FISCAL POLICY AND ETHNO-RACIAL INEQUALITY IN BOLIVIA, BRAZIL, GUATEMALA AND URUGUAY

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COMMITMENT TO EQUITY

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ABSTRACT

African descendants and indigenous peoples in Latin America face higher poverty rates and are disproportionately represented among the poor. Per capita income of the white population can be sixty percent higher to twice as high as the per capita income of the African descendant and indigenous populations. Using comparable fiscal incidence analyses for Bolivia, Brazil, Guatemala and Uruguay, I analyze how much poverty and inequality change after fiscal interventions. I also propose a set of indicators for measuring how progressive and pro-indigenous or pro-African descendant government intervention is in ethno-racial dimensions. Based on these indicators, I explore which elements of tax and transfer systems within each country specifically contribute to narrowing or increasing existing ethno-racial gaps. The ratio of average per capita incomes by ethnicity or race declines by at most one decimal point (Bolivia, Brazil and Uruguay) to nothing (Guatemala). In Brazil and Uruguay, where there is a respectable decline in overall inequality, the decline in inequality between different ethno-racial groups still does not decline significantly, changing by a very small amount in Uruguay and actually increasing in Brazil.

JEL Codes: H22, I3, O1

Keywords: fiscal incidence, inequality, poverty, taxes, social spending, race, ethnicity, Latin America

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1. INTRODUCTION

Ethnic and racial differences in human capital and earnings are one of the key determinants of inequality in Latin America. African descendants and indigenous peoples have systematically higher poverty rates and are disproportionately represented among the poor. These groups have lower education levels, lower earnings and access to services, and are more likely to work in low-productivity jobs in the informal sector (de Ferranti et al., 2004; Hall and Patrinos, 2006; Ñopo, 2012).

Given these facts, the extent to which governments use their power to tax and spend to reduce the welfare gaps between ethnic and racial groups is of great importance.[1] The importance of reducing the ethno-racial divide arises both from what this divide means ethically as well as its causes and consequences. Ethnic and racial groups are what philosophers call "morally relevant" groups and, as such, sharp inequalities between them are not ethically acceptable. This is exacerbated by the fact that today's ethnic and racial inequalities are often the product of morally condemnable societal actions such as discrimination in the present and subjugation of indigenous groups and slavery in the past. Finally, ethnic and racial inequalities are found to be associated with lower overall development and growth (Alesina et al., 2012); thus, addressing ethno-racial inequalities may have the additional benefit of generating higher welfare levels for everyone.

Using comparable fiscal incidence analyses for Bolivia, Brazil, Guatemala and Uruguay,[2] this paper analyzes the effect of taxes and social spending on ethnic and racial inequality. Except for Uruguay, where Afro-descendants and indigenous groups represent only 4.4 percent of the total population, the share of the indigenous or Afro-descendant population in these countries is large: representing 54.2 percent of the population in Bolivia, 50.8 percent in Brazil and 40.7 percent in Guatemala.[3]

Ethnic and racial inequality in these four countries is high (Table 1). Per capita *pre-fiscal* income of the white population is between sixty percent and two times higher than the Afro-descendants or indigenous population's income. Inequality between ethnic or racial groups accounts for between 1 percent of total inequality in Uruguay to 9.1 percent in Brazil. The indigenous and Afro-descendants populations represent a considerably larger share of the poor than they do of the total population. The probability of being poor (measured by the headcount ratio using the international poverty line of $2.50 in purchasing power parity dollars per day) is between two and three times higher for indigenous and Afro-descendants than whites. Average educational attainment levels are roughly between two and three years lower for Afro-descendants

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[1] In this paper, fiscal policy, fiscal interventions and taxes and transfers policy are used interchangeably.

[2] These studies were produced under the Commitment to Equity-Inter-American Development Bank (CEQ-IADB) project "Incidence of Taxes and Social Spending by Ethnicity and Race." The fiscal incidence study for Bolivia was carried out by Veronica Paz Arauco, George Gray-Molina, Wilson Jimenez and Ernesto Yañez (2013); for Brazil by Sean Higgins and Claudiney Pereira (2013); for Guatemala by Maynor Cabrera and Hilcias E. Moran (2014); and, for Uruguay by Marisa Bucheli, Maximo Rossi and Florencia Amabile (2014). The household surveys used for the analyses are: Bolivia (Encuesta de Hogares, 2009), Brazil (Pesquisa de Orçamentos Familiares, 2009), Guatemala (Encuesta Nacional de Ingresos y Gastos de las Familias, 2009-2010) and Uruguay (Encuesta Continua de Hogares, 2009).

[3] The ethnicity and race of each individual in the household surveys was determined by self-identification. For details see the country-by-country descriptions available upon request. In Brazil, although data is available for white, Asian, blacks (*pretos*), *pardos* (literally, brown), and indigenous, for the purpose of this analysis the non-white population refers to Afro-Brazilians which is the combination of *pretos* and *pardos*, with *pardos* representing the majority of the group (43 percent of total population). Disaggregated data for the different ethno-racial groups is available upon request.

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or indigenous populations in all four countries. As we shall see below, although taxes and transfers reduce these gaps, the change is very small.

2. INCIDENCE ANALYSIS BY ETHNIC AND RACIAL GROUPS: INDICATORS

i Measuring the ethno-racial divide

A fiscal incidence analysis designed to assess how governments reduce the welfare gap between ethnic and racial groups needs to include indicators that can capture how inequities across these groups change with fiscal interventions. A necessary first step is to select indicators to measure the ethno-racial divide.[4] Here I propose to use the following.[5]

Income Gap: The ethno-racial gap can be measured by simply taking the ratio of per capita incomes between different groups.

Contribution to Overall Inequality: The contribution of the ethno-racial income gap to overall inequality can be estimated using a standard decomposable inequality index such as the Theil index.

Inequality of Opportunity: A society with high ethno-racial equity should feature fairly equal opportunities across ethnic and racial groups. To assess the extent to which fiscal policy equalizes opportunities, following the ideas originally set out by Roemer (1998) and their application by Ferreira et al. (2012), I propose to use an indicator that can track the extent to which taxes and transfers reduce the inequality associated with circumstances. Circumstances are pre-determined factors that are not dependent on an individual's effort, such as ethnicity and race, gender, place of birth, and parents' education or parents' income. In these national surveys, information on parents or place of birth is not available. Thus, for our purposes, circumstances include race or ethnic group, gender and location (rural or urban).[6]

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[4] The ethno-racial divide exists well beyond the income or public services space but for the purposes of a fiscal incidence analysis we focus on the latter.

[5] In addition to the present list, one may want to consider other outcome variables that are not necessarily present in the income or public services space. For example, one may want to assess access to urban infrastructure (water and sanitation, street lighting, and so on) or the extent to which the fiscal system exacerbates or reduces occupational segregation or discrimination. These are not included in this paper.

[6] Once each individual's circumstances set has been identified, the mean income of each circumstances set (i.e., the mean income of all individuals in that circumstances set) is calculated for the "pre fisc" and the "post fisc" income. Let s_i^j indicate the income of each individual i, which in the smoothed distribution equals the mean income for income concept j (where the latter can be before taxes and transfers or after taxes and/or transfers, see Diagram 1 in Appendix) of everyone in individual i's circumstances set. Each individual is attributed the mean income of their circumstances set, and this income distribution is called the smoothed income distribution. Inequality is then measured over the smoothed income distribution for each income concept associated with taxes and transfers. Here the mean log deviation was used, which gives the measure of inequality of opportunity (in levels) by income concept. The mean log deviation of the smoothed distribution (for income concept j) is calculated as

$$\frac{1}{n}\sum_i \ln\left(\frac{\mu^j}{s_i^j}\right)$$

where μ^j is the mean income of the population for income concept j (either the original or smoothed distribution can be used to calculate μ^j since they have the same mean by definition), and s_i^j is defined above.

Poverty: An indication of ethnic and racial inequity is the extent to which the probability of being poor differs across ethno-racial groups. This can be measured with the incidence or headcount ratios for different ethnic and racial groups.

The above indicators can be estimated for different income concepts that take into account fiscal interventions.[7] In particular, one would like to compare the size of these indicators measured with income before taxes and transfers (or, market income) with their size using disposable income, where the latter equals market income less direct taxes (personal income taxes and contributions to social security) plus direct transfers (cash and near cash transfers such as food transfers and school uniforms) (Table 2). As we shall see below, we may also want to measure poverty after taking into account the effects of consumption taxes and subsidies (indirect net taxes).

ii Defining progressivity and pro-poorness in the ethno-racial dimension

The above indicators of the fiscal system are outcomes of the characteristics of the fiscal system in terms of progressivity and pro-poorness. These concepts are fairly developed in the literature on fiscal incidence in the income space.[8] Here I propose an adaptation of these concepts to the ethno-racial dimension (Table 3).

Progressivity: In order to measure *progressivity* between ethnic and racial groups, I propose to use an approach analogous to that used for analyzing taxes and transfers in the income space. The ethnic or racial groups shall be ranked based on their per capita market income. A tax will be defined as progressive (regressive) in the ethno-racial sense if the share paid by the ethnic or racial group with the highest per capita income is higher (lower) than their market income share. A transfer will be defined as progressive (regressive) if the share received by the ethnic or racial group with the lowest per capita income is higher (lower) than their market income share. A transfer will be defined as progressive in absolute terms if the share received by the ethnic or racial group with the lowest per capita income is higher than their population share.

Pro-disadvantaged Group: I propose to use the following measures to assess how pro-indigenous or pro-Afro-descendant the fiscal system is. Given the large difference in market income poverty rates between whites and indigenous peoples and Afro-descendants, a pro-disadvantaged-group fiscal system should feature a higher probability of escaping poverty after taxes and transfers for the ethnic or racial groups with higher incidences of poverty.[9] This would also imply that net transfers should be higher for the poor in the ethnic or racial group with the highest incidence of poverty.

The directional mobility literature provides a useful framework to measure the transfers-induced probability of escaping poverty.[10] In particular, the probability of escaping poverty can be estimated using a Markovian transition matrix that Higgins and Lustig (2013) called a "fiscal mobility matrix" (FMM). Fiscal mobility is the

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[7] See the definition of the income concepts in Diagram 1 in the methodological appendix at the end.

[8] On progressivity see, for example, Lambert (1988) and Duclos (1997, 2008).

[9] This probability is calculated using the "hazard rates" as in Amabile et al. (2014). However, in contrast to these authors, I do not believe that racial equity entails having the same hazard rates for all the groups. Thus, the probability of escaping poverty means the probability of crossing this threshold with transfers. Recall that for all the poverty measures here I use the international poverty line of $2.50 in purchasing power parity dollars per day.

[10] Directional mobility is a subcategory of the "mobility as movement" definition (as opposed to the time independence definition). See Fields (2008) for a survey of the income mobility literature.

directional movement between the before and after taxes and transfers situations among k pre-defined income categories. It can be represented by the $k \times k$ transition matrix P, where the ijth element of P, denoted p_{ij}, can be interpreted as the probability of moving to income group j after taxes and transfers for individuals who were in income group i before taxes and transfers. Hence, P is a row stochastic matrix with $\sum_{j=1}^{k} p_{ij} = 1$ for all $i \in \{1, \dots, k\}$.[11] Define $\mathbf{z}$ as a vector of poverty lines between $\underline{z}$ (the lowest reasonable poverty line) and $\bar{z}$ (the highest reasonable poverty line). In other words, $\mathbf{z}$ is an ordered vector whose component values define tranches of income ranges which demarcate varying degrees of poverty severity.[12] These poverty lines will determine a subset r of the k income categories ($r < k$) for which p_{ij} denotes the probability of moving out of poverty (poverty) after taxes and transfers, for individuals who were poor before taxes and transfers. The probability of escaping poverty is estimated by the following: $\sum_{i=1}^{r} \sum_{j:j>i} p_{ij} > 0$. In the estimates presented here, I set r = 1, with r being the \$2.50 per day in purchasing power parity dollars international poverty line. The number of k income categories is set equal to two: poor and non-poor. Thus, the transition matrix or FMM is a two by two.[13]

Horizontal Equity: Note that a "pro-disadvantaged group" criterion will often run in contradiction to the principle of horizontal equity. *Horizontal equity* entails that the fiscal system should treat pre-fiscal equals equally (Feldstein, 1976).[14] Under such a principle, one could argue that the poor should be treated the same regardless of their race or ethnicity. If one embraces this principle, the share of net transfers received by equally poor individuals of any racial or ethnic groups should be equal to their share of the poor population. That is, the average per capita net transfers going to the poor should be the same regardless of their race or ethnicity. In general, this will not result in equalizing the probability of escaping poverty across racial and ethnic groups.

As with gender, inequities in the fiscal system between ethnic and racial groups can arise due to explicit provisions in the tax and transfers system or can be implicit. The latter occur when taxes and transfers have a differential impact on ethnic and racial groups due to, for example, the geographic distribution of these groups (e.g., rural versus urban), employment status (e.g., informal versus formal sector) or consumption patterns (e.g., level of taxes on specific goods or location of purchase). Absence of ethno-racial inequity in the statutory design of a tax or a transfer can give a false sense of comfort since the inequities may result from implicit biases.

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[11] Mobility matrices were used to compare pre- and post-tax and transfer income distributions in Lustig et al. (2011).

[12] We are grateful to Peter Lambert for suggesting this interpretation of the vector of poverty lines.

[13] Note that the probability of becoming poorer with the fiscal system, especially after consumption taxes can be positive as well. In such circumstances there is downward mobility among the poor. If $\sum_{i=1}^{r} \sum_{j:j<i} p_{ij} > 0$, then there is downward mobility among the poor. If $\sum_{i=r+1}^{k} \sum_{j:j<r} p_{ij} > 0$ then there is downward mobility of some non-poor into poverty. Higgins and Lustig (2013) call this "fiscal impoverishment" and axiomatically develop a measure.

[14] Given limited resources if one wants to give priority to equalizing opportunities or outcomes across ethno-racial groups, this may mean to transfer all or most the resources to the poor in the disadvantaged group and none or almost none to the equally poor in the non-disadvantaged group.

3. MAIN RESULTS

i Fiscal Policy, Inequality and Poverty in the Ethno-racial dimension

What is the impact of direct taxes and direct transfers on ethnic and racial inequality? Using the indicators described above, Table 4 reveals that the answer is a simple "not much." Although all the indicators move in the right direction, the order of magnitude of the change is, with the exception of Uruguay, quite small.

The ratio of average per capita incomes by ethnicity or race declines by one decimal point (Bolivia, Brazil and Uruguay) to nothing (Guatemala). In Brazil and Uruguay, where there is a respectable decline in overall inequality, the decline in inequality between different ethno-racial groups still does not decline significantly, changing by a very small amount in Uruguay and actually increasing in Brazil. The case of Brazil indicates that inequality within each ethno-racial group (intra-racial inequality) is falling (due to the effect of taxes and transfers) at a faster rate than the inequality evident between different races (inter-racial inequality). Inequality of opportunity also declines by a relatively small amount, this occurs even though all three circumstances are considered simultaneously.

Although the difference in the probability of being poor after taxes and transfers is less than before taxes and transfers,[15] the difference in headcount ratios by ethnic group and race remain very large, with the exception of Uruguay. More importantly, when one adds the effect of consumption taxes, the gap in the headcount ratio increases above that for market income in Brazil and remains unchanged in Bolivia (Table 5). In the cases of Guatemala and Uruguay, while the narrowing of the gap is somewhat offset by consumption taxes, the difference is still smaller than for market income. That is, when the combined effect of direct and indirect (net of subsidies) taxes and direct transfers is considered, fiscal interventions reduce the differences in the probability of being poor between ethnic and racial groups in Guatemala and, especially, Uruguay, while in Brazil they increase the ethno-racial gap and in Bolivia there is little to no change.

ii Fiscal Policy: Progressivity and Pro-disadvantage Group in the Ethno-racial dimension

As seen above, fiscal interventions have little impact on the indicators we selected to measure the ethno-racial divide. In fact, when (net) indirect taxes are added, the differences in the probability of being poor move in the wrong direction (Brazil) or not at all (Bolivia). Are there specific characteristics of the fiscal system that may be associated with these rather disappointing outcomes?

a. Bolivia
Although transfers are progressive in absolute terms in the ethno-racial dimension (i.e., shares are higher for indigenous peoples than their population share), they are not progressive enough. For example, the share of non-contributory pensions, CCTs and other direct transfers going to the indigenous population living in poverty is lower than their share in the total poor population.

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[15] Recall that for all the poverty measures here I use the international poverty line of $2.50 in purchasing power parity dollars per day.

In Table 7 we can observe that while the probability of escaping poverty through direct transfers is higher for indigenous peoples than the non-indigenous population, it is only slightly so.[16] In order to narrow the gap in the headcount ratios, the difference would have to be much higher. For example, if the goal were to equalize the incidence of disposable income poverty between the disadvantaged group to the market income poverty rate of the non-disadvantaged group, the probability of escaping poverty for Bolivia's indigenous population would have to be 63.5 percent instead of just 10.4 percent. This means that transfers to this group would have to be significantly higher than for the non-indigenous poor. In Figure 1, we can see that at present, they are quite similar for the poor in both ethnic groups.

Could Bolivia do better in terms of reducing the difference in indigenous and non-indigenous headcount ratios with the same amount of direct transfers? From Paz-Arauco et al. (2014), we know that direct transfers in Bolivia are quasi-universal which means that a significant portion of transfers are received by the non-poor. With better targeting, these resources could be used to expand the coverage and/or average size of transfers for indigenous groups so that the probability of escaping poverty for these groups would be higher. It should be noted, however, that cash transfer coverage for the non-indigenous poor is considerably lower, so reducing the gap in the probability of being poor between the two ethnic groups would be at the cost of higher horizontal inequity within the poor. That is, the indigenous group already features higher coverage and higher per capita transfers in beneficiary households than the non-indigenous poor. The required change would make this difference more pronounced.

On the tax side, the situation is significantly worse. As we see in Table 6, consumption taxes are regressive in the ethno-racial dimension: the indigenous population pays a higher share of these taxes than their share in total market income. [17] It remains to be seen which factors are behind this result. For example, it would be interesting to assess the extent to which consumption patterns, both in terms of goods purchased and location of purchase, explain the differences in taxation rates.[18]

b. Brazil

Direct transfers are progressive in the ethno-racial dimension, but not progressive enough. This is because the very progressive CCT, *Bolsa Familia*, is partially offset by the Special Circumstances Pensions, which is neutral in the ethno-racial dimension (that is, the share of the transfer is practically the same as the share of market income), and by scholarships, which are regressive.[19] In fact, as Figure 1 shows, the poorest segment of the white population receives nearly twice as much in direct transfers as equally poor Afro-Brazilians.[20] This is primarily due to Special Circumstances Pensions.

The Special Circumstances Pension includes social protection programs against illness, disability, widowhood, orphanhood and other adverse shocks. Although these are paid through the formal social security system in

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[16] Recall that for all the poverty measures here I use the international poverty line of $2.50 in purchasing power parity dollars per day. Thus, the probability of escaping poverty means the probability of crossing this threshold with transfers.

[17] As Paz-Arauco et al., op. cit., explain, Bolivia —for all practical purposes—does not have personal income taxes.

[18] See Higgins and Lustig (2013) for a similar analysis for Brazil.

[19] For a description of this program, see Higgins and Pereira (2014).

[20] The national survey used for Brazil (*Pesquisa Nacional por Amostra de Domicílios*) allows for the disaggregation of race into five groups; white, black (*preto*), brown (*pardo*), Asian, and indigenous. For the purpose of this paper, the analysis compares the white population to the Afro-Brazilian population. The Afro-Brazilian population includes both p*retos* and *pardos*.

which beneficiaries need to be enrolled, individuals can be eligible to receive benefits even if they have not made contributions to the system. Coverage by the special circumstances pension system is higher for the white population, especially among the poorest groups. The per capita benefit is also higher for the white population as a whole in all income groups, including the poorest. The white population also benefits more from scholarships primarily because the average per capita transfer is higher. Except for *Bolsa Familia*, the poorer groups among the white population not only have higher per capita transfers but also higher coverage rates.

The above probably explains why the probability of escaping poverty through transfers is higher for Brazil's white population than for Afro-descendants (Table 7). If the goal were to equalize the disposable income poverty of Afro-Brazilians to the market income poverty rate of the white population, the probability of escaping poverty for the Afro-Brazilian population would have to be 62.2 percent instead of 24.3 percent. This means that transfers to this group would have to be significantly higher than for the white poor, which is the opposite of what the fiscal incidence analysis shows is happening.

Brazil could improve the redistributive power of its cash transfers both in the income (Higgins and Pereira, 2014) and, especially, in the ethno-racial dimension, if the benefits of the Special Circumstances Pensions were expanded to rural areas and to *pardo,* indigenous and black groups.

Although consumption taxes are neutral in the ethno-racial dimension, the net effect regarding the number of individuals pushed below the poverty line as a result of consumption taxes must have offset the number of people who were pushed out of poverty among the whites by more than among the Afro-descendants. This explains the increase in the difference between headcount ratios with post-fiscal income shown in Table 5. It would be interesting to check whether there are identifiable differences in the consumption patterns between racial groups that may explain what we found in terms of the effects of consumption taxes.

c. Guatemala

As seen in Table 4, transfers-induced poverty reduction in Guatemala is small for both the non-indigenous and indigenous populations. As in the cases of Bolivia and Brazil, transfers are progressive in the ethno-racial dimension but not enough. The progressivity of the CCT program is partially offset by the regressivity of noncontributory pensions and other direct transfers.[21] In contrast to Brazil, however, the incidence of transfers is higher for the indigenous population and the difference is larger for the income category with less than U$2.50 ppp per day (Figure 1).

In Table 7 we can observe that the probability of escaping poverty through direct transfers is higher for the indigenous than the non-indigenous population, although both are painstakingly small.[22] In order to narrow the gap in headcount ratios, the difference would have to be much higher. If like in the cases of Bolivia and Brazil the goal were to equalize the disposable income poverty of the disadvantaged group to the market income poverty of the non-disadvantaged group, for example, the probability of escaping poverty for the

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[21] For a description of transfer programs, see Cabrera et al. (2014).

[22] Recall that for all the poverty measures here I use the international poverty line of $2.50 in purchasing power parity dollars per day. Thus, the probability of escaping poverty means the probability of crossing this threshold with transfers.

indigenous population would have to be 53.3 percent instead of 4.7 percent. This means that transfers to the indigenous poor, relative to the non-indigenous poor, would have to be even higher than they are now.

Direct taxes and consumption taxes are progressive in the ethno-racial dimension. Overall, taxes and cash transfers in Guatemala are "pro-indigenous" but the amount that is redistributed in cash to either ethnic group is very small and some of the individual transfers still benefit the non-indigenous more than the indigenous population.

d. Uruguay

Uruguay narrows the difference in the headcount ratio between the non-Afro-descendant and Afro-descendant populations more than any of the other countries examined here. In fact, the ex-post disposable income headcount ratios are quite low and similar. This is no coincidence. Not only does Uruguay have higher per capita incomes, lower overall inequality and considerably lower poverty rates than the other three countries, but Uruguay's policies are also significantly more progressive in the ethno-racial dimension. In Table 6 one can observe that direct taxes are progressive and, above all, that direct transfers as a whole, as well as each transfer individually, are progressive in absolute terms in the ethno-racial dimension: that is, that per capita transfers are higher for groups which experience a higher incidence of poverty.

It is also the only country for which the actual transfers-induced probability of escaping poverty is higher than what would be required to equalize the poverty headcount ratio between the Afro-descendants disposable income and the non-Afro-descendants market income poverty headcount ratio. The probability of escaping poverty for the Afro-descendants is 70.3 percent while what would be required is 61.3 percent.

The only category that is not progressive in the ethno-racial dimension is consumption taxes, which turn out to be slightly regressive or neutral. Again, it would be interesting to determine if this is associated with differences in consumption patterns between non-Afro-descendant and Afro-descendant populations.

TABLE 1 – ETHNIC AND RACIAL INEQUALITY BEFORE TAXES AND TRANSFERS: BOLIVIA, BRAZIL, GUATEMALA AND URUGUAY

Indicator	Bolivia (2009)	Brazil (2009)	Guatemala (2009/10)	Uruguay (2009)
White/Nonwhite Average Per Capita Market Income*	1.6	2.1	2.1	1.8
Theil Index	.497	.674	.692	.456
Contribution of Between Race Inequality*** (in %)	4.9	9.1	8.5	1
Nonwhite Population in Total* (in %)	54.2	50.8	40.7	4.4
Nonwhite Population in Poor** (in %)	76.5	72.8	59.5	9.5
Headcount Ratio of White Population** (in %)	10.1	8.2	24.5	4.8
Headcount Ratio of Nonwhite Population**(in %)	27.7	21.7	52.5	12.4
Poverty Gap of White Population** (in %)	4.1	3.3	8.5	1.7
Poverty Gap of Nonwhite Population**(in %)	14.7	9.3	19.2	4.7
Poverty Gap Squared of White Population** (in %)	2.4	1.9	4.1	.9
Poverty Gap Squared of Nonwhite Population**(in %)	9.7	5.5	9.5	2.5
Average Years of Schooling of White Population (+25 yrs old)	9.7	8.2	5.8	8.8
Average Years of Schooling of Nonwhite Population (+25 yrs old)	7	6.3	2.3	6.8

Source: Author's based on Bolivia (2009): Paz-Arauco et al., 2013 CEQ-IDB; Brazil (2009): Higgins and Pereira, 2013 CEQ-IDB; Guatemala (2010/2011): Cabrera and Moran, 2013 CEQ-IDB; Uruguay (2009): Bucheli, Rossi and Amabile, 2013 CEQ-IDB.

Note: Household surveys used for the analyses are: Bolivia (Encuesta de Hogares, 2009), Brazil (Pesquisa de Orçamentos Familiares, 2009), Guatemala (Encuesta Nacional de Ingresos y Gastos de las Familias, 2009-2010) and Uruguay (Encuesta Continua de Hogares, 2009). All the presented above measures use pre-fisc or market income, defined as gross wages and salaries, income from capital, private transfers and contributory pensions; it includes self-consumption (except for Bolivia) and imputed rent for owner's occupied housing. *The nonwhite population for Bolivia and Guatemala refer to the indigenous population; in the case of Brazil, to the Afro-Brazilian (pardo and preto) population; and, in the case of Uruguay, to Afro-descendants. **Poverty is measured for per capita market income with the international poverty line of US$2.50 ppp per day. ***This corresponds to the "between" component of a standard decomposition of the Theil index.

TABLE 2 – FISCAL POLICY OUTCOME INDICATORS AND THE ETHNO-RACIAL DIVIDE

Outcome	Indicator
Inequality	White/nonwhite average per capita market vs. disposable income
	Decomposable inequality measure (e.g., Theil index) for market income vs. disposable income
	Contribution of between race inequality to overall inequality for market income vs. disposable income
Inequality of Opportunity	Smoothed inequality measure over circumstances, including ethnicity or race as one of them (e.g., Mean Log Deviation) for market income vs. disposable income
Poverty	Headcount Ratio, Poverty Gap Index and Squared Poverty Gap Index for the White Population Minus Headcount ratio for the Non-white Population for market income vs. disposable income and post-fiscal income

TABLE 3 – INDICATORS OF PROGRESSIVITY, PRO-DISADVANTAGED GROUP AND HORIZONTAL EQUITY IN THE ETHNO-RACIAL DIVIDE

Dimension of Fiscal System	Indicator
Progressivity	Share of taxes (transfers) paid (received) by each ethnic or racial group compared to the respective shares of market income and population
Pro-disadvantaged group	Probability of escaping poverty (impoverishment) by ethnic or racial group
Horizontal equity among the poor	The share of taxes and transfers is the same as the population shares by race and ethnicity within the poor

TABLE 4 – ETHNO-RACIAL DIVIDE BEFORE (MARKET INCOME) AND AFTER (DISPOSABLE INCOME) TAXES AND TRANSFERS: BOLIVIA, BRAZIL, GUATEMALA AND URUGUAY

Indicator	Bolivia		Brazil		Guatemala		Uruguay	
	Market Income	Disposable Income	Market Income	Disposable Income	Market Income	Disposable Income	Market Income	Disposable Income
White/nonwhite average per capita income*	1.5	1.5	2.1	2	2.1	2.1	1.8	1.7
Theil Index	.497	.478	.674	.588	.692	.682	.456	.389
Contribution of between race inequality*** (in %)	4.9	4.8	9.1	9.2	8.5	8.4	.96	.96
Inequality of opportunity****	0.092	0.082	0.096	0.083	0.197	0.195	0.013	0.011
Headcount ratio of white population** (in %)	10.1	9.1	8.2	5.6	24.5	24	4.8	1.4
Headcount ratio of nonwhite population**(in %)	27.7	24.8	21.7	16.4	52.5	50.1	12.4	3.7

Source: Author's based on Bolivia (2009): Paz-Arauco et al., 2013 CEQ-IDB; Brazil (2009): Higgins and Pereira, 2013 CEQ-IDB; Guatemala (2010/2011): Cabrera and Moran, 2013 CEQ-IDB; Uruguay (2009): Bucheli, Rossi and Amabile, 2013 CEQ-IDB.

Note: Market income is defined as gross wages and salaries, income from capital, private transfers and contributory pensions; it includes self-consumption (except for Bolivia) and imputed rent for owner's occupied housing. Disposable income equals market income minus personal income taxes and (non-pension) contributions to social security plus direct transfers (cash and near cash). *The nonwhite population for Bolivia and Guatemala refer to the indigenous population; in the case of Brazil, to the Afro-Brazilian (*pardo* and *preto*) population; and, in the case of Uruguay, to the Afro-descendants. **Poverty is measured with the international poverty line of US$2.50 ppp per day. ***This corresponds to the "between" component of a standard decomposition of the Theil index. ****Mean log deviation of smoothed distribution with gender of head, location (rural or urban), and race/ethnicity as circumstances.

TABLE 5 – DIFFERENCES IN PROBABILITY OF BEING POOR BY ETHNIC AND RACIAL GROUP BY INCOME CONCEPT

Headcount Ratio for the Non-white Population Minus Headcount ratio for White Population in Percentage Points	Market Income	Disposable Income	Post-fiscal Income
Bolivia	17.6	15.7	16.9
Brazil	13.5	10.8	14
Guatemala	28	26.1	27.1
Uruguay	7.6	2.3	3.1

Source: Author's based on Bolivia (2009): Paz-Arauco et al., 2013 CEQ-IDB; Brazil (2009): Higgins and Pereira, 2013 CEQ-IDB; Guatemala (2010/2011): Cabrera and Moran, 2013 CEQ-IDB; Uruguay (2009): Bucheli, Rossi and Amabile, 2013 CEQ-IDB.

Note: The probability of being poor is measured as the headcount ratio. Market income is defined as gross wages and salaries, income from capital, private transfers and contributory pensions; it includes self-consumption (except for Bolivia) and imputed rent for owner's occupied housing. Disposable income equals market income minus personal income taxes and (non-pension) contributions to social security plus direct transfers (cash and near cash). Post-fiscal income is defined as disposable income minus net indirect taxes. *The nonwhite population for Bolivia and Guatemala refer to the indigenous population; in the case of Brazil, to the Afro-Brazilian (*pardo* and *preto*) population; and, in the case of Uruguay, to the Afro-descendants. **Poverty is measured with the international poverty line of US$2.50 ppp per day.

TABLE 6 –PROGRESSIVITY OF TAXES AND TRANSFERS IN THE ETHNO-RACIAL DIMENSION

(Shares in percent)

Bolivia	NON INDIGENOUS	INDIGENOUS
	% nat'l	% nat'l
POPULATION	45.80%	54.17%
MARKET INCOME	56.61%	43.28%
All Direct Transfers	39.36%	60.53%
Non-contributory Pensions	38.71%	61.14%
Flagship CCT	38.75%	61.25%
Other Direct Transfers	43.69%	56.31%
Indirect Subsidies	57.40%	42.54%
Indirect Taxes	56.28%	43.51%
Net Indirect Taxes	56.17%	43.61%

Brazil	WHITE	AFRODESCENDANTS (Preto + Pardo)
	% nat'l	% nat'l
POPULATION	48.0%	50.8%
MARKET INCOME	64.9%	33.4%
Direct Taxes	71.4%	26.8%
Direct Taxes&Contributions	70.5%	27.7%
All Direct Transfers	56.9%	42.2%
CCT	26.6%	72.3%
Scholarships	72.2%	27.4%
Special Circums Pensions	64.5%	34.7%
Unemployment Benefits	50.5%	48.9%
Other Direct Transfers	51.9%	47.6%
Indirect Taxes	63.6%	34.8%
Net Indirect Taxes	63.7%	34.7%

Guatemala	NON INDIGENOUS	INDIGENOUS	
	% nat'l	% nat'l	
POPULATION	59.29%	40.71%	
MARKET INCOME	75.61%	24.39%	
All Direct	35.29%	64.71%	
CCT	24.02%	75.98%	
Non-Contributory Pensions	62.03%	37.97%	
Other Direct Transfers	75.64%	24.36%	
Indirect Subsidies	77.89%	22.11%	
Indirect Taxes	78.01%	21.99%	
Net Indirect Taxes	78.03%	21.97%	

Uruguay	WHITE	AFRODESCENDANT	INDIGENOUS
	% nat'l	% nat'l	% nat'l
POPULATION	95.5%	3.4%	1.0%
MARKET INCOME	97.2%	1.9%	0.7%
Direct Taxes	97.6%	1.7%	0.6%
All Direct Transfers	92.8%	5.8%	1.3%
CCT	91.9%	6.7%	1.4%
Non-contributory pension	92.6%	6.1%	1.3%
Other Direct Transfers	93.3%	5.3%	1.3%
Indirect Taxes	97.2%	1.9%	0.8%
Net Indirect Taxes	97.2%	1.9%	0.8%

Source: Author's based on Bolivia (2009): Paz-Arauco et al., 2013 CEQ-IDB; Brazil (2009): Higgins and Pereira, 2013 CEQ-IDB; Guatemala (2010/2011): Cabrera and Moran, 2013 CEQ-IDB; Uruguay (2009): Bucheli, Rossi and Amabile, 2013 CEQ-IDB.

TABLE 7 – PROBABILITY OF ESCAPING POVERTY THROUGH DIRECT TRANSFERS (IN PERCENT)

	Bolivia	Brazil	Guatemala	Uruguay
National	10.4	26.1	3.7	71.5
White	10.1	31.2	2.2	71.5
Non-White	10.4	24.3	4.7	70.3

Source: Author's based on Bolivia (2009): Paz-Arauco et al., 2013 CEQ-IDB; Brazil (2009): Higgins and Pereira, 2013 CEQ-IDB; Guatemala (2010/2011): Cabrera and Moran, 2013 CEQ-IDB; Uruguay (2009): Bucheli, Rossi and Amabile, 2013 CEQ-IDB.

Note: Poverty is measured with the international poverty line of US$2.50 ppp per day.

TABLE 8 – HORIZONTAL EQUITY OF TAXES AND TRANSFERS (BOLIVIA)

Bolivia		NON INDIGENOUS	INDIGENOUS
		% nat'l	% nat'l
POPULATION	y<=1.25	15.43%	84.57%
	1.25<y<=2.50	31.91%	68.09%
	2.50<y<=4	40.08%	59.92%
MARKET INCOME	y<=1.25	15.95%	84.05%
	1.25<y<=2.50	32.51%	67.49%
	2.50<y<=4	40.05%	59.95%
All Direct Transfers	y<=1.25	15.87%	84.13%
	1.25<y<=2.50	20.88%	79.12%
	2.50<y<=4	33.70%	66.30%
Non-contributory Pensions	y<=1.25	14.25%	85.75%
	1.25<y<=2.50	18.16%	81.84%
	2.50<y<=4	29.69%	70.31%
Flagship CCT	y<=1.25	9.89%	90.09%
	1.25<y<=2.50	31.95%	68.05%
	2.50<y<=4	39.36%	60.64%
Other Direct Transfers	y<=1.25	33.74%	66.26%
	1.25<y<=2.50	22.77%	77.23%
	2.50<y<=4	40.05%	59.95%
Indirect Subsidies	y<=1.25	54.81%	45.19%
	1.25<y<=2.50	50.69%	49.31%
	2.50<y<=4	45.11%	54.87%
Indirect Taxes	y<=1.25	25.17%	74.83%
	1.25<y<=2.50	37.28%	62.72%
	2.50<y<=4	41.41%	58.59%
Net Indirect Taxes	y<=1.25	23.23%	76.77%
	1.25<y<=2.50	35.91%	64.09%
	2.50<y<=4	40.98%	59.02%

Source: Bolivia (2009): Paz-Arauco et al., 2013 CEQ-IDB.

TABLE 9 – HORIZONTAL EQUITY OF TAXES AND TRANSFERS (BRAZIL)

Brazil		WHITE	AFRODESCENDANTS (Preto + Pardo)
		% nat'l	% nat'l
POPULATION	y<=1.25	23.6%	75.2%
	1.25<y<=2.50	27.6%	71.4%
	2.50<y<=4	33.0%	65.6%
MARKET INCOME	y<=1.25	23.5%	75.5%
	1.25<y<=2.50	27.6%	71.4%
	2.50<y<=4	33.0%	65.6%
Direct Taxes	y<=1.25	44.5%	53.3%
	1.25<y<=2.50	33.0%	65.9%
	2.50<y<=4	41.0%	57.8%
Direct Taxes & Contributions	y<=1.25	44.1%	53.7%
	1.25<y<=2.50	32.0%	66.8%
	2.50<y<=4	39.5%	59.3%
All Direct Transfers	y<=1.25	33.2%	65.7%
	1.25<y<=2.50	36.8%	62.2%
	2.50<y<=4	39.4%	59.7%
CCT	y<=1.25	21.3%	77.5%
	1.25<y<=2.50	24.4%	74.6%
	2.50<y<=4	26.7%	72.1%
Scholarships	y<=1.25	94.7%	5.2%
	1.25<y<=2.50	64.2%	35.3%
	2.50<y<=4	35.7%	64.0%
Special Circumstances Pensions	y<=1.25	40.8%	57.9%
	1.25<y<=2.50	49.6%	49.6%
	2.50<y<=4	51.8%	47.5%
Unemployment Benefits	y<=1.25	24.0%	76.0%
	1.25<y<=2.50	28.5%	70.9%
	2.50<y<=4	26.8%	72.3%
Other Direct Transfers	y<=1.25	11.4%	88.3%
	1.25<y<=2.50	28.6%	71.2%
	2.50<y<=4	32.9%	65.4%
Indirect Taxes	y<=1.25	28.8%	70.1%
	1.25<y<=2.50	30.4%	68.6%
	2.50<y<=4	34.2%	64.6%
Net Indirect Taxes	y<=1.25	30.1%	68.8%
	1.25<y<=2.50	31.0%	67.9%
	2.50<y<=4	34.4%	64.4%

Source: CEQ-IDB; Brazil (2009): Higgins and Pereira, 2013 CEQ-IDB

TABLE 10 – HORIZONTAL EQUITY OF TAXES AND TRANSFERS (GUATEMALA)

| Guatemala		NON INDIGENOUS	INDIGENOUS
		% nat'l	% nat'l
POPULATION	y<=1.25	36.32%	63.68%
	1.25<y<=2.50	42.03%	57.97%
	2.50<y<=4	52.64%	47.36%
MARKET INCOME	y<=1.25	35.46%	64.54%
	1.25<y<=2.50	42.30%	57.70%
	2.50<y<=4	53.36%	46.64%
All Direct Transfers	y<=1.25	23.80%	76.20%
	1.25<y<=2.50	26.03%	73.97%
	2.50<y<=4	35.04%	64.96%
CCT	y<=1.25	24.03%	75.97%
	1.25<y<=2.50	23.54%	76.46%
	2.50<y<=4	21.29%	78.71%
Non-Contributory Pensions	y<=1.25	19.68%	80.32%
	1.25<y<=2.50	40.79%	59.21%
	2.50<y<=4	68.90%	31.10%
Other Direct Transfers	y<=1.25	22.61%	77.39%
	1.25<y<=2.50	49.93%	50.07%
	2.50<y<=4	58.73%	41.27%
Indirect Subsidies	y<=1.25	51.13%	48.87%
	1.25<y<=2.50	53.64%	46.36%
	2.50<y<=4	63.17%	36.83%
Indirect Taxes	y<=1.25	43.44%	56.56%
	1.25<y<=2.50	44.53%	55.47%
	2.50<y<=4	56.35%	43.65%
Net Indirect Taxes	y<=1.25	41.92%	58.08%
	1.25<y<=2.50	42.55%	57.45%
	2.50<y<=4	54.69%	45.31%

Source: Guatemala (2010/2011): Cabrera and Moran, 2013 CEQ-IDB

TABLE 11 – HORIZONTAL EQUITY OF TAXES AND TRANSFERS (URUGUAY)

| Uruguay		WHITE	AFRODESCENDANT	INDIGENOUS
		% nat'l	% nat'l	% nat'l
POPULATION	y<=1.25	90.4%	8.4%	1.2%
	1.25<y<=2.50	90.5%	8.3%	1.2%
	2.50<y<=4	91.4%	7.0%	1.5%
MARKET INCOME	y<=1.25	90.2%	8.3%	1.5%
	1.25<y<=2.50	90.9%	8.0%	1.1%
	2.50<y<=4	91.7%	6.8%	1.4%
Direct Taxes	y<=1.25	96.2%	3.8%	0.0%
	1.25<y<=2.50	85.3%	14.0%	0.7%
	2.50<y<=4	92.5%	6.7%	0.6%
All Direct Transfers	y<=1.25	89.7%	8.9%	1.4%
	1.25<y<=2.50	89.8%	9.2%	1.0%
	2.50<y<=4	90.7%	7.8%	1.5%
CCT	y<=1.25	90.5%	8.4%	1.1%
	1.25<y<=2.50	90.0%	8.8%	1.2%
	2.50<y<=4	92.2%	6.4%	1.4%
Non-contributory pension	y<=1.25	90.6%	9.0%	0.4%
	1.25<y<=2.50	91.9%	7.3%	0.8%
	2.50<y<=4	89.2%	9.6%	1.1%
Other Direct Transfers	y<=1.25	88.7%	9.0%	2.2%
	1.25<y<=2.50	88.4%	10.6%	1.0%
	2.50<y<=4	90.4%	7.8%	1.7%
Indirect Taxes	y<=1.25	89.3%	9.2%	1.5%
	1.25<y<=2.50	91.6%	7.1%	1.3%
	2.50<y<=4	92.1%	6.3%	1.4%
Net Indirect Taxes	y<=1.25	89.3%	9.2%	1.5%
	1.25<y<=2.50	91.6%	7.1%	1.3%
	2.50<y<=4	92.1%	6.3%	1.4%

Source: Uruguay (2009): Bucheli, Rossi and Amabile, 2013 CEQ-IDB.

FIGURE 1 – INCIDENCE OF DIRECT TRANSFERS BY MARKET INCOME CATEGORY AND ETHNO-RACIAL GROUP (WITH RESPECT TO MARKET INCOME; IN PERCENT)
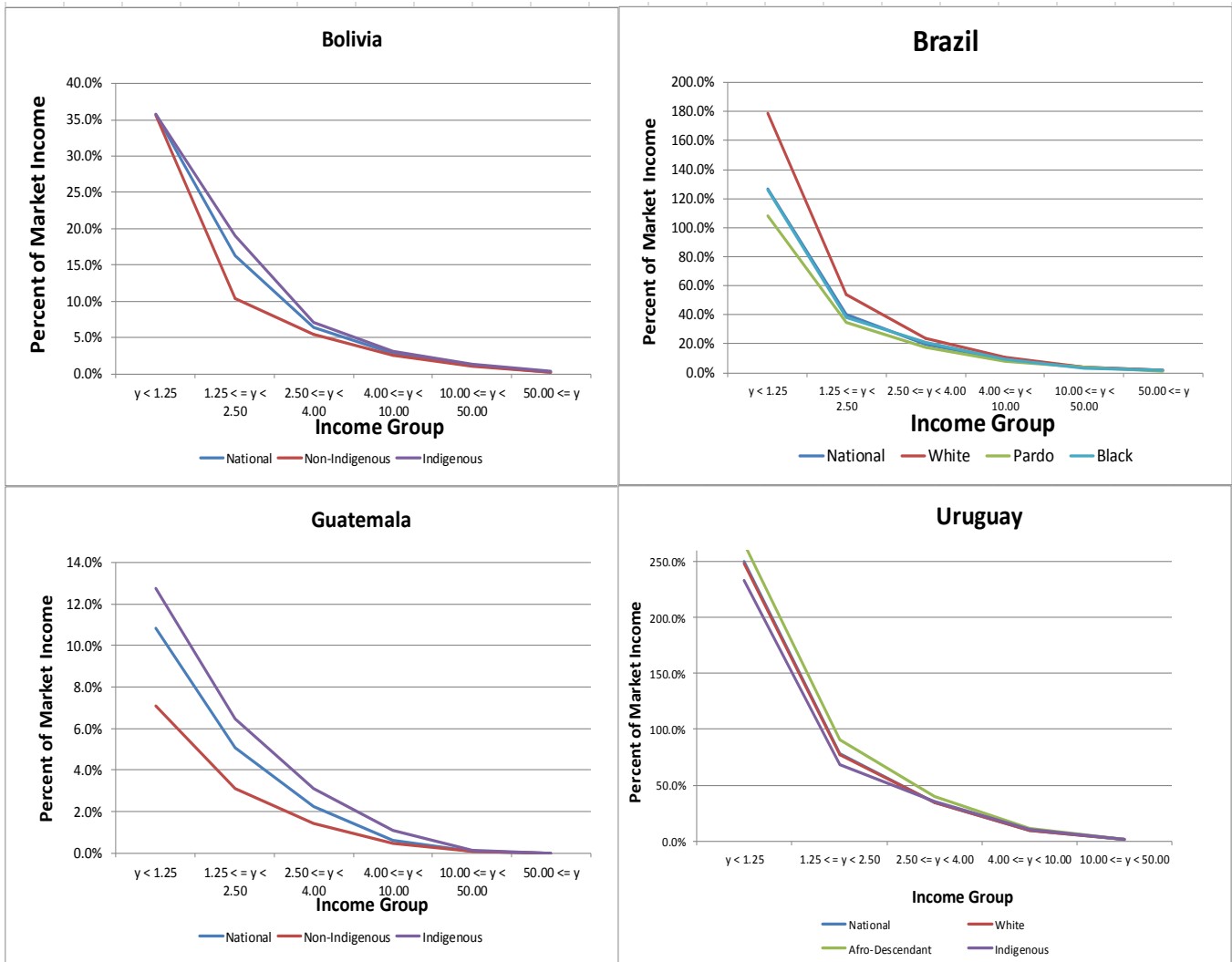
Source: Author's based on Bolivia (2009): Paz-Arauco et al., 2013 CEQ-IDB; Brazil (2009): Higgins and Pereira, 2013 CEQ-IDB; Guatemala (2010/2011): Cabrera and Moran, 2013 CEQ-IDB; Uruguay (2009): Bucheli, Rossi and Amabile, 2013 CEQ-IDB.

FIGURE 2 – GROWTH INCIDENCE CURVES OF POST-FISCAL INCOME BY MARKET INCOME CATEGORY AND ETHNO-RACIAL GROUP (WITH RESPECT TO MARKET INCOME; IN PERCENT)
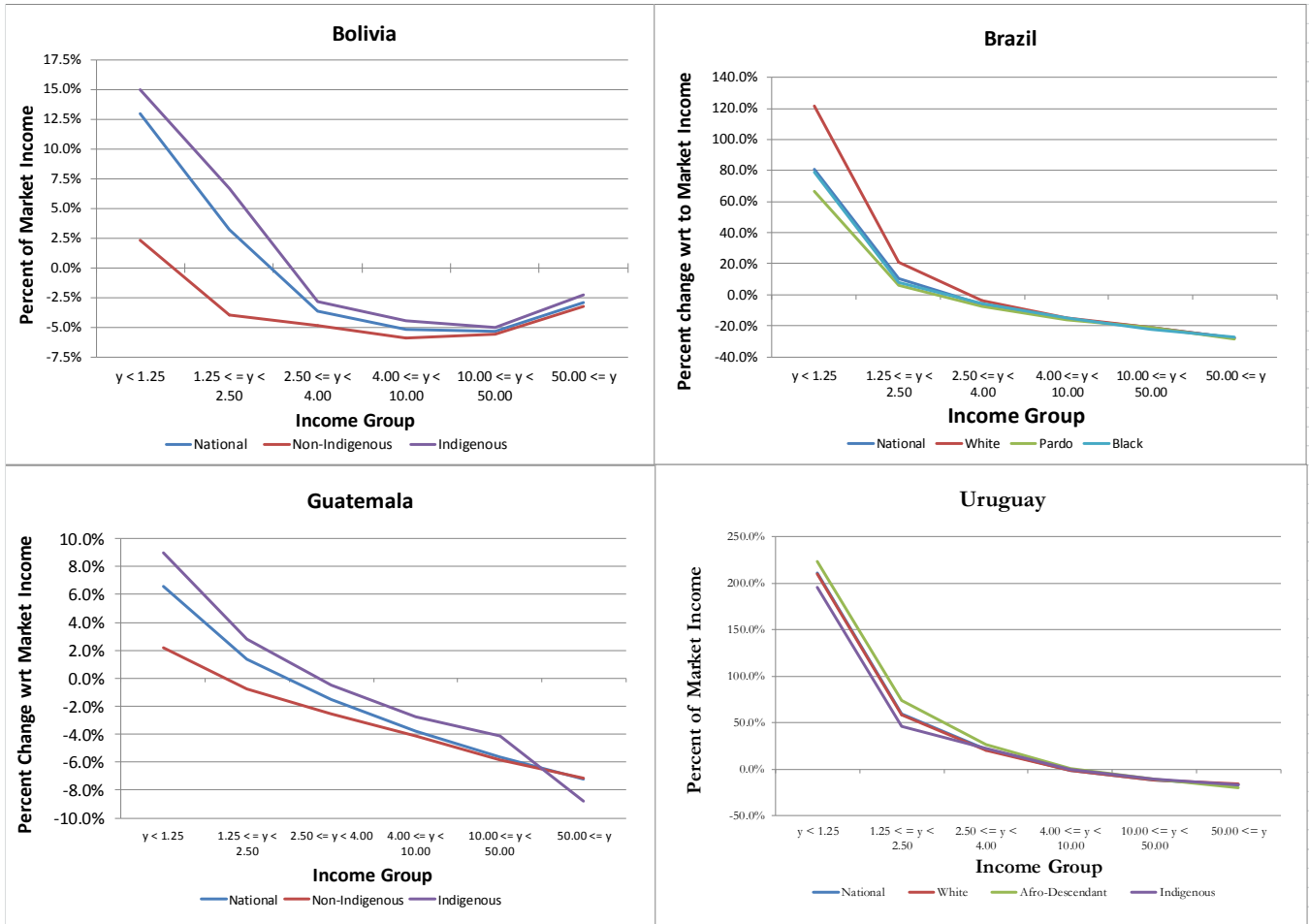
Source: Author's based on Bolivia (2009): Paz-Arauco et al., 2013 CEQ-IDB; Brazil (2009): Higgins and Pereira, 2013 CEQ-IDB; Guatemala (2010/2011): Cabrera and Moran, 2013 CEQ-IDB; Uruguay (2009): Bucheli, Rossi and Amabile, 2013 CEQ-IDB.

APPENDIX

The incidence of social spending and taxes: methodological highlights[23]

Let's define the before taxes and transfers income of unit h as I_h and net taxes of type i as T_i. Let's define the "allocator" of tax i to unit h as S_{ih} (or the share of net tax i borne by unit h). Then, post-tax income of unit h can be defined as: $Y_h = I_h - \sum_i T_i S_{ih}$. This method is known in the literature as the "accounting approach."[24] The CEQ handbook by Lustig and Higgins (2013) presents a detailed description of this methodology.

The exercise applied here is quite comprehensive because the studies cover a very broad spectrum of taxes and transfers. In particular, the taxes examined in these studies include direct (personal income tax and contributions to social security) and indirect consumption taxes. Spending covers transfers and indirect subsidies, in addition to in-kind transfers from public spending on education and health.[25] The full description of the tax and transfers system in Bolivia, Brazil and Uruguay can be found in Lustig et al. (2013). For Guatemala, see Cabrera et al. (2014).

The incidence analysis used here is point-in-time and calculates the average incidence. By definition, the accounting approach does not incorporate behavioral or general equilibrium effects. However, the analysis is not mechanical: the incidence of taxes is calculated based on their (assumed) economic rather than statutory incidence. For instance, individual income taxes and social security contributions (both by employee and employer) are assumed to be paid by formal sector labor only, and consumption taxes are fully shifted forward to consumers. In the case of consumption taxes, the analyses take into account the lower incidence associated with auto-consumption (in rural areas) and informality.

i. Income Concepts Before and After Fiscal Policy

Defining and constructing the income concepts that prevail before and after taxes and transfers is the cornerstone of incidence analysis. It entails the process by which taxes, subsidies and transfers are allocated to each household to assess how incomes, and thus, inequality and poverty indicators, change with fiscal policy. Income concepts are essential to analyze the incidence of specific fiscal interventions and whether they are progressive or regressive.

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[23] This section draws heavily from Lustig et al. (2013). Note that although some of the text is the same as in the latter, quotation marks were not used for ease of exposition.

[24] For a description, applications and limitations of the accounting approach see, for example, Adema and Ladaique (2005), Alleyne et al. (2004), Atkinson (1983), Bergh (2005), Bourguignon and Pereira da Silva (2003), Barr (2004), Barros et al. (2009), Birdsall et al. (2008), Breceda et al. (2008), Dilnot et al. (1990), Ferreira and Robalino (2010), Fiszbein et al. (2009), Grosh et al. (2008), Goñi et al. (2011), Kakwani (1977), Lambert (2002), Lora (2006), Morra et al. (2009), Martinez-Vazquez (2008), Moreno-Dodson and Wodon (2008), O'Donnell et al. (2008), Shah (2003), Suits (1977), van de Walle and Nead (1995), World Bank (2000/2001, 2006, 2009, 2011).

[25] The studies exclude corporate and international trade taxes, some spending categories (such as infrastructure investments including urban services and rural roads that benefit the poor), and other public goods.

The studies included here use five income concepts: market, net market, disposable, post-fiscal, and final income.[26] *Market income*[27] is total current income before direct taxes,[28] equal to the sum of gross (pre-tax) wages and salaries in the formal and informal sectors (also known as earned income), income from capital (dividends, interest, profits, rents, etc.) in the formal and informal sectors (excludes capital gains and gifts), auto-consumption (except in the case of Bolivia),[29] imputed rent for owner-occupied housing, private transfers (remittances and other private transfers such as alimony), and old-age and other pensions from the contributory social security system. *Net market income* equals market income minus direct personal income taxes on all income sources (included in market income) that are subject to taxation and all contributions to social security except for the portion going towards pensions.[30] *Disposable income* is equal to the sum of net market income plus direct government transfers (mainly cash transfers but can include food transfers where applicable). *Post-fiscal income* is defined as disposable income plus indirect subsidies minus indirect taxes (e.g., value added tax, sales tax, etc.). *Final income* is defined as post-fiscal income plus government in-kind transfers in the form of free or subsidized services in education, health, and housing minus co-payments or user fees.[31] These income concept definitions are summarized in Diagram 1. The results presented in the main text do not include inequality measures for Final Income. They are included in the Statistical Appendix, available upon request.

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[26] For more details on concepts and definitions, see Lustig and Higgins (2013).

[27] Market income is sometimes called primary income.

[28] Taxes include non-pension social security contributions in the benchmark analysis and all social security contributions in the sensitivity analysis.

[29] In the case of Bolivia the results with autoconsumption are specious (e.g., Bolivia ends up with the same distribution of income as Uruguay and a lower rural poverty than Mexico) so we opted to not use them.

[30] Since here we are treating contributory pensions as part of market income, the portion of the contributions to social security going towards pensions is treated as "saving."

[31] One may also include participation costs such as transportation costs or foregone incomes because of use of time in obtaining benefits. In our study, they were not included.

DIAGRAM 1 – DEFINITIONS OF INCOME CONCEPTS: A STYLIZED PRESENTATION
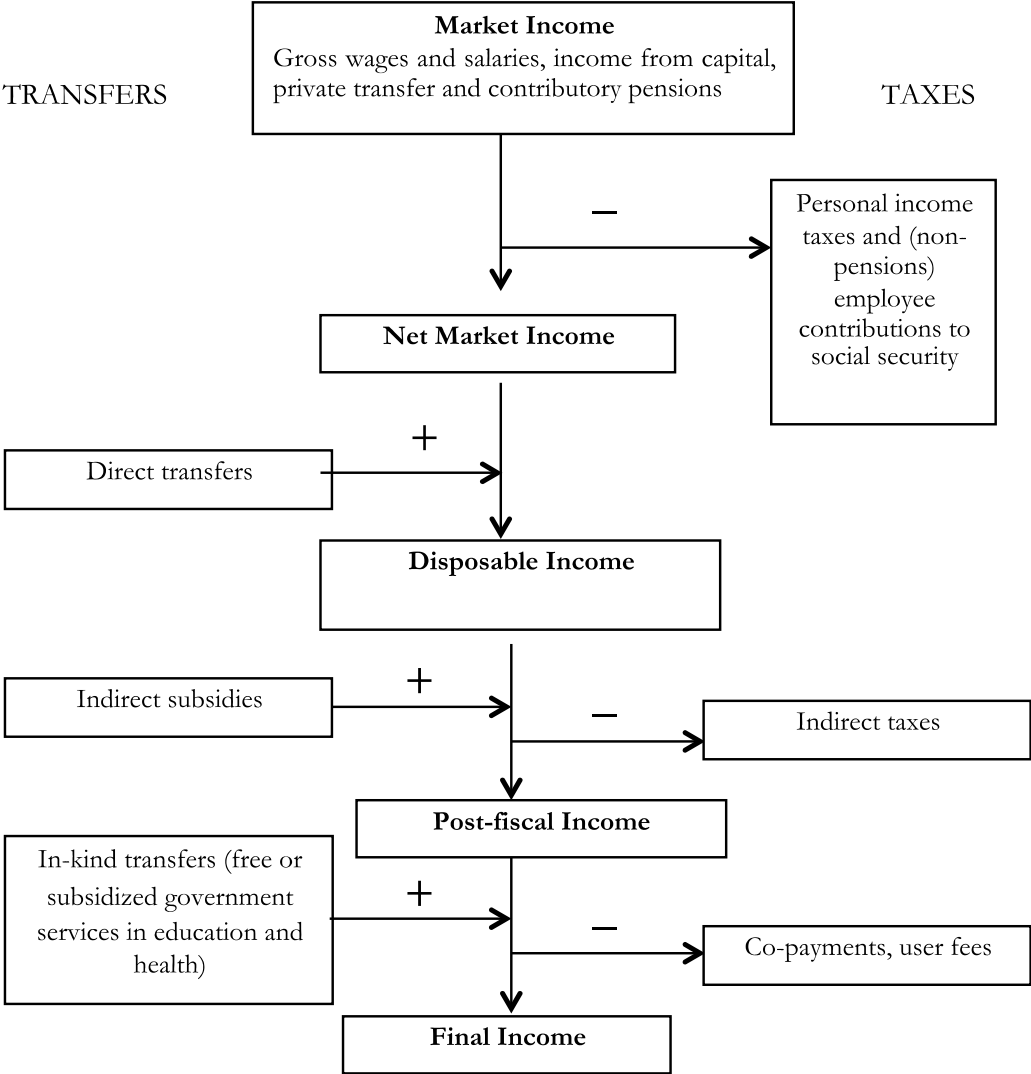
Source: Lustig and Higgins (2013).

In the fiscal incidence literature, pensions from contributory systems have been sometimes treated as part of market income and other times as government transfers. Arguments exist both for treating contributory pensions as part of market income because they are deferred income (Breceda, Rigolini, and Saavedra, 2008; Immervoll et al., 2009) and for treating them as a government transfer, especially in systems with a large subsidized component (Goñi, López, and Servén, 2011; Immervoll et al., 2009; Lindert, Skoufias, and Shapiro, 2006; Silveira et al., 2011). Since this is an unresolved issue, in our study we defined a benchmark case in which contributory pensions are part of market income. We also performed a sensitivity analysis where pensions are classified under government transfers.[32] The principal results presented here are for the benchmark analysis.

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[32] Immervoll et al. (2009) do the analysis under these two scenarios as well.

An analysis of the effects of treating pensions as transfers is included at the end of this overview. More detailed results of this sensitivity analysis can be found in the Statistical Appendix, available upon request.

ii. Tax Shifting Assumptions

Consistent with other conventional tax incidence analyses, here we assume that the economic burden of direct personal income taxes is borne by the recipient of income. The burden of payroll and social security taxes is assumed to fall entirely on workers. Consumption taxes are assumed to be shifted forward to consumers. These assumptions are strong because, in essence, they imply that labor supply is perfectly inelastic and consumers have perfectly inelastic demands for goods and services. In practice they provide a reasonable approximation.[33]

Evasion of direct income and payroll taxes is taken into account in the analysis by assuming that individuals who do not participate in the contributory social security system do not pay income or payroll taxes (Brazil's survey includes a question on tax payments so tax evasion is assumed to be as reported in the survey). In the case of direct taxes (simulated using 2010 tax legislation), it was assumed that workers and self-employed in firms with less than 5 employees did not pay this tax. In the case of indirect (consumption) taxes, assumptions to take evasion into account varied. In Bolivia, it was assumed that purchases in informal sector establishments avoid indirect taxes both in urban and rural areas, but the rest of rural purchases include indirect taxes. In Brazil, the indirect tax rate for each type of good or service was obtained from a secondary source that estimated the effective rates taking into account evasion and indirect effects, but not the distribution of this evasion (Siqueira et al, 2010). In Guatemala, unprocessed food in rural areas was assumed not to pay VAT; purchases in urban informal markets were also assumed not to pay VAT.[34] In Uruguay, the legal rate of VAT was applied to every purchase regardless of place of purchases or region because evasion of such taxes is very small. Thus for Brazil and Uruguay, this analysis may thus overestimate the impact and regressivity of indirect taxes. Taking into account informality in this analysis may also be more important in some countries than in others, depending on the actual extent of informality. Care must be taken in comparing the results for post-fiscal incomes.

iii. Incidence of Public Services

The approach to estimate the incidence of public spending on education and health followed here is the so-called "benefit or expenditure incidence" or "government cost" approach. In essence, we use per beneficiary input costs obtained from administrative data as the measure of average benefits. This approach, also known as the "classic" or "non-behavioral approach," amounts to asking the following question: how much would the income of a household have to be increased if it had to pay for the free or subsidized public service at full cost? The paper presents the results for coverage of tertiary education by income category and ethnic-racial groups only. The whole array of results for education and health are in the Statistical Appendix, available upon request.

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[33] For example, Martinez-Vazquez (2008, p. 123) finds that "…the results obtained with more realistic and laborious assumptions on elasticities tend to yield quite similar results."

[34] For more details, see Cabrera et al. (2014).

iv. Allocating Taxes and Transfers at the Household Level

Information on direct and indirect taxes, transfers in cash and in-kind, and subsidies cannot always be obtained directly from household surveys. When it can be obtained, we call this the *direct identification method*. When the direct method is not feasible, one can use the inference, simulation, imputation methods, or an alternate source. As a last resort, one can use secondary sources.[35] The specific method used for each category of taxes and transfers in each country study is available upon request. The *direct identification* method was the method most frequently used, especially for cash transfers. Direct personal income taxes and indirect consumption taxes were simulated (including assumptions for evasion) in all cases except for direct taxes in Brazil. As discussed above, in-kind transfers were imputed using the government cost approach.

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[35] The methods one can use to allocate taxes and transfers are described in detail in Lustig and Higgins (2013).

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WHAT IS CEQ?

Led by Nora Lustig since 2008, the Commitment to Equity (CEQ) project is an initiative of the Center for Inter-American Policy and Research (CIPR) and the Department of Economics, Tulane University, the Center for Global Development and the Inter-American Dialogue. The project's main output is the CEQ Assessment, a methodological framework designed to analyze the impact of taxation and social spending on inequality and poverty in individual countries. The main objective of the CEQ is to provide a roadmap for governments, multilateral institutions, and nongovernmental organizations in their efforts to build more equitable societies.

COMMITMENT TO EQUITY

The CEQ logo is a stylized graphical representation of a Lorenz curve for a fairly unequal distribution of income (the bottom part of the C, below the diagonal) and a concentration curve for a very progressive transfer (the top part of the C).