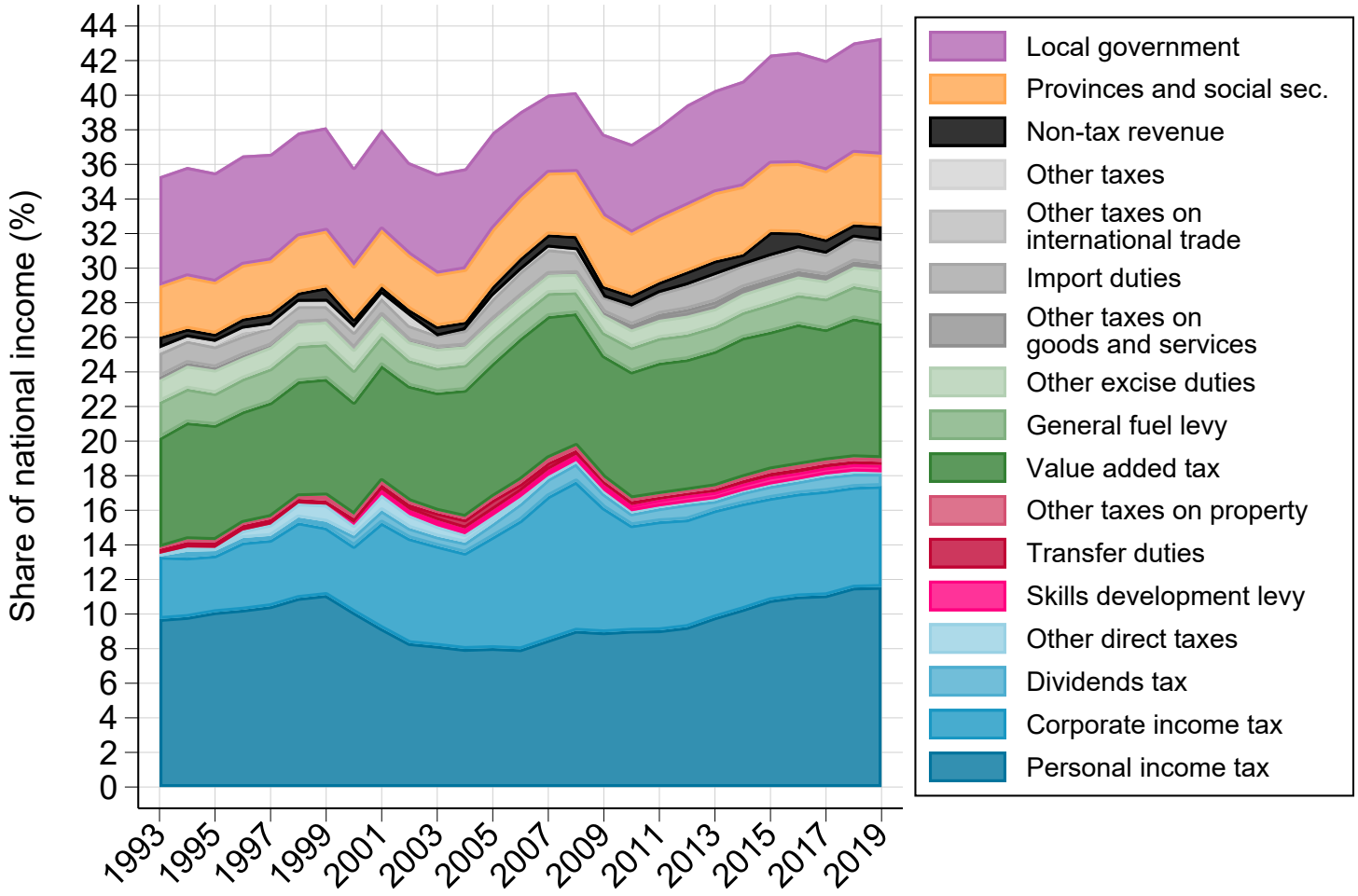
Notes. Authors' computations combining survey, tax, and national accounts data. The figure represents the composition of the factor income of top 1% earners.

Figure 4 – From factor to pretax income: net transfers operated between factor income groups by the pension and unemployment insurance systems



Notes. Authors' computations combining survey, tax, and national accounts data. The figure represents the net transfers received or paid by factor income group through the pension and unemployment insurance systems (that is, the difference between total benefits received and total contributions paid), expressed as a share of national income.

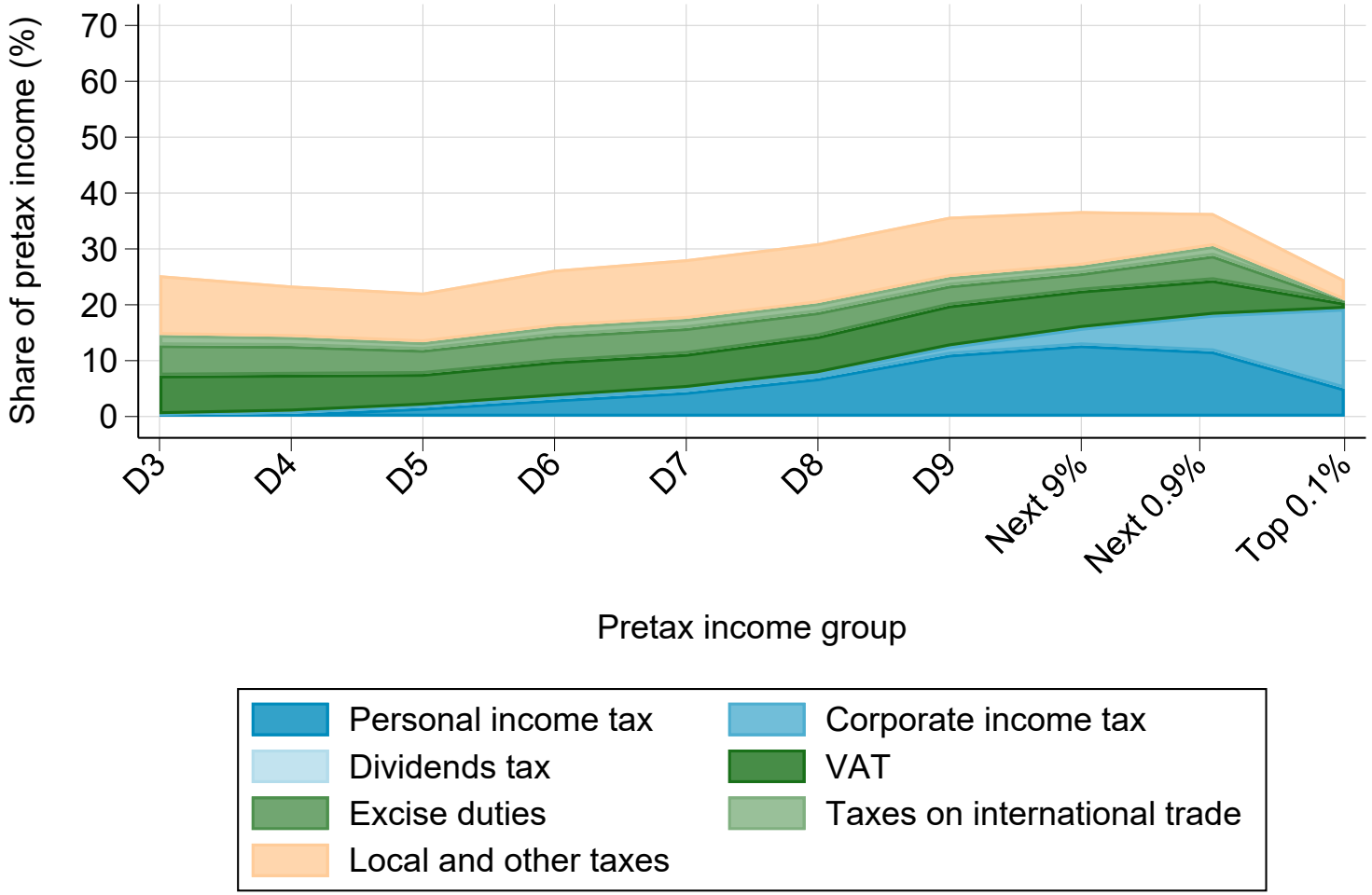
Figure 5 – Government revenue in South Africa



Notes. Authors' computations combining national accounts series from the South African Reserve Bank Quarterly Bulletin with government budget data collected from Treasury National Budget Reports.

Figure 6 – Taxes paid by pretax national income group: 1993 versus 2019

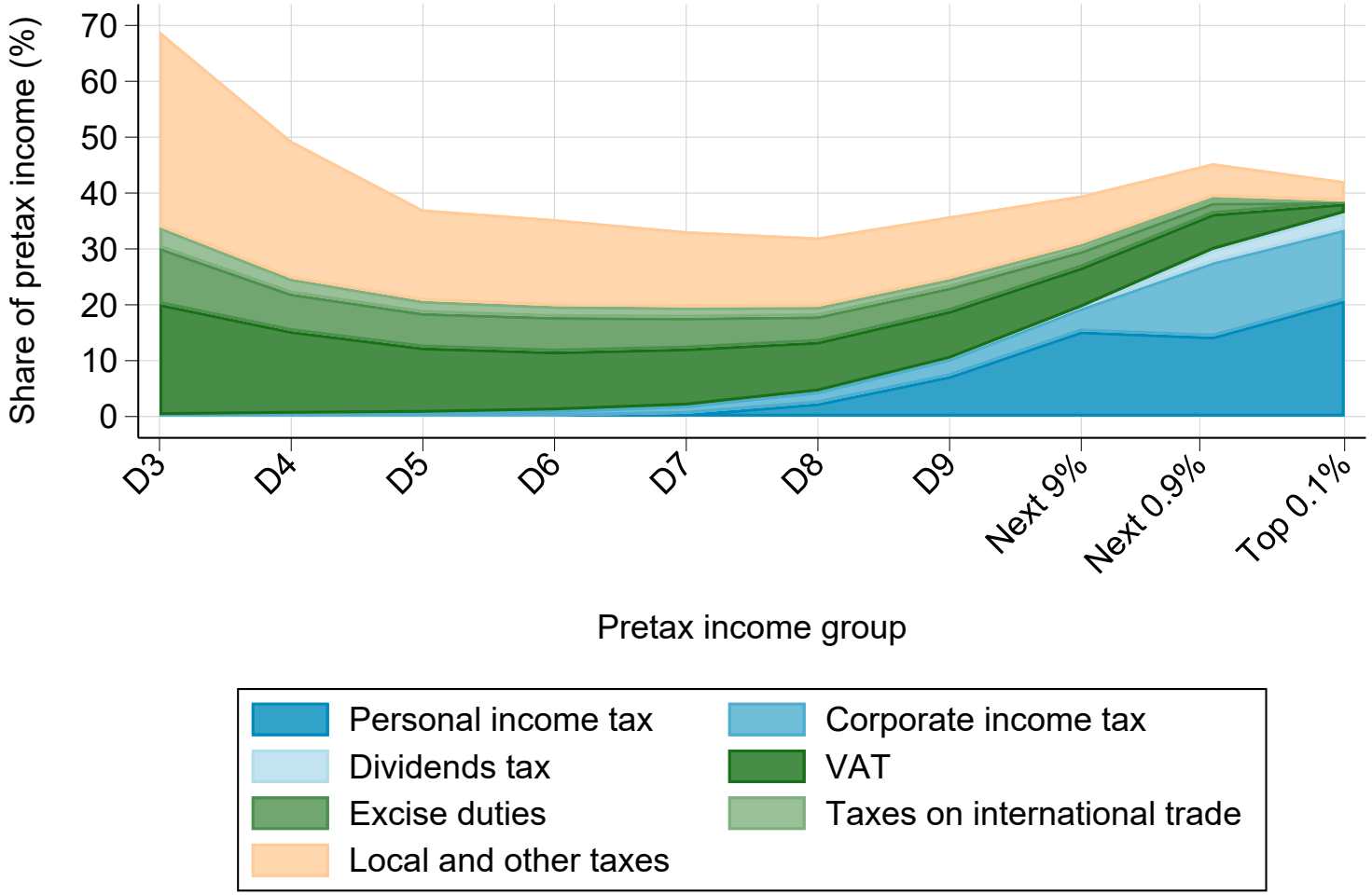
(a) 1993



Notes. Authors' computations combining survey, tax, and national accounts data. The figure represents the effective tax rate faced by pretax income group in South Africa in 1993, expressed as a share of pretax income.

Figure 6 – Taxes paid by pretax national income group: 1993 versus 2019

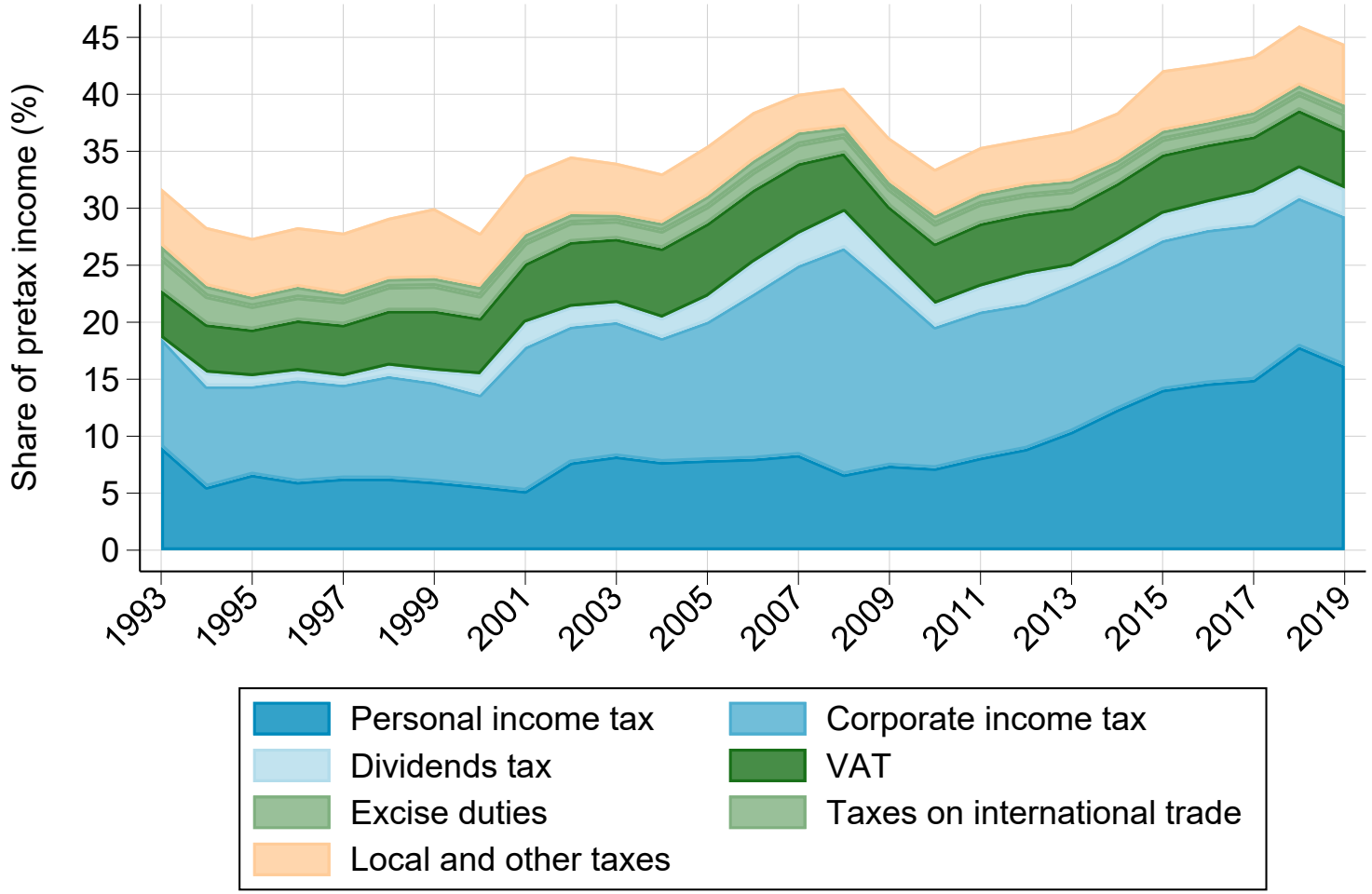
(b) 2019



Notes. Authors' computations combining survey, tax, and national accounts data. The figure represents the effective tax rate faced by pretax income group in South Africa in 2019, expressed as a share of pretax income.

Figure 7 – Taxes paid by the top 1% and the bottom 50%

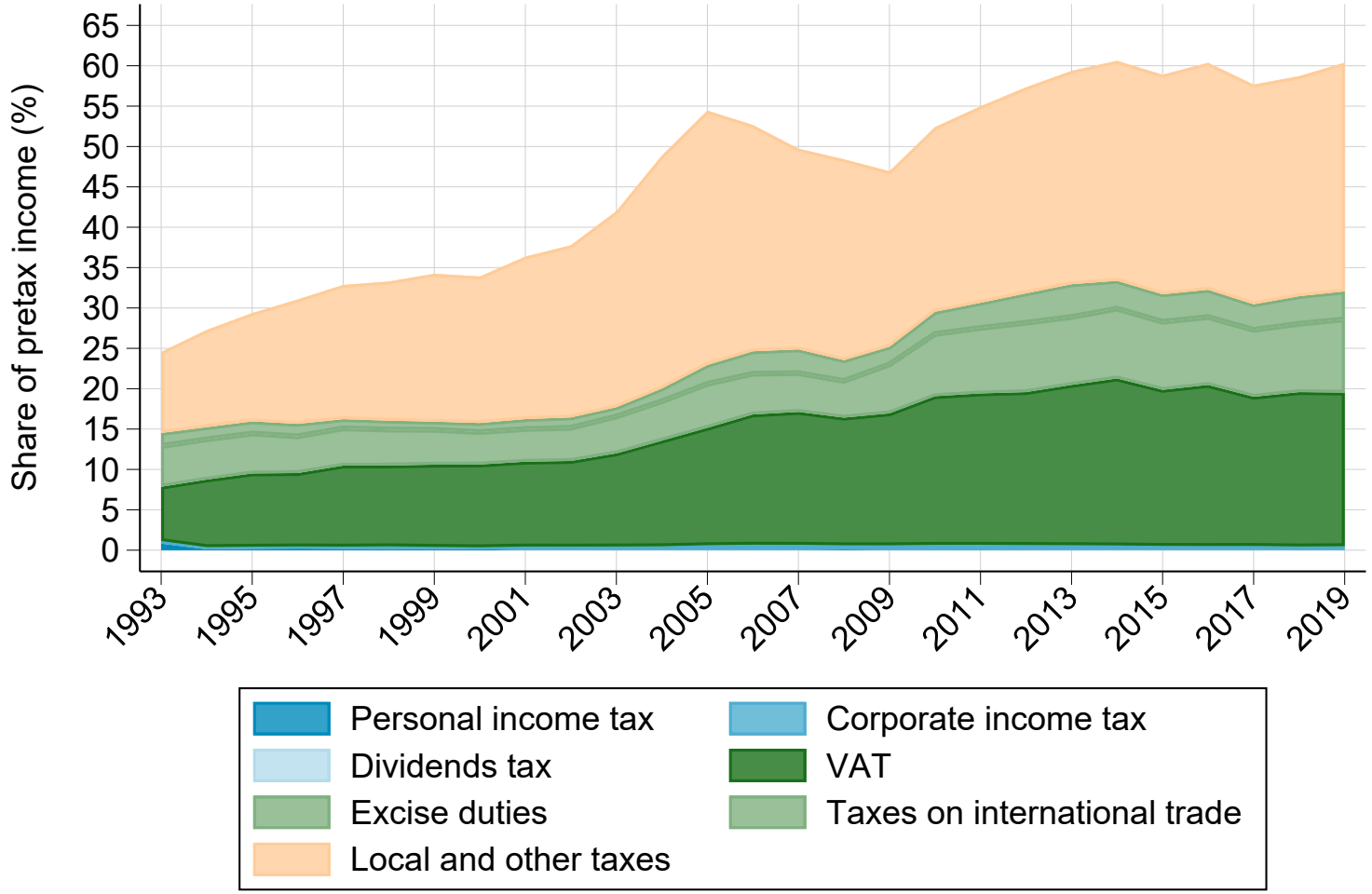
(a) Top 1%



Notes. Authors' computations combining survey, tax, and national accounts data. The figure represents the effective tax rates faced by top 1% pretax income earners (panel A) and bottom 50% pretax income earners (panel B), expressed as a share of pretax income.

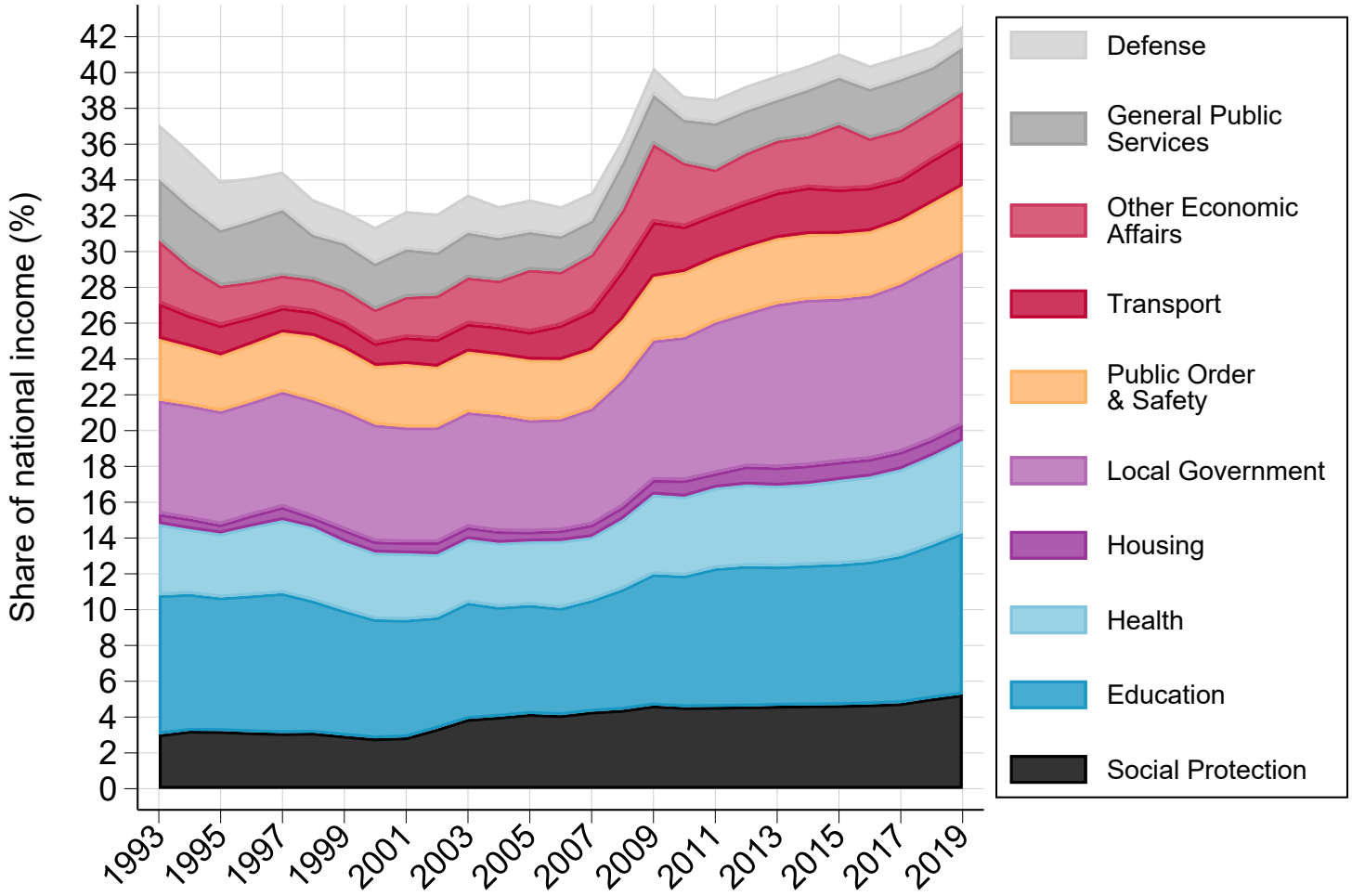
Figure 7 – Taxes paid by the top 1% and the bottom 50%

(b) Bottom 50%



Notes. Authors' computations combining survey, tax, and national accounts data. The figure represents the effective tax rates faced by top 1% pretax income earners (panel A) and bottom 50% pretax income earners (panel B), expressed as a share of pretax income.

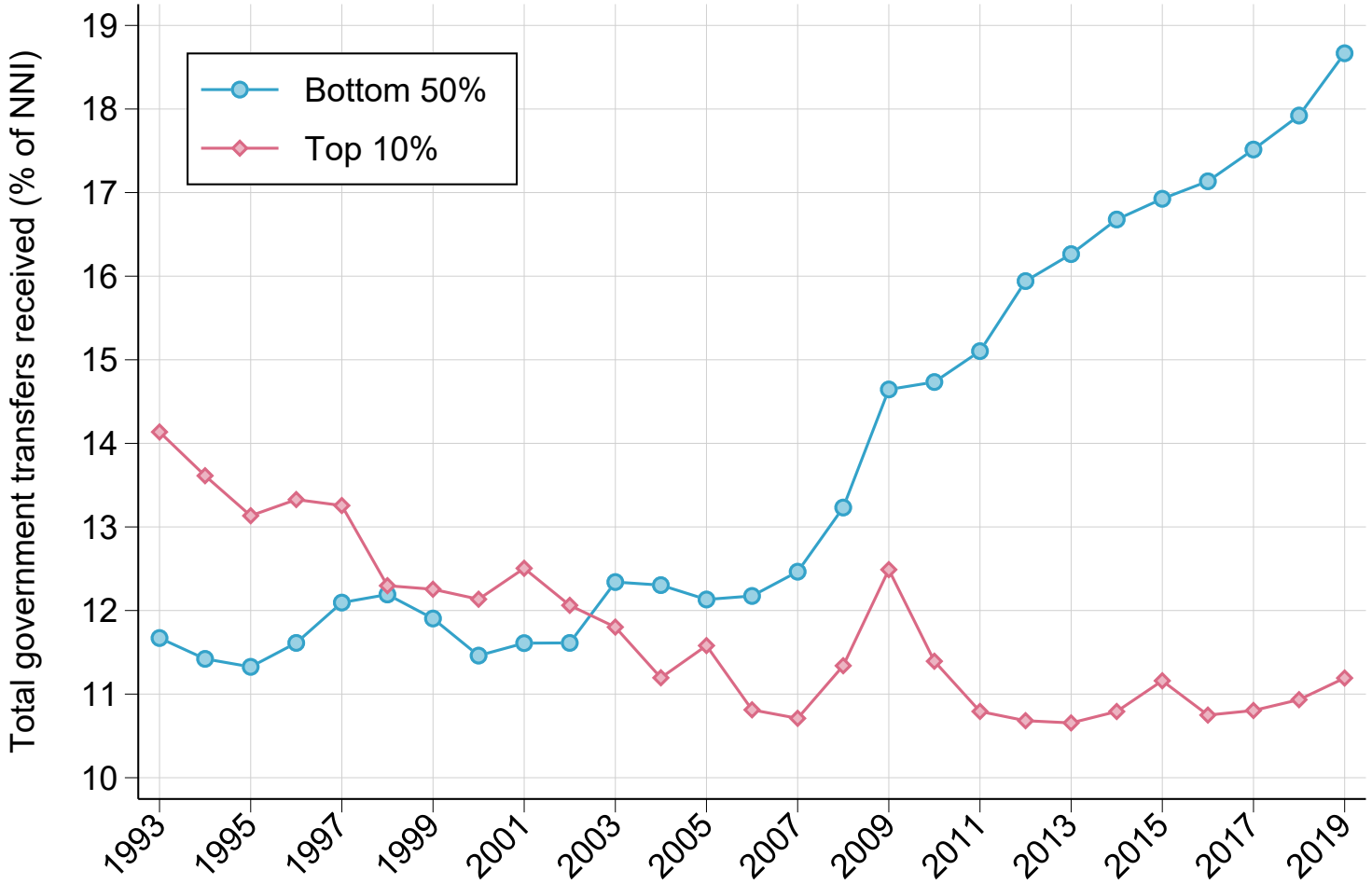
Figure 8 – Government expenditure in South Africa



Notes. Authors' computations combining national accounts series from the South African Reserve Bank Quarterly Bulletin with government budget data collected from Treasury National Budget Reports.

Figure 9 – The rise of social transfers

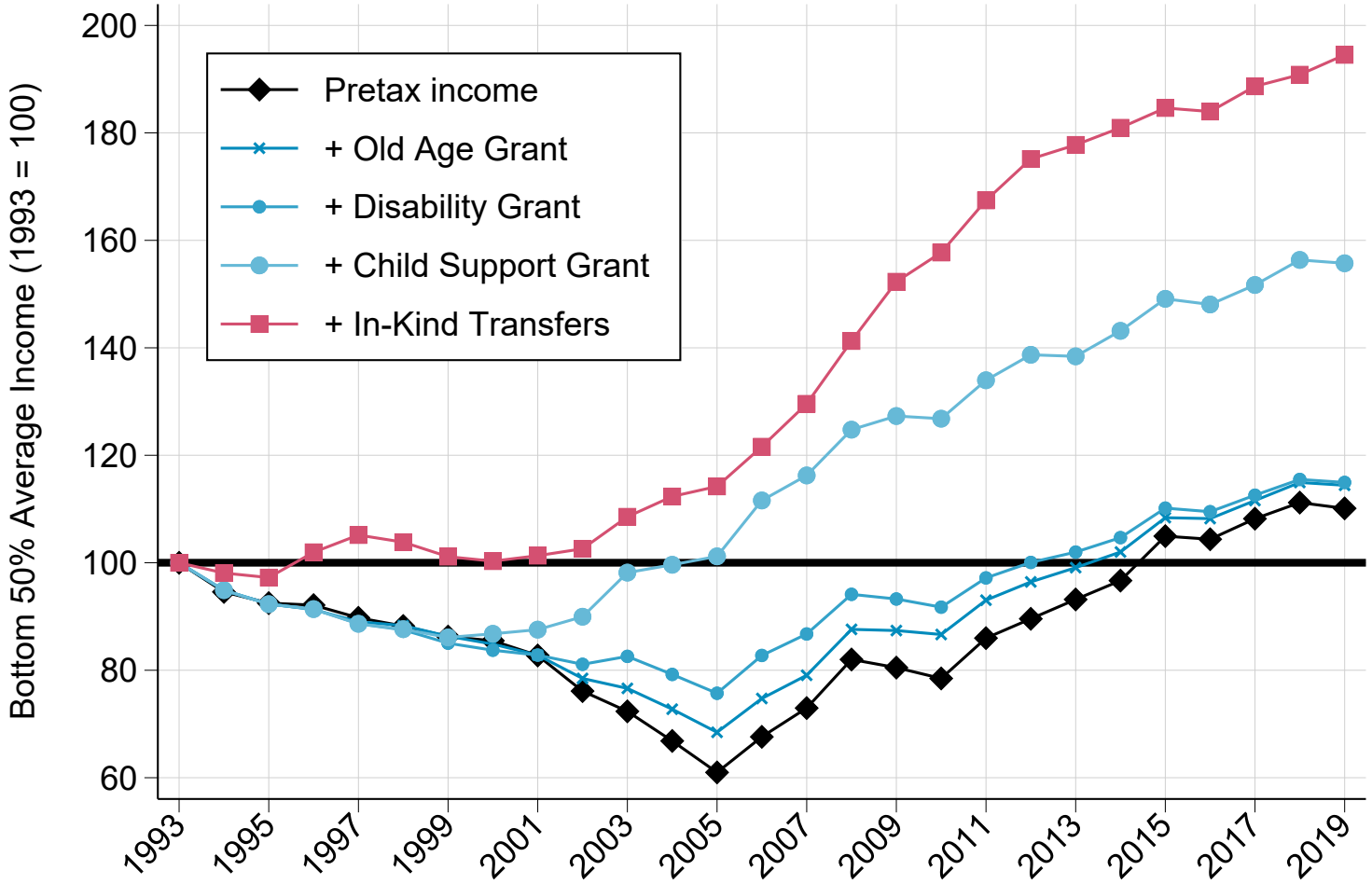
(a) Total individualized transfers received by pretax income group



Notes. Authors' computations combining survey, tax, and national accounts data. The figure represents the total individualized transfers (social protection, education, and health transfers) received by bottom 50%, middle 40%, and top 10% pretax income earners, expressed as a share of national income.

Figure 9 – The rise of social transfers

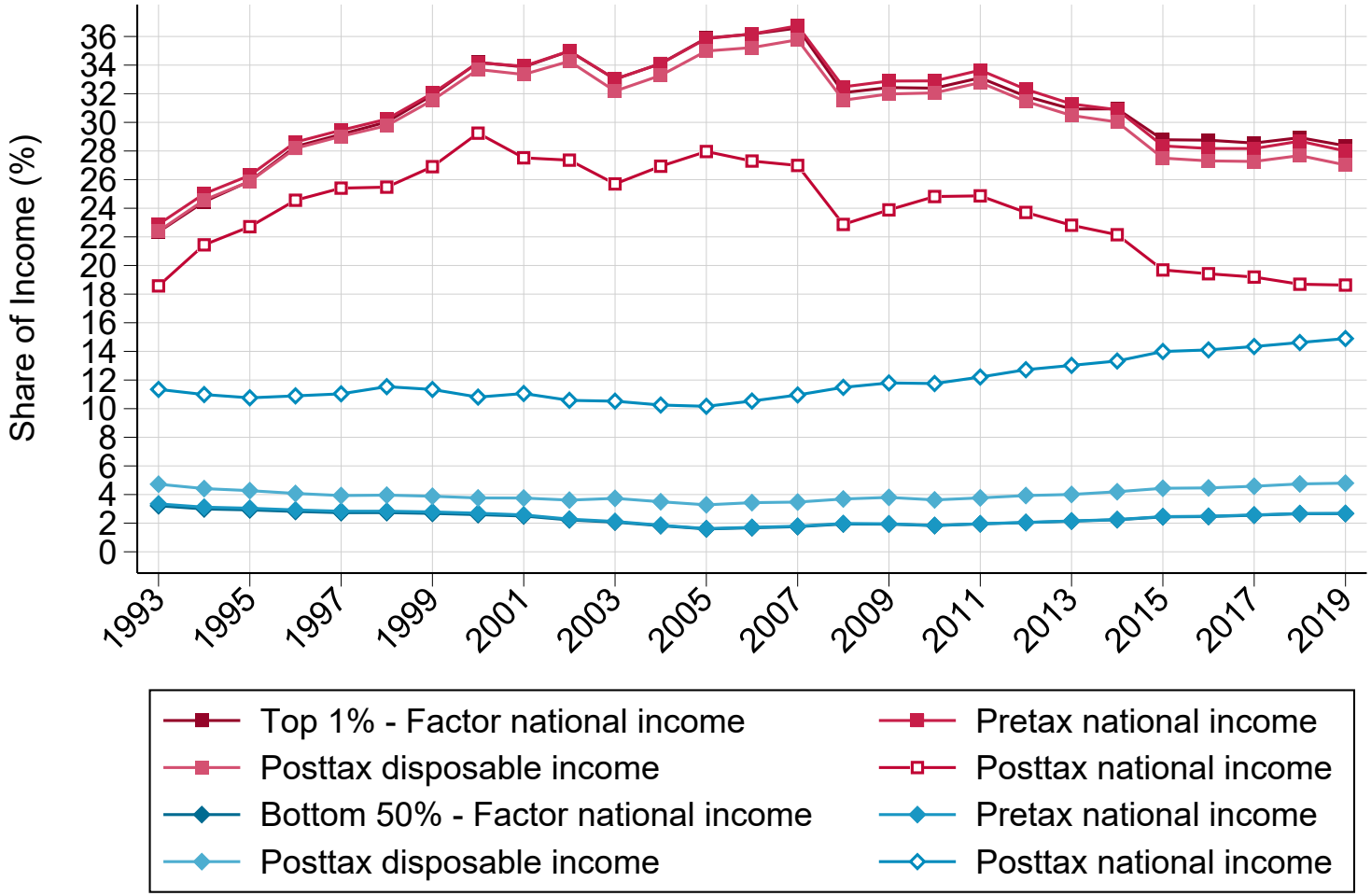
(b) Bottom 50% average income growth, before and after transfers



Notes. Authors' computations combining survey, tax, and national accounts data. The figure represents the cumulated income growth rate of bottom 50% earners between 1993 and 2019, before and after adding specific social transfers to individual pretax incomes.

Figure 10 – The overall impact of taxes and transfers on inequality

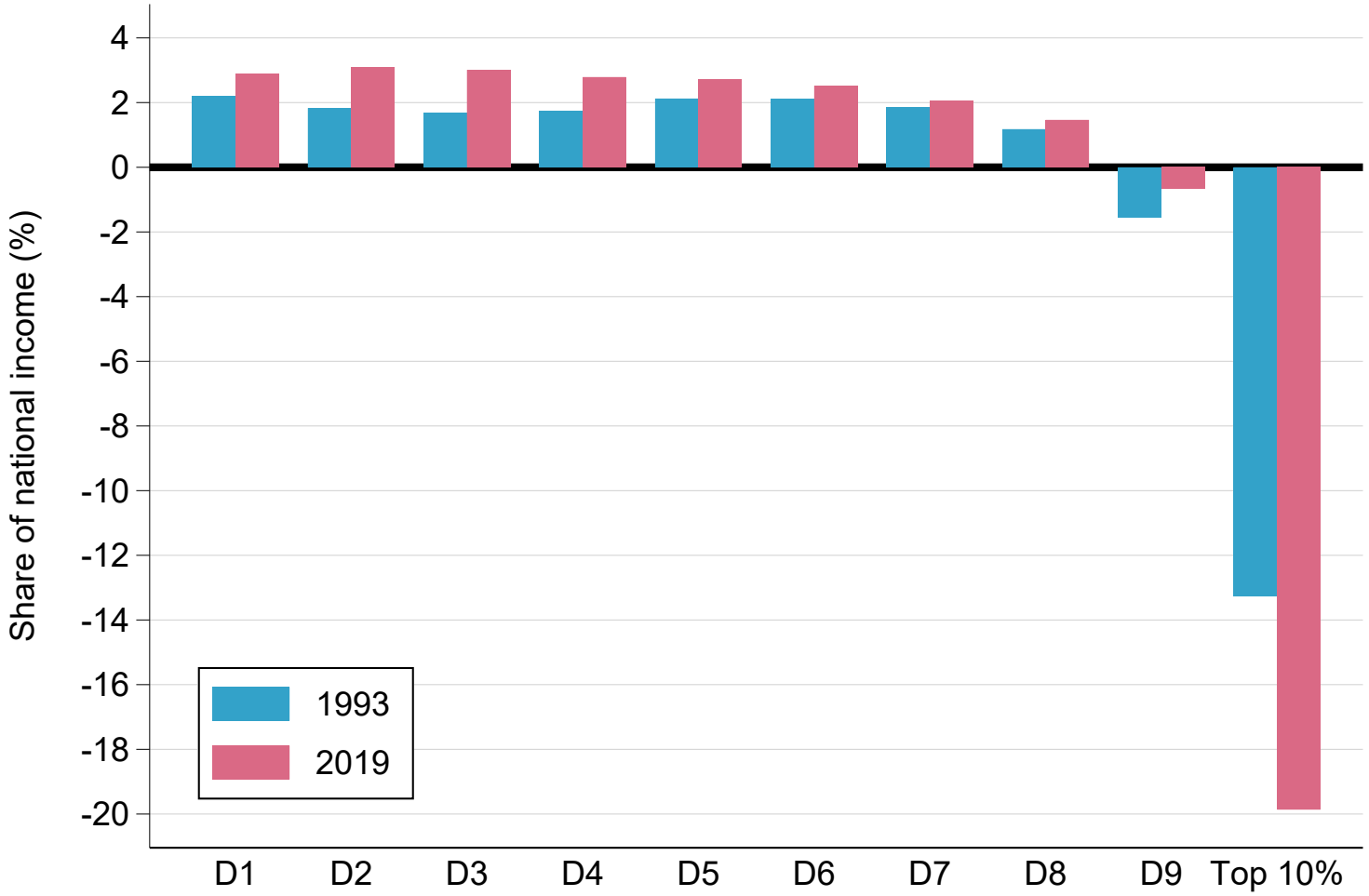
(a) Top 1% versus bottom 50%: from factor to posttax national income



Notes. Authors' computations combining survey, tax, and national accounts data.

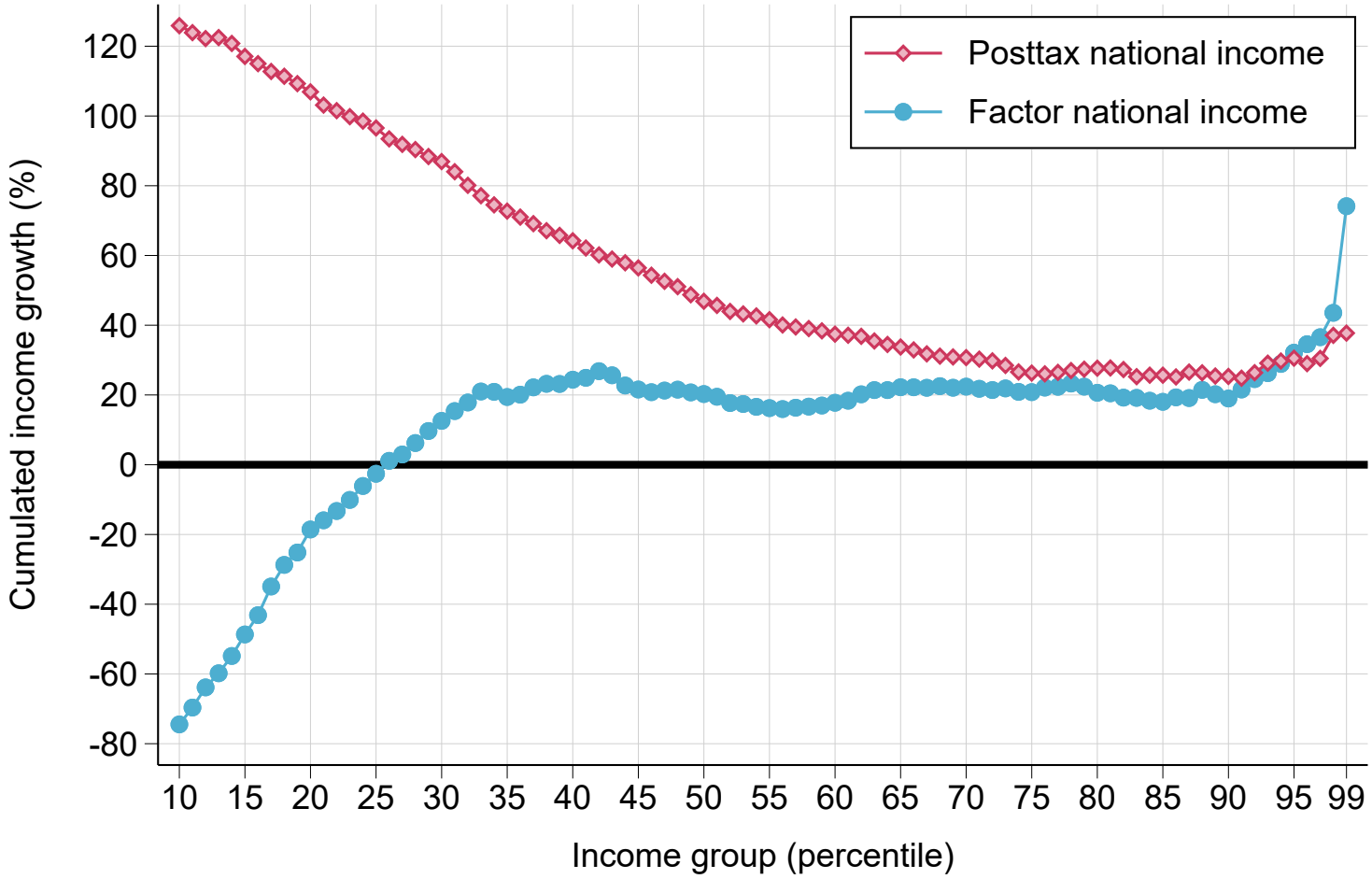
Figure 10 – The overall impact of taxes and transfers on inequality

(b) Net transfers operated by the tax-and-transfer system by factor income group



Notes. Authors' computations combining survey, tax, and national accounts data. The figure represents the net transfers operated between factor income deciles by the tax-and-transfer system, that is, the difference between total transfers received and total taxes paid, expressed as a share of national income.

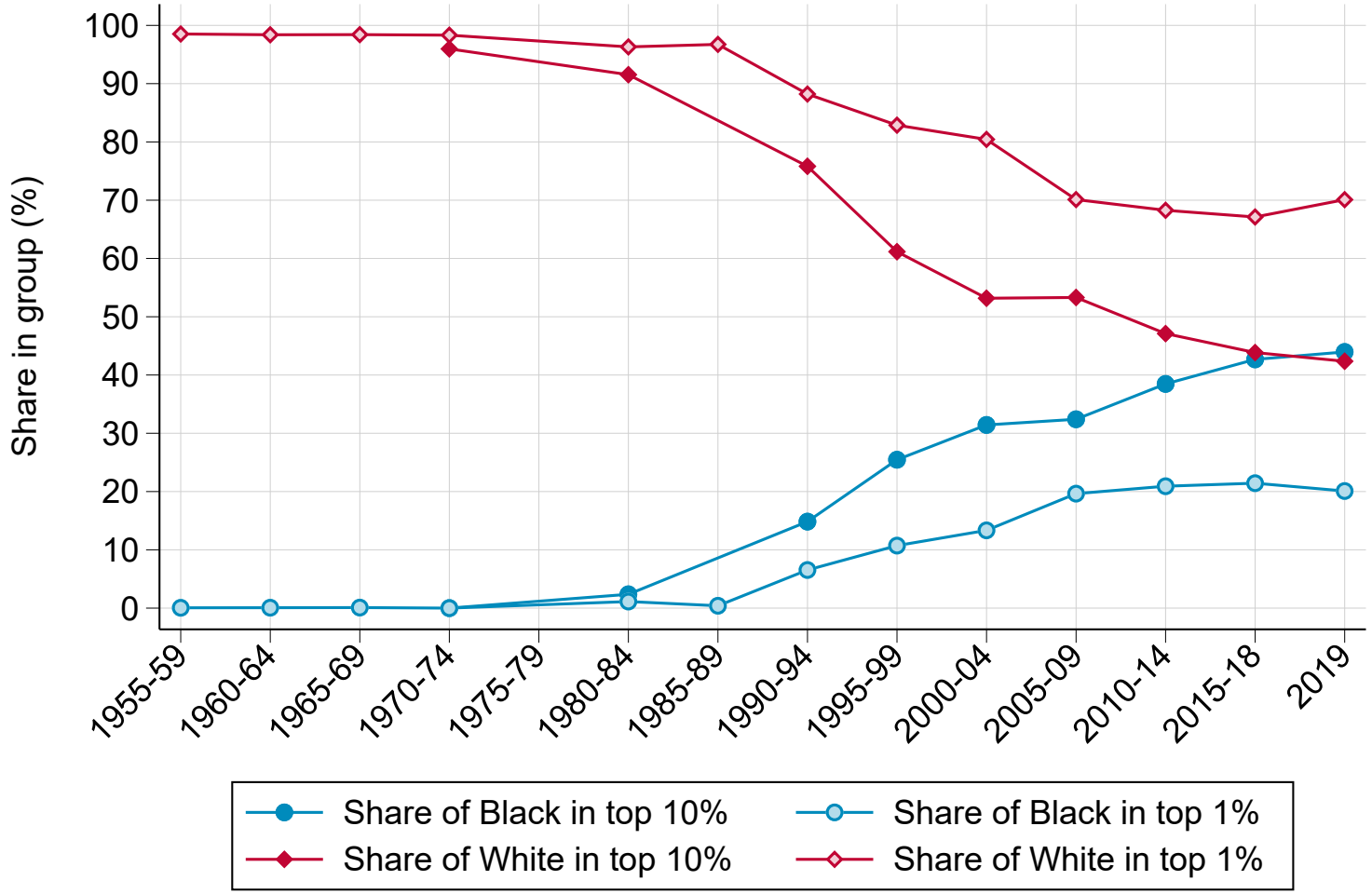
Figure 11 – Redistribution, inequality, and growth: cumulated income growth by percentile, 1993-2019



Notes. Authors' computations combining survey, tax, and national accounts data. The figure represents the cumulated income growth rate by percentile between 1993 and 2019 in terms of factor national income and posttax national income.

Figure 12 – Racial inequality and top incomes

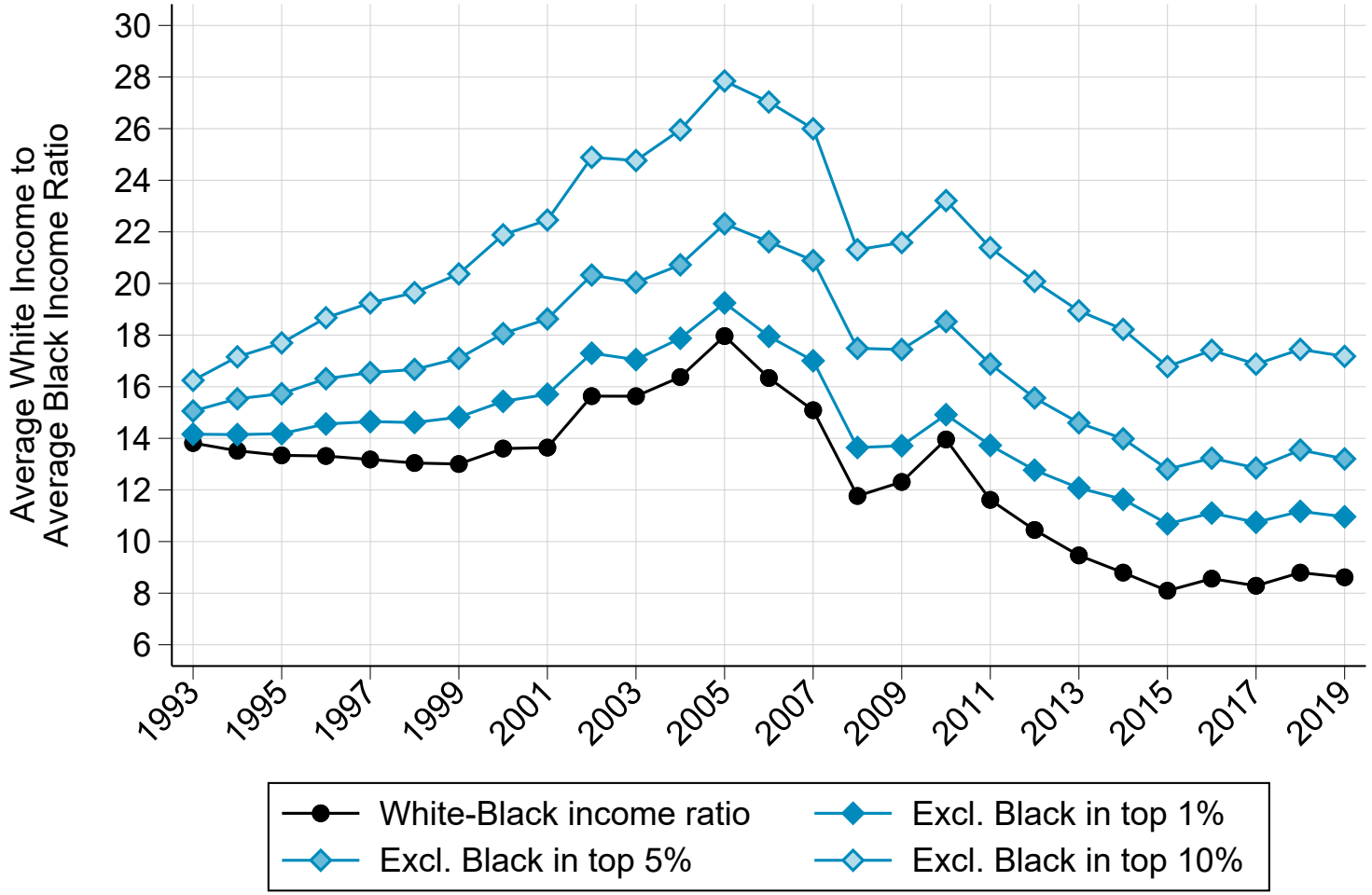
(a) Share of Black versus White earners in top factor income groups, 1955-2019



Notes. Authors' computations using from Alvaredo and Atkinson (2010) for the top 1% before 1993; census data for 1970, 1980, and 1990 (top 10%); distributional national accounts for 1993-2019. The figure represents the share of Black earners and White earners in top factor income groups between 1955 and 2019.

Figure 12 – Racial inequality and top incomes

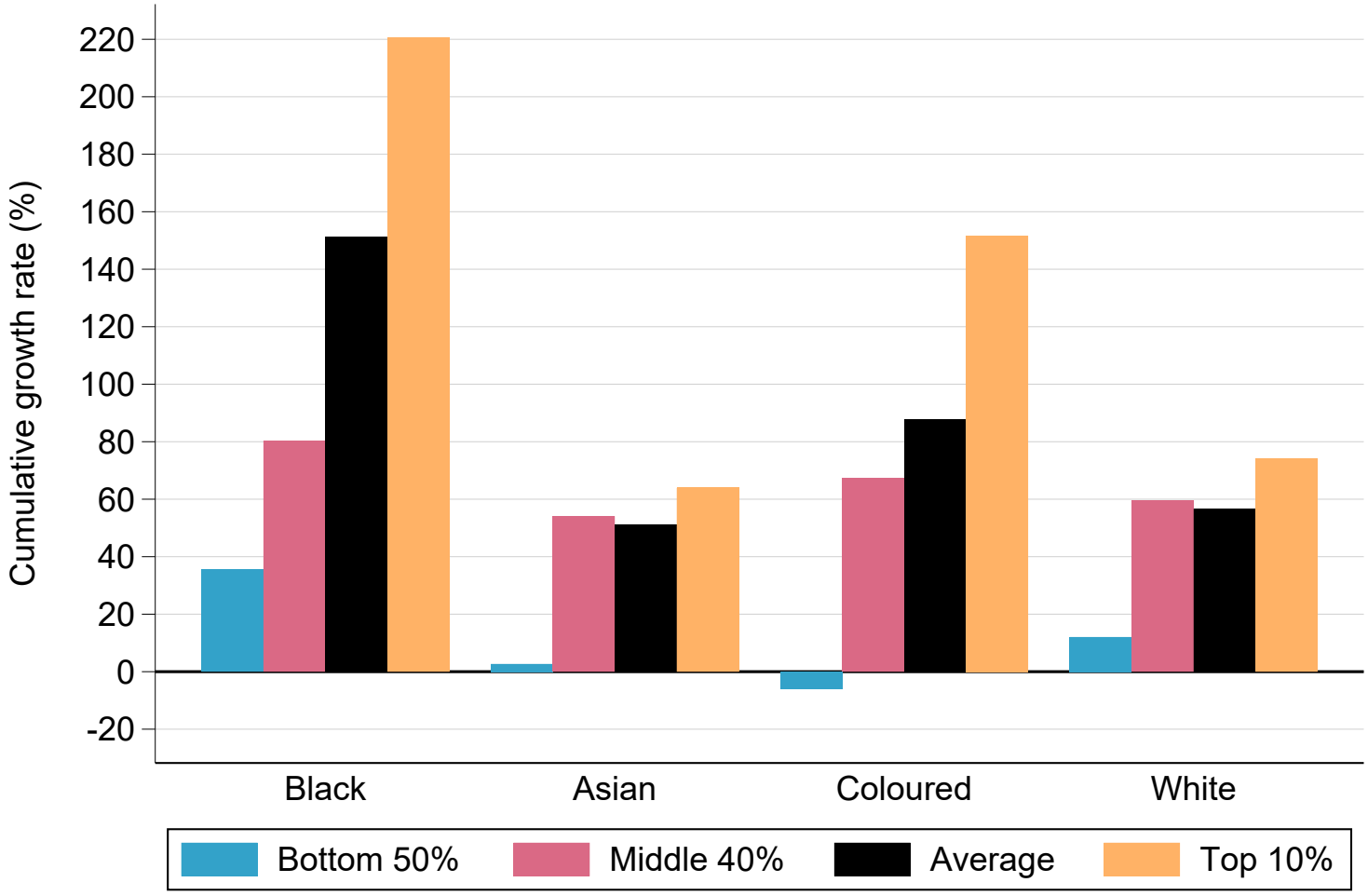
(b) Top Black incomes and the decline in the racial factor income gap



Notes. Authors' computations combining survey, tax, and national accounts data. The figure represents the ratio of the average factor income of White earners and the average factor income of Black earners between 1993 and 2019, before after excluding all Black earners located in the top 10%, the top 5%, and the top 1% of the overall factor income distribution.

Figure 12 – Racial inequality and top incomes

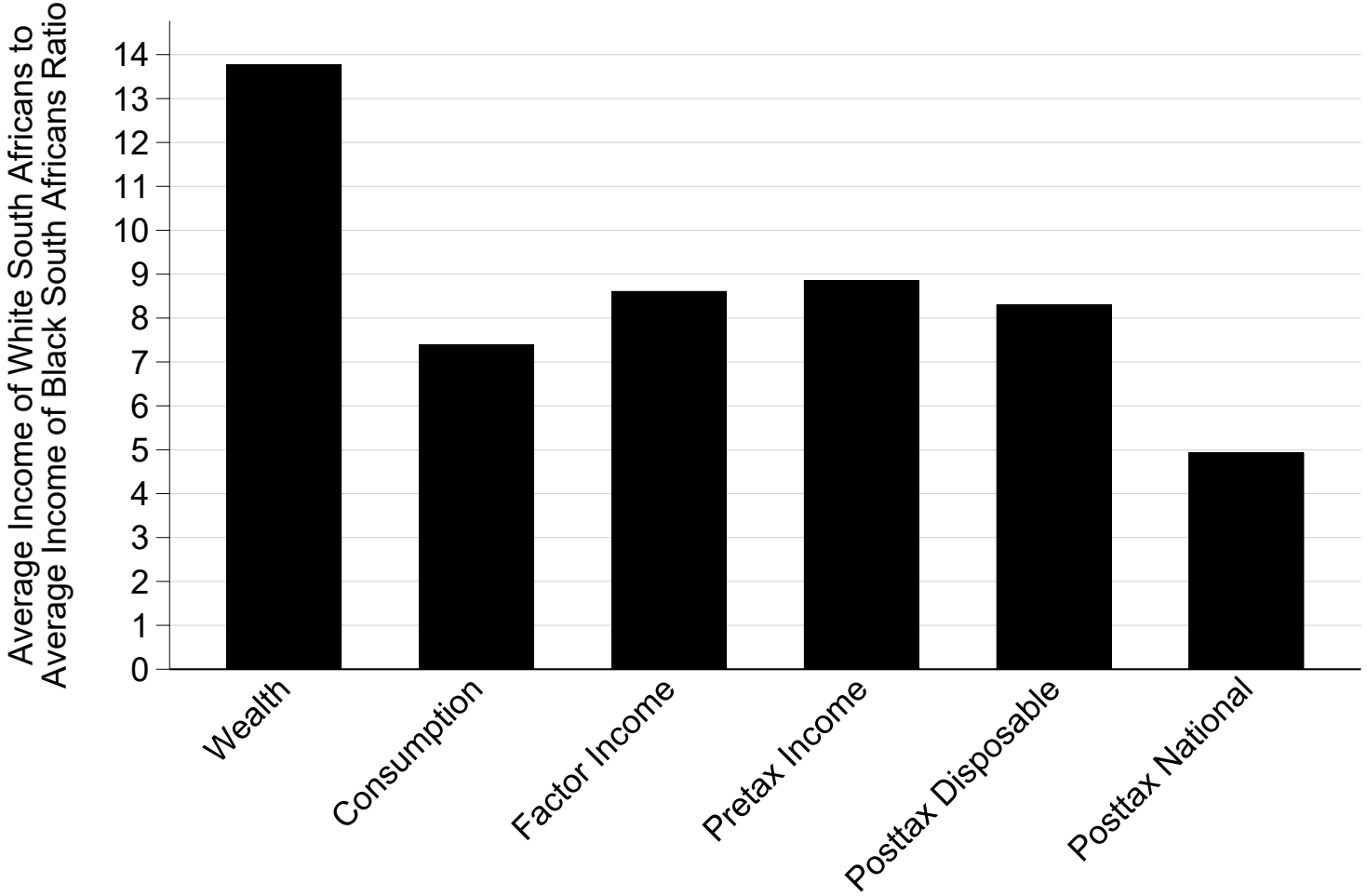
(c) The distribution of growth within population groups, 1993-2019



Notes. Authors' computations combining survey, tax, and national accounts data. The figure represents the total growth rate of selected factor income groups within each population group from 1993 to 2019. The top 10% of Black earners saw their average income grow by 200% during this period.

Figure 13 – The structure of racial inequality in 2019

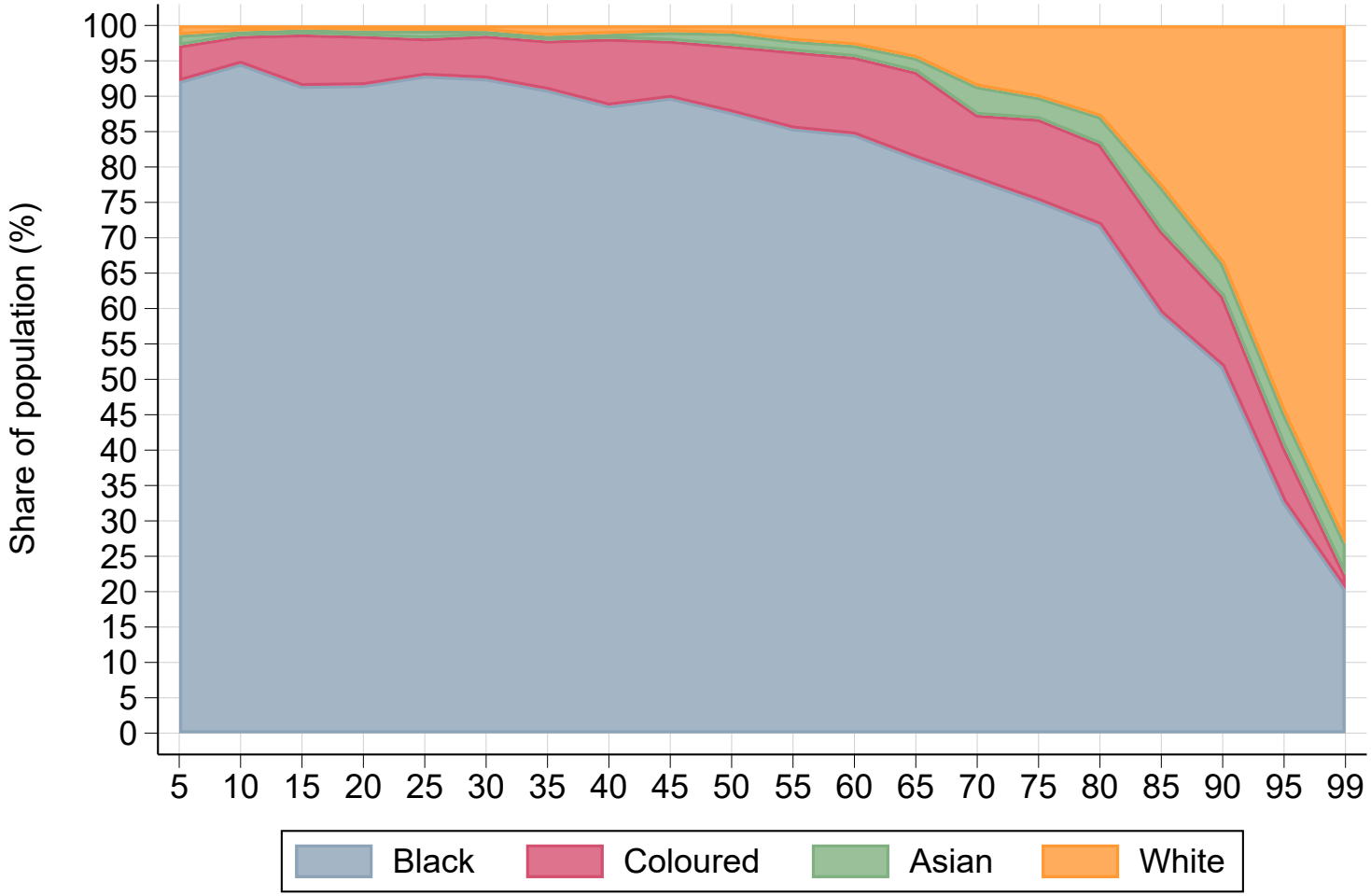
(a) The White-Black gap in income, consumption, and wealth



Notes. Authors' computations combining survey, tax, and national accounts data. The figure represents the ratio of White to Black average income, consumption, and wealth in 2019.

Figure 13 – The structure of racial inequality in 2019

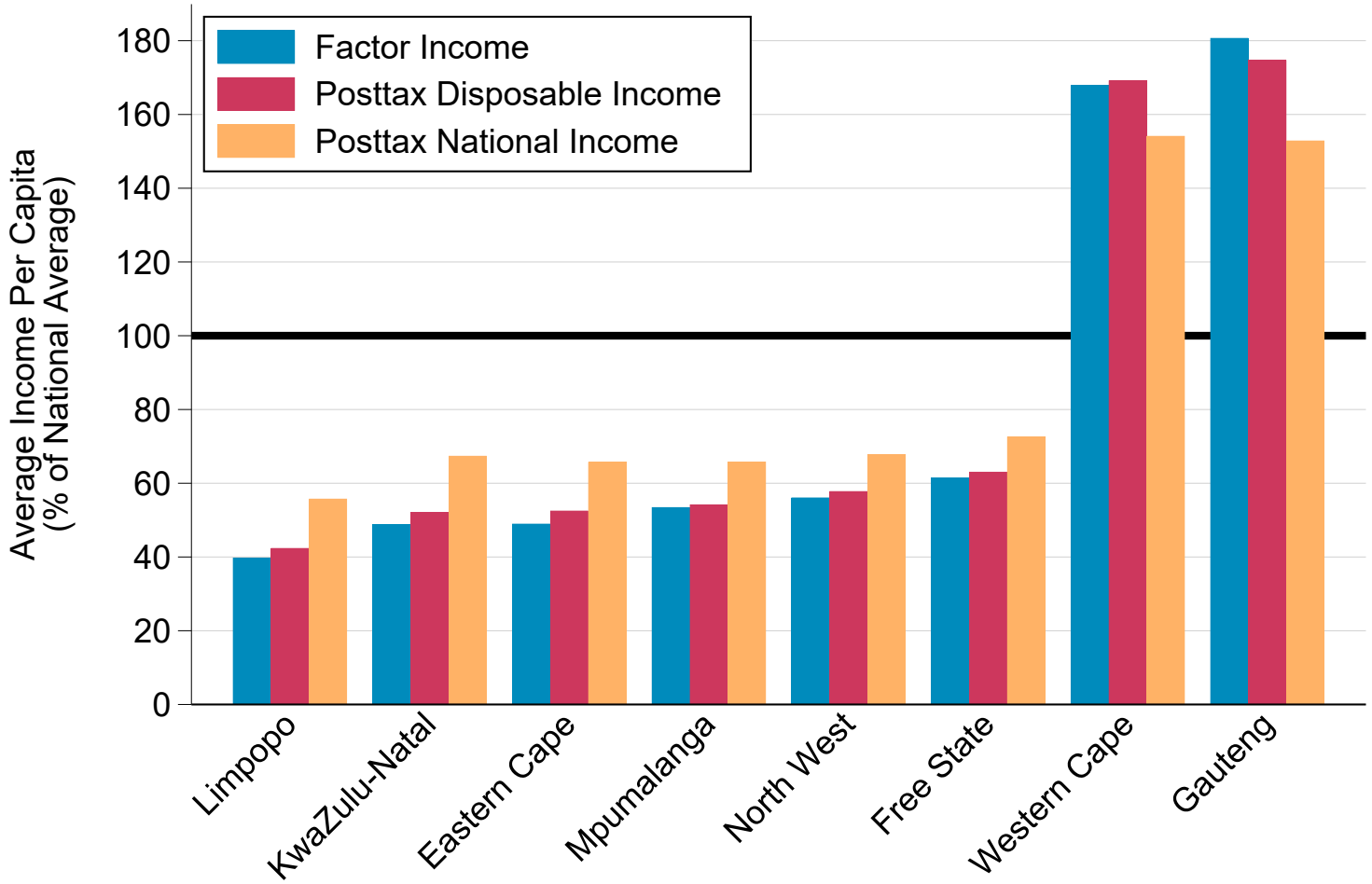
(b) Racial composition of posttax national income groups



Notes. Authors' computations combining survey, tax, and national accounts data. The figure represents the composition of posttax national income groups (ventiles) by population group in 2019.

Figure 14 – Spatial inequality and redistribution

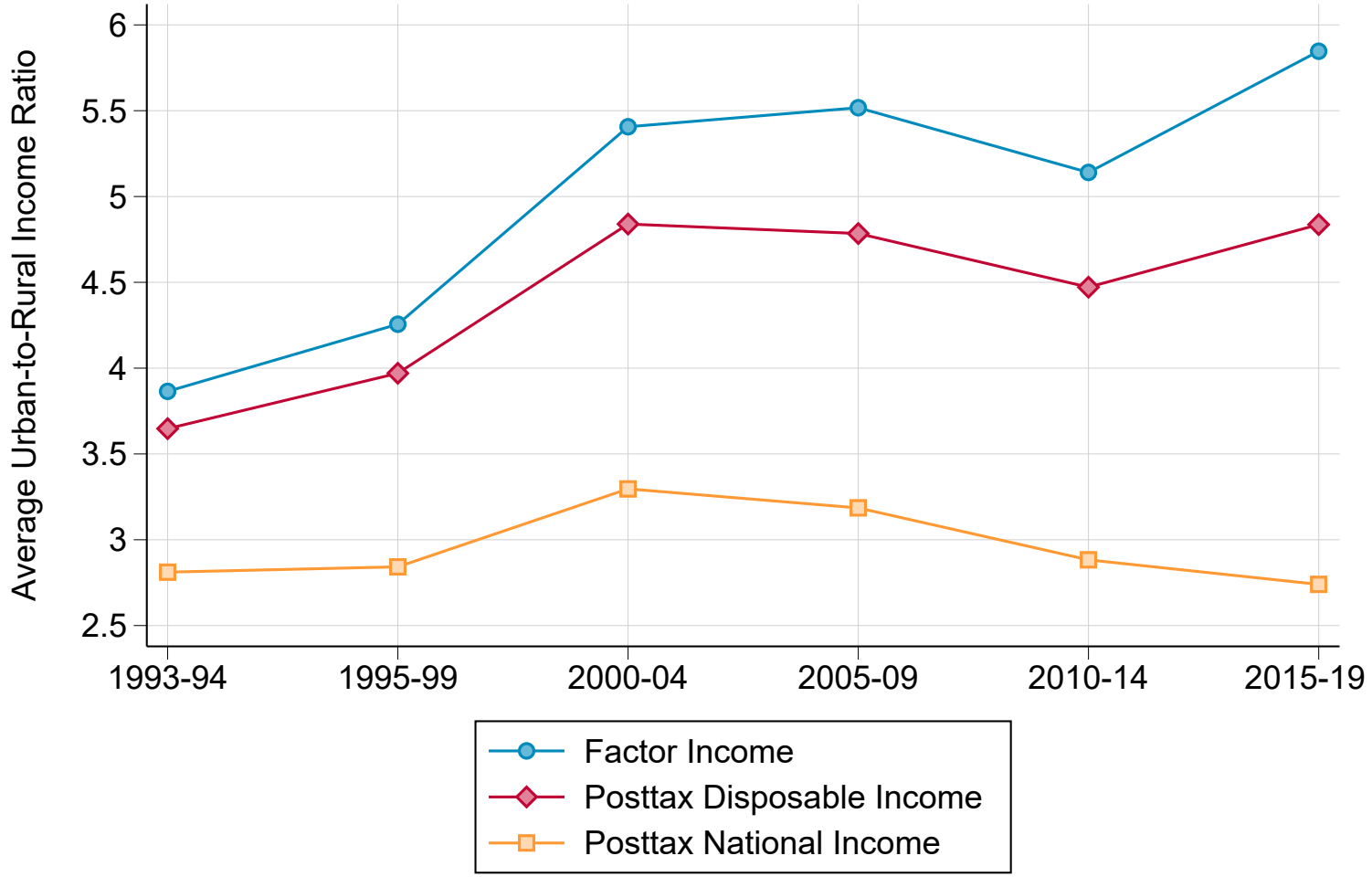
(a) Average income by province relative to national income, 2019



Notes. Authors' computations combining survey, tax, and national accounts data. Limpopo includes the North West province. The figure represents the average income of South African provinces, before and after taxes and transfers, relative to the national average in 2019.

Figure 14 – Spatial inequality and redistribution

(b) Social transfers and the rural-urban income gap



Notes. Authors' computations combining survey, tax, and national accounts data. The figure represents the ratio of the average income of urban areas to the average income of rural areas, before and after accounting for taxes and transfers.

Table 1 – The distribution of factor national income 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 (for more details, see sections II.B and II.C), along with the size of each component expressed as a share of net national income (NNI) in 2019. Factor national income is the sum of all income flows accruing directly or indirectly to individuals, before accounting for the operation of the tax-and-transfer system, and before accounting for the operation of the pension and unemployment systems. Pretax national income is equal to factor income after the operation of the pension and unemployment systems. Both factor national income and pretax national income sum to the net national income.

Table 2 – 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 (for more details, see section II.D), along with the size of each component, expressed as a share of net national income (NNI), in 2019.

Table 3 – The distribution of factor income in South Africa in 2019

	Number of individuals	Income threshold	Average income	Income share
Full population	58,600,000	$ 0	$ 11,700	100%
Bottom 90% (p0p90)	52,740,000	$ 0	$ 4,100	31.3%
Bottom 50% (p0p50)	29,300,000	$ 0	$ 600	2.7%
Middle 40% (p50p90)	23,440,000	$ 2,200	$ 8,400	28.7%
Top 10% (p90p100)	5,860,000	$ 26,200	$ 80,600	68.7%
Top 1% (p99p100)	586,000	$ 129,000	$ 332,000	28.3%
Top 0.1% (p99.9p100)	58,600	$ 662,000	$ 973,000	8.3%
Top 0.01% (p99.99p100)	5,860	$ 1,370,000	$ 2,400,000	2.0%

Notes. The table reports the distribution of factor national income in 2019, providing information for each income group on the number of adults belonging to this group, the minimum income required to belong to this group, the average income of this group expressed in 2019 PPP US dollars ($1 = R6.3), and the share of factor national income received. Factor national income is the sum of all income flows accruing directly or indirectly to individuals, before accounting for the operation of the tax-and-transfer system, and before acounting for the operation of the pension and unemployment systems. Income is split equally among all adults members of the household (aged 20 or above).

Appendices

A. Construction of Distributional National Accounts Microfile

This section provides additional details on the methodology used to build South African Distributional National Accounts. Section A.1 lists the data sources used to estimate macroeconomic aggregates, including national accounts, population estimates, and other government budget and administrative data. Section A.2 describes the combination of available survey and tax data to build a microfile covering the distributions of factor national income every year from 1993 to 2019. Section A.3 explains how taxes and transfers are allocated to reach posttax national income.

A.1. Harmonization of Macroeconomic Aggregates

A.1.1. National Accounts Data

Main Aggregates Estimates of national income, wealth, and expenditure aggregates come from the South African Reserve Bank (SARB) quarterly bulletin.[2] The published files provide detailed decompositions of national accounts components, which we directly match with the microfile to estimate distributional national accounts. The exceptions are mixed income and corporate undistributed profits, which we decompose further to refine the imputation.

Decomposition of Mixed Income and Imputed Rents The SARB data does not publish separate series for mixed income, rental income, and imputed rents, instead providing a single aggregate for [B2N + B3N, S14]. To derive an estimate of total rental income received by households, we combine all income surveys (1993, 1995, 2000, 2005, 2008, 2010, 2015: see section A.2) and General Household Surveys (GHS, 2016-2019), which have collected information on rents paid by South African tenants.[3] The resulting total rental income represented 1.9% of

[2] See https://www.resbank.co.za/en/home/publications/quarterly-bulletin1/download-information-from-xlsx-data-files.

[3] I first aggregate all rent payments recorded in income surveys. We then interpolate the series linearly between years to cover the entire 1993-2015 period. Finally, we use GHS growth rates in rent payments to extrapolate series forward to 2019.

national income (14% of [B2N + B3N, S14]) in 2019, up from 1.4% (12%) in 1993. Following recommendations by the South Africa Reserve Bank, we assume that imputed rents represent a fixed 20% of the total, and we compute mixed income (*i.e.*, self-employment income excluding rental income) as the residual of these two categories.

Decomposition of Corporate Undistributed Profits To allocate corporate retained earnings to individuals, one has to decompose them between the part that belongs to households (distributed proportionally to equity ownership) and the part that belongs to the government (distributed proportionally to factor income). We do so by relying on a preliminary estimate published by the SARB on the equity assets and liabilities of the household and government sectors in 2011 (see Beer and Kock, 2017). Dividing the sum of the equity assets held by the government by the total equity liabilities of the corporate sector, we estimate that about 93% of retained earnings can be attributed to households. In the absence of better data, we assume that this share has remained stable over the 1993-2019 period.

A.1.2. General Government Revenue and Expenditure Data

To move from factor income to pretax income and then posttax income, we collect data on general government revenue and expenditure from three main sources: the SARB, the OECD, and the South African National Treasury.

Government Revenue Yearly data on consolidated government revenue and its decomposition are available from the public finance series published in the SARB Quarterly Bulettin. We complement these harmonized series with OECD public revenue data to further decompose revenue from direct taxes into the personal income tax, the corporate income tax, and other taxes on income and wealth.[4]

Government Expenditure Data on the composition of general government expenditure by function are available from the Treasury Budget Reviews.[5]

Social Security Data To make the DINA microfile more representative of Unemployment Insurance Fund (UIF) and private pension contributions and benefits, we collect data on total contributions/benefits and number of contributors/recipients to the UIF and private pension

[4] See https://stats.oecd.org/Index.aspx?DataSetCode=REVZAF.

[5] See http://www.treasury.gov.za/documents/national%20budget/default.aspx.

funds in South Africa. Data on total UIF revenue and expenditure (2001-2019) and on the number of UIF recipients (2008-2012) are reported in various issues of the Treasury Budget Review. The number of individuals earning private pension income is estimated from the income tax panel microdata (2011-2017) available from the South African Revenue Service (see Ebrahim and Axelson, 2019), and extrapolated to 1993 assuming that it has remained a constant share of the adult population.[6] Total contributions to private pension funds and total private pension income are also estimated from the income tax panel, and extrapolated to 1993 using the growth rates of social contributions received by financial corporations and social benefits paid by financial corporations, respectively (both available from SARB national accounts data).

Social Protection Data We also collect data on the number of recipients and the monthly values of social grants from various issues of the Treasury Budget Reviews. Data on grant values are available every year since 1993 (or since the year the grant was implemented) for all major cash transfers in South Africa (including the old age grant, the disability grant, the child support grant, the foster care grant, and the care dependency grant). Data on the number of recipients of each grant are available since 1996.

A.2. Construction of DINA Microfile

A.2.1. Combination of Survey Data Sources

The main data source used to estimate the distributions of income, consumption, and wealth at the micro level are household surveys that have collected detailed information on the earnings and expenditure of households in South Africa. Seven such surveys, which we refer to as "income surveys" in what follows, have been conducted since 1993: the Project for Statistics on Living Standards and Development (1993), the Income and Expenditure Surveys (1995, 2000, 2005, 2010), and the Living Conditions Surveys (2008, 2015). Drawing on representative samples of households, they ask individuals to report earnings from various sources (such as wages, self-employment income, and property income), as well as other information such as contributions to private pension funds, taxes and transfers received, the market value of the home individuals live in, or expenditure on specific goods and services.

I create a harmonized microfile covering the entire 1993-2019 period by combining all available surveys (1993, 1995, 2000, 2005, 2008, 2010, and 2015) and filling missing years in the

[6]This is a reasonable assumption to the extent that the number of pension recipients has also remained stable in income surveys, although at a lower level than in the tax microdata.

following way. For a given missing year (for instance 1997), we create a new dataset by appending all observations from the two surveys available in surrounding years (1995 and 2000), and then reweight observations so as to give a weight to each survey that is proportional to the distance from the year considered. To approximate the distribution of income in 1997, for instance, we append the 1995 and 2000 IES surveys, and then multiply existing sample weights by 1/2 in the former and 1/3 in the latter. This is similar to a linear interpolation strategy: it amounts to considering that in 1997 the distribution of income was somewhere between that of 1995 and that of 2000, and was closer to that of 1995. The resulting microfile thus combines all available surveys to cover individual-level data every year from 1993 to 2019.

A.2.2. Combination of Surveys with Tax Data

I correct surveys for misreporting of income at the top of the distribution by combining them with tabulated income tax returns. This correction is performed in three steps, following the methodology developed by Blanchet, Flores, and Morgan (2018).

First, we define an income concept, “merging income", that can be consistently measured in both survey data and the income tax panel microdata (2011-2017). This income concept is equal to the sum of gross wages, business income, interest, rental income, and private pension income.

Second, we generate a “taxable income" variable in the survey microfile by multiplying merging income by the ratio of taxable income to merging income by percentile observed in the tax microdata. This effectively amounts to incorporating deductions (that is, the gap between merging income and taxable income) in the survey microdata.[7]

Third, we calibrate the survey microfile on the tabulated income tax returns available from SARS, which report the number of taxpayers and total taxable income by income tax bracket every year since 2002 (as well as in 1993). We first recover full distributions from the tax tabulations using Generalized Pareto Interpolation (Blanchet, Fournier, and Piketty, 2017).[8] We then calibrate the survey microdata on the tax tabulations using the algorithm developed by Blanchet, Flores, and Morgan (2018), which reweights survey observations so as to match the distribution of top taxable incomes reported in the tax data. The resulting survey microfile is thus perfectly representative of the distribution of taxable income reported in the income tax

[7]For simplicity, we take the overall average of this ratio by percentile observed in 2011-2017 and apply it to the entire period. This corresponds to assuming that the profile of deductions has remained relatively stable between 1993 and 2019.

[8]For missing years (1994-2001), we assume that the extent of the under-representation of top incomes in survey data has evolved linearly, that is, we create synthetic income tax tabulations by linearly interpolating the correction by percentile observed in 1993 and 2002.

tabulations.

A.2.3. Combination of Survey and Tax Data with Macroeconomic Aggregates

After combining surveys with tax data, we rescale reported household income components to macro totals, and distribute components of the net national income that are not directly received by individuals.

First, we proportionally scale up household income components to their corresponding totals reported in the national accounts:

- Gross wages proportionally to compensation of employees.
- Self-employment/business income proportionally to mixed income (excluding rental income, see section A.1)
- Rental income proportionally to total rents paid by households
- Interest income proportionally to total interest received by households
- Dividends proportionally to total dividends received by households

Second, we distribute unreported income components proportionally to proxy variables available in surveys:

- Imputed rents proportionally to the reported market value of the home of owner-occupiers
- Property income attributed to insurance holders and pension entitlements proportionally to the value of pension and life insurance assets
- Interest paid by households proportionally to the factor income of debtors
- Private corporate undistributed profits proportionally to directly and indirectly held stock ownership
- Government primary income and other remaining national income components proportionally to factor income

A.3. Distribution of Taxes and Transfers

A.3.1. Pension and Unemployment Systems

Pension and unemployment contributions and benefits are recorded in income surveys, so we distribute macro aggregates proportionally to values reported by respondents. In order to reach pretax national income, we distribute 50% of the deficit or surplus of each system proportionally to contributions paid, and 50% proportionally to benefits received.

A.3.2. Taxes

Personal Income Tax We microsimulate the personal income tax every year from 1993 to 2019. To do so, we first collect data on taxable income thresholds, marginal tax rates, and rebates at each income level from various reports published by the South African Revenue Service. We then apply the corresponding rules in the microdata to calculate the tax burden of each individual. Because we have calibrated top taxable incomes directly on income tax tabulations (see section A.2.2), the estimates of total personal income tax revenue derived from microsimulation match almost perfectly actual revenue statistics. We close the residual gap between micro and macro estimates by proportionally rescaling the income tax burden of each individual.

Dividends Tax we distribute the dividends tax proportionally to dividends reported in income surveys.

Corporate Income Tax we distribute the corporate income tax proportionally to equity ownership, including both directly held equity and equity held indirectly through pension funds (see Chatterjee, Czajka, and Gethin, 2022).

Skills Development Levy The Skills Development Levy (SDL) is a 1% additional levy paid by wage earners who already contribute to the Unemployment Insurance Fund. We simulate it following this rule, and proportionally rescale the total to match total SDL revenue throughout the period.

Other Direct Taxes Other direct taxes include a number of minor taxes and levies, which have represented less than 1% of national income from 1993 to 2019. We distribute them proportionally to pretax income.

Transfer Duties The Transfer Duty is a tax levied on the value of properties acquired by individuals in South Africa. In the absence of information on property transactions, we distribute it proportionally to housing wealth (including both owner-occupied and tenant-occupied housing: see Chatterjee, Czajka, and Gethin, 2022).

Securities Transfer Tax The Securities Transfer Tax is a small tax that applies to the purchase and transfers of listed and unlisted securities. We distribute it proportionally to equity ownership.

Estate Duty and Donations Tax The Estate Duty and the Donations Tax are taxes on inheritance. In the absence of data on these transactions, we distribute them proportionally to total household wealth.

Value Added Tax we distribute total VAT revenue proportionally to household consumption expenditure, excluding both VAT-exempt goods and goods purchased on the informal market. Following the tax legislation, we directly identify VAT-exempt goods in income surveys and exclude them from taxable consumption. To identify goods purchased on the informal market, we derive a profile of informal consumption by income rank using the 2010 Income and Expenditure Survey, which reports the type of store at which the household purchased different kinds of goods. We extrapolate this profile to all years, assuming it has remained constant over the period. Expenditure in the informal sector is very small in South Africa, so that accounting for informality only has a negligible impact on the estimated distributional incidence of indirect taxation.

General Fuel Levy The General Fuel Levy is an excise tax charged on petroleum products. We distribute it proportionally to total transport expenditure reported by households in income surveys.

Other Excise Taxes Other excise duties mainly consist in excises applied to alcohol and tobacco products. In the absence of data on the decomposition of these taxes category by type of product, we distribute total revenue from non-GFL excises proportionally to combined alcohol and tobacco expenditure, as reported in income surveys.

Other Taxes on Goods and Services Other taxes on goods and services include a number of other small taxes, which have represented less than 0.5% of national income from 1993 to 2019. We distribute them proportionally to overall consumption expenditure.

Taxes on International Trade Import duties are effectively paid by households consuming a greater proportion of goods imported from abroad. Accordingly, we distribute taxes on international trade proportionally to import-intensive household expenditure, which we estimate using input-output tables available from the OECD (2005-2015).

Other Taxes Other taxes consist in a number of other small taxes and levies such as stamp duties. They have represented less than 0.5% of national income since 1993. We distribute them proportionally to pretax income.

Other Government Revenue we distribute all other government revenue, including non-tax revenue, proportionally to pretax income, so as to match total consolidated general government revenue in South Africa throughout the 1993-2019 period.

A.3.3. Social Protection

Social protection expenditure in South Africa mainly consists in the old age grant, the disability grant, the child support grant, other small cash transfers, and other social protection expenditure.

Old Age Grant The old age grant is a means-tested benefit paid to South African citizens who are 60 years or older. Old age grant beneficiaries are directly reported in income surveys, but their number is slightly below that reported in administrative data sources, suggesting a tendency to under-report. To correct this bias and ensure that my microfile matches both the true number of beneficiaries and total expenditure on the grant as reported in government budgets, we impute additional beneficiaries in two steps. First, we estimate the probability of surveyed individuals to receive the grant using a saturated linear probability model with the following explanatory variables: pretax income percentile, household expenditure percentile, gender, age, race, province or residence, and rural-urban location. Second, we rank individuals according to the predicted probability to receive the grant, and recursively allocate additional grants to those individuals most likely to receive it, until reaching the true number of beneficiaries every year from 1993 to 2019.

Disability Grant The disability grant is a means-tested benefit given to South African citizens who have a physical or mental disability that makes them unfit to work for a period of longer than six months. As in the case of the old age grant, it is reported in income surveys. We follow the same two-step strategy to impute additional beneficiaries when necessary, so as to match administrative statistics on both number of beneficiaries and total grant expenditure.

Child Support Grant The child support grant is a means-tested benefit given to low-income South African families to assist parents with the costs of the basic needs of their children. As in the case of the old age and disability grants, it is reported in income surveys. We follow the same imputation strategy as for these two grants, so as to match administrative statistics on both number of beneficiaries and total grant expenditure. The child support grant was first implemented in 1998, so we set grant expenditure and beneficiaries to zero before that year.

Other Social Grants Other small cash grants in South Africa include the foster care grant, the care dependency grant, the grant-in-aid, and social relief. We distribute them proportionally to their values reported in income surveys.[9]

Other Social Protection Expenditure Other social protection expenditure mainly consists in “provincial social development" expenditure, which brings together a large number of heterogeneous subnational policies targeted to poor households. These include, for instance, projects dedicated to reducing HIV prevalence, supporting disabled persons, providing centers for the treatment and prevention of drug abuse, or developing services aimed to prevent violence against women and children. In the absence of precise information on who benefits from each of these policies, we distribute other social protection expenditure proportionally to total social grants received.

A.3.4. Other Government Transfers

See Gethin (2023).

[9]Most income surveys do not report receipts from these grants separately, so we derive an aggregate for “other social grants" in each survey and distribute total expenditure on these grants proportionally to this aggregate.