THE IMPACT OF TAXES AND TRANSFERS ON POVERTY AND INCOME DISTRIBUTION IN SOUTH AFRICA 2014/2015

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The impact of taxes and transfers on poverty and income distribution in South Africa 2014/2015

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Abstract
This paper applies the Commitment to Equity (CEQ) Assessment Framework to the 2014/15 Living Conditions Survey for South Africa to analyse the progressivity of the main tax and social spending programs and quantify their impact on poverty and inequality. The tax and social spending system is progressive - the burden of taxes falls on the richest in South Africa and social spending results in sizable increases in the incomes of the poor. Reductions in poverty and inequality are the largest achieved in the emerging market countries that have so far been included in the CEQ. The analysis by gender shows that the fiscal system is partially responsive to the additional burden of childcare borne by women through social transfers such as the child support grant and public healthcare and education services, and partially responsive to inequality of access to labour opportunities through the progressive direct taxation system. However, these impressive results are partly due to high levels of pre-fiscal inequality in the country and due to valuing in-kind benefits from free government services in education and health at the average cost of provision – they do not take into account the significant variation in the quality of the services provided.

Introduction

Reducing poverty and inequality are key policy objectives of the South African government. Since the end of apartheid, the government has progressively expanded its fiscal toolkit to address poverty and inequality, both directly through budgetary interventions in taxation and expenditure, and indirectly through efforts to support pro-poor growth and public investment.

Despite these stated policy objectives, progress has been slow. While poverty decreased between 2006 and 2015, South Africa has seen an increase in the poverty headcount since 2011, from 36.4 to 40.0, measured by consumption expenditures against the Lower Bound Poverty Line (LBPL). Inequality in South Africa was the highest in the world in 2015 with a Gini coefficient of 0.64 (measured by consumption expenditures), down slightly from 0.65 in 2014 (Statistics South Africa, 2017). While inequality initially increased after apartheid, since 2006 it has been slowly decreasing. In 2015 it was still higher than it was in 1996 (0.61).

The literature on poverty and inequality in South Africa is already rich with information on the causes and multidimensional nature of both poverty (StatsSA, 2014) and inequality (Stats SA, 2019). This analysis situates itself within these broader works with a specific analysis of taxes and social spending and their impact on poverty and inequality, measured by income or consumption expenditures.

In a country as unequal as South Africa, it is critical to determine the progressivity of the major fiscal policy instruments, that is, to establish whether government spending and taxation separately and together are ameliorating or worsening the extent of poverty and the degree of inequality that would otherwise exist between individuals. In order to make this determination, one must ask two critical questions. First, who bears more of the burden and the benefits of taxation and who benefits relatively more from the various forms of social spending[1] – the poor, those in the middle or the rich? Secondly, what is the combined impact of taxes and spending patterns on inequality?

In this paper we update and build on the model and results of the 2010/11 South African CEQ Assessment, written up in *The Distributional Impact of Fiscal Policy in South Africa* (Inchauste et al, 2017). A CEQ Assessment conducts a systematic analysis of the distributional impact of taxes and public spending. It uses a common methodological framework developed by the CEQ Institute and presented in the CEQ Handbook by Lustig (2018), allowing for cross-country comparison. The report aims to answer the four questions laid out in the CEQ Handbook (Lustig, 2018: p13), namely:

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[1] Social spending here refers to any spending with the social good in mind, although we are only able to model a subset of these goods in a fiscal incidence analysis – in this case we model cash transfers, free basic services, housing transfers, education and health. This is explained in more detail in Sections 2.2 and in Box 1 on methodological caveats.

i. How much income redistribution and poverty reduction was accomplished in 2015 through fiscal policy relative to 2011, and how does this compare internationally?

ii. How equalizing and pro-poor were specific taxes and government spending in 2015, and how has this changed since 2011?

iii. How effective are taxes and government spending in reducing inequality and poverty? and

iv. What is the impact of fiscal reforms that change the size and/or progressivity of a particular tax or benefit?

In this round we work with the 2014/15 Living Conditions Survey, and we implement a number of methodological improvements on the previous 2010/11 analysis. We update the 2011 results for comparability wherever possible. We implement an updated VAT methodology which accounts for the distinction between imports and domestic goods when calculating indirect effects, we demonstrate two different models for the inclusion of the housing transfers, we improve on the education and health transfers using detailed provincial level budget records, and we correct for underreporting by adjusting the survey weights to achieve a distribution that more closely resembles the distribution observed in the personal income tax records. We also include the Compensation Fund contributions in the analysis, as far as possible, and disaggregate the road accident fund (RAF) contributions from the General Fuel Levy[2].

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[2] As far as possible, we update these methodological changes in the previous round, and we show selected results here. Due to the updates and the flexibility of the CEQ framework2, the 2011 results do not always match (or appear to match) what is displayed in the Inchauste et al. (2017) report. In particular, in this round we work with consumption as our baseline measure of welfare, in order to match the official statistics from Statistics SA. This has implications for understanding some of the results - in particular regarding the direct taxes and contributions to social security.

The main findings are threefold. First, the burden of taxes falls on the richest in South Africa and social spending results in sizable increases in the incomes of the poor. In other words, taxes and social spending are each progressive and so is the overall effect of both combined. Second, fiscal policy in South Africa achieves appreciable reductions in income inequality and poverty, and these reductions are in fact the largest achieved in the emerging market countries that have so far been included in the CEQ. The combination of taxes, direct transfers and health and education spending reduces the Gini coefficient from 0.737 to 0.538 (a change of 19.9 Gini points), and taxes and transfers reduce poverty from 50.3 to 45.6 at the LBPL (a change of 4.7 percentage points). Third, the fiscal system is partially responsive to the additional burden of childcare borne by women through the child support grant and public primary healthcare facilities, and inequality of access to labour opportunities through the progressive direct taxation system. We also find that female-headed households and females benefits disproportionately from public education services, and tertiary education in particular.

Despite fiscal policy being both progressive and equalizing, inequality and poverty remains high. South Africa is grappling with slowing economic growth, a high fiscal deficit and rising debt burden. In this context, addressing the twin challenges of high inequality and poverty will require not only policy that continues to significantly redistribute funds from the rich to the poor, but also a much-improved quality of public services.

The paper is structured as follows: Section 2 provides an overview of the key fiscal instruments used by the South African government to redistribute income, and Section 3 lays out the overall methodology of a CEQ Assessment, the data used in the assessment and the weaknesses. In Section 4 we describe each of the taxes and transfers, and how they were allocated. In section 5 we provide a discussion of the overall impact on poverty and inequality and fiscal impoverishment / fiscal gains to the poor, and in Section 6 we look at what is driving the results, by looking at the marginal contributions of the broad categories of taxes and transfers. In Section 7 we look at the characteristics of specific taxes and expenditures and, finally, in Section 8 we provide a gender disaggregation, before concluding in Section 9.

1. The fiscal system in South Africa

As shown in Lustig (2018), the redistributive power of the fiscal system depends on two crucial factors: the size of taxes and transfers and their progressivity. In this section, we present the size of the taxes and transfers according to the budgetary data. We describe each item in detail in Section 4.

The 2014/15 budget aimed at fiscal consolidation, designed to curtail the rising costs of servicing the debt, and yet continued to finance investments in infrastructure which would increase the potential for future economic growth (National Treasury, 2015: p13). Amongst other measures, the expenditure ceiling was reduced, and additional revenue was collected through increases in the fuel levy, excise taxes and capital gains taxes, while social spending was protected (National Treasury, 2016).

1.1. Revenue

Tax revenue increased in 2014/15 to 25.5 percent of GDP, from 24.5 percent of GDP in 2010/11. Corporate income tax was the only tax item to decrease in size from 2010/11, with a change of -0.7 percent of GDP.

The majority of South Africa's taxes in 2014/15 came from direct taxes, at 14.9 percent of GDP and 58.6 percent of tax revenue. Direct tax collection overall was slightly higher as a percent of GDP than in 2010/11 (14.2 percent of GDP). Personal income tax (PIT) alone comprises 35.8 percent of tax revenue, and corporate income tax[3] accounts for a further 18.7 percent. The remaining direct **taxes** are mainly comprised of the skills development levy (1.4 percent of tax revenues) and the transfer duty (which is not modelled here).

Indirect taxes combined were slightly larger than the PIT at 10.6 percent of GDP in 2014/15, up slightly from 10.4 percent in 2010/11. The largest of the indirect taxes is the value added tax (VAT) at 26.5 percent of tax revenue. This analysis also models specific excise taxes on tobacco and alcohol (3.3 percent of tax revenue), and the fuel levy, of which only the general fuel levy (4.9 percent of tax revenue) is included in indirect taxes and the remainder (2.2 percent of tax revenue) in contributions to social insurance (via the RAF).

The contributions to social insurance were 2.8 percent of GDP in 2014/15, slightly up from 2.6 percent of GDP in 2010/11. We include contributions to the unemployment insurance fund (UIF), compensation fund and the RAF, from the fuel levy[4] in the analysis. The compensation fund and UIF contributions were 0.9 and 1.6 percent of tax revenue respectively, and the RAF contributions were 2.2 percent of tax revenue. We do not include the government employees pensions fund (GEPF) with contributions of 5.7 percent of tax revenue in the analysis as a public pension, as the pension is essentially private.

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[3] Tax on corporate profits are not modelled here as there is no satisfactory way of determining the incidence of these taxes on individual households.

[4] The contributions to the RAF are a contribution to social insurance for road accidents, despite being levied in the same way as the general fuel levy.

Table 1. South African government tax revenue collections
Source: authors' calculations and 2018 Budget Review

	2010/11 (percent of GDP)	2014/15 (percent of GDP)	Share of tax revenue (percent)	Incidence analysis (percent of GDP)
Main Budget Revenue	24.5	25.0		
Tax Revenue	24.5	25.5	100.0	10.7
Direct taxes *of which*	14.2	14.9	58.6	6.0
Personal Income Tax	8.3	9.1	35.8	5.7
Corporate Income Tax	5.5	4.8	18.7	–
Skills Development Levy	0.3	0.4	1.4	0.3
Indirect taxes *of which*	10.4	10.6	41.5	4.7
VAT	6.7	6.8	26.5	3.5
Specific Excise Taxes	0.8	0.8	3.3	0.5
Ad valorem Excise Duties	0.1	0.1	0.3	–
General Fuel Levy	1.3	1.3	4.9	0.6
Contributions to social security, *of which*	2.6	2.6	10.4	0.9
Unemployment Insurance Fund	0.4	0.4	1.6	0.5
Road Accident Fund	0.5	0.6	2.2	0.3
Compensation Fund	0.3	0.2	0.9	0.1
Government Employees Pension Fund	1.4	1.5	5.7	–

Overall, taxes constitute 25.5 percent of GDP in the administrative data [5]. In our analysis we model taxes and contributions to social security to the amount of 10.7 percent of GDP. The difference is driven by two elements: firstly, we do not include corporate income tax as there is no satisfactory way of determining the incidence of these taxes on individual households; secondly, low coverage of consumption in the survey leads to an under-allocation of indirect taxes (Section 3.2).

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[5] Throughout this report we will distinguish between administrative data – data collected by government as part of their operations – and data from the household survey.

1.2. Expenditure

A CEQ Assessment concentrates on social expenditures, which constituted 62.0 percent of primary government spending in 2014. As we explain in Box 1 on CEQ Assessment caveats, we do not include spending on infrastructure, general public services, public order and safety, economic affairs, recreation, culture and religion, and environmental protection, amongst others. We nonetheless acknowledge the importance of inequalities in the distribution and quality of these services.

Primary government expenditure decreased slightly from 2010/11 to 2014/15, from 29.8 to 26.6 percent of GDP, while spending on social protection, education, health and housing decreased from 17.9 to 17.6 percent of GDP.

In 2014/15, education was the largest of South Africa's spending programmes at 6.4 percent of GDP and 23.9 percent of primary government spending. This is up from 6.2 percent of GDP in 2010/11. The largest component of this is spending on primary education.

Spending on social protection was 17.8 percent of primary government spending in 2014/15, and remained unchanged from 4.7 percent of GDP in 2010/11. All cash transfers decrease slightly from 3.2 to 3.1 percent of GDP as a result of a decrease in the size of the disability grant, care dependency grant, and the foster care grant. The main cash transfer programmes, however, were the old age grant and the child support grant, which together made up 9.0 percent of primary government spending, and increased slightly from 2.3 to 2.4 percent of GDP.

Spending on health was 14.0 percent of primary government spending, and reduced to 3.7 percent of GDP in 2014/15 from 3.8 percent in 2010/11.

The Human Settlements Development Grant constituted 1.6 percent of primary government spending and 0.4 percent of GDP in 2014/15, down from 0.5 percent in 2010/11.

Table 2. South African government social spending
Source: authors' calculations and 2018 Budget Review

	2010/11 Percent of GDP	2014/15 Percent of GDP	Share of primary government spending (%)	Incidence analysis (% of GDP)
Primary Government Expenditure	29.8	26.6	100.0	–
Social Spending	17.9	17.6	66.1	10.7
Social Protection	4.7	4.7	17.8	3.3
Cash Transfers	3.2	3.1	11.7	3.0
Old age grant	1.2	1.3	4.8	1.3
Disability grant	0.6	0.5	1.8	0.5
Child support grant	1.1	1.1	4.3	1.1
Care dependency grant	0.1	0.1	0.2	0.0
Foster care grant	0.2	0.1	0.5	0.1
Free basic services	–	0.8	3.0	0.3
Education	6.2	6.4	23.9	3.5
Health	3.8	3.7	14.0	3.2
Housing & Urban	3.2	2.8	10.5	0.5
Human Settlements Development Grant	0.5	0.4	1.6	0.5

Overall, social spending constituted 17.6 percent of GDP and two-thirds of primary government spending[6] (66.1) in 2014/15. This is amongst the highest of all the countries for which CEQ Assessments have been completed (Figure 1). Of this social spending, we allocate 10.7 percent of GDP in the survey. In addition to the social grants, education and health, and RDP housing, we also analyse the subsidies provided for free basic services, namely water, electricity, refuse and property rates.

1.3. International comparison

The size of South Africa's personal and payroll taxes as a share of GDP is larger than all other countries for which CEQ Assessments have been completed (a selection of the 42 assessments are shown here, chosen for geographical relevance or size), while the indirect taxes and contributions to social security are around the median size. We show a selection of relevant countries below, chosen for being on the continent, or for being in the group of major emerging market economics – Brazil, Russia, India, China, South Africa (BRICS).

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[6] Total expenditure less interest paid on debt.

Figure 1. Components of a. Revenue (top panel) and b. Social spending (bottom panel) as a share of GDP

Source: Brazil (Higgins, Pereira & Cabrera, 2019), Burkina Faso (World Bank, 2018), Egypt (Lara Ibarra et al., 2019), Ethiopia (Hill, Inchauste, Lustig, Tsehaye & Woldehanna, 2017), Ghana (Younger, Osei-Assibey & Oppong, CEQ Master Workbook: Ghana (2012-2013), 2018), Kenya (Pape, 2018), Mexico (Scott et al., 2017), Russia (Popova, 2019), Tanzania (Younger, 2019), Uganda (Jellema, Haas, Lustig & Wolf, 2018) (available at www.commitmenttoequity.org). Note that in the above graphs we choose selected countries from the CEQ Data Center based on their policy relevance either through geography (being on the African continent), through membership in political alliances such as the Brazil, Russia, India, China, and South Africa (BRICS) agreement for major emerging market economies, or as a country which South Africa is often compared to, like Mexico – due it's high inequality, crime rate, and large economy.
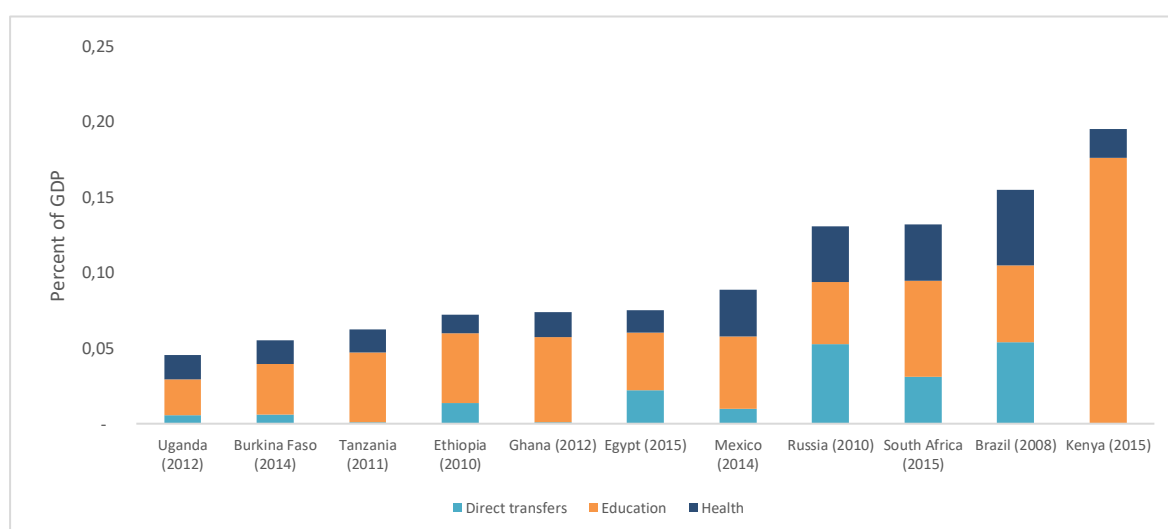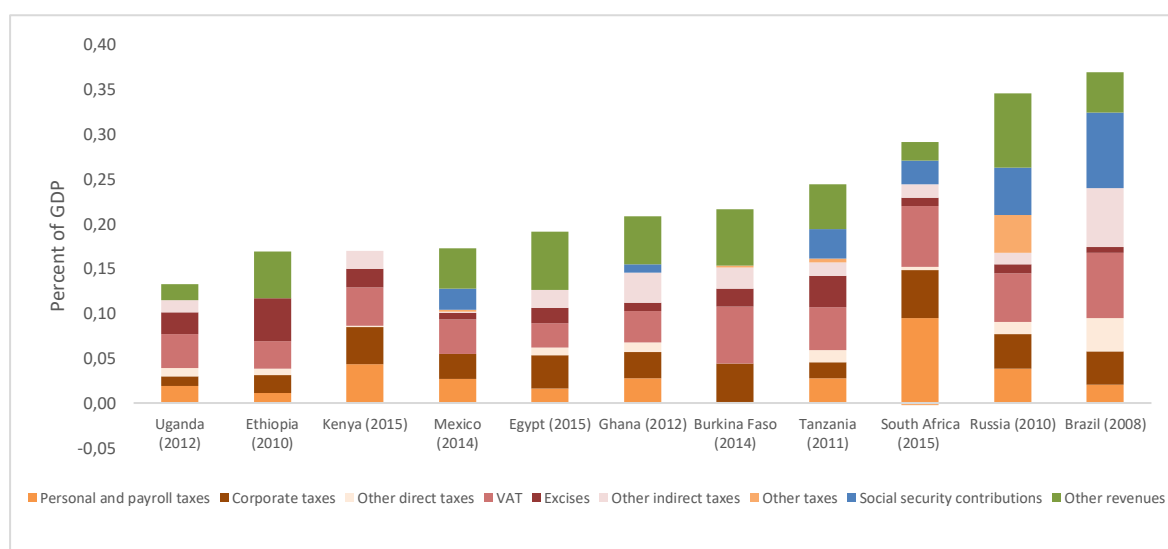
2. Methodology, data and measurement

2.1. Methodology

The CEQ framework permits systematic analysis of the distributional impact of taxes and public spending using a common methodological framework developed by the CEQ Institute and presented in the CEQ Handbook (Lustig, 2018). A CEQ Assessment takes specific fiscal policy elements, programmes, expenditures, or revenue collections and allocates them to individuals and households appearing in a micro-level socio-economic survey.

The building block of fiscal incidence analysis is the construction of income concepts. Starting from market income, each new income concept is constructed by adding another element of the fiscal system to the previous one, as shown in Figure 2[7].

Once the allocations are made, an analysis calculates different measures of poverty and impoverishment, inequality and progressiveness, and the amount of redistribution accomplished on the income concepts that exclude (pre-fiscal) and include (post-fiscal) these fiscal policy elements.

Regarding pensions: a CEQ Assessment generally has two scenarios for the treatment of public contributory pensions, one where pensions are treated as deferred income, and another where they are treated as a government transfer[8]. However, as discussed in Section 2, South Africa does not have a publicly funded contributory pension programme[9]. In this case, the two scenarios are equivalent, and market income is equal to market income plus pensions.

We construct net market income by subtracting direct taxes and contributions to social security from pre-fiscal income. In the case of South Africa, the direct taxes consist of the personal income tax and the skills development levy (SDL) payroll tax. Direct contributions to social security consist of the unemployment insurance fund (UIF), and the compensation fund.

We construct disposable income by adding direct transfers to net market income. Direct transfers consist of social grants, free basic services, and housing transfers in the baseline scenario. We calculate two different scenarios for the treatment of housing transfers, which will be detailed in the sections below. In the baseline we include housing as a near-cash transfer, and in an alternative scenario we include it as an in-kind transfer.

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[7] A CEQ Assessment can start with market income and work backwards, or start with disposable income and work backwards and then forwards. For comparability, all results analysed here started with setting disposable income equal to the official welfare aggregate. We then work backwards to calculate net market income and pre-fiscal income, and forwards to calculate consumable and final income.

[8] See Lustig (2018) for more information.

[9] Although it does have other contributory systems such as unemployment insurance.

We construct consumable income by subtracting indirect taxes and indirect contributions from disposable income, namely the VAT, specific excise taxes on alcohol and tobacco, the general fuel levy and the contributions to the road accident fund.

We construct final income by adding the in-kind transfers to consumable income. These include the monetised value of education and health transfers, and in-kind housing transfers in the alternative scenario.

Figure 2. CEQ income concepts, the case of South Africa 2014/15
Source: adapted from Lustig (2018).

Pre-fiscal / Market income + Pensions Wages and salaries, income from capital, private transfers; retirement income, alimony and remittances.	
- Direct taxes & social security contributions Personal income tax & SDL payroll taxes Contributions to UIF & Compensation Fund	**Net market income**
+ Direct transfers Social grants, Free basic services, Near-cash housing transfers	**Disposable income**
- Indirect taxes & contributions VAT, Excise, Fuel Levy, RAF contributions	**Consumable income**
+ In-kind transfers Education, Health, [Housing transfers]	**Final income**

Note that while we look at the contributions of the in-kind transfers to inequality, we do not take poverty measurements at final income. This is because the poverty line is constructed by estimating the price of a basic basket of goods. The method that we use for calculating the in-kind transfers is based on the *cost* of providing the service, and does not tell us how much additional purchasing power an individual has as a result of the receipt of the service or asset. We therefore cannot estimate the change in that individual's ability to purchase that basic basket of goods.

Box 1. Methodological weaknesses of a CEQ Assessment

CEQ Assessment caveats

A CEQ Assessment should be interpreted with a number of important caveats in mind.

1. The analysis excludes important categories of taxes and spending, such as spending on infrastructure, corporate income taxes (an important share of government revenues), defence, and other public goods because no generally accepted methodology exists for assigning these benefits or burdens to any single individual. We therefore cannot take into account where government service provision of public goods is skewed towards one or another ethnic group, gender, or race, and may, therefore, substantially underestimate the degree of inequality and overestimate the equalising impact of public policy.

2. A CEQ considers only the *redistributive* effects of taxes and transfers and redistribution is only one of many criteria that matter when making public policy. A CEQ Assessment does not attempt to assess the sustainability of taxes and transfers from the macroeconomic, demographic, or natural capital perspectives, nor the impact on future levels of inequality, poverty, or vulnerability from fiscal policies that positively impact current economic growth. Results should be weighed with other evidence before deciding whether a tax or a benefit is desirable in its present form or should be reformed.

3. The fiscal incidence analysis used in CEQ Assessments is an accounting framework and is point-in-time. It is a first order approximation and does not incorporate behavioural or general equilibrium effects. This limits the framework in important ways, namely:

  a) CEQ results cannot inform the trade-offs between spending on transfers to alleviate poverty in the present and investments in physical and human capital (through health and education expenditures, for example,) that could lead to large impacts on well-being in the future through higher economic growth.

  b) CEQ Assessments cannot measure the redistributive role of pensions in an intertemporal framework, which is important to accurately estimate the true redistributive impact of pensions.

  c) The CEQ framework currently ignores the behavioural responses that taxes and transfers trigger and which may imply important trade-offs in terms of efficiency, effectiveness, and sustainability of the fiscal redistribution compact.

4. In-kind benefits from free government services in education and health are valued at the average cost of provision. We make use of inputs rather than the impact of the spending. Such an approach ignores the fact that the "true" value to consumers and the returns on investments in human capital may be quite different from what they cost the government, due to, for example, poor quality and waste.

5. CEQ analysis is based on household surveys and the contribution to government revenues from the richest individuals in society is very poorly reflected if at all. If the richest are excluded from the analysis, it is difficult to assess the fairness of the tax and transfer system and its impact on inequality in full. We have, however, attempted to correct for this by an adjustment of the household weights to match the income tax records.

Adapted from Lustig (2018)

2.2. Data

To determine the size of each tax and transfer that we allocate to each household, an assessment requires a nationally representative survey that includes at a minimum income and consumption records, and health and education modules. We use the Living Conditions Survey (LCS) 2014/15 conducted by Statistics South Africa. The survey has two primary objectives of informing the consumer price index (CPI), and poverty statistics[10]. Information was collected from 23 380 households during a period of 12 months, from October 2014 to October 2015 (Statistics South Africa, 2017).

We also include results from an update of the previous CEQ Assessment (Goldman, Houts & Jellema; forthcoming) based on Inchauste et al. (2017) using the 2010/11 Income and Expenditure Survey (IES), and supplemented by the health module from the National Income Dynamics Survey (NIDS).

Working with different surveys reduces the comparability of the results, despite the similarities in the content of the surveys. In particular, while the NIDS modules asks about the number of health visits and actual healthcare facility which was visited during a particular period, the LCS asks only about the *usual* healthcare facility visited. This has led to differences in the distribution of health transfers. In addition, the IES income module does not directly identify formal workers, and groups incomes less finely than the LCS. The implications of these changes for the results are discussed in Section 6.1, which compares the marginal contributions of both years for different categories of instruments.

The survey suffered from a particularly high non-response rate in the province of Gauteng, which accounts for a third of all consumption items. The consumption expenditure coverage in the survey is slightly lower than in 2010/11, at 0.58, and in particular affects consumption expenditure on food, beverages and tobacco (Statistics South Africa, 2017). Table 3 summarises the coverage, that is, the ratio of consumption of household income and consumption expenditures in the survey to the national accounts. In Section 3.3, we explain the reweighting exercise which was undertaken and which results in a change to income and consumption coverage. These results are also shown in Table 3.

We use the information on taxes and transfers explicitly available in the surveys unless there are reasons to believe that it is not reliable. In the case of specific excises on alcohol and tobacco, for example, given the issues with coverage mentioned in the paragraph above, we work with the administrative data[11]. Where not collected in the household survey, or unreliable, we use administrative data on revenues and government expenditures and knowledge of the tax and transfer programmes to allocate the taxes and transfers.

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[10] The previous South African assessment used the Income and Expenditure Survey (IES) 2010/11, which was conducted on 25 328 households.

[11] This is explained in more detail in Section 4.4 on indirect taxes.

Table 3. Survey coverage
Source: authors' calculations based on LCS 2014/15 and IES 2010/11

Survey	Sample size	Households surveyed	Consumption coverage[12]
IES 2010/11	31 319	25 328	0.61
IES 2010/11 Reweighted			0.65
LCS 2014/15	30 818	23 280	0.58
LCS 2014/15 Reweighted			0.60

A CEQ Assessment can start with market income and work forwards, or start with disposable income and work simultaneously backwards to market (pre-fiscal) income and forwards to final (post-fiscal) income. The official poverty statistics work with consumption expenditures, and so the results analysed here begin by setting the official welfare aggregate equal to disposable income and working backwards to market income and forwards to final income.

2.3. Reweighting [13]

As mentioned in Box 1(5), often the richest households are poorly captured in household surveys. Where we have administrative income tax records, however, we can observe what the actual income distribution is for individual income taxpayers. We know that the household survey contains 11.5 million income-tax-registered individuals in the survey versus 15.3 million in the Budget Review (National Treasury, 2014). The actual proportions of taxpayers in each bracket are shown in column 2 of Table 4, compared to the survey proportions shown in column 4. Before reweighting, the top 1 percent of taxpayers in the administrative data earn about R1.5 million annually in gross income, versus R223 000 in the survey data. While adjusting the weights of the household survey is not to be done lightly, we judge it worthwhile given that our analysis rests on accurate information on distribution.

We adjust the household weights in the survey such that the proportion of income taxpayers in each income bracket matches the administrative records. Where house-holds have more than one income taxpayer in different income brackets, we assign the household to the bracket of the taxpayer with the highest taxable income. We then adjust the weights of the households in the various brackets by a factor increasing with the size of the income bracket[14].

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[12] For consumption coverage, we compare the official consumption aggregate, as calculated by Stats SA, with households and non profit institutions serving households (NPISHs) final consumption expenditure, as recorded in the World Development Indicators database (available at https://data.worldbank.org/indicator/NE.CON.PRVT.CN?locations=ZA).

[13] The total income tax amount in the 2015 Budget Review is higher than the amount recorded in the budget for 2015. We therefore use estimates as published in the 2014 Budget Review.

[14] Individuals in the lowest-earning bracket decrease from 58.9 percent of all tax-registered individuals to 57.9 percent. Individuals in the highest-earning income bracket increase from 0.4 to 1.0 percent of all tax-registered individuals.

**Table 4. Comparison of taxpaying individuals before and after reweighting**
Source: authors' calculations based on LCS 2014/15

	Taxpaying individuals					
Taxable income bracket	1. Admin	2. Share of total	3. Survey	4. Share of total	5. Reweighted survey	5. Share of total
R0 - 70 000	8 835 791	0.58	6 760 767	0.59	6 654 417	0.58
R70 001 - R150 00	2 758 078	0.18	2 162 197	0.19	2 077 009	0.18
R150 001 - R250 0	1 644 142	0.11	1 304 554	0.11	1 238 148	0.11
R250 001 - R350 0	852 656	0.06	596 743	0.05	642 044	0.06
R350 001 - R500 0	531 173	0.03	347 400	0.03	399 918	0.03
R500 001 - R 750	346 123	0.02	190 762	0.02	260 582	0.02
R750 001 - R1 000	132 917	0.01	66 690	0.01	100 073	0.01
> R1 000 001	154 111	0.01	50 979	0.00	116 017	0.01
Total	15 254 991	1.00	11 480 091	1.00	11 488 208	1.00

The survey population reduces slightly after the reweighting from 54.7 million individuals to 54.6, and the number of poor at the upper bound poverty line (UBPL) reduces by 23 000 individuals[15]. The number of taxpaying individuals increases by R8 100. After the reweighting, the average tax payment in the survey and admin data are close in all the tax brackets except the highest bracket. Using more detailed information on the upper end of the distribution would help to better match the administrative records in the future. The change in income taxes paid per bracket due to the reweighting is shown in Figure 3 below.

Figure 3. Adjusted gross taxable income by National Treasury's taxable brackets in administrative records, and before and after reweighting
Source: authors' calculations based on LCS 2014/15, and (National Treasury, 2014)

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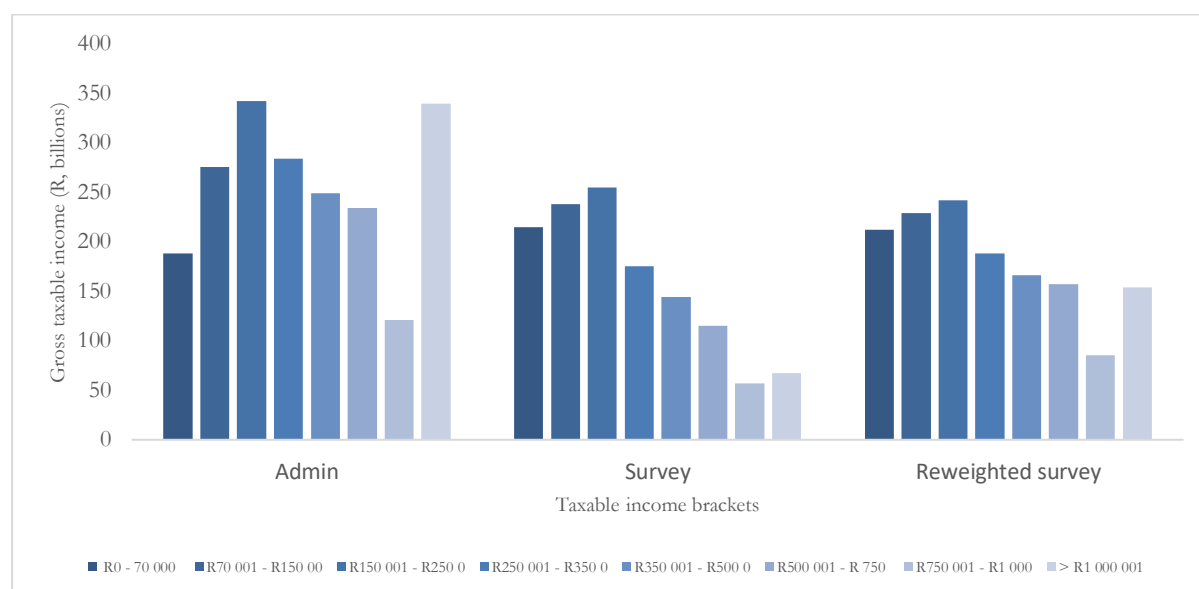
[15] The number of poor at the LBPL reduces by 0.14 million individuals, and the number of poor at the food poverty line reduces by 0.08 million individuals.

Reweighting the survey in this manner results in a 0.14 percentage point drop in poverty[16] and an increase in consumption coverage[17] from 0.58 to 0.60. The drop in poverty is due to the reduction in the weights of the lower-earning households in lower tax brackets. Our disposable income poverty headcount is therefore 39.6 percent at the LBPL, rather than the 39.7 percent before the reweighting (Table 14). The increase in consumption is due to the increase in weights of the richer households. After the reweight, coverage increases from 0.58 to 0.60 in 2015, and from 0.61 to 0.65 in 2011 (Table 3). We show both sets of results for comparison in Section 5, and we use the reweighted results in the analysis that follows.

The LBPL, at R647 per month, falls in the 6th decile of market income, and the 5th decile of disposable income. The food poverty line, at R441 per month, falls in the 5th decile of market income and the 3rd decile of disposable income. The UBPL, at R992 per month, fall in the 7th decile of market income and the 6th decile of disposable income. The ranges of monthly income for each decile of market and disposable income after reweighting are shown in Table 5a, and the accompanying chart in 5b shows the impact of the reweighting.

Table 5. a. Monthly per capita consumption expenditure ranges, by deciles, market and disposable income, b. Minimum monthly per capita disposable income (consumption expenditures) by decile, before and after reweighting
Source: authors' calculations based on LCS 2014/15

	Reweighted survey			
	Market income (R)		Disposable income (R)	
Deciles	Min	Max	Min	Max
1	–	–	27	262
2	–	105	262	377
3	105	255	377	506
4	255	421	506	655
5	421	640	655	851
6	640	989	851	1 164
7	989	1 621	1 164	1 701
8	1 622	2 990	1 702	2 763
9	2 991	6 689	2 763	5 674
10	6 691	–	5 675	–

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[16] We measure this at our starting income – disposable income.

[17] By survey coverage we mean the ratio of total consumption in the survey to total households & non-profit institutions serving households (NPISHs) final consumption expenditure.
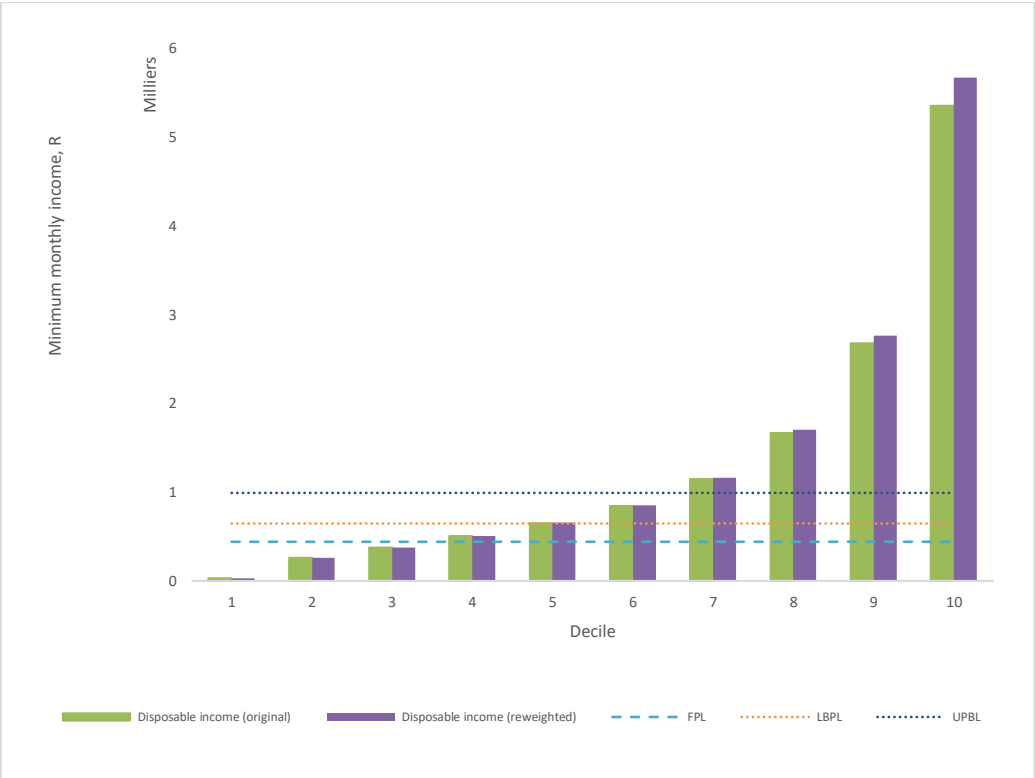
3. Allocating the income concepts

3.1. Direct taxes

Direct taxes are taxes levied directly on income. Here we define the personal income tax and the skills development levy payroll tax as direct taxes. The skills development levy is a payroll tax designed to finance training initiatives, as per the skills development strategy. It is funded only by employer contributions. We assume full pass through of contributions to the employee in the form of lower wages, and therefore allocate the 1 percent of payroll skills development levy contributed by employers to individual employees.

We impute income tax payments by applying statutory rates[18] to households' income records, tax deductible retirement and medical aid contributions (Table 7). We directly identify households working in the formal sector in the survey however we pick up only 63 percent of income tax in the survey (Table 3) likely because survey coverage is only 60 percent after reweighting.

Table 6. Income tax rates
Source: South African Revenue Service (2015)

Taxable income (R)	2015/16 Income tax rate	Taxable income (R)	2011/12 Income tax rate
R0 – 181,900	0.18	R0 – R150 000	0.18
R181,900 – 284,100	0.26	R150,001 – R235,000	0.25
R284,101 – 393,200	0.31	R235,001 – R325,000	0.30
R393,201 – R550,100	0.36	R325,001 – R455,000	0.35
R550,100 – R701,300	0.39	R455,001 – R580,000	0.38
R701,300 +	0.41	R580,001 +	0.40

SDL contributions are only levied on organisations with a payroll greater than R500 000. Given that we are unable to observe the size of the organisation for which an employee works, we likely allocate too much in SDL contributions at the lower end of the distribution and the results of the SDL contributions in the model likely appear more regressive than they are in reality. In total we allocate 0.79 percent of the budget amount in the survey.

Table 7. Direct taxes
Source: authors' calculations based on LCS 2014/15

Tax or contribution	Beneficiaries (Millions)			Payments (R, Billions)		
	Admin	Survey reweighted	Ratio	Admin	Reweighted	Ratio
Skills development levy	n.d.	4.5	n.c.	14.0	11.1	0.79
Income tax	6.4	4.8	0.8	352.0	221.1	0.63

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[18] The 2015/16 tax year months overlap more closely with the survey months than the 2014/15 tax year.

3.2. Indirect taxes

Indirect taxes are taxes levied as a proportion of the retail price, or quantity of good consumed. We allocate the value added tax (VAT), specific excises on alcohol and cigarettes and the general fuel levy. VAT and the fuel levy have a direct and indirect component. The direct component is the direct increase in the price of the good due to the tax applied to that good. In the case of fuel levies, the indirect component is the increase in the cost of other goods and services in the economy which use fuel as an input. In the case of VAT, the indirect component is the VAT on inputs used in exempt goods, which cannot be reclaimed by the supplier, and are therefore carried through to the final retail price.

The statutory VAT rate in South Africa in 2014/15 and in 2010/11 was 14 percent[19]. For all indirect taxes we impute the amount paid based on consumption records. The Value-Added-Tax Act, No 89 of 1991, treats public community activities, transport, domestic rent, education, public health (excluding medicine), and financial services (including long-term insurance policies) as exempt, and agricultural goods (animal feed, remedy, fertilizer, pesticide, plants and seed) and 41 percent of basic food products as zero-rated (this includes items such as rice, samp, eggs, fruits and vegetables). In 2011, we had information on place of purchase and were able to exclude goods bought from informal traders from VAT.

The general fuel levy was increased in line with inflation in the 2014/15 budget, but decreased to 16 percent as a share of the pump price from 21 percent in 2010/11 (for 93 Octane petrol, for example)[20], and specific excise rates are laid out in Table 10 below.

Table 8. Specific excises
Source: authors' calculations based on National Treasury (2010, 2014)

Specific excises	2010 Budget	2014 Budget	Nominal percentage change	Unit
Malt beer	R50.20	R68.92	0.37	R/ litre of absolute alcohol
Traditional African beer	R0.08	R0.08	–	R/ litre
Traditional beer powder	R0.03	R0.03	–	R/ kg
Unfortified wine	R2.14	R2.87	0.34	R/ litre
Fortified wine	R4.03	R5.21	0.29	R/ litre
Sparkling wine	R6.67	R9.11	0.37	R/ litre
Ciders and alcoholic fruit beverages	R2.52	R3.45	0.37	R/ litre
Spirits	R84.57	R137.54	0.63	R/ litre
Cigarettes	R8.94	R11.60	0.30	R/ 20 cigarettes
Cigarette tobacco	R9.73	R13.03	0.34	R/ 50g
Pipe tobacco	R2.70	R3.63	0.34	R/ 25g
Cigars	R47.66	R61.87	0.30	R/ 23g

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[19] This has since been increased to 15 percent in April 2018.

[20] The general fuel levy on 93 octane petrol was 224.5 cents per litre in 2014/15, and the pump price was 1375 cents per litre. In 2010/11, the General fuel levy was 167.5 cents per litre, and the retail pump price was 785 cents per litre (South African Reserve Bank, 2017).

The direct component of VAT is calculated on the final retail price of the good, based on the statutory rate and whether the good is standard-rated, zero-rated, or exempt. Indirect effects are calculated using an IO table - a model of the flow of outputs from industries that are used as inputs into other industries (Statistics South Africa, 2014). To account for informality, we calculate *effective* VAT rates[21]. We use the method described in Harris et al. (2018)[22] to generate an effective rate of VAT for each IO sector, such that the effective index in the survey matches the effective index in the national accounts. The effective index (the ratio of total VAT to total household consumption) as per the national accounts in 2014/15 was 10.8 percent. Finally, we exclude all VAT on durables so as to calculate a consumable income amount comparable to disposable income (the consumption aggregate).

For excise, we scale down the national accounts excise total as reported in the budget for survey coverage, and distribute this amongst households according to their shares of consumption of each item. This is rather than calculating excise by applying a rate to the existing consumption records which would result in too low an estimation of household excise payments due to the extensive underreporting of consumption records for alcohol and cigarettes in the survey (Statistics South Africa, 2017).

Regarding the fuel levy (General and RAF contributions), we apply an average statutory rate to household fuel purchases to calculate the direct effects. The statutory rate comes to about 24 percent of the retail price (South African Reserve Bank, 2017), of which 16 percent is the fuel levy and 8 percent is contributions to the Road Accident Fund. We use the Jellema et al. (2018) price shifting method to calculate the indirect effects.

For the indirect taxes we allocate between 52 and 60 percent of the budget amount. This is mainly due to the low rates of consumption coverage in the survey (Table 3), and secondly because we exclude VAT on durables. See Harris et al. (2018) for a detailed discussion of the methodology and assumptions used here.

Table 9. Indirect taxes
Source: authors' calculations based on LCS 2014/15

Tax	Payments (R, Billions)		
	Admin	**Reweighted survey**	**Ratio**
VAT	261.3	136.5	0.52
General fuel levy	48.5	25.1	0.52
Specific excise taxes	32.3	19.4	0.60

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[21] Note that this method assumes a constant level of informality across all households. While the survey requests information on place of purchase, which should allow us to distinguish between goods sold formally or informally and apply VAT to the former, Stats SA did not include this information in the LCS 2014/15 dataset, but we did have that information in the 2010/11 IES dataset.

[22] The method is based on the price-shifting model elaborated in Jellema et al. (2018) and includes a differential treatment of imports and exports.

3.3. Contributions to social security

There are three social security funds included in the analysis, namely the UIF, the RAF, and the Compensation Fund. The UIF is deducted explicitly off wage income, the Compensation Fund contributions are made by employers as a proportion of turnover, and the RAF contribution resembles an indirect tax in that an individual contributes a proportion of the fuel retail price to the fund and therefore their contributions increases as their consumption increases.

Importantly, social security funds contain a contributions component and a benefit component. As a result of data limitations, however, we model only the incidence of contributions here. This should be kept in mind when analysing the results.

The UIF provides benefits to workers who are out of work due to retrenchment or illness, or on maternity leave (including adoption). It also provides a death benefit. Employees contribute 1 percent of their salaries in UIF contributions up to a ceiling of R148.72 per month, and employers contribute 1 percent of payroll. We assume that employers' contributions are directly passed on to employees in the form of lower wages, and therefore allocate the full 2 percent to the individual employee.

National and provincial public servants and members of the National Assembly, the National Council of Provinces and municipal councils do not pay UIF contributions. These individuals cannot be identified in the LCS 2014/15 dataset. This is likely the reason why total UIF contributions allocated in the survey are higher than the budget contributions at a ratio of 1.1.

The compensation fund provides insurance for workers who have been injured or contracted disease at work, or have died as a result. Its main revenue source is levies paid by employers based on turnover, with rates that vary by an organisation's sectoral level of health and safety risk. The survey does not include information on the sector in which an individual works[23], nor the profit that an organisation makes linked to an individual's wage. We therefore impute the amount by allocating the budget amount of the compensation fund, scaled down for consumption coverage in the survey (as per Table 3), to workers in the formal sector, based on their share of total wage income in the sector. We allocate 60 percent of the budget total.

The RAF covers all drivers for injuries or death sustained from road accidents. All drivers contribute through a tax on fuel consumption. The tax constituted 8 percent of the fuel pump price in 2014 and 2015. We calculate the direct and indirect incidence of the RAF contributions in the same way as the general fuel levy. The method is discussed in more detail in Section 4.5 on indirect taxes. We allocate 55 percent of the budget total, due to lower rates of fuel consumption in the survey than in the national accounts.

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[23] While this information was requested in the survey, the data was not included in the LCS 2014/15 dataset.

Table 10. Contributions to social security

Source: authors' calculations based on LCS 2014/15

	Payments (R, Billions)		
Tax or contribution	Admin	Survey	Ratio
Unemployment Insurance Fund	15.8	17.6	1.12
Compensation Fund	8.4	5.1	0.60
Road Accident Fund	21.7	12.0	0.55

3.4. Direct transfers

The old age grant, disability grant and the child support grant constituted 93 percent of grant expenditures in both 2015 and 2011. Grant beneficiaries and amounts were directly identified in the survey for the old-age pension, disability grant, child support grant, care dependency grant and the foster care grant. The grant-in-aid was not well identified and we exclude it from the analysis.

The number of old age grant beneficiaries increased from 2.6 million in 2010/11 to 3.1 million in 2014/15, and reached 3.8 million beneficiaries by 2020 (National Treasury, 2020). In April 2015 the maximum disbursement amount increased from R1350 to R1410 per month, and in 2018 it increased further to R1600 per month. We identify 3.2 million beneficiaries in the survey, and allocate R51.8 billion – 106 percent of total disbursements in the budget.

The disability grant targets people of working-age who are unable to work due to chronic illness or disability. The number of disability grant recipients decreased slightly from 1.2 million beneficiaries in 2010/11 to 1.1 million in 2014/15, and 1.05 in 2018. The disbursement value is the same as the old age grant. We identify 1.2 million beneficiaries in the survey and allocate R18.5 billion – 99 percent of total disbursements in the budget.

The child support grant (CSG) is available to all primary caregivers who pass a means test. The eligibility threshold is set at ten times the amount of the grant. From 2009, the grant was extended from ages 0-13 years to include children aged 14 years. From 2012, the CSG has been available to children until they turn 18 years. The number of CSG recipients increased from 10.2 in 2010/11 to 11.7 million beneficiaries in 2014/15. It has increased further to 12.9 million by 2020. The value of the CSG was R330 per month in 2014/15, up from R250 in 2010/11, and in 2020 (pre-Covid19) was R440 per month. We identify 60 percent of the CSG recipients, and allocate 95 percent of the disbursements in the budget.

The remaining 7 percent of the social grant budget is spent on the care dependency grant, the foster care grant, the war veterans grant (which had only 326 beneficiaries in 2014/15), and social relief of distress. The care dependency grant is for caregivers of severely disabled children and is the same amount as the old age grant. The foster care grant is available to foster parents of children. The disbursement amount was increased

from R830 per month to R860 per month in April 2015. We identify 90 percent of the care dependency grant beneficiaries, and allocate 75 percent of the budget, and we identify 50 percent of the foster grant beneficiaries, and allocate 57 percent of the budget. We do not allocate the war veterans grant, nor social relief of distress.

Table 11. Direct transfers
Source: authors' calculations based on LCS 2014/15 and National Treasury (2020)

Grant	Beneficiaries (millions)			Disbursements (R, billions)		
	Admin	Survey	Ratio	Budget	Survey	Ratio
Old age grant	3.1	3.2	1.04	49.0	51.8	1.06
Disability grant	1.1	1.2	1.10	18.7	18.5	0.99
Child support grant	10.2	6.4	0.63	43.7	41.4	0.95
Care dependency grant	0.1	0.1	0.88	2.2	1.7	0.75
Foster care grant	0.5	0.2	0.50	5.4	3.1	0.57
Grant-in-aid	0.1	0.0	0.12	0.4	–	–

3.5. Free basic services

Local government legislation (such as the Municipal Property Rates Act 6 of 2004) contains a mandate for municipalities to provide relief for the poor in the way in which they charge for municipal services (property rates, water, electricity, and sanitation and refuse removal). The free basic services policy is determined and implemented by local government, and funded by the Local Government Equitable Share. Some municipalities target indigent households with free basic services – essentially providing direct transfers to indigent households – and others use a block tariff system which indirectly subsidises households that consume less electricity.

Reliable data does not exist to determine the actual value of the subsidy amounts provided to households, nor the numbers of recipients. Municipalities determine their own criteria for identifying and registering indigents. In 2015, out of 278 municipalities, 158 municipalities classified an indigent household as a family earning a combined income of less than R2700 per month. Fourteen municipalities adopted a threshold of less than R1600 per month, and 67 municipalities adopted a threshold above R2700 per month (Statistics South Africa, 2016). We do not have data on the municipality in which the household is located[24], and therefore what threshold would apply.

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[24] Stats SA do not release this information. They explain that this is because the survey is not representative at the municipal level.

For the purposes of the simulation, we assume an eligible household to be a family earning a combined pre-fiscal income of less than R2700 per month, with access to electricity from the grid. This picks up more than 4 million households (26 percent of the dataset), compared to the 3.56 million indigent households reported in the non-financial census for 2015. In order to simulate actual recipients of the free basic services, we then randomly select 3.56 million households from the pool of eligible households.

This method simulates an upper bound of the potential impact of the free basic services were it applied as intended by policy, as a targeted, direct transfer to households[25]. We allocate a subsidy of R293 per month per recipient household, which is the National Treasury's estimate of the cost of providing basic services in 2014/15 (National Treasury, 2014). In total we allocate 12.4 billion, which is 28 percent of the equitable share provided by National Treasury for local government in the 2014 budget.

3.6. In-kind transfers

3.6.1 Beneficiaries

An individual in the survey that reports currently attending a public education facility, and being in either pre-school, primary, secondary, college or tertiary education[26] is allocated a subsidy. However, **i**mplausible ages matched with grades suggest that there may be a slight problem with reporting on schooling enrolment in the survey. For early childhood education we treat pre-school and Grade R education as combined, we exclude creches, and we include students recorded as enrolled in primary school and less than 5 years of age. For primary and secondary schooling we restrict the beneficiaries by age. Primary school students are restricted to ages 7 to 18. Secondary school students are restricted from ages 12 to 18. The resulting number of beneficiaries is 105 percent of the administrative numbers for early childhood education, and exactly 100 percent for primary and secondary education.

We restrict the beneficiaries of higher education institutions (HEIs) and college transfers to students older than 15, and the resulting numbers are 85 to 86 percent of the budget numbers. In the case of HEIs, the sample excludes students in residences so we expect the numbers to be less than 100 percent of the administrative numbers (Table 11).

We identify all education transfer recipients directly, except for the recipients of the National Student Financial Aid Scheme (NSFAS) and the recipients of independent schools' subsidies[27]. We simulate NSFAS recipients as college or tertiary education students who report access to a scholarship that covers all fees or that reported an amount amassed in student debt over the last 12 months, with a household income below the R120 000 annual threshold for disposable income, and that received a loan worth less than

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[25] Inchauste et al (2017) model both scenarios and demonstrate that the free basic services will always be more progressive if it targets indigent households than if municipalities implement a block tariff to cross-subsidise the poor.

[26] We limit primary school students to individuals between the age of 5 and 18, and secondary school students to individuals between the age of 13 and 25.

[27] We do not update the 2010/11 round with the NSFAS transfers due to lack of available information.

the 2015 maximum loan amount of R67 200 (SALDRU, 2017). This method identifies 33 percent of the number of disbursements as recorded in the administrative data – this could be improved in future rounds with a specific question in the survey.

The South African Schools Act (No. 84 of 1996) allows for subsidies to be granted to independent schools. While the provincial budgets provide information on the amount spent in subsidies, the National Department for Basic Education does not record information on how many independent learners were subsidised (National Treasury, personal communication, September 15, 2020) and we were unable to identify which independent schools in the survey were subsidised. We therefore spread the independent school subsidy amongst all independent primary and secondary school learners.

For health transfers, the survey allows us to identify individuals that were sick and sought care in the last month. We do not directly identify where that specific consultation took place – whether at a public or private hospital or primary healthcare facility. However, we are able to simulate this information using a question on where the individual *usually* goes when they are sick. We then scale this information to match the administrative data on numbers of hospital visits and primary healthcare (PHC) consultations, by province. We exclude individuals with private medical insurance (medical aid)[28].

Table 12. Student enrolment and healthcare consultations: comparison of administrative and survey data
Source: authors' calculations based on LCS 2014/15, Education Statistics in South Africa 2014 (Department of Basic Education, 2016), Statistics on Post-School Education and Training in South Africa 2014 (DHET), Budget Review (National Treasury, 2018), and HMIS data (DH, unpublished)

| | Students enrolled (millions) | | | | | | | Health facility consultations (millions) | |
	Pre-primary & Grade R	Public primary	Independent primary	Public secondary	Independent secondary	Colleges	HEIs [1]	Hospital	PHC [2]
Admin	0.8	6.9	0.3	4.4	0.2	0.7	1.0	25.8	129.4
Survey	0.8	6.8	0.4	4.4	0.3	0.6	0.8	10.3	85.7
Scaling factor	–	–	0.69	–	0.56	–	–	2.5	1.5
Ratio after scaling	1.0	1.0	1.0	1.0	1.0	1.2	1.2	1.0	1.0

Notes: [1] Higher Education Institutions; [2] Primary Healthcare Centres

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[28] This method differs from the 2010/11 assessment, where an alternate survey allowed for direct identification of patient visits to particular institutions. These visits were imported to the IES dataset via province-decile shares of visits, where the calculated average subsidy per province was imputed to all observations.

3.6.2 Subsidies

For pre-school, primary and secondary education we calculate a per capita subsidy that varies by province, by using Estimates of Provincial Revenue and Expenditure tables (National Treasury, 2016/7) and provincial enrolment numbers (Department of Basic Education, 2016).

Of the schooling subsidies, the public primary and secondary subsidies are the largest. The cost per student to provincial governments of a year of primary school ranges from R10 800 per year in Gauteng to R13 000 per year in Mpumalanga. The cost of a year of secondary school ranges from R11 200 per year in the North West province to R146 000 per year in Gauteng and the Northern Cape[29].

We calculate the subsidy for independent primary and secondary schools as the ratio of provincial budget amounts to all potential subsidy recipients – that is to say – all students enrolled in primary and secondary schools[30]. The subsidy provided for independent primary and secondary schools is small in comparison to the primary and secondary school subsidies because it is spread amongst a pool of potential recipients. This could be improved in future models with more detailed information about subsidy allocations by province. The subsidy for independent primary schools ranges from R300 per student in the Northern Cape up to R4 300 in the Free State. The subsidy for independent secondary schools ranges from R500 per student in Mpumalanga up to R5 000 per student in the Free State.

The pre-school and grade R subsidy is highest in the Western Cape and North West province at about R8 200 per year. In other provinces the subsidy ranges between R1 100 (Limpopo) and R5 600 per student (Gauteng).

College and higher education are a national function and we therefore use the national budget data (National Treasury, 2018) **and national enrolment numbers** (DHET, 2014)[31]**.** The cost to government per student of a year of tertiary education is substantially higher than all other levels of schooling. A year of tertiary education is subsidised at R22 000 per year in 2014/15 (authors' calculations). In contrast, a year at a training college cost only R11 500, in the same range as the primary and secondary school subsidies.

In 2015, the NSFAS loans to technical and vocational education and training (TVET) students were all converted to grants. We calculate an average grant per TVET student of R8 500 as the ratio of total TVET disbursements to total TVET students assisted National Student Financial Aid Scheme (n.d.).

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[29] In the Eastern Cape all primary and secondary spending is combined into one combined school subsidy for both primary and secondary school of R13 000 per year.

[30] Essentially we calculate an expected value, and assign all independent school students an equal probability of being subsidised, given that we have no other information to the contrary.

[31] The 2015 Publication was not available, and so we used 2014 numbers only.

NSFAS disbursed 60 percent of its disbursements to university students as bursaries in 2015, and the remainder were loans. From inception to 2015, the percentage of repayment on disbursements (bursaries and loans) has been 9 percent[32]. For university students we therefore assume that 91 percent of all disbursements are grants, and we calculate an average subsidy of R34 100 for all students as the ratio of the total grant amount (bursaries plus non-recoverable loans) to the total number of university students assisted.

Figure 4. Annual cost per student, by level of schooling and province
Source: authors' calculations based on 2014/15 Estimates of Provincial Revenue and Expenditure Tables (National Treasury, 2016/7), and Education Statistics in South Africa 2014 (Department of Basic Education, 2016).
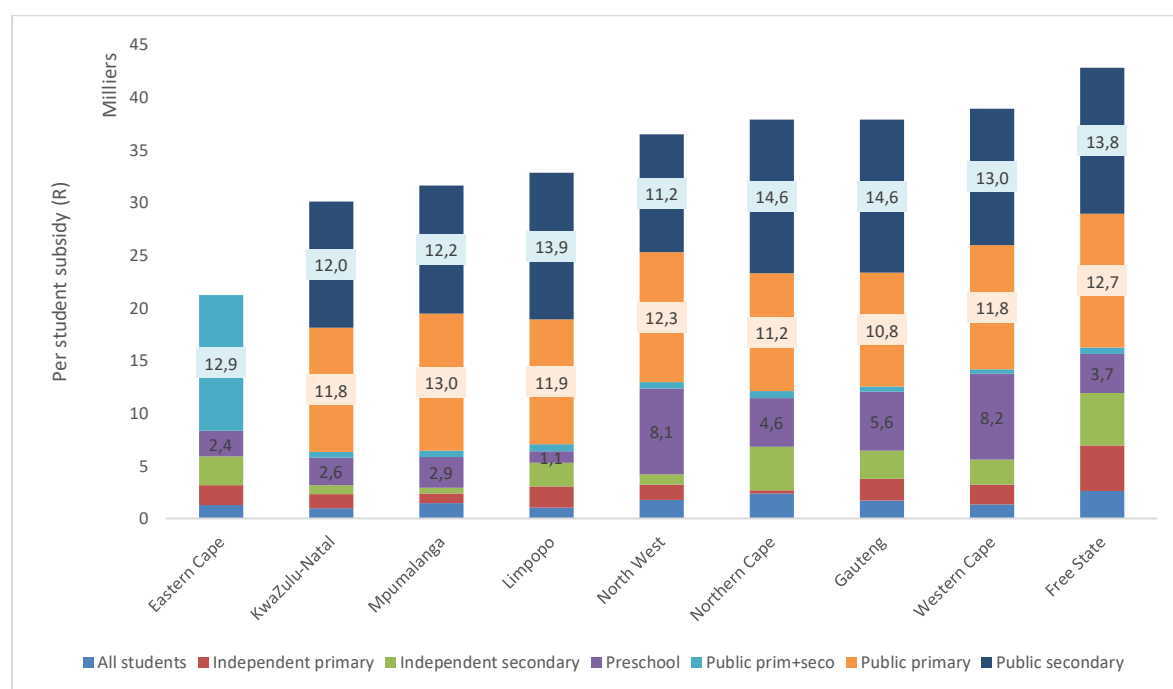
* Eastern Cape secondary school spending is treated as combined primary and secondary school spending according to advice from National Treasury employees that Eastern Cape schools are combined schools.

As with the education transfers, a per capita subsidy for hospital and primary health-care facilities is calculated using administrative data on health expenditures and health visits. We calculate the ratio of the budget data[33] to the numbers of consultations, for both levels of care – hospital[34] (Department of Health, 2020) and primary healthcare as per the Budget Review (National Treasury, 2018)[35]. The cost of a hospital consultation is substantially higher than the cost of a consultation at a primary health-care facility (PHC). The cost of providing a hospital consultation ranges from R2 400 in

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[32] We calculate this as the amount collected in loan repayments since inception over the total disbursements since inception, from the NSFAS annual report (2015: p69).

[33] Using National Treasury's 2016/7 Estimates of Provincial Revenue and Expenditure tables.

[34] We calculate hospital visits as the number of inpatient deaths + the number of discharges. This is different to the number of inpatient separations which includes transfers to another facility.

[35] Note that we include HIV/AIDS subprogramme spending in the PHC subsidy, as the PHC headcount includes HIV-related visits. We include TB and psychiatric hospital subprogramme spending in the hospital subsidy.

Mpumalanga to R5 100 in the Northern Cape and North West Province. In contrast the cost per primary healthcare consultation is between R160 (in KwaZulu-Natal) and R280 (in the Free State). [36]

Figure 5. Annual cost per health consultation, by level of healthcare and province
Source: authors' calculations based on 2014/15 Estimates of Provincial Revenue and Expenditure Tables (National Treasury, 2016/7), and the District Health Information System (Department of Health, 2014/15).
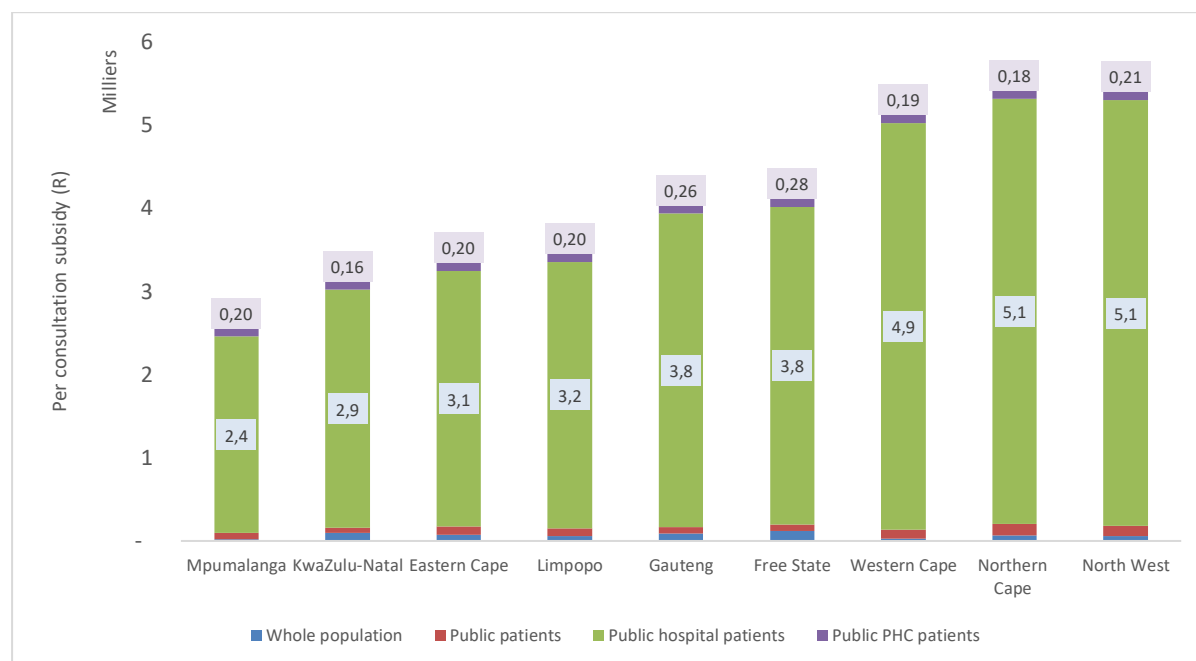
3.7. Housing

The Reconstruction and Development Housing Programme (RDP) was created in 1994[37] and allowed a beneficiary to acquire a house built and provided for by government. We directly identify households who own a subsidised house in the survey, as well as the year that the house was acquired[38]. We observe close to 2 million beneficiaries in the survey, compared to 2.65 million reported by the Department of Human Settlements (DHS).

We model the housing subsidy in two different ways within the CEQ Assessment framework. For both methods, we are estimating (the value of) the annual flow of housing services, and we allocate the transfer only to subsidised houses acquired post-1994.

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[36] In addition to subsidies provided to hospital and PHC patients we allocate a benefit of between R29 and R120 to the whole population for activities that have positive externalities and we allocate a per capita subsidy to all patients between R61 and R143 for the costs of the health system as a whole.

[37] The income threshold for those who qualify for state-provided houses (RDP houses) has remained at R0 – R3500 monthly per household.

[38] 82 percent of the subsidised households do not have information on year of acquisition. Where households with subsidised houses do not report the year of purchase, we assume the year to be post-1994. In the 2010/11 round there was no question on year of acquisition, so all government subsidised houses are taken into account.

In the baseline scenario we allocate the near-cash transfer value of the free housing provided, that is to say, the amount of additional purchasing power a household has available due to the housing subsidy. Given that there is a secondary housing market for free housing provided (although by law an RDP house cannot be sold prior to 8 years of ownership), we assume that the imputed or market rental value of the house is a measure of the additional purchasing power that such a house can provide, and we allocate that amount. The median value per household of the near-cash transfer is increasing by decile or market income, likely because the imputed rent (market value) of subsidised housing for wealthier individuals is affected by location.

In an alternative scenario, we allocate the in-kind transfer value of the free housing provided, which is to say a proxy value for the actual housing asset that a household receives. We allocate the subsidy only to those households that have purchased their housing in the last 20 years (Table 12). In this scenario, similar to health and education, we use the government cost value of the in-kind housing transfer which we estimate to be R29 000 per year[39]. This is higher, on average, than the subsidy value in the baseline scenario in all but the 10th decile of market income.

Table 13: By decile: median imputed rent and number of beneficiary households
Source: authors' calculations based on the LCS 2014/15

Decile of market income	1	2	3	4	5	6	7	8	9	10	All
Median imputed rent (R'000, annual)	2.5	2.6	5.3	5.3	5.3	5.3	5.3	5.4	12.3	48.5	5.3
Beneficiary households (thousands)	253	213	241	225	241	249	217	166	85	26	1 916

In the alternative scenario, as with the health and education in-kind transfers, we do not estimate a contribution to poverty reduction. Housing is very valuable, but providing a very valuable house (as an in-kind transfer) to someone at the bottom end of the income distribution that they cannot monetise does not help them to purchase a basket of goods.

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[39] Based on personal communications with National Treasury, we assume the principal cost of a Breaking New Ground (BNG) house to be R250 000, and the repayment interest rate to be 10 percent. We also assume that the loan will be paid off in constant monthly instalments within a 20-year period. Using these assumptions, the monthly repayment value is R2412.55, and the annual repayment value is R28 950.65.

4. What is fiscal policy's impact on poverty and inequality?

4.1. Inequality

With the reweighting[40], we find that fiscal policy reduces the Gini coefficient by a total of 19.1 points, starting from 0.737 at pre-fiscal income and ending at 0.546 post fiscal intervention (Table 14). All the fiscal instruments are inequality-reducing except the indirect taxes. Analogous results without reweighting are shown in Table 14 below.

The largest decrease in inequality occurs through the introduction of the direct transfers (7.7 Gini points), and the in-kind transfers (9.4 Gini points) (Table 14). Starting with a pre-fiscal (market) income of 0.737 we subtract direct taxes and social security contributions to calculate net market income[41]. This reduces the Gini by 2.1 Gini points, and results in a Gini coefficient of 0.716. We add in direct transfers to get to disposable income, which gives us a Gini coefficient of 0.638 (a reduction of 7.7 Gini points)[42]. We subtract the indirect taxes and contributions from disposable income to create consumable income with a Gini of 0.640 (an *increase* in inequality of 0.1 Gini points). And finally, when we add in the health and education transfers, we reduce the Gini further to 0.546 (a decrease in inequality of 9.4 Gini points).

The overall impact of fiscal policy appears slightly larger in 2011 (Inchauste et al., 2017; Goldman, Houts, & Jellema, forthcoming), at 20.0 Gini points, than in 2015, at 19.1 Gini points. The divergence in results is largely empirical, driven by differences in the underlying survey populations and (despite our best attempts to make the results comparable) methodologies that vary due to differences in the survey data.

The result is driven by a larger change at net market income in 2011, due to the direct taxes, and at final income, due to the in-kind transfers. The impact of the direct transfers appears smaller in 2011. The differences at net market income is the result of a reduced impact of the income tax in 2015. This is possibly because taxpayers were simulated in 2011, thereby picking up a wider net of taxpayers than in 2015. It may also be due to the reduced detail in the IES module on income sources. We consider the 2015 result to be more accurate.

The increased impact at final income is driven by the contributions of the health transfers (Section 6) and mitigated by the reduced contributions of the education transfers. The change in the contribution of the health transfers is because the distribution of

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[40] From here all results reported will be using the reweighted survey unless explicitly stated otherwise.

[41] In practice we are moving backwards from disposable income to net market income, rather than forwards, because we are starting from Consumption Expenditures rather than market income. The unusually large size of direct transfers in South Africa results in a substantial number of negatives moving backwards from disposable income to net market income by subtracting the direct transfers. We adjust these negative incomes by setting them to 0, otherwise our poverty and inequality measures do not behave – for example, we get a Gini coefficient greater than 1 for net market income.

[42] Note that disposable income is created from the official welfare aggregate, and so the Gini coefficient at disposable income most closely matches the official Gini coefficient as reported by the South African government of 0.64 for 2015 (Statistics South Africa, 2017).

hospital transfers in 2011 appears more pro-poor than in 2015 (not shown here). This is likely the result of the phrasing of the questions in the LCS health module compared to the phrasing in the NIDS module, as discussed in Section 3.2 on Data. We consider the 2011 results likely to be more accurate. Regarding the education transfers, the impact in 2011 is less than in 2015, partly because we were unable to include the NSFAS transfers in the 2011 results, and partly because the impact of secondary education is larger – the transfers appear more concentrated amongst the poor, and larger in size than in 2011.

Table 14. Inequality
Source: authors' calculations based on LCS 2014/15; Goldman, Houts & Jellema (forthcoming) based on Inchauste et al., (2017) and IES 2010/11

Inequality					
Income concept	Unweighted Gini	Reweighted Gini	Change (points)	2010/11	Change (points)
Pre-fiscal income	0.727	0.737	–	0.735	–
Net market	0.710	0.716	2.1	0.706	2.9
Disposable	0.630	0.638	7.7	0.640	6.5
Consumable	0.632	0.640	0.1	0.636	0.4
Final	0.537	0.546	9.4	0.536	10.0
Total fiscal impact (Gini points)	**19.0**	**19.1**	**–**	**20.0**	**–**

Note: any substantial changes between 2011 and 2015 are mostly to do with small methodological differences as a result of differences in the survey.

South Africa, in both 2015 and 2011, has the highest pre-fiscal income inequality and does more to redistribute than any other country available in the CEQ Institute's database (Figure 6). Belarus has the lowest pre-fiscal income inequality in the database. At final income the Gini coefficient for South Africa remains higher than all other countries in the database except for Honduras (2011).

Figure 6. International comparison, change in Gini coefficient (ranked by pre-fiscal income inequality)
Source: authors' calculations based on LCS 2014/15 and Brazil (Higgins, Pereira, & Cabrera, M, 2019), Burkina Faso (World Bank, 2018), Egypt (Lara Ibarra, et al., 2019), Ethiopia (Hill, Inchauste, Lustig, Tsehaye & Woldehanna, 2017), Ghana (Younger & Oppong, 2018), Kenya (Pape, 2018), Mexico (Scott, J., et al., 2017), Russia (Popova, D, 2019), Tanzania (Younger S., 2019), Uganda (Jellema, Haas, Lustig & Wolf, 2018) (available at www.commitmenttoequity.org), South Africa (Goldman, Houts & Jellema, forthcoming; Inchauste et al., 2017).
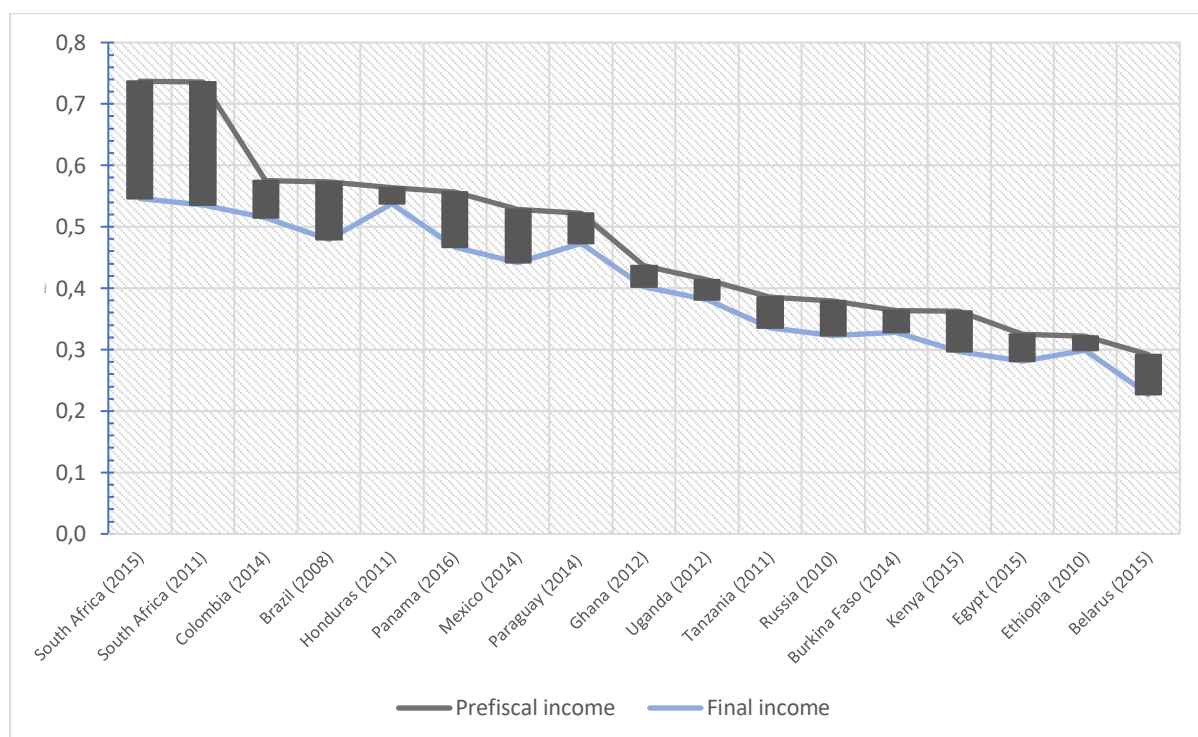
Notes: [1] In the graph above the top of the bar shows the pre-fiscal income Gini coefficient, and the bottom of the bar shows the Final (postfiscal) income Gini coefficient. The length of the bar reflects the amount of redistribution.

[2] We choose selected countries from the CEQ Data center based on their policy relevance either through geography (being on the African continent), through membership in political alliances such as the Brazil, Russia, India, China, and South Africa (BRICS) agreement for major emerging market economies, or as a country with high pre-fiscal income inequality. Belarus is included, as the country with the lowest pre-fiscal income inequality, to show the full range.

4.2. Poverty

We find that fiscal policy lifts 3.10 million people above the LBPL of R613 per month[43], starting with a pre-fiscal income poverty headcount of 50.3 percent of the population and ending with a post-fiscal poverty headcount of 45.2 percent. At the LBPL, the reweighting reduces poverty levels at all the income concepts by a small amount – 0.1 to 0.2 percentage points.

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[43] It lifts 6.26 million people out of extreme poverty (at the Food Poverty Line of R417 per month), and lifts 0.11 million people above the UBPL of R942 per month.

The direct transfers are of course poverty-reducing, and the size of the impact is large. Poverty is reduced significantly by 11.4 percentage points when we add direct transfers to net market income to calculate disposable income. We do not measure the impact of in-kind transfers on poverty, as discussed in Section 3.1 on Methodology.

By definition, taxes and contributions can only be poverty-increasing or neutral. In South Africa, at the LBPL, the largest increase in poverty occurs through the introduction of the indirect taxes and RAF contributions at 5.6 percentage points (versus 5.1 percentage points in 2011). In comparison, when we include (subtract off) the direct taxes and social security contributions to calculate net market income, poverty increases by 0.7 percentage points in 2015 (and 0.9 in 2011). These changes are most likely due to differences in methods of calculating the direct taxes and indirect taxes as a result of differences in the survey.

In 2015 fiscal policy the poverty rate at the LBPL declines by more than in 2011 from pre-fiscal to consumable income (2.9 million versus 2.7 million). This result is driven by the increase in the change due to indirect taxes in 2015, which outweighs the effects of the smaller impact of direct taxes in the 2015 model's methodology, and the larger impact of direct transfers in 2015. In the 2010/11 IES dataset, there was information on place of purchase for consumption expenditures, thereby allowing us to directly identify which goods were likely outside the VAT system, rather than assuming a constant rate of informality across all goods as we did for the 2014/15 model. Given that the poor are more likely to purchase goods from informal marketplaces, including information on place of purchase should reduce the burden of indirect taxes for the poor. We therefore expect the 2010/11 results to be closer to reality than 2014/15[44].

Table 15. Poverty
Source: authors' calculations based on LCS 2014/15; Goldman, Houts
& Jellema (forthcoming) based on Inchauste et al., (2017) and IES 2010/11
*Disposable income is set to the official welfare aggregate.

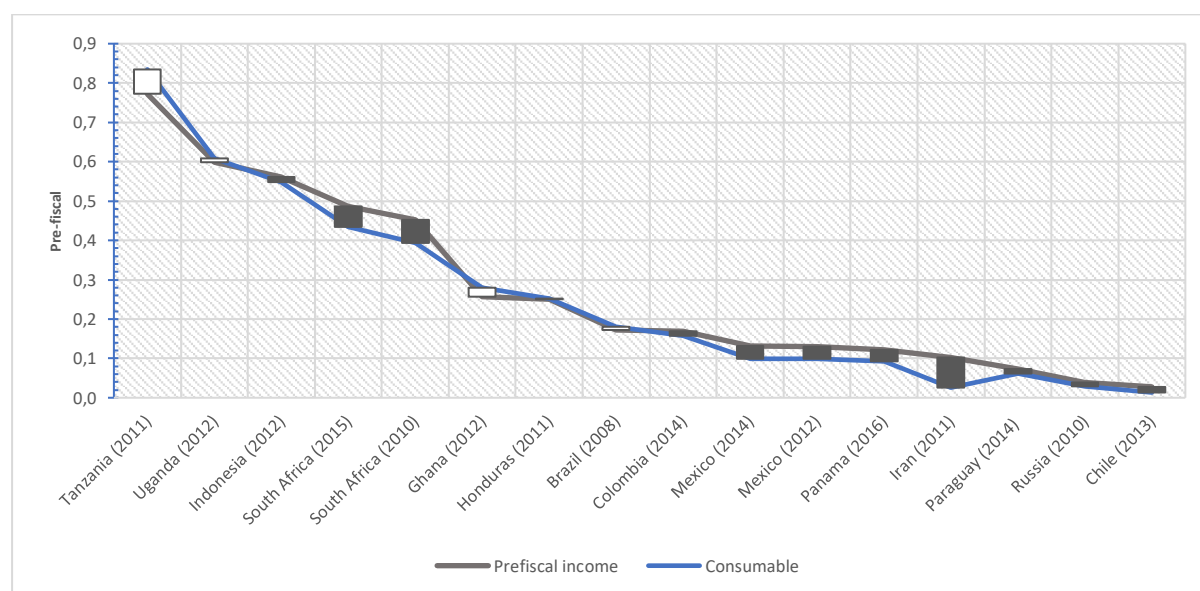|	Poverty headcount						
	2015 Reweighted				2011 Reweighted		2015 Unweighted
Income concept	FPL	LBPL	UBPL	Change (p.p.) LBPL	LBPL	Change (p.p.) LBPL	LBPL
Pre-fiscal income	41.0	50.3	60.1	-	45.5	-	50.5
Net market	41.7	51.0	61.1	- 0.7	46.5	- 0.9	51.2
Disposable*	24.9	39.6	55.0	11.4	35.5	6.1	39.7
Consumable	30.2	45.2	60.1	- 5.6	40.1	- 5.1	45.4
Total fiscal impact (perc. points)	10.9	5.1	0.1	-	5.4	-	5.1
Total fiscal impact (million people)	6.0	2.8	0.0	-	2.7	-	3.1

Note: [1] Any substantial changes between 2011 and 2015 are mostly to do with small methodological differences as a result of differences in the survey. [2] In 2015 the FPL is set at R417 p.m., the LBPL is R613 p.m., and the UBPL is R942 p.m.

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[44] As discussed in Section 5.1., the divergence in results is largely empirical, driven by differences in the underlying survey populations and (despite our best attempts to make the results comparable) methodologies that vary due to differences in the survey data.

At the internationally comparable $2.50 per person per day 2005 PPP poverty line, South Africa's pre-fiscal income poverty headcount (in 2015 and 2011) is higher than all countries with available data except Tanzania, Uganda and Indonesia. South Africa again does more to reduce extreme poverty from pre-fiscal to consumable income than any other country in the CEQ Institute's database except for Iran (2011). Nonetheless poverty remains comparatively very high. Note that we do not measure the impact on poverty at final income (after in-kind transfers) in these graphs (Section 3.1), despite that South Africa spends 38 percent of primary government expenditures on health and education.

Figure 7. International comparison, change in poverty headcount at the PPP2005 $2.50 per day poverty line, ranked by pre-fiscal income poverty headcount
Source: authors' calculations based on LCS 2014/15 and Brazil (Higgins, Pereira, & Cabrera, 2019), Burkina Faso (World Bank, 2018), Egypt (Lara Ibarra et al, 2019), Ethiopia (Hill et al., 2017), Ghana (Younger & Oppong, 2018), Kenya (Pape, 2018), Mexico (Scott et al., 2017), Russia (Popova, 2019), Tanzania (Younger, 2019), Uganda (Jellema et al., 2018) (available at www.commitmenttoequity.org), South Africa (Goldman, Houts & Jellema, forthcoming; Inchauste et al., 2017).

Notes:[1] In the graph above the top of the black bar (or the bottom of the white bar) shows the pre-fiscal income poverty headcount, and the bottom of the black bar (or the top of the white bar) shows the consumable (postfiscal) income poverty headcount. The length of the black bar reflects the amount of poverty reduction. The length of the white bar reflects the amount of increase in poverty.

[2] We choose selected countries from the CEQ Data center based on their policy relevance either through geography (being on the African continent), through membership in political alliances such as the Brazil, Russia, India, China, and South Africa (BRICS) agreement for major emerging market economies, or as a country with high Pre-fiscal income inequality or poverty headcount. Tanzania and Chile are included, as the countries with the highest and lowest Pre-fiscal income poverty headcount respectively, to show the full range.

Box 2. Matching official statistics

Using the consumption aggregate and weights provided in the publicly available dataset, we are able to match the numbers in the South African poverty assessment (World Bank Group, 2018), **but not the Statistics SA published numbers** (Statistics South Africa, 2017). Using a different aggregate and set of weights from Stats SA, we are able to get very close to the official poverty and inequality statistics. In order to see this, we refer to the unweighted disposable income measurements – it is the official consumption aggregate.

Poverty: In 2015 our poverty headcount is 39.7 instead of Statistics SA's 40.0. In 2011, our poverty headcount is 36.8, compared to the official statistic of 36.6; a difference of 0.03 and 0.02 percentage points respectively.

Inequality: In 2015 our unweighted Gini coefficient is 0.63 instead of the 0.64 recorded by Statistics SA. In 2011, our Gini coefficient is 0.64 instead of the 0.65 recorded by Statistics SA.

The consumption aggregate and weights provided in the publicly available dataset gives a population of 57.9 million and total annual consumption expenditures of R1.7 billion. The alternative consumption aggregate and weights gives a population of 54.8 million and total annual consumption expenditures of R1.4 billion.

4.3. Fiscal impoverishment and fiscal gains to the poor (FI / FGP)

This section shows what proportion of the population is _already_ poor and experiences further impoverishment versus fiscal gains. Looking at poverty before and after taxes and transfers can fail to capture the numbers of _already_ poor individuals that are made poorer – by paying more in taxes than they receive in transfers (FI) - or that experienced fiscal gains (FGP) by receiving more in transfers than they pay in taxes (Higgins & Lustig, 2016).

We find that, overall, 6.5 percent of the population is fiscally impoverished[45] by fiscal policy, while 45.6 percent of the population experience overall fiscal gains taking into account the cumulative impact of social grants, housing transfers and free basic services, together with the direct and indirect taxes and contributions to social security. Note that fiscal impoverishment and gains are by definition limited to the poor populations, the post-fiscal and pre-fiscal poor populations respectively, and so the maximum amount of fiscal gains that can be experienced is 50.3 percent (the population that is poor at market income).

Direct taxes and social security contributions, taken on their own, fiscally impoverish 16.1 percent of the population, but by a per capita average amount of only 60 cents per year. This is possibly an overestimate as the compensation fund contributions drive this result, and we have made the assumption that these contributions are passed through to all formal employees, without a minimum threshold. Only a small component of this is due to the direct taxes, as only 2.2 percent of the poor population (measured by per capita consumption expenditures at the LBPL) belongs to a household which contributes to income tax.

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[45] By which we mean, poor (measured at post-fiscal income), and made poorer by fiscal policy.

Even this 2.2 percent fiscal impoverishment from direct taxes is higher than we might expect, given the high income tax threshold, and the result is driven by cases where there is a large difference between individual taxable income (calculated based on earnings) and household per capita consumable income (calculated based on consumption expenditures) – due to a low correlation between consumption expenditures and income.

All households consume a non-zero amount, and so the entire poor population (45.6 percent measured at consumable income) experience *some* fiscal impoverishment as a result of paying VAT on standard-rated goods. In addition, large numbers of the population are consuming fuel, and so paying fuel levies and RAF contributions as well as excises on tobacco and alcohol.

While it may be tempting to conclude, therefore, that the VAT is increasing of poverty and inequality, it is important at this point to consider the fiscal system as a whole. Revenues raised from the VAT (at 6.8 percent of GDP) are more than enough to fund the social grants (at 3.1 percent of GDP) and yet when we look at the impact of the direct transfers and the indirect taxes together[46], they are impoverishing for only 5.8 percent of the population. Overall, fiscal policy impoverishes the poor by 30 cents per person annually, while it provides fiscal gains[47], overall, for 45.6 percent of the population[48], at an average amount of R5.1 per person, annually.

Table 16. FI / FGP
Source: authors' calculations based on the LCS 2014/15

	Proportion of population fiscally impoverished (FI)		Proportion of population that gain fiscally (FGP)	
	Marginal change	Cumulative change	Marginal change	Cumulative change
Post / pre fiscal headcount	45.6		50.3	
Net Market income	16.1	16.1	–	–
Disposable income	–	1.4	48.9	48.1
Consumable income	45.6	6.5	–	45.6

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[46] Measured once direct taxes are already included in the system.

[47] By which we mean, poor (measured at pre-fiscal income), and made less poor by fiscal policy.

[48] Note that the pre-poor population is 50.3 percent, which is the upper bound.

5. Marginal contributions to inequality and poverty reduction

What is driving the impact of fiscal policy on poverty and inequality? Marginal contributions measure the impact of a tax or transfer by calculating a poverty or inequality measure with and without the tax or transfer (or group of taxes and transfers). Unlike the changes in the Gini coefficient and poverty headcount that we calculated above when doing the analysis sequentially, calculating marginal contributions has the benefit of being independent of the sequence with which you include them in the system (Lustig, 2018).

We can therefore choose whether to consider the actual impact of a particular tax or transfer once all other taxes and transfers are included in the system (post-fiscal income), the impact independent of other taxes and transfers (pre-fiscal income) – or even once taxes or transfers are partially included. For policymakers it seems most useful to take into account the real-world interaction with other taxes and transfers and so in all the results that follow we show Marginal Impacts at consumable income. At consumable income we have included all taxes and transfers including housing near-cash transfers and excluding in-kind benefits of health and education (given that these do not affect purchasing power in the short-term)[49].

It is important for understanding the graphs in the next sections to note that a positive contribution signals a desirable outcome such as a *reduction* in poverty or inequality, and a negative one signals an undesirable outcome, such as an increase in poverty or inequality.

Direct transfers make the largest marginal contribution to the redistributive impact of fiscal policy in both 2015 and 2011, and to poverty reduction. The Gini coefficient is reduced by 11.3 points in 2015, and 8.9 points in 2011. The poverty headcount is reduced by 10.2 percentage points in 2015 and 10.5 in 2011.

Education is the second largest contributor to inequality reduction in 2015 at 7.8 points, and health as modelled in 2015 reduces inequality by only 3.0 points. In 2011, education transfers reduced the Gini coefficient by only 4.5 Gini points while the health transfers had a much larger impact than the education transfers, at 6.3 Gini points. We believe the 2011 health results to be more reflective of the reality with the 2015 results biased by the phrasing of the survey questions in the health module[50].

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[49] An additional benefit to looking at the results at consumable income, rather than final income, is that the impact of potential bias in the distribution of the health transfers will not influence the marginal impacts of other taxes and transfers.

[50] In 2011 there was no health module in the IES survey and the proportion of health visits per province-decile were calculated using the NIDS data. A decile-wide expected value of visits was calculated in the IES data, by province, using the NIDS health module and the admin data on visits. We expect these results to be accurate at the decile-wide level, but the within-decile inequality will be compressed. In 2015, the LCS included a health module but the phrasing of the question likely biased the results by asking about the usual place of care, rather than an actual place of care, and number of visits, within a particular period. We expect the within decile inequality to be more accurate, but the between decile inequality to be compressed. Overall, we lean towards the 2011 era results as a better reflection of between-group inequality.

Direct taxes and contributions to social security are both inequality-reducing and poverty-increasing. The impact of direct taxes and contributions to social security on both inequality and poverty appears lower in 2015. Direct taxes reduce inequality by 3.4 Gini points versus 4.7 in 2011, and create a 0.6 percentage points increase in the poverty headcount in 2015 versus 1.0 in 2011. We expect the 2015-era results to be more accurate in this case, as there is direct identification of income-tax payers in the 2015 LCS dataset and more detailed information regarding income sources, whereas formal taxpayers were simulated in the 2011 IES dataset. Contributions to social security have roughly zero impact on inequality, and a 0.2 to 0.4 increase in poverty.

Finally, indirect taxes and RAF contributions have almost no impact on inequality reduction in 2015 and 2011, but a large impact on poverty. In 2015, indirect taxes increase the poverty headcount by 5.6 percentage points, and in 2011, the increase was 4.7 percentage points. As discussed in Section 5.2, we expect the impact of indirect taxes on poverty to be overestimated in 2015 and more accurate in the 2011 model, given that information was included on place of purchase.

Figure 8. Marginal contributions to a. Redistributive effect (left panel) and b. Poverty reduction (right panel)
Source: authors' calculations based on LCS 2014/15 and Goldman, Houts & Jellema (forthcoming) based on Inchauste et al., (2017) and IES 2010/11.

Note: [1] Any substantial changes between 2011 and 2015 are mostly to do with small methodological differences as a result of differences in the survey. [2] Measured at Consumable income.

Marginal contributions are determined by the size of a tax or transfer (relative to a household's income) and by its distribution. Measuring the *incidence* of taxes and transfers by decile shows the total size of a tax or transfer relative to the total size of income in that decile. Incidence therefore provides a measure of size, and of the distribution *relative to a reference income.* Concentration shares, on the other hand, show the share of the total tax or transfer amount which is allocated to each decile. It therefore provides an *absolute* measure of the distribution of a tax or transfer, with households

allocated to deciles based on a reference income. In the analysis that follows we will consider both incidence and concentration of each of the categories of taxes and transfers to understand what is driving their marginal contributions to poverty and inequality.

The substantial impact of the social grants on both poverty and inequality can be explained by both the incidence and the pro-poor nature of the targeted and means-tested social grant spending. The incidence of the social grants in the first three deciles is second only to the education transfers and the poorest decile receives the largest con-centration of the transfers, with the proportion of income received in grants decreasing slowly by decile of market income. The free basic services, if implemented as simulated here, would be pro-poor, similar to the other social grants, and with an incidence greater than the foster care grant and the care dependency grant, and just less than the disability grant (at all deciles). The near-cash housing transfers are comparatively small in size as a share of disposable income (between 0 and 4 percent) and are concentrated in deciles 2 to 6 of the distribution – households containing individuals with per capita consumption expenditures up to R1 000 per month.

The impact of the education transfers on inequality (Figure 8a) can be explained by the size of the incidence of the education transfers in the poorer deciles relative to all other taxes and transfers. While the concentration shares are relatively flat across the deciles, with 11 percent of total expenditure accessed by the lowest earning decile and 8 percent accessed by the highest earning decile (Figure 9b), the incidence of education transfers ranges from 181 percent of disposable income in the first decile to 2 percent of disposable income in the highest earning decile (Figure 9a) – 1.5 and 3.6 times larger than the inci-dence of social grants respectively.

The direct taxes are strongly redistributive in nature. Direct taxes are targeted to the rich in both absolute and relative terms, with an incidence increasing sharply by decile of dis-posable income, with the poorest decile spending 1.6 percent of their disposable income in direct taxes, and the richest decile spending 19.9 percent of their disposable income in direct taxes (Figure 9a). This is shown even more clearly by their concentration shares (Figure 9b), with 79 percent of direct taxes concentrated in the richest decile.

In contrast, the incidence of the indirect taxes is relatively neutral. While in absolute terms more of the indirect taxes are paid by the rich because their consumption expenditures are higher (49 percent paid by the highest earning decile), relative to income, the inci-dence ranges from 11 percent of disposable income in the lowest earning decile to 14 per-cent in the 8th decile, and comes back down to 13 percent in the highest earning decile.

Figure 9. a. Incidence (top panel) and b. Concentration shares (bottom panel) of tax and transfers by decile
Source: authors' calculations based on LCS 2014/15.
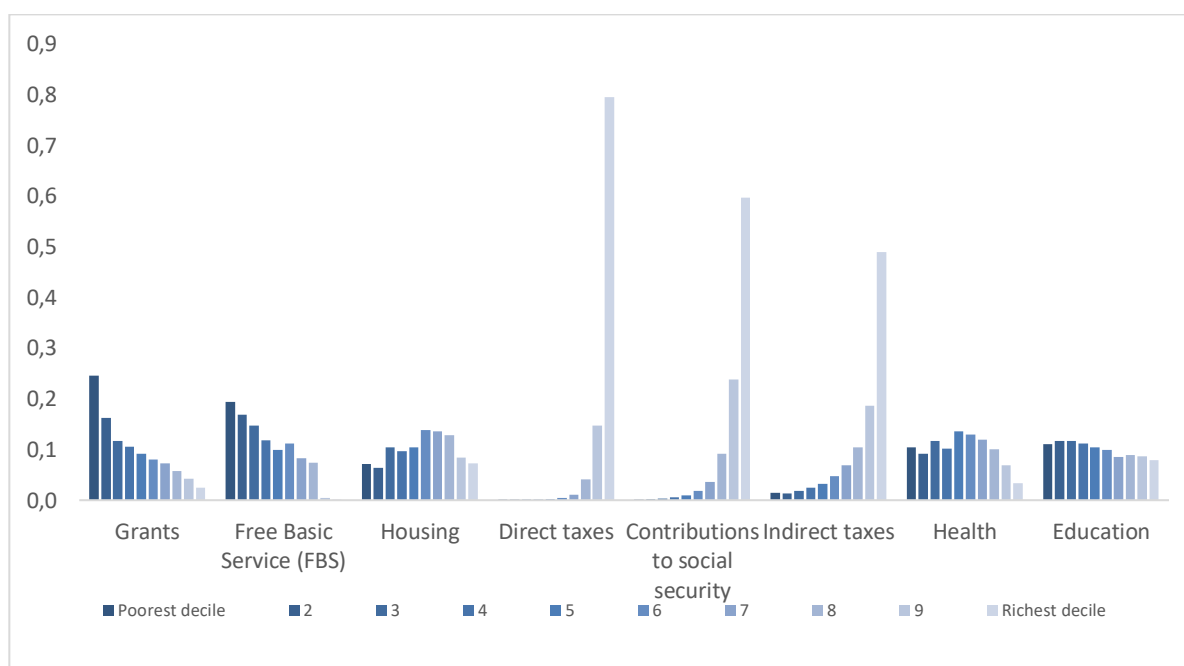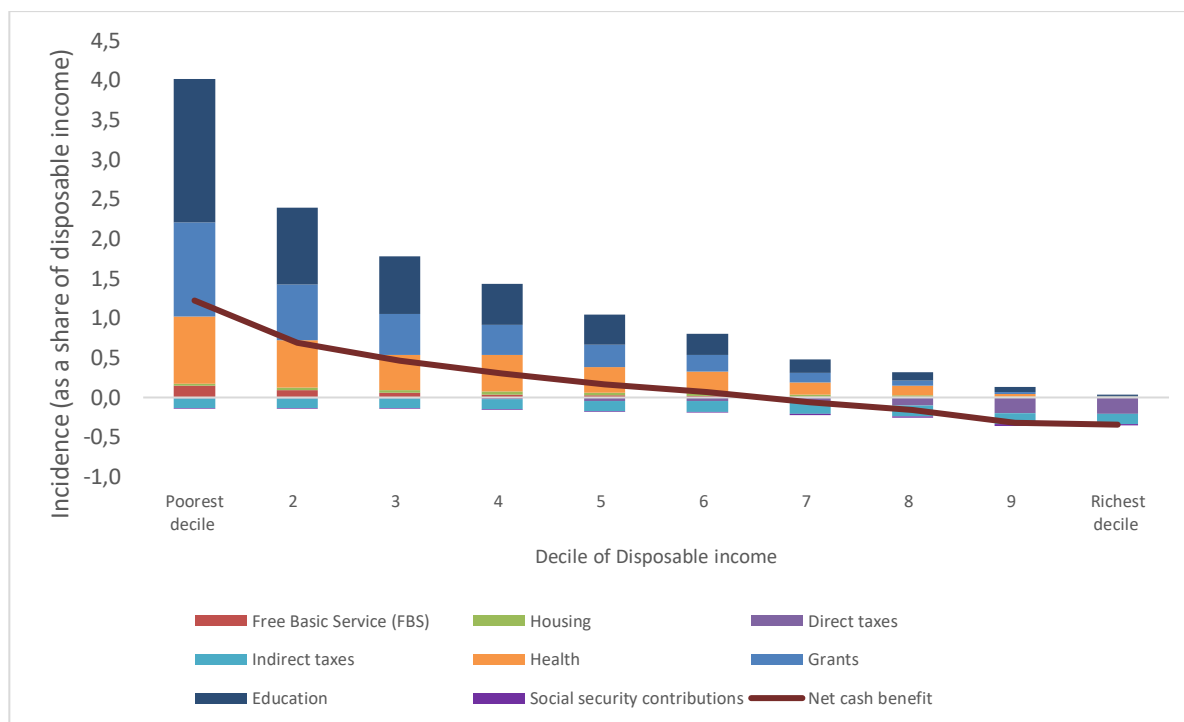
Notes: incidence is calculated by decile of disposable income (consumption expenditures). Concentration shares are calculated by decile of market income.

Table 17. Comparison of marginal contributions, relative size and concentration: 2015 vs 2011

Source: authors' calculations based on LCS 2014/15; and Goldman, Houts & Jellema (forthcoming) based on Inchauste et al., (2017) and IES 2010/11.

| Taxes and transfers | Relative size | | Concentration coefficients | | Marginal contributions | | | |
| | | | | | Redistribution (Gini points) | | Poverty reduction (perc. points) | |
	2015	2011	2015	2011	2015	2011	2015	2011
Old age grant	0.03	0.02	−0.23	−0.27	3.49	2.62	4.08	3.48
Disability grants	0.01	0.01	−0.39	−0.41	1.49	1.43	1.60	1.84
Child support grant	0.03	0.02	−0.34	−0.38	3.42	2.40	3.67	3.36
Care dependency grant	0.00	0.00	−0.46	−0.58	0.15	0.12	0.10	0.06
Foster care grant	0.00	0.00	−0.44	−0.45	0.26	0.18	0.23	0.24
Near cash housing transfer	0.01	0.01	0.05	−0.13	0.68	0.53	1.74	1.29
Free basic service	0.01	0.01	−0.32	−0.22	0.95	1.03	1.19	2.02
All direct transfers	0.09	0.07	−0.27	−0.31	11.32	8.88	10.21	10.47
All direct transfers	0.09	0.07	−0.27	−0.31	11.32	8.88	10.21	10.47
Income tax	−0.14	−0.20	0.88	0.88	3.26	4.61	−0.50	−0.89
SDL payroll tax	−0.01	−0.01	0.81	0.80	0.11	0.09	−0.06	−0.09
UIF contributions	−0.01	−0.01	0.79	0.62	0.14	−0.05	−0.18	−0.33
Compensation fund	−0.00	−0.00	0.73	0.76	0.02	0.03	−0.06	0.08
All direct taxes	−0.15	−0.20	0.88	0.87	3.36	4.69	−0.58	−1.00
All contributions	−0.01	−0.01	0.78	0.67	0.16	−0.02	−0.25	−0.44
All direct taxes & contributions	−0.16	−0.21	0.87	0.86	3.51	4.66	−0.79	−1.49
Excise	−0.01	−0.01	0.50	0.52	−0.24	−0.15	−0.99	−0.62
Fuel Levy (Genl, ind.)	−0.01	−0.01	0.57	0.71	−0.05	0.08	−0.38	−0.34
Fuel Levy (Genl, dir.)	−0.01	−0.01	0.75	0.69	0.11	0.08	−0.15	−0.50
Fuel Levy (RAF cont.)	−0.01	−0.01	0.67	0.70	0.03	0.07	−0.24	−0.39
VAT (direct)	−0.08	−0.07	0.62	0.67	−0.07	0.36	−3.84	−3.13
VAT (indirect)	−0.01	−0.00	0.69	0.73	0.05	–	−0.22	–
All indirect taxes	−0.12	−0.11	0.62	0.67	−0.13	0.44	−5.59	−4.67

All taxes	– 0.27	–0.32	0.76	0.80	2.82	4.51	– 6.04	– 5.43
All taxes & contributions	– 0.28	–0.33	0.76	0.80	2.96	4.49	– 6.18	– 5.69
PHC benefit	0.02	0.02	– 0.22	– 0.27	2.24	2.02	5.15	4.42
Hospital benefit	0.06	0.05	– 0.01	– 0.16	0.66	4.49	2.63	12.51
Whole population benefit	0.00	0.00	0.00	– 0.01	0.20	0.18	0.30	0.33
Net health transfers	0.08	0.07	– 0.07	– 0.19	2.97	6.32	7.89	19.49
Pre-R & Grade R educ.	0.00	0.00	– 0.09	– 0.09	0.16	0.03	0.35	0.10
Primary educ.	0.04	0.03	– 0.15	– 0.19	3.43	3.08	9.10	8.90
Secondary educ.	0.03	0.02	– 0.06	– 0.08	2.20	1.60	5.79	4.48
College educ.	0.00	0.00	0.27	0.40	0.14	0.08	0.35	0.28
Tertiary educ.	0.01	0.01	0.61	0.70	– 0.03	– 0.16	0.29	0.15
Net education transfers	0.11	0.07	– 0.07	0.02	7.82	4.48	22.31	14.46
Health user fees	– 0.00	– 0.00	0.38	0.30	– 0.05	– 0.04	– 0.09	– 0.11
All health user fees	– 0.00	– 0.00	0.38	0.30	– 0.05	– 0.04	– 0.09	– 0.11
Education user fees	– 0.01	– 0.02	0.65	0.66	– 0.01	0.01	– 0.52	– 0.62
All education user fees	– 0.01	– 0.02	0.65	0.66	– 0.01	0.01	– 0.52	– 0.62
All user fees	– 0.01	– 0.02	0.62	0.65	– 0.05	– 0.02	– 0.62	– 0.73

Note: any substantial changes between 2011 and 2015 are likely to do with small methodological differences as a result of differences in the survey. Relative size and Concentration coefficients calculated with respect to (and ranked by) market income. Marginal contributions calculated at consumable income.

6. Progressivity and incidence of each tax and transfer

In the analysis that follows we analyse the marginal impacts of adding an additional tax or transfer into the system at consumable income – once all cash taxes and transfers are included in the system but before the inclusion of in-kind transfers. We look at incidence as a share of either market or disposable income, and we look at concentration shares ranked by market income - so as to compare the distribution of the tax and transfer with the original distribution of earnings. We also report Kakwani Indices in Section 7.7; a summary statistics of relative progressivity.

6.1. Direct transfers

The incidence of direct transfers as a share of market income (Figure 10b) clearly demonstrates the strongly pro-poor distribution of the transfers. The child support grant and the old age grant have the largest impact on poverty and inequality, due to their large incidence, but of all the transfers they are the least concentrated in the lower deciles of the income distribution, together with the Free basic services. They have a marginal contribution to inequality reduction of 3.42 and 3.49 Gini points respectively, and to poverty reduction of 3.67 and 4.08 percentage points respectively (Figure 10a).

The care dependency grant and the foster care grant are most concentrated in the lower deciles of the direct transfers (Figure 10c). They are small in size, however, and so their contribution to both inequality and poverty reduction is small.

Free basic services and the disability grants are both medium-size. The impact of the disability grant is stronger than the free basic services, however, as it is concentrated in the lower deciles.

**Figure 10. Direct transfers a. Marginal contributions (left panel),
and b. Incidence (right panel), and c. Concentration shares (bottom panel)**
Source: authors' calculations based on the LCS 2014/15 Marginal impacts calculated
at consumable income
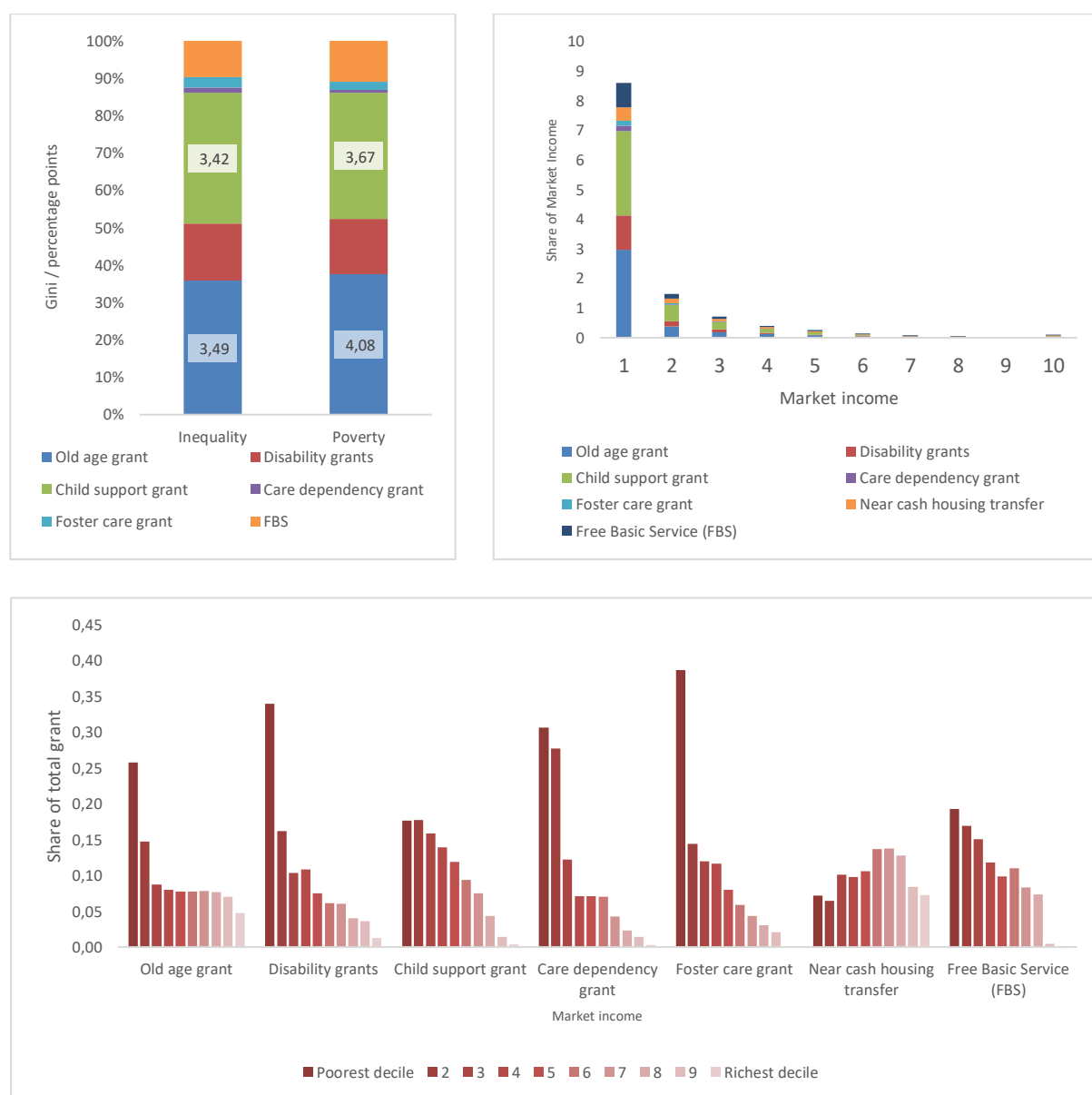

6.2. Education

Public primary and secondary education transfers are driving the large impact of education transfers on inequality (Figure 11a). This is both the result of their size in 2015 (Figure 11b), and their relative progressivity compared to college, tertiary education subsidies and NSFAS funding. Independent primary and secondary subsidies also appear strongly regressive, with the caveat that we were unable to identify which students in private schools received the subsidy, and so all private school students received a portion of spending (Figure 11c). While 12 percent of primary and 9 percent of secondary education transfers

are accessed by the poorest decile, 2 percent of NSFAS funding, zero percent of tertiary education expenditures, and 3 percent of TVET colleges expenditures is accessed by the poorest decile (Figure 11c).

Education transfers directed at higher education – TVET, tertiary and NSFAS transfers – are all accessed more by the higher earning deciles, as the barriers to access for the lower earning deciles are high. NSFAS funding goes to TVET college and university students and the NSFAS funding therefore demonstrates a hybrid of these two distributions. NSFAS is also targeted at middle income households earning less than R120 000 per year, which partly explain why the concentration drops off in the highest decile to 0 (with households containing individuals with per capita incomes of over R80 000 per year).

Figure 11. Education benefits a. Marginal contribution to redistribution (top left), b. Incidence (top right), and c. Concentration shares (bottom panel)
Source: authors' calculations based on LCS 2014/15 Marginal impacts calculated at consumable income
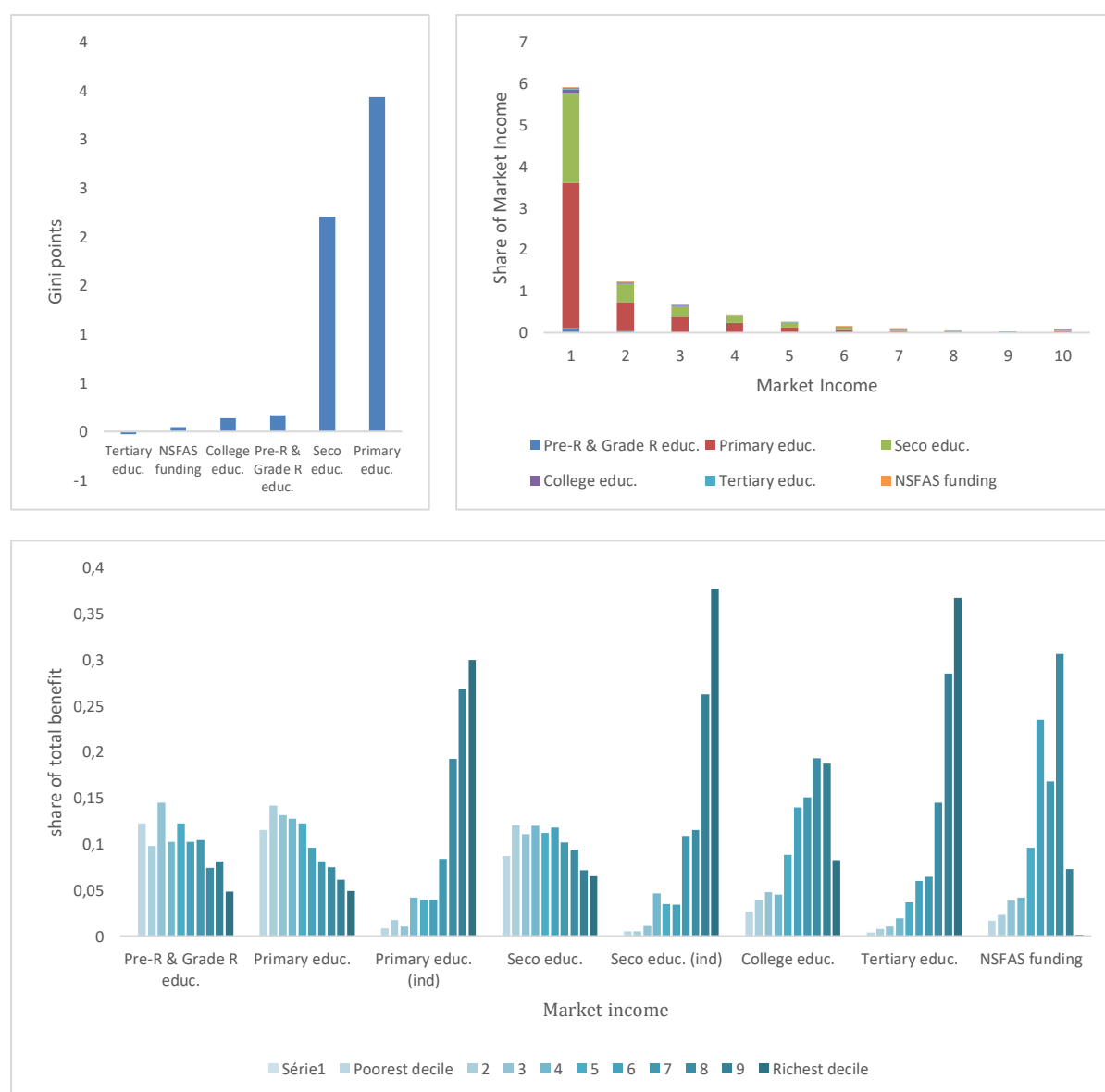
6.3. Housing

As discussed in Section 4.7, we compare the results of two different housing scenarios. In the baseline scenario, the near-cash housing transfers are added to net market income to get to disposable income, and in the alternative scenario no direct housing transfer is added, but an in-kind housing transfer is added to final income.

Housing transfers are inequality reducing. In the baseline scenario, housing reduces inequality by 0.69 Gini points and in the alternative scenario, housing reduces inequality by 2.17 Gini points. Housing transfers appear more inequality-reducing in the alternative scenario, because the size of the transfers is larger and does not decrease as earnings decrease, although this does not reflect the reality of their impact on purchasing power.

Housing transfers are poverty reducing. In the baseline scenario, they reduce poverty by 1.66 percentage points. As explained in Section 3.1 on methodology, we do not calculate the impact of in-kind transfers on poverty reduction.

In the baseline scenario, the near-cash housing transfers are added to net market income to calculate disposable income. In the alternative scenario no direct housing transfer is added at disposable income, but the in-kind housing transfer is added at final income. There is therefore no change in pre-fiscal income and net market income poverty and inequality when we move from the baseline scenario (where we estimate housing as a near-cash transfer), to the scenario where we estimate housing as an in-kind transfer. Disposable and consumable income inequality and poverty increase, however, with the removal of the near-cash housing transfer – there is a 0.6 to 0.7 Gini points increase in inequality, and a 1.5 to 1.7 percentage point increase in poverty. Adding in the in-kind housing transfers at final income (valuing the house at its cost rather than its value on the market), we see a reduction in inequality of 1.5 points more than in the baseline scenario.

Table 18. Comparison of the impacts on poverty and inequality of the housing scenarios
Source: authors' calculations based on LCS 2014/15 Poverty headcount calculated using the LBPL

| Income concept	Inequality			Poverty		
	A. Near-cash housing transfer	B. In-kind housing transfer	Change (Gini points)	A. Near-cash housing transfer	B. In-kind housing transfer	Change (p.p.)
Disposable	0.638	0.644	−0.6	0.396	0.411	−1.5
Consumable	0.640	0.646	−0.7	0.452	0.473	−1.7
Final	0.546	0.531	1.5	0.173	0.144	2.9
Total fiscal impact (Gini / percentage points)	19.10	20.62		32.98	35.91	

Treating housing as a near-cash transfer provides the greatest benefits to deciles 6 and 7, at 14 percent of the total housing allocation. The poorer deciles receive less benefits, starting at 6-7 percent of the housing allocation in deciles 1 and 2, due to the smaller imputed rental values of their houses. (In Section 4.6 we saw that imputed rent for subsidised housing was increasing with income. Further research to better understand what is driving this result could be important for policymaking.) The incidence in the higher earning deciles is lower at 7 to 8 percent of the housing allocation because fewer house-holds are accessing subsidised housing, as expected given the eligibility threshold of R3500 per month.

Treating housing as an in-kind transfer makes the subsidy appear more pro-poor than in the baseline as each household receives the same transfer value. The concentration coefficient for the in-kind housing transfer is -0.15 versus 0.29 in the baseline scenario. Figure 12 shows that the concentration of the in-kind housing transfers is higher than the near-cash housing transfers in deciles 1-5, almost the same in decile 6, and lower in deciles 7-10.

The variation in concentration by decile in this scenario is driven solely by numbers of beneficiary households in each decile (the subsidy is the same for all households in the case of the in-kind transfer). The in-kind housing transfer results are therefore reflective of the pro-poor distribution of free housing and they do not take into account the differing abilities of households to use their housing assets to raise cash.

Figure 12. Housing concentration shares
Source: authors' calculations based on the LCS 2014/15
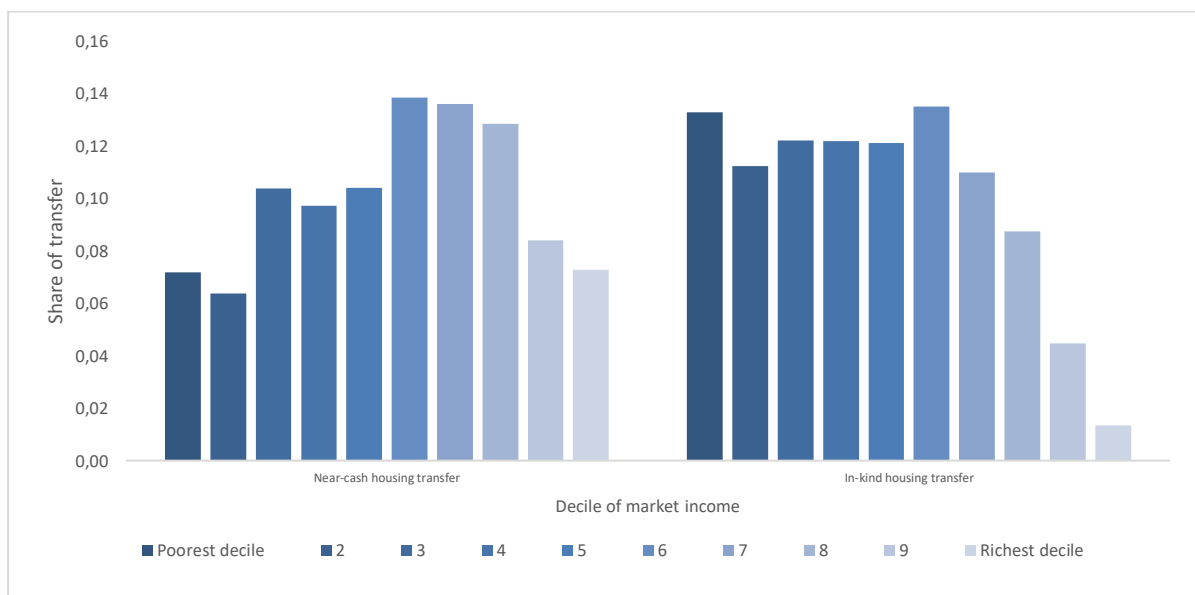
The marginal impact on inequality of in-kind housing transfers measures access to housing, whereas the impact of the near-cash housing transfers tells us how well the poor are able to monetise their housing assets. We see that access to housing transfers is more progressive than the purchasing power that is gained from it, as the richer house-holds appear better able to monetise their housing assets.

6.4. Health

Primary healthcare transfers have a greater impact on inequality (a reduction of 2.24 Gini points), than the hospital healthcare transfers (a reduction of 0.66 Gini points). The poorest decile accesses 15 percent of all PHC benefits, and as income increases households use the primary healthcare system less – and use the private healthcare system more (own calculations).

Hospital concentrations, on the other hand, appear to show barriers to access for the poor, with access increasing with income for the poorer half of the distribution, and the 5th and 6th deciles receiving the largest share (14 percent each) of total hospital benefits.

Figure 13. Health transfers, a. Concentration shares (top panel) and b. Incidence (bottom panel)
Source: authors' calculations based on LCS 2014/15 Marginal impacts calculated at consumable income
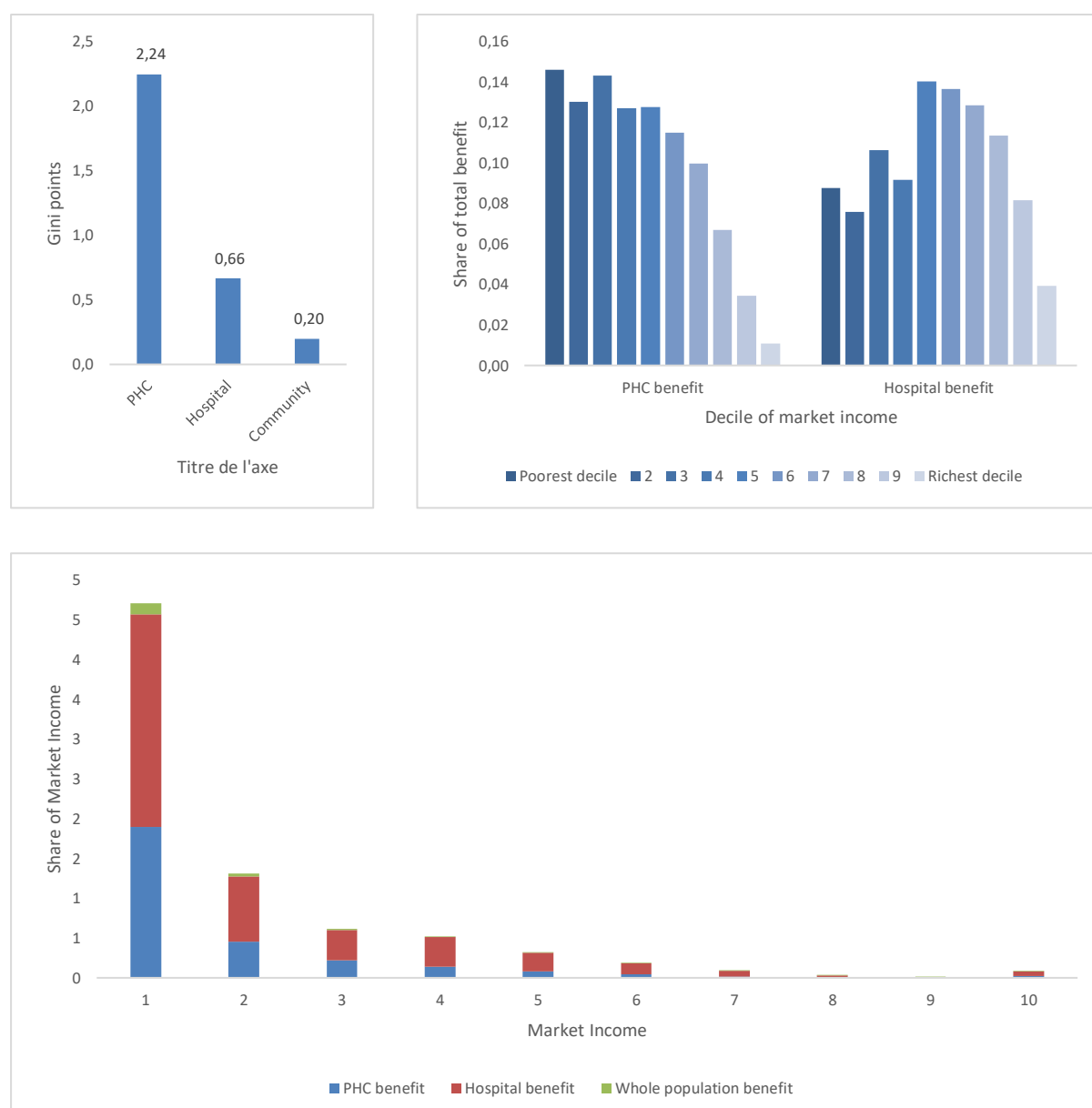
6.5. Taxes

Overall, the portion of the tax system that we examine here is the most progressive of all countries in the CEQ Data Center (Figure 14), with a concentration coefficient of 0.76. It contributes to a reduction in inequality of 2.82 Gini points, and an increase in poverty of 6.04 percentage points (Table 17). We emphasise, however, that corporate income tax is not included here, despite being South Africa's third largest tax revenue item, and we take note of empirical studies suggesting that corporate income taxes are more regressive than they may appear[51] (Bastagli, Coady, & Gupta, 2012) and that, despite its progressive design, in practice, South Africa's effective CIT rates place the highest burden on the smallest companies (Carreras, Dachapalli, & Mascagni, 2017).

Figure 14. All taxes: concentration coefficient
Source: authors' calculations based on LCS 2014/15 and Goldman, Houts & Jellema (forthcoming) based on Inchauste et al. (2017) and IES 2010/11, Argentina (Rossignolo, 2018), Brazil (Higgins, Pereira & Cabrera, 2019), Colombia (Melendez, 2019), El Salvador (Margarita, Lustig & Oliva, 2018), Ethiopia (Hill et al., 2017), Ghana (Younger & Oppong, 2018), Honduras (Icefi, 2017b), Mexico (Scott, J., et al., 2017), Sri Lanka (Arunatilake & Abayasekara, 2019), Panama (Martinez-Aguilar, 2019), Paraguay (Gimenez et al., 2017), Peru (Miguel, 2019), Tanzania (Younger S., 2019), Uganda (Jellema et al., 2018) (available at www.commitmenttoequity.org).
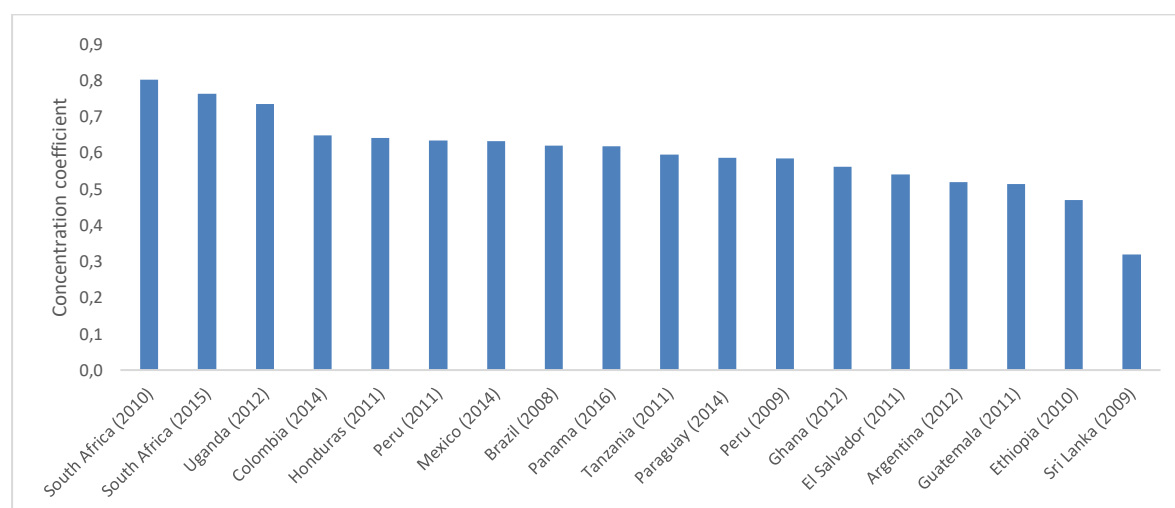
Notes: we display selected countries from the CEQ Data Center here based on their policy relevance either through geography (being on the African continent), through membership in political alliances such as the Brazil, Russia, India, China, and South Africa (BRICS) agreement for major emerging market economies, or as a country with high Pre-fiscal income inequality. Belarus is included, as the country with the lowest Pre-fiscal income inequality, to show the full range.

The personal income tax reduces inequality by 3.26 Gini points and increases poverty by 0.50 percentage points. As discussed in Section 5.3. on fiscal impoverishment and fiscal gains to the poor, there are households in the lower deciles of consumption that are paying income tax when we measure welfare using consumption expenditures, because of the difference between individual taxable income (calculated based on earnings) and household per capita disposable income.

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[51] In part because the incidence of the corporate tax burden falls heavily on wage earners and wage earners typically earn less than those with capital income.

VAT has a large impact on poverty and no impact on inequality (measured at consumable income). The direct component is slightly inequality-increasing, with a marginal contribution to inequality of -0.07 Gini points, and the indirect component reduces inequality slightly by 0.05 Gini points. The incidence, as a share of disposable income, shows this clearly as the incidence of the VAT in the bottom deciles is significant, and remains relatively constant as income increases, in contrast to the incidence of the personal income tax which is small in the bottom deciles of the distribution, and increases substantially with an increase in income (Figure 15b).

The reference income concept that we compare the distribution of a tax or transfer to has implications for the results. VAT, for example, as discussed above, appears neutral in terms of progressivity[52], when we compare the Gini coefficient with and without the VAT in the system after all cash taxes and transfers have been added (at consumable income). However, if we look at the impact of VAT at pre-fiscal income (before direct taxes and transfers have been included), then the marginal contribution of the VAT (direct and indirect) is inequality-increasing[53].

As discussed in Section 5.3 on fiscal impoverishment and fiscal gains to the poor, we consider the impact of the VAT as part of a system of redistribution. While the incidence of VAT on the poor is large, to fully understand the impact of the VAT we need to consider whether the impact of the expenditures that the VAT collects outweighs the negative impacts of the VAT on poverty. The VAT collects enough revenues to fund all the direct transfers, for example, and overall, the direct transfers reduce inequality by 11.5 points and poverty by 10.2 points.

The excises on alcohol and tobacco have adverse effects for the poor, in the short term. These specific excise taxes are inequality-increasing by 0.24 Gini points and poverty-increasing by 0.99 percentage points (Figure 15a). However, while CEQ Assessments do not look at medium- to long-term effects, Fuchs et al. show in a policy note that the future benefits of large price shocks on tobacco can improve the welfare of lower income households through reducing medical expenses and avoiding premature deaths, and that these effects can be enhanced if the revenues are used to fund policies that control the use of tobacco (World Bank, 2019).

The direct component of the fuel levy reduces inequality by 0.11 Gini points and has a marginal impact on poverty of -0.38 percentage points. While fuel consumption is more concentrated amongst the rich than are overall consumption expenditures, and the Kakwani Index[54] at market income is 0.01, the poor are paying a non-zero proportion of their disposable income in fuel tax.

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[52] The Kakwani Index at disposable income is -0.12 for the direct component, and -0.05 for the indirect component (Section 7.7, Figure 17).

[53] The Kakwani Index at market income is -0.1 for the direct component, and -0.03 for the indirect component (Section 7.7, Figure 17).

[54] The Kakwani Index is a measure of progressivity discussed in detail in Section 7.7.

The indirect component of the fuel levy, however, is inequality- and poverty-increasing with a -0.05 point marginal contribution to inequality and a -0.22 point contribution to the poverty headcount. The richer deciles are paying less of a share of fuel tax than their share of consumption expenditures. The influence of higher prices of fuel filter through to higher prices of other goods and services which have a higher incidence on the poor than fuel expenditures themselves. Despite the indirect effects being more concentrated in the lower deciles than the direct effects, the total size of the indirect effects is smaller than the direct effects, and so the impact on poverty is smaller.

Figure 15. Taxes a. Marginal impacts (top left), b. Incidence (top right), and c. Concentration shares (bottom)
Source: authors' calculations based on LCS 2014/15 Marginal impacts calculated at consumable income
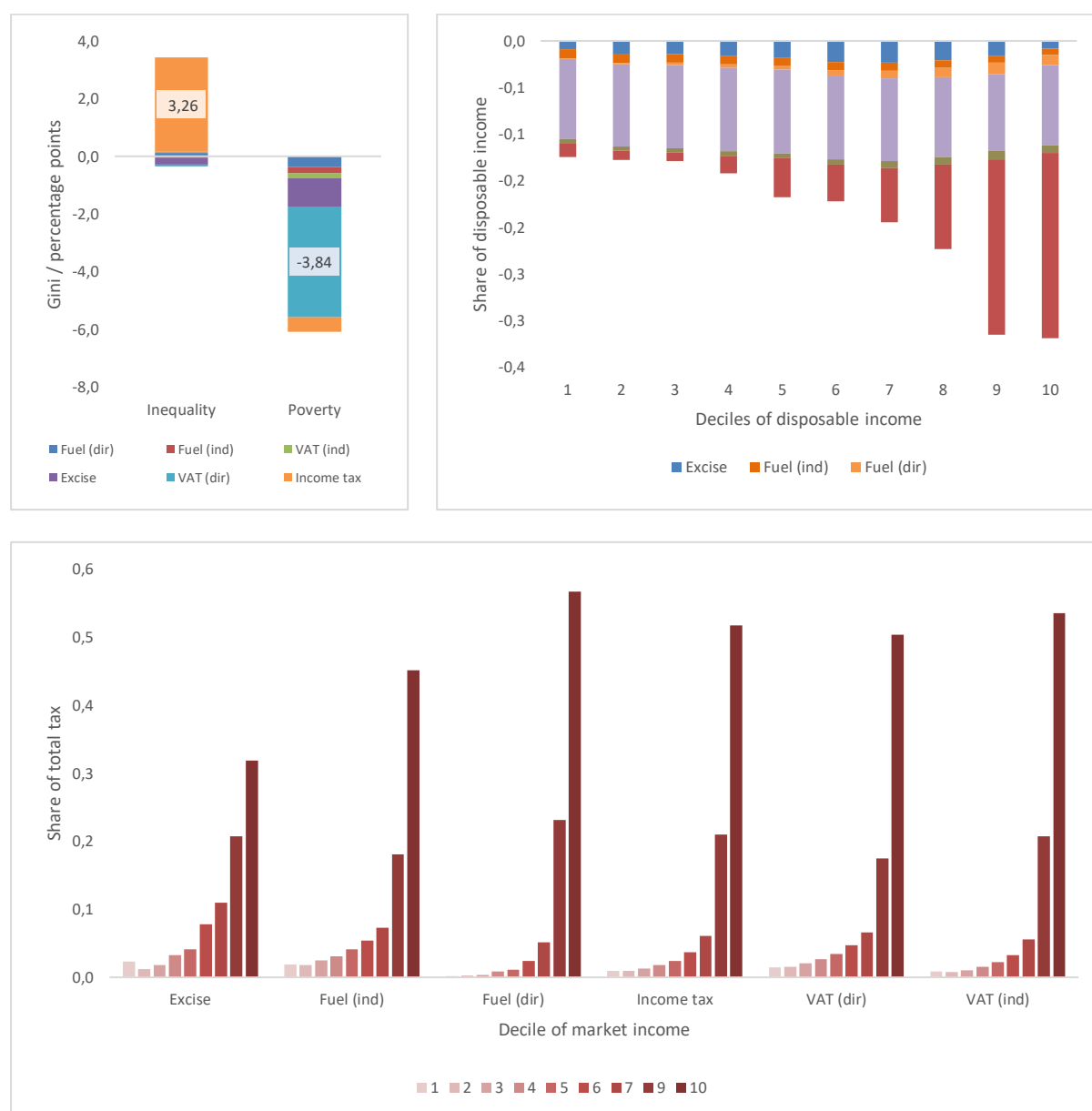
6.6. Contributions to social security

The impacts of contributions to social security are small relative to taxes. The direct contributions are all inequality-reducing and poverty-increasing[55]. The RAF contributions cause the largest increase in poverty of all the contributions (while neutral with regard to inequality - see the discussion on the general fuel levy in Section 7.5 for more information). This to be expected - they are not targeted to the formal sector, nor do they have a threshold. Of the direct contributions, the UIF makes the greatest contribution to inequality reduction (0.14), and causes the largest **increase** in poverty (-0.18).

We do not model the benefit component of the social security funds, which should be taken into account when drawing policy conclusions about these instruments.

Figure 16. Contributions to social security a. Marginal contributions b. Incidence
Source: authors' calculations based on LCS 2014/15 Marginal impacts calculated at consumable income
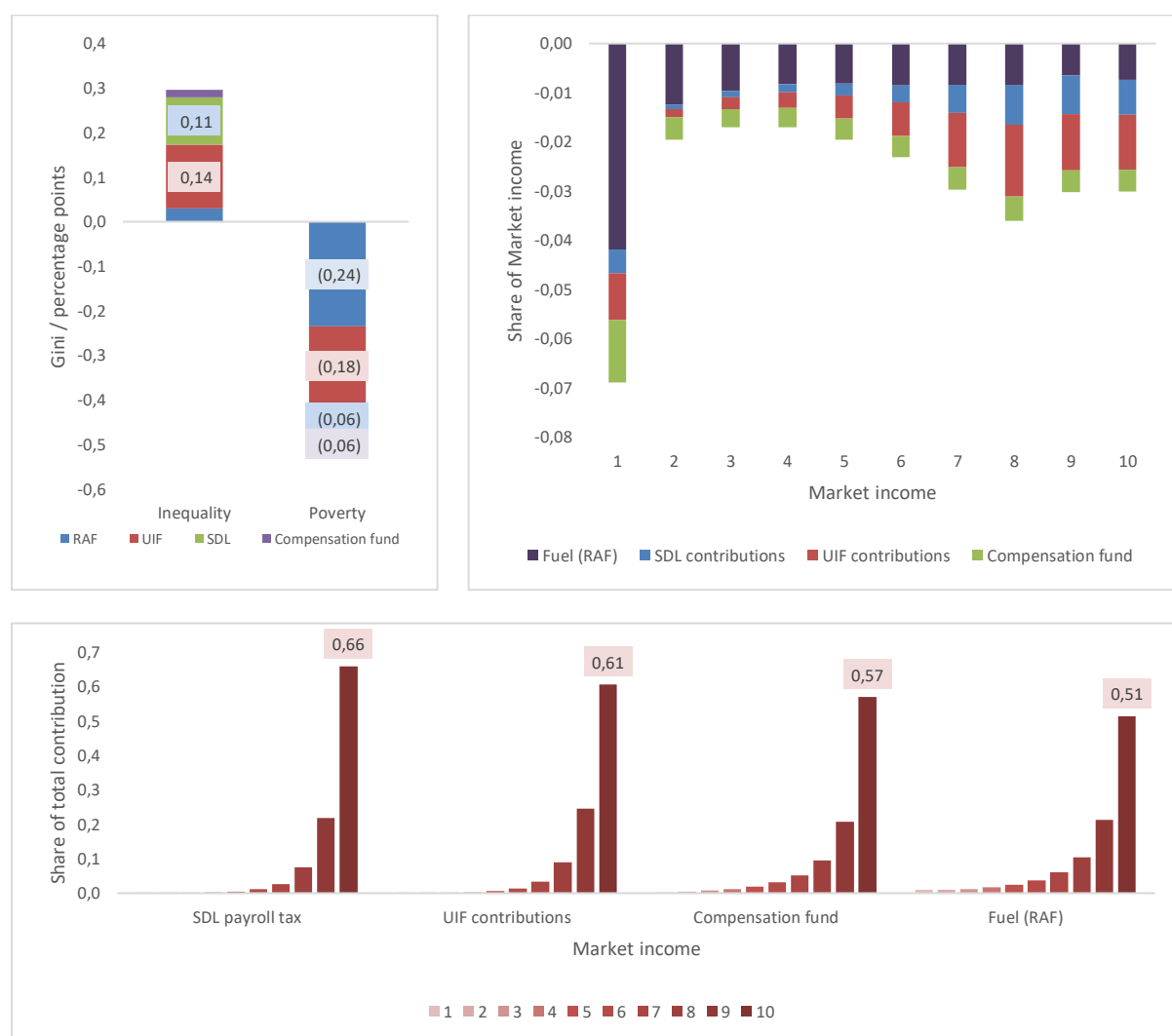
[55] As discussed in Section 5.3. on fiscal impoverishment and fiscal gains to the poor, and in Section 7.5 on the personal income tax, there are households in the lower deciles of consumption that are paying income tax, because of the difference between individual taxable income (calculated based on earnings) and household per capita consumable income (calculated based on consumption expenditures).

6.7. Kakwani Index: summary of progressivity

The Kakwani Index is a summary statistic of progressivity, and is equal to the difference between the concentration coefficient[56] of a particular tax minus the Gini coefficient of the reference income. If the Kakwani coefficient is greater than zero, the tax/transfer is progressive (in the tax redistribution sense); if it is equal to zero, the tax is neutral; and if it is less than zero, the tax/transfer is regressive. We define as neutral those taxes for which the Kakwani index lies between -0.1 and 0.1. The Kakwani Indices for all taxes and transfers at both market income and disposable income are summarised in Figure 17 below.

Figure 17. Kakwani Index: all taxes and transfers
Source: authors' calculations based on LCS 2014/15.

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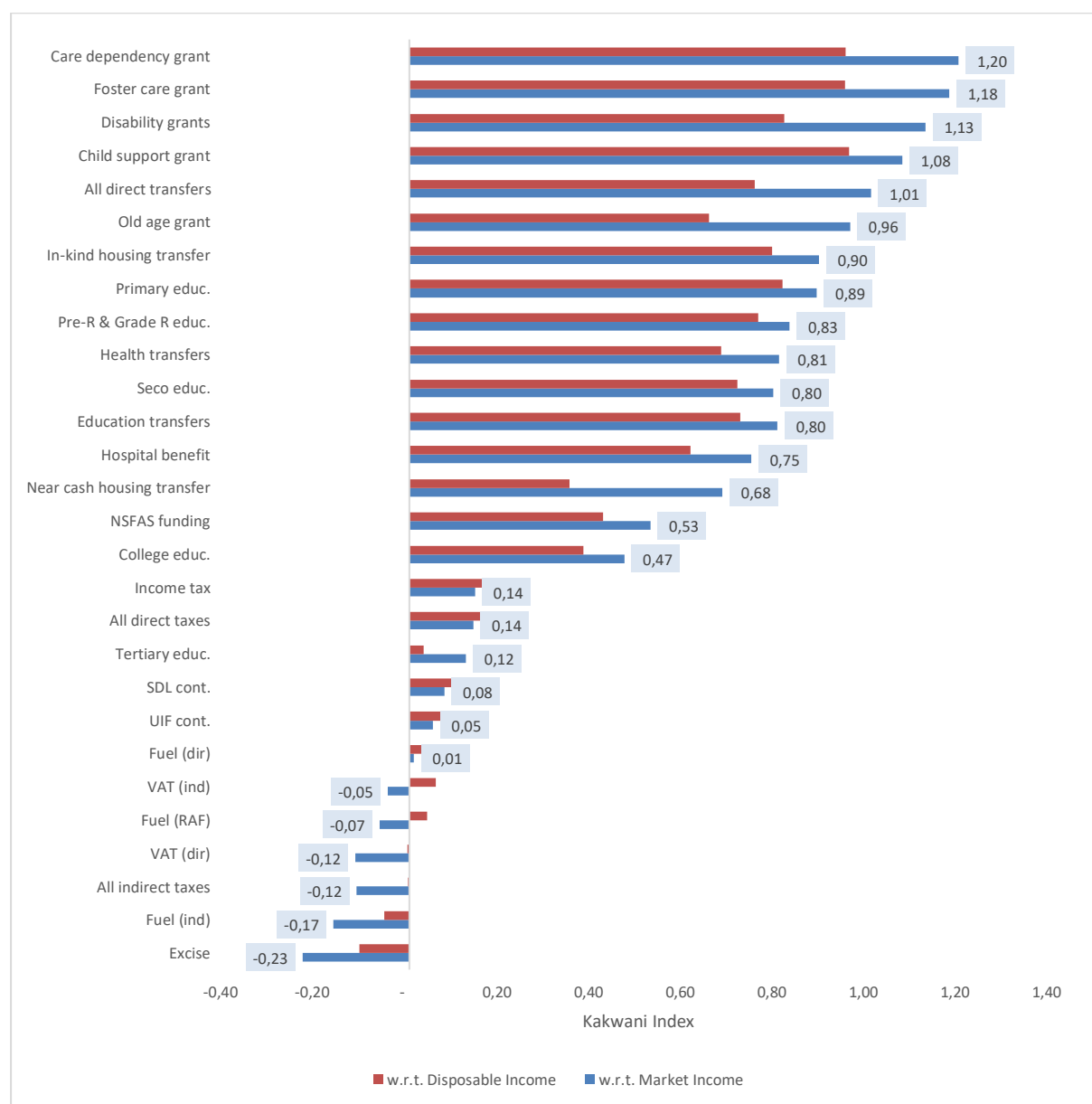
[56] The concentration coefficient is calculated in the same manner as the Gini, using a concentration curve.

7. How does the impact of fiscal policy vary by gender?

In this section we provide information disaggregated by gender and by gender of household head in order to inform understanding of how gender affects the impacts of fiscal policy. We cannot here examine all of the complex ways in which the design and implementation of fiscal policy interacts with intra-household dynamics to produce differing results for women and men, and female- versus male-headed households, and it is not the subject of this paper. We nonetheless hope that this disaggregation of results will prove useful to facilitate thinking around how to design equitable policy, from a gender perspective, and facilitate future research in that regard.

We include results here on both the adult populations in female- versus male-headed households and the adult female versus adult male populations. Both of these perspectives are limited in their ability to shed light on the gendered experience of fiscal policy and we acknowledge that gender of household head is a somewhat antiquated concept and is problematic in the traditional understanding and interpretation of the concept. We treat children below 18 and pensioners above 60 as separate population groups, and include information on them where useful.

7.1. Population

South Africa's working-age adults comprise 53 percent of the population. Children comprise 39 percent of the population, and pensioners 8 percent. The number of children in the household decreases with decile of market income, and the number of pensioners decreases from deciles 1 to 7, and then starts to increase.

We can split working-age adults by gender or by gender of the household head (Table 18, columns A and B). The A columns show roughly equal numbers of females and males (15.4 million females and 14.8 million males), whereas the B columns show the numbers living in male-headed households to be much larger, with 11.4 million adults living in a female-headed household and 18.8 million adults living in a male-headed household.

There are more females than males in deciles 1 to 5 of market income, and fewer females than males in decile 6 to 10. The number of adult females and males both increase by income decile, and the number of adult males increases at a faster rate than the number of adult females.

There are more individuals living in female-headed households than male-headed households in deciles 1 to 3 of market income. While the number of individuals in male-headed households increases with income decile, the number of individuals in female-headed households increases from deciles 1 to 3 and then decreases with income decile.

| Decile of market income | Working-age adults | | | | Children | Pensioners | Total population |
| | A. By gender | | B. By gender of head | | | | |
	Female	Male	Female-head	Male-head			
1	1.2	1.0	1.2	0.9	2.5	0.8	5.5
2	1.3	1.0	1.3	1.0	2.7	0.5	5.5
3	1.4	1.1	1.4	1.1	2.7	0.3	5.5
4	1.5	1.3	1.3	1.4	2.5	0.3	5.5
5	1.5	1.4	1.2	1.7	2.4	0.3	5.6
6	1.6	1.7	1.2	2.0	2.0	0.3	5.6
7	1.6	1.8	1.1	2.3	2.0	0.3	5.7
8	1.7	1.9	1.1	2.5	1.9	0.4	5.8
9	1.8	1.9	0.9	2.8	1.9	0.5	6.0
10	1.8	1.8	0.6	2.9	1.7	0.8	6.0
All	**15.4**	**14.8**	**11.4**	**18.8**	**22.2**	**4.4**	**56.8**
Share of population	**0.27**	**0.26**	**0.20**	**0.33**	**0.39**	**0.08**	**1.00**

7.2. Income

Adults in male-headed households capture the largest share of market income, relative to their share of the population. Note that here income is the sum of per capita household income, not of individual earned income. They consume 46 percent of total market income, and comprise 33 percent of the total population. Working-age adult males consume 30 percent of the income and comprise 26 percent of the population. Working-age adult females consume 29 percent of the income versus 27 percent of the population. Finally working-age adults in female-headed households consume only 13 percent of the income, and comprise 20 percent of the population.

For completeness, we also show children and pensioners here, with pensioners capturing 12 percent of income compared to their 8 percent of the population, and children consuming 28 percent of income versus their 39 percent of the population.

Figure 18. Share of total income vs total population
Source: authors' calculations based on LCS 2014/15
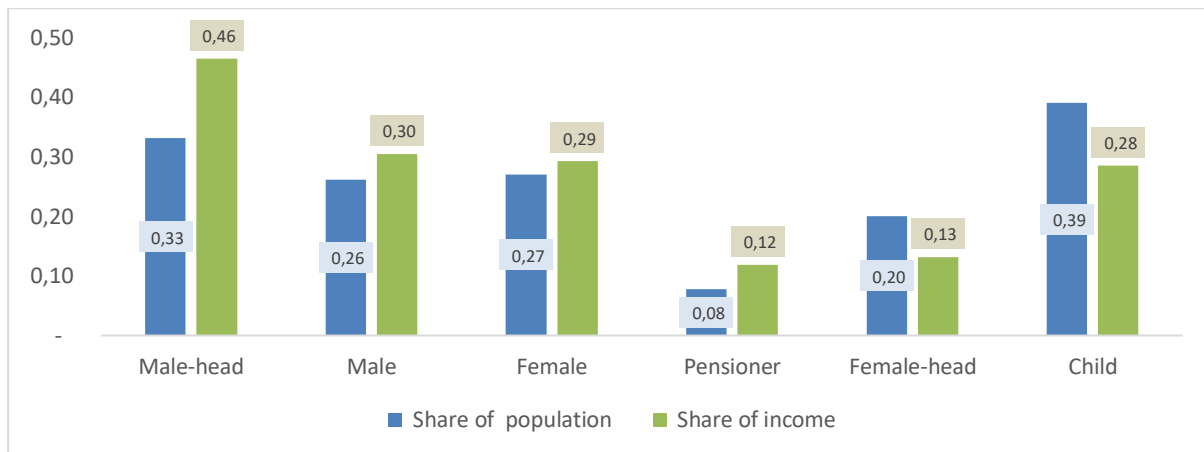
Fiscal policy reduces the gap between individuals in male-headed and female-headed households. Male-headed households' mean annual income decreases by R10 900 with taxes and transfers - from R42 200 at pre-fiscal income to R31 400 at consumable income. In female-headed households, mean annual income decreases by R2 800 - from R19 800 to R17 000. Before fiscal policy, individuals in female-headed households have a mean income that is 46.9 percent of male-headed households. Post-fiscal policy this ratio increases to 54.3 percent.

Fiscal policy also reduces the gap between males and females. Mean income for males decreases by R8 300 with taxes and transfers - from R35.1 at pre-fiscal income to R26 800 at consumable income. Females' mean income decreases by R7 400 - from R32 500 to R25 100. Before fiscal policy, females have a mean income that is 92.6 percent of male-headed households. Post-fiscal policy this ratio increases to 93.6 percent.

Figure 19. Mean annual income, by gender categories
Source: authors' calculations based on LCS 2014/15
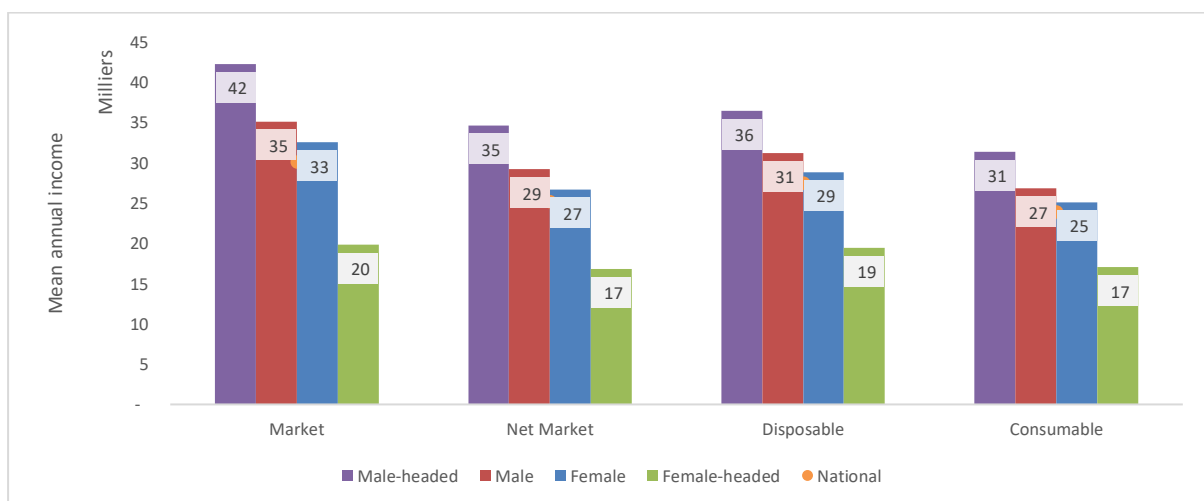
7.3. Poverty, inequality and the impact of fiscal policy

Poverty is highest for individuals in female-headed households[57]. Using the LBPL, the poverty headcount is 57.3 percent at pre-fiscal income for female-headed households, versus 33.3 percent for male-headed households.

Overall, fiscal policy reduces poverty in female-headed households by 6.7 percentage points, and in male-headed household by 1.8 percentage points. The poverty headcount for female-headed households drops by 12.1 percentage points to 45.1 percent when we include direct taxes, direct contributions to social security, and direct transfers, and increases by 5.4 percent with the inclusion of indirect taxes and contributions to 50.6 percent (Figure 20a).

Poverty is higher for females than for males. Using the LBPL, the poverty headcount is 45.7 percent at pre-fiscal income, versus 38.9 percent for males.

Overall, fiscal policy reduces female poverty by 4.5 percentage points, and male poverty by 2.8 percentage points. Female poverty drops by 9.8 percentage points to 35.9 percent when we include direct taxes, direct contributions to social security, and direct transfers, and increases by 5.3 percentage points with the inclusion of indirect taxes and contributions to 41.2 percent (Figure 20b).

Figure 20. Poverty disaggregated by gender a. gender of household head (left), b. gender (right)
Source: authors' calculations based on LCS 2014/15
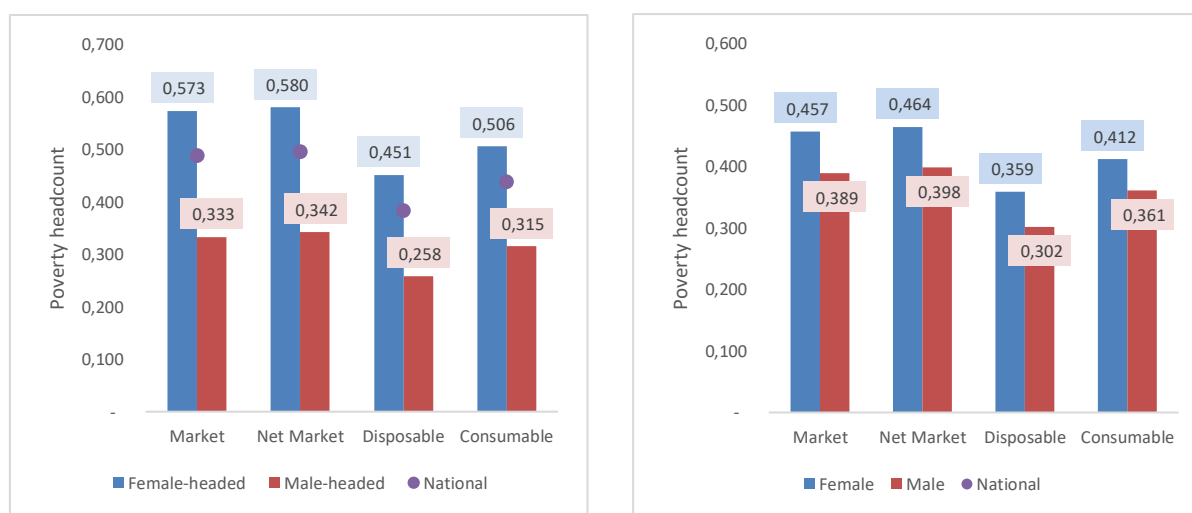
Note: in graph b, the national poverty average is higher than both female and male poverty due to child and pensioner poverty, which is not shown here.

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[57] Poverty is always calculated at the household level by comparing per capita household income with the poverty line. If poor households have more females than males, then there will be more poor females, and vice versa.

Fiscal policy reduces within female inequality by 8.9 Gini points, moving from market income to consumable income, and within male inequality by 7.9 Gini points. At market income, inequality amongst females is higher than males with a Gini coefficient of 0.718 versus 0.696 for males. At consumable income, the female Gini coefficient is reduced to 0.629 and male inequality is 0.609.

Fiscal policy reduces inequality amongst female-headed households by 13.3 Gini points, moving from market income to consumable income, and within male-headed households by 6.4 Gini points. At market income, inequality within female-headed households is higher than males with a Gini coefficient of 0.742 versus 0.673 for males. At consumable income, the female-headed Gini coefficient is reduced to 0.609. Male-headed inequality at consumable income is 0.609.

If we include the impact of health and education transfers at final income, then fiscal policy reduces inequality within females by 17.1 Gini points versus 14.3 for males and within female-headed households by 22.8 Gini points (to below that of male-headed households) versus 12.2 for male-headed households.

Table 20. Inequality, by gender and gender of head
Source: authors' calculations based on LCS 2014/15

	Inequality					
	Gender			**Gender of head**		
Income concept	**Female**	**Male**	**Gap**	**Female-headed**	**Male-headed**	**Gap**
Pre-fiscal income	0.718	0.696	2.3	0.742	0.673	6.9
Net market	0.693	0.670	2.3	0.714	0.648	6.6
Disposable	0.628	0.613	1.5	0.608	0.605	0.3
Consumable	0.629	0.616	1.3	0.609	0.609	0.0
Final	0.547	0.553	- 0.5	0.513	0.551	- 3.8
Total fiscal impact (Gini points)	17.1	14.3	- 2.8	22.8	12.2	10.7

7.4. Coverage

To analyse what is driving this result we split the working-age population into economic groups based on household per capita market income (Table 21 shows the numbers of individuals in each group)[58]**.** Poor individuals are those below the UBPL of R12 000 annually. Non-poor individuals are split into the vulnerable (above the UBPL and earning less than R120 000), middle-income households (earning between R120 000 and R140 000), and upper-income households (earning above R140 000 in market income annually).

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[58] While individuals are grouped into categories based on household income, coverage for the analysis by gender is measured by whether an individual receives a transfer or pays a tax, not by whether the household does.

Table 21. Population by economic group (scale: millions)
Source: authors' calculations based on LCS 2014/15

	Groups				Total
	Poor	Vulnerable	Middle-income	Upper-income	
Female-headed	7.8	3.2	0.1	0.3	11.3
Male-headed	8.5	8.5	0.3	1.4	18.5
Female	8.7	5.7	0.2	0.8	15.3
Male	7.6	6.2	0.2	0.8	14.7
Total	**16.4**	**11.8**	**0.4**	**1.7**	**30.0**

7.4.1. Direct taxes and transfers

All social grants cover a slightly higher proportion of poor females than males, but the difference is most stark with the child support grant (Figure 21a and b). Of females in poor households, 57 percent receive the child support grant, with an incidence of 101 percent of their market income, compared to only 2 percent of poor males[59] receiving a value that is 4 percent of market income for poor males. In vulnerable households, 16 percent of females receive it, and only 1 percent of males. This shows both that the grant is well targeted to support women in poorer households, and also highlights what we already know – that women are disproportionately shouldering the burden of childcare.

In all economic groups, males are more likely to pay direct taxes and contributions to social security than females, as are individuals in male-headed households. Two percent of males in poor households pay direct taxes compared to 1 percent of females[60]. Direct taxes and contributions constitute 81 percent of their market income, and 4 percent of income for females. In the upper-income group, 76 percent of males pay direct taxes, spending 47 percent of their total market income, compared to 64 percent of females paying 24 percent of their total market income[61]. The results highlight the increased opportunities for formal, higher-earning employment for males, with women more likely to be in precarious, informal, or comparatively lower-earning employment[62].

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[59] By household head we find that 38 percent of individuals in poor female-headed households are recipients of the child-support grant, versus 26 percent in poor male-headed households.

[60] Two percent of individuals in male-headed households pay direct taxes compared to 1 percent of individuals in female-headed households.

[61] This is compared to 72 percent of individuals in male-headed households compared to 67 percent of individuals in female-headed households.

[62] Stats SA calculate male employment at 49.9 in 2015 versus 37.7 for females, with an unemployment rate of 27.7 for females, versus 23.4 for males (2019: p60). Additionally, in a summary of the literature on precarious employment, Mabilo (2018) concludes that women and immigrants are disproportionately represented.

**Figure 21. Coverage of direct taxes and transfers, a. Females (top left panel),
b. Males (top right panel).**
Source: authors' calculations based on LCS 2014/15
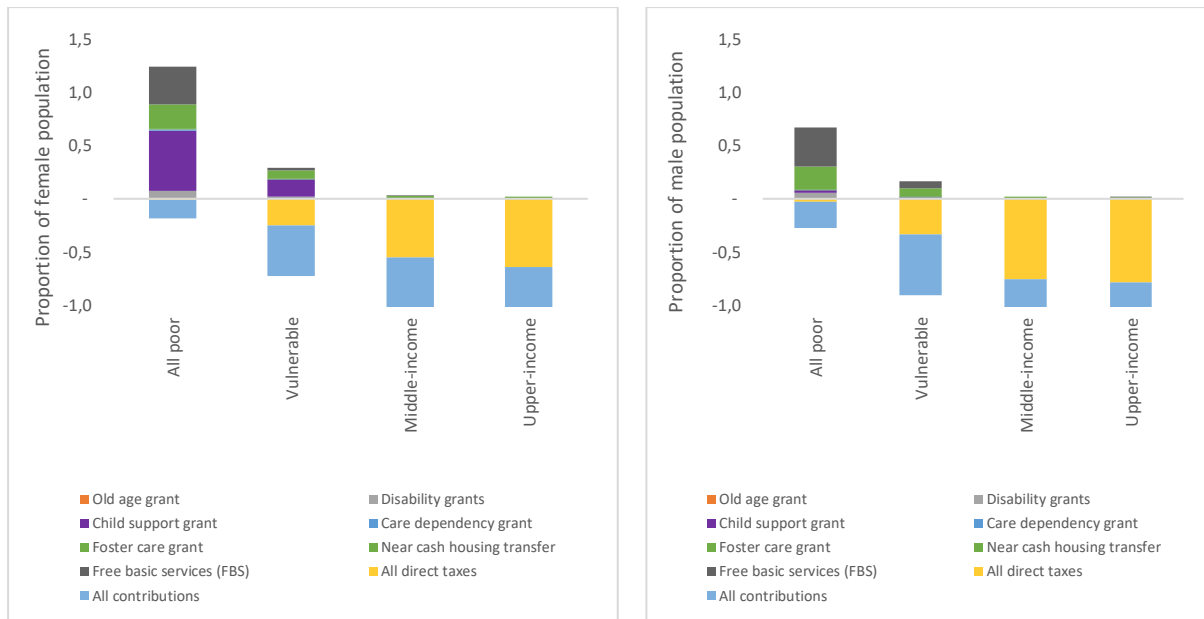

7.4.2. In-kind transfers

There are a number of factors that influence women's health needs differently to men's, including check-up requirements during pregnancy and after giving birth, increased vulnerability to contracting sexually transmitted infections, the increased likelihood of depression in women, and high rates of gender-based violence (Hassim, Heywood, & Berger, 2007).

In the poor and vulnerable economic groups, all public education and health transfers are accessed more by women more than men. In particular, 13 percent of women benefit from the PHC benefit, versus 8 percent of men.

In all economic groups, females benefit more from tertiary education transfers than males. Most striking is that 8 percent of females benefit from public tertiary education in the middle-income group, compared to only 2 percent of males. Females in the poor and vulnerable groups access public college education and NSFAS funding more than males; however, in the middle- and upper-income groups, males appear to be more likely to choose public college education than females.

Figure 22. Coverage of in-kind transfers a. Females (left panel), b. Males (right panel).
Source: authors' calculations based on LCS 2014/15
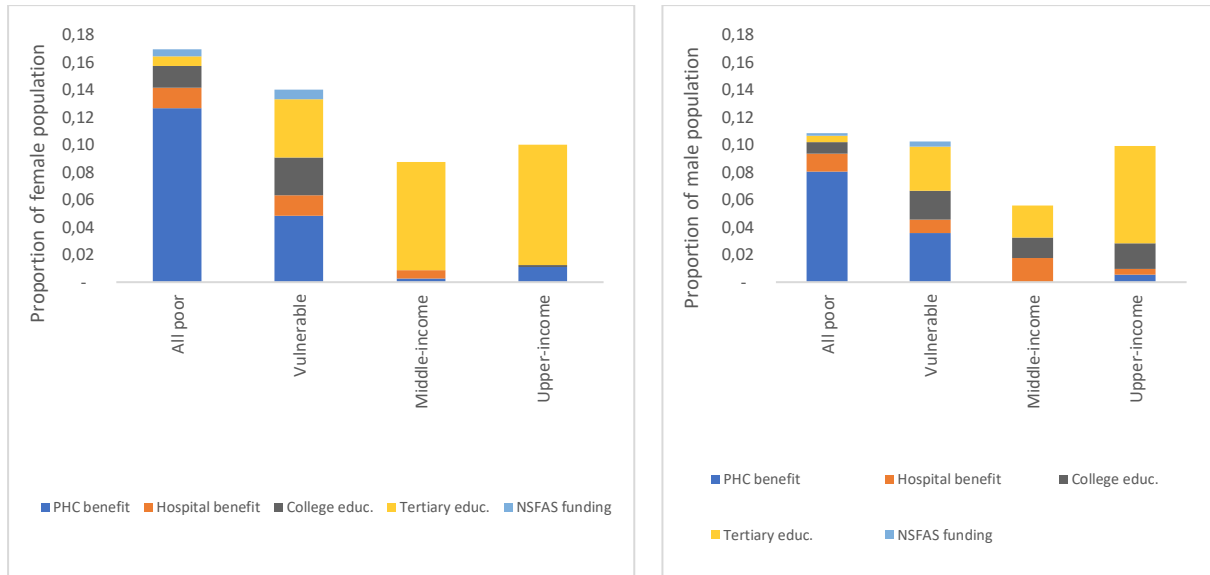
Female-headed households, across all income groups, appear more likely to access tertiary education. Access is increasing with income group, but increases much faster for female-headed households than male-headed. In vulnerable households, 4 percent of individuals in female-headed households attend tertiary education versus 3 percent in male-headed households. In middle-income households, this increases to 10 percent of individuals in female-headed households, versus 4 percent of individuals in male-headed households. Finally, in the upper-income group the gap widens to 6 percentage points, at 13 percent in female-headed households, and 7 percent in male-headed households.

Access to college is also more likely in female-headed households than in male-headed households, in all groups except for the upper-income decile, where individuals in male-headed households appear more likely to substitute a college education for a university tertiary education.

**Figure 23. Coverage of in-kind transfers a. Female-headed (left panel),
b. Male-headed (right panel).**
Source: authors' calculations based on LCS 2014/15
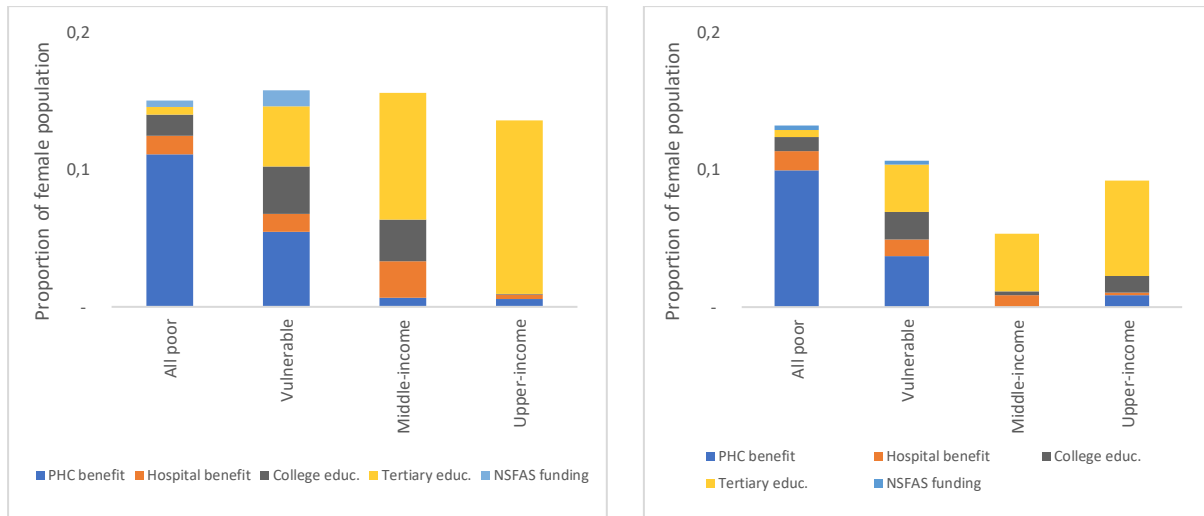
7.5. Conclusion

Disaggregating the working-age population by gender, and gender of the household head, we see that males and females both comprise roughly 15 million, and there are nearly 1.5 times the number of individuals living in a male-headed household than female-headed household (18.8 versus 11.4 million).

Fiscal policy reduces poverty more for females than males (4.5 versus 2.8 percentage points) and more in female-headed households than in male-headed households (6.7 versus 1.8 percentage points). It also narrows the consumption expenditure gap. Prior to fiscal policy, females start off with a mean market income that is 92.6 percent that of males, and after fiscal-policy, at consumable income, their mean income is 93.6 percent of males.

Disaggregating these populations further into economic groups, we find the most significant differences in access to transfers to be the result of the disproportionate burden that women bear with regard to childcare. The child support grant is accessed by 57 percent of females below the UBPL, and the amount disbursed is the equivalent of 101 percent of market income for poor females. This compares to 2 percent of males below the UBPL receiving the child support grant, to an amount of 4 percent of their market income. We also find poor females more likely to make use of public primary healthcare clinics than males, with a coverage of 13 percent versus 8 percent.

There also substantial gender differences in coverage and relative size of direct taxes and contributions, due to the increased access to formal labour and high-income earning opportunities of the male population. A larger share of men in all economic groups are paying direct taxes and contributions and upper-income males pay 47 percent of their market income while upper-income females pay only 24 percent of their market income.

Females – in all income groups – are more likely to access tertiary education opportunities than males and the gap in middle-income males versus females is particularly high. Finally, and while acknowledging that the concept of a household head is a controversial one, we see that individuals in female-headed households are significantly more likely to enrol in college or tertiary education than individuals in male-headed households, an effect which is increasing with income, suggesting that education is more highly valued in female-headed households, at all income levels.

8. Conclusion

This paper aimed to comprehensively assess the distributional impact of government taxation and spending. On the tax side, the paper has analysed the main components of tax revenue, with the exception of the corporate income tax, the burden of which cannot be allocated easily to individuals or households. On the expenditure side, the paper has analysed the incidence of slightly more than half of general government expenditures and focused on social spending, including direct cash transfers, housing, health, and education spending.

The results show that South Africa uses its fiscal instruments to effectively reduce poverty and inequality through a highly progressive direct tax system, a slightly regressive indirect tax system (when measured against market income), and highly progressive social spending. In other words, the rich in South Africa bear the brunt of taxes and the government redirects these resources to the poorest in society to raise their incomes. It is estimated that in the absence of fiscal policy, the Gini coefficient would be 0.737 rather than the 0.640 that we observe when studying consumable income, or 0.546 at final income. The poverty rate is reduced by some 2.8 million individuals (out of a total 27.5 million of market income poor) as a result of the fiscal system when measured as those living on less than the LBPL of R613 per person per month. While more needs to be done to reduce the pre-fiscal distribution of resources through investment in fiscal policy, which will increase equality of opportunities, this is beyond the scope of this paper.

On the tax side, fiscal policy relies on a mix of progressive direct taxes and slightly regressive indirect/consumption taxes, which when combined generate a highly progressive tax system, which stands out internationally. Direct taxes (PIT and payroll taxes) are progressive, since the richer deciles pay a proportionally higher share of total direct tax collections than their share of market income. The poorest 60 percent of individuals contribute less than 1 percent of PIT; the richest 10 percent contribute 80 percent. Moreover, because PIT makes up a relatively high share of GDP, it significantly erodes the gap in incomes between the rich and poor. Indirect taxes and contributions on the other hand increase both poverty (by almost 6 percentage points) and inequality (by just over 1 Gini point), and yet, when we consider the system as a whole, we note that the revenue from indirect taxes more than covers the cost of the direct transfers, thereby more than outweighing the adverse outcomes. The result is nonetheless a reminder of the importance of ensuring that none of the poor fall outside of this safety net. While we are unable to include corporate income tax here, based on other empirical research we expect that the corporate income tax reduces the apparent progressivity of the system, passing a large portion of the burden onto wage earners and in effect (contrary to its design), collecting a higher proportion of profits from small businesses.

On the spending side of fiscal policy, social spending contributes to large reductions in poverty and inequality. Direct transfers effectively target the poor through means-testing and are sizable in terms of GDP; this combination means that the cash transfers result in important reductions in poverty and inequality. Public education and health benefits also benefit the poorer parts of the income distribution relatively more than the non-poor. However, there are important concerns about the uneven quality of these services.

Given higher rates of poverty amongst females and in female-headed households, the progressivity of the fiscal system results in partial compensation for the increased rates of female poverty and poverty in female-headed households and over-compensates for the higher initial levels of inequality. Of the 12.8 million working-age adults living in poverty at the LBPL, 7.0 million are females and 5.8 million are males. Fiscal policy reduces poverty for females by 0.69 million and for males by 0.41 million. Alternatively disaggregated, there are 6.5 million working-age adults living in female-headed households in poverty and 6.2 living in male-headed households in poverty. Fiscal policy reduces poverty for individuals in female-headed households by 0.8 million and in male-headed households by 0.3 million. Despite starting out at a higher level of inequality, females and female-headed households post fiscal policy end up with lower inequality than males or male-headed households. Fiscal policy reduces inequality amongst female-headed households by 22.8 Gini points (versus 12.2 for male-headed households), and amongst females by 17.1 Gini points (versus 14.3 for males).

In sum, South Africa has one of the highest levels of poverty and inequality in the world. Fiscal policy already goes a long way toward the goal of poverty reduction and redistribution, nevertheless, even after fiscal policy the level of inequality and poverty in South Africa after taxes and spending remains extremely high. Pre-fiscal and post-fiscal inequality is higher than any other country available in the CEQ database, and poverty is 3rd at the 2005PPP $2.50 per day poverty line after fiscal policy. Renewed efforts will be required to ensure that spending is effective and that sufficient taxes are raised in a way that is equalizing but also does the least damage to inclusive and sustainable economic growth.

The efficiency and equity with which taxes are raised and government spending is utilised to deliver services are key elements of an effective state. We recognize that this report comes at a time when the fiscus is under unprecedented pressure. The debt-to-GDP ratio is moving rapidly upwards, tax revenues have plummeted, and there are new and pressing expenditure priorities. Difficult expenditure prioritisation is going to be imperative and a discussion about new forms of taxation is likely. Tax legitimacy and perceptions of fairness in the distribution of the tax burden will be crucial to the willingness of citizens to pay additional taxes, but cannot be divorced from broader government legitimacy. The ability to cement a new social compact aimed at a stronger and more effective state will ultimately depend on factors such as honest and clean governance and the willingness and ability to root out corruption.

Finally, this work opens the way for further analysis and points. Firstly, the existing model could be extended to take into account a measure of the quality of in-kind services, and to include, as best as possible, differences in infrastructure — such as water, electricity and sanitation. Secondly, changes in budget in the post-2015 years could be simulated so as to see the differences in impact from budget changes – including elements such as the rising public wage bill, and the increasing debt-servicing costs. This framework also allows for modelling of short-term impacts of different fiscal reforms and external shocks.

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the private sector; and soon, Expertise France
for technical cooperation, the Group finances,
supports and accelerates transitions towards
a more resilient and sustainable world.
We are building – with our partners – shared
solutions, with and for the people of the Global
South. Our teams are active in more than 4,000
projects in the field, in the French overseas
departments and some 115 countries, including
areas in crisis. We strive to protect the common
good – promoting peace, biodiversity and
a stable climate, as well as gender equality,
health and education. It's our way of contributing
to the commitment that France and the French
people have made to fulfill the Sustainable
Development Goals. Towards a world in common.