



# THE DISTRIBUTIONAL IMPACT OF FISCAL POLICY IN SOUTH AFRICA

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## THE DISTRIBUTIONAL IMPACT OF FISCAL POLICY IN SOUTH AFRICA\*

*Gabriela Inchauste, Nora Lustig, Mashekwa Maboshe, Catriona Purfield, and Ingrid Woolard<sup>†</sup>*



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### ABSTRACT

This paper estimated the distributional impact of the main elements of general government taxation and spending in South Africa, applying fiscal incidence analysis to the 2010/11 IES (Stats SA 2012b). On the tax side, it analyzed the incidence of 64.5 percent of total tax revenue, including PIT, VAT, excise taxes on alcohol and tobacco, and the general fuel levy. On the expenditure side, it analyzed the incidence of 43 percent of general government expenditures, focused on social spending including direct cash transfers, free basic services, and health and education spending. The results show that South Africa uses its fiscal instruments to significantly reduce market income inequality and poverty through a progressive tax system and highly progressive social spending. The rich in South Africa bear the brunt of taxes that we examined, and the government redirects these resources to the poorest in society to raise their incomes. Only the top three deciles of the income distribution pay more in taxes than they receive in transfers. As a result, the fiscal system lifts some 3.6 million individuals out of poverty. Despite the large fiscal redistribution, however, South Africa remains one of the most unequal countries in the world. More can and should be done to improve the quality of education and health service delivery.

**JEL Codes:** H22, I38, D31

**Keywords:** *fiscal policy, fiscal incidence, social spending, inequality, Africa*

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# 1. Introduction

Since the end of apartheid in the early 1990s, South Africa has made progress toward establishing a more equitable society. In particular, advances in areas such as electrification and access to education have increased equality of opportunities (World Bank 2012). In recent years poverty has decreased significantly. Between 2006 and 2011, the proportion of the population living below the national poverty line fell from 57.2 percent to 45.5 percent.<sup>1</sup> Inequality of per capita household consumption also declined during this period: the Gini coefficient fell from 0.67 in 2006 to 0.65 in 2011.<sup>2</sup>

In spite of this progress, South Africa continues to be one of the most unequal countries in the world. In 2011, the top 20 percent of the population accounted for 61.3 percent of national consumption, while the bottom 20 percent accounted for 4.3 percent (Stats SA 2014). South Africa also has higher poverty rates than other middle-income countries with similar per capita gross domestic product (GDP). For example, using the international poverty line of US\$2.50 per person per day, South Africa's poverty headcount ratio was 34 percent in 2011, while it was 11.7 percent in Brazil and 5 percent in Costa Rica the same year.<sup>3</sup>

In large part, progress toward greater income equality has proven elusive because of the enduring legacy of the apartheid system. This is true even though South Africa's government has tried to attack the inequality inertia on several fronts, most prominently through taxation and social spending. The 1996 Constitution's Bill of Rights established citizens' rights to health care, food, water, social security, and assistance. It required the state to fulfill these rights progressively and to the best of its ability. Since the end of apartheid, the government has expanded social assistance programs and spends sizable resources (by the standards of middle-income countries) on health and education services. By 2013/14, total government spending amounted to 33.2 percent of GDP, more than half of which was devoted to social spending (Stats SA 2014).

Indeed, largely owing to the expansion of the social grant system, disposable income in the lower part of the distribution grew between 1995 and 2005; without the grants, two-fifths of the population would have seen its income decline in the first decade after apartheid (Van der Berg 2009). Indeed, Van der Berg (2009) found that social spending had become increasingly progressive. More recently, Leibbrandt et al. (2010) estimated that redistributive spending policies have undone about 40 percent of the increase over the 1993–2008 period in market income inequality (measured by the Gini coefficient), with the expansion of social cash transfers being particularly important. Meanwhile, the tax system generated considerable resources for redistribution, with total general government revenue collections amounting to 29.2 percent of GDP in 2008.

The government's commitment to greater equality remains strong. The *National Development Plan 2030* sets the ambitious goal of eliminating poverty and reducing inequality. It aims to (a) cut the Gini coefficient to 0.60 by 2030 by raising employment, and (b) increase the share of income of the bottom 40 percent from 6 percent to 10 percent (NPC 2011). In 2014, with an overall fiscal deficit at about 4 percent of GDP and debt burden close to 40 percent of GDP, fiscal space has become more limited. In such an environment, the question becomes whether the government is using fiscal policy adequately to achieve its goals of reducing poverty and inequality.

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<sup>1</sup> The 2010/11 national poverty headcount is calculated on the basis of the 2011 national upper-bound poverty line of R 620 per month (Stats SA 2014). (The upper-bound poverty line represents the level of consumption at which individuals can obtain both adequate food and nonfood items.) On February 3, 2015, Statistics South Africa released a methodological report on the rebasing (updating) of national poverty lines and development of pilot provincial poverty lines. That report estimated the upper-bound poverty line to be R 779 per capita per month in February–March 2011 prices, representing a 25.6 percent increase from R 620 when the 2000 line was consumer price index (CPI)-adjusted to 2011. As a result, the new poverty rate using the national upper-bound poverty line was 53.8 percent in 2011 (Stats SA 2015).

<sup>2</sup> The Gini coefficients are calculated on the basis of expenditure (rather than income) per capita excluding taxes (Stats SA 2014).

<sup>3</sup> Country-specific poverty headcount data come from the World Bank's PovcalNet online analysis tool, <http://iresearch.worldbank.org/PovcalNet>. The US\$2.50 poverty line is measured in purchasing power parity (PPP) using private consumption conversion factors for 2005. The headcount ratios are for disposable income.

In this context, this working paper assesses the distributional impact of the main taxes and social spending programs in South Africa by applying a state-of-the-art fiscal incidence analysis based on the methodological framework described in Lustig and Higgins (2013) and Lustig (2018). In particular, the working paper first quantifies the impact of taxes and social spending on inequality and poverty. Second, it examines the extent to which spending on education and health is not only equalizing but also pro-poor. Given the differences across provinces in the country, the authors calculate education benefits by province and level to impute the monetary value of these benefits. Finally, the working paper estimates the contribution of the different components of fiscal policy to the changes in inequality and poverty. We carry out this fiscal incidence analysis using the Income and Expenditure Survey (IES) from 2010/11 (Stats SA 2012b), which contains data on household income, expenditures, cash transfers, and use of educational services collected from 25,328 households covering over 95,000 individuals.

As described in Inchauste and Lustig (2017), one important drawback in the methodology is that we are unable to account for the distribution of spending on infrastructure, defense, spending on state-owned enterprises, and other public goods, as the information available in household surveys does not enable us to assign the benefits of this spending to individual households. Similarly, corporate taxes are not included in the analysis, as assigned the burden of these taxes across the distribution is not straight forward since corporations are likely to shift at least a portion of the tax burden to workers (through lower wages or lower employment) and to their consumers. These issues are not unique to the methodology employed here; they are common to micro-level analysis of this kind.<sup>4</sup>

Our analysis makes three main contributions:

- Existing studies are more than a decade old. In contrast, this working paper uses a household survey collected more than 15 years after the end of apartheid; thus, the information on employment, consumption, and use of services in this survey must have captured the behavioral changes induced by fiscal policy reforms in the postapartheid period.
- The working paper applies methodological innovations in fiscal incidence analysis to estimate both (a) the combined effect of the most important fiscal interventions on income redistribution and poverty reduction, and (b) the marginal contribution to income redistribution associated with each component.
- By applying the common methodological framework of the Commitment to Equity (CEQ) project, the working paper can compare the results for South Africa with those of other middle-income countries to which the framework has also been applied.<sup>5</sup>

The main results are the following:

- Fiscal policy in South Africa achieves significant reductions in income inequality and poverty—the largest among the emerging-market countries so far included in the CEQ project. Yet despite fiscal policy being both equalizing and poverty-reducing, the country’s inequality and poverty levels remain very high, as previously noted, ranking as some of the highest in middle-income countries.
- Except for tertiary education, spending on education is well targeted at the poor, and so is spending on health, although concerns remain about the quality and effectiveness of such spending.
- Except for excise taxes, all the components of fiscal policy are equalizing, including the value-added tax (VAT).

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<sup>4</sup> See, for example, the European Union’s microsimulation model, EUROMOD (<https://www.euromod.ac.uk/>), or models developed by the Institute for Fiscal Studies (<https://www.ifs.org.uk/>).

<sup>5</sup> Led by Nora Lustig since 2008, the Commitment to Equity (CEQ) is joint project of the Center for Inter-American Policy the Department of Economics at Tulane University, and the Inter-American Dialogue. For more details, see <http://www.commitmenttoequity.org>.

The next section provides an overview of the key fiscal tools used by the South African government to tackle poverty and inequality. The “Data and Assumptions” section describes the data used in the analysis as well as the fiscal incidence assumptions. “Impact of Taxes and Government Spending on Inequality and Poverty” analyzes how taxation and social spending have affected inequality, poverty, and horizontal equity and examines the marginal contribution of individual components to the redistributive effect. The final section summarizes the working paper’s findings and concludes.

## 2. General Government’s Fiscal Instruments to Tackle Poverty and Inequality

### Tax Revenue

On the revenue side, the tax system in South Africa generates considerable resources for potential redistribution by middle-income country standards.<sup>6</sup> Just over half of South Africa’s general government tax collections (totaling 27.1 percent of GDP in 2010/11) came from direct taxes: the personal income tax (PIT), corporate income tax, and payroll taxes in the form of unemployment insurance and the skills development levy (table 1). South Africa relies relatively more on PIT and less on indirect or consumption taxes than other CEQ countries (figure 1)—a welcome feature of its tax system (in terms of equity, that is) because PIT tends to be more progressive than consumption taxes, as further discussed below.<sup>7</sup>

**Table 1. South Africa General Government Revenue Collections, 2010/11**  
*Percentage of GDP*

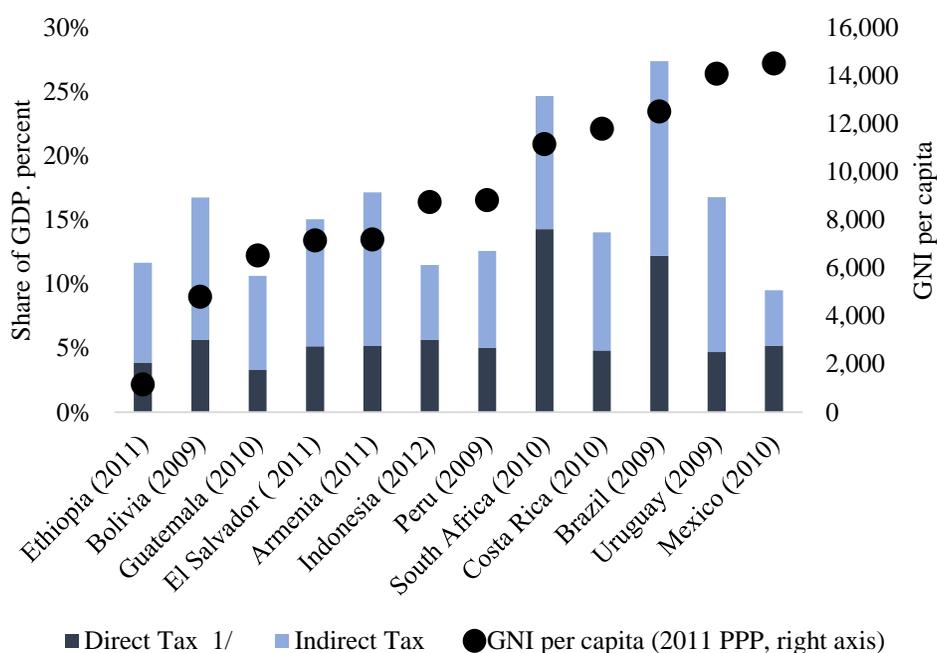
Revenue source	2010/11	Incidence analysis
Total general government revenue	30.9	17.5
Tax revenue	27.1	17.5
Direct taxes	15.0	8.5
Personal income tax	8.5	8.5
Corporate income tax	5.6	n.a.
Skills development levy	0.3	0.3
Other direct taxes	0.5	n.a.
Indirect taxes	10.4	9.0
Value added tax	6.9	6.9
Specific excise duties	0.9	0.8
General fuel levy	1.3	1.3
International trade taxes	1.0	n.a.
Other indirect taxes	0.3	n.a.
Other taxes	1.8	n.a.
Nontax revenue	3.8	n.a.
Memo: UIF contributions	0.4	0.4

*Sources:* Stats SA 2012a (for totals); National Treasury 2013 Budget Review (for line items under direct and indirect taxes). *Note:* n.a. = not applicable. UIF = Unemployment Insurance Fund.

<sup>6</sup> The ratios reported throughout this section are calculated from the revenue and expenditure levels reported at the time of writing by the National Treasury, the various line ministries, and the Financial and Fiscal Commission; they do not capture the 2015 revision to nominal GDP series.

<sup>7</sup> Of course, equity is not the only criterion by which a tax system should be evaluated. Direct taxes can constrain economic growth, which in turn limits the ability of the fiscal system to reduce inequality in the future.

**Figure 1. Composition of Taxes as Share of GDP, Ranked by GNI Per Capita, Selected Countries**



Sources: Beneke, Lustig, and Oliva, 2018 (El Salvador); Bucheli et al. 2014 (Uruguay); Higgins and Pereira 2014 (Brazil); Jaramillo 2014 (Peru); Lustig, 2018, based on Cabrera, Lustig, and Morán 2015 (Guatemala); Paz Arauco et al. 2014 (Bolivia); Sauma and Trejos 2014 (Costa Rica); Scott 2014 (Mexico); World Bank estimates based on Stats SA 2012b (South Africa); Armenia, Ethiopia, and Indonesia data from Younger and Khachatryan (2017), Hill et al. (2017) and Jellema, Wai-Poi and Afkar (2017).

Note: GNI = gross national income. PPP = purchasing power parity.

a. Direct taxes include both corporate and personal income tax collections.

The analysis presented below focuses on the major tax items, namely PIT, payroll taxes, VAT, specific excise duties on alcohol and tobacco, and the general fuel levy. These items made up about 64.5 percent of all general government tax revenue in 2010/11 (Stats SA 2012a).<sup>8</sup>

### **Direct Taxes**

PIT is levied on individual taxable income (gross income less exemptions and allowable deductions) including capital gains. Individuals generally receive their income as salary or wages, pension or annuity payments, and investment income (interest and dividends). Filing is done individually, and the system does not provide deductions for married persons or children. All formal sector employees must be registered by their employers for PIT, and the employer is responsible for calculating and withholding the PIT payable.<sup>9</sup> Limited deductions are permitted for travel expenses, contributions to pension funds, and medical aid (health insurance) schemes. There are no social security taxes because there is no contributory social security in South Africa.

Two earmarked payroll taxes exist: The first is the skills development levy, under which employers contribute 1 percent of total payroll toward a levy used to fund training facilitated through the

<sup>8</sup> The largest omitted item is corporate income tax, which accounts for about 21 percent of tax revenue. The analysis only assesses items included in South Africa's general government budget and therefore excludes revenues collected or activities undertaken by state-owned enterprises.

<sup>9</sup> In 2010/11, individuals with an annual income of less than R 120,000 (US\$16,438, calculated at the average 2010/11 exchange rate of R 7.3 per US\$1)—comprising more than half of all taxpayers—were not required to file tax returns. In 2010/11, the tax threshold (the taxable income below which no PIT was payable) was R 54,200 (US\$7,424) for individuals below age 65 and R 84,200 (US\$11,534) for individuals over age 65. The top marginal tax rate was 40 percent and kicked in at R 525,000 (\$71,917) per year. A certain level of interest income (R 22,300 or US\$3,054 per year in 2010/11) is tax-exempt to promote saving.

Sector Education and Training Authorities.<sup>10</sup> The second is the Unemployment Insurance Fund (UIF), under which employers and employees each contribute 1 percent of earnings (up to a cap, currently set at R 14,872, or US\$1,487 per month) toward a fund that provides income protection for up to 236 days in the event of unemployment.

### ***Indirect Taxes***

The South African VAT system is an example of a “modern” VAT in the sense that most goods and services are subject to a uniform standard rate of 14 percent. Certain foodstuffs are zero-rated, and educational and financial services as well as certain forms of passenger transport are exempt.<sup>11</sup>

Specific excise duties are levied on tobacco products; alcohol products (malt and traditional beer, wine and other fermented beverages, and spirits); and petroleum products (gasoline, distillate fuel, residual fuel, and base oil). Fuel levies include general levies and specific excise duties on gasoline, diesel, and illuminating paraffin. Gasoline and diesel fuel are also levied with a contribution to the Road Accident Fund, which compensates victims of traffic accidents.

### **Expenditures**

Total general government spending in South Africa is also somewhat higher than the average for middle-income countries.<sup>12</sup> Excluding interest payments, it amounted to 32.2 percent of GDP in 2010/11 (Stats SA 2012b), as shown in table 2.

**Table 2. South Africa General Government Expenditure, 2010/11**  
*Percentage of GDP*

Expenditure type	2010/11	Incidence analysis
Total general government expenditure <sup>a</sup>	34.8	14.9
Primary government spending <sup>b</sup>	32.2	14.9
Social spending	17.6	14.9
Cash transfers	3.8	3.8
Child support grant	1.1	1.1
Old-age grant (noncontributory)	1.3	1.3
Disability grant	0.6	0.6
Foster care grant	0.2	0.2
Other grants	0.1	0.1
Free basic services <sup>c</sup>	0.5	0.5
In-kind transfers	12.6	11.1
Education	7.0	7.0
Health	4.1	4.1
Housing and urban development <sup>d</sup>	1.5	—
Other social spending <sup>e</sup>	1.1	—
Non-social spending (incl. public sector pensions)	14.6	—

<sup>10</sup> Under the Skills Development Act No. 97 of 1998, employers pay a monthly skills development levy (determined by the employer’s salary bill) to the South African Revenue Service for skills development of employees. If employees undergo training, the employer can reclaim this amount from the relevant Sector Education and Training Authority.

<sup>11</sup> The following foodstuffs are currently zero-rated: brown bread, maize meal, samp, maize rice, dried maize, dried beans, lentils, tinned pilchards or sardines, milk powder, dairy powder blend, rice, vegetables, fruit, vegetable oil, milk, cultured milk, brown wheaten meal, eggs, and legumes or pulses. Other goods such as diesel and gasoline are zero-rated because they are instead subject to excise duties, and municipal taxes are zero-rated to avoid cascading taxes.

<sup>12</sup> “General government” excludes state-owned enterprises.

Sources: Stats SA 2012b (totals); National Treasury 2013 Budget Review (line items).

Note: — = not available.

a. Total government spending = primary government spending + interest payments on debt.

b. Primary government spending = social spending + non-social spending.

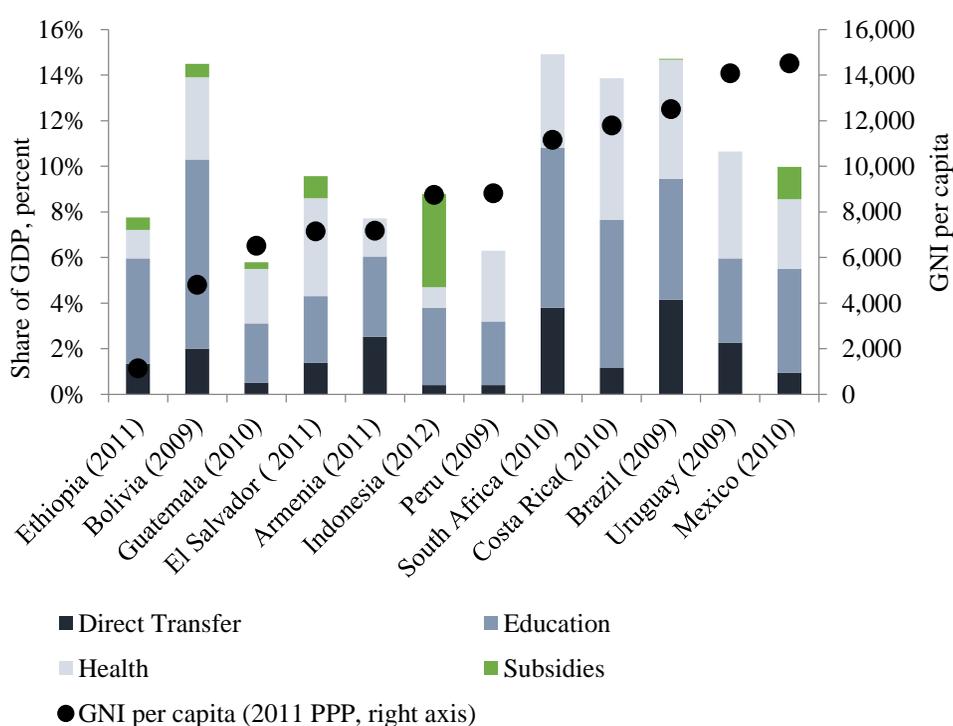
c. For free basic services, the data represent the amount transferred under the equitable share formula for 2010/11 to municipalities to compensate them for providing basic services (such as power, sanitation, water, and refuse removal) to poor households. Data were provided by the Financial and Fiscal Commission of South Africa.

d. In-kind transfers for housing and urban development include expenditure for the Integrated Residential Development Program (IRDP), which was not included formally in the incidence analysis for lack of detailed administrative data on housing values.

e. Data limitations preclude an incidence analysis of the remaining items of social spending.

South Africa’s social spending (as a share of GDP) is among the highest in our sample of comparable countries (figure 2). Just over half of South Africa’s total general government expenditure in 2010/11 was devoted to social spending (Stats SA 2012b). Some 3.3 percent of GDP was dedicated to direct cash transfers to individuals in 2010/11, including items such as noncontributory pensions and child grants (table 2). Transfers amounting to an additional 0.5 percent of GDP covered “free basic services” such as power, sanitation, water supply, and refuse removal, which the government provides free to low-income households (Stats SA 2012b). Because these are sometimes provided in the form of cash transfers, the expenditure on free basic services is included among cash transfers under a benchmark scenario (as further discussed below).

**Figure 2. Social Spending and Subsidies as a Share of GDP in Relation to GNI Per Capita, Selected Countries**



Sources: Beneke, Lustig, and Oliva, 2018 (El Salvador); Bucheli et al. 2014 (Uruguay); Higgins and Pereira 2014 (Brazil); Jaramillo 2014 (Peru); Lustig, 2018, based on Cabrera, Lustig, and Morán 2015 (Guatemala); Paz Arauco et al. 2014 (Bolivia); Sauma and Trejos 2014 (Costa Rica); Scott 2014 (Mexico); World Bank estimates based on Stats SA 2012b (South Africa); Armenia, Ethiopia, and Indonesia data from Younger and Khachatryan (2017), Hill et al. (2017) and Jellema, Wai-Poi and Afkar (2017), respectively.

Note: GNI = gross national income. PPP = purchasing power parity. Social spending does not include contributory old-age pensions.

South Africa's total social expenditures are more than twice the median level among developing countries (World Bank 2009). Over the past decade, the number of beneficiaries receiving social grants doubled—from almost 8 million in 2003/04 to 15.8 million in 2013/14—mainly reflecting the expansion of direct cash transfers to children and the elderly. The child support grant was introduced in 1998 and initially targeted children aged 0–7 years, with the age limit progressively raised to 18 years. The age of eligibility for the old-age grant for men was also lowered from 65 to 60 years to match the eligibility age for women.

In addition, 12.6 percent of GDP in 2010/11 was spent on in-kind transfers through health (4.1 percent of GDP) and education (7 percent of GDP) outlays, while 1.5 percent of GDP was devoted to housing and urban development in-kind transfers, including Integrated Residential Development Program (IRDP) housing (table 2).<sup>13</sup> Compared with other relatively big social spenders such as Bolivia and Brazil, South Africa spends somewhat more on education and less on health and direct cash transfers than Brazil does, but more on direct cash transfers than Bolivia does (figure 2).

The components of social spending included in this study are direct cash transfers, free municipal basic services, and in-kind transfers in the form of health and education spending. Together, these items account for 43 percent of total spending and 85 percent of social spending (table 2). Data limitations made it impossible to include the remaining items of social spending. The text below further describes the main features of each of these social spending programs in South Africa.

### *Cash Transfer Programs*

Social assistance is prioritized in the national budget in line with section 27(1) of the Constitution, which states, “[E]veryone has the right to have access to . . . social security, including, if they are unable to support themselves and their dependents, appropriate social assistance.” Social grants target categories of individuals who are unlikely to be able to provide for their own needs, namely the elderly, the disabled, and children. Not including free basic services, the social grant system comprises the following programs, on which government spending amounted to 3.3 percent of GDP in 2010/11, as further described below (Stats SA 2012a): the old-age grant (1.3 percent of GDP), the disability grant (0.6 percent of GDP), the child support grant (1.1 percent of GDP), the care dependency grant (0.1 percent of GDP), and the foster care grant (0.2 percent of GDP). In addition, spending on the grant-in-aid (for social grant beneficiaries who need to pay a full-time caregiver) amounted to 0.01 percent of GDP, and the war veterans pension to 0.001 percent of GDP.

**Old-age grant.** This noncontributory pension transfers cash to eligible people aged 60 years or above. It is means-tested, reaching over 80 percent of age-eligible individuals, totaling 2.65 million beneficiaries in fiscal year 2010/11 (Woolard and Leibbrandt 2010). The value of the old-age grant in 2010 was R 1,080 per month, which increased to R 1,410 (US\$127.5) per month by 2015, having kept pace with inflation in recent years.

**Disability grant.** This grant (which has the same monetary value as the old-age grant) is paid to about 1.1 million working-age people who cannot work because of chronic illness or disability. The number of beneficiaries is slightly down from 2010/11, when 1.2 million people collected this grant (Stats SA 2012a).

**Child grants.** The social grant system also includes three child grants:<sup>14</sup>

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<sup>13</sup> In-kind transfer data come from the National Treasury 2013 Budget Review. The Integrated Residential Development Program (IRDP) focuses on the development of integrated housing projects. It provides for land acquisition; servicing of stands for a variety of land uses including commercial, recreational, schools, and clinics; and residential stands for low-, middle-, and high-income groups. The IRDP land use and income group mix are based on local planning and needs assessment, but the program is not explicitly targeted to the poor. IRDP expenditure was not included formally in the incidence analysis because of the lack of detailed administrative data on housing values.

<sup>14</sup> Data on the child grants come from the National Treasury 2015 Budget Review.

- *The child support grant (CSG)* is the main poverty-oriented child grant available to all primary caregivers who pass a means test. In fiscal year 2014/15, a CSG of R 330 (US\$29) per month was paid for 11.6 million children.
- *The care dependency grant (CDG)* is provided to caregivers of severely disabled children with intensive care needs. In fiscal year 2014/15, a CDG of R 1,410 (US\$127) per month was paid for 138,000 children.
- *The foster care grant (FCG)* is available to foster parents of children found by the courts to need “care and protection” under the Children’s Act. In fiscal year 2014/15, an FCG of R 860 (US\$78) per month was paid for 478,000 children.

The number of FCG and CDG beneficiaries has remained steady over the past few years, while the number of CSG beneficiaries has risen by 1 million children between 2010/11 and 2014/15.

### ***Education***

Education spending amounted to 7 percent of GDP in 2010/11 (Stats SA 2012b). Schooling is compulsory for all children aged 7–15 years. The vast majority (96 percent) of schoolchildren attend public schools. The government provides all public schools with a grant to finance their operational costs and teacher salaries. Schools in poorer neighborhoods are designated “no fee” schools, which receive a slightly higher state subsidy to compensate for the absence of school fees. In 2011, 78 percent of students attended no-fee schools (DBE 2012).

Other public schools charge fees that vary enormously, from about R 100 to about R 30,000 per year. Even at fee-paying schools, however, parents can apply for a full or partial reduction of fees, and schools may not refuse admission to students living in the immediate vicinity. On application, beneficiaries of the child support grant should automatically be exempted from the payment of school fees. Tertiary education is not free but is subsidized.

### ***Health***

The health care system in South Africa is divided into public care (serving more than 80 percent of the population) and private care (serving only those who can afford the high fees). Public health spending amounted to 4.1 percent of GDP in 2010/11 (Stats SA 2012b).

Primary health care is available free of charge to everyone, while hospital services are provided at relatively low cost, with a sliding tariff scale calculated according to income level. Individuals living in households with an income of less than R 6,000 (US\$566) per month in 2010/11, children under six years old, pregnant women, and social grant beneficiaries were automatically exempt from paying for any public health services.

### ***Free Basic Services***

The Municipal Property Rates Act explicitly requires municipalities to provide relief for the poor from charges for municipal services (including water, electricity, and sanitation and refuse removal), which are referred to as “free basic services.” Drawing on international benchmarks, South Africa has adopted a minimum provision of 50 kilowatt-hours of free electricity and 6 kiloliters of free water per household per month, while the minimum requirement for sanitation is a ventilated pit latrine. In 2010, 97 percent of households had access to water supply infrastructure (though this includes communal taps), and 79 percent had access to adequate sanitation.<sup>15</sup> More than three-quarters of households are connected to the electricity grid.

The national government funds about half of total municipal spending through an “equitable share formula.” This transfer amounted to about 1 percent of GDP in 2010/11 (SALGA 2012). About

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<sup>15</sup> Data on access to services come from the National Treasury 2011 Budget Review.

three-quarters of the equitable share transfer reflects that part of the formula used to cover the operating costs of providing basic services to poor households in each municipality, using an estimated number of poor households in their area. However, at the local level, some municipalities also use a block tariff system, which makes it possible for municipalities to cross-subsidize free basic service allocations to the poor, using revenue from service fees paid by the nonpoor.

The availability of free basic services is variable, in that municipalities determine their own eligibility criteria or “indigence” levels. Larger municipalities provide a certain amount of free water and electricity by not charging for the first few units and then applying rising block tariffs for consumption over that amount. Other municipalities provide a rebate to households that apply on grounds of indigence (typically defined as a monthly income below twice the amount of the old-age grant). An important limitation of the free basic services safety net is that households in areas without service infrastructure cannot benefit from the free services.

### 3. Data and Assumptions

#### Data

This working paper uses the 2010/11 IES conducted by Statistics South Africa, which contains data on household income, expenditures, cash transfers, and use of educational services collected from 25,328 households across the country over a 12-month period (Stats SA 2012b).<sup>16</sup> The allocation or “mapping” to individuals is obtained by dividing the total tax paid or transfer received by each household by the total number of household members (excluding lodgers and domestic workers).

In addition, we use national accounts, administrative, and fiscal account information for 2010 and 2011, coinciding with the years of the household survey. Finally, we use the 2009 input-output table provided by the National Treasury (the closest one available to the year of the survey) to estimate second-round effects of indirect taxes and subsidies.

#### Assumptions

In some cases, information on the incidence of a particular component of fiscal policy can be obtained directly from the IES. When the direct identification method is not feasible, one can use other methods to allocate taxes or transfers, as described in detail in Lustig and Higgins (2013) and Lustig (2018). The methods used for each category of taxes and transfers in our study are summarized below, with details in annex 8A.

#### *Tax Estimation*

On the tax side, the IES does not provide information on personal income taxes or payroll taxes such as the skills development levy and contributions to the UIF. Thus, the burden of these payments had to be simulated. Consistent with other conventional tax incidence analyses, we assume that the economic burden of direct personal income taxes is borne by the income recipient. The burden of payroll taxes is assumed to fall entirely on workers.

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<sup>16</sup> The methodology for IES data collection is an internationally accepted best practice, and the quality of the survey’s income and consumption data is generally considered to be good. However, because the reported share of food consumption of the extreme poor in South Africa is much lower than one would expect, there is concern about potential underreporting at the bottom of the distribution. The survey combines the diary and recall methods to calculate total household consumption, and surveys using these methods over extended periods often risk underestimation of income and consumption. In addition, the IES does not separately identify own-produced goods, which also could lead to underreporting of consumption at the bottom of the distribution and could account for at least part of the gap in the share of food in the consumption basket of the poor relative to what surveys report in other countries. Finally, as in other countries, there are questions about the ability of this type of survey to collect adequate information on households at the top of the distribution. One area for further research would be to try alternative methods to simulate the top of the distribution to try to correct for this.

In contrast, for indirect taxes, the IES provides detailed consumption data that allow us to estimate the burdens of the VAT, the fuel levy, and specific excise duties on alcohol and tobacco. Consumption taxes are assumed to be shifted forward to consumers (see annex 8A for details). Evasion of consumption taxes was taken into account implicitly by using “effective” rates (that is, collected tax as a share of total consumption of that good according to national accounts) rather than statutory rates. As for excise taxes on alcohol and tobacco, the survey severely underestimates actual consumption relative to what is recorded in the national accounts. To correct for this, we assume that the extent of underreporting is proportional across the income distribution. In other words, we assume that the survey provides the correct *distribution* of spending on alcohol and tobacco but that the *levels* of spending are too low.<sup>17</sup>

Finally, we use the National Treasury’s 2009 input-output matrix and a price-shifting model to estimate the second-round effects of indirect taxes, whereby these taxes result in higher costs in sectors that use these goods as inputs.<sup>18</sup> For the VAT, the indirect effects are only considered in the case of exempt items because VAT refunds ensure that there is no cascading of nonexempt items.

### ***Public Spending Estimation***

On the spending side, the IES provides detailed information on the receipt of cash transfers. The numbers of old-age, child, disability, and foster care grant beneficiaries represented in the survey align well with the figures provided by administrative fiscal data from the National Treasury 2014 Budget Review. As for consumption subsidies, note that these are relatively small except for the free basic services provided by municipal governments. However, many municipalities essentially give these services for free to nearly the entire population instead of in the form of reduced rates targeted to the poor, and thus they are similar to a direct transfer to households. In most of this working paper, these municipal services are considered a transfer in our baseline scenario. Under an alternative scenario, we treat these services as an indirect subsidy; these results are available upon request.

To estimate the incidence of public spending on education and health, we follow the “government cost” approach, which measures the input costs per beneficiary obtained from administrative fiscal data (disaggregated by province and type of service) and assigns it to households using those services as identified in the household survey. This approach, also known as the “classic” or “nonbehavioral” approach, amounts to asking the following question: how much would the income of a household have to be increased if it had to pay for the free or subsidized public service at the full cost to the government?

The IES provides information on educational enrollment by level and type (that is, public versus private institutions). Education benefits at the preprimary, primary, and secondary school levels as well as for vocational training were imputed as total government education expenditure (by province) divided by total enrollment (also by province). Given that university education falls under the mandate of the national government, university education benefits were imputed as total national government spending on university education divided by total university enrollment.

As for health spending, data on the use of public health services come from the 2008 National Income Dynamics Study (SALDRU 2014). Details on the assumptions used for the health incidence are included in annex 8A.

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<sup>17</sup> The IES value of alcohol consumption is only 17 percent of total sales reported by the Reserve Bank of South Africa, because many households report zero alcohol or tobacco consumption. Although previous fiscal incidence analysis for South Africa used scaling assumptions similar to the ones used here, the results were mixed, with excise duties found to be quite regressive in 1995 but almost neutral in 2000 (Woolard et al. 2005). Although we could be overestimating the incidence of excises at the bottom of the distribution because of this scaling, we apply the same excise tax regardless of the quality of the alcoholic beverage or tobacco product, which could underestimate excises at the top of the distribution. See annex 8A for details.

<sup>18</sup> See Coady (2008) for a description of the price-shifting model and annex 8A for a description of the approach.

## ***Household Income Estimation***

Once we allocate taxes and transfers to households, we construct the CEQ income concepts:

- *Market income* comprises pretax wages, salaries, income earned from capital assets (rent, interest, or dividends), and private transfers.<sup>19</sup> It also includes imputed rent for owner-occupied housing but does not include self-consumption because this concept is ambiguous in the survey.
- *Disposable income* is constructed by subtracting direct taxes (PIT and employee and employer contributions to the UIF and skills development levy) from market income and adding direct cash transfers. In South Africa, direct cash transfers include the old-age, child, disability, and foster grants.
- *Consumable income* adds the impact of indirect taxes and subsidies to disposable income. In South Africa, indirect taxes included in this analysis include VAT, excises on alcohol and tobacco, and the fuel levy.
- *Final income* adds in-kind benefits such as health and education to consumable income.

## ***Limitations***

Bear in mind the following important caveats about what the fiscal incidence analysis applied here does *not* address:

- It does not take into account behavioral, life-cycle, or general equilibrium effects, and it focuses on average incidence rather than incidence at the margin. Our tax-shifting and labor supply response assumptions are strong because they imply that both consumer demand and labor supply are perfectly inelastic. In practice, they provide a reasonable approximation, and they are commonly used.
- It does not take into account intrahousehold distribution of consumption.
- It does not take into account the differences in the quality of services delivered by the government across income groups.
- We cannot include some important taxes and spending that are in the general government budget. Revenues such as corporate income, international trade, or property taxes and spending categories such as infrastructure investments (including urban services and rural roads, for example) are excluded even though they affect income distribution and poverty; these exclusions reflect a combination of data and methodological constraints.<sup>20</sup>

Note, too, that by considering the poverty and redistributive effects of the fiscal instruments examined in this working paper, we do not offer a full analysis of whether specific taxes or expenditures are *desirable*. When one tax or expenditure is found to be more redistributive to the poor than another, the temptation is to conclude that it is preferable. However, redistribution is only one of many criteria that matter when making public policy. Good tax policy will aim to be sufficient, efficient, and simple in addition to being equitable. Moreover, public spending will aim (among other goals) to provide the minimal functions of a state (such as security) and invest in the

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<sup>19</sup> In South Africa, we take net market income reported by each household in the IES and impute each direct tax paid to arrive at market income. This figure is then divided by the number of members in each household to arrive at per capita market income. We did not include the value of own production (sometimes called autoconsumption). Statistics South Africa did not measure autoconsumption in the conventional way; instead its variable captured both home production and business inventories, and we had no way of separating out the autoconsumption component. Market income does include the imputed value of an owner's occupied housing, though.

<sup>20</sup> The incidence of international customs tariffs can be estimated in the same way as the incidence of other indirect taxes. However, this paper does not do so because of time constraints. For property taxes, the cadastral value of property would be required, and this value was not available for this study. Moreover, the empirical tools necessary to undertake incidence analysis of corporate taxes and investment spending are not well established in the literature and were beyond the scope of what could be done in this paper.

essential public goods (such as infrastructure) that are necessary to ensure prosperity in addition to improving equity. The assessments of the equity of specific taxes and spending programs presented in this working paper are just one type of input to public policy making—one that should be weighed with other evidence before deciding whether a tax or expenditure is desirable.

To try to control for possible shortcomings and biases, we conduct various robustness tests. In particular, although we treat free basic services as targeted cash transfers in most of the working paper, some municipalities provide these services as untargeted indirect subsidies. Because we cannot differentiate across municipalities, one robustness check is to treat free basic services as an indirect subsidy in all municipalities. We also construct all income concepts beginning with reported household consumption from the survey instead of starting from income as reported in the survey. These robustness test results corroborate the main findings and are available upon request.

## 4. Impact of Taxes and Government Spending on Inequality and Poverty

From theory, one knows that a tax or expenditure instrument could be progressive but not have large impacts on equity if it is too small (Duclos and Tabi 1996). Moreover, a tax could be regressive but still equalizing if analyzed in conjunction with other taxes and, especially, transfers.<sup>21</sup> Furthermore, taxes and transfers could be equalizing and yet poverty increasing, because inequality is measured on the basis of *relative* incomes, while poverty is affected by *absolute* incomes: that is, a tax system could be progressive and equalizing but hurt the poor if they pay more in taxes than they receive in transfers (Higgins and Lustig 2015).

Finally, taxes and transfers could introduce horizontal inequity. One typical form of horizontal inequity occurs when the ranking of individuals (that is, the ordering of individuals in the income distribution before taxes and transfers) gets changed (swapping some individuals' positions) by the fiscal system.<sup>22</sup>

In what follows, we show that taxes and transfers in South Africa are designed such that the combination of their size, progressivity, and interaction among fiscal components results in a fiscal system with several desirable characteristics from the equity point of view:

- Taxes and transfers in South Africa reduce inequality *and* poverty.
- The system produces relatively little horizontal inequity in the form of reranking.
- Except for tertiary education, spending on education is pro-poor (that is, the share of spending devoted to the poorest deciles exceeds what is spent on the richer deciles), and so is spending on health.
- Except for excise taxes, all the components of fiscal policy are equalizing, including the VAT.

### Impact on Inequality

Fiscal policy contributes substantially to reducing market income inequality in South Africa (table 3). Using income per capita as the welfare indicator, fiscal policy reduced the “market income” Gini coefficient from 0.771 to a “disposable income” Gini of 0.694 once direct taxes (PIT and payroll taxes) and transfers (cash transfer and free basic services) are taken into account, in line with what is typically reported by Statistics South Africa,<sup>23</sup> representing a drop of some 7.7 Gini points. If indirect

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<sup>21</sup> As soon as there is more than one intervention, assessing the progressivity of fiscal interventions individually is not sufficient to determine whether they are equalizing (see, for example, Lambert 2002).

<sup>22</sup> For more about how vertical equity, reranking, and horizontal inequity are defined and used in the analyses throughout this volume, see Inchauste and Lustig (2017) as well as Enami, Lustig, and Aranda (2018).

<sup>23</sup> The Gini coefficient, including all forms of income and social grants but *excluding* free basic services, was 0.69 in 2011 (Stats SA 2014a).

taxes (VAT, excise taxes, and the fuel levy) are included, the Gini remains more or less the same. However, if one wanted to take an extra step and monetize the value of health and education spending—bearing in mind potential differences in the quality of services, as described below—the “final income” Gini coefficient would be 0.596, a decline of 17.5 Gini points.

In terms of fiscal redistribution, South Africa performs quite well when compared with other middle-income countries, although its inequality is still much higher than other countries even after well-targeted transfers. The reduction in the Gini coefficient for consumable income (income after direct transfers and both direct and indirect taxes and subsidies) relative to the Gini for full market income (all pretax wages, salaries, capital earnings, and private transfers) is larger in South Africa than in the other countries included in our sample (table 3).

Nonetheless, South Africa’s Gini of 0.596 on final income (or 0.695 on consumable income, which excludes the monetized value of education and health services)—reflecting the full impact of redistribution through the fiscal instruments that we examined—is still higher than the market income Gini of Brazil, the second-most unequal country shown in table 3. In other words, before Brazil even begins to implement redistribution through its fiscal system, it starts off with market income that is already less unequal than what South Africa can achieve *after* using all the fiscal policy instruments at its disposal.

**Table 3. Overall Redistributive Effect of Taxes, Transfers, and Subsidies in South Africa Relative to Other Selected Middle-Income Countries**

Indicator	South Africa (2010)	Bolivia (2009)	Brazil (2009)	Indonesia (2012)
Gini (market income) <sup>a</sup>	0.771	0.503	0.579	0.394
Gini (consumable income) <sup>b</sup>	0.695	0.503	0.546	0.391
Redistributive effect <sup>c</sup>	0.077	0.000	0.033	0.003
Vertical equity (VE) <sup>d</sup>	0.083	0.003	0.048	0.006
Reranking effect (RR) <sup>e</sup>	0.006	0.003	0.014	0.003
RR/VE <sup>f</sup>	0.075	1.000	0.300	0.451

Sources: Lustig, 2018, based on Higgins and Pereira 2014 (Brazil); Paz Arauco et al. 2014 (Bolivia); World Bank estimates based on Stats SA 2012b (South Africa); Indonesia data from Jellema, Wai-Poi and Afkar (2017).

Note: Gini coefficients are calculated starting from income-based data in the cases of Bolivia, Brazil, and South Africa and from consumption-based data in the case of Indonesia.

a. “Market income” comprises pretax wages, salaries, and income earned from capital assets (rent, interest, or dividends) and private transfers. It also includes contributory pensions in all cases as well as imputed rent for owner-occupied housing but not self-consumption. (For more information about how market income is calculated for South Africa, see footnote 19 of this working paper.)

b. “Consumable income” = market income – direct and indirect taxes + direct cash transfers, Social Security contributions, and consumption subsidies and taxes.

c. The “redistributive effect” refers to the change in inequality associated with fiscal policy (direct and indirect taxes, direct transfers, and subsidies). It is calculated as the difference between the market income and consumable income Gini coefficients. Declines in the consumable income Gini relative to the market income Gini indicate a positive redistributive effect.

d. Vertical equity (VE) is equal to the difference between the Gini coefficient for incomes *before* taxes and transfers and the concentration coefficient for incomes *after* taxes and transfers

e. The reranking (RR) effect refers to a form of horizontal inequity that occurs when the fiscal system changes the ordering of individuals in the income distribution. RR is equal to the difference between the Gini coefficient for incomes *after* taxes and transfers and the concentration coefficient for incomes *after* taxes and transfers.

f. “Horizontal inequity” is calculated as the RR effect as a proportion of the VE effect, or RR/VE.

Analyzing the equity dimension of a fiscal system should also assess how much horizontal inequity is generated by fiscal policy (Duclos and Araar 2006). Table 3 shows the redistributive effect (RE), vertical equity (VE) effect, and reranking (RR) effect for four middle-income countries with comparable data. Here the RE is measured by subtracting the Gini coefficient for consumable income from the Gini for market income; in other words, it is the change in inequality associated with direct and indirect taxes as well as direct transfers and subsidies. As table 3 also shows, South Africa is the country with both the highest RE and the lowest horizontal inequity. Reranking as a proportion of the VE effect (or RR/VE) is significantly lower in South Africa (7.5 percent) than, for example, in Brazil (30 percent), the country with the second-lowest RR/VE ratio.<sup>24</sup> An extreme case of horizontal inequity induced by fiscal policy is Bolivia, where reranking completely wipes out the reduction in vertical inequity.

## Impact on Poverty

Tax and expenditure instruments in South Africa reduced the incidence of extreme poverty (measured as US\$1.25 per day at 2005 purchasing power parity [PPP]) from 39.2 percent (based on market income) to 25.9 percent (based on consumable income) in 2010, as shown in table 4. As previously noted, consumable income includes the combined effect of all taxes, cash transfers, and free basic services.<sup>25</sup>

It is also more common to see the incidence of poverty calculated on the basis of disposable income (subtracting direct taxes from market income and adding direct cash transfers but excluding the effects of indirect taxes and subsidies). By this calculation, direct taxes and transfers cut extreme poverty in 2010 almost in half: from 39.2 percent (market income) to 20.2 percent (disposable income).<sup>26</sup>

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<sup>24</sup> One element that causes reranking in Brazil is the country's large program of special circumstances pensions, a social safety net designed to help households cope with adverse shocks (such as unemployment, illness, death, and disability). The program is available regardless of household poverty level, and because the size of compensation is determined by the previous labor income of the household, it can lead to larger transfers to nonpoor families.

<sup>25</sup> In line with international practice, we exclude the monetary value of education and health services in calculating the impact of fiscal policy on poverty rates because households are unlikely to be willing to pay as much as the government spends on these services and consequently do not view these services as part of their income.

<sup>26</sup> A caveat is in order. For reasons explained in Bibi and Duclos (2010), care should be taken not to attribute effects to individual interventions on the sole basis of the difference between consecutive pairs of indicators. For example, the difference between the Gini coefficients for consumable and disposable income *is not equal to* the contribution of indirect subsidies and indirect taxes to the decline of inequality from market to consumable income. This is simply because the contribution of each intervention is path dependent, and what we are showing is just one of the paths. We *can* compare, however, the impact of interventions on any indicator with respect to market income, which is what we do in this section.

**Table 4. Inequality and Poverty Indicators in South Africa, by Income Concept, 2010**

Indicator	Market income <sup>a</sup> (1)	Disposable income <sup>b</sup> (2)	Consumable income <sup>c</sup> (3)	Final income <sup>d</sup> (4)
<i>Inequality indicators</i>				
Gini coefficient	0.771	0.694	0.695	0.597
Theil index <sup>e</sup>	1.222	0.971	0.971	0.723
90/10 <sup>f</sup>	198.9	32.7	33.2	12.2
<i>Headcount poverty indicators</i>				
National food poverty line (%)	40.8	23.4	29.0	—
Official consumption-based food poverty line (%)	—	20.2	—	—
National lower-bound poverty line (%)	46.5	34.2	39.6	—
Official consumption-based poverty line (lower bound) (%)	—	32.2	—	—
National upper-bound poverty line (%)	52.3	45.1	50.1	—
US\$1.25 per day at 2005 PPP (%)	39.2	20.2	25.9	—
US\$2.50 per day at 2005 PPP (%)	44.1	29.6	35.2	—
US\$4.00 per day at 2005 PPP (%)	52.3	44.9	49.9	—

*Source:* World Bank estimates based on 2010/11 Income and Expenditure Survey (IES) data.

*Notes:* — = not available. PPP = purchasing power parity. These results correspond to the scenario in which free basic services are treated as a direct transfer.

a. “Market income” comprises pretax wages, salaries, and income earned from capital assets (rent, interest, or dividends) and private transfers. It also includes contributory pensions in all cases as well as imputed rent for owner-occupied housing but not self-consumption. (For more information about how market income is calculated for South Africa, see footnote 19 of this working paper.)

b. “Disposable income” = “market income” – direct taxes and contributions + cash transfers.

c. “Consumable income” = “disposable income” – indirect taxes + consumption subsidies.

d. “Final income” = “consumable income” + in-kind transfers (such as public health and education expenditure)

e. While less commonly used than the Gini coefficient, the Theil index is another inequality indicator (Theil 1967).

f. 90/10 is the ratio of the 90th income percentile to the 10th income percentile.

In this regard, South Africa also stands out relative to comparator countries (table 5). It shows the largest percentage-point poverty reduction of the “CEQ countries” (countries to which the same methodological approach was applied, as described in Lustig and Higgins 2013). Most notably, indirect taxes on consumption do not reverse the poverty reduction associated with direct transfers; thus South Africa’s consumable-income poverty (column 3) is still lower than its market-income poverty (column 1), in contrast to what happens in several of the other countries, including Brazil.

**Table 5. Poverty Headcount of CEQ Countries, by Income Concept***Percentage earning US\$2.50 (PPP 2005) per person per day*

Country (year of data)	Market income <sup>a</sup> (1)	Disposable income <sup>b</sup> (2)	Consumable income <sup>c</sup> (3)
Armenia (2011)	31.3	28.9	34.9
Bolivia (2009)	19.6	17.6	20.2
<b>Brazil (2009)</b>	<b>15.1</b>	<b>11.2</b>	<b>16.3</b>
Costa Rica (2010)	5.4	3.9	4.2
El Salvador (2011)	14.7	12.9	14.4
Guatemala (2010)	35.9	34.6	36.5
Indonesia (2012)	56.4	55.9	54.9
Mexico (2010)	12.6	10.7	10.7
Peru (2009)	15.2	14.0	14.5
<b>South Africa (2010)</b>	<b>44.1</b>	<b>29.6</b>	<b>35.2</b>
Uruguay (2009)	5.1	1.5	2.3

*Sources:* Beneke, Lustig, and Oliva, 2018 (El Salvador); Bucheli et al. 2014 (Uruguay); Cabrera, Lustig, and Morán 2015 (Guatemala); Higgins and Pereira 2014 (Brazil); Jaramillo 2014 (Peru); Lustig, 2018, based on Sauma and Trejos 2014 (Costa Rica); Paz Arauco et al. 2014 (Bolivia); Scott 2014 (Mexico); World Bank estimates based on Stats SA 2012b (South Africa); Armenia and Indonesia data from Younger and Khachatryan (2017) and Jellema, Wai-Poi and Afkar (2017), respectively.

*Note:* PPP = purchasing power parity. “CEQ countries” are those assessed using the same methodological approach in the Commitment to Equity (CEQ) initiative (Lustig and Higgins 2013).

a. “Market income” comprises pretax wages, salaries, and income earned from capital assets (rent, interest, or dividends) and private transfers. It also includes contributory pensions in all cases as well as imputed rent for owner-occupied housing but not self-consumption. (For more information about how market income is calculated for South Africa, see footnote 19 of this working paper.)

b. “Disposable income” = “market income” – direct taxes and contributions + cash transfers.

c. “Consumable income” = “disposable income” – indirect taxes + consumption subsidies.

By how much does social spending in South Africa boost the incomes of the poor? Our analysis finds that households in the poorest decile receive transfers and indirect subsidies that are worth 11 times their market income. (The benefits would be 32 times their market income if the monetized value of in-kind benefits such as health and education were added to the cash transfers.) Their tax burden, in contrast, amounted to twice their market income. Households in the bottom half of the income distribution overall receive far more in direct transfers and free basic municipal services than they pay in taxes. The net cash position of the household after taxes and transfers is positive for the bottom 60 percent of the population, a far larger share of the population than in other middle-income countries.

Furthermore, once the monetized value of in-kind spending on education and health are also included in benefits, the bottom decile “received” R 6,900 (or US\$945) per capita in 2010/11 from the government, compared with R 724 (US\$99) paid in taxes. Only the top three deciles of the market income distribution pay more in taxes than they receive in all forms of cash and in-kind benefits.

### **Education and Health Spending: How Pro-Poor?**

As shown earlier in table 4, adding the monetized value of spending on education and health results in an additional reduction of the Gini coefficient (from consumable income to final income) of 10 percentage points. Apart from this decrease in inequality, how *pro-poor* is the government’s spending

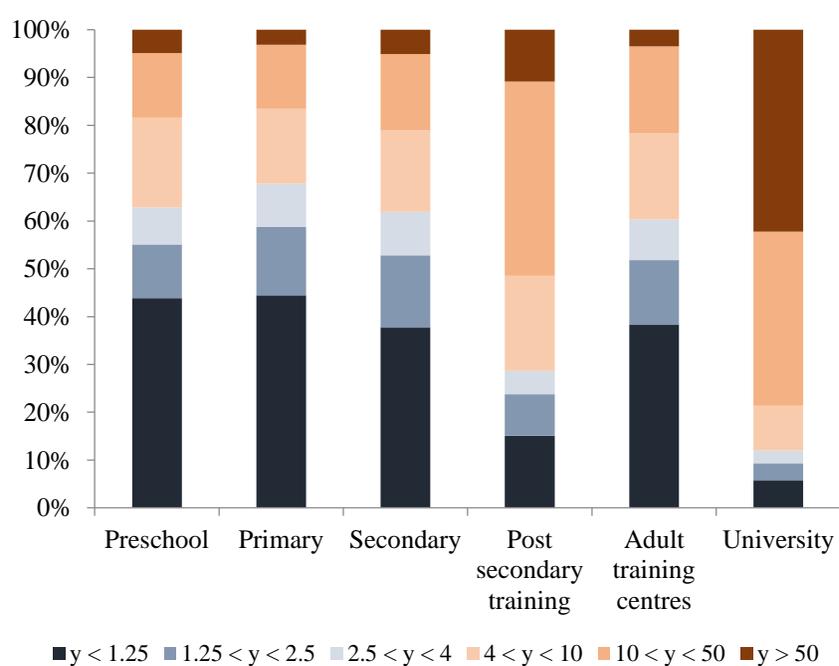
on education and health? (“Pro-poor” means spending that is progressive in absolute terms: that is, per capita spending that decreases with income.)

In assessing how education and health spending benefit the poor, we have to caution that our analysis does not address the *quality* of such spending. We use government expenditure data on the various forms of education and health services to estimate unit costs of these programs. The analysis thus assumes that the actual benefit received by individuals is equal to the amount spent per capita. A clear limitation of the analysis is the variation in quality of school infrastructure, teachers, and health clinics and hospitals across the country.

### ***Education Spending***

Spending in South Africa on preschool, primary, and secondary education is pro-poor (figure 3), reflecting both relatively high spending and high enrollment rates (over 97 percent participation for 7- to 15-year-olds and 83 percent for 16- to 18-year-olds [NPC 2011]). Spending on adult education is also pro-poor: about half of the spending on adult training centers benefits households with incomes of less than US\$4 a day in 2005 PPP. However, although postsecondary school is still equalizing, it is not pro-poor because the poor have lower rates of attendance at colleges and universities. Spending on college education and university education is progressive only in relative terms, with spending on college education being more progressive than spending on university education.<sup>27</sup>

**Figure 3. Distribution of Benefits from Government Education Spending in South Africa, by Educational and Household Income Level, 2010/11**



*Source:* World Bank estimates based on 2010/11 Income and Expenditure Survey (IES) data.

*Note:* Figure shows the share of education benefits going to households (y) within ranges of per capita income per day (in U.S. dollars at 2005 purchasing power parity [PPP]).

### ***Health Spending***

Health spending is pro-poor to a (roughly) similar extent as education spending. The monetized value of health spending per patient makes up a larger share of the market incomes of those at the bottom of the income distribution than of those at the top of the distribution, amounting to nine times the market incomes of the poorest market-income decile. Public spending on health is

<sup>27</sup> Note that students are captured in surveys wherever they find themselves when studying, which sometimes are not the same places as their households of origin. As a result, it may appear that some students from very poor households are not actually appearing in the survey as poor.

relatively well targeted, not because poorer people have higher utilization rates but because high-income households choose not to use the public health care system.

The public sector, whose health expenditure in 2010/11 equaled 4 percent of GDP, serves roughly 83 percent (41.7 million) of the South African population (NPC 2011). The remaining 17 percent (8.3 million) of the population have private health insurance (termed “medical aid” in South Africa) and mostly use private facilities, with total private sector health-related spending amounting to about 4.3 percent of GDP in 2010 (NPC 2011). Many households use both private and public health care systems, with even quite poor households often choosing to see private general practitioners (GPs) rather than attend public clinics, where waiting times are long and a GP can only be seen after a referral from a nurse.

### ***Education and Health Performance and Outcomes***

Given the limitations of the analysis mentioned earlier, a few words of caution are warranted to explain how our findings on targeting may not translate into a commensurate actual impact on the poor. Despite good policy and relatively high spending on education and health in relation to GDP, actual performance and outcomes in these sectors have been disappointing.

**Education.** South Africa achieves sixth-grade test scores in reading and mathematics that are below the regional averages for South and East Africa, even though many of these comparator countries spend the same or less on education per capita (Presidency, Republic of South Africa 2014; SACMEQ 2011). The 2011 Trends in International Mathematics and Science Study (TIMSS) showed large improvements in ninth-grade scores relative to 2002, but South African students are still ranked in the bottom 5 out of 42 economies. Moreover, the TIMSS results showed that the average math and science scores for South Africa’s best-performing students (those in the 95th percentile) were below the average scores of students in Finland; Japan; the Republic of Korea; the Russian Federation; Singapore; Slovenia; and Taiwan, China (Presidency, Republic of South Africa 2014).

Another important consideration is how education spending per student varies by population group. One of the major features of social spending under apartheid was the large gap in spending per schoolchild: per capita funding for white students was 10 times that of black students. However, race-based allocations became unconstitutional under the postapartheid rules. As expected, the gap in public financing based on a student’s race has been eliminated: although in the early 1990s the average white child still received a spending subsidy for education that was 4.5 times that of a black child, the disparity was eliminated by 2006 (Van der Berg 2009).

Any remaining gap in spending per pupil is caused by the fact that more highly qualified teachers tend to be concentrated in richer schools, implying a slight bias in salary expenditure per student to these schools. But this disparity is virtually balanced by the higher allocations of spending to meet national norms and standards in poorer schools. Although schools in more-affluent neighborhoods can supplement state resources by charging school fees, the public financing of schools is more or less equal. As a result, public spending per student averaged R 11,000 in 2011, and about 78 percent of students (more than 8 million) in 80 percent of public schools (almost 20,000) benefited from no-fee schools (Presidency, Republic of South Africa 2014).

**Health.** Despite steady improvements, South Africa still has comparatively high maternal and infant mortality by middle-income country standards even though its health spending (public and private) of just over 8 percent of GDP is comparatively high (DPME 2013).

### **Contribution of Taxes and Transfers to Income Redistribution**

As shown above, the *combined* effects of taxes and social spending in South Africa are quite redistributive. Next we turn to this question: which components of the fiscal system are equalizing, which ones are unequalizing, and to what extent?

As discussed in Lustig (2018) and summarized in Inchauste and Lustig (2017), in a world where multiple fiscal interventions exist, one cannot rely on the standard progressivity measures (such as the Kakwani coefficients) to determine whether an intervention exercises an equalizing or unequalizing force, because of path dependency. To measure the contribution of a particular fiscal intervention (or combinations of them), we have opted to use the “marginal contribution.” Recall that the marginal contribution to the redistributive effect of a particular fiscal intervention is measured as the difference in the Gini for the income concept without that intervention and the Gini with the intervention. For example, to calculate the marginal contribution of the VAT to the observed change from the market income Gini to the consumable income Gini, one must take the difference between the Gini coefficient of consumable income *without* the VAT and the Gini coefficient of consumable income *with* the VAT. If the VAT is equalizing, this difference shall be positive; if unequalizing, the difference shall be negative.

Table 6 shows the marginal contributions of each individual fiscal intervention analyzed here as well as those of the conventional broad categories such as direct taxes, direct transfers, indirect taxes, and in-kind transfers for education and health. Hence, the marginal contributions are shown for the “cash” portion of the fiscal system (cash transfers, direct taxes, and indirect taxes) as well as for the fiscal system including noncash benefits in education and health.

**Table 6. Marginal Contribution of Taxes and Transfers in South Africa, 2010/11**

Fiscal intervention	Size <sup>a</sup> (%)	Concentration coefficient	Kakwani coefficient <sup>b</sup>	Marginal contribution <sup>c</sup>	
				Redistributive effect (Gini points)	Poverty reduction effect (pp)
Total from market income to consumable income <sup>d</sup>	n.a.	n.a.	n.a.	0.0766	0.1054
Direct taxes and contributions	13.58	0.8966	0.1254	0.0327	-0.0018
Personal income tax	13.58	0.9093	0.1381	0.0321	-0.0002
Payroll taxes (UIF and SDL)	—	0.7711	-0.0001	0.0013	-0.0018
Direct transfers	5.38	-0.2709	1.0421	0.0672	0.0881
Old-age pension	1.93	-0.1744	0.9456	0.0198	0.0384
Child support grant	1.47	-0.3352	1.1065	0.0204	0.0281
Disability grant	0.93	-0.2545	1.0257	0.0103	0.0217
Child care dependency grant	0.07	-0.3729	1.1441	0.0008	0.0024
Child foster care	0.11	-0.3203	1.0915	0.0013	0.0039
Grant-in-aid	0.03	-0.1538	0.9250	0.0003	0.0007
War veterans grant	0.00	-0.1009	0.8721	0.0000	0.0000
Other grants	0.02	0.0112	0.7600	0.0001	0.0004
Free basic services (treated as direct transfers) <sup>e</sup>	0.84	-0.3890	1.1602	0.0117	0.0197
Indirect taxes	14.09	0.6885	-0.0828	-0.0002	-0.0534
Value added tax	10.05	0.7098	-0.0614	0.0025	-0.0364
Excise taxes on alcohol and tobacco	1.07	0.4062	-0.3650	-0.0040	-0.0107
Fuel levy	2.97	0.7179	-0.0533	0.0010	-0.0112
Total from market income to final income <sup>d</sup>	n.a.	n.a.	n.a.	0.1758	0.3689
Direct taxes and contributions	13.58	0.8966	0.1254	0.0430	-0.0003
Direct transfers	5.38	-0.2709	1.0421	0.0517	0.1762
Indirect taxes	14.09	0.6885	-0.0828	0.0127	-0.0258
In-kind transfers	12.45	-0.0505	0.8217	0.0992	0.3169
Education spending	6.93	-0.0457	0.8169	0.0490	0.1944
Preschool	0.05	-0.1140	0.8852	0.0004	0.0010
Primary school	3.45	-0.1898	0.9611	0.0298	0.1090
Secondary school	2.20	-0.1226	0.8938	0.0166	0.0511
College education	0.27	0.2952	0.4760	0.0008	0.0014
Adult education	0.08	-0.0779	0.8491	0.0005	0.0012
University education	0.88	0.6150	0.1562	-0.0007	0.0011
Health spending	5.52	-0.0563	0.8275	0.0433	0.1283

*Source:* World Bank estimates based on 2010/11 Income and Expenditure Survey (IES) and 2010 National Income Dynamics Study (NIDS) data.

*Note:* pp = percentage points. n.a. = not applicable. — = not available. UIF = Unemployment Insurance Fund. SDL = Skills Development Levy.

- a. Size equals the ratio of the amount collected or spent divided by total market income.
- b. The Kakwani coefficient, a measure of progressivity, is computed as the difference between the market-income Gini coefficient and the concentration coefficient for each fiscal intervention; those with positive Kakwani coefficients are progressive. The Gini coefficient measures inequality of income distribution, from 0 (full equality) to 1 (maximum inequality).
- c. The “marginal contribution” columns show the difference between (a) the Gini coefficient, or the headcount poverty rate, of the relevant income concept *without* the specified fiscal intervention; and (b) the Gini coefficient, or headcount poverty rate, of the relevant income concept *including* that intervention. By definition, the sum of the marginal contributions does not fulfill the adding-up principle, so it will not be equal to the redistributive effect unless by coincidence.
- d. “Market income” comprises pretax wages, salaries, and income earned from capital assets (rent, interest, or dividends) and private transfers. It also includes contributory pensions in all cases as well as imputed rent for owner-occupied housing but not self-consumption. (For more information about how market income is calculated for South Africa, see footnote 19 of this working paper.) “Consumable income” = market income – direct and indirect taxes and contributions + cash transfers + consumption subsidies. “Final income” = consumable income + in-kind transfers (such as public health and education expenditure).
- e. In this analysis, the “free basic services” (municipal provision of free power, sanitation, water supply, and refuse removal to low-income households) are considered to be a direct transfer because these services are sometimes provided in the form of cash transfers.

As mentioned above, the redistributive effect of the “cash” portion of the fiscal system is measured as the difference in the market-income Gini minus the consumable-income Gini. As indicated earlier (and shown again in table 6), this redistributive effect equals 7.7 Gini points. As one can observe, direct transfers are equalizing and have the largest marginal contribution to the reduction in inequality (6.7 Gini points), followed by direct taxes and contributions (3.3 Gini points). Indirect taxes are neutral.

The specific interventions with the largest equalizing marginal contributions are PIT (3.2 Gini points); the child support grant (2 Gini points); the old-age grant (2 Gini points); free basic services, which although not cash transfers, are treated here as cash transfers (1.2 Gini points); and the disability grant (1 Gini point).

Notably, despite the fact that the UIF and indirect taxes are regressive as measured by the Kakwani coefficient, their marginal contributions are equalizing (that is, the Gini coefficient for consumable income would be higher if the fiscal system did not include these taxes). The VAT in particular has an equalizing effect that is not negligible. This counterintuitive result—that a regressive tax can be equalizing—results from the fact that although these three taxes are regressive in relation to market income, they are progressive in relation to the income concept that includes all the other interventions except the one analyzed.<sup>28</sup> In the case of the VAT, the equalizing effect stems from the fact that although the VAT is regressive in relation to market income, this tax is no longer regressive when measured against post-cash-transfer income. In contrast, based on their marginal contribution, excise taxes increase the Gini by 0.4 points when they are included in the analysis. That is, even after cash transfers, these taxes are regressive.

The redistributive effect of the whole fiscal system—cash and in-kind portions—equals 17.6 Gini points (table 6). Direct taxes, direct transfers, education spending, and health spending are all strongly equalizing, and their marginal contributions are similar (reducing the Gini by 4.3, 5.2, 4.9, and 4.3 points, respectively). Interestingly, when the income definition includes the in-kind transfers (“final income”) and not just net cash transfers, we see that net indirect taxes (“consumable income”) turn from neutral (no change in the Gini if we take them into account in the analysis) to

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<sup>28</sup> As discussed in Inchauste and Lustig (2017), this counterintuitive result has been dubbed “Lambert’s conundrum” to acknowledge the author’s discovery of such a phenomenon (Lambert 2002).

equalizing (subtracting 1.2 Gini points). The order of magnitude, as expected, is much smaller than the equalizing marginal contributions of the other categories.

## 5. Conclusions

This paper estimated the distributional impact of the main elements of general government taxation and spending in South Africa, applying fiscal incidence analysis to the 2010/11 IES (Stats SA 2012b). On the tax side, it analyzed the incidence of 64.5 percent of total tax revenue, including PIT, VAT, excise taxes on alcohol and tobacco, and the general fuel levy. On the expenditure side, it analyzed the incidence of 43 percent of general government expenditures, focused on social spending including direct cash transfers, free basic services, and health and education spending.

The results show that South Africa uses its fiscal instruments to significantly reduce market income inequality and poverty through a progressive tax system and highly progressive social spending. The rich in South Africa bear the brunt of taxes that we examined, and the government redirects these resources to the poorest in society to raise their incomes. Only the top three deciles of the income distribution pay more in taxes than they receive in transfers. As a result, the fiscal system lifts some 3.6 million individuals out of poverty (measured as those living on less than US\$2.50 per day in 2005 PPP adjusted). It also reduces inequality from a situation where, without these progressive fiscal instruments, the incomes of the richest decile would be over 1,000 times higher than the poorest to one where they are about 66 times higher. The Gini coefficient falls from 0.77 before taxes and social spending programs to 0.59 after their application (or 0.695 when the monetized value of health and education spending are excluded). Despite the large fiscal redistribution, however, South Africa remains one of the most unequal countries in the world.

On the tax side, the only unequalizing component in the analysis consisted of excise taxes. Apart from those, fiscal policy relies on a mix of equalizing direct taxes (such as PIT) and neutral or equalizing indirect and consumption taxes. In combination, they generate an equalizing tax system as follows:

- *Direct taxes* (PIT and payroll taxes) are progressive and equalizing. Because they make up a relatively high share of GDP, their contribution to reducing the gap in incomes between the rich and poor is high. Among the direct taxes, all three (PIT, skills development levy, and UIF) are equalizing.
- *Indirect taxes* are neutral when measured against consumable income (the income concept excluding education and health spending) and slightly equalizing when their contribution is measured against final income (the income concept including education and health spending). Among the indirect taxes, both the VAT and the fuel levy are equalizing.

On the spending side of fiscal policy, social spending is not only progressive but also contributes to large reductions in inequality and poverty (which, as stated earlier, nonetheless remain very high), as follows:

- *Direct transfers* are strongly equalizing, with the child support grant and the old-age grant showing the largest marginal contributions to the redistributive effect.
- *In-kind transfers* through education spending (both in the aggregate and for each level) are equalizing as well as through health spending. Total spending on education and health makes a high marginal contribution to the reduction in inequality. Except for tertiary education, spending on education is pro-poor (per capita spending declines with income), and so is spending on health.

Relative to other middle-income countries, South Africa performs well: it achieves the most income “redistribution” of the comparator middle-income countries, but its inequality and poverty remain far higher than in other countries (Lustig 2016). In fact, inequality in South Africa *after* taxes and

spending is still higher than that of other middle-income countries *before* they begin to use fiscal policy interventions.

Our analysis suggests that although South Africa has some scope to improve the targeting of certain social programs like free basic services, cash transfer programs are already well targeted and substantive. Education and health spending also benefit the poorer parts of the income distribution relatively more than the rich. However, given concerns about the quality of such spending, South Africa could do more to maximize the potential of education and health spending in reducing poverty and inequality. Excise taxes clearly deserve attention from the equity point of view because they are unequalizing and may be too onerous on the poor.

In sum, fiscal policy already goes a long way toward achieving redistribution. Nevertheless, the levels of inequality and poverty in South Africa after taxes and spending remain unacceptably high. More can and should be done to improve the quality of education and health service delivery. But South Africa's fiscal deficit and debt indicators show that the fiscal space to do so is extremely limited, and little room remains on the macro front to spend more to achieve even greater redistribution. Addressing the twin challenges of poverty and inequality in a fiscally sustainable way requires higher and more-inclusive economic growth to support fiscal policy. Such growth would be particularly important in addressing the need for more jobs and higher incomes, especially at the lower end of the income distribution—thus helping narrow the gap in incomes between rich and poor and reinforcing the effectiveness of fiscal policy.

## Annex A. Fiscal Incidence Assumptions

### Personal Income Taxes

Labor incomes reported in the household survey were assumed to reflect labor incomes net of taxes. As a result, personal income tax (PIT) was imputed based on the 2010 PIT rules specified in the National Treasury Budget Review. Similarly, employee contributions to social security, including the Unemployment Insurance Fund (UIF) and Skills Development Levy, were imputed based on reported net incomes. Given imputed direct taxes and contributions, we construct a measure of market income for each individual whereby market income is the imputed income before taxes and contributions.

### Indirect Taxes

#### *Value Added Tax*

First, to find the incidence of VAT, we applied the statutory rate of 14 percent to all goods consumed by households in the survey except for exempt items and the 19 food items and petroleum products that are zero-rated. In general, because retailers can claim VAT refunds for the inputs they used in production, the final burden on the consumer is simply the VAT rate at the final point of sale. For exempt goods, a final consumer pays no VAT *directly*; in exempt sectors, VAT works exclusively *indirectly* when the final consumption price of a good in an exempt sector is higher by the amount of VAT paid on inputs (which a producer in an exempt sector cannot reclaim). To capture this effect, we used the 2009 social accounting matrix (SAM) for exempt goods and find that the indirect effect is 5 percent of the total incidence, given that exemptions are narrowly defined.

#### *Excise Taxes*

For excise taxes, we found that the total weighted value of expenditure on excisable alcohol and tobacco products in the household survey is far below estimates from administrative data. For instance, the ratio of the value of Income and Expenditure Survey (IES) consumption on alcohol is only 17 percent of total sales, according to South African Reserve Bank records. This is because a very large number of households indicated purchasing zero amounts of alcohol or tobacco. To correct for this underreporting, the analysis

1. Rescaled verified excise tax collections from administrative data by the ratio of private consumption in the household survey to what is observed in national accounts;
2. Calculated each (market income) decile's share of alcohol and tobacco expenditure in total alcohol and tobacco expenditure recorded in the household survey; and
3. Multiplied the shares calculated in step 1 by the total calculated in step 2 and distributed that amount uniformly to every household in the market income decile.

The allocation of excise collections in step 3 is, in essence, an estimate of the expected burden. Because excises are primarily a tax to deter consumption, the burden on the income of those who consume these goods can be sizable. Alcohol and tobacco outlays comprise about 1 percent of total expenditure in the bottom decile, and thus, as a share of those households' relatively low market income, the excise on these goods is high.

#### *Fuel Levy*

Finally, the fuel levy has a non-negligible impact across the income distribution, reflecting not only direct taxes paid on fuel consumed but also the indirect impact where the levy increases input costs for other sectors that use fuel. More specifically, the fuel levy was taken as a weighted average of the statutory rates on diesel and gasoline, which average 31.75 percent.

To calculate the direct incidence, this average rate was applied to the household purchases of these fuels observed in the IES. The indirect effects were calculated using a “price-shifting” model (Coady 2008) and the 2009 SAM to assess the price changes for goods and services in sectors that use fuel as an input and assuming that the fuel tax was passed on to the consumer in the form of higher prices. The price-shifting model is static and assumes that exogenously generated price changes are either “pushed forward” to output prices or “pushed backward” onto factor payments. We therefore take results generated as an upper-bound or “overnight” estimate of the impact of any change in government-administered price policy on household welfare.

The percentage price changes derived from the SAM (in all sectors other than fuel) are multiplied by the household budget shares of those sectors to produce a total price change for each household’s consumption basket. Because fuel is used as an input in so many sectors, the indirect effects are sizable, accounting for 58 percent of the total fuel tax incidence in South Africa.

## **Direct Transfers**

Households receiving cash transfers are directly identified in the household survey. Direct transfers overwhelmingly benefit the poor in relative terms, regardless of whether we use market incomes or consumption as the welfare measure.

## **Health Spending**

We used the National Income Dynamics Study (NIDS) Wave 1 data (SALDRU 2014) to look at health facility use. We chose the NIDS Wave 1 data (from 2008) rather than the Wave 2 data (from 2010) because of concerns about the quality of the expenditure data in Wave 2 and selective attrition rates (as higher-income households were much more likely to attrite) between Wave 1 and Wave 2.

A limitation of the data is that different questions were asked of adults and children. For individuals aged 15 years and over (“adults” in the NIDS methodology), we have information about how long ago the last health visit occurred and the type of facility visited. For children (individuals aged 14 years and under), we know whether the child had any routine health checks (when not ill) in the previous year and whether the child had been ill and saw a health care practitioner in the previous 30 days. In cases where the child consulted a health worker, we do not know whether the consultation occurred at a public or private clinic, hospital, or private doctor’s office.

### ***Medical Aid***

The NIDS data suggest that 16 percent of adults and 12 percent of children (under the age of 15 years) in the NIDS sample were covered by medical aid (private health insurance) (SALDRU 2014). Reassuringly, 17 percent of adults and 12 percent of children in the 2010/11 IES data also reported that they were covered by medical aid. Taking adults and children together, this implies that 15 percent of the population was insured in 2010.

### ***Type of Facility Visited***

As shown in table 8A.1, adults without medical aid typically use public clinics (49 percent) or public hospitals (21 percent), although large numbers go to private doctors (25 percent) (SALDRU 2014). As one would expect, adults with medical aid rarely attend public facilities.

**Table A.1 Adult Use of Health Facilities in South Africa, by Medical Aid Status, 2008***percentage*

Last health consultation was at a...?	Adult has medical aid?		Total
	Yes	No	
Public hospital	3.4	20.8	17.0
Private hospital	11.1	1.7	3.8
Public health clinic	5.8	48.9	39.5
Private clinic	3.6	2.6	2.8
Private doctor	74.5	25.0	35.7
Nurse or chemist	1.5	0.5	0.7
Traditional healer	0.1	0.3	0.2
Do not remember	0.0	0.3	0.2
Total	100	100	100

*Source:* Estimates based on 2010 NIDS Wave 1 data.

*Note:* “Medical aid” refers to private health insurance.

### ***User Fees***

Primary health care user fees were abolished in 1996. Whereas Burger and Grobler (2007), using 2003 General Household Survey data, find that 7–10 percent of public clinic users in the bottom 60 percent of the distribution reported paying a fee for service, the NIDS data show this percentage was less than 2 percent. The median fee reported among the 60 respondents who did report a fee was R 35. Given this, we assume that copayments are zero.

Fee-for-payment in public hospitals was more common, with almost a quarter (24 percent) of those who used public hospitals reporting that they had been charged a fee. In the cases where there was a charge, the fees were very low, with the median fee being R 20 and the mean R 51. Across all hospital visits, the mean copayment was R 12. Relative to the cost of a hospital visit (R 2,782), these copayments are so small that they can safely be disregarded.

### ***Number of Visits***

For adults, the NIDS data indicate whether the last visit to a health facility was in the past 30 days, 1–5 months, 6–12 months, and so on. From this, we estimate that the median number of adult visits per year is 1.33.

For children, we know very little. We know whether the child went for a checkup (when not ill) once, more than once, or not at all in the past 12 months. We also know whether the child was ill for more than three days in the past month and whether the ill child was taken to a health care provider.

These data indicate that almost one-tenth (9.6 percent) of children were reported to have been ill for more than three days in the past 30 days. Of these, more than three-quarters (78 percent) sought medical attention. Of those who did not seek medical attention, almost half (48 percent) were regarded by their caregivers as “not sick enough” to need attention. Just over one-quarter (27 percent) of caregivers said that they did not take the child to a health facility because they “did not have the money.”

Children covered by medical aid were much more likely to have been “ill” in the past 30 days (13 percent versus 9 percent overall). This disparity may simply reflect varying caregiver perceptions of what “ill” means. In addition, children with medical aid were more likely to have been taken to a health care provider when ill (84 percent versus 76 percent overall).

Overall, 7 percent of children sought medical attention for illness in the 30 days preceding the survey. Among those with medical aid, this percentage was 10 percent versus 7 percent for the uninsured.

### ***Assumptions***

For children, the NIDS survey does not indicate what type of health facility the child visited. However, for routine health checks (when the child is not sick), we assume that all these health checks occur at clinics. We assume that uninsured children only use public clinics for health checks and that insured children only use private clinics. If more than one routine health checkup (when the child was not ill) occurred in the past year, we assume that there were two visits.

When children are sick, we assume that their patterns of health facility use are similar to those of the adults in the same households. We thus assign facility use to children in proportion to the usage patterns (for public clinic, public hospital, or private facility) of all the adults in the household. Among the 406 cases in which no adults in the household reported ever having made a health visit, we assume that insured children go to private doctors and uninsured children go to public clinics.

### ***Ranking of Households***

We rank households according to per capita expenditure to later merge these data into our primary survey. To make expenditure broadly comparable between the NIDS and IES data, we exclude income tax payments and “lumpy” expenditures such as the purchase of jewelry and durables, bride payments, and expenditures on ceremonies such as weddings, and funerals.

We create expenditure ventiles (5 percent shares), each one containing equal numbers of individuals, ranked by per capita expenditure. We played around with creating more groups such as percentiles, but the small sample size (28,226 individuals in 7,296 households) made the results very sensitive to variations in the data.

### ***Value of a Health Visit***

The total health budget in 2010/11 was R 98 billion. Of this, R 54 billion was for hospitals and about R 17 billion was for primary health care. These line items are assigned to respondents in the survey that report using public hospitals and clinics, respectively. An additional R 7 billion went toward medicines and R 5 billion toward medical supplies. These are assigned equally across all visits to public hospitals and clinics. The residual of R 14 billion is assumed to benefit all individuals who make contact with the health system, regardless of whether they are insured or uninsured and whether they use private or public facilities.

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