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Fiscal Incidence Analysis for Kenya

Using the Kenya Integrated Household Budget Survey 2015/16

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ABBREVIATIONS AND ACRONYMS

CEQ   Commitment to Equity
CT   Cash transfer
FPE   Free Primary Education
GDP   Gross Domestic Product
GoK   Government of Kenya
HSNP   Hunger Safety Net Program
KES   Kenya Economic Survey
KIHBS   Kenya Integrated Household Budget Survey
KRA   Kenya Revenue Authority
KSh   Kenyan Shillings
MoH   Ministry of Health
NHA   National Health Accounts
NHIF   National Hospital Insurance Fund
NSNP   National Safety Net Programme
NSSF   National Social Security Fund
OPCT   Older Persons Cash Transfer
OVC   Orphans and Vulnerable Children
PIT   Personal Income Tax
PMT   Proxy-means test
PSSB   Presidential Secondary School Bursary
PwSD   Persons with Severe Disability
SEBF   Secondary Education Bursary Fund
SPS   Social Protection Secretariat
UFS   Urban Food Subsidy
VAT   Value Added Tax

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Executive Summary

1.   **Kenya has made satisfactory progress in reducing poverty and inequality in recent years.** Economic growth in Kenya between 2005/06 and 2015/16 averaged around 5.3 percent, exceeding the average growth of 4.9 percent observed for Sub-Saharan Africa. This robust economic growth resulted in a reduction in poverty, whether measured by the national or international poverty line. The proportion of the population living beneath the national poverty line fell from 46.8 percent in 2005/06 to 36.1 percent in 2015/16, showing a modest improvement in the living standards of the Kenyan population. Similarly, poverty under the international poverty line of US$ 1.90 a day declined from 43.6 percent in 2005/06 to 35.6 percent in 2015/16. At this level, poverty in Kenya is below the average in sub-Saharan Africa and is amongst the lowest in the East African Community (World Bank, 2018b).

2.   **However, the proportion of the population living in poverty remains comparatively high in Kenya and the rate at which growth translated into poverty reduction was lower than elsewhere.** At twice the average, Kenya's poverty rate is still high for a lower-middle income country, a group that Kenya joined only in 2015. In addition, the Kenya's growth elasticity of poverty reduction, the percentage reduction in the poverty rate associated with a one-percent increase in mean per capita income is only 0.57, lower than in Tanzania, Ghana, or Uganda (World Bank, 2018b). This leads to the obvious question of what can be done to make economic growth more pro-poor in Kenya.

3.   **This study assesses the distributional consequences of Kenya's system of taxes and transfers, covering 60 percent of revenue and between 25 and 30 percent of government spending.** The analysis of fiscal incidence and distributional consequences of Kenya's tax and transfer system is an important input for designing pro-poor policies and potentially for influencing the rate at which economic growth translates into poverty reduction. In this study, direct taxes and transfers, indirect taxes (VAT and excise duties), as well as public health and education spending are assessed in terms of their distributional impacts. Overall, these taxes and transfers account for about 60 percent of revenue and between 25 and 30 percent of government spending.

4.   **The methodology applied in the main analysis of this report follows the Commitment to Equity (CEQ) approach.** The CEQ approach is a type of comprehensive fiscal incidence analysis developed by the Commitment to Equity project to assess the poverty and redistributive effects of taxes and government spending. By decomposing the contributions of individual tax and spending measures, the report provides a unified framework for measuring program and tax progressivity and incidence as well as final impacts. While this approach has important limitations, it's main advantage lies in its comprehensiveness and its ability to identify priority areas for further investigation.

5.   **Overall, Kenya's tax and transfer system reduces inequality with each intervention.** The Gini index of real pre-fiscal income per adult is 0.362, falling to 0.336 after direct taxes and transfers, 0.328 after indirect taxes, and 0.297 after public education spending. These magnitudes are not unlike those observed in other countries in the region. However, with the exception of VAT, the effects on poverty tend to be small.

6.   **Direct taxes on individual incomes are progressive.** 80 percent of the tax incidence falls upon the richest ten percent of the population. The poor are less likely to hold formal sector jobs in Kenya and only

earnings generated in the formal sector are likely to be taxed. In addition, personal income tax in Kenya is subject to progressive rates, starting from a ten percent marginal tax rate to 30 percent for higher income groups. At the same time, direct taxes have very limited effects on poverty as the tax burden is concentrated in the upper quintiles and few of these households are pushed below the poverty line. However, direct taxes reduce the Gini index, a measure of inequality with zero indicating perfect equality and one indicating the most extreme form of inequality, by about 2.2 percentage points. Almost a third of all taxpayers are in the top tax bracket.

7.   Direct transfer programs are well-targeted but reach only a small fraction of the population, resulting in only a modest effect on poverty and inequality. Direct cash transfer programs include the Hunger Safety Net Program (HSNP), the Cash Transfer for Orphans & Vulnerable Children (CT-OVC), the Older Persons Cash Transfer (OPCT), and the Cash Transfer for Persons with Severe Disabilities (CT-PwSD). These programs have expanded rapidly in recent years, albeit from a very small base. The OPCT, the largest of these programs in terms of coverage, covered only around three percent of all households in Kenya in 2015/16. Consequently, transfers from all four of the programs account for, on average, only 3.8 percent of total household expenditure among the bottom 20 percent of the population. The analysis concludes that these programs are mostly well-targeted and, therefore, progressive and pro-poor. Overall, more than 60 percent of the benefits are captured by the poorest 40 percent of the population. Direct cash transfers reduce the poverty rate by only 0.7 percentage points.

8.   The impact of Value Added Tax (VAT) on consumption-based measures of inequality is marginal. Kenya applies a VAT rate of 16 percent. However, reflecting development priorities, including the intention to make certain goods affordable for the greater majority of low-income households, a number of items are zero-rated or VAT-exempt. The analysis finds that VAT is mildly progressive with respect to consumption (but not with respect to income) but close to being neutral. This suggests that exemptions and zero-rates benefit the poor only marginally. VAT reduces the Gini index by 0.5 percentage points.

9.   Excise duties on goods and services are largely progressive. Excise duties on non-alcoholic and alcoholic beverages, tobacco, and airtime account for more than 80 percent of revenues from this tax category. With the exception of excise duty on tobacco products, excise taxes are progressive. However, excise duties account, on average, for only little more than one percent of total household expenditure.

10.   Public education spending is progressive in absolute terms, but progressivity declines with increasing levels of education. A disproportionately larger share of children from poor households benefit from public education, in contrast with children of higher income households where the uptake of private primary education is higher. Nonetheless, the net benefits of spending at higher levels of the education system increasingly benefit the better-off. Public technical and teacher education are progressive only in relative terms and public university education is regressive due to low levels of enrollment among the poor.

11.   Public health spending on outpatient care is progressive. While Kenya's poor are less likely to seek outpatient care in case of injuries or illness, they are more likely to consult public providers if they do, particularly lower-level facilities such as health centres and dispensaries. This higher uptake among the poor of outpatient care in low-level facilities compensates for lower unit costs at this level relative to

government hospitals and lower uptake of outpatient care overall, resulting in a progressive impact of public spending on outpatient care.

12.   Three potential areas are recommended for further investigation. First, direct cash transfers should be further expanded in terms of coverage and size. Second, exemptions and zero-rate taxes benefit the poor only marginally. A reevaluation of exemptions and zero rates with an eye to the item-level incidence of VAT across the welfare distribution might boost revenue collection or improve the targeting of exemptions. However, more empirical work is needed in this area and the present analysis should be followed up accordingly. Third, public spending on health could further be shifted away from higher-level health facilities towards lower-level facilities.

1 Background

1.1 Country context

1. **Economic growth in Kenya between 2005 and 2015 remained resilient despite several challenges.**[1] The Kenyan economy recorded an average real growth rate of 5.3 percent between 2005 and 2015. Overall growth was volatile, with years of high growth (6.9 percent in 2007 and 8.4 percent in 2010) interrupted by a near-stagnant economy in 2008. The economy faced two major shocks in this period. First, electoral violence in early 2008 compounded the initial effects of the global financial crisis, reducing annual economic growth to 0.2 percent. The government respondent with a stimulus package, which contributed to an increase in annual growth to 3.3 percent in 2009 and 8.4 percent in 2010. A second dual shock affected the economy in 2011 when international oil prices increased by 37.4 percent while a drought in the Horn of Africa reduced food output. The escalation in food and fuel prices led to an increase in inflation to 18.9 percent year-on-year in Q3 2011. Low-income households were affected the most, with an inflation rate of 19.6 percent year-on-year compared to high-income households which saw prices increase by 14.5 percent year-on-year. The effects of the shocks in 2011 continued into 2012, causing a dip in annual economic growth to 4.6 percent before rebounding to an average of between 2013-2015 at 5.6 percent.

2. **Real GDP per capita growth mirrored economic growth**. GDP per capita growth rose from 2.8 percent in 2005 to 4.0 percent in 2007, then fell to -2.5 percent in 2008. Low growth in the agriculture sector following post-election violence in 2008 was the main driver of the decline in per capita growth in 2008. Per capita growth then peaked at 5.5 percent in 2009. This can be attributed to a recovery in the agriculture sector, implementation of the government economic stimulus, and a recovery in the tourism sector. Since 2009, per capita growth has been moderate, reaching 3.2 percent in 2016.

3. **Kenya has seen a steady but modest reduction in the poverty rate between 2005/06 and 2015/16.** Consistent with the overall robust economic growth observed, the country has been able to reduce the share of people living below the national poverty line by more than ten percentage points. The national poverty headcount rate went down from 46.8 percent in 2005/06 to 36.1 percent in 2015/16, which corresponds to an annualized rate of poverty reduction of 2.6 percent. Despite this successful reduction in the incidence of poverty, the absolute number of poor declined only marginally, from 16.6 million in 2005/06 to 16.4 million ten years later.

4. **Inequality in Kenya declined between 2005/06 and 2015/16.** Inequality in Kenya has declined at the national level since 2005/06, in line with a pro-poor pattern of economic growth contributing to the observed poverty reduction. The Gini index fell from 0.45 in 2005/06 to 0.39 in 2015/16, indicating that Kenya made considerable progress in terms of reducing inequality. The Gini index in rural areas declined from 0.37 to 0.33, a significant improvement for an indicator that is usually very stable over time. This suggests that redistribution contributed positively to the substantial poverty reduction observed in

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[1] The analysis in this report is limited to the 2005/06-2015/16 era, the period during which detailed household consumption data is available. See World Bank (2018a; 2018b) for more details on the macroeconomic situation, and poverty and inequality, respectively. The fiscal incidence analysis is based on household data collected in 2015/16.

Kenya's rural areas during this period. The level of inequality in Kenya is moderate and comparable to inequality in Tanzania, Uganda, and Ghana.

1.2 Tax structure

5.   **In 2015/16, total government revenue in Kenya was in line with other countries at similar levels of economic development.** A cross-country average over a sample of 31 low- and middle-income countries[2] shows a revenue of 23 percent. However, the observed share of total revenue in GDP in Kenya, 18 percent, was rather typical of countries at Kenya's level of economic development (Figure 1a). Growth in revenue was erratic in recent years, with revenue collection peaking in FY2009/10 at 21.9 percent of GDP.

Figure 1: Total revenue and share of taxes of the total revenue against GDP per capita (2011 PPPs, log scale).

(a) Total revenue as percent of GDP

(b) Taxes as percent of total government revenue
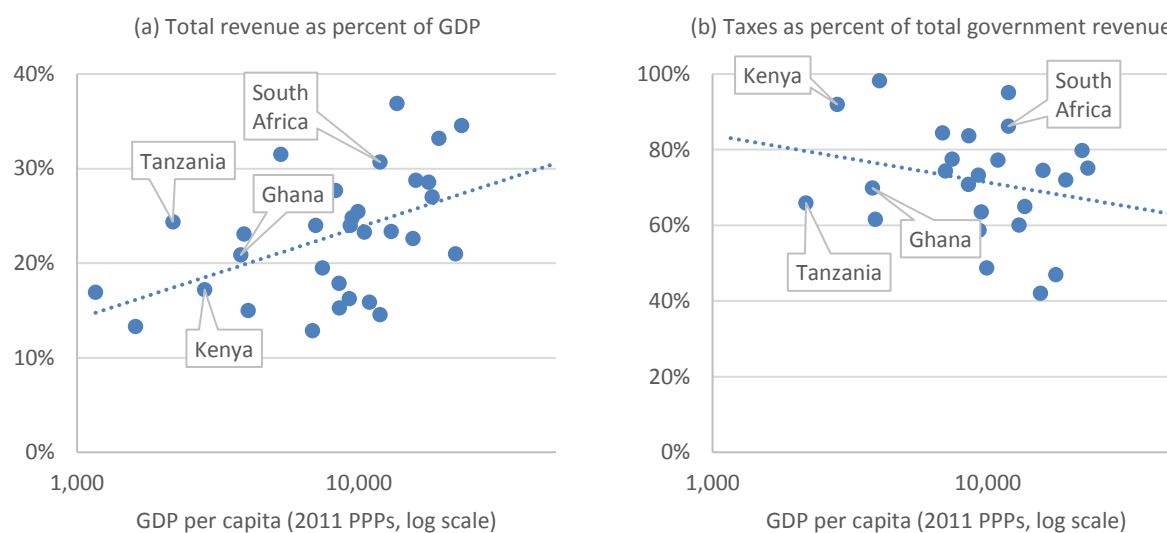
Source: Kenya Economic Survey 2017, World Development Indicators, and CEQ Institute.

6.   **The tax share of total government revenue in Kenya is high in comparison to other countries.** Across a sample of 25 lower- and middle-income countries for which the share of taxes in total government revenue was available, the average share is about 70 percent. It declines somewhat in the level of economic development–by about half a percentage point for every ten-percent increase in GDP per capita–as social security contributions become more important. In Kenya, taxes accounted for 90 percent of government revenue, pointing to the importance of taxes relative to other sources of revenue (Figure 1b).

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[2] Data for countries other than Kenya are taken from the CEQ Institute's webpage: http://commitmentoequity.org/.

Figure 2: Share of direct and indirect taxes in GDP against GDP per capita (2011 PPPs, log scale).

(a) Direct taxes as percent of GDP

(b) Indirect taxes as percent of total government revenue
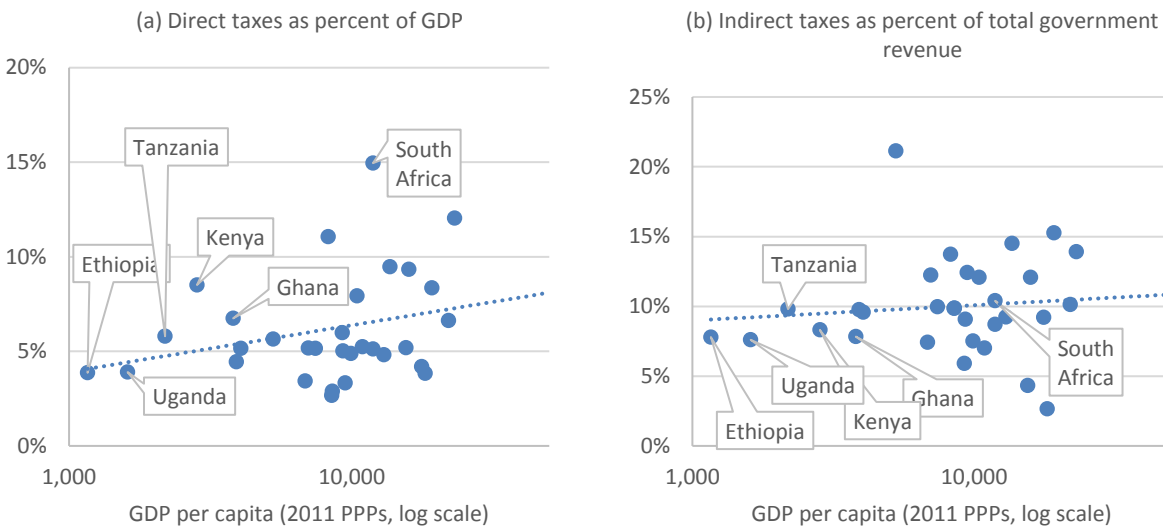
Source: Kenya Economic Survey 2017, World Development Indicators, and CEQ Institute.

7.   Direct and indirect taxes each account for about eight percent of GDP. Across 31 countries, indirect taxes tend to be more important that direct taxes: on average, they account for around ten percent of GDP while direct taxes account only for around six percent (Figure 2). In Kenya, however, both direct and indirect taxes account for about eight percent of GDP. Kenya recently started to rely more heavily on direct taxes than other countries at similar levels of economic development while indirect taxes are as important as in similar countries (World Bank, 2017).

8.   Income tax from individuals, corporate tax, and VAT each account for about one fourth of total tax collection. In 2015/16 in Kenya, direct taxes were roughly equally split between income tax from individuals and corporate taxes. Each source accounted for about one in four Shillings in tax revenue. Capital gains taxes played a negligible role. VAT contributed another fourth to the total tax take while excise taxes contributed 12.3 percent. Taxes on international trade accounted for a little less than ten percent of the total tax revenue (Table 1).

9.   Income tax in Kenya is a direct tax imposed, *inter alia*, on business income, employment income (including benefits), rental income, pensions, and investment income. In addition to taxes on income from gainful employment, interest earnings and dividends, royalties, management or professional fees, commissions, pension or retirement annuity, rent, appearance or performance fees for entertaining, and sporting or diverting an audience are all subject to tax in Kenya (Kenya Revenue Authority, 2018). Methods of collecting taxes include pay-as-you-earn (PAYE), withholding tax, instalment tax, advance tax, and presumptive income tax. The present analysis only considers taxes on salaries and household business incomes.

	KSh million	Share in total revenue	Share in GDP
Taxes on income, profits, and capital gains	**569,811.18**	**50.1%**	**8.5%**
Income tax from individuals (PAYE)	286,166.16	25.2%	4.3%
Income tax from corporations	279,834.49	24.6%	4.2%
Capital gains tax	3,810.54	0.3%	0.1%
Taxes on property	**88.26**	**0.0%**	**0.0%**
Immovable property	0.00	0.0%	0.0%
Financial and capital transactions	88.26	0.0%	0.0%
Value-added tax (VAT)	**289,213.47**	**25.4%**	**4.3%**
VAT on domestic goods and services	160,389.01	14.1%	2.4%
VAT on imported goods and services	128,824.45	11.3%	1.9%
Taxes on other goods and services	**162,593.81**	**14.3%**	**2.4%**
Excise taxes	139,540.34	12.3%	2.1%
Taxes on use of goods and on permission to use goods or to perform services and activities	5,780.10	0.5%	0.1%
Taxes on goods and services collected as AIA	17,273.37	1.5%	0.3%
Taxes on international trade transactions	**104,433.27**	**9.2%**	**1.6%**
Custom duties	79,187.93	7.0%	1.2%
Other taxes on international trade and transactions	25,245.33	2.2%	0.4%
Other taxes not elsewhere classified	10,423.54	0.9%	0.2%
Total tax revenue	**1,136,563.52**	**100.0%**	**17.0%**

Source: Kenya Economic Survey 2017. Note: GDP in the last column is calculated as the geometric mean of GDP in market prices in 2015 and 2016.

10.   Among indirect taxes, VAT in Kenya accounts for about half of total tax revenue, a lower share than in other low- and middle-income countries. The standard rate of VAT in Kenya is 16 percent. However, a considerable number of goods and services are either zero-rated or exempt. As a result, VAT, which accounted for half of the revenue from indirect taxes, is less important in Kenya than in other countries, where it accounts for around 60 percent. The number of exempt categories recently increased to more than 30, with a resulting loss in tax revenue of about two percent of GDP in 2015 (World Bank, 2017).

11.   Excise taxes account for one fourth of indirect taxes, a larger share than typically seen in low- and middle-income countries. Excise taxes are applied to tobacco products, alcoholic and non-alcoholic beverages, airtime, and some other goods and services. They account for a fourth of indirect taxes, a somewhat larger share than in other countries (about 18 percent).

1.3 Government spending

12.   Government spending in Kenya picked up pace throughout the decade, outpacing revenues. From FY2005/06 to FY2015/16, the government increased deficit spending. Recurrent spending was the main driver of government expenditure, averaging about 17.1 percent of GDP over the period. Wages and salaries were the largest component of recurrent spending, with interest payments picking up during the

latter half of the period to 3.2 percent of GDP in FY2015/16. Development spending nearly doubled from 4.5 percent of GDP in FY2005/06 to 8.7 percent of GDP in FY2014/15, a reflection of government policy to increase infrastructure development in a bid to remove supply-side constraints. However, as the government began fiscal consolidation, development spending declined in FY2015/16 to 7.2 percent of GDP. Growth in expenditure was faster than growth in revenue collection, putting pressure on the fiscal deficit. As a result, the fiscal deficit increased by 3.5 percentage points from 4.7 percent of GDP in FY2005/06 to 8.2 percent of GDP in FY2015/16.

13.   Calculating total public allocations to health, education, and other sectors has become challenging in the wake of devolution. Since 2013, some government services, including a large part of health services and smaller parts of public education services have been devolved functions of the counties. This has made compiling accurate public expenditure data challenging due to lack of access and incompatible reporting.[3] Here, total government expenditure on education, health, and social protection was calculated based on separate tabulations of national government and county-level expenditure in the 2017 KES (KNBS, 2017). These were added by subtracting transfers from the national government to other levels of government (assuming that these are mostly transfers to the counties) from the national-level spending data in order to avoid double-counting.

Figure 3: Budget shares of public education, health, and social protection spending by level of government, 2015/16.
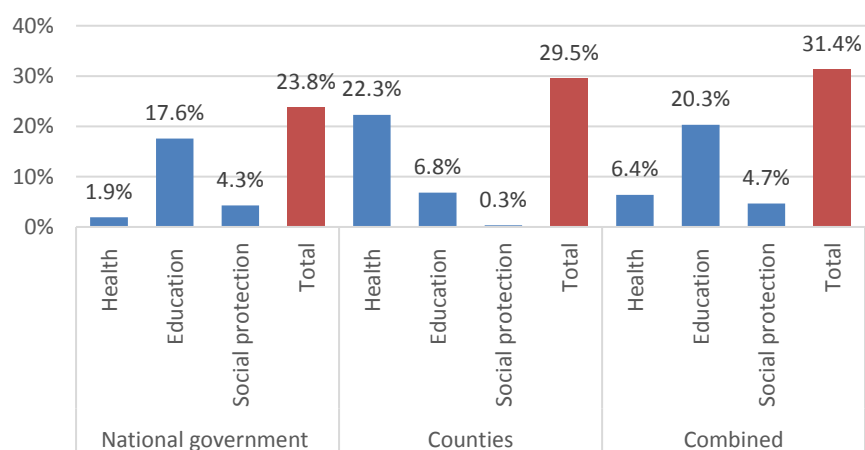
Source: Own calculations based on KNBS *(2017)* (see text).

14.   Education expenditure accounts for a large fraction of total government expenditure, with health and social protection accounting for significantly smaller shares. The resulting expenditure shares suggest that the largest share of education expenditure is executed by the national government (Figure 3). This is not surprising given that only minor functions of public education were devolved. Education expenditure accounts for a significant share of total government expenditure, at around 20 percent. Public

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[3] For instance, the authors of one study that aims to compile combined budgets for public health note that, "in some instances, gaining access to information in a homogenous form was challenging because counties presented budgets in different formats. […] To address this issue going forward, there is a need for standard formats for the compilation of health budgets in the counties" (Ministry of Health, 2016).

health expenditure accounts for around 22 percent of the combined budget of the counties. Overall, it accounts for around six percent of total government expenditure. Separate estimates reported by the Ministry of Health suggest that the share of health expenditure of total government expenditure was somewhat higher in 2015/16, at 7.7 percent, see below. Social protection expenditure accounts for around 4.7 percent of total government expenditure and is mainly executed at the national level.

Figure 4: Public education spending and public health spending (as a percent of GDP) against GDP per capita (2011 PPPs, log scale).

(a) Public education spending (percent of GDP)   (b) Public health spending (percent of GDP)
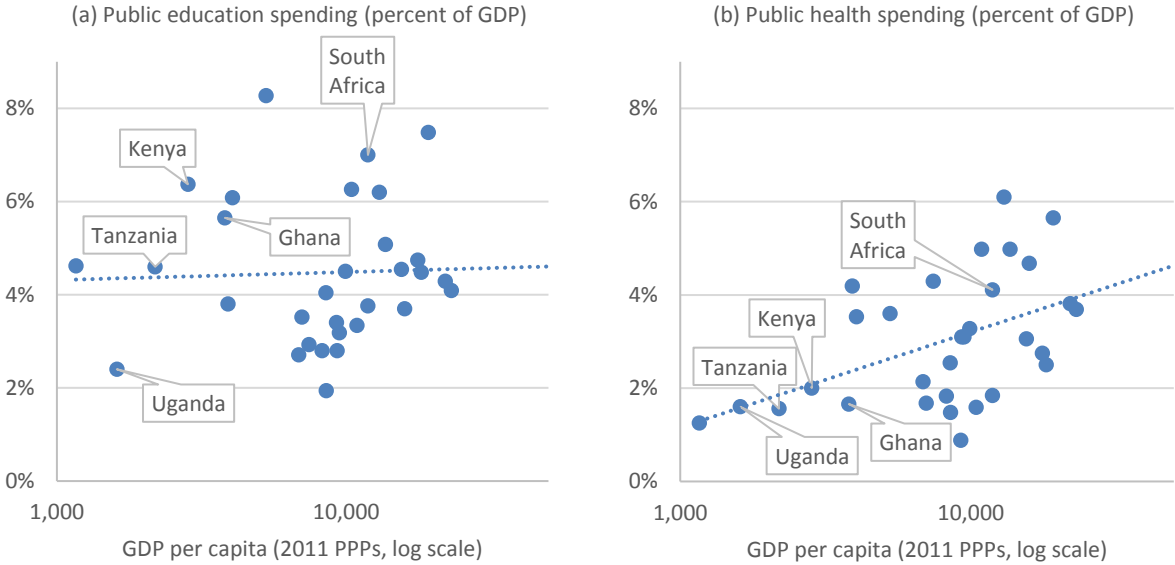
Source: Own calculations based on KES 2017 (see text) and CEQ Institute.

15.   **Public education spending accounts for a comparatively large share of GDP in Kenya.** Based on the above-described calculations, the share of total public education and health spending can be compared to cross-country data as well as GDP per capita (in 2011 PPPs) at the time of the assessment. Kenya's public education system absorbs a comparatively large share of total GDP, around 6.7 percent (Kremer, Moulin, & Namuyu, 2003). Only three countries out of the 31 for which data was available, South Africa, Bolivia, and Argentina, had higher levels of education spending as a share of their GDP (Figure 4a). This is despite a decrease in public education expenditure as a share of GDP and total government spending in Kenya since the mid-2000s.

Figure 5: Public expenditure in education in Kenya and Sub-Saharan Africa, 2000-2015.

(a) Percent of GDP

(b) Percent of total government expenditure

Kenya ● Sub-Saharan Africa

Kenya ● Sub-Saharan Africa
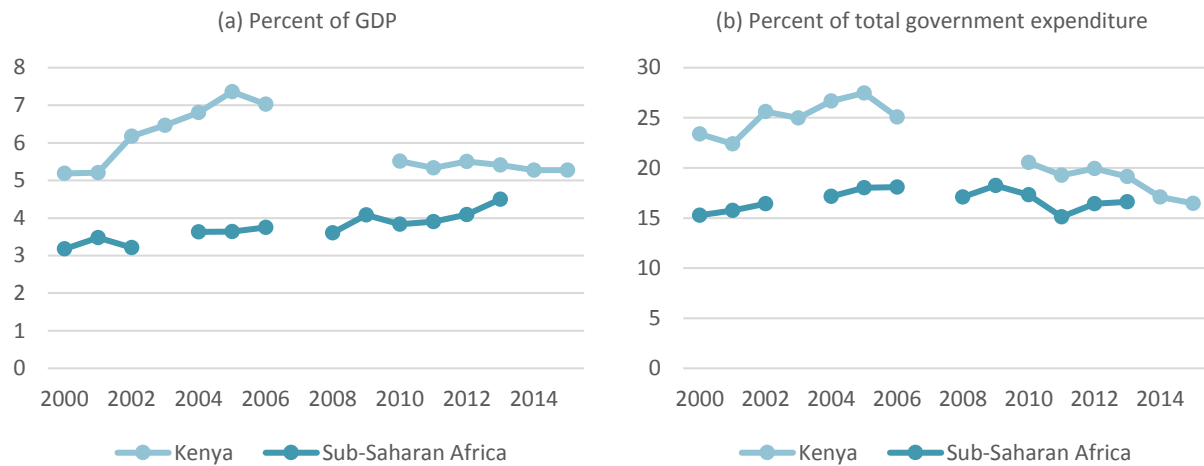
Source: Own calculations based on World Development Indicators data.

16.   Public education spending has recently declined. While Kenya's government still spends a comparatively large share of its resources on education, there is a clear downward trend observable since around 2005, both in terms of spending as a share of GDP and spending as a share of total government expenditure (Figure 5). This is mostly due to a hiring freeze on civil-service teachers that was enforced in the late 1990s and was only lifted in 2010 when the central government hired 18,000 new civil-service teachers, approximately one per school (Barton, Bold, & Sandefur, 2017).[4]

17.   Public spending on health relative to GDP is similar to spending observed in neighboring countries and countries at similar levels of economic development. Across countries, public health spending as a share of GDP increases by a little less than a tenth of a percentage point for every ten-percent increase in GDP per capita (Figure 4b). In Kenya, it was around two percent of GDP per capita, only slightly higher than shares in neighboring Uganda and Tanzania, and in line with Kenya's level of economic development.

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[4] Note that the series depicted here are taken from World Bank Development Indicators database and, thus, differ slightly from those reported in Figure 4.

Figure 6: Trends in health sector allocation (percent of total budget) by level of government.
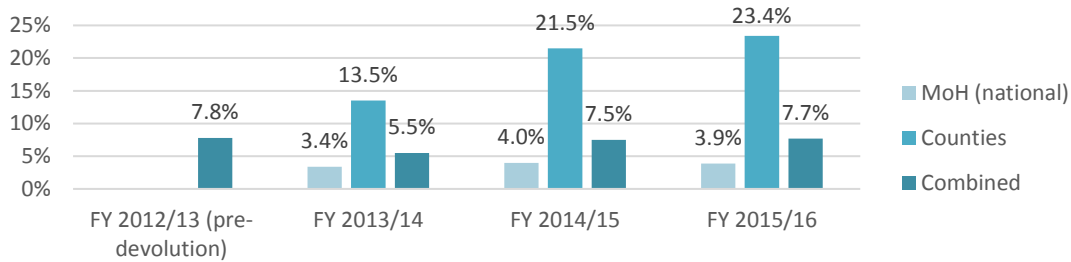
Source: Ministry of Health *(2016).*

18. **The share of the total government budget allocated to the health sector dropped with the devolution of authority over service delivery to the counties but has since recovered.** Devolution of health service delivery makes accounting for public health expenditure more challenging. The Ministry of Health (MoH) estimates that total public health spending in Kenya was around 7.7 percent of total public spending (Figure 6) (Ministry of Health, 2016). The share of resources allocated to the health sector dropped by more than 2 percentage points at the time of devolution took effect in 2013 but recovered subsequently due to counties allocating increasing shares of their expenditure to the health sector.

19. **The present distributional assessment covers more than 60 percent of the revenue side of the tax and transfer system and 25 to 30 percent of the spending side.** This assessment will analyze the distributional impacts of a large share of direct taxes collected from individuals, VAT, and excise taxes. Details on how these taxes are matched to survey information are outlined in the next section and appendices and results presented in the fourth section. With these taxes included, the analysis covers more than 60 percent of the revenue side of the tax and transfer system. Taxes on cross-border trade flows and a number of smaller revenue items are excluded as they cannot be allocated to households in the survey data. On the spending side, with public spending on four cash transfers schemes and public spending on education and health, the assessment covers 25 to 30 percent of the spending side. As will be explained below, this is subject to the caveat that no attempt was made to relate public spending on health to the CEQ framework used in this report. The imbalance that results from covering a larger share of the revenue side is not unusual for CEQs.[5] Government spending often takes the form of public goods that cannot easily be allocated to specific households. As taxes usually exert a positive effect on poverty while transfers exert a negative effect, the overall stock-taking from the analysis will tend to show increasing poverty.

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[5] For instance, a CEQ for South Africa covers 56.6 percent of the revenue side and 42.8 percent of the spending side (Inchauste, Lustig, Maboshe, Purfield, & Woolard, 2015). A CEQ analysis for Ghana includes almost 70 percent of the revenue side and 34.3 percent of the spending side (Younger, Osei-Assibey, & Oppong, 2017).

2 Methods: The CEQ Framework

2.1 General remarks

20. **The analysis seeks to answer the question, "What are the effects of Kenya's system of taxes and transfers?"** To answer the question above, the analysis draws closely on methods and recommendations documented as part of the CEQ project (particularly Ch. 6 of the CEQ Handbook) (Lustig & Higgins, 2013). Departures from the framework are explicitly noted. The framework is premised on the notion that in analyzing the impacts of taxes and transfers on poverty and inequality, it is important to consider taxation and expenditure jointly. For instance, specific taxes, studied in isolation, may be progressive or regressive. But it is important to also assess how the revenues are employed on the spending side. In addition to country-specific results, the CEQ framework provides comparable estimates of the impact of fiscal policy on inequality and poverty across countries. The advantages are thus two-fold: first, the method results in comparable estimates and, second, it considers as much of the system of taxes and transfers that can reasonably be assigned to individual households.

Figure 7: Four income concepts in the CEQ framework.
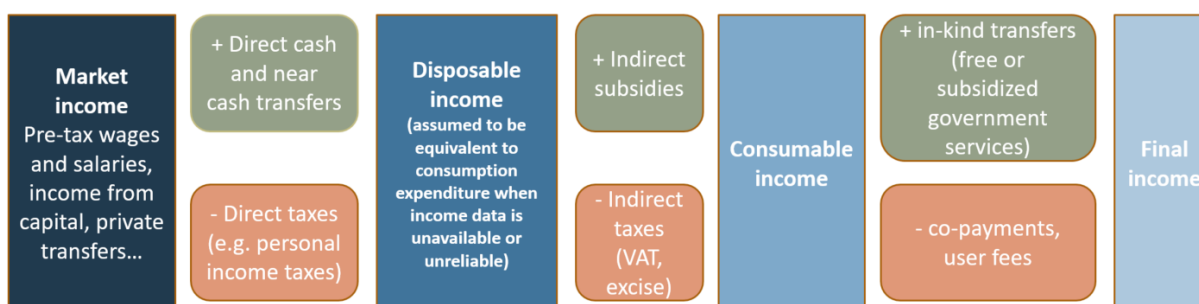
Source: Based on Lustig and Higgins *(2013)*.

21. **At the core of the CEQ method is the construction of *income concepts* and the analysis of their respective distributions.** Starting from market or pre-fiscal income, the burden and benefits of distinct components of the tax and transfer system will be added consecutively to obtain disposable income, consumable income, and final income (Figure 7). In brief, disposable income is market income less personal income taxes and employee contributions to social security plus direct cash and near-cash benefits (e.g. transfers from conditional or unconditional cash transfer programs, free food programs). Consumable income is disposable income plus indirect subsidies less indirect taxes (e.g. VAT). Final income is consumable income plus in-kind transfers (e.g. free or subsidized government services) less co-payments and user-fees. Once these income variables are constructed, the analysis tracks changes in

poverty and inequality measures across the different types of income. Note that this assessment uses consumption as the underlying welfare indicator, not income.[6]

22.   This assessment is based on the 2015/16 KIHBS as well as administrative data from various sources. Implementing a CEQ assessment requires a comprehensive household survey as well as administrative data on taxes and transfers at the time of data collection. The CEQ framework stipulates various methods of assigning burdens and benefits to sample households (Lustig & Higgins, 2013).

23.   While CEQ assessments have important limitations, they are broad in scope and can serve as a baseline from which more narrow questions about the tax and transfer system can be addressed. CEQ assessments such as the present study have important limitations that will be discussed presently. On the other hand, they are typically broad in scope, covering all taxes and transfers that can be plausibly allocated directly to households. In addition, they can be used as a baseline for further analysis such similariton of alternative VAT regimes or changes to the parameters of transfer schemes.

2.2 Limitations

24.   There are important limitations of the analysis that are common in this type of analysis. First, the analysis does not consider behavioral, life-cycle, or general equilibrium effects. Furthermore, the analysis provides information about the average incidence, not the incidence at the margin. Tax shifting and labor supply assumptions are strong as they imply that both consumer demand and labor supply are perfectly inelastic. Second, as in much of the literature on poverty analysis and inequality, the analysis ignores the intra-household distribution of consumption. Third, the analysis does not take into account differences in the quality of education or health care services delivered by the government across income groups. Fourth, important taxes and spending that are part of the government budget are not considered in this analysis. These include taxation of corporate income and international trade, property taxes, and infrastructure spending, which is difficult to assign to individual households because of its public good nature.

25.   The fact that the share of revenues captured in the analysis is significantly larger than the share of spending results in a lop-sided view of the overall effect on poverty. As noted above, the analysis covers a significantly larger share of the revenue side than of the spending side. Since the former will always tend to increase poverty while the later will tend to reduce poverty, it should be expected that poverty will likely be higher once all interventions are accounted for.

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[6] While most CEQ assessments so far have used income as the relevant welfare indicator, this analysis uses the value of consumption. Only eight of the 31 CEQs completed so far use consumption rather than income as the main welfare indicator. This is mostly due to a large share of them having been produced for countries in Latin America, a region in which income has traditionally been the mainstay of distributional analysis. In other developing regions, including Sub-Saharan Africa, consumption is more frequently used as the basis for a welfare indicator. This is also the case for Kenya. Consumption is often preferred to income as a welfare indicator in poverty and distributional analysis. It is usually less volatile than income as even poor households are usually able to limit variation in consumption over time (Deaton & Zaidi, 2002). This is particularly important in a country-context in which agriculture and the urban informal sector account for a large share of economic activity. In such a setting, it is also often true that individual respondents experience difficulties reporting their incomes accurately, particularly if it involves calculating profits from informal enterprises, a common source of incomes in urban settings.

26.   CEQ-type analyses are point-in-time analyses that are not suited to analyze dynamic tradeoffs. Policy-makers will have to decide between public spending that immediately benefits the population in the form of higher levels of economic welfare (e.g. direct cash transfers) and public investment that will increase economic welfare only over time (e.g. public education and infrastructure). The CEQ framework is not well placed to address these trade-offs between consumption now and consumption later. Rather, it constitutes an analysis of the immediate impact of fiscal interventions at one point in time.

27.   Indirect subsidies are not considered in this analysis. There are few indirect subsidies in Kenya and those relevant to this category are probably minor in terms of their fiscal impact. Follow-up work may investigate more closely the pricing of electricity, which is provided by a parastatal and priced non-linearly, with the price increasing in the consumption of kilowatt hours.

3 Direct Taxes and Transfers

3.1 Personal income tax

28.   Personal income is taxed based on a progressive rate structure with six tax brackets. Income tax in Kenya is imposed *inter alia* on business income, employment income (including benefits), rental income, pensions, and investment income. Personal income tax (PIT) is governed by the Income Tax Act (Kenya Revenue Authority, 2014). Marginal tax rates on income increase progressively from ten percent to 30 percent. In addition, every individual is entitled to an allowance, known in Kenya as 'personal relief,' which was KSh13,944 in 2015/16. The personal relief is granted against tax payable. Brackets are periodically adjusted. The present analysis uses the tax brackets as applied in 2015 and 2016 (Table 2).

Table 2: Personal income tax rates, 2016 tax calendar year.

Annual taxable income	Marginal tax rate (percent)	Tax bracket as share of GDP per capita in 2016
On first KSh121,968	10	0.86
On next KSh114.912	15	1.59
On next KSh114.912	20	2.32
On next KSh114.912	25	3.05
On taxable income in excess of KSh466,704	30	3.78

29.   The relationship between structural progressivity, changes in the average or marginal tax rate along the income distribution, and observed progressivity of PIT is empirically ambiguous. Efficiency considerations aside, higher top tax rates and the resulting increase in structural progressivity imply that the rich pay a relatively larger share of their pre-tax income in taxes. The negative effect on inequality may further be strengthened if the additional revenue is progressively redistributed. While this may seem

intuitive, responses to taxation of personal income such as tax evasion and tax avoidance imply that the empirical relationship between structural progressivity and actual inequality is ambiguous.[7]

Box 1: Measuring progressivity and redistributive effect: basic concepts and definitions.

When are taxes and transfers progressive? A common way to measure the progressivity of a tax (transfer) is by comparing the cumulative distribution also known as cumulative concentration shares of their burden (benefit) with the cumulative distribution of market income. This is known as the tax (transfer) redistribution approach (Duclos & Araar, 2006). In the case of spending, it is also useful to compare the cumulative distribution of benefits with the cumulative share of total population ranked by income. To illustrate, Figure 8 presents a Lorenz curve where the population is ranked along the horizontal axis using market (sometimes called 'original' or 'reference') income, and the cumulative shares of taxes paid or transfers received is plotted along the vertical axis. The latter are concentration curves.

The report uses the following classification of taxes and transfers when referring to whether taxes or government spending are progressive or not: a tax (transfer) whose concentration curve lies everywhere below (above) the Lorenz curve for market income is globally progressive. A transfer whose concentration curve lies everywhere above the diagonal is globally progressive in absolute terms. Such a transfer is also referred to as 'pro-poor.' A tax (transfer) whose concentration curve coincides with the Lorenz curve of market income is neutral. Lastly, a tax (transfer) whose concentration curve lies everywhere above (below) the Lorenz curve is globally regressive.

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[7] One cross-country study finds that the negative effect of structural progressivity on inequality in consumption is much smaller than its effect on inequality in net income and that the discrepancy is more pronounced in countries with weaker institutions (Duncan & Sabirianova Peter, 2016). Another study argues that the introduction of a flat rate income tax in Russia, a reform that received substantial academic attention, was instrumental in decreasing tax evasion and can be linked to increased voluntary tax compliance and reporting (Gorodnichenko, Martinez-Vazquez, & Sabirianova Peter, 2009).

Figure 8: Progressivity and taxes and transfers (diagrammatic representation).

Source: Lustig and Higgins *(2013)*.

For ease of interpretation, adjustments for differences in prices and household demographic make-up are initially omitted. Kenya's national poverty methodology is based on a consumption aggregate that is adjusted for spatial price differences as well as differences in the households' demographic make-up that is sensitive to differences in needs among different demographic groups (World Bank, 2018b). However, the graphs used throughout the report will report the cumulative shares of tax burdens, transfers, and income in nominal terms and on a per-capita basis. While this results in a minor disconnect between the graphs and welfare measurement in Kenya, it makes it easier to interpret these graphs. For instance, it allows for statements such as "the bottom 40 percent capture x percent of the benefits of program y." Effects of fiscal interventions on poverty and inequality based on the fully-adjusted consumption measure are reported in section 6.1.

Source: Based on Lustig and Higgins *(2013)* and Inchauste, et al. *(2015)*.

30.   Direct taxes are progressive. Direct taxes were allocated to individuals in the survey based on the assumptions about formal-sector employment and report of salaries net of taxes (Appendix A) and progressivity is assessed based on comparisons between Lorenz and concentration curves (Box 1). The poorest 40 percent of the population in terms of per capita market income account for 14.3 percent of market income but less than one percent of direct taxes (Figure 9a). In contrast, 80 percent of the incidence is borne by the richest ten percent of the population. On average, direct individual taxes account for only 1.2 percent of total household expenditure among the poorest quintile (Figure 9b). But their share increases to 4.5 percent in the fourth quintile and more than eight percent in the top quintile. As discussed

in the previous section, this is a result of both limited access to formal-sector jobs among the poor and the progressivity of the tax system.

Figure 9: Lorenz and concentration curves for per capita market income and direct taxes on individual income and share in total expenditure by quintile.

(a) Lorenz and concentration curve for direct taxes and market income

(b) Share of personal income tax in total expenditure by quintile
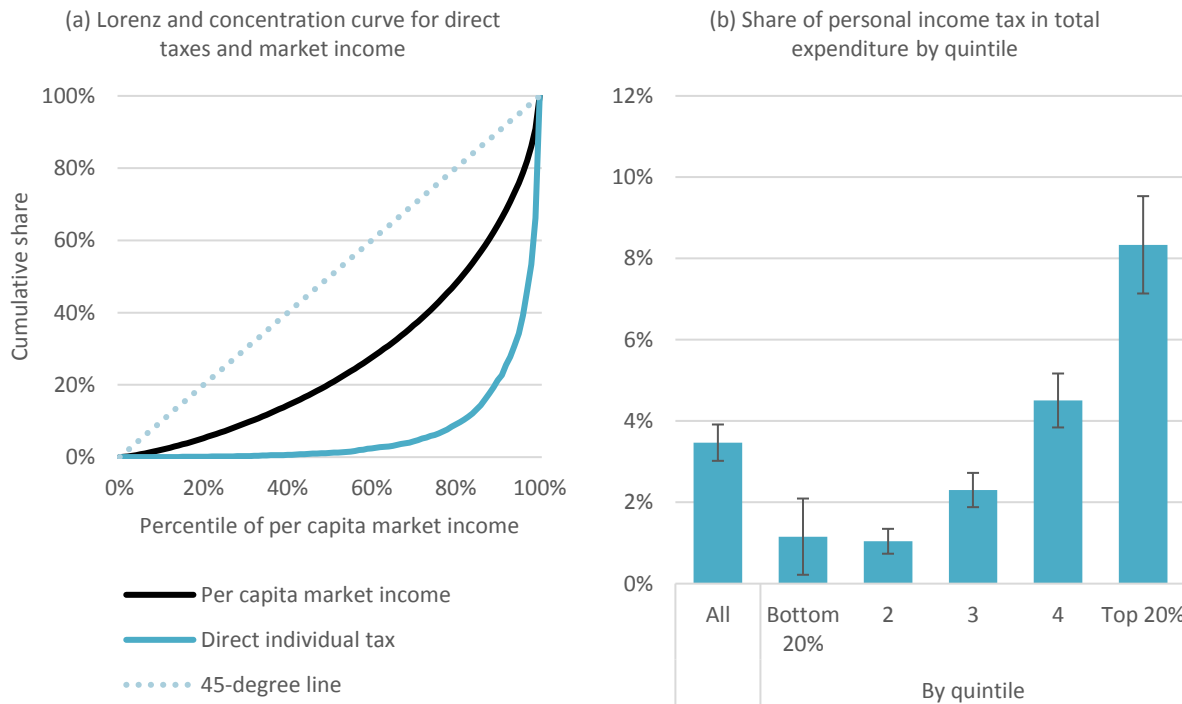
Source: Own calculations based on KIHBS 2015/16. Note: 95-percent confidence intervals indicated in panel (b).

31. **Poor workers earn lower salaries and are less likely to hold formal sector jobs, increasing progressivity.** Progressivity depends on the tax rate schedule. But since typically only workers in the formal sector pay income tax, progressivity depends also on the distribution of formal sector jobs. Based on the definition of formality that uses employer's National Social Security Fund (NSSF) contributions (Appendix A), less than five percent of all formal sector jobs are held by individuals in the bottom 20 percent while 48 percent are held by individuals in the top 20 percent (Figure 10).

24

(a) Salaried workers reporting employer contributions to
the NHHS

88,433

153,088

1,011,827

327,915

537,012

■ Bottom 20%

■ 2

■ 3

■ 4

■ Top 20%
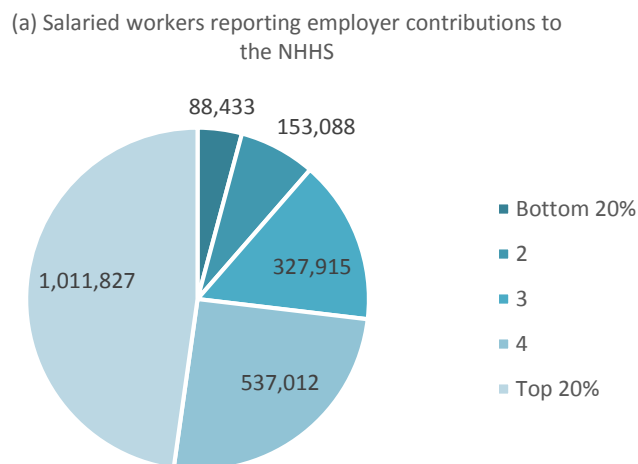
Source: Own calculations based on KIHBS 2015/16.

32.   The distribution of taxpayers across tax brackets suggests that a large share–one third–of those that pay income tax end up paying the highest marginal tax rate of 30 percent. Only 2.8 percent of individuals report employer contributions to the NSSF whose taxable income falls below the personal relief threshold (Table 3). Around 20 percent fall into the two subsequent tax brackets, with marginal tax rates of ten and 15 percent, respectively. On average, they pay 7.4 and 9.4 percent of their gross income in taxes, respectively. Almost one in three individuals that are assumed to pay income tax in the analysis are in the top tax bracket with a marginal tax rate of 30 percent. The estimated average tax rate in this bracket is 18 percent.

Table 3: Simulation results for personal income tax – taxpayers and average tax rate by bracket.

Tax brackets	Taxpayers	Share in total taxpayers (payroll and business income)	Average tax rate
< KSh13,944	68,482	2.8%	0.0%
KSh13,944 - KSh135,912	502,667	20.9%	7.4%
KSh135,912 - KSh250,824	487,235	20.3%	9.4%
KSh250,824 - KSh365,736	355,683	14.8%	11.4%
KSh365,736 - KSh480,648	227,561	9.5%	13.3%
KSh480,648 and above	761,263	31.7%	18.0%
All	2,402,891	100.0%	12.3%

Source: Own calculations based on KIHBS 2015/16 and using income tax brackets as applied in 2015 and 2016 (see text).

3.2 Cash transfers[8]

33.   The Government of Kenya (GoK) recently introduced a series of direct cash transfer (CT) programs whose fiscal incidence is analyzed in this report. The direct cash transfer programs considered here are the Cash Transfer for Hunger Safety Net Program (CT-HSNP), the Cash Transfer for Orphans & Vulnerable Children (CT-OVC), the Older Persons Cash Transfer (OPCT), and the Cash Transfer for Persons with Severe Disabilities (CT-PwSD).[9] These programs were all launched between 2005 (CT-OVC) and 2011 (CT-PwSD) and have seen rapid growth in coverage since (Ministry of Labour and East African Affairs, 2016). Transfer programs not considered in this analysis include the Urban Food Subsidy (UFS) program and bursary fund programs.[10]

34.   Cash transfer programs have different objectives but are unified administratively under a common operating framework. The OPCT and the CT-PwSD aim at reducing poverty among specific demographic groups, namely the elderly and persons with severe disabilities. The CT-HSNP aims to reduce hunger and vulnerability in specific geographic areas and the CT-OVC aims to build human capital among orphans and vulnerable children and to encourage civil registration. These programs were initially operated independently from one another with limited coordination across departments and ministries. However, in 2013, the Kenya National Safety Net Programme (NSNP) was established as part of the government's initiatives to improve and coordinate social protection delivery in the country. In particular, the NSNP was established to provide a common operating framework for the government's cash transfer programs. As part of efforts to develop a harmonized social safety net, the Social Protection Secretariat (SPS) unified the social assistance program information in a single registry. The objective of this single registry system is to consolidate information from the different cash transfer programs in a single platform.

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[8] See Appendix B for technical details.

[9] The incidence of these programs as well as their effect on a number of outcomes are also studied in World Bank (2018b).

[10] The UFS was launched only in March 2012 in Mombasa as a pilot program and today only covers around 10,000 households. Its impact on overall poverty and inequality can therefore be assumed to be minor. Bursary fund programs, which are designed to financially support student enrolled in secondary education or at higher levels of the education system, are run by different levels of government and target different groups of students. These programs were not considered for different reasons. UFS beneficiary status is not recorded in the household survey underlying this analysis. Bursary fund transfer amounts, on the other hand, are probably underreported in the survey. In addition, there are a number of public bursary fund programs run by different entities, including constituencies, which makes consolidating survey estimates with administrative data particularly challenging.

Table 4: Description of four main cash transfer programs.

Program	Geographic coverage (2015)	Households covered (2015)	Transfer (KSh per household)	Targeting
Hunger Safety Net Program (CT-HSNP)	4 counties	84,340	2,550 monthly	PMT
Orphans and Vulnerable Children (CT-OVC)	47 counties	255,643	2,000 monthly	PMT, OVCs
Older People (OPCT)	47 counties	162,695	2,000 monthly	Poor and older than 65 years
Persons with Severe Disability (CT-PwSD)	47 counties	25,471	2,000 monthly	Poor and disabled
Total		519,878		

Source: Ministry of Labour and East African Affairs *(2016)*.

35. **Cash transfer programs differ in terms of coverage, payouts, and their targeting mechanism.** Three of the four programs considered here are unrestricted in terms of their geographic coverage. The HSNP is targeted exclusively at households in Mandera, Marsabit, Turkana, and Wajir. Both the HSNP and the CT-OVC use proxy-means tests (PMTs) for targeting while the OPCT and the CT-PwSD are targeted based on a combination of poverty status and demographic characteristics, old-age and disability, respectively. Payout amounts are similar in all four programs (Table 4), ranging from KSh 2,000 per month and household for the CT-OVC, the OPCT, and the CT-PwSD to KSh 2,550 per month for the HSNP.

36. **Transfer receipt is typically correlated with programs' inclusion criteria.** It was found that the survey estimate of the total number of beneficiaries households (with the exception of HSNP beneficiaries) was significantly lower than suggested by administrative data.[11] Hence, statistical models of program receipt were estimated which was then used to scale-up survey estimates to match administrative data. Appendix B provides details. Results from these models are useful in two other ways. First, they confirm that receipt is typically correlated with program's inclusion criteria. OPCT beneficiary households are more likely to have household members aged 65 and above, OVC beneficiary households are more likely to include an orphan, and PwSD beneficiary status is correlated with having a household member with disabilities. Second, estimated models provide a straight-forward way of simulating the effects changes to program parameters such as coverage of transfer amount on poverty and inequality.

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[11] One explanation is that survey respondents were not aware of the name of the program of which they were beneficiaries. This is in line with the finding that the survey estimate of the total number of beneficiary households of the HSNP, a program which was reportedly well-advertised in the four counties in which it is operated, is close to the reported number of beneficiaries reported in administrative data. On the other hand, it should also be noted that the survey was not stratified to be representative of any of the beneficiary populations.

(a) Lorenz- and concentration curvey for cash transfer receipts and market income

(b) Share of cash transfer receipts in total expenditure by quintile
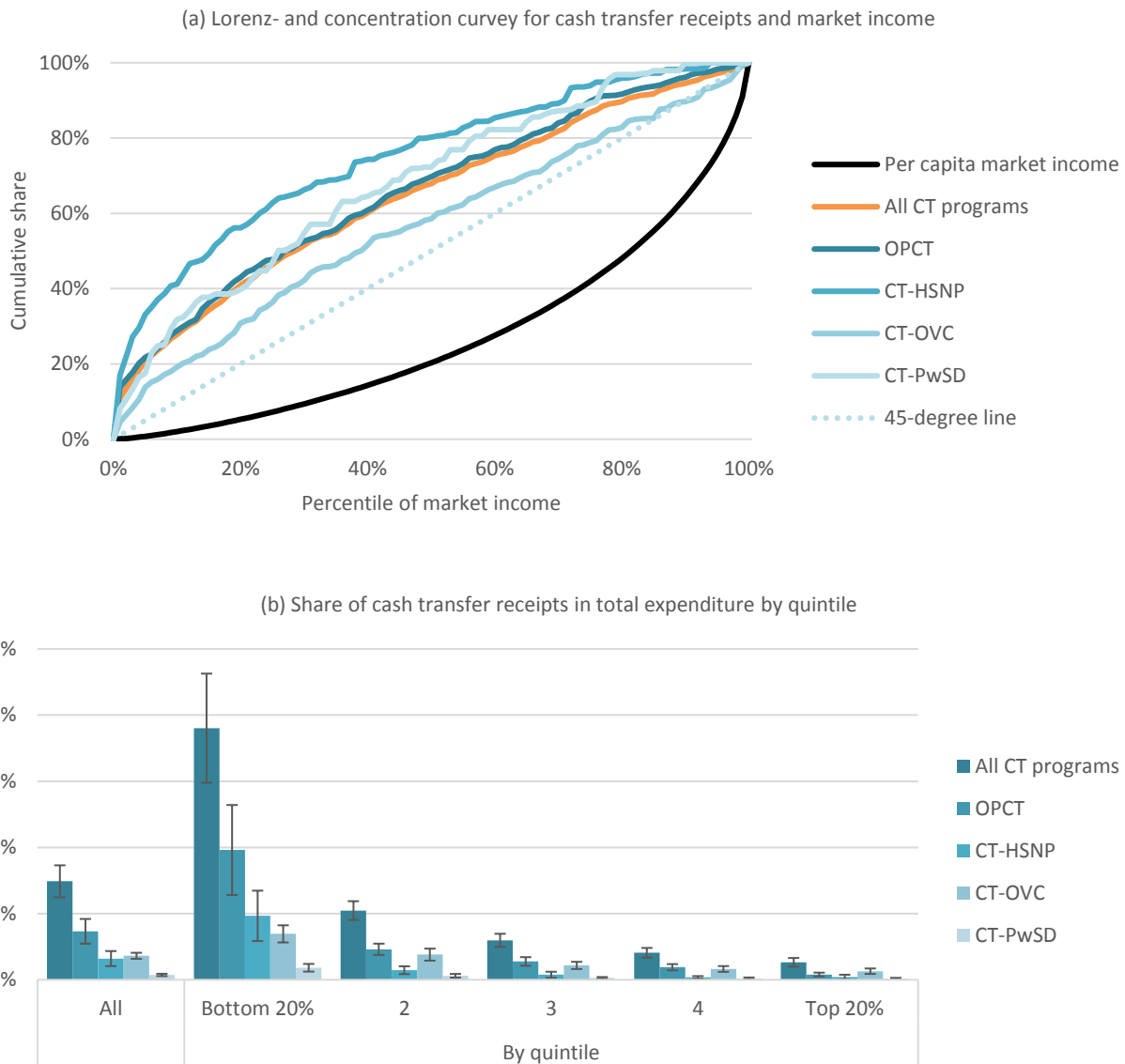
37.   All four cash transfer programs are progressive and pro-poor. The four cash transfer programs, the OPCT, the CT-HSNP, the CT-OVC, and the CT-PwSD, appear well-targeted to the poor. Overall, 60.2 percent of the benefits are captured by the poorest 40 percent of the population (Figure 11a). There is some variation across programs. CT-HSNP, which uses a combination of geographic targeting and a PMT, directs 74.3 percent of the benefits distributed to the poorest 40 percent and is thus the best-targeted program among the four. It is followed by the CT-PwSD with 64.5 percent targeted to the bottom 40 percent, the OPCT with 60.8 percent, and finally the CT-OVC with 51.6 percent.

38. **The targeting performance of Kenya's cash transfer is comparable or slightly better than the targeting performance of similar programs elsewhere.** One study that assembles a dataset of 122 interventions finds that the mean and median among 68 programs for which this indicator is available are 59.2 and 52.5 percent captured by the bottom 40 percent, respectively, and similar–56.3 and 61.8 percent–among the eight programs in that sample that are based on PMTs (Coady, Grosh, & Hoddinott, 2004). Hence, the targeting performance of Kenya's cash transfer programs seems typical or even slightly above-average among programs of this type.

39. **Because of its size, the OPCT is the most important program for the poor.** The estimates used in this report of the total number of recipient households are closer to those reported for 2016. In that year, the OPCT was the largest program in terms of coverage. Because of that and its good targeting performance, OPCT transfers appear more important to the poor than the other CT programs. Transfers account, on average, for almost two percent of total household expenditure among the poorest quintile, decreasing to 1.0 and 0.6 percent among the second and third quintiles (Figure 11b). The HSNP program is also marginally significant for the poor with an average budget share of around one percent among the poorest 20 percent. Overall and on average, cash transfers account for close to 1.5 percent of household expenditure across the entire population and 3.8 percent among the bottom 20 percent.

4 Indirect Taxes

4.1 Value Added Tax[12]

40. **Goods and services in Kenya's VAT regime are either standard-rated, zero-rated, or exempt.** The standard VAT rate in Kenya is 16 percent. Exclusion from VAT in Kenya appears in two different ways, zero-ratings[13] and exemptions.[14] Of the 460 items for which expenditure was recorded in the survey data, 311 were taxed at 16 percent, 29 were zero-rated, and 120 were exempt. Most exempt goods and services were found in the agricultural sector.[15] The exemption also extends to agricultural inputs such as seeds, fertilizers, and tractors (World Bank, 2017).[16] Two alternative assumptions were made regarding exempt goods in this analysis. Exempt items were either (1) treated as taxed at the 16-percent rate or (2) treated as zero-rated items. While the actual tax rate will typically fall somewhere in-between, it turned out that the distributional implications of these assumptions do not differ substantially. Given that many exempt items in the data pertained to the agricultural sector, in which inputs are often also exempt, it was decided to proceed with the assumption that exempt goods carry no VAT.[17]

41. **VAT is mildly progressive but close to neutral, regardless of how exempt goods are treated.** The burden of VAT is distributed almost proportionally to market income (Figure 12). For instance, the bottom-40 percent account for between 12.4 and 14.1 percent of the VAT burden, depending on whether exempt

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[12] See also Appendix C.
[13] In this case, a firm selling these items is still allowed to receive credits for taxes paid on its purchases of intermediate and investment goods.
[14] Here, firms selling exempt items are no longer registered tax payer and no credit is allowed for taxes paid on their inputs.
[15] The agriculture sector is largely exempt (VAT ACT 2013)
[16] This may be justified on the basis that agricultural households may be unsophisticated and operating in places where the KRA may not reach easily (World Bank, 2017).
[17] However, it should be noted that fuel is not exempt. Hence, transport costs do carry embedded VAT.

items are treated as zero-rated or taxed at 16 percent, compared to a share in market income of 14.3 percent. The average share of VAT in total household expenditure is 8.4 percent if exempt items are assumed to be zero-rated and 9.0 percent if they are assumed to carry 16 percent VAT. Again, treating exempt goods as zero-rated renders VAT slightly more progressive, but the differences are very small. The expenditure share among the bottom 20 percent increases from 7.2 to 8.4 percent in going from zero-rates to the full 16-percent tax rate and falls from 10.3 to 9.7 among the richest 20 percent. This may be driven to some extent by the choice of welfare indicator in this analysis, a technical rather than an economic cause (Box 2). As noted above, many exempt items in Kenya are produced in the agricultural sector, where inputs are also often exempt, therefore it is assumed in the analysis that exempt goods carry no VAT.

Figure 12: Lorenz and concentration curves for market income and VAT under different assumptions about exempt items and share in total expenditure by quintile.
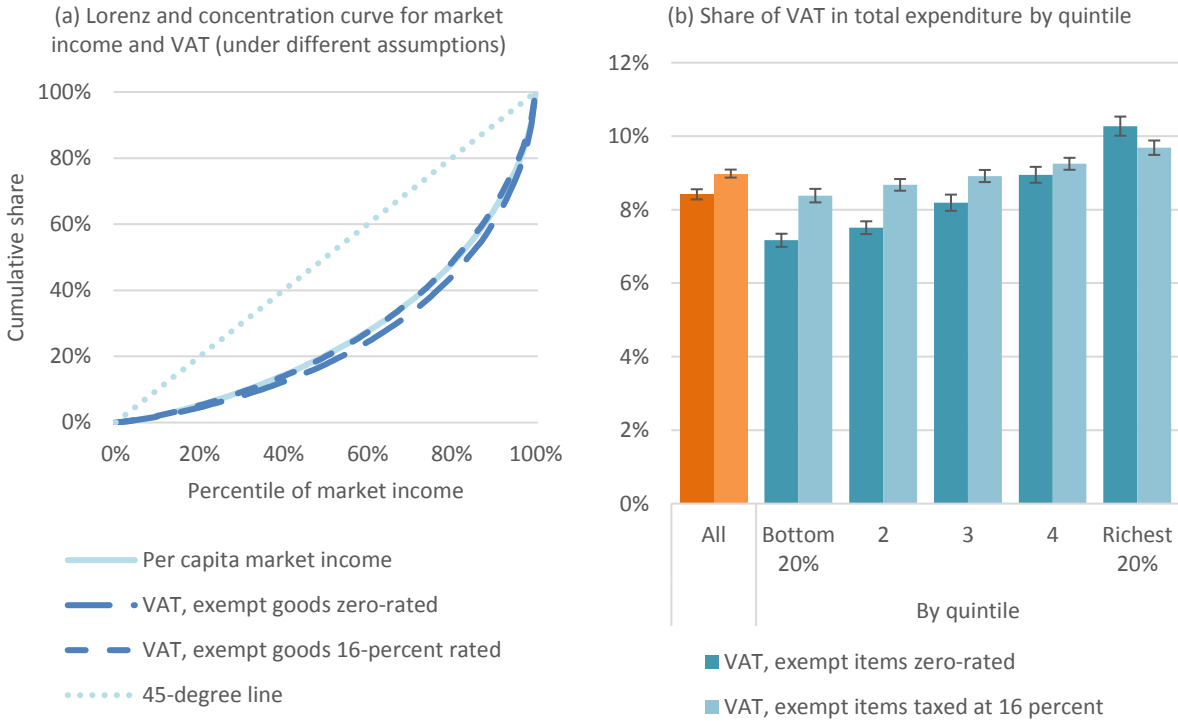
Source: Own calculations based on KIHBS 2015/16 and administrative data (Appendix C).
Note: 95-percent confidence intervals indicated in panel (b).

42.   Exemptions could be eliminated or replaced by zero-rates for merit goods without major distributional consequences. Exemptions do not have a large effect on the relative distribution of welfare because they are both applied to merit goods and other goods that could be considered luxury goods and services, such as air ticketing services supplied by travel agents. The removal of exemptions would boost tax collection without major impacts at least on the relative distribution of welfare. A revenue-neutral removal of some exemptions for luxury items and a concomitant shift of merit goods into the category of

zero-rated goods would have positive effects for the poor. Alternatively, additional revenue from the removal of exemptions and zero rates could be redistributed in ways that are less distortive, e.g. through cash transfers. However, greater in-depth analysis of this question is called for to identify exemption and zero-rates that appear poorly targeted to the bottom of the distribution.

Box 2: Can VAT be progressive?

VAT usually disproportionately affects the poor. Why not in Kenya? Exempt and zero-rated items may be disproportionately consumed by the poor, contributing to a mildly progressive impact of VTA. Is this also true for Kenya? Expenditure shares (in total expenditure) of zero-rated goods are generally too small to make much of a difference, increasing from only 3.1 percent in the bottom quintile to 6.2 percent in the top quintile. But the share of exempt items falls from 46.9 percent among the poorest 20 percent to 37.2 percent among the richest 20 percent. Hence, while exemptions are not particularly well-targeted to the poor, they do benefit them somewhat. Also, the poor typically have lower shares of expenditure in consumption because they rely more heavily on auto-consumption or transfers. In Kenya, the share of expenditure in total consumption increases from 49.2 percent among the bottom 20 percent to 62.9 percent among the richest 20 percent (Figure 13a).

Figure 13: Share of expenditure in total consumption of items differentiated by type of VAT.

(a) Share of expenditure in total consumption by VAT type

(b) Lorenz and concentration curve for (income-based) market income and VAT (under alternative assumptions)

Source: Own calculations based on KIHBS 2015/16.

The use of consumption as the relevant welfare indicator makes the result of progressive VAT more likely. VAT is foremost a tax on consumption. It is often assumed to be regressive as the share of consumption in income is lower for the rich than for the poor, the difference being savings.[18] In this exercise, however, consumption is used as the relevant welfare indicator, not income. This implies that even if expenditure were equal to consumption and there were no exemptions, VAT could at most be neutral. If progressivity would be measured against a welfare indicator based on actual household income, VAT would clearly be regressive (Figure 13b). Hence, differences in the method used to assess economic welfare are largely responsible for this result.

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[18] For instance, the Tax Policy Center states that "[b]ecause lower-income households spend a greater share of their income on consumption than higher income households do, the burden of VAT is regressive when measured as a share of current income." See https://www.taxpolicycenter.org/briefing-book/who-would-bear-burden-vat.

4.2 Excise taxes[19]

43.   **The analysis of excise tax in this report accounts for more than 80 percent of revenue from this tax.** The analysis considers excises taxes on beer, wine and spirits, mineral water, soft drinks and juices, cigarettes, and airtime. Beverages and cigarettes are taxed based on quantities whereas consumption of airtime is taxed at ten percent. Excise tax on financial transactions and other commodities (jewelry, cosmetics, and locally assembled vehicles) is not considered. However, the items included in the analysis account for 87 and 82 percent of total revenue from excise tax in 2015 and 2016, respectively

Table 5: Excise tax revenue by item, 2015 and 2016.

	KSh million		Share in total	
	2015	2016	2015	2016
Beer	19,526	24,443	31.2%	30.4%
Wine and spirits	6,148	10,681	9.8%	13.3%
Mineral water, soft drinks, and juices	2,515	3,319	4.0%	4.1%
Cigarettes	12,230	12,441	19.5%	15.5%
Airtime	14,139	15,541	22.6%	19.3%
Financial transactions	7,222	11,313	11.5%	14.1%
Other commodities	902	2,642	1.4%	3.3%
Total	62,682	80,380	100.0%	100.0%

Source: Own calculations based on KES 2017 *(KNBS, 2017).*

Figure 14: Lorenz and concentration curves for market income and excise taxes and share in total expenditure by quintile.

(a) Lorenz and concetration for market income and excise taxes

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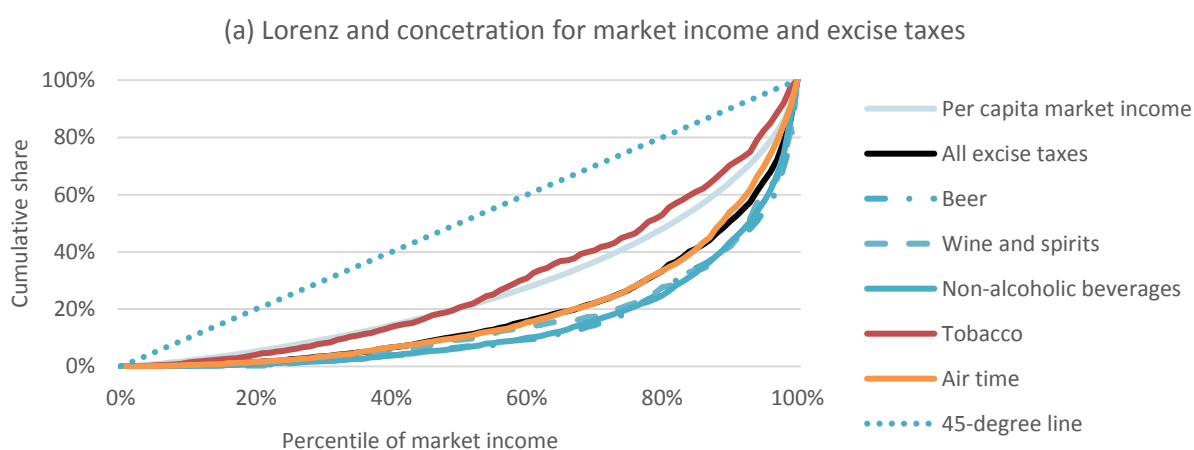
[19] See also Appendix C.

(b) Share of excise taxes in total expenditure by quintile
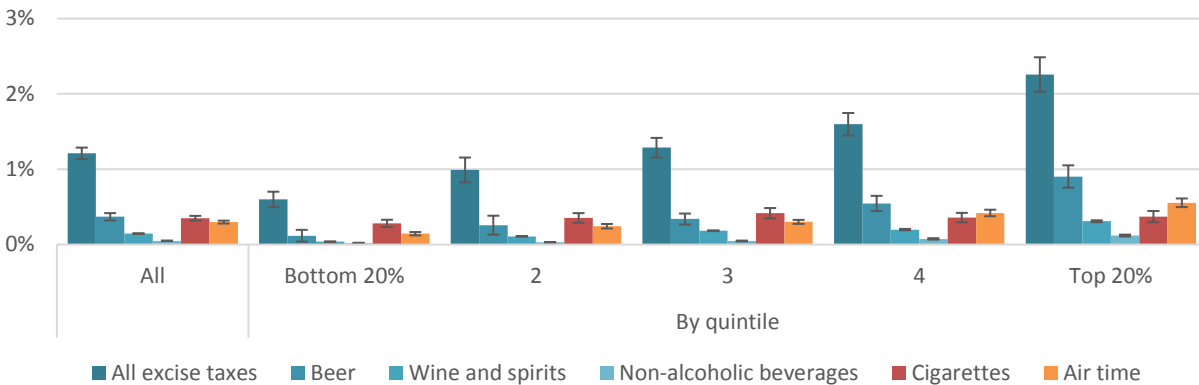
Source: Own calculations based on KIHBS 2015/16 and administrative data (Appendix C). Note: 95-percent confidence intervals indicated in panel (b).
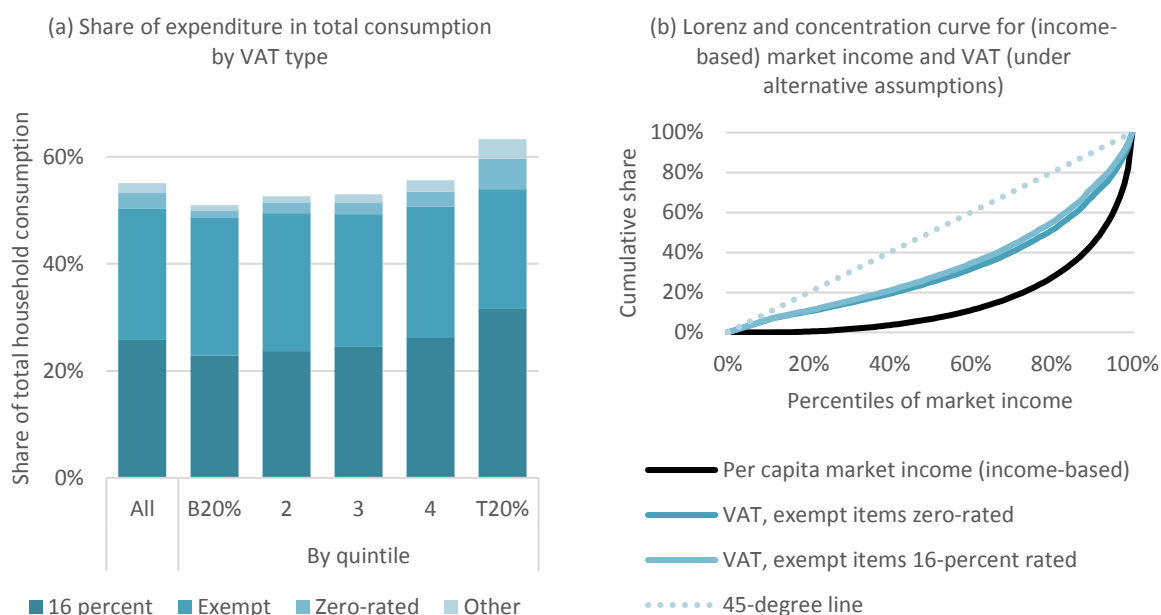
44.   Excise taxes are progressive except for tobacco products. The bottom 40 percent, which account for 14.3 percent of market income, account for only 6.6 percent of all excise taxes, rendering the overall tax highly progressive (Figure 14a). This is driven mainly by excise taxes on beer (3.9 percent), wine and spirits (4.4), non-alcoholic beverages (3.9), and air time (6.6). Excise duty on tobacco is initially mildly progressive but then turns regressive around the median. The bottom ten percent account for only 2.2 percent of per capita market income yet 1.4 percent of tobacco excise tax. However, the concentration curve for tobacco excise duties eventually crosses the Lorenz curve so that the poorest 60 percent already account for 30.7 percent of tobacco excise tax, a larger share than their 27.5 percent in market income. This suggests lower relative spending among the poor and higher relative spending among the middle quintiles. The expenditure shares of excise taxes are small (Figure 14b). Across the entire population, excise tax duty accounts for little more than one percent of total household expenditure. The share rises from 0.6 percent among the poorest quintile to 2.3 percent among the richest 20 percent of the population.

45.   Adverse economic effects of tobacco consumption that arise only in the medium- and long-term have the potential to alter the assessment of the progressivity of excise duty on tobacco. Tobacco taxes are often assessed as regressive as low-income household tend to allocate a larger share of their budgets to the purchase of tobacco products. This is also found in this study for Kenya. On the other hand, Tobacco consumption is associated with shorter life expectance, higher medical expenses, added years of disability, and negative externalities through secondhand smoke and tobacco taxes are considered an effective policy tool to reduce tobacco consumption (Lewit & Coate, 1982). To the extent that tobacco consumption is price-elastic, higher duties have the potential to reduce these adverse economic effects. Recent evidence from extended cost-benefit analyses in developing countries suggest that the aggregate net effect of immediate negative income variations and long-term benefits of reduced uptake can result in positive benefits that can be more pronounced among low-income households (Fuchs & Meneses, 2017a; Fuchs & Meneses, 2017b; Fuchs, Del Carmen, & Kechia Mukong, 2018). More research would be required to assess this conjecture for Kenya.

5 Public Spending on Education and Health

5.1 Public education spending

46. **Close to three quarters of the GoK's recurrent public education spending is directed to primary and secondary education.** Kenya's education system comprises eight years of primary, four years of secondary, and four years of tertiary education. Only early childhood education and aspects of vocational education have recently been transitioned from the central government to the counties. But public primary, secondary, and tertiary education remained under central control. They have become more important in recent years. But public primary still accounts for 42.2 percent and public secondary for 32.2 percent of total recurrent spending on education (Figure 15a). Tertiary education also accounts for a significant portion, around 14.8 percent.

Figure 15: Distribution of recurrent public education spending by education level.

(a) Distribution of recurrent public education spending by level

(b) Share of children age 6-17 by quintile
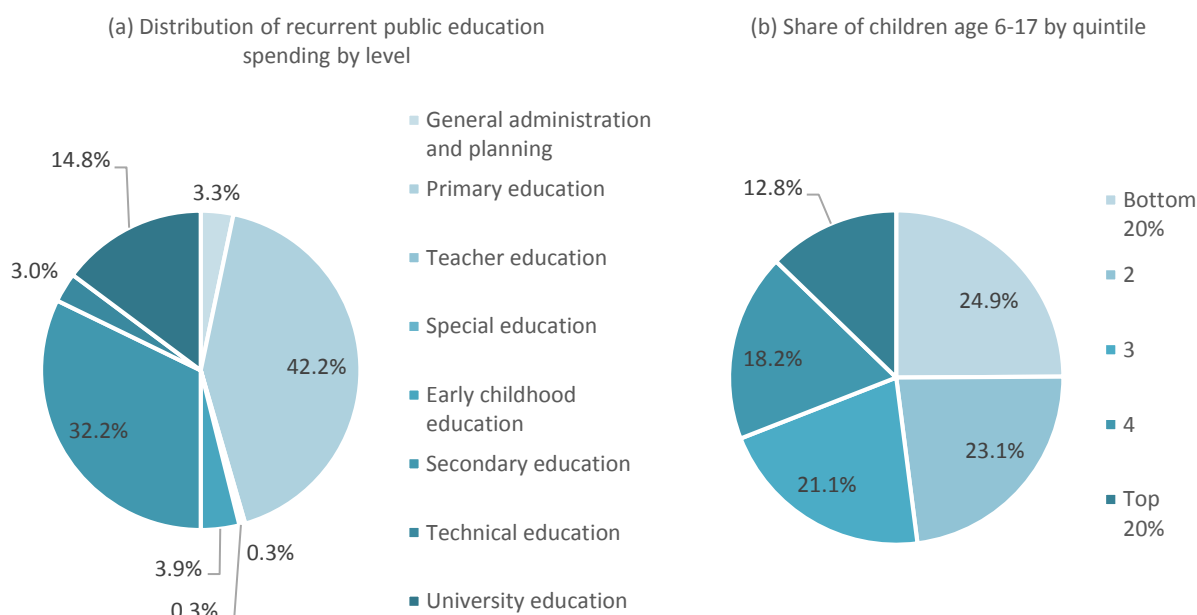
Source: Own calculations based on various issues of the education sector reports (panel (a)) and KIHBS 2015/16 (panel (b)).

47. **Public education spending is expected to be pro-poor in Kenya for three reasons.** The first is related to demographics: the share of school-age children is higher among the poor, nearly half of all children between the ages of 6 and 17 are among the bottom 40 percent (Figure 15b). Even without differences in public school enrollment, the poor would therefore stand to benefit disproportionately from public education spending. Second, the poor are more likely to be enrolled in public schools than their wealthier counterparts, particularly at the primary level (Figure 16a). The trend towards higher uptake of private education at the primary level is well documented and has been linked to the introduction of Free Primary Education (FPE) in 2003 (Lucas & Mbiti, 2012; Bold, Kimenyi, Mwabu, &

Sandefur, Can Free Provision Reduce Demand for Public Services? Evidence from Kenyan Education, 2014). Differences in overall enrollment rates only materialize at post-primary levels, especially in tertiary education (World Bank, 2018b). The final reason relates to school financing. Public primary education is fully subsidized while post-primary education often requires substantial co-payments, even for public provision (World Bank, 2018b). This arrangement is expected to further increase the effect of higher

uptake of primary public education among the poor and to mitigate the benefits of public secondary that would otherwise accrue to richer families.

Figure 16: Distribution of school-age children and gross enrollment, 2015/16.

(a) Gross enrollment ratios in primary by type of provider

(b) Gross enrollment ratios in secondary by type of provider
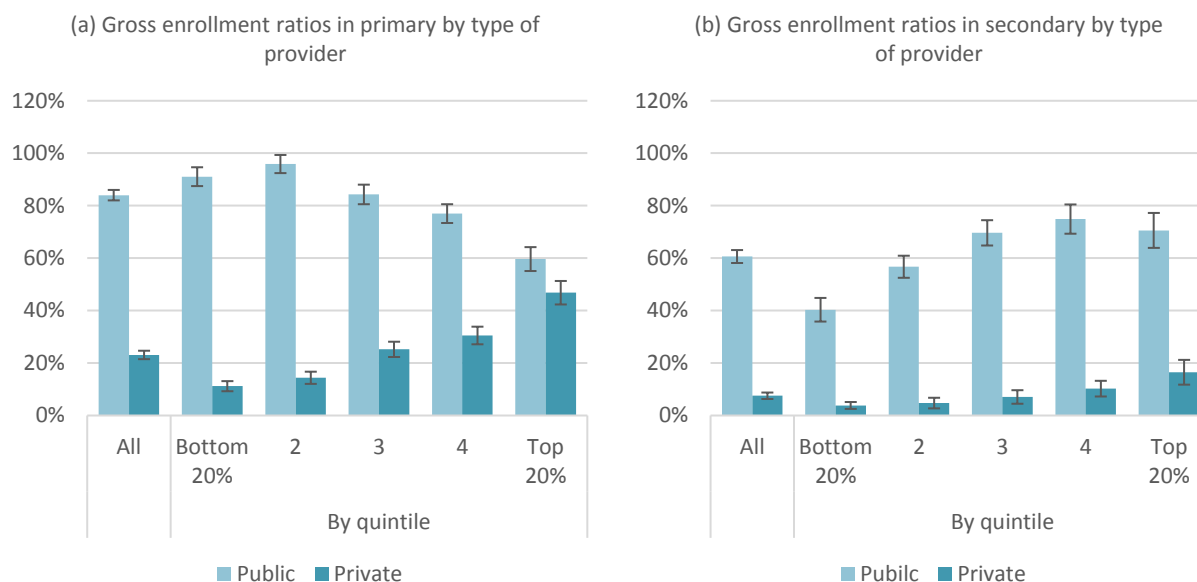
Source: Own calculations based on KIHBS 2015/16.

Table 6: Tuition, gross, and net benefits of public education expenditure, 2015/16.

	Average tuition			Gross benefit allocated per student in public	Average net benefit per student in public	Net benefit as share of gross benefit
	Public	Private	Ratio			
Early childhood education	917	5,685	16.1%	6,024	5,107	84.8%
Primary and special education	456	10,466	4.4%	15,074	14,619	97.0%
Secondary education	14,553	27,451	53.0%	39,013	24,460	62.7%
Technical and teacher education	29,780	36,228	82.2%	31,823	2,043	6.4%
University education	58,921	107,709	54.7%	111,921	52,999	47.4%

Source: Own calculations based on KIHBS 2015/16 and various issues of the education sector reports.

48.   While enrollment rates are declining, public (per-student) spending increases across the education system. Kenya spends significant public resources on all major levels of the education system. More than 40 percent of total recurrent spending is allocated to primary, more than 30 percent to secondary, and about 15 percent to university education (Figure 15a). However, the total number of students enrolled decreases drastically across these levels, partly as a result of the 8-4-4 structure of the education system with its focus on eight years of primary and partly because of decreasing enrollment

rates. This results in escalating levels of per student spending: while the average net benefit to public primary school students is around KSh14,600, it is KSh24,500 in secondary, and KSh53,000 in university (Table 6).

Figure 17: Lorenz and concentration curves for per capita market income and the net benefit of public education expenditure by level of the education system.
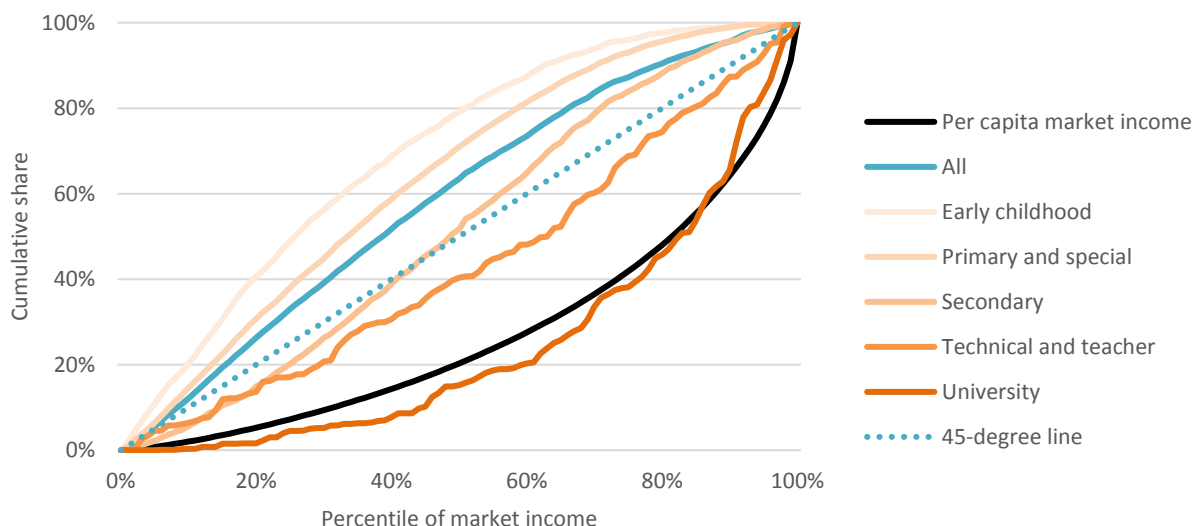
Source: Own calculations based on KIHBS 2015/16 and administrative data (Appendix D).

49.   The combined net benefits of public education expenditure is progressive in absolute terms. The bottom 40 percent capture 14.3 percent of per capita market income but 51.7 percent of the net benefits of public education spending (Figure 17). This result is driven by early childhood education and primary education spending, of which the poorest 40 percent capture 67.8 and 58.2 percent, respectively.

50.   Public education expenditures become increasingly regressive at higher levels of the education system. While public spending on early childhood education and primary and special education are progressive in absolute terms, spending on secondary public education and technical and teacher education is progressive only in relative terms. Spending on public universities, on the other hand, is regressive, due to low levels of enrollment among the poor (World Bank, 2018b).

51.   Allocation of public education spending is based on a cost-of-production approach, which may be particularly problematic in Kenya. Public education spending (obtained from administrative data) is allocated to households in which members are enrolled in public schools. The allocation is made on a per-student basis and by education level, using the number of students estimated from the survey.[20] It should be noted that this approach may be particularly problematic in the case of Kenya. One problem is that there is no guarantee that households' willingness-to-pay for public education is in line with public per-student spending. In Kenya, there is increasing evidence that a large fraction of public education spending

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[20] Details are provided in Appendix D and results are discussed in section 0.

is captured by civil-service teachers in the form of rents (Barton, Bold, & Sandefur, 2017) and that private provision–at least of primary education–is often more efficient (Bold, Kimenyi, Mwabu, & Sandefur, 2011).

5.2 Public health spending

52. **While the poor are less likely to seek health services in general, they are more likely to consult with public providers.** As in the case of public education spending, there are several factors that determine the incidence of public health spending in Kenya. One is simply the difference in the propensity to seek care. The poor are typically less likely to seek care and this holds for all types of care, curative outpatient visits, inpatient care, and preventive care, and–with the exception of preventive care for children below 15 years–across all age groups (Figure 18). But conditional on uptake, the poor are more likely to consult government-run facilities. This is true for health centers and dispensaries, but not for government hospitals (Figure 19). Reliance on public services is high in rural areas and less so in urban areas.

Figure 18: Uptake of outpatient, inpatient, and preventive care by age group and quintile, 2015/16.
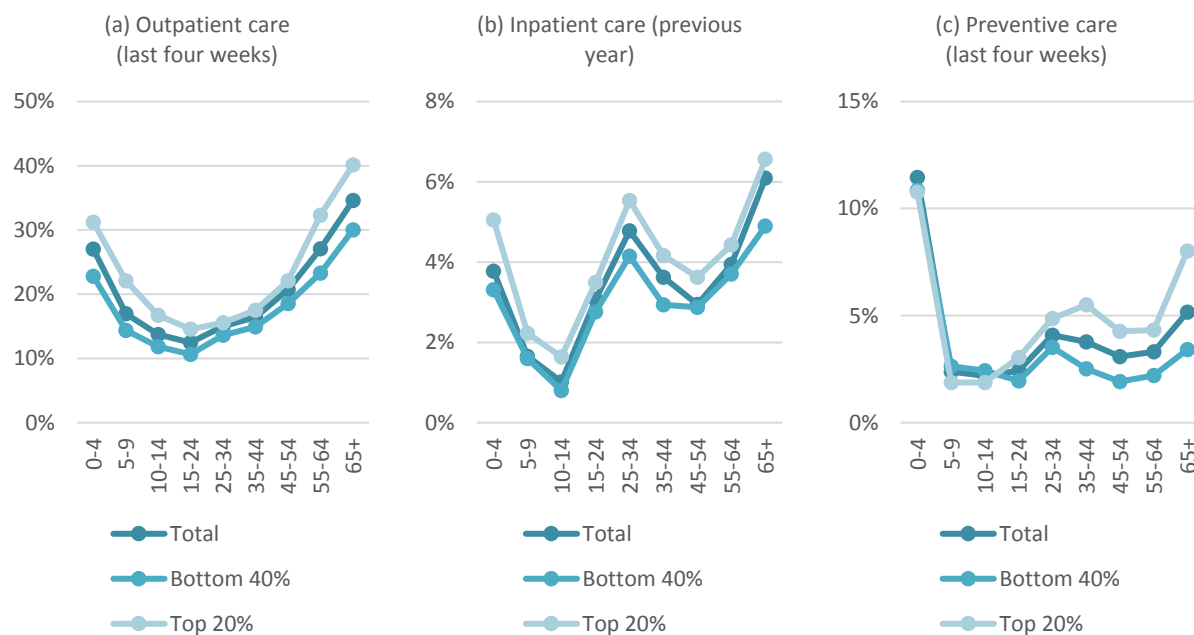
Source: Own calculations based on KIHBS 2015/16.

53. **The role of demography is less clear.** It is also worth noting that uptake of curative and preventive care is typically higher among the young and the old. But in contrast to the anticipated effect of demography on the incidence of public education, the effect on the incidence of public health is less clear. Interestingly, children below the age of five and adults 65 and above are almost equally distributed across quintiles.
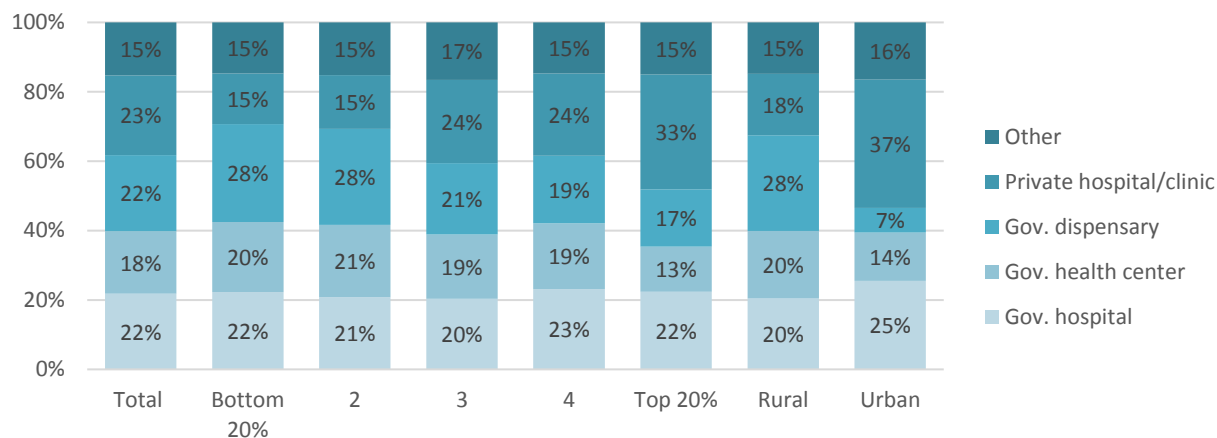
54.   Recent years have seen a shift of public health spending from higher-level facilities to lower-level facilities through the removal of user fees in primary health care facilities as well as for maternal health services. On June 1, 2013, the president decreed that maternal health services in all public facilities should be provided free of charge. User fees at all primary health care facilities were also removed. This resulted in an increase in uptake of public health services and, in the case of deliveries, a shift in demand from private to public provision (World Bank, 2018b).

55.   Public spending on outpatient care in lower-level facilities is pro-poor.[21] The overall incidence of public spending on outpatient care is nearly neutral: the bottom 40 percent account for 36.6 percent of the benefits (Figure 20a). The result follows from a combination of effects. The poor are less likely to consult health providers. But conditional on uptake, they are more likely to consult public facilities, particularly lower-level facilities such as dispensaries and health centers. Consequently, the bottom 40 percent capture 41.2 and 50.3 percent of the gross benefits associated with health centers and dispensaries but only 30.6 percent of the gross benefits associated with government hospitals. Globally, public spending on outpatient care in health centers and dispensaries is progressive in absolute terms while public spending on outpatient care in government hospitals is still progressive.

56.   User fees and over-the-counter purchases associated with outpatient care in public facilities are regressive. The poorest 40 percent have a share of 16.1 percent in market income but account for 25.9 percent of all fees and over-the-counter purchases associated with public outpatient health services (Figure 20b).

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[21] Details regarding the allocation are provided in Appendix E.

Figure 20: Incidence of outpatient visits, public expenditure on outpatient visits, and user fees by facility.

(a) Incidence of outpatient visits and gross benefits of public expenditure on outpatient visits by facility

(b) Incidence of user fees (fees and over-the-counter purchases)

Market income

Government hospitals

Government health centers

Government dispensaries

Total benefit (weighted by cost)

45-degree line

Market income

Co-payments and over-the-counter purchases in government facilities

45-degree line

Source: Own calculations based on KIHBS 2015/16 and information tabulated in Flessa, et al *(2011)*.

6 Conclusions

6.1 Effects on poverty and inequality

57. **Direct taxes and transfers have virtually no effect on poverty but an attenuating effect on inequality.** The poverty headcount ratio increases with direct taxes by around 0.6 percentage points and decreases with direct transfers by almost the same amount (Figure 22). While poverty effects of these interventions are small, the Gini index decreases by 2.3 percentage points with direct taxes and by another one third of a percentage point with cash transfers (Figure 22a). The analysis suggests that the top ten percent account for 80 percent of the income tax burden which is reflected here in a sharp drop in their share in income (Figure 22b).

Figure 21: Combined effects of taxes and transfers on poverty (based on the national poverty methodology) – headcount ratio and poverty gap index.
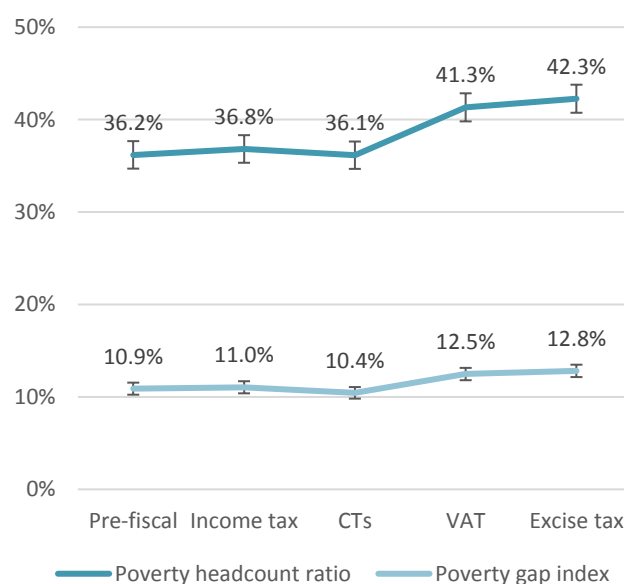
Source: Own calculations based on KIHBS 2015/16 and administrative data as detailed in the text.
Note: 95-percent confidence intervals are indicated but only reference sampling variability, not uncertainty associated with the allocation of fiscal measures.

58. **VAT and excise tax increase poverty and have a small, negative effect on inequality.** The poverty rate increases by more than five percentage points after VAT is accounted for. However, because VAT is mildly progressive and the burden is high across all income groups, it also has a sizable, negative effect on the Gini index (0.6 percentage points) (Figure 22a). Excise taxes, which generate only half of the revenue

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that VAT generates, have a similar effect on poverty and inequality. They further increase poverty, by about one percentage point, and lower the Gini index by 0.3 percentage points (Figure 22a).[22]

Figure 22: Combined effects of taxes and transfers on inequality – Gini index and income shares of top 10 percent and bottom 40 percent
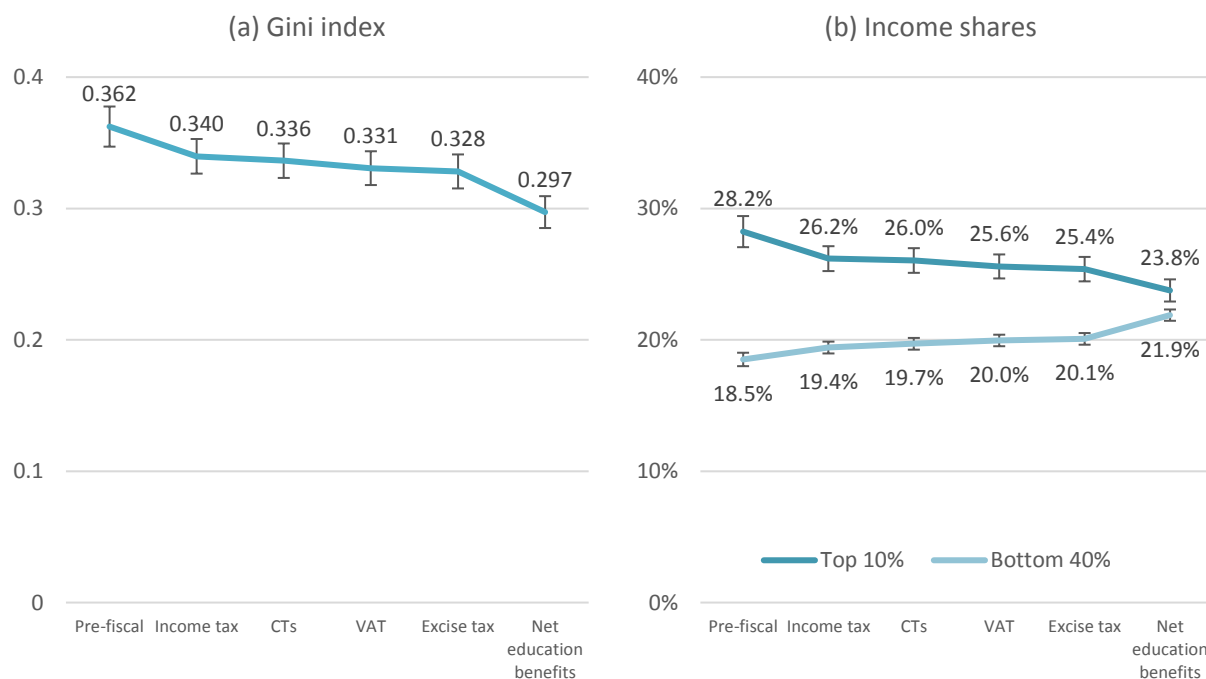
Source: Own calculations based on KIHBS 2015/16 and administrative data as detailed in the text.
Note: 95-percent confidence intervals are indicated but only reference sampling variability, not uncertainty associated with the allocation of fiscal measures.

59.   The net benefits of public education spending have a large, negative effect on inequality.[23] Public education spending is large and progressive in absolute terms, primarily through spending on pre-primary, primary, and secondary. The Gini index drops to only 0.297 after the net benefits of public education spending are accounted for and the income shares of the top ten percent and the bottom 40 percent converge significantly (Figure 22). This result should be interpreted only carefully. As noted

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[22] As noted previously, the overall increase in poverty at least partially results from capturing in the analysis a significantly larger share of the revenue side of the tax and transfer system than of the spending side.

[23] No attempt was made to relate estimates to total household expenditure or to include this in final income. There are two reasons for this, one conceptual and one practical: first, it is difficult to argue that uptake of public health is welfare-improving when the reason for uptake is illness or injury. Second, it was decided that the administrative data required to assign benefits that the authors were able to obtain had insufficient resolution to adequately account for differences between the poor and the non-poor. For instance, patterns in uptake of public health services between the poor and the rich in Kenya differ substantially, with the poor more likely to seek care in lower-level public facilities. Hence, public spending by type of facility would be required. In addition, the devolution of health service delivery to the counties resulted in lower-level public health facilities being run by the counties. One should therefore also use data disaggregated at the county level. The kind of data required, disaggregated data on total public health expenditure by county, type of care, and facility level, was not available for this report. However, it is still possible to use the household survey data to investigate patterns of health services uptake and to combine these data with estimates of the unit cost of different types of care. Details are provided in Appendix E.

before, the production cost of education (see Appendix D) is not necessarily equal to households' willingness-to-pay for public education, particularly in the Kenyan context in which there is evidence for large rents earned by civil-service teachers.

Figure 23: Poverty headcount ratios (using the World Bank's $1.25 and $2.50-poverty lines based on 2005 PPPs) across countries and income concepts.
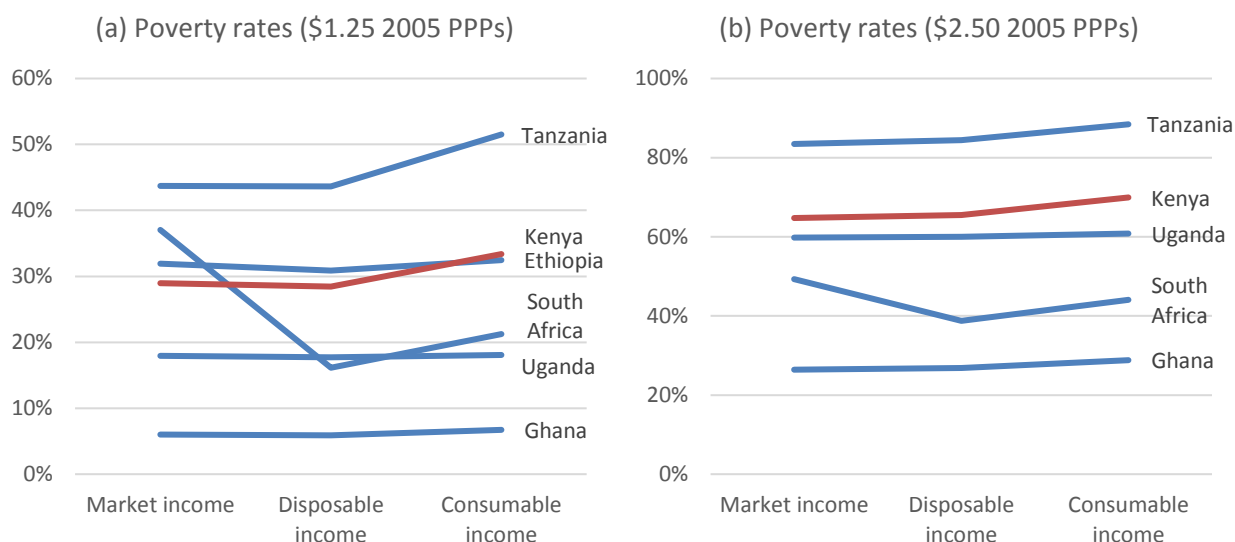
(a) Poverty rates ($1.25 2005 PPPs)

(b) Poverty rates ($2.50 2005 PPPs)

Source: Own calculations based on KIHBS 2015/16 and administrative data as detailed in text as well as data from the CEQ institute.

60.   As in other countries in Sub-Saharan Africa, the effects of direct transfers and taxes on poverty are moderate in Kenya. Cross-country comparisons suggest that the change in the poverty headcount ratio using the World Bank's $1.25-poverty line based on 2005 PPPs in going from market income to disposable income is often limited in Sub-Saharan Africa (Figure 23a). They range from a reduction by only a tenth of a percentage point in Tanzania to one percentage point in Ethiopia. Kenya falls roughly in the middle of this range with a reduction in the poverty headcount by half a percentage point. Using the $2.50-poverty line, the positive effect on poverty of direct taxes even dominates the poverty-reducing effect of direct transfers in Ghana, Uganda, Kenya, and Tanzania but the overall effect remains small (Figure 23b).[24] It seems plausible that the same factors are at play that are also observed in Kenya, namely a small effective tax base due to high levels of informality and direct transfers programs that are small in terms of coverage. The major exception to this pattern is South Africa, which achieves significant poverty reduction in going from market to disposable income, mainly as a result of large direct transfer programs.[25]

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[24] For the poverty headcount using the $2.50-poverty line no data was available for Ethiopia.
[25] The CEQ for that country reports that direct transfers, mainly in the form of transfers to the elderly, to the disabled, and to children, account for ten times the market income of household in the bottom decile (Inchauste, Lustig, Maboshe, Purfield, & Woolard, 2015). On the other hand, it should be noted that South Africa is the only country in Figure 23 that uses income rather than consumption as the welfare indicator in the analysis. The effects of this on comparisons is currently not well understood.

61.   As in Kenya, indirect taxes and transfers often increase poverty in Sub-Saharan Africa substantially. In going from disposable to consumable income, poverty rates increase in most countries, including those in Sub-Saharan Africa. The increase in the poverty headcount using the $1.25-poverty line range from three tenths of a percentage points in Uganda to 7.9 percentage points in Tanzania. With an increase in poverty by 5.9 percentage points, Kenya is close to the upper end of this range. However, it should be noted again that indirect subsidies in Kenya, while likely negligible, were not included in this study.

Figure 24: Density distribution of poverty effects in going from market to disposable and from disposable to consumable income (based on the World Bank's $1.25-poverty line using 2005 PPPs).

(a) Density of change in poverty rate: market to disposable income

(b) Density of change in poverty rate: disposable to consumable income

Source: Own calculations based on KIHBS 2015/16 and administrative data as detailed in text as well as data from the CEQ institute.
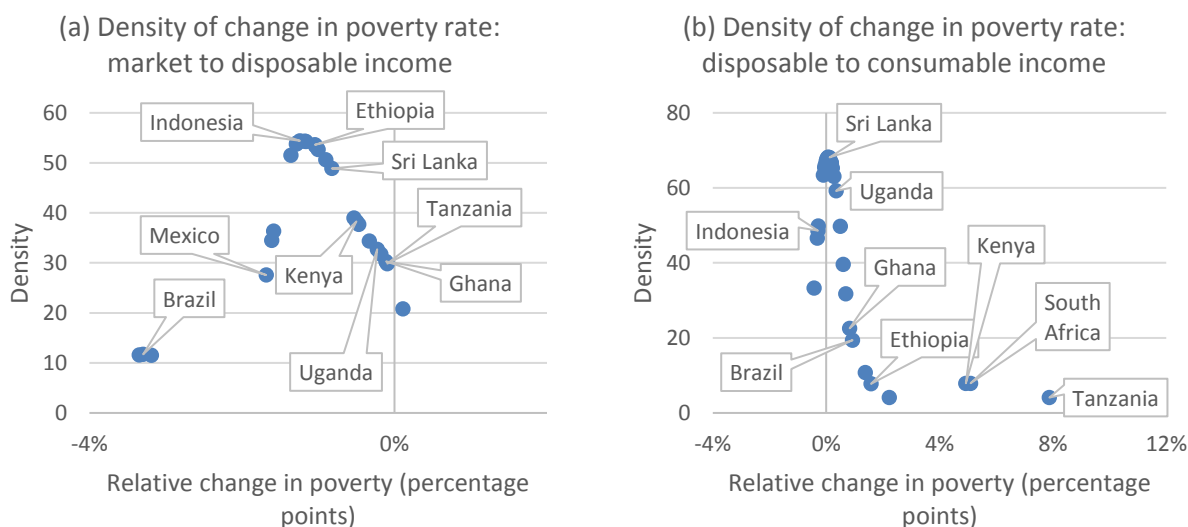*Note:* The observation for South Africa is removed from panel (a) as an outlier (see text).

62.   Kenya achieves little poverty reduction through direct taxes and transfers while indirect taxes contribute significantly to poverty. Among countries for which CEQs have been completed, poverty reduction (based on the $1.25-poverty line) in going from market income to disposable income varies widely (Figure 24a). For instance, almost one fifth of South Africa's population are initially lifted out of poverty in South Africa at this stage, compared to almost basically no one in Ghana and Armenia. While South Africa is an outlier here, countries like Brazil and Mexico, which were among the first to adopt large-scale cash transfer programs, are also among those that achieve significant reductions in extreme poverty at this stage. Kenya's reduction of half a percentage point ranks among the upper end of the distribution. Only seven out of a total of 29 countries in the dataset achieve less poverty reduction. On the other hand, only two countries, Tanzania and South Africa, register a larger effect on poverty of indirect taxes and transfers (Figure 24b). Results are qualitatively similar when the $2.50-poverty line is used.

Figure 25: Gini coefficient by CEQ income concepts and country.
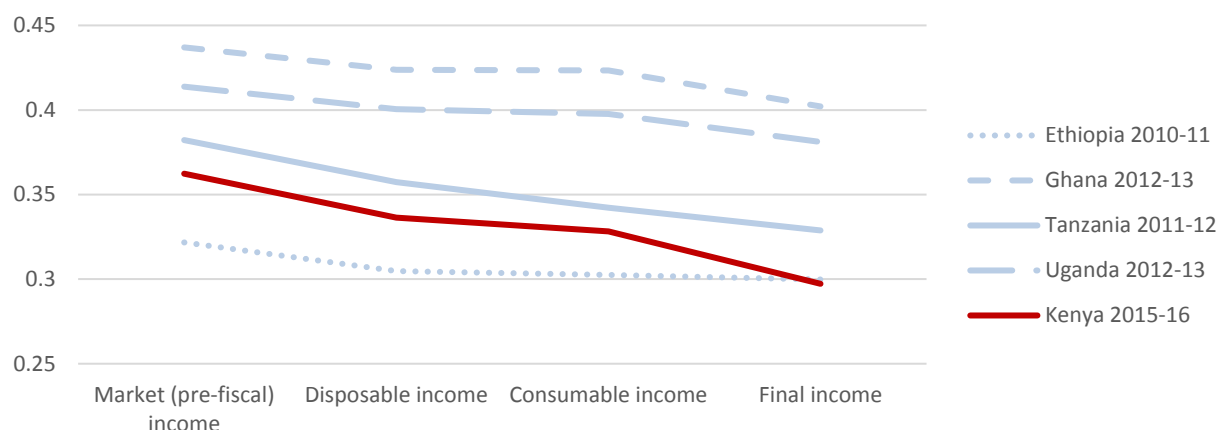
63. **The inequality-reducing effect of direct taxes and transfers between market income and consumable income in Kenya is similar to other countries in the region.** Ethiopia, Ghana, Tanzania, and Uganda all reduce inequality through direct taxation and transfers, ranging from a decline in the Gini by 1.3 percentage points in Ghana and Uganda to 2.5 percentage points in Tanzania (Figure 25). With 2.6 percentage points, the reduction in Kenya is at the upper end of this range but not very different from that of Tanzania. As in Kenya, inequality barely changes in these countries between disposable income and consumable income. Only Tanzania achieves a reduction by 1.5 percentage points.

64. **The negative effect of public education spending on poverty and inequality is substantially more pronounced in Kenya relative to benchmark countries.** The effect of public education spending on inequality is pronounced in Ghana, Tanzania, and Uganda, at 2.1, 1.3, and 1.7 percent. However, it is much larger in Kenya, at 3.1. It should be noted that the estimates for Kenya do not include public health spending. Again, there are major concerns about allocating public education spending to households based on the production-cost approach, maybe more so than in other countries.

6.2 Summary and policy implications

65. **Overall, taxes and transfers have mostly an attenuating effect on inequality while their effect on poverty is more mixed.** This report considers the combined effect of taxes and transfers in Kenya on poverty and inequality. Direct taxes and transfers reduce inequality and are almost exactly off-setting in their effect on poverty. Indirect taxes are progressive and thus reduce inequality. But they increase poverty by definition. Public spending on education is pro-poor. But the analysis in this case relies on strong assumptions. Overall, changes in inequality and poverty are similar to those observed in other countries in the region.

66. **The GoK should consider further expanding direct cash transfer programs.** Cash transfer programs are well-targeted so that a large fraction of the benefits is captured by the poor. This is particularly true for the HSNP, which is restricted to northern counties in which poverty is heavily

concentrated. However, cash transfer schemes in Kenya cover only a small fraction of the population. These programs, which have been introduced only recently, should further be expanded in order to increase their poverty-reducing effect.

67.   Overall, exempt and zero-rated items within Kenya's VAT regime benefit the poor only marginally. The report finds that the variation in consumption shares of exempt and zero-rated across the welfare distribution is small. A review of the VAT code might help to make VAT more progressive or, alternatively, increase revenue that could then be employed in progressive transfer programs, while also addressing other concerns about exemptions. However, a more detailed follow-up analysis of exemptions and zero-rates would be necessary to determine item-level incidence.

68.   Shifting public resources from higher-level health facilities to lower-level facilities is likely to benefit the poor. The analysis of the incidence of public health expenditures has important limitations, particularly with regard to the effect of public spending on poverty and inequality. However, the relative incidence across different levels of the health and education system can be readily assessed. Results suggest that redirecting spending from higher-level health public health facilities to primary care facilities has the potential to benefit the poor and might increase access. However, it is important to also assess in this case the absorptive capacities of these facilities. This is less clear for public spending on tertiary education. The immediate benefits, calculated as the cost of producing public tertiary education, are captured overwhelmingly by the top 20 percent. But higher education has also been linked to an economy's prospect of achieving high rates of growth through fostering technological convergence (Bloom, Canning, Chan, & Luca, 2014). The framework employed in this study is not well-placed to capture such dynamic effects on public interventions on growth and, possibly, poverty reduction.

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Appendix A.   Direct Taxes

69.   Personal income tax under the PAYE scheme are simulated based on information about the tax code. It was assumed that income reported in the KIHBS data is always income net of taxes. A standard assumption in the CEQ framework is that taxes paid by the employer are shifted to workers in the form of lower wages. Hence, disposable income–in this case, the value of consumption–was taken as a point of departure and the tax code was then applied to arrive at market income (CEQ Handbook, Ch. 6, pp. 27f. and 33).

70.   Payroll tax was assumed to apply only to those with formal sector salaries as well as profits from household-owned businesses that were registered with county authorities. Formal sector workers were identified through employer contributions to the National Social Security Fund (NSSF). Using the KHIBS 2015/16, the analysis deduced formal employment through employer contributions to the NSSF, resulting in an estimated 2.1 million formal sector workers.[26] The number is reasonable yet still higher than the number of income tax payers reported by the KRA for 2015/16 of around 1.6 million.

71.   The total tax rate estimated from the survey was 72 percent of tax revenues reported in administrative data. Individual tax burdens were estimated by applying the six pre-2017 brackets generated by four cut-offs and 'personal relief,' an allowance for untaxed personal income. The marginal tax rate increased from 0 to 10 percent for individual incomes above the personal relief of KSh 13.944 and then subsequently up to 30 percent in 5-percentage point steps. Summing gross eligible incomes resulted in a total estimate of KSh 206,478 billion, around 72 percent of the tax take reported in administrative data. The gap is to be expected: individuals earning very high incomes are notoriously difficult to capture in a household budget survey.[27]

72.   Additional administrative data would likely improve the analysis of the incidence of direct taxes. Overall, results of the simulation indicate an estimated 2.3 million taxpayers in Kenya (Table 3), including salaries and business profits. This is likely an overestimate; the number of income tax payers reported by the KRA is lower for 2015/16 (1.6 million) and household surveys typically underestimate the incidence of top incomes. Taken together, the analysis likely overestimates the number of taxpayers while underestimating total revenue from income tax. It could be improved if additional administrative data on income tax would be available, such as the actual number of taxpayers per bracket or the total taxable income declared.

73.   Contributory pensions and contributions to social security are not considered in the analysis. The CEQ analysis stipulates the calculations of two alternative concepts of market income, market income and market income plus pensions. In this analysis, pension receipts and contributions to pension schemes will for brevity be treated simply as deferred income, not as government transfers. The distributional

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[26] Income tax payments are not directly reported in the survey. Hence, available survey information was used to infer who is likely to be employed as a wage worker in the formal sector to determine who is likely to be subject personal income tax. Employer contributions to the National Health Insurance Fund (NHIF) were also considered. But this approach was discarded when it was found that 2.7 million respondents claimed employer contributions to the NHIF. This total is considerably higher than the number of taxpayers in 2015/16 reported by KRA, of 1.6 million people.

[27] It is well-known that households tend to under-report income, that some households participating in the survey do not report income at all, and that other households do not participate in surveys even when selected in the survey sample. High-income earners are commonly thought to have a greater propensity to either underreport incomes or to refuse participation in the survey. See, for instance, the literature on top incomes and the measurement of inequality (Cowell & Flachaire, 2007; Korinek, Mistiaen, & Ravallion, 2006).

consequences of this are in all likelihood small as contributory pension schemes are typically linked to formal sector employment, a small share of employment in Kenya.

74. **The simulation of market income resulted in occurrences of negative values that were set to zero.** This is in line with conventions in the CEQ framework, which urges that variables that have negative values are left as negative but to convert negative market income to zero once all income components are aggregated at the household level.

Appendix B.   Direct Cash Transfers

Underreporting of beneficiary status and transfer receipt

Table 7: Administrative data and scaled survey estimates of the number of beneficiary households by program, 2015/16.

	2015 coverage	2016 administrative data	Scaled survey estimates
CT-OVC	255,643	261,943	248,207
OPCT	162,695	350,347	336,252
CT-PwSD	25,471	53,950	38,661
HSNP	84,340	101,689	97,413

Source: Data reported in the first column are from Ministry of Labour and East African Affairs *(2016)*.

Note: Data in the second column were provided by Development Pathways (direct contact), and survey estimates are based on KIHBS and the second source of administrative data.

75. **Adjustments to the survey data were necessary before statutory transfers were allocated to survey households.** Both beneficiary status and transfer amount were heavily underreported in the survey. To correct for this, a statistical model of transfer receipt was estimated which was then used to identify other likely beneficiary households. Iterations are made such that the number of beneficiary households in each county within the analysis matched those reported in administrative data in 2016 (columns two and three of Table 7). Finally, statutory transfer amounts were allocated to survey households.[28]

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[28] Note that this assume that beneficiary households always receive the stipulated transfer amount.

Figure 26: Underreporting of household beneficiary status at the county-level in the survey vis-à-vis administrative data (thousand households).

(a) OPCT

(b) HSNP

(c) OVC

(d) PwSD
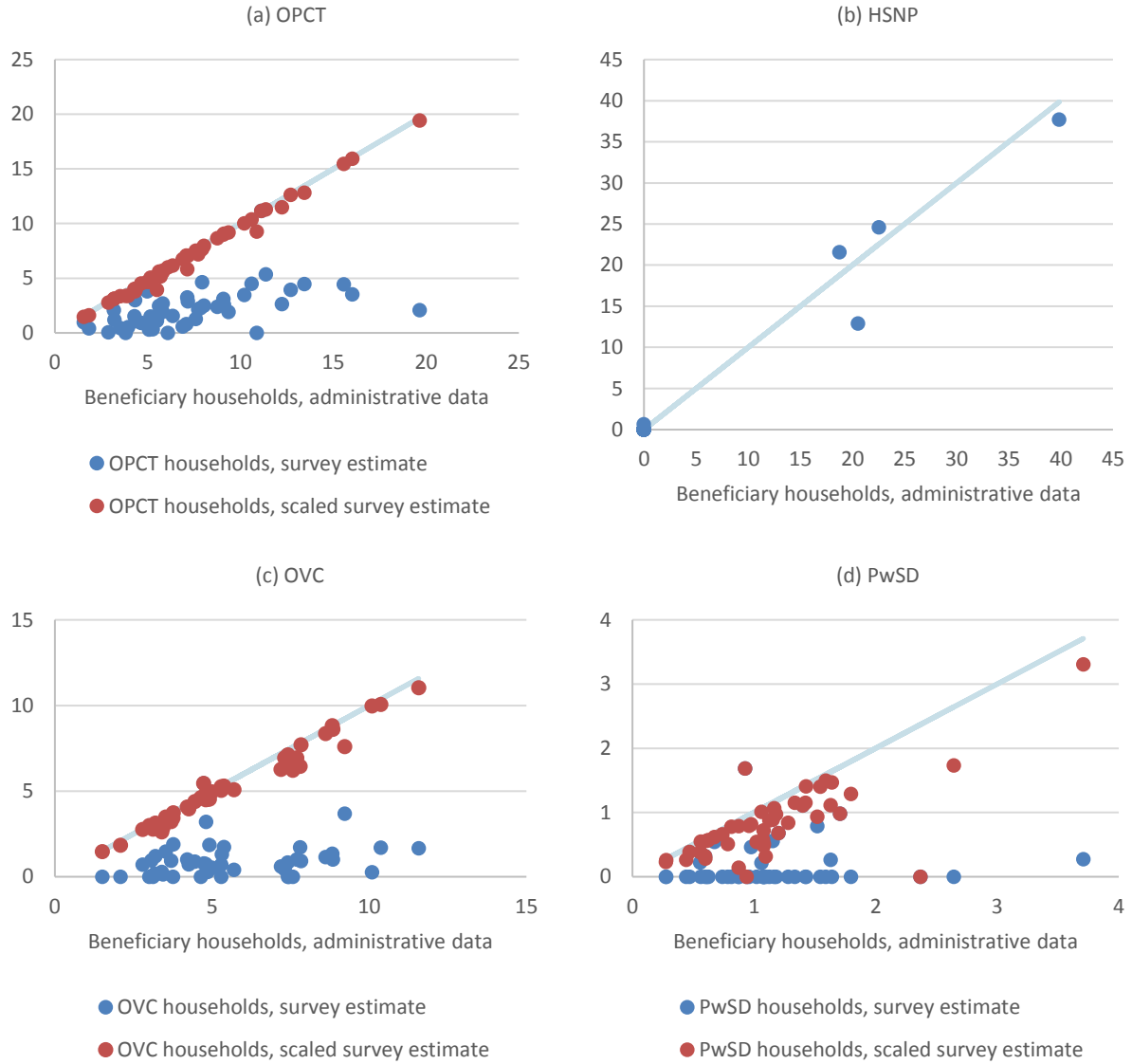
Source: Own calculations based on KIHBS 2015/16 and administrative data.

Table 8: Comparison of survey estimates and administrative data in terms of coverage and incidence of main cash transfer programs.

	Coverage among households (percent)		Total transfer amounts (as percent of GDP), no adjustment to survey estimates	
	KIHBS 2015/16	Administrative data	KIHBS 2015/16	Administrative data
CT-HSNP	0.85	0.89	0.02	0.19
CT-OVC	0.39	2.29	0.01	0.37
OPCT	0.93	3.07	0.03	0.50
CT-PwSD	0.07	0.47	0.00	0.07

Source: Own calculations based on 2015/16 KIHBS data and administrative data.

Note: Estimates in the final column are obtained by multiplying the reported number of beneficiary households with the total annual transfer amount and dividing by GDP (average between 2015 and 2016).

76. **Coverage and transfers are vastly underreported in the KIHBS data.** In principle, data on transfers receipts in the KIHBS could be screened for outliers, scaled, and further subtracted from disposable income (total household consumption) in order to arrive at market income. However, for the CT-OVC, the OPCT, and the CT-PwSD, administrative data indicate a much higher number of beneficiary households than survey estimates and survey estimates of coverage and total transfer amounts were far lower that what was reported in the administrative data (Figure 26 and Table 8). One explanation is that households receive transfers but are not familiar with the name of the program they are benefiting from. For instance, survey estimates of the total number of beneficiary households and the number of households in administrative data seem better aligned for the HSNP, which was reportedly well-advertised (Figure 26b). But it should also be noted that the survey was not stratified

Table 9: Disbursement of funds, administrative data and survey estimates after imputation, million KSh per year.

	Administrative data	Survey estimates, post-imputation
CT-HSNP	-	2,980.84
CT-OVC	8,439.6	5,940.35
OPCT	7,445.3	8,085.15
CT-PwSD	-	968.45

Source: Administrative data are from the KES 2017 *(KNBS, 2017)*.

Note: Survey estimates are based on KIHBS and administrative data on the number of beneficiaries per county.

77. **Beneficiary status and transfer amounts were imputed based on administrative data for the CT-OVC, the OPCT, and the CT-PwSD, but not for the CT-HSNP**. This assumes that the number of beneficiaries is underestimated but that survey information about the distribution of beneficiaries is otherwise accurate. First, estimates of the probability of transfer receipt were obtained through a logit regression at the household-level of beneficiary status on a number of variables capturing household characteristics including targeting criteria (e.g. the number or household members aged 65 and above, the presence of household members with disabilities, the presence of an orphan below the age of 18, etc.) (see below). Second, the predicted probabilities were used to rank households that did not identify as beneficiaries within each county. These were then allocated transfers starting with the highest-ranked household until the county quota suggested by the administrative data were filled. For all four CT programs, it was found that survey data on transfer amounts was not reliable. Therefore, statutory transfer amounts were allocated to households.

78.   Statistical analysis of beneficiary status, which was used to correct underreporting in the survey, is also informative in terms of the targeting performance of the programs. As explained in the main text, underreporting for three of the four direct cash transfer programs in the survey was corrected by estimating binary choice models of transfer receipt and then classifying households as beneficiaries in order to scale-up the survey estimates to the reported number of beneficiaries in the survey. This exercise was found to be informative about targeting performance and was thus extended in two ways: first, it was also applied to the other two programs studied in this report, the CT-HSNP and the bursary funds. Second, additional models were estimated that included log real per adult consumption as a regressor. Results from these logit regressions are reported in Table 10.

79.   Reassuringly, transfer receipt is typically correlated with programs' inclusion criteria. OPCT beneficiary households are more likely to have household members aged 65 and above, OVC beneficiary households are more likely to include an orphan, and PwSD beneficiary status is correlated with having a household member with disabilities.

80.   Further results from this exercise are worth noting: first, households headed by women are ceteris paribus more likely to be beneficiaries of the OPCT, the HSNP, and the OVC program, but not with either being a PwSD beneficiary household. This seems to be partly an issue of statistical power as fewer households are included in the estimation. Note that few households in the KIHBS report being recipients of this program. Second, household members enrolled in secondary is partially correlated with OVC beneficiary status. This is not surprising as one bursary fund program to foster enrollment among OVCs is attached to the OVC program. There is also evidence for a positive effect of OVC receipt on enrollment in secondary education (Kenya CT-OVC Evaluation Team, 2012).

Table 10: Targeting of cash transfer programs - result from logit estimation at the household-level (results reported as odds ratios).

	OPCT		HSNP		OVC		PwSD	
	(1a)	(1b)	(2a)	(2b)	(3a)	(3b)	(4a)	(4b)
Log per adult real consumption		0.72**		1.07		0.97		0.54
		(-2.19)		(0.36)		(-0.09)		(-1.06)
Household head is woman	1.85**	1.78**	1.72**	1.74**	3.61**	3.60**	1.79	1.54
	(3.12)	(2.89)	(2.89)	(2.87)	(3.87)	(3.99)	(1.22)	(0.91)
Household head age	1.16**	1.16**	1.03	1.04	1.19**	1.19**	1.41**	1.40**
	(2.92)	(2.91)	(0.90)	(0.91)	(2.13)	(2.11)	(2.31)	(2.35)
Household head age sq.	1.00	1.00	1.00	1.00	1.00*	1.00*	1.00**	1.00**
	(-1.44)	(-1.48)	(-0.64)	(-0.64)	(-1.94)	(-1.93)	(-2.16)	(-2.21)
Log number of rooms	0.78	0.85	0.12**	0.12**	0.78	0.79	0.85	1.07
	(-1.28)	(-0.79)	(-5.84)	(-6.01)	(-0.77)	(-0.70)	(-0.31)	(0.14)
Log HH size	0.92	0.87	2.79**	2.90**	1.30	1.28	1.64	1.21
	(-0.38)	(-0.65)	(3.40)	(3.24)	(0.89)	(0.83)	(0.59)	(0.23)
Members 65 and older	2.56**	2.53**	1.24	1.24	1.98	1.98	2.78**	2.58**
	(5.06)	(5.03)	(0.88)	(0.87)	(1.60)	(1.57)	(2.09)	(2.06)
Members below 18	1.16*	1.14	0.99	0.99	0.93	0.93	1.15	1.16
	(1.69)	(1.52)	(-0.11)	(-0.13)	(-0.81)	(-0.80)	(0.49)	(0.53)
Member enrolled in technical/post-primary	3.71**	3.76*			2.23	2.24	0.82	0.90
	(1.98)	(1.95)			(1.20)	(1.21)	(-0.21)	(-0.12)
Member in secondary	0.67	0.69	1.08	1.07	1.60*	1.61*	0.05**	0.06**
	(-1.50)	(-1.38)	(0.34)	(0.30)	(1.83)	(1.80)	(-2.17)	(-1.97)
Member enrolled in mid-level/college	1.11	1.25	0.85	0.84	0.37	0.37		
	(0.21)	(0.46)	(-0.35)	(-0.38)	(-1.62)	(-1.61)		
Member in university			2.89*	2.81*	1.14	1.15		
			(1.85)	(1.77)	(0.20)	(0.21)		
Disability: visual	1.07	1.03	0.71	0.71	1.34	1.34	0.24	0.27
	(0.23)	(0.11)	(-0.66)	(-0.64)	(0.67)	(0.67)	(-0.90)	(-0.89)
Disability: hearing	0.97	0.95	1.96*	1.96*	1.09	1.09	19.95**	21.78**
	(-0.09)	(-0.13)	(1.95)	(1.95)	(0.13)	(0.13)	(3.86)	(3.94)
Disability: speech	2.72	2.79*			1.12	1.12	19.90**	18.56**
	(1.61)	(1.66)			(0.12)	(0.12)	(3.92)	(3.56)
Disability: physical	1.46*	1.35	1.23	1.24	1.07	1.06	12.30**	11.96**
	(1.70)	(1.30)	(0.72)	(0.75)	(0.14)	(0.14)	(4.33)	(4.27)
Disability: mental	0.91	0.88	0.28*	0.29*	0.49	0.49	2.13	2.30
	(-0.20)	(-0.26)	(-1.71)	(-1.66)	(-1.01)	(-1.02)	(0.74)	(0.86)
Disability: other	0.92	0.88	0.81	0.82	2.86	2.85	6.81*	7.10*
	(-0.16)	(-0.25)	(-0.26)	(-0.25)	(0.82)	(0.82)	(1.76)	(1.90)
Member is orphan	0.64	0.64	1.36	1.37	8.63**	8.62**	0.33	0.34
	(-1.50)	(-1.50)	(1.33)	(1.35)	(7.28)	(7.30)	(-1.06)	(-1.02)
Observations	20,779	20,779	20,831	20,831	20,479	20,479	13,989	13,989

Note: *, **, and *** denote significance at the ten-, five-, and one-percent level. -values reported in parentheses are based on standard errors clustered at the PSU-level. Household-sampling weights are used throughout.

Appendix C.   Indirect Taxes

81.   Indirect taxes considered in the analysis include VAT and excise tax. In the analysis, it was assumed that households report the value of purchases inclusive of taxes. Further, it was assumed that the burden of VAT is shifted entirely to consumers, so that consumers bear the tax burden in proportion to their purchases of taxable items (Bird & Miller, 1989; Martinez-Vazquez, 2001).

VAT

82.   The total tax take estimated in the survey was scaled so that the ratio of VAT-to-consumption expenditure in the survey matched the ratio of actual VAT to private consumption. There are several reasons to assume that the total VAT take would be underestimated in the survey: consumption expenditure will typically be underreported in any household budget survey. In addition, these surveys do not cover non-household entities. Assuming that consumption is underestimated but that the distribution of consumption expenditure reflects the actual distribution, all allocations of VAT were scaled so that the ratio of the tax take to private consumption estimated from the survey matched that of the actual tax take to private consumption in administrative data. The total VAT take was initially estimated to be KSh 116.4 billion or KSh 208.2 billion per year, depending on the treatment of exempt goods. However, the resulting allocations were subsequently scaled up–by factors of 2.2 and 1.2, respectively–so that the tax-to-private consumption ratio was equal to that in the national accounts. The resulting VAT revenue estimate of KSh 249.84 billion is 86.4 percent of the total VAT tax take in 2015/16 (Table 1). As results with regard to the incidence of VAT between both assumptions regarding exempt items differed only marginally, the analysis used the first assumption going forward, that is, exempt items were treated as zero-rated.

83.   The assumption made regarding informality is that household expenditures are equally informal across the distribution. Scaling ensures that the effective VAT rate in the survey matches administrative records. However, some items are sold and bought in informal markets and will thus not carry VAT at the final stage. This does not mean that they do not carry any VAT at all as VAT is likely to have been applied at earlier stages such as on inputs in production or at the wholesale stage. The assumption made here is that informality does not vary across the welfare distribution, i.e. that all households are equally informal in their consumption.

Excise taxes

84.   The incidence of excise taxes is estimated based either on the value of consumption or quantities. This analysis considers excise taxes on beer, wine and spirits, mineral water, soft drinks and juices, cigarettes, and airtime. Beverages are taxed based on quantities, KSh 5 for mineral water, sodas, energy health drinks, and other drinks (including drinks at hotels and in restaurants); KSh 10 for fruit juices, vegetable juices, squashes, and vinegar; KSh 100 for beers; KSh 150 for wines; and KSh175 for spirits. In these cases, consumption in liters was multiplied by the value of the excise tax per liter to estimate the tax burden. In the case of cigarettes, it is more challenging to interpret units reported by households. For instance, it is not clear whether one 'piece' refers to a pack or a single cigarette. It was therefore assumed that the tax burden is proportion to expenditure on tobacco products. Airtime is taxed at ten percent and

this information was directly used, assuming that all expenditures on airtime reported by households carried ten percent excise tax.

Table 11: Excise tax revenue by selected commodities and services, KSh million, 2015-2016.

	2015	2016	Survey estimates post-scaling
Beer	19,525.74	24,443.46	19,484.12
Wine and spirits	6,148.36	10,681.38	7,457.78
Mineral water, soft drinks, and juices	2,514.64	3,318.56	2,584.87
Cigarettes	12,230.19	12,440.94	10,932.54
Airtime	14,138.80	15,540.89	13,151.99
Financial transactions	7,222.07	11,312.92	NA
Other commodities	902,15	2,642.24	NA
Total	62,681.94	80,380.39	NA

Source: KNBS *(2017)*.

Notes: 2016 data is provisional. Other commodities include jewelry, cosmetics, and locally assembled vehicles.

85. **As in the case of VAT, administrative data on tax revenue from the Kenya Economic Survey are then used to scale household-level tax burdens.** Data on the total tax take is reported in Table 11. Since the survey was conducted in 2015 and 2016, the average of the tax take in these two years was computed. The tax burden was then scaled so that the ratio of the total tax take by category to total private consumption in the survey equaled the ratio of revenue as reported in Table 11 to private consumption in the national accounts data. The results are reported in the final column of Table 11.

Appendix D.   Public Education Expenditure

86. **The benefits of public education expenditure were estimated and allocated by dividing total recurrent spending at a given level of the education system by the number of students as estimated in the survey.** The KIHBS data elicit enrollment in education by level and type of provider (public or private). These data were linked to administrative data from the 2017 Kenya Economic Survey on recurrent education (pre-primary and primary, secondary, and tertiary).[29,30] Tuition for public education as recorded in the KIHBS were subtracted to arrive at the net benefit of public education spending.

87. **There are several caveats in allocating per-student education expenditure to individual households.** The method of allocation used here implicitly assumes that the cost of production equals the value of consumption, an assumption that will almost always result in an overestimate of the effect of public education expenditures on economic welfare.[31] Moreover, it is assumed that the value of services is constant across users. This assumption is violated if, for instance, in the case of education, students from poor families attend public schools that have fewer resources.

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[29] Recurrent expenditure was used as opposed to total expenditure, which comprises both recurrent expenditure and development spending, as the latter is more likely to accrue not immediately but over time. In the case of education, a large fraction of total expenditure is recurrent expenditure.

[30] Data at the county level were not available for this analysis.

[31] For instance, there is some evidence that Kenyan civil-service teachers earn large rents relative to contract teachers that cannot be attributed to either observed characteristics or higher motivation (Barton, Bold, & Sandefur, 2017).

88.   Administrative data on recurrent expenditure at different levels was allocated to five levels that could be matched to the survey data. These levels are (1) early childhood education, (2) primary and special education, (3) secondary education, (4) technical and teacher education, and (5) university education. Total annual recurrent expenditure is aggregated accordingly and then allocated on a per-capita basis into the survey.

89.   Public spending at each level of the education system was scaled down in order to align estimates of the effect of public education spending with other interventions in the report. Dividing total public education spending by level to the number of students estimated from the survey will likely result in an overestimation of the redistributive effect. This is because they are obtained from the budgetary cost of providing these services reported in the national accounts while the total of other taxes and transfers are not 'forced' to equal those in the administrative data (and tend to be smaller in the survey). To correct for this, administrative data on public education spending was multiplied with the ratio of total household expenditure to private consumption reported in the national accounts (Lustig & Higgins, 2013). The estimated ratio is 0.886. In other words, administrative data on education spending is scaled down by a little more than ten percent.

90.   Implicit subsidies, which are likely to result from misreporting, were not considered in the construction of concentration curves. The allocation of public education expenditures and tuition fees resulted in negative net benefits associated for a small number of households, typically less than one percent except for secondary, in which case around two percent of households appeared to have negative net benefits. Taken at face-value, this would imply that these households are subsidizing the education system through their uptake of public provision. However, given the low occurrence, it seems more likely that these are due to misreporting of tuition fees. To obtain well-defined concentration curves, it was decided to replace the net benefit with zeros for the incidence analysis if they were negative but not for the calculation of final income.

Appendix E.   Public Health Expenditure

91.   For health, only outpatient curative visits were considered and unit costs were obtained from academic analysis. The KIHBS records ample information about outpatient visits, including the number of visits in the last four weeks and the type and level of provider (e.g. government hospital, private clinic) for up to two visits. It also records co-payments, transport costs, and the costs of over-the-counter purchases of medical goods for all outpatient visits combined. Less data is available for inpatient care and preventive care. For preventive care, the survey records uptake over the last twelve months as well as copayments but not the number of days spent in a hospital nor the type of provider. For preventive health service, only the type of provider for one visit is observed. But there is no information on co-payments. It was thus decided to restrict the analysis to outpatient curative care.

92.   Outpatient visits to public facilities were estimated based on information about the two most recent visits during the last four weeks. The KIHBS records the number of visits for outpatient care over the last four weeks as well as the type of provider. Government hospitals, health centers, and dispensaries are classified as public providers. In the case where one individual sought outpatient care more often than two times during the last four weeks, the number of visits was multiplied with the share of visits to a

specific public provider. Some households reported a large number of visits over the course of the last four weeks. In these cases, it was decided to cap the variable to four visits, i.e. one per week.

93. **The unit costs of curative and preventive outpatient visits as well as inpatient curative care were obtained from the academic literature.** Unit costs are reported by Flessa, et al. (2011). They estimate that the cost per outpatient visit in public sector facilities in 2006/07 was KSh 174 in dispensaries, KSh 223 in health centers, KSh 518 in district hospitals, KSh 434 in provincial hospitals, and KSh 1,405 in tertiary hospitals. Only government hospitals, dispensaries, and health centers were included as response options in the 2015/16 KIHBS. It was assumed that the unit cost of an outpatient visit to a hospital was equal to that of a district hospital at KSh 518 in 2006/07 prices. Reassuringly, it was found that the ratio of total cost of outpatient care in government hospitals relative to the total cost in health centers and dispensaries at 1.37 was almost identical to the ratio of shares of government hospitals to health centers and facilities in the 2015/16 National Health Accounts (1.34). User fees for outpatient services in public facilities were obtained by dividing the total fees and costs of over-the-counter purchases reported in the survey by the share of visits in government facilities for each household member.