



# IMF Working Paper

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## Inclusive Growth and the Incidence of Fiscal Policy in Mauritius— Much Progress, But More Could be Done

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**IMF Working Paper**

African Department

**Inclusive Growth and the Incidence of Fiscal Policy  
in Mauritius—Much Progress, but More Could be Done<sup>1</sup>**

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**Abstract**

*Using data from three household surveys, we review whether growth in Mauritius was inclusive and discuss the incidence of public expenditures and taxes. Generally, Mauritius enjoys an even income distribution and low rates of poverty. Nevertheless, over the 2000s, despite overall progress, the benefits of growth appear to have become more skewed. Employment income is the main contributor to inequality in Mauritius. Social protection expenditures reduce poverty and inequality, but could be better targeted, particularly for pensions. Income taxes are progressive, though given their small relative weight they have a negligible impact on income distribution. The VAT appears relatively progressive compared to other developing countries, although its impact on the overall distribution is also small. With better targeting of the sizable social spending, significant further progress in poverty alleviation could be achieved.*

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## I. INTRODUCTION

Since independence Mauritius has had a strong economic record based on sound institutions and macroeconomic policies, despite adverse endowments and high vulnerability to external shocks. Economic openness and a political system that favors the establishment of coalition governments with a track record of protecting property rights are thought to have played a key role in this success story (Frankel, 2010). Crucially, Mauritian policymakers also made good use of rents from preferential access to markets in Europe and the United States for redistribution and investment in human and physical capital (Subramanian, 2009). The country has a history of consensus building and policy continuity, despite changes in coalitions and governments (World Bank, 1989).

In fact, between 1968 and 2007, Mauritius experienced strong per capita real GDP growth, averaging 3.6 percent per year (according to Penn World Table data<sup>2</sup>). Extreme poverty, measured by the proportion of the population living below \$1.25 a day in PPP terms was below 1 percent in 2006/07 (CSO, 2009). Furthermore, by international standards, inequality in Mauritius is relatively low with a Gini coefficient of 38.8. Egalitarian societies such as Sweden and Canada have Gini coefficients between 25 and 35, whereas most countries in the World have coefficients around 40 (Milanovic, 2011).<sup>3</sup>

The 2000s marked a period of profound structural changes in the Mauritian economy linked the loss of sugar preferences and the phase-out of textile trade preferences (dismantling of the Multi-Fiber Agreement). In this context and as new engines of growth emerge in the services sector, the question is whether the benefits of economic growth continue to be widely shared by different segments of the population.

Based on data from three household budget surveys (HBS) covering 1996 to 2007, this paper reviews the evidence on the inclusiveness of growth in Mauritius. HBS surveys are nationally representative surveys primarily intended to obtain data on household consumption expenditure on goods and services to be used in the elaboration of the consumer price index. But, the surveys also collect a range of information on household characteristics and different sources of household income, which form the basis for analysis of this paper. Some basic characteristics of the surveys are presented in Annex A.

The paper discusses factors that may explain recent trends in inequality and analyzes the distributional incidence of social protection expenditures. The paper also discusses the incidence of public expenditures on education from a comparative perspective. Finally, the paper considers the evolution of the tax structure in the country and assesses the

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<sup>2</sup> See Heston, A., Summers, R. and Aten, B., 2011 “Penn World Table Version 7.0”, Center for International Comparisons of Production, Income and Prices at the University of Pennsylvania, June.

<sup>3</sup> Cross-country comparisons of inequality measures should only be seen as indicative for several reasons including differences in survey years and methodologies, differences in welfare measures used for the calculations, among other issues.

redistributive impact of two important sources of revenue, the VAT and personal income taxes.

We find that over the 2000s, despite some overall progress, the evidence points to a more skewed distribution of the benefits of growth, possibly because of fundamental structural changes in the Mauritian economy. Most of the measured inequality is explained by employment income. The largely untargeted social protection system plays an important role in securing favorable outcomes for combating poverty and inequality, but reform efforts would be desirable to ensure that resources are spent in the most cost-effective way. On the revenue side, income taxes in Mauritius are relatively progressive, although they have a negligible impact on overall income distribution. Our analysis also indicates that the VAT is relatively progressive, even if its impact on overall income distribution is small.

## II. THE INCLUSIVENESS OF GROWTH IN MAURITIUS SINCE THE MID-1990S

Over the period of interest for this paper, Statistics Mauritius documents that extreme poverty, measured as the percentage of the population living below \$1.25 a day in PPP terms, remained low and stable at below 1 percent (CSO, 2009a). Relative poverty, defined as the proportion of population living below half of the median monthly household income per adult equivalent, increased marginally from 7.7 percent in 2001/02 to 7.9 percent by 2006/07 (CSO, *ibid.*). Among households with lower educational attainment (below Certificate of Primary Education-CPE), poverty (defined in these relative terms) was found to be more prevalent at 13 percent.

In addition, poverty maps constructed by Statistics Mauritius with technical support from the World Bank show that the Island of Rodrigues and the Village Council Area of Bambous Virieux had the highest poverty rates throughout the period. The number of administrative areas with high poverty rates (above 15 percent) increased from 4 in 2001/02 to 15 in 2006/07 (CSO, 2009b).<sup>4</sup> Although income inequality measured by the Gini coefficient for household income remained broadly stable over the entire period 1996/97–2006/07, there was an increase when considering the more recent surveys from 37.1 in 2001/02 to 38.8 in 2006/07 (CSO, 2009c). Furthermore, the latest estimates of the Gini coefficient based on the Continuous Multi-Purpose Household Survey (CMPHS)—a less in-depth income and expenditure survey than the HBS—indicate that inequality increased further since 2006/07.

### Growth incidence curves

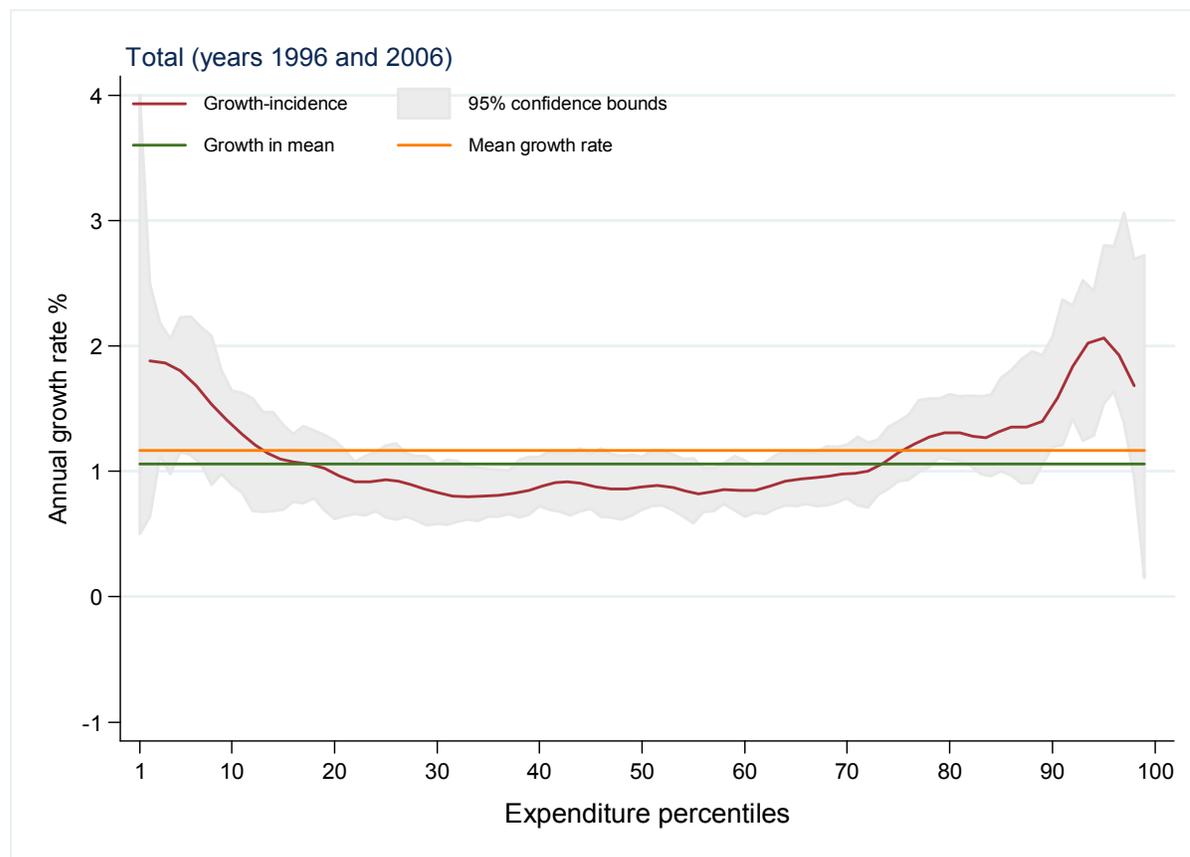
Growth incidence curves are a useful tool to examine the interaction between growth, poverty and inequality. Specifically, growth incidence curves measure how consumption growth differed across groups compared to the average and the mean consumption growth. We use household consumption expenditure per capita as the welfare measure to construct

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<sup>4</sup> It is not immediately clear what is driving this increase in the number of administrative areas with high poverty rates. It is possible that the increase is linked to resettlement of workers across the island as part of the reform of the sugar industry, but in this case poverty might be overestimated as some of these workers were given land (and sometimes housing) as part of the resettlement.

growth incidence curves for the period 1996–2007 (Figure 1 and Figure 2). We chose this measure to facilitate the comparison of the results obtained with the analysis presented in IMF (2011), as well as Borat and Van Der Westhuizen (2011). Note that this is different from the measure used in Statistics Mauritius analytical reports of HBS data, which focus on income per adult equivalent.

**Figure 1. Growth Incidence Curves for per Capita Household Expenditures Between 1996/97 and 2006/07**



Sources: HBS Surveys; and Authors' estimates

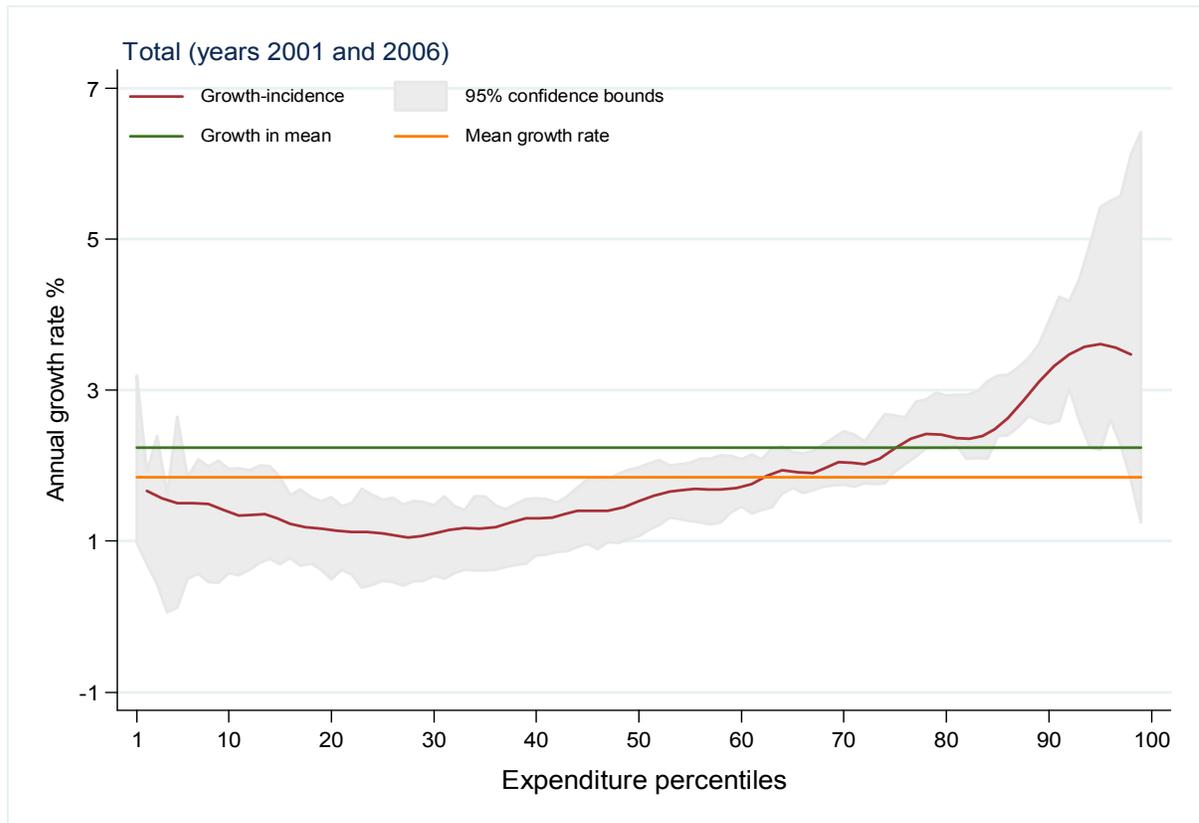
There are advantages and disadvantages of using consumption as opposed to income as a measure of welfare. Generally, income tends to be more volatile than consumption and certain types of income (such as income from self-employment) tend to be underreported in surveys. It is frequently the case that consumption is more evenly distributed across households than income because more affluent households tend to save a larger share of their income, which might bias estimates of inequality downward. In addition, the household consumption measure used in this section does not take into account the consumption of publicly-provided health and education services.

As depicted in Figures 1 and 2, in Mauritius all groups have experienced positive growth in expenditure per capita in real terms over the time period covered by the surveys. When comparing data from the 1996/1997 survey to the 2006/2007 survey (Figure 1), both the

poorest percentiles and the richest percentiles experienced growth well above the mean (both in terms of the growth rate in the mean and mean growth rates).

Nevertheless, when comparing the 2001/2002 survey with the latest survey (Figure 2), over this later period richer groups have experienced higher growth in expenditures, pointing to a more unequal distribution of the benefits of growth in recent years. Overall, compared to African countries analyzed in IMF (2011), Mauritius has performed well. Even though in a number of countries, the mean growth in real expenditure per capita has been stronger (which is not surprising given lower levels of development), in several instances poorer households have experienced slower growth and even negative growth in expenditure per capita. Mirroring developments in Mauritius over the whole period, household surveys for South Africa covering the period 1995–2005 also show growth incidence curves in which the poorest percentiles and richer percentiles experienced faster growth rates in annual per capita expenditures than the mean growth rates (Bhorat and Van der Westhuizen, 2011).

**Figure 2. Growth Incidence Curves for per Capita Household Expenditures Between 2001/02 and 2006/07**



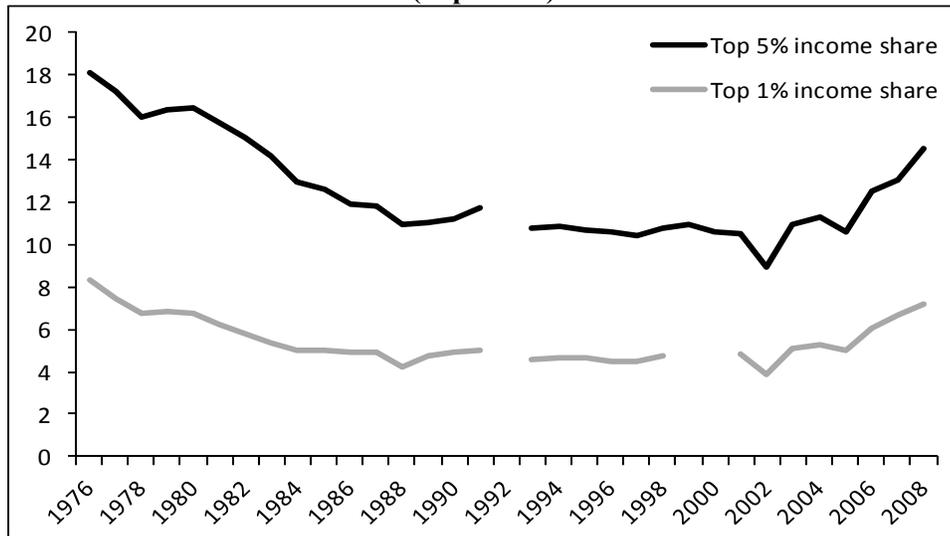
Sources: HBS Surveys; and Authors' estimates

### Evolution of top income shares

The relative growth of the income of richer segments of the population is confirmed by data from “The World Top Incomes” database. Note that in this case, the series only measure top income shares and do not depict how inequality is evolving elsewhere in the distribution.

These top income series were constructed using information on tax statistics rather than self-reported information from household surveys. Figure 3 shows that the shares of the top 1 percent and of the top 5 percent in total income have increased somewhat in Mauritius in the 2000s.

**Figure 3. Evolution of Top Income Shares in Mauritius since 1976  
(in percent)**



Source: The World Top Incomes Database

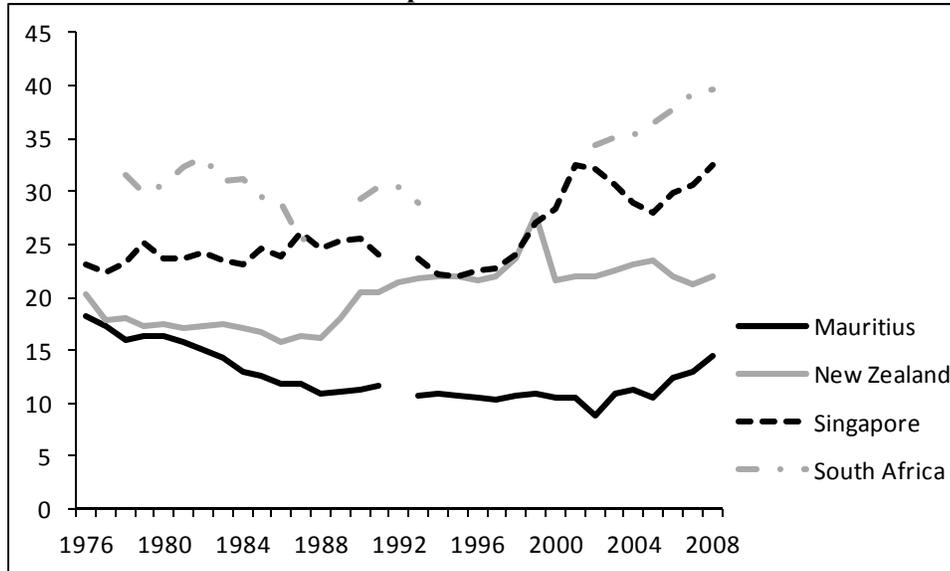
The series are subject to several shortcomings such as incentives to underreport taxable income and consistency problems as the tax system changes over time (see Atkinson, Piketty and Saenz, 2011 for a methodological discussion; the series for Mauritius was constructed by Atkinson, 2011). Nevertheless, tax-based income series also have certain advantages over household survey data; for example they allow for a better assessment of the evolution of inequality over time as more time points are available (often annual). Moreover, they may be less subject to the bias of self-reported income in the surveys, including incomplete responses (Atkinson, Piketty and Saenz, 2011).

Compared to New Zealand, Singapore and South Africa, the Mauritian economy seems to be less unequal with a relatively small share of the top 5 percent in total income, 14.5 percent compared to 32.5 percent for Singapore and 39.6 percent for South Africa. With the exception of New Zealand, the other comparator countries also witnessed an increase in the share of top incomes in total incomes in the second half of the 2000s (Figure 4).

Overall, Mauritius has performed well in terms of securing relatively high growth rates without large adverse consequences for inequality, but it would be desirable for efforts to promote inclusive growth to continue in light of the measured increase in inequality over the period 2001/02–2006/07. It is important to bear in mind that 2006 and 2007 were years during which unemployment rates were relatively high (9.1 and 8.5 percent, respectively), which might bias the results in favor of finding more inequality. In fact, in the first part of the 2000s, labor force growth in Mauritius exceeded net employment creation by 15,000 workers (World Bank, 2010 and Figure 5, top left panel). But in the period 2006–08, net employment

creation surpassed the growth of the labor force and this trend persisted until Mauritius was affected by the global recession in 2009/10.

**Figure 4. Evolution of Top 5 percent Income Shares in Mauritius and Comparator Countries**



Source: The World Top Incomes Database

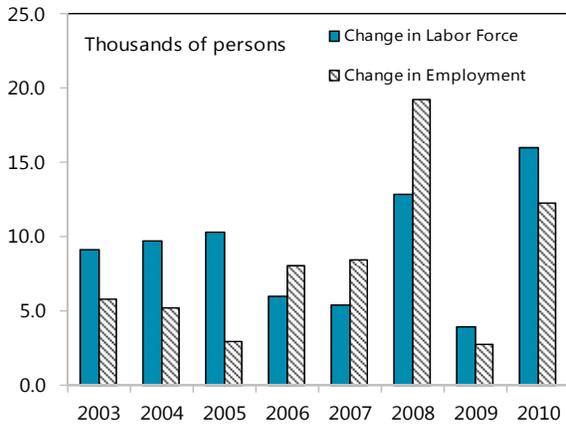
In addition, an outward shift in the so-called “Beveridge Curve”, which depicts the relationship between the job vacancy rate and the unemployment rate, points to a deterioration in the job-matching process over the 2000s (Figure 5, top right panel), possibly linked to skill mismatches, suggesting a potential increase in structural unemployment over the period. IMF (2013) also points to evidence that unemployment in Mauritius seems to be mostly structural and particularly concentrated among the youth and women. At end-2011, the female unemployment rate was close to 12 percent according to data from Statistics Mauritius, compared to a rate of close to 5 percent for men.

Structural changes that took place in the Mauritian economy might be an important factor in explaining recent trends in inequality. These changes include the loss of trade preferences in textile, the decline in some traditional sectors (agriculture, textile manufacturing), and an increased role for the service sector as an engine of growth. These transformations are reflected in the shares of main sectors in total employment (Figure 5, middle left and right panels). In the first half of the 2000s, sectors affected by the phase-out of trade preferences shed labor, while other activities such as ICT, retail, non-textile manufacturing, financial services and tourism absorbed workers (World Bank, 2010).

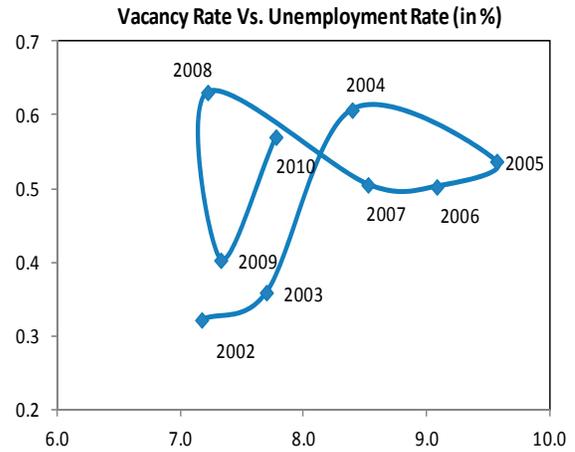
The relative decline of textile manufacturing also has a gender dimension, as most of the workers laid-off in this sector were low-skilled female workers. For example, over the first half of the 2000s, female workers accounted for over 65 percent of total workers in the EPZ sector. Overall female unemployment increased from 9 percent in 2000 to a peak of around 16 percent in 2005, and remains well above the overall unemployment rate (Figure 5, lower left panel). An exploration of the gender dimensions of the inclusiveness of growth in Mauritius goes beyond the scope of this paper, but should be pursued in further research.

**Figure 5. Structural Change and Labor Market Developments**

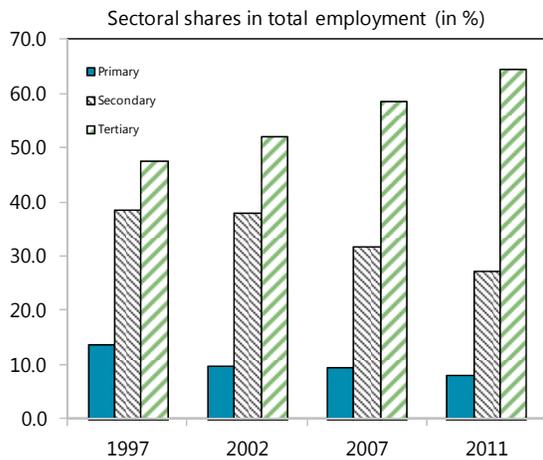
*The labor force grew more quickly than employment except for 2006-08.*



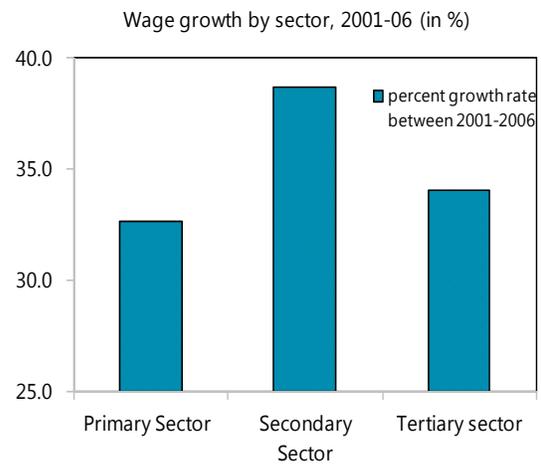
*The "Beveridge Curve" points to deterioration in matching.*



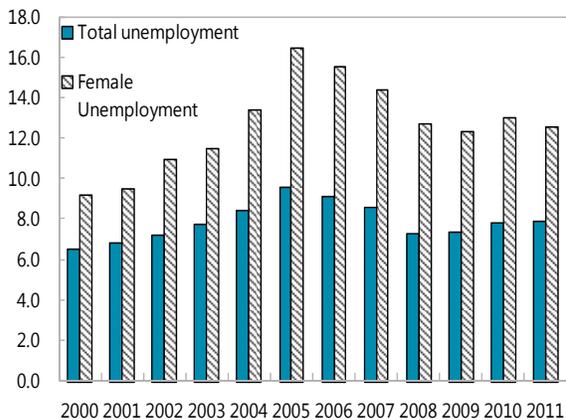
*Traditional sectors have shed labor in the 2000s.*



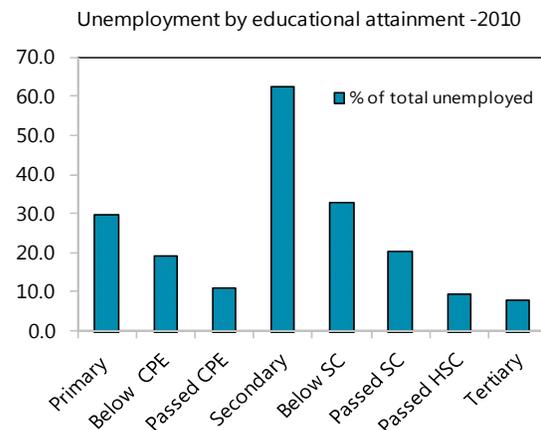
*Wage growth differed substantially across sectors.*



*Female unemployment is particularly high.*



*Large share of unemployed are low-skilled workers.*



Sources: Statistics Mauritius; and Authors' calculations.

Disparities in human capital accumulation might also be an important channel in explaining the observed increase in inequality in the 2000s. Available evidence points to a strong link between low educational attainment and unemployment in Mauritius (Figure 5, lower right panel).<sup>5</sup> Globalization and technological progress are also likely to have increased the returns on human capital, thus contributing to increased inequality between skilled and unskilled workers, reflecting a global trend analyzed in Jaumotte, Lall and Papageorgiou (2008). World Bank (2010) also argues that returns to education among the highly skilled are expected to grow faster in the future than other groups.

### **Decomposing the income inequality by income sources**

To shed further light on the recent determinants of inequality in Mauritius, we undertake “static” and “dynamic” decompositions of the Gini coefficient by income sources. We use the term “static” decomposition to refer to a decomposition of the Gini coefficient for a given survey year (2006/07 in our case). “Dynamic” refers to the decomposition of the change in the Gini over different survey years (2001/02 to 2006/07). For the static decomposition, we use data from the 2006/07 HBS on the following sources of household income: (i) income from employment; (ii) income from self-employment; (iii) net rent income; (iv) any other income from property; and (v) income from public and private transfers (these include social protection and social insurance payments further analyzed below, as well as private transfers). Furthermore, we focus mainly on decompositions of inequality for income before taxes to facilitate comparability across survey years and because we will discuss their redistributive impact in subsequent sections.

Since we focus on income sources in this section, we decided to consider a different measure of welfare, namely income per adult equivalent. We use Bank and Johnson’s non-linear adult equivalence scale for the analysis in line with CSO (2009). The scale considers some economies of scale with respect to household size and stipulates that the number of adult equivalents ( $E$ ) is given by the equation below, where  $A$  refers to the number of adults (aged 16 and over) and  $C$  to the number of children.

$$E = (A + 0.7 * C)^{0.7}$$

The results of decompositions of the Gini coefficient for before-tax and disposable income are presented in Table 1 (Araar and Duclos (2009) provide a detailed description of the methodologies used for “static” decompositions). The analysis indicates that both in relative and absolute terms, wage income is by far the main contributor to inequality in Mauritius. This conclusion is robust to different approaches to decompose inequality, which are depicted in Table 1. Employment income accounted for between 68 and 75 percent of total inequality in before-tax-income in the 2006/07 survey, whereas income from self-

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<sup>5</sup> In the Figure, CPE refers to Certificate of Primary Education; a national examination that needs to be passed at the completion of primary education, SC refers to the Cambridge School Certificate, an examination that students sit at 5th year of study at secondary level. HSC refers to the Higher School Certificate, an examination, which is taken at the end of secondary education.

employment accounted for between 12 and 14 percent of total inequality and transfers (public and private) for between 9 and 14 percent.

<b>Table 1. Inequality Decompositions by Income Sources</b>		
<b>Income Sources</b>	<b>Decompositions</b>	
<b>Static Decompositions (2006/07)</b>		
<b>Lerman &amp; Yitzhaki (1985) Approach</b>		
	<b><i>Absolute Contribution</i></b>	<b><i>Relative Contribution</i></b>
Employment Income	28.45	75.21
Self-employment Income	4.45	11.76
Net Rent	1.23	3.26
Other income from property	0.45	1.18
Transfers	3.25	8.59
<b>Shapley Value Approach</b>		
	<b><i>Absolute Contribution</i></b>	<b><i>Relative Contribution</i></b>
Employment Income	25.59	67.66
Self-employment Income	5.24	13.85
Net Rent	1.21	3.19
Other income from property	0.45	1.18
Transfers	5.34	14.13
<b>Regression-based Approach <sup>1</sup></b>		
	<b><i>Absolute Contribution</i></b>	<b><i>Relative Contribution</i></b>
Employment Income	21.99	60.90
Self-employment Income	5.47	15.14
Net Rent	1.32	3.65
Other income from property	0.52	1.44
Transfers	5.96	16.51
Residual	0.85	2.35
<b>Shapley Dynamic Decomposition (Change between 2001/02 and 2006/07)</b>		
	<b><i>Absolute Contribution</i></b>	<b><i>Relative Contribution</i></b>
Total change in Gini	1.40	...
Employment Income	1.20	85.71
Self-employment Income	0.20	14.29
Transfers	-0.50	-35.71
Other Income (excl. transfers)	0.50	35.71

Sources: HBS surveys; and Authors' estimates.

1/ For this approach, the dependent variable is disposable income.

In fact, the predominance of employment income in explaining total inequality is also confirmed when we consider inequality in disposable income rather than before-tax income (see results under "Regression-based Approach" heading on the Table). Nevertheless, in this case, the relative contribution of employment income falls to 61 percent, which is followed

by transfers and income from self-employment (around 15 percent each), whereas residual factors not included in the regression account for only 2 percent. One caveat that should be considered when interpreting these results is the well-known fact that household surveys, such as HBS, typically do not properly capture income at the top end of the distribution, which could bias the results as showing less inequality than in reality.

Moreover, we also decompose the change in the Gini coefficient over the period 2001/02 to 2006/07, following the methodology proposed by Azevedo, Sanfelice and Nguyen (2012a and 2012b). The methodology decomposes the contributions of changes in different income sources to changes in inequality by simulating the distribution of the welfare measure changing only one income component at a time, keeping everything else constant (see Azevedo et al (2013) for an application using data for several developing economies). The methodology addresses path dependence issues (the results are sensitive to the order in which effects are calculated) by calculating decompositions across all possible paths and then averaging results for each component.

Because of data availability issues across surveys, we focus on four sources of income for this exercise: employment income; self-employment income; transfers (public and private); and other income (excluding transfers). The results of the “dynamic” decomposition are presented on the bottom part of Table 1. The analysis indicates that changes in employment income explain most of the increase in inequality over the period, with a contribution of over 85 percent. Changes in transfer income actually contributed to a decrease in inequality, which suggests that policies did contribute to lowering inequality. Changes in other sources of income (including self-employment income) contributed to an increase in inequality over the period.

### **III. INCIDENCE OF PUBLIC EXPENDITURES**

Fiscal policy refers to the government’s ability to influence economic and social outcomes, in particular with respect to increasing economic growth and sharing the gains from additional economic activity. In this respect it is important to know whether the government finances productive economic activities through investment in human or physical capital or whether it mainly consumes economic output. A decomposition of public expenditures in Mauritius over the last 10 years indicates that the share of current expenditures on total expenditures has increased, particularly since 2008/09, partly because of countercyclical policies to attenuate the impact of the global financial crisis (Table 2).

The share of expenditures on physical capital has declined both in relative terms and as a share of GDP, despite the authorities’ ambitious public investment plans. In fact, public expenditure on physical capital investment throughout the period has been quite volatile. The share of expenditures on human capital (education and health) and on social security and welfare (which also includes housing) has increased marginally over the period. Overall, these trends indicate that there is scope to improve the quality of public expenditures by re-allocating towards areas that are more conducive to growth, in particular by increasing the share of expenditures on physical capital.

**Table 2. Decomposition of Public Expenditures in Mauritius**

	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	Jul-Dec 2009	2010
	(% of total expenditures)									
Physical capital expenditures	15.4	18.2	16.9	14.3	14.2	13.9	19.4	7.8	12.7	10.8
Human capital expenditures <sup>1</sup>	20.5	19.1	20.7	21.2	20.8	20.7	18.8	20.2	19.7	21.2
Current expenditures	64.1	62.7	62.5	64.5	64.9	65.4	61.7	71.9	67.6	68.0
<i>of which</i>										
<i>Social security and welfare</i>	20.1	18.0	18.4	19.3	19.6	20.7	19.3	19.8	19.9	21.0
<i>Transfers to local government</i> <sup>2</sup>	2.6	3.7	4.5	4.6	4.4	4.2	3.8	4.4	6.2	2.8
<i>Interest on public debt</i>	13.8	16.6	15.7	16.2	15.0	17.3	17.8	15.1	13.6	13.7
	(% of GDP)									
Physical capital expenditures	3.6	4.6	4.1	3.4	3.4	3.1	4.5	2.0	3.3	2.7
Human capital expenditures <sup>1</sup>	4.8	4.8	5.1	5.1	5.0	4.6	4.4	5.1	5.2	5.3
Current expenditures	15.1	15.7	15.3	15.4	15.7	14.6	14.3	18.3	17.8	17.1
<i>of which</i>										
<i>Social security and welfare</i>	4.7	4.5	4.5	4.6	4.7	4.6	4.5	5.0	5.2	5.3
<i>Transfers to local government</i> <sup>2</sup>	0.6	0.9	1.1	1.1	1.1	0.9	0.9	1.1	1.6	0.7
<i>Interest on public debt</i>	3.3	4.2	3.8	3.9	3.6	3.9	4.1	3.8	3.6	3.4
<i>Memo item:</i>										
<i>GDP in millions of Rupees</i>	139,724	153,673	171,600	186,151	202,419	228,721	259,157	278,184	148,596	299,343

<sup>1</sup> Human capital expenditures comprises current expenditures on health and education

<sup>2</sup> Includes transfers to Rodrigues

Sources: Mauritian authorities and IMF staff estimates. Prior to 2010 fiscal year GDP series used.

## Social Protection and Inclusive Growth

The social protection system can play an important role in ensuring that all segments of society benefit from economic development. Social protection expenditures in Mauritius are relatively high; in 2010 they amounted to close to 5 percent of GDP. Expenditures on universal non-contributory old age pensions amounted to over 2 percent of GDP. Old-age pensions are payable to every Mauritian citizen aged 60 years and above subject to certain residency conditions. It consists of a fixed monthly amount that varies according to the age of the recipient and is updated annually mostly to adjust for inflation.

In addition, other important components of the social protection system in Mauritius are the National Pension Fund (NPF), a defined-benefit scheme for private sector workers (self-employed workers can join voluntarily), and Social Aid, the main means-tested cash transfer program. The government subsidizes the price of rice, flour, cooking gas and transportation. With the exception of the rice subsidies, the distributional incidence of these price subsidies is largely regressive (Government of Mauritius, 2010). This section will use data from the 2006/07 HBS survey to assess the distributional incidence of selected social protection programs for which information is available.<sup>6</sup>

The authorities have elaborated a strategy to reform the social protection system with support from the World Bank. A review undertaken in 2010 concluded that social assistance programs are fragmented, even after the creation of the National Empowerment Foundation, whose objective was to consolidate some programs and act as an umbrella institution for social protection. This fragmentation leads to diseconomies of scale. Furthermore, programs generally do not help beneficiaries transition from welfare to work. Finally, the monitoring and evaluation of these programs is considered to be weak, which impairs the ability of policy makers to determine whether programs are cost effective.

Not surprisingly, Social Aid seems to be the best targeted social protection program according to the Coady-Grosh-Hoddinott (CGH) indicator (Table 3). CGH indicators compare the portion of the transfer budget received by a population quantile with the portion of population in that quantile. A program with even targeting (where every individual received the same transfer) would have CGH indicators of 1.0. Larger numbers indicate that a program is more progressive. Overall, social protection programs in Mauritius are not well-targeted with CGH indicators of less than one. This implies that the poorest deciles of the population receive less support in absolute terms than the richest deciles. In fact, only Social Aid and the Handicapped Pension programs have CGH indicators above 1 for the lowest deciles of the distribution of household consumption expenditure per capita. In contrast, old age pensions are not targeted with poorer segments of the population having indicators well below one.

Note also that the concentration index for Social Aid is negative. The concentration index indicates how unequally transfers are distributed; it is the area between the concentration

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<sup>6</sup> The welfare measure used in this section is household consumption expenditure per capita (including social transfers).

curve of a transfer and the diagonal line where everyone receives the same amount. Its values vary between -1.0 and 1.0, and it is negative when the transfer curve is above the diagonal implying that poorer households get more transfers in absolute terms. This measure also shows that the most social protection program benefit the richer segments of the population more than the poorer ones.

**Table 3. Coady-Grosh-Hoddinott Indicator of Benefits' Incidence**  
**Bottom**

	10%	20%	30%	40%	Concentration Index
All social protection	0.67	0.80	0.83	0.82	0.09
All social insurance	0.63	0.77	0.80	0.79	0.11
Old Age Pension	0.56	0.70	0.74	0.76	0.13
Widows' and Children	0.72	0.79	0.85	0.81	0.09
Handicapped Pension	1.11	1.36	1.32	1.17	-0.13
NPF Contributory Retirement Pension	0.30	0.39	0.44	0.43	0.29
Social Aid	2.26	2.05	1.94	1.73	-0.40

Sources: 2006/07 HBS survey; and Authors' estimates. Sample of households with positive per capita transfer. The indicator is calculated across this sample using household size-weighted expansion factors...

Additional evidence from household surveys also suggests that targeting of the Social Aid program could be improved (Table 4). Only about 30 percent of direct and indirect beneficiaries of Social Aid live below the poverty line, which is defined as 50 percent of the median consumption expenditure per capita. Non-contributory old age pension benefits overwhelming go to non-poor households (only about 10 percent of recipients of old age pensions are poor). In addition, the poor only receive about 23 percent of all Social Aid benefit payments and less than 7 percent of total social insurance payments (results are not shown here to save space).

**Table 4. Distribution of Direct and Indirect Beneficiaries**

	Poor	Non-poor
<b>Direct and indirect beneficiaries</b>		
All social protection	11.0	89.0
All social insurance	10.4	89.6
Old Age Pension	9.7	90.3
Widows' and Children	12.0	88.0
Handicapped Pension	14.3	85.7
NPF Contributory Retirement Pension	7.0	93.0
Social Aid	28.3	71.7

Sources: 2006/07 HBS survey; and Authors' estimates. Beneficiaries' incidence shows the proportion of beneficiaries in each group. Beneficiaries' incidence is calculated using household size-weighted expansion factors.

Furthermore, 26 percent of the non-contributory old-age pension benefits go to the richest 20 percent of the population (Table 5). Estimates indicate that the two richest quintiles of the

population receive close to 46 percent of all social protection benefits and that the richest 20 percent receive about 25 percent. Thus, there is substantial scope for savings to be made transfers to the richest 40 percent of the population could be eliminated or reduced. These resources could be deployed more effectively in the pro-poor sectors of primary and secondary education as well as health.

**Table 5. Distribution of Benefits (in % by quintile)**

	Q1	Q2	Q3	Q4	Q5
All social protection	16.0	16.6	21.4	21.4	24.6
All social insurance	15.4	16.3	21.5	21.7	25.1
Old Age Pension	14.0	16.2	21.3	22.0	26.4
Social Aid	40.9	28.4	17.5	9.1	4.1

Sources: 2006/07 HBS survey; and Authors' estimates. Benefits' incidence is the transfer amount received by the group as a percent of total transfers received by the population. Aggregated transfer amounts are estimated using household size-weighted expansion factors.

Despite these shortcomings, the social protection system does reduce inequality and poverty. Simulations point to important increases in poverty and inequality indicators if social protection programs were eliminated (Table 6). For example, eliminating old age pensions would have a large negative impact on inequality and poverty measures as measured by the Gini indicator. In the absence of all social protection programs, the Foster-Greer-Thorbecke (FGT0) poverty indicator would double and the Generalized Entropy index (GE(0)) would almost quadruple. The main message from these results is that these programs are working, but they could be more efficient if better targeted.

**Table 6. Impact of Programs on Poverty and Inequality Measures - Simulating the Absence of the Program**

	FGT0	Gini	GE(0)
Indicator	0.101	0.377	0.235
<b>Indicator without listed transfer</b>			
All social protection	0.207	0.429	0.820
All social insurance	0.204	0.427	0.783
Old Age Pension	0.172	0.410	0.512
Widows' and Children	0.116	0.384	0.253
Handicapped Pension	0.119	0.385	0.265
NPF Contributory Retirement Pension	0.105	0.379	0.239
Social Aid	0.106	0.379	0.247

Sources: 2006/07 HBS survey; and Authors' estimates. The simulated impact is the change in a poverty or inequality indicator due to transfer, assuming that household welfare would diminish by the full value of that transfer. Note that the value of the Gini coefficient differs from Statistics Mauritius figures presented previously because of the different welfare measure used in this analysis.

The government is undertaking initiatives to mitigate these shortcomings, notably by creating an absolute poverty benefit based on objective and transparent targeting criteria, which could

replace Social Aid and similar programs. It has introduced the Social Registry of Mauritius (MRS) and is exploring other options to help improve the targeting of Social Aid. The use of conditional cash transfers could also improve targeting and promote human capital development. But policy makers are also generally concerned about the political economy consequences of altering social protection systems that are deeply ingrained into the social fabric of the country. Furthermore, some policy makers point to potentially high administrative costs associated with targeting and to the fact that universal systems might be less prone to corruption and fraud.<sup>7</sup> It is also likely that universal systems are more politically palatable if tax-payers believe that they will benefit from the system into which they are paying. Nevertheless, it seems likely that better targeting would allow social objectives to be achieved while shifting resources to higher priority spending areas over time.

### **Public Expenditures on Education**

Public expenditure on human capital accumulation can also be a factor ensuring that the benefits of growth are widely shared across society. The HBS survey does not include direct information on how households benefit from public expenditure in education, but Statistics Mauritius has undertaken an incidence analysis based on enrollment data from education statistics and data on recurrent government expenditure in primary and secondary education (CSO 2009). The analysis assumes that the distribution of students attending primary and secondary school by decile group of household income is identical to the one reported in the HBS, which seems a reasonable assumption.

In this context, the incidence of public expenditures on education in Mauritius seems to be mildly progressive in absolute terms, i.e. considering the share of total spending that each group receives. Statistics Mauritius estimates that around 25 percent of recurrent public expenditures on primary and secondary education went to the two poorest deciles of the population, whereas 15 percent of expenditures went to the two richest deciles. Not surprisingly expenditure on primary education is estimated to be more progressive than expenditure on secondary education, as 30 percent of primary education expenditure goes to the poorest two deciles compared to 23 percent for secondary education.

These results are somewhat in contrast with evidence for the rest of Africa. Sahn and Younger (2000) examine the incidence of health and education expenditures in eight African countries including South Africa and Madagascar and find that these expenditures do not have a substantial redistributive impact. In absolute terms, most of the expenditures on health and education in Africa are regressive. But in relative terms, considering the distribution of social spending relative to overall distribution of income in the economy, these expenditures are progressive.

The Mauritian experience indicates that there is significant scope for improved targeting of these expenditures in the countries considered. These authors also find that primary education expenditures are typically more progressive, whereas expenditures on tertiary

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<sup>7</sup> For a more detailed discussion of the administrative costs of cash transfer programs in sub-Saharan Africa and elsewhere see Garcia and Moore (2012).

education are less progressive and in some cases are even regressive in absolute terms, i.e. richer segments of the population benefit disproportionately from these expenditures.

Cubero and Hollar (2010) survey studies of the distributional impact of social spending in several Central American countries and conclude that total spending on education is progressive in relative terms. But the distributional impact of spending differs according to the level of education considered. Expenditures on primary education are unambiguously pro-poor (strongly progressive even in absolute terms), whereas public spending on secondary education follows an inverted-U shape with benefits accruing to the middle quintiles. Public expenditure on tertiary education is found to be regressive in all countries considered in the study.

More generally, Chu, Davoodi and Gupta (2000) survey studies for a large set of developing countries and conclude that for most countries public expenditures on education benefit the poorest segments of the population more than richer ones. Government expenditures in primary education are relatively well targeted in the sense that the share of benefits accruing to the poorest quintile is larger than the share of spending benefiting the richest quintile in absolute terms.

#### **IV. STRUCTURE OF TAX REVENUE AND INCIDENCE OF TAXES**

We now turn to the revenue side of the analysis of the incidence of fiscal policy in Mauritius. Starting in fiscal year 2005/06, the Mauritian authorities implemented major tax reforms aiming at broadening the tax base and increasing tax progressivity. Reforms included the introduction of a single flat income tax rate of 15 percent and an increase in the exemption threshold. Taxes on consumption continue to be the most important sources of tax revenue in Mauritius (Table 7). VAT and excise duties account for more than half of total tax revenue. Corporate income taxes are also an important item, amounting to over 15 percent of total tax revenue in 2010, whereas income tax on individuals accounted for 8 percent of tax revenue.

Although taxing consumption more than income is desirable on efficiency grounds, in terms of minimizing distortions on incentives to work and accumulate capital, taxes on consumption might have adverse distributive impacts as poorer households tend to consume a larger share of their incomes than richer ones (see discussion below). In the remainder of this section, we use data from the 2006/07 HBS survey to analyze the incidence of income taxes and the VAT in Mauritius in a comparative perspective. Generally, it is preferable to address inequality through expenditure policy rather than taxes, but as the experience of advanced economies demonstrates, there is scope for addressing inequality through personal income taxes (see discussion below).

##### **Incidence of Income Taxes**

Firstly, we focus on income taxes, given that information on these payments is readily available in the survey questionnaire. We use household income per adult equivalent, as a measure of welfare. In the present context, this measure is preferable to the consumption-based measure because it naturally allows for a comparison of gross household income and income net of taxes. We define gross income as the sum of income from employment,

income from self-employment, net rent income, any other income from property, and income from public and private transfers. The measure of income net of income taxes simply subtracts from the gross income measure deductions related to income tax withheld (Pay as you Earn-PAYE) and income tax on income from self-employment.

**Table 7. Decomposition of Tax Revenue in Mauritius**

	2007	2008	2009	2010
	(in percent of total tax revenue)			
Income Tax on Individuals	6.7	7.5	8.0	8.1
Corporate Income Tax	13.4	16.5	19.2	15.3
Property Taxes	7.9	6.4	4.1	4.3
VAT	39.6	37.5	36.2	38.2
Excise and Gambling Taxes	21.2	19.9	19.5	21.0
Customs Duty	5.6	4.1	2.9	2.8
Other	5.6	8.2	10.1	10.3
	(in percent of GDP)			
Total	17.6	18.2	19.1	18.5
of which: Income Tax on Individuals	1.2	1.4	1.5	1.5
of which: Corporate Income Tax	2.4	3.0	3.7	2.8
of which: VAT	7.0	6.8	6.9	7.1
of which: Excise and Gambling	3.7	3.6	3.7	3.9
of which: Customs Duty	1.0	0.8	0.6	0.5

Sources: Mauritian authorities; and authors' estimates.

The evidence indicates that, as of 2006/2007, income taxes in Mauritius were relatively progressive (see Figure 6 and Table 8). Although income taxes had little impact on income distribution, as indicated by the Reynolds-Smolensky (RS) index,<sup>8</sup> the concentration index for income tax payments is very high, indicating that richer segments of the population bear a disproportionate share of the tax burden. In fact, the concentration index for income tax payments is well above the Gini for gross income. The concentration curve for income taxes paid, lies consistently below the Lorenz curve for gross income, which corroborates the conclusion that income taxes are progressive in Mauritius (Figure 6).

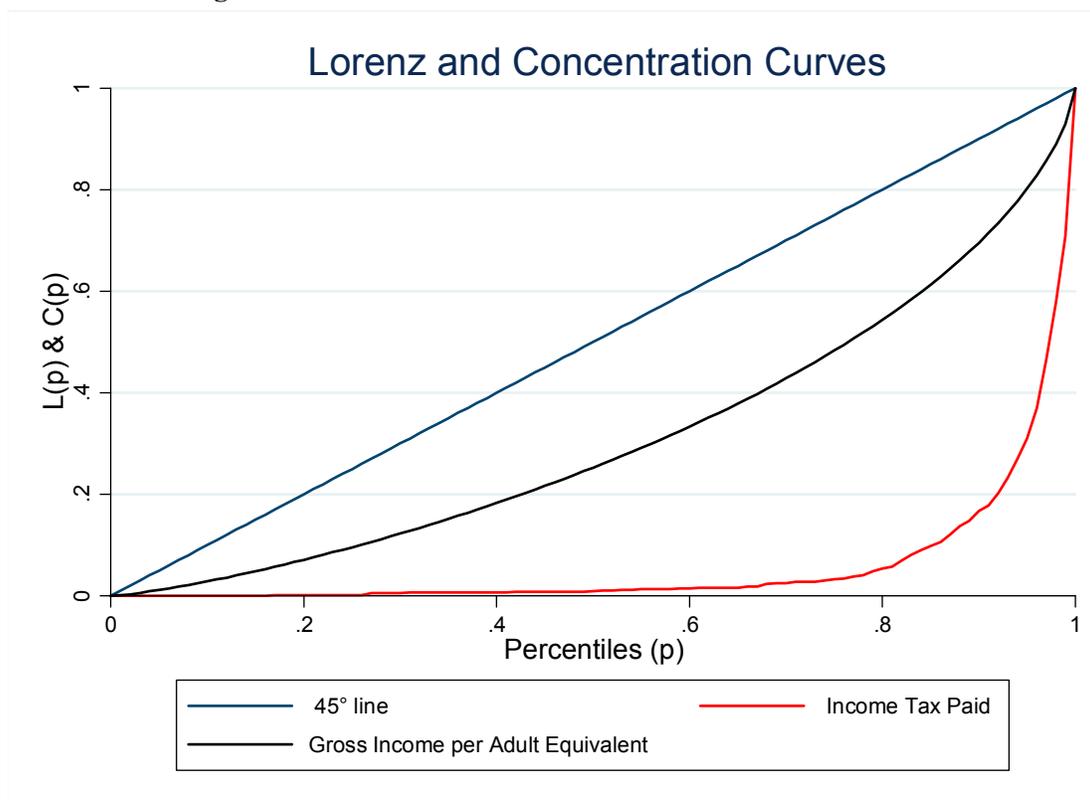
Compared to other countries, the income tax incidence in Mauritius is highly progressive in the sense that richer segments of the population bear more of the tax burden. The Kakwani index<sup>9</sup> for Mauritius is the highest among the countries considered and close to the ones observed for Colombia and the United States. Nevertheless, the Kakwani index does not take into account the economic importance of tax revenues associated with a given tax and therefore does not capture the redistributive potential of the tax (Cubero and Hollard, 2010).

<sup>8</sup> The index is defined as the difference between the Gini coefficient for gross income and the Gini for income net of income taxes. In the case of Mauritius, the index is not statistically significantly different from zero.

<sup>9</sup> The Kakwani index is the difference between the Gini for pre-tax income and the concentration index for taxes.

As we discussed previously, consumption taxes are the most important source of tax revenue in Mauritius and income taxes amount to less than 1.5 percent of GDP. We also present results with a welfare measure that considers only market income (and hence excludes transfers) and the results obtained are similar (Table 8).

**Figure 6. Concentration Curves for Personal Income Taxes**



Sources: HBS surveys; and authors' estimates.

**Table 8. Redistributive Impact of Income Taxes in Mauritius and Comparator Countries**

	Gini for pre-Tax Income	Gini for post-Tax income	RS Index	Concentration Index	Kakwani Index
Colombia (2003)	53.7	51.3	2.4	89.4	35.7
Costa Rica (2000)	45.1	44.8	0.3	48.1	3.0
Mauritius (2006/07) incl. transfers	37.8	37.3	0.5	88.6	50.8
Mauritius (2006/07) excl. transfers	46.4	45.9	0.5	89.2	42.8
New Zealand (2006/07)	39.1	36.3	2.8	47.9	8.8
Panama (2003)	53.8	53.4	0.4	73.9	20.1
US (Federal, 2004)	43.8	39.8	4	75.5	31.7

Sources: Creedy et al. 2008, Cubero and Hollard 2010; and authors' estimates.

The Reynolds-Smolensky (RS) index addresses this shortcoming and suggests that although income taxes are progressive they have a negligible income distribution capacity. The RS

index for Mauritius is close to zero, comparable to Costa Rica and Panama, whereas redistribution through taxation is much stronger in New Zealand and the United States. Chu, Davoodi and Gupta (2000) present evidence from the 1990s that suggests that the overall tax system in Singapore had no impact on the distribution of income. These authors also state that for most developing countries taxes do not significantly reduce Gini coefficients. Once again, it is important to bear in mind the caveats previously discussed about international comparisons of these indicators given different definitions and other data limitations. The main purpose of the comparison is to provide a sense of orders of magnitude.

### **Incidence of the VAT**

Early surveys of the incidence of indirect taxes, such as the VAT, tended to conclude that these taxes are regressive (Chu, Davoodi and Gupta, 2000). Nevertheless, several recent studies on VAT incidence conclude that they are less regressive than previously thought. For example, in the case of Jamaica, Bird and Gendron (2006) find that a VAT-like tax is mildly progressive in the sense that it amounted to a larger share of total expenditures for the richest group than for the lowest group in terms of household expenditures (9 percent of total expenditures compared to 6.4 percent for the lowest group). Furthermore, a recent study for Portugal (Braz and Cunha, 2009) suggests that the RS index for the VAT is close zero in this country, indicating that it has no effect on income distribution.

Nevertheless, Cubero and Hollard (2010) conclude that the VAT and similar taxes are generally regressive for Central American countries as both the Kakwani and the RS indexes are negative for all the countries considered in the study. In addition, on average, the VAT is more regressive and has a stronger negative redistributive effect in Central America than in Andean countries. Thus, the cross-country evidence on the redistributive impact of the VAT and other indirect taxes is mixed.

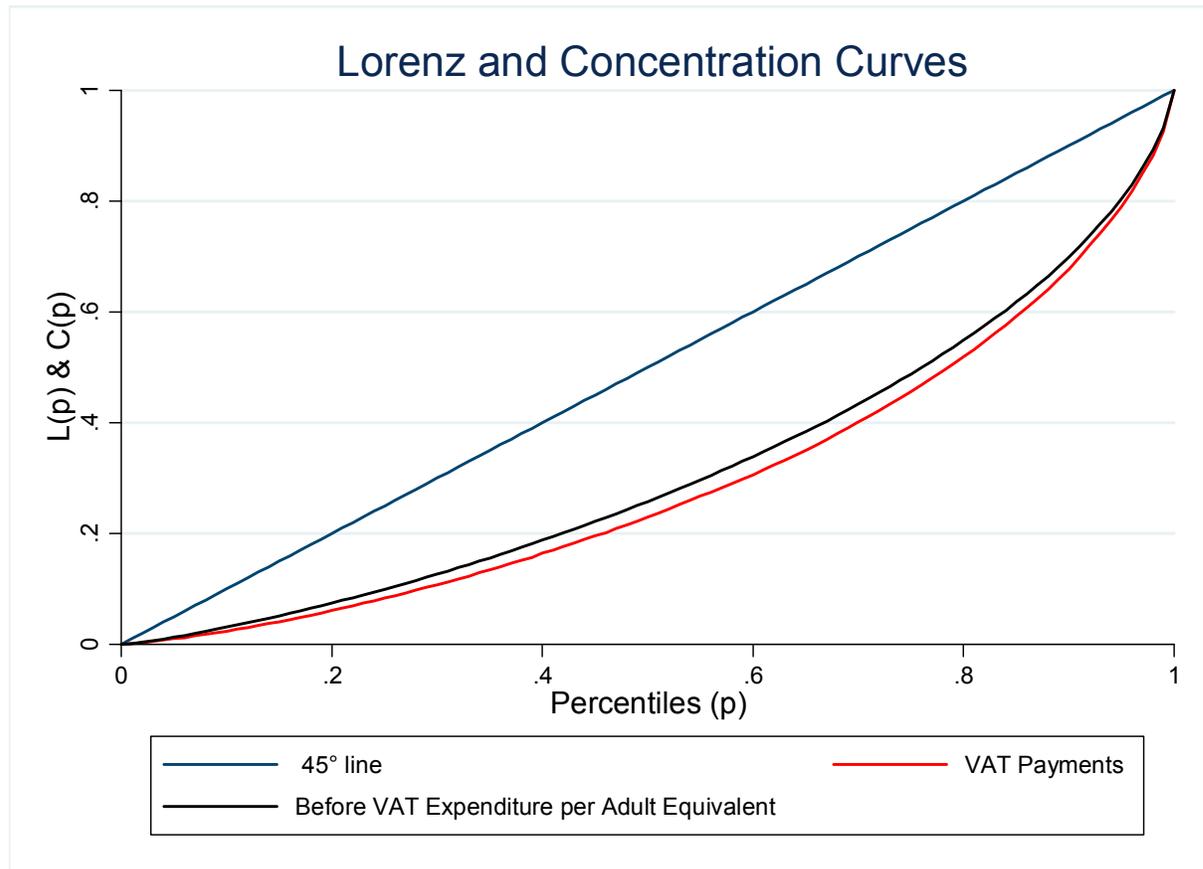
The incidence of VAT is of particular policy relevance in Mauritius, given the importance of VAT revenue both as a share of total taxes and as a share of GDP. It is important to note that several items, including basic foodstuffs, are exempt from VAT in Mauritius (see below). Statistics Mauritius has undertaken some preliminary analysis of the incidence of the VAT in the country using data from the latest household survey. It concluded that the average share of VAT payments relative to total household expenditure was 5.8 percent for poor households and 8.7 percent for the richest households (compared to 7.2 percent for all households). Furthermore, the poor accounted for 2.8 percent of VAT payments, whereas the richest 10 percent of the population accounted for 26.7 percent of payments.

To complement the analysis undertaken by Statistics Mauritius, we use the same toolkit that we applied previously to income taxes, but focus on consumption expenditure per adult equivalent as a measure of welfare. Direct information on effective VAT payments is not available in the HBS survey. We estimate VAT payments at the household level by assuming that households pay the 15 percent rate when purchasing items that are subject to the VAT, using a list of goods and services provided by the Mauritian authorities. When an expenditure item is not included in the list of goods subject to the VAT, we set effective VAT payments to zero.

An additional complication relates to the fact that the survey data made available to us do not include expenditure information on all expenditure sub-categories (the survey includes 12 broad categories). When information on expenditure on a particular sub-item was not directly available in the household survey dataset, we assumed that this item was consumed by the household with the same weight attributed to the item in the CPI basket.<sup>10</sup> These assumptions are likely to overestimate the amount of VAT effectively paid by poorer households because they may buy their consumption goods in smaller shops where turnover is below the VAT reporting limit.

Figure 7 depicts the Lorenz curve for expenditure per adult equivalent before VAT payments as well as the concentration curve for the estimated effective VAT payments. The concentration curve for VAT payments lies consistently below the Lorenz curve, even if the distance between the two curves is not very large. This indicates that the VAT is mildly progressive in Mauritius. This result is arguably due to the fact that several food items that are disproportionately consumed by the poorest segments of the population are not taxed.

**Figure 7. Concentration Curves for VAT Payments**



Sources: HBS surveys; and authors' estimates.

<sup>10</sup> Detailed calculations on effective VAT payments are available from the authors upon request.

As shown in Table 9, the Kakwani index for the VAT in Mauritius is positive, indicating that richer segments of the population bear more of the tax burden. But its magnitude is smaller than the one calculated for personal income taxes (which appear more progressive). In contrast, most comparator countries in Latin America have negative index measures. In addition, contrary to several developing countries in Latin America (with the exception of Ecuador) as well as Portugal, the Reynolds-Smolensky (RS) index for VAT payments in Mauritius is positive (Table 9) indicating that this tax is progressive, but again its magnitude is small suggesting a modest impact on income distribution. Overall, our analysis suggests that the scope for reducing inequality through changes in personal income taxes and the VAT is limited. In the context of Mauritius, reforms to expenditure policy might offer better tools for addressing social disparities.

**Table 9. Redistributive Impact of VAT in Mauritius and Comparator Countries**

	Gini pre-VAT	Gini for post-VAT	RS Index	Concentration Index	Kakwani Index
Colombia (2003)	53.7	54.1	-0.4	46.9	-6.8
Costa Rica (2000)	45.1	45.3	-0.2	42.9	-2.2
Ecuador (2003)	40.8	40.6	0.2	44.5	3.7
Mauritius (2006/07)	37.0	36.5	0.6	41.2	4.2
Panama (2003)	53.8	53.9	-0.1	50.5	-3.3
Portugal (2005/06)	36.2	36.7	-0.5	n.a.	n.a.

Sources: Braz, C. and Cunha, J.C. (2009); Cubero and Hollard 2010; and authors' estimates.

## V. CONCLUSIONS AND POLICY IMPLICATIONS

The evidence presented in this paper suggests that Mauritius has performed well in terms of securing high growth rates with generally positive measures of equality. Nevertheless, over the past 10 years or so, the evidence points to a more skewed distribution of the benefits of growth, possibly related to structural changes in the Mauritian economy as well as other developments such as higher returns to skills linked to globalization and deeper financial integration. Decompositions of inequality by sources of income indicate that employment income accounts for most of the measured inequality and changes in employment income explain most of the increase in inequality over period of the last two surveys.

Our analysis indicates that there is scope to improve the quality of public expenditures by re-allocating towards areas that are more conducive to growth, in particular by increasing the share of public expenditures on physical and human capital. Redistributive tools used in the past, including an extensive largely untargeted social protection system, still play an important role in securing favorable outcomes in terms of combating poverty and inequality, but reform efforts would be desirable to ensure that resources are spent in the most cost-effective way given the limited fiscal space available.

In light of these trends, the Mauritian authorities could improve the targeting of social protection expenditures, notably by rendering the Social Registry of Mauritius (an information system that could provide comprehensive data on existing and potential program clients) fully operational. In addition, it would be useful to replace existing untargeted programs with a new absolute poverty benefit based on objective targeting criteria. The more widespread use of conditional cash-transfer schemes could also foster human capital accumulation and help to address skills mismatches in the labor market in the longer term. Pension reform, including a redesign of eligibility criteria for the basic retirement pension, could also have a positive redistributive impact, although these reforms would be more difficult to implement from a political economy perspective.

An earned income tax credit, if designed appropriately, might help lift low-skilled workers out of poverty and provide them with greater incentives to work without placing additional costs on employers. This measure would likely also lead to an increase in formal employment since low-income workers in the informal sector would have an incentive to join the formal sector to receive the subsidy.

As low educational attainment seems to be linked to social vulnerability, the authorities should continue to pursue their efforts to reform the educational system focusing on primary and secondary levels as well as technical and vocational training. The government has already developed an education sector strategy to address unequal learning achievements and is undertaking initial steps in prevocational education reform (World Bank, 2011).

Income taxes in Mauritius are relatively progressive, but they have a negligible impact on income distribution given the small relative importance of these taxes in the economy (they amount to less than 1.5 percent of GDP). Given that taxes on consumption are the most important sources of government revenue in Mauritius, an analysis of the incidence of the VAT and excise duties, which amount to about 10 percent of GDP, is of crucial importance for a thorough assessment of the redistributive impact of the overall tax system. Our analysis indicates that the VAT is relatively progressive compared to other developing countries, even if its impact on overall income distribution is small. Overall, in the Mauritian context, our analysis suggests that the scope for reducing inequality through changes in the tax system appears to be limited.

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## Annex A

### Household Budget Surveys- Main Characteristics

Survey	Year	Data collection agency	Start date of data collection	End date of data collection	Sampling frame	Sampling Scheme	Expenditure measure	Income measure
Household Budget Survey	2006/07	Central Statistics Office	Jul-06	Jun-07	2000 Housing and Population Census	6,720 households surveyed. Two-stage stratified random sampling.	Regular consumption expenditure on goods and services during the reference month.	Disposable income is defined as receipts (both in cash and in kind) which are regular and recurring minus compulsory deductions.
Household Budget Survey	2001/02	Central Statistics Office	Jul-01	Jun-02	2000 Housing and Population Census	6,720 households surveyed.	Regular consumption expenditure on goods and services during the reference month.	Disposable income is defined as receipts (both in cash and in kind) which are regular and recurring minus compulsory deductions.
Household Budget Survey	1996/97	Central Statistics Office	Jul-96	Jun-97	1990 Housing and Population Census	6,240 households surveyed. Two-stage stratified random sampling.	Regular consumption expenditure on goods and services during the reference month.	Disposable income is defined as receipts (both in cash and in kind) which are regular and recurring minus compulsory deductions.

Source: HBS surveys.