THE EFFECTS OF BRAZIL'S HIGH TAXATION AND SOCIAL SPENDING ON THE DISTRIBUTION OF HOUSEHOLD INCOME

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COMMITMENT TO EQUITY

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ABSTRACT

Relative to other countries in Latin America, Brazil has high rates of taxation and large social spending. We estimate the redistributive effect of fiscal policy on income distribution and poverty in Brazil using household survey data that contain detailed information about many labor and non-labor income sources, direct taxes paid, contributions to the pension system, transfers received, use of public education and health services, and consumption. The rich detail of our data set allows us to single out the effects of each direct tax and transfer without simulating taxes or benefits. On the spending side, we find that although Brazil has some well-targeted anti-poverty programs, a large portion of direct transfer beneficiaries are non-poor and inequality and poverty reduction are low relative to Brazil's spending. On the tax side, indirect taxes paid by the poor often surpass the benefits they receive.

Keywords: fiscal policy, poverty, inequality, Brazil.

JEL: D31, H22, I14

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1. INTRODUCTION

Historically, Brazil has had one of the highest levels of inequality in the world; in 1989, for example, Brazil had a Gini coefficient of 0.63, making it the second most unequal country in the world, narrowly behind Sierra Leone (Ferreira, Leite, and Litchfield 2008). Over the last decade, however, inequality has been falling in Brazil, as in other countries in Latin America (Lustig and López-Calva 2010). Indeed, inequality has fallen in Brazil in every year since 2001.[1] The recent decline is largely due to increased public cash transfers (Barros et al. 2010) and a more equal distribution of educational attainment resulting from expanded access to education in the 1990s (Gasparini and Lustig 2011). Social spending has become both larger and more progressive (Silveira et al. 2011). Poverty has decreased in every year since 2003—despite the recent recession—regardless of whether poverty is measured by the headcount index, poverty gap index, or squared poverty gap index.[2] Brazil's conditional cash transfer program Bolsa Família is very effective at reducing poverty (Soares 2012), especially in rural areas (Higgins 2012).

Our goal is to estimate the redistributive effect of fiscal policy in Brazil using the Pesquisa de Orçamentos Familiares (POF), 2008-2009. In particular, we estimate the effects of taxation (direct and indirect) as well as cash transfers and in-kind benefits on income distribution and poverty. The rich detail of our data set allows us to single out the effects of each direct tax and transfer without needing to simulate taxes or benefits. This has the advantage that unlike incidence studies based on microsimulation models, our study is based on what individuals actually pay and receive (assuming they report correctly), rather than what tax and program rules dictate they should pay.

Recent incidence analyses for Brazil include Immervoll et al. (2009), Nogueira, Siqueira, and Souza (2011), and Silveira et al. (2011). The first two use a different data set, the Pesquisa Nacional de Amostra por Domicílio (PNAD)—which has no information on taxes or contributions and very limited information about cash transfers—in combination with tax/benefit microsimulation models. As a result, they measure the incidence of the fiscal system according to its rules, rather than in practice. There are many reasons that the incidence of the fiscal system could be different in practice than in theory, such as evasion, exclusion, and leakages. Silveira et al. (2011) use the same data set that we do, but their analysis has a different treatment of social security payments and indirect taxes. In particular, they treat social security pensions as a government transfer, while in our main analysis we treat them as part of market income; we also include a sensitivity analysis in which they are treated as a government transfer. And, contrasting with their study, we use effective indirect tax rates instead of the legal rates. According to Siqueira, Nogueira, and Souza (2010), the use of legal rates greatly overestimates the effective rate paid.

Our contribution is to undertake a comprehensive incidence analysis for Brazil, including both indirect taxes and in-kind benefits from public education and health, to assess the distributive impact of various fiscal interventions and the fiscal system as a whole. By using a consistent methodology (see Lustig, Pessino, and Scott 2012), the results for Brazil will be comparable to those of other countries. We take a neutral stance on

[1] This observation is a result of authors' calculations using micro-data from the Pesquisa Nacional por Amostra de Domicílios (PNAD); the result holds regardless of whether inequality is measured by the Gini, mean log deviation, or Theil's T index. Furthermore, following Atkinson (1969), we can state that inequality was unambiguously lower in 2011 than in 2001 using any inequality measure that reflects a social welfare function that is an additively separable and symmetric function of individual incomes, since the Lorenz curve for 2011 Lorenz dominates that of 2001 and mean real income was higher in 2011.

[2] Headcount rates over the period 1995-2011 are available from IPEA (2012) and poverty gap and squared poverty gap indices over the period 1981-2009 from SEDLAC (sedlac.econo.unlp.edu.ar).

the treatment of contributory pensions, a matter on which there is no agreement in the literature, by presenting results with pensions treated as part of market income (hereafter called the benchmark scenario) and a sensitivity analysis with them treated as a government transfer.

Our results show that in comparison to the other countries included in this issue, Brazil has relatively high taxation and spending, but poor targeting of direct transfers overall, and low inequality and poverty reduction relative to its spending. Some programs, such as Bolsa Família and Benefício de Prestação Continuada, are well-targeted, but they make up a small share of social spending. Others, such as unemployment benefits and special circumstances pensions, are large and progressive only in relative terms. While public health spending is progressive in absolute terms for each type of care, tertiary education spending is almost neutral in relative terms, indicating that the better-off receive most of the benefits.

Overall, direct taxes and transfers reduce the Gini by 6 percent, and in-kind transfers are particularly equalizing: the reduction between the market income and final income Ginis is 19 percent.[3] Although Brazil's market income Gini is substantially higher (by at least 5 percentage points) than that of any of the other countries included in this special issue, its final income Gini is almost identical to Peru's. Indirect taxes have a deleterious effect on post-fiscal income and often result in post-fiscal income poverty being higher than market income poverty.

The paper is organized as follows. The next section describes the social spending and taxation systems in Brazil. Section 3 describes the data used as well as the methodology, focusing on aspects of the methodology that are unique to Brazil. Section 4 summarizes the mains results of our incidence analysis. The main conclusions and policy recommendations are presented in section 5.

2. SOCIAL SPENDING AND TAXATION IN BRAZIL

i Social Spending

Social spending as defined in the benchmark scenario accounts for 16 percent of GDP in Brazil. This figure includes social assistance (direct transfers and other social assistance spending), health spending, and education spending and includes spending at the federal, state, and municipal levels. If we also include spending on contributory pension payments as part of social spending, as is often done, social spending is 25 percent of GDP.[4] Direct transfers include conditional cash transfers programs, non-contributory pensions, food transfers, unemployment benefits, special circumstances pensions, and others. In-kind transfers are benefits received from the universal free public education and health systems. The main programs are described below, and their budget sizes are given in Table 1.

Bolsa Família, Brazil's flagship conditional cash transfer program, transfers cash to eligible families in exchange for complying with certain conditions. Eligible families are poor families with children less than

[3] The difference between the market income Gini and disposable income Gini, relative to the market income Gini, is (0.574-0.542)/0.574 = -0.055, or a 6 percent decrease. The difference between the market income Gini and final income Gini, relative to the market income Gini, is (0.574-0.464)/0.574 = -0.192, or a 19 percent decrease. See table 3.
[4] See table 1 for the sources of the various components of social spending.

eighteen years of age or with pregnant women, and all extreme poor (the latter group is regardless of having children). Eligibility is determined through partially-verified means testing; households with income below the cut-offs are incorporated into the program. Income is self-reported and partially verified by cross-checking it against formal sector employment databases and other social program databases. Families in the program have an electronic card they can use to withdraw their monthly transfer at ATMs. The conditions are pre-natal and post-natal care sessions for pregnant women, adherence to a calendar of vaccinations for children ages zero to five, and a minimum level of school attendance for children ages six to seventeen. There are no conditions for the "fixed benefit" given to extremely poor households. The average monthly benefit in 2009 was approximately 95 reais per month ($1.82 PPP per day) per beneficiary family, both according to the Ministry of Social Development and household survey data (Souza, Osório, and Soares 2011). There were 41.2 million individuals living in beneficiary families in 2009 (MDS 2011).[5]

Benefício de Prestação Continuada (Continued Payment Benefits, BPC) is a non-contributory pension program which provides a monthly monetary transfer of one minimum salary (465 reais per month [US$8.83 PPP per day] in 2009) to elderly poor or incapacitated poor. Elderly means sixty-five years old and older, and incapacitated is determined by doctors based on ability to work. In 2009, there were 3.2 million beneficiaries (SAGI and MDS 2012).

Unemployment insurance is funded by taxes on employers (PIS and PASEP; see description below) through the Fundo de Amparo ao Trabalhador (Worker's Assistance Fund). Eligibility requirements include working continuously for at least six months prior to the layoff and not receiving BPC. The benefit varies according to worker's salary, but it ranges from 1 to 1.9 minimum wages (465-884 reais per month [US$8.93-16.97 PPP per day] in 2009) with a maximum of five payments based on the duration of employment. To receive five payments, the worker must have been employed at least twenty-four of the thirty-six months preceding the layoff. There were about 8 million beneficiaries in 2009 (Ministério do Trabalho 2011).

Special circumstances pensions (Pensões and Outros benefícios) are funded by the contributory pension system, but they are considered non-contributory, as opposed to the normal retirement and disability pensions paid by the social security system (Aposentadorias and Benefício mensal ao deficiente e ao idoso; hereafter "contributory pensions"). The special circumstances pensions are paid in the case of an accident at work, sickness, or related idiosyncratic shock. They are considered non-contributory because they have low or no requirements in terms of length of time of contribution and are designed to smooth the impact of idiosyncratic shocks or are means-tested. In 2009, there were about 2.9 million beneficiaries. In the benchmark scenario, special circumstances pensions are considered a government transfer, while contributory pensions are considered part of market income. In sensitivity analysis 1, we consider contributory pensions as a government transfer along with special circumstances pensions. In sensitivity analysis 2, we consider both contributory and special circumstances pensions as part of market income.

[5] Further details about the transfer size are as follows. According to the program rules, the transfer amount was, in 2009, 22 reais per month (US$0.42 PPP per day) per child ages zero to fifteen (up to three children), and 33 reais per month (US$0.63 PPP per day) per adolescent ages sixteen to seventeen (up to two adolescents) for families with income below 140 reais per capita per month (US$2.69 PPP per day) and at least one child under eighteen or a pregnant woman (the "variable benefit"), and an additional 68 reais (US$1.31 PPP per day) for households with income below 70 reais per capita per month (US$1.34 PPP per day), regardless of whether there are children (the "fixed benefit"). For more information about the program, Soares (2012) provides an excellent overview of its history, design features, and impact.

Education in Brazil is free at all education levels, including preschool and tertiary education. There is also free public daycare provided for poor families. The large majority of Brazilians attending school are enrolled in the public system: 85 percent of elementary students, 86 percent of secondary students, and 75 percent of post-secondary students. Health care is free for all types of care: instead of a national health insurance system, as is common in many countries, Brazil has the Unified Health System (SUS in Portuguese) created by the 1988 Constitution, which guarantees access to health care to every citizen at public health facilities.

TABLE 1. BRAZILIAN SOCIAL SPENDING, 2009

Spending Component	Included in Analysis	Billions of reais	% of GDP	Notes and Source
Direct Cash and Food Transfers				
Bolsa Família (CCT)	Yes	12.5	0.4	a
BPC (Non-contributory pensions)	Yes	16.9	0.5	a
Child Labor Eradication	Yes	0.3	0.0	b
Bolsa Escola, Auxílio Gás, and other auxílios	Yes	0.4	0.0	b
Other elements of Basic Social Protection	No	2.4	0.1	b, c
Minimum Income Programs	Yes	0.1	0.0	d
Assistance from PIS/PASEP	Yes	7.3	0.2	e
Unemployment benefits	Yes	18.6	0.6	e
Professional qualification grant	No	0.1	0.0	e
Food for workers program	No	0.5	0.0	e
Scholarships	Yes	3.5	0.1	f
Basic food basket	Yes	0.0	0.0	g
Other food access programs	No	0.6	0.0	c, g
Special circumstances pensions	Yes	72.6	2.3	h
Social Assistance (not direct transfers)				
Assistance to the elderly and disabled	No	19.0	0.6	i
Assistance to children and adolescents	No	2.7	0.1	i
Community assistance	No	18.1	0.6	i
Other	No	4.3	0.1	i
Education				
Early childhood education	Yes	9.6	0.3	i
Primary education	Yes	75.1	2.4	i
Secondary education	Yes	12.0	0.4	i
Tertiary education	Yes	26.0	0.8	i
Other	Yes	46.5	1.5	i
Health				
Primary care	Yes	33.6	1.1	i
In-patient care	Yes	81.7	2.6	i
Preventative care	Yes	9.1	0.3	i
Other	Yes	41.6	1.3	i
Social Spending Analyzed (Benchmark)	**Yes**	**467.4**	**14.7**	
Total Social Spending (Benchmark)	**Part**	**515.1**	**16.2**	
Contributory Pensions				
Contributory pensions (INSS)	Yes	164.8	5.2	j
Other federal contributory pensions	Yes	53.7	1.7	c, i
State contributory pensions	Yes	56.1	1.8	i
Municipal contributory pensions	Yes	14.0	0.4	i
Social Spending Analyzed (Sensitivity Analysis)	**Yes**	**756.0**	**23.7**	

Total Social Spending (Sensitivity Analysis)	**Part**	**803.7**	**25.2**	k

Notes and sources: All spending totals include spending at the federal, state, and municipal levels, unless otherwise specificied. (a) Amount paid in transfers. SAGI and MDS (2012). (b) MDS (2011). (c) Calculated as a residual by the authors. (d) This is the total for Renda Cidadã in São Paulo state, which is the largest minimum income program. Secretaria do Desenvolvimento Social, Governo do Estado de São Paulo. (e) Ministério do Trabalho (2011). (f) Portal da Transparência, Controladora Geral da União. (g) Ministério da Agricultura, Pecuaria e Abastecimento (2009). (h) This is the total for pensões and outros benefícios from Ministério de Previdência e Assistência Social (2009). (i) Ministerio da Fazenda (2010). (j) This is the total for aposentadorias and benefício mensal. Ministério de Previdência e Assistência Social (2009). (k) This number can be compared with Brazil's total social pending as a percent of GDP according to the UN Economic Commission for Latin America and the Caribbean of 27 percent.

ii The Brazilian Tax System

There are more than eighty-five taxes in Brazil (Portal Tributário 2012). Total tax revenues were about 35 percent of GDP in 2009. Direct taxes represent 45 percent of the taxes levied by the government and indirect taxes represent 55 percent. Individuals are required to file personal income tax returns if taxable income goes above the exemption limit of one monthly minimum wage. There are exemptions for taxpayers filing jointly and dependents, as well as allowances for health insurance and educational expenses. The standard deduction is equivalent to 20 percent of the taxable income (marginal rates range from 15 to 27.5 percent). Less than 10 percent of the economically active population pays income tax. Corporate taxable income is taxed at 25 percent. In addition, businesses must pay social contribution taxes on profits (9 percent on net taxable income).

Many indirect taxes operate each with their own administering department which may be at the federal, state, or municipal level. The most important indirect tax is the Imposto sobre Circulação de Mercadorias e Serviços (ICMS), a state tax levied on the sale or physical movement of goods, freight, transportation, communication services, and electricity. Intrastate transactions are taxed at 18 percent on average, interstate transactions are taxed at 7 percent or 12 percent, and imports are taxed at a rate between 4 percent and 25 percent. Intrastate rates are determined at the state level and interstate rates are regulated by the Brazilian Senate. Communication services are taxed at a rate between 13 and 25 percent. ICMS revenue accounts for 21 percent of the tax collection in 2009. Other important indirect taxes are the COFINS (federal tax to finance the social security deficit), ISS (municipal tax on services), PIS (federal tax to finance social services for workers), and IPI (federal tax on industrial products). They correspond to 10.8, 4.1, 2.9, and 2.8 percent of total tax collection, respectively (table 2).

The Brazilian tax system is exceedingly complex and the "cascading effect" is one of its major distortions (Amaral, Olineike, and Amaral 2007). The cascading effect derives from the fact that taxes levied at the federal, state, and municipal levels compound on each other. This occurs because the taxes are applied to the final sales price of the good (including taxes), not the pre-tax sales price. About 18 percent of the collected revenue in 2003 was attributed to compounded taxes resulting from the cascading effect (Siqueira, Nogueira, and Souza 2010), and the overall cost of the distortions created by it was about 2 percent of GDP (Amaral, Olineike, and Amaral 2007).

As we are analyzing the effects of fiscal policy on income inequality and poverty, the distortions created are even more important, considering the effects of indirect taxes on consumer purchasing power. The effective rates paid on basic food products in Brazil can be especially deleterious for the poor. According to Siqueira, Nogueira, and Souza (2010), the effective tax rate on the basic food basket is 13.1 percent on average,

despite the lower ICMS rates for food. Because the poor spend a larger proportion of their income on food, they are hit very hard by the amount of indirect taxes, as shown in section 4.

TABLE 2. BRAZILIAN TAX REVENUE, 2009

Taxes	Billions of reais	% of total	% of GDP
Federal			
Income Tax (IR)	191.6	17.5	6.0
Tax on industrialized products (IPI)	30.8	2.8	1.0
Imported Goods	16.1	1.5	0.5
Tax on financial transactions (IOF)	19.2	1.8	0.6
Tax on rural properties (ITR)	0.5	0.0	0.0
Tax on bank account transactions (CPMF)	0.3	0.0	0.0
Tax collected from employers to finance social security (COFINS)	117.9	10.8	3.7
Tax to finance social services for workers (PIS)	31.8	2.9	1.0
Contribution on net profit (CSSL)	44.2	4.0	1.4
Tax on technical services (CIDE)	4.8	0.4	0.2
Fund for development and improvement of auditing (FUNDAF)	0.3	0.0	0.0
Contributions to federal pension funds	200.7	18.3	6.3
Payroll tax collected from employers (FGTS)	54.8	5.0	1.7
Others	46.9	4.3	1.5
Total Federal	759.9	69.3	23.9
State			
Tax on movement of goods and services (ICMS)	229.4	20.9	7.2
Contributions to state pension funds	20.3	1.9	0.6
Others	36.9	3.4	1.2
Total State	286.6	26.1	9.0
Municipal			
Contributions to municipal pension funds	5.6	0.5	0.2
Tax on services (ISS) and real estate tax (IPTU)	44.4	4.1	1.4
Total Municipal	50.0	4.6	1.6
TOTAL	1096.5	100.0	34.4

Source: Amaral et al (2011).

3. DATA

The data on household incomes, taxes and transfers come from the Pesquisa de Orçamentos Familiares (Family Expenditure Survey, POF), 2008-2009. This survey has national coverage, sampling 56,091 households using a two-stage stratified sample design, and is conducted approximately once every five years. It contains detailed information about many labor and non-labor income sources, direct taxes paid, transfers received, use of public education, and consumption.[6] When POF does not include questions on certain items (such as the amount of consumption taxes paid), the values are imputed following the methodologies described below. Data on the use of public health services come from the Pesquisa Nacional por Amostra de Domicílios (National Household Sample Survey, PNAD), 2008, which contains income data and a detailed supplemental health survey containing the necessary information regarding the use of public health services. PNAD 2008 has national coverage, sampling 118,138 households using a three-stage stratified

[6] For more information on the POF survey, see IBGE (2012).

sample design. The main survey is conducted annually except in census years; the health supplement, however, was only conducted in 2003 and 2008.[7] Data on government revenues and spending, which are used to scale up household survey data for the inequality (but not poverty) calculations, come from Brazil's national accounts.[8]

The amounts received in direct transfers and paid in direct taxes are directly identified from the survey. The number of Bolsa Família beneficiaries captured by the survey (7.3 million households), however, is significantly lower than the number reported in national accounts (12.4 million households).[9] Souza (2010) shows that much of this discrepancy can be attributed to the survey's sample design. To correct for this problem, we use a propensity score matching method suggested by Souza, Osório, and Soares (2011) to impute benefits to the missing 5.1 million households, selecting households who are very similar to beneficiary households but did not report receiving benefits. After applying this method, both the number of beneficiaries and the total program benefits in our data approximate the corresponding amounts in national accounts. This method has very little impact on inequality results, increases the poverty-reducing impact of direct transfers, and increases the coverage of direct transfers among the poor, compared to the results when the method is not implemented. Results without this method are available from the authors upon request.

The amounts paid in indirect taxes are not available from POF; instead we use the incidence of indirect taxes calculated by Siqueira, Nogueira, and Souza (2010) by decile, and assume that all individuals within each decile pay the same proportion of their income to indirect taxes. In preliminary results not reported here, we instead compute indirect taxes using consumption data from POF and effective tax rates calculated by Siquiera, Nogueira, and Souza (2010) for various groups of consumption items. The negative impacts of indirect taxes are even more pronounced when the amount paid by each household in indirect taxes is computed using consumption data.[10]

In-kind education benefits are equal to the average spending per student by level (early childhood development, pre-school, primary, lower secondary, upper secondary, and tertiary), which is obtained from national accounts and imputed to students who attend public school. To estimate in-kind health benefits, we take advantage of the supplement to the 2008 PNAD survey, which asks detailed questions relating to the use of health services. POF, on the other hand, has no questions that would allow us to distinguish who uses public health facilities. We first group the types of health services reported in PNAD into the three

[7] For more information on the PNAD survey, see IBGE (2008).

[8] For the precise sources of the components of social spending, see table 1. On the revenue side, the source of the total for direct taxes is Ministério da Fazenda (2010) and it includes income taxes paid by employers. The source of the total for employee contributions to social security is Ministério da Previdência e Assistência Social (2009) and is calculated as a residual: it is calculated as total contributions minus employer contributions minus others' contributions. The source for the total for indirect taxes is Ministério da Fazenda (2010).

[9] The number of transfer beneficiaries reported by Brazil's Ministry of Social Development is regarded to be accurate. Beneficiaries are part of the Cadastro Único (Single Registry) database; information in the database is collected by municipal agents, then sent to the Ministry of Social Development (MDS) and Caixa Econômica Federal, the government-controlled bank responsible for transfer payments. Thus, the number of beneficiaries reported by MDS matches those receiving payments through Caixa Econômica Federal. In addition, the list of Bolsa Família recipients is part of an open access database.

[10] We opt to use a secondary source for indirect taxes rather than consumption data for the time being due to the following problem: some households have reported consumption much higher than reported income, likely as a result of either income underreporting, dissaving, or borrowing. For approximately 1 percent of our sample, this results in negative post-fiscal income when indirect taxes computed by combining consumption data and effective tax rates are subtracted from disposable income.

aggregate categories for which we have spending by state in national accounts: primary care, in-patient care, and preventative care. Then, for each of Brazil's twenty-six states plus the Federal District, we calculate the average benefit received per health facility visit by dividing the total spent in that state (combining spending at the federal, state, and municipal levels) by the total number of patient visits in the past year when the patient received that particular type of care. Then the values obtained for these benefits, which vary by state and type of care, are imputed to the households that report receiving that type of health service from the Unified Health System (essentially, from a free public health facility). Our method closely follows the best practices for health benefit incidence analysis outlined in O'Donnell et al. (2008).

Since PNAD includes many questions about income as well, we are able to construct an income definition that is similar to market income. We calculate the concentration coefficients of each type of health care directly in the PNAD data set. To generate final income, however, we must impute health benefits back into the POF data, so we calculate average health benefits by groups of 5 percent of the population (vintiles), ranked by income, and add this value to each individual in the corresponding POF vintile. Thus, to construct final income we are essentially assuming that each individual receives the average benefit received by his or her vintile. While this assumption is not realistic, the point estimates of the concentration coefficients for total health spending in PNAD (where in-kind health benefits are imputed at the household level based on reported use of health services) and POF (where we impute health spending by vintile) are approximately equal and statistically not significantly different.

4. RESULTS

To assess the impact of taxes and social spending, we use a variety of measures of inequality and poverty, the concentration of benefits received and taxes paid with respect to market income, and effectiveness indicators.[11] Our results show that market income inequality is very high in Brazil, with a Gini coefficient of 0.57 (table 3). Through direct taxes and transfers, Brazil is able to reduce inequality by 6 percent, which is impressive by Latin American but not Western European standards.[12] Through all taxes and transfers (direct and indirect taxes and direct and in-kind transfers), Brazil reduces inequality by 19 percent. Our results are consistent with Immervoll et. al. (2009), who demonstrate the limited redistributive effects of fiscal policy in Brazil (using a different data set and microsimulations), despite its high level of taxation (35 percent of GDP) and high spending on social programs. Given its high spending, it is no surprise that the effectiveness indicators for Brazil's inequality reductions are low. The effectiveness indicators for direct transfers and all transfers, respectively, are 0.89 and 1.32 in the benchmark scenario. These indicate relatively low effectiveness: Brazil's direct transfer effectiveness indicator is tied with Bolivia for the lowest among all countries in this special issue.

To measure the impact of fiscal policy on poverty in a middle income country, we use the international poverty lines proposed by the World Bank of US$1.25 PPP per day (ultra poverty), US$2.50 PPP per day

[11] The effectiveness indicators measure how well governments reduce inequality and poverty per amount spent. The inequality reduction effectiveness indicator for direct transfers is defined as the proportional change between the net market and disposable income Ginis (which can be exclusively attributed to direct transfers) divided by the amount spent on direct transfers as a percent of GDP.

[12] Direct taxes and transfers reduce inequality by about one-third on average in Europe (Immervoll et al. 2006).

(extreme poverty), and US$4.00 PPP per day (moderate poverty), as well as the lines used to determine eligibility for Bolsa Família's fixed benefit (70 reais per month [$1.34 PPP per day]) and variable benefit (140 reais per month [$2.69 PPP per day]). Ultra poverty is reduced by 55 percent by direct transfers (net of any direct taxes paid), extreme poverty by 28 percent, and moderate poverty by just 14 percent. However, when indirect taxes are considered, the reduction in ultra poverty is significantly tempered, the reduction in extreme poverty nearly disappears, and moderate poverty actually *increases* when one compares market income with post-fiscal income. In other words, the number of near-poor who are pushed into moderate poverty by paying more in taxes than they receive in benefits is higher than the number of poor who escape poverty by receiving more in transfers than they pay in taxes.

TABLE 3. GINI AND HEADCOUNT INDEX FOR DIFFERENT INCOME CONCEPTS, BRAZIL 2009.

	Market Income	Net Market Income	Disposable Income	Post-fiscal Income	Final Income
Benchmark case					
Gini	0.574	0.563	0.542	0.539	0.464
Headcount index (%)					
$1.25 PPP/day	5.8%	5.9%	2.6%	3.6%	-.-
$2.50 PPP/day	15.4%	15.5%	11.0%	14.2%	-.-
$4.00 PPP/day	26.7%	26.9%	23.0%	28.1%	-.-
70 reais per month	6.5%	6.5%	3.1%	4.2%	-.-
140 reais per month	16.8%	16.9%	12.5%	15.8%	-.-
Sensitivity analysis 1: Contributory pensions as a government transfer					
Gini	0.594	0.591	0.540	0.537	0.460
Headcount index (%)					
$1.25 PPP/day	9.5%	10.0%	2.6%	3.6%	-.-
$2.50 PPP/day	21.3%	22.1%	11.2%	14.6%	-.-
$4.00 PPP/day	33.9%	35.0%	23.6%	29.0%	-.-
70 reais per month	10.4%	10.9%	3.1%	4.3%	-.-
140 reais per month	22.9%	24.0%	12.8%	16.4%	-.-
Sensitivity analysis 2: Special pensions and contributory pensions as market income					
Gini	0.568	0.558	0.542	0.539	0.464
Headcount index (%)					
$1.25 PPP/day	5.1%	5.1%	2.6%	3.6%	-.-
$2.50 PPP/day	14.0%	14.1%	11.0%	14.2%	-.-
$4.00 PPP/day	25.1%	25.3%	23.0%	28.1%	-.-
70 reais per month	5.7%	5.7%	3.1%	4.2%	-.-
140 reais per month	15.4%	15.5%	12.5%	15.8%	-.-

Source: Authors' calculations based on Pesquisa de Orçamentos Familiares, 2008-2009.

The moderate success of direct transfers at reducing poverty can be attributed to high coverage of the poor: 85 percent of the poor live in households receiving at least one direct transfer; the figure is even higher among the extreme poor (93 percent) and the ultra poor (98 percent). The fact that poverty is not reduced further despite Brazil's high spending on direct transfers is due to high leakages to the non-poor (in addition

to the deleterious effect of indirect taxes): 74 percent of total direct transfer benefits go to the non-poor. As a result, the amount remaining to transfer to the poor is spread thinly: the average transfer size of Bolsa Família, for example, is just US$0.35 PPP per day in household per capita terms.

Table 4 shows concentration coefficients and budget sizes for direct transfer programs, contributory pensions, education and health spending, and overall social spending. Bolsa Família and BPC are well targeted to the poor, with concentration coefficients of -0.58 and -0.48, respectively. However, unemployment benefits, special circumstances pensions, scholarships, and other direct transfers are progressive only in relative terms (i.e., their concentration curves with respect to market income lie everywhere between the market income Lorenz curve and the 45 degree line and, thus, are equalizing). As a result of these opposing forces, the concentration curve of direct transfers as defined in the benchmark case crosses the 45 degree line (figure 1), implying that they are progressive, but not everywhere progressive in absolute terms. The curve is initially concave and above the 45 degree line of inequality; the bottom two quintiles receive a larger share of direct transfers than their population share. However, a large chunk of transfers (relative to population shares) are concentrated at the top of the distribution as well. The shape of the curve is not surprising, as highly progressive programs like Bolsa Família are concentrated on the bottom quintile while other direct transfers are concentrated at the top.

TABLE 4. CONCENTRATION COEFFICIENTS AND BUDGET SIZES FOR SELECTED PROGRAMS, BRAZIL 2009

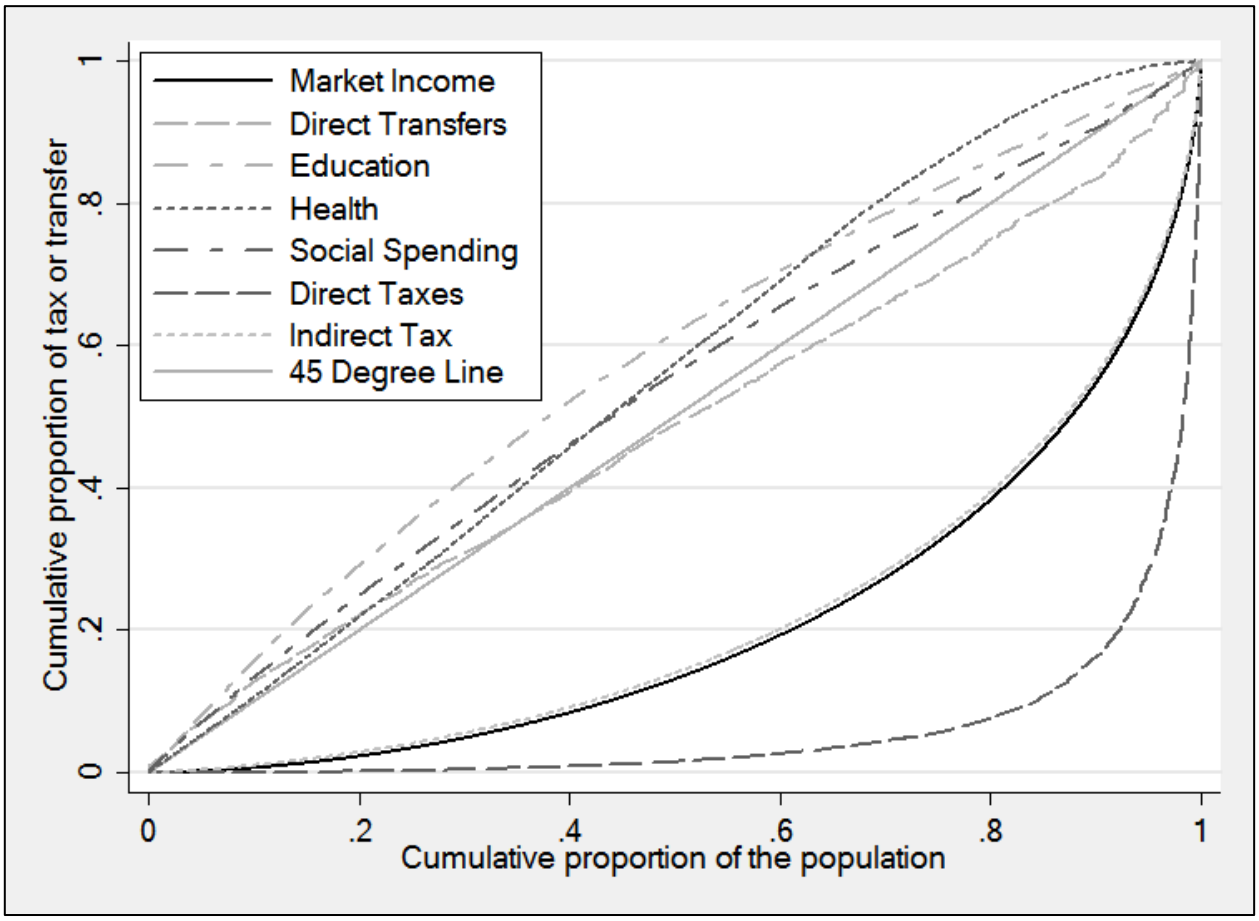
Program	Concentration coefficient with respect to benchmark case market income	Concentration coefficient with respect to sensitivity analysis 1 market income	Concentration coefficient with respect to sensitivity analysis 2 market income	Budget size (% of GDP)
Bolsa Família (CCT)	-0.58	-0.51	-0.59	0.4
BPC (Non-contributory pensions)	-0.48	-0.49	-0.48	0.5
Unemployment benefits	0.18	0.24	0.16	0.6
Special circumstances pensions	0.20	0.04	-.-	2.3
Scholarships	0.28	0.31	0.28	0.1
Other direct transfers	0.15	0.20	0.15	0.3
Contributory pensions	-.-	0.06	-.-	9.1
Direct transfers excluding special circumstances pensions	-0.22	-0.18	-0.23	1.9
Direct transfers including special circumstances pensions	0.03	-0.05	-.-	4.2
Direct transfers plus contributory pensions	-.-	0.02	-.-	13.2
Preschool	-0.33	-0.25	-0.34	0.3
Primary Education	-0.31	-0.25	-0.32	2.4
Secondary Education	-0.21	-0.16	-0.21	0.4
Tertiary Education	0.43	0.42	0.43	0.8
Education Spending	-0.15	-0.11	-0.16	5.3
Primary Care	-0.12	-0.16	-0.11	1.1
In-patient Care	-0.11	-0.16	-0.09	2.6
Preventative Care	-0.15	-0.19	-0.13	0.3
Health Spending	-0.11	-0.16	-0.10	5.2
Social spending excluding special circumstances pensions	-0.15	-0.12	-0.16	13.9
Social spending including special circumstances pensions	-0.08	-0.09	-.-	16.2
Social Spending plus contributory pensions	-.-	-0.03	-.-	25.2

Source: Authors' calculations based on Pesquisa de Orçamentos Familiares, 2008-2009.

Notes: All concentration coefficients are statistically significant from zero at the 1% significance level. The table including standard errors is available from the authors upon request.

Contributory pensions, which are considered a government transfer in sensitivity analysis 1, are progressive in relative terms with a concentration coefficient of 0.06. Total direct transfers plus contributory pensions are progressive in relative terms with a concentration coefficient of 0.02, and total social spending plus contributory pensions are progressive in absolute terms with a concentration coefficient of -0.03. Note that when we assess the progressivity of contributory pensions, we assess it with respect to sensitivity analysis 1 market income, which by definition does not include contributory pensions. As explained in Immervoll et al. (2009), many recipients of contributory pensions have low income in the absence of contributory pensions but high incomes after including them. If contributory pensions are being treated as a government transfer, the concentration coefficients should therefore be calculated with respect to pre-transfer income, which cannot include contributory pensions. The misconception that contributory pensions are "highly regressive" derives from the fact that their concentration coefficient is often calculated with respect to disposable income, which is an income concept that includes contributory pensions.

FIGURE 1. CONCENTRATION CURVES WITH RESPECT TO MARKET INCOME (BENCHMARK ANALYSIS), BRAZIL 2009



Source: Authors' elaboration based on Pesquisa de Orçamentos Familiares, 2008-2009.

Moving to in-kind benefits, education spending is progressive in absolute terms overall; its only component that is not progressive in absolute terms is tertiary education. It is worth noting that the concentration coefficient of tertiary education, at 0.43, makes Brazil one of the worst performers in Latin America in terms of providing tertiary education access to the poor. Health spending and all of its components are progressive in absolute terms. Overall social spending is progressive in absolute terms—this is a robust result that holds for the different definitions of social spending that arise in the benchmark scenario and sensitivity analyses, as shown in table 4. Although overall social spending is not *everywhere* progressive in absolute terms in all three scenarios (i.e., its concentration curve does not lie entirely above the 45 degree line), it *is* everywhere progressive over the domain of the poorest three quarters of the population in all three scenarios.

5. CONCLUSIONS

We calculate the effects of fiscal policy on income distribution and poverty in Brazil. In terms of direct transfers, Brazil has relatively high spending, poor targeting, and low effectiveness. Bolsa Família and BPC are well-targeted to the poor and highly progressive in absolute terms, but other much larger direct transfers are progressive only in relative terms. Brazil is also a relatively high spender on health and education compared to the other countries studied in this special issue. With the exception of tertiary education, all components of public health and education spending are progressive in absolute terms.

Our analysis finds a troublesome result when taking into account post-fiscal income: there is a substantial deleterious effect of indirect taxes on poverty. In many cases, the benefits of transfer programs are offset by indirect taxes. A reform of the indirect tax system, especially with respect to taxes on basic food items, must be a high priority.

Following Musgrave's (1959) assertions with respect to distribution, Brazil is moving in the right direction by decreasing income inequality through fiscal policy. However, despite the fact that transfer payments increased significantly recently, they were associated with an even higher level of taxation. Taxation as proportion of GDP increased by more than 50 percent in Brazil over the last two decades (Amaral et al. 2011). In addition, according to García-Peñalosa and Turnovsky (2011), the consequences of tax increases on income distribution depend mainly on how the resulting revenues are spent. The elasticity of labor supply also plays a crucial role, reinforcing or offsetting the redistributive impact of taxes. In particular, the dynamics of the response of income inequality depends on two effects: changes in labor supply and changes in the distribution of capital and factor prices during the transition to the new steady state. They can move in opposite directions, so the response to fiscal policy is nonmonotonic. Further research would require analysis on the dynamic effects of Brazil's redistributive policies on labor supply.

Finally, our policy recommendations include: (1) a reform of the indirect tax system, especially regarding basic food taxes—surprisingly enough, Brazil's President Dilma Rouseff recently vetoed a proposal to end or drastically reduce taxes on basic food items;[13] (2) expansion of Bolsa Família; (3) an increase in Bolsa Família and BPC's eligibility cut-offs to include the ineligible poor; and (4) increased access to tertiary education for the poor.

[13] The presidential veto was published by the Diário Oficial da União (Imprensa Nacional, Presidência da República) on September 18, 2012; section 1, number 181, pages 12-13.

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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).