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World Development Vol. 76, pp. 263–279, 2015

http://dx.doi.org/10.1016/j.worlddev.2015.07.008

Fiscal Policy, Inequality, and the Ethnic Divide in Guatemala

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Summary. — Guatemala is among the most unequal countries in Latin America. It also has the highest incidence of poverty, especially for the indigenous population. In this paper we do a fiscal incidence analysis using the 2009–10 household survey ENIGFAM. The results show that fiscal policy does very little to reduce inequality and poverty overall and along ethnic lines. Persistently low tax revenues are the main limiting factor. Even worse, tax revenues are not only low but also regressive and burdensome on the poor. Consumption taxes are high enough to offset the benefits of cash transfers: poverty after taxes and cash transfers is higher than market income poverty.

Key words — inequality, poverty, ethnic divide, fiscal incidence, taxes and social spending, Guatemala

1. INTRODUCTION

Guatemala is a lower middle-income country with one of the most unequal distributions of income and one of the highest poverty rates in Latin America. In 2011, while the (unweighted) average Gini coefficient for Latin America was 0.487, the Gini for Guatemala was equal to 0.522 (Figure 1). Although over the last two decades poverty has declined, the pace was slow. [1] Moreover, since the mid-2000s, poverty rose: in 2011, the headcount ratio was 40.7%, up from 33.4% in 2006. [2] According to UNDP (2014), the Human Development Index in 2013 (0.628) was far below the Latin American and Caribbean average (0.74) and only above those of Haiti, Honduras, and Nicaragua. Guatemala had the lowest level in the Human Opportunity Index from a sample of 19 countries in Latin America (De Barros, Ferreira, Molinas, & Saavedra, 2009, p. 10). Sahn and Younger (2006) found that Guatemala had the most unequal distribution of education and health of a sample of six Latin American countries.

Poverty and low levels of human development are highly correlated with ethnicity: the indigenous population is much poorer and has much lower levels of human development than the nonindigenous group. With an incidence of poverty of 58.6%, an indigenous individual is more than twice as likely of being poor than a nonindigenous one. [3] Although the indigenous population represents around 40% of the total population, 60% of the extreme poor are indigenous. [4] Poor Guatemalan families are predominantly indigenous and have experienced centuries of exploitation and exclusion, with weak influence over local and national decision-making (de Ferranti *et al.*, 2003). The poverty gap between indigenous and nonindigenous individuals is highly correlated with the disparities in educational attainment by ethnicity. [5]

The profound ethnic divide was a fundamental cause of a long and protracted civil war that plagued Guatemala for 36 years. In 1996 – after more than 200,000 deaths and "disappearances" and more than half a million displaced individuals – the Guatemalan Peace Accords were signed (Archdiocese of Guatemala, 1999; Historical Clarification Commission, 1999). The Peace Accords committed the country to raise the tax burden by 50% – that is, to reach 13.2 of GDP – during 1996–2002, and to gradually increase the tax burden further subsequently. Twenty years later, not even the initial goal has been reached. In spite of the repeated attempts to introduce revenue raising tax reforms, the tax burden continues to be one of the lowest in Latin America. While in Latin America the average tax burden (including social security contributions) was around 24.7% in 2013, in Guatemala it was only 13.0% (ECLAC, 2015). In particular, personal income taxes were a meager 0.4% of GDP in Guatemala while the average for Latin America equaled 2.5% in 2013.

Fiscal policy in Guatemala has been mainly concerned with macroeconomic stability: fiscal deficits and public indebtedness have been relatively and consistently low (about 2.5% of GDP and around 24 of GDP from 2010 to 2014, respectively, according to data of Ministry of Finance of Guatemala). Social equity concerns, however, have fallen between the cracks. While there have been occasional attempts to expand social spending to benefit the most disadvantaged groups – i.e., the rural and indigenous population, [6] resources devoted to this end remain low. Social spending (including contributory pensions) is around 7.4 of GDP in Guatemala – one of the lowest in Latin America (ECLAC, 2015). With such low levels of social spending and a high reliance on indirect taxes, tax-based redistribution in Guatemala is bound to be limited.

In addition to low revenues, the government faces a series of rigidities embedded in the Constitution or in its interpretation given by the justice system. These constraints make it very difficult to increase social spending or to change its composition (Barreix, Bes, & Roca, 2009, p. 33). According to the Ministry of Finance, in 2014, about 88% of fiscal revenues were pre-committed to specific spending lines such as the public sector wage bill, debt service, municipalities, the justice system,

* The study for Guatemala is part of the Commitment to Equity (CEQ) project. Led by Nora Lustig since 2008, the CEQ is a joint initiative of the Center for Inter-American Policy and the Department of Economics, Tulane University and the Inter-American Dialogue. The study for Guatemala has been partially funded by the Gender and Diversity Division of the Inter-American Development Bank. For their very useful comments, the authors are grateful to the anonymous reviewers and to the participants of the conference "Commitment to Equity: Fiscal Policy and Income Redistribution in Latin America" held at Tulane University, October 17–18, 2013. Final revision accepted: July 9, 2015.

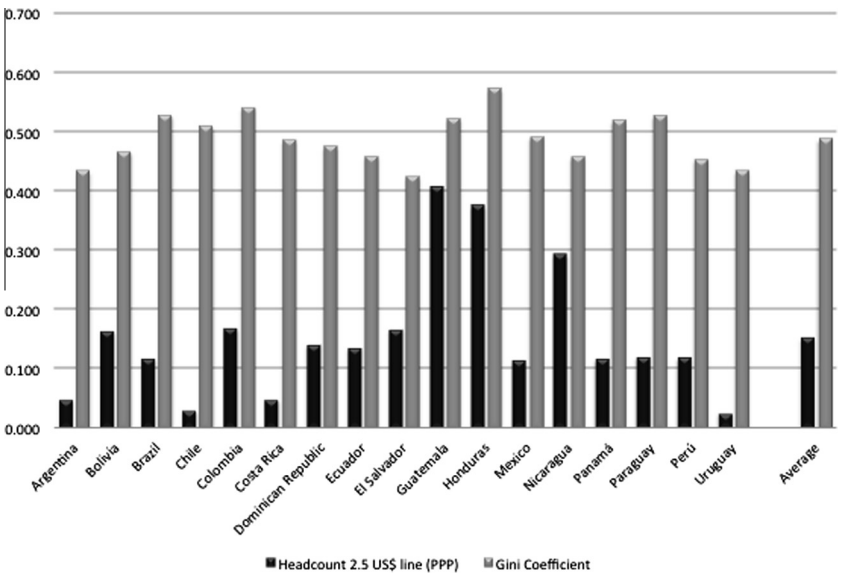

Figure 1. *Poverty and inequality in some Latin America countries. Source: ECLAC (2015). Poverty is expressed as a fraction of total population.*

tertiary education, support to sports (Alianza Técnica de Apoyo al Legislativo, 2014). [7]

Among the attempts to help the poor, escape the vicious cycle of poverty, Guatemala has been no exception to the pervasive trend in Latin America of incorporating targeted cash transfers programs to the social policy menu designed to reduce poverty and social exclusion. [8] In 2006, the government launched the noncontributory pension known as the Economic Assistance Program for the Elderly. [9] Designed to provide a minimum living standard for the elderly poor population (over 65 years old) who are not beneficiaries of contributory pensions. Eligible individuals receive a transfer of close to $50 dollars per month. By 2010, the program had around 103,000 beneficiaries or, 18.6% of target population (Acción Ciudadana, 2013). In 2010, spending on this program represented 0.1% of GDP.

In 2008, the government launched the conditional cash transfer program "My family progresses" [10] (MIFAPRO) as part of an attempt to tackle social inequities more forcefully. The main objective of MIFAPRO is to increase the human capital of younger generations in order to break the intergenerational transmission of poverty. The program provides two cash transfers, both targeted to poor women. A monthly health and nutrition cash transfer of approximately $19 current dollars in 2010 is given to mothers of children under the age of six, to pregnant women and breast-feeding mothers, under the condition that they attend health centers to receive a basic package of nutritional and preventive maternal-child health care services. An education grant of the same magnitude is given to poor families with at least one child between 6 and 15 years old attending primary public school or preschool. Families can receive both transfers (approximately $38 dollars). Spending on this program equaled 0.4% of GDP in 2010. By 2011, the number of children from age 0 to 15 years old that benefited from this program equaled about 2,420,000 (living in 887,972 beneficiary households) (Secretaría de Planificación y Programación de la Presidencia, 2012). A small program to start with, spending on this program has fallen since 2010, reducing its ability to make an impact on the extreme poor. By 2013, the budget for MIFAPRO has been gradually reduced to only 0.1% of GDP.

Given the constraints imposed by a limited budget and a hand-tying legal framework, how much redistribution, poverty reduction, and reduction of the welfare gap between the indigenous and nonindigenous population is accomplished through fiscal policy? In particular, has the introduction of targeted cash transfers made a difference? If the answer is affirmative, how significant that difference is? We respond to these questions by applying a standard fiscal incidence analysis to examine the impact of taxes and social spending on income inequality and poverty for the population as a whole and by ethnicity. In particular, we analyze the impact of fiscal policy on the income gap between the indigenous and nonindigenous population and examine how equitable the use of public health and education services is across income categories and between groups. The fiscal incidence method we apply here is described in detail in Lustig and Higgins (2013) and was applied to several countries in (Lustig, Pessino, & Scott, 2014). Our incidence analysis uses the National Survey of Family Income and Expenditures 2009–2010 (or, ENIGFAM, for its Spanish acronym).

Known in the literature as the "accounting approach" because it ignores behavioral responses and general equilibrium effects, incidence analysis of public spending and taxation is designed to respond to the question of who benefits from government transfers and who ultimately bears the burden of taxes in the economy. With a long tradition in applied public finance, tax, and benefit incidence analysis is an efficient instrument to evaluate whether fiscal policy has the desired effect on poverty and inequality (Martínez-Vazquez, 2008; McKay, 2002; Musgrave, 1959; Pechman, 1985). The increasing availability of household surveys containing sufficient information to assess the effects of fiscal policy on incomes and their distribution has increased considerably the number of empirical studies in this area. A literature review by Chu, Davoodi, and Gupta (2000) covering 55 developing country studies, for example, finds that while public spending in cash transfers, education and health are progressive (i.e., equalizing), they were not sufficiently targeted to the poor especially in sub-Saharan Africa. Similarly, Lustig *et al.* (2014) find that the combined effect of social spending and taxation is equalizing but not always poverty reducing for six Latin American countries. [11]

There are a few existing fiscal incidence studies that show results for Guatemala. These include (in chronological order by date of publication): Bahl, Wallace, and Martínez-Vazquez (1996), Hicks and Lee (1997), Lindert, Skoufias, and Shapiro (2006), Barreix *et al.* (2009), and Cubero and Hollar (2010). The studies completed prior to the 2000s are of little relevance for comparison purposes since they use information that is dated. In particular, they use information that does not incorporate the potential impact of the fiscal and social commitments stemming from the Peace Accords. Of the three post-Peace Accords studies, Cubero and Hollar (2010) rely on secondary sources that could not be found and, hence, we do not review the results here.

Lindert *et al.* (2006) measure the extent to which spending on social assistance and social insurance, consumption subsidies and spending on education and health favor the poor in eight Latin America and the Caribbean (LAC) countries. For Guatemala, the paper uses the National Survey on Living Conditions (ENCOVI) for 2000. The main findings are as follows. Guatemala is one of the countries with the lowest social spending in their sample; coverage of social assistance programs greatly favors the poor, but per capita benefits are very low; coverage and per capita transfers for social insurance are low overall, with benefits more concentrated in the top quintile; and, the combined effect of social assistance and social insurance transfers shows that per capita benefits are fairly uniform across the distribution (i.e., the concentration coefficient is close to zero).

The paper by Barreix *et al.* (2009) examines the impact of fiscal policy (spending and taxation) on inequality. It is based on a collection of studies for Central America and the Dominican Republic written by different authors who followed a common methodology. [12] As in the case of Lindert *et al.* (2006), the source used for the incidence analysis was ENCOVI 2000. The incidence analysis covers direct and indirect taxes and spending on education and health on inequality but it does not include indirect subsidies. It does not include direct cash transfers programs because they were nonexistent in 2000. This study finds that fiscal policy, as a whole is equalizing but not pro-poor: i.e., per capita benefits do not decrease with income. Social spending – comprised mainly of education – is somewhat progressive. The tax system is slightly regressive, a result driven by the regressivity of the Value Added Tax. [13]

In contrast to previous studies, since our incidence analysis uses the household survey ENIGFAM 2009–10, it incorporates information on the impact after the two cash transfers programs were put in place. Adding the effect of these targeted social programs in the fiscal incidence analysis is important because their combined budget was equal to 0.5% of GDP in 2010, while it was zero pre-2006. Per our results summarized below, these programs appear to have increased the redistributive effect. Their impact, however, is too small to change the daunting welfare gaps between the indigenous and nonindigenous groups and the rural and urban population.

Although the data from ENIGFAM were collected in the midst of the global financial crisis (between July 2009 and June 2010), total public spending and social spending in particular were at their peak in 2010. Social spending (cash transfers, health and education without contributory pensions) as a share of GDP increased from 5.1% in 2008 to 5.5% in 2010. The main cash transfers program (MIFAPRO) launched in 2008 reached its peak in 2010 when spending on the program was around 0.4% of GDP. Thus, we do not think that the onset of the global crisis affected the redistributive capacity of the state in any significant way. On the contrary, the fiscal incidence results are probably a reflection of Guatemalan redistribution at its peak. More public spending combined with the drop of fiscal revenues increased the fiscal deficit during 2008–10 by almost two percentage points. The higher fiscal deficit was financed through borrowing and the public debt to GDP ratio increased from 19.9% in 2008 to 24.0% in 2010. These developments curtailed the government's fiscal space and have affected its redistributive capacity in the aftermath of the crisis. For example, spending on the CCT program "My Family Progresses" declined from about $142 million dollars in 2010 to approximately $50 million dollars in 2013.

The main contribution of this paper is threefold. First, ours is the first comprehensive analysis of the impact of fiscal policy on the distribution of income that incorporates the effect of the two targeted cash transfer programs introduced to improve welfare levels of the most disadvantaged groups – the indigenous and rural population. Second, this is the first study for Guatemala that measures the impact of fiscal policy not only on inequality, but also on poverty. Third, because our analysis distinguishes individuals by their ethnicity and location, we can assess the impact of fiscal policy not only on inequality and poverty overall but its effect on closing the indigenous *vs.* nonindigenous and rural *vs.* urban welfare gaps. In particular, we assess the effect of direct taxes, cash transfers, consumption taxes and subsidies, and public education and health spending on inequality, poverty, and coverage of public services in education and health not only for the population as a whole but also for indigenous-nonindigenous and rural–urban groups. Because we use a common methodology (Lustig & Higgins, 2013), we can compare the results for Guatemala with those of countries with similar income per capita such as Bolivia (Paz-Arauco *et al.*, 2014) and El Salvador (Beneke, Lustig, & Oliva, 2015). [14]

Unsurprisingly, given the small size of the social spending budget, we find that the tax and transfer system does little to reduce inequality and the ethnic and rural–urban divide. The Gini coefficient after direct taxes and cash transfers declines from 0.551 to 0.546, a mere 0.005 points. When the monetized value (at government cost) of education and health services are incorporated, the decline equals 0.024, still very small. The most recent comprehensive fiscal incidence study on Guatemala by Barreix *et al.* (2009), however, found a considerably smaller reduction in the Gini coefficient: just of .0053 points. This seems to indicate that fiscal policy became more redistributive in 2010 than it was in 2000. The difference is probably due to two main factors: the introduction of the two targeted cash transfers programs mentioned above and the expansion of education and health services (and their usage) to the indigenous and rural population. When compared to Bolivia and El Salvador, two countries whose income per capita is similar to that of Guatemala, the tax and transfers system is more redistributive in the first two. [15]

Although direct taxes are somewhat progressive, their impact is very limited because the share of direct taxes to GDP is painstakingly low. In contrast, consumption taxes are outright regressive and income inequality after direct and consumption taxes and direct transfers (which we call post-fiscal income) is the same as market income inequality. Even worse, consumption taxes are so burdensome for the poor that they more than offset the benefits of the well-targeted cash transfers. As a result, the post-fiscal headcount ratio is practically the same as market income poverty. The headcount ratio for market income equals 40.3% (with the US$2.50 ppp international poverty line). With cash transfers (and direct taxes), it declines to 39.1%. However, consumption taxes bring the incidence of poverty back to 40.9%.

The average market income per capita of the nonindigenous population is more than twice as high as that for the indigenous population. Taxes and transfers do almost nothing to change this dramatic difference in average living standards between the two ethnic groups. After all taxes and transfers are considered (including the monetized value of education and health), the ratio of per capita income between nonindigenous and indigenous individuals decreased from 2.13 to 2.03. While the conditional cash transfers program *Mi Familia Progresa* is pro-poor and pro-indigenous, the size of the per capita transfer is too small to make a significant difference. Education spending is not pro-poor or pro-indigenous enough and health spending reaches only a fraction of the poor. Inequality of opportunity (i.e., inequality due to circumstances such as gender, ethnicity and location) is not reduced at all.

The paper is organized as follows. Section 2 briefly describes the tax and transfer system. The methodology and data are discussed in Section 3. Section 4 presents the main results. Conclusions are in Section 5.

2. GUATEMALA: PATTERNS OF GOVERNMENT SPENDING AND TAXATION

Tables 1 and 2 present public spending and tax revenues as a share of GDP for 2010 – the year of the survey used in our incidence analysis – and identify which taxes and transfer programs were included in the incidence analysis (column "IA"). Measured by its budget, the size of Guatemala's government is very small.[16] In 2010, total primary government spending (excluding interest payments) is only 13.6% of GDP, the lowest in Latin America.[17] The tax burden (including social security contributions) in the same year is only 12.2%, again it is the lowest in Latin American and the Caribbean (ECLAC, 2015).[18]

(a) *Social spending and subsidies*

At 7.4% of GDP, social spending is one of the lowest in the region. Total social spending includes direct cash transfers: the conditional cash transfer program MIFAPRO, noncontributory pensions and a few other smaller programs. Altogether, direct cash transfers represent around 0.5% of GDP.[19] In-kind transfers include social spending on education and health and are equal to 5% of GDP. Contributory pensions (which are not included in social spending) equal 0.5% of GDP.[20] Other social-spending, non-social spending, and debt servicing represent 1.4%, 6.1% and 1.5% of GDP, respectively. The fiscal incidence results presented here include direct cash transfers, education, and health which together comprise 5.5% of GDP.

(i) *Direct transfers (social assistance)*

Spending on direct cash transfers (also called social assistance) comprehends five main programs (in 2010): a conditional cash transfer (CCT) called *Mi Familia Progresa* (MIFAPRO), a noncontributory pension program called Economic Assistance Program for the Elderly (*Programa de Aporte Económico del Adulto Mayor*), a food transfer program called *Bolsa Solidaria*, two educational scholarships program called *Bolsa de estudio* and *Becas solidarias* and a small cash transfer for transportation called *Bono de Transporte*. From this list, the most relevant programs are MIFAPRO and the noncontributory pension. Together they represent 0.5% of GDP; the rest are very small programs that altogether amount to 0.1% of GDP.

Table 1. *Guatemala: Government spending by category (2010) (as d% of GDP)*

Description	% of GDP	
	Total	IA[a]
Gross National Income per capita (PPP US$)	4,773	
Total Government Spending[b]	15.0	
Primary Government Spending[c]	13.6	
Social Spending (including contributory pensions)[d]	7.4	6.0
Social Spending (w/o contributory pensions)[e]	6.9	5.5
Total Cash Transfers	0.5	0.5
Cash Transfers (excluding all Pensions)	0.4	0.4
Noncontributory Pensions[e]	0.1	0.1
Total In-kind Transfers[f]	5.0	5.0
Education	2.6	2.6
of which tertiary education	0.3	0.3
Health	2.4	2.4
Contributory[g]	1.1	1.1
Noncontributory	1.3	1.3
Other Social Spending[f]	1.4	0.0
Contributory Pensions	0.5	0.5
Non-Social Spending	4.2	0.3
Indirect Subsidies	0.3	0.3
Other Non-Social Spending[i]	3.9	0.0
Debt Servicing	1.5	0.0

Source: Ministerio de Finanzas Públicas, Superintendencia de Administración Tributaria (SAT), Banco de Guatemala, Instituto Guatemalteco de Seguridad Social and World Bank.

[a]In Incidence Analysis; [b]Total Government Spending = Primary Government Spending + Debt Services (interests and amortizations); [c]Primary Government Spending = Social Spending with Contributory Pensions + Non-social Spending; [d]Social Spending (including social contributions) = Total Cash Transfers + Total In-kind Transfers + Other Social Spending + Contributory Pensions; [e]Social Spending (w/o social contributions) = Total Cash Transfers + Total In-kind Transfers + Other Social Spending; [f]Other Social Spending includes a considerable number of small social assistance programs that were not possible identify and included in the analysis.

Table 2. *Tax revenues by category (2010)*

Category	As a% of Total	As a% of GDP	IA[a]
Total tax revenues	100	12.2	7.7
Indirect taxes	60.2	7.3	5.7
VAT	41.8	5.1	5.1
Import taxes	5.8	0.7	–
Other indirect taxes[b]	12.6	1.5	0.6
Direct taxes	26.9	3.3	0.4
Personal income	2.9	0.4	0.4
Corporate income tax	22.4	2.7	–
Other income tax	0.1	0	–
Property tax	1.6	0.2	–
Social security contributions	12.9	1.6	1.6

Source: Own calculations based on data of Ministry of Finance. *Notes:* [a]Categories included in the incidence analysis; [b]Includes Stamp Tax, Excises on Tobacco, beverages, cement, gasoline, diesel. Other indirect taxes not include in analysis were vehicles and royalties from extractive industries (mining and oil).

Launched in 2008, the objective of MIFAPRO is to increase the human capital of younger generations in order to break the intergenerational cycle of poverty. The program provides two cash transfers, both targeted to poor women. First, a monthly health and nutrition cash transfer of 150 quetzals (local currency equivalent to approximately $19 current dollars in 2010) given to mothers of children under the age of six, to pregnant women and to breast-feeding mothers, under the condition that they attend health centers to receive a basic package of nutritional and preventive maternal-child health care services; and second, an education cash transfer of around $19 dollars per month given to poor families with at least one child between 6 and 15 years old attending primary public school or preschool. Families can receive both transfers. Therefore, a family may get a cash transfer of up to 300 quetzals per month (approximately $38 dollars).

As observed in Table 1, in 2010 spending on MIFAPRO program is 0.4% of GDP. Based on the information in the ENIGFAM 2009–10, the number of beneficiaries was 2.684 million and the total amount of benefits granted by the program reached approximately $152 millions of dollars. According to these numbers, the average per capita transfer among beneficiary household is about $57 dollars per year.[21] This program covers 51% of the indigenous poor and 23% of the nonindigenous ones. The average per capita transfer for the extreme poor (i.e., individuals with income below the $2.50 ppp dollars per day) was equal to approximately of $55 current dollars per year, just 6.3% of market income of the poor population. A worrisome trend is that the program has become even smaller. Since a new government took office in 2012, the budget for MIFAPRO has been gradually reduced to only 0.1% of GDP in 2013.

Launched in 2006, the Economic Assistance Program for the Elderly (*Programa de Aporte Económico del Adulto Mayor*) was designed to provide a minimum living standard for the elderly poor population who are not beneficiaries of contributory pensions. In order to be eligible, people older than 65 years old have to apply to Ministry of Labor. If the socioeconomic status of an individual qualifies her/him to become a beneficiary of the program, he or she obtains a monthly transfer of 400 quetzals (around $50 dollars). Estimates from the ENIGFAM 2009–10 show that the number of beneficiaries was 368,825 and the total amount of benefits granted by the program reached approximately $55 millions of dollars. This program covers 22% of the elderly indigenous poor and 24% of nonindigenous ones (Table 8). The average per capita transfer for the extreme poor (i.e., individuals with income below the $2.50 ppp dollars per day) was equal to approximately of $107 current dollars per year, or 12.3% of market income of the poor population.

Other direct transfers included in the fiscal incidence analysis are: *Becas Solidarias*, which includes two types of scholarships: scholarship for students in high school and a scholarship for young people who want to learn a particular trade. Based on statistics from the Ministry of Education, in 2010 the number of beneficiaries was a little over 13,000 students. The scholarships are of around $312 dollars per year. Spending on these scholarships amounted to .01% of GDP in 2010 (or $3.9 million of current dollars).

(ii) *Price subsidies*

The most important consumption subsidies are a subsidy on electricity for households who consume less than 300 Kilowatt hour per month and a public transportation subsidy that is delivered to owners of public buses (in Guatemala City and major cities of the country). Both subsidies represent 0.3% of GDP and the beneficiaries live in urban areas. The beneficiaries of the public transportation subsidy are mainly individuals who use public transportation in Guatemala City.

(iii) *Education system*

The educational system has three levels: preprimary (age 5–6 years), primary from 1st to 6th grade (age 7–12 years) and secondary, which include lower secondary school (*básicos*) from 7th to 9th grade (age 13–15 years) and high school (*diversificado*) from 10th to 11/12th (age 16–17/18 years). The University of San Carlos of Guatemala (USAC), the sole public university, and 10 private universities provide higher education. The Technical Training and Productivity Institute (INTECAP in Spanish), a decentralized entity, provides technical training for current and prospective workers. In 2010, 53.2% of public expenditure on education went to primary education, 21.4 to secondary, 16.4 to tertiary education and 11% to pre-school.

(iv) *Public health system*

The public health system comprises two main agencies: the noncontributory system from Ministry of Public Health and Social Assistance (Ministerio de Salud Pública y Asistencia Social, MSPAS) and the Health Program from the Guatemalan Institute of Social Security (IGSS, the acronym for Instituto Guatemalteco de Seguridad Social). According to PAHO (2007), about 10% of the population had no access to any health services. Of those who had access to health services, 60% was covered by public services under MSPAS, 18% was served by IGSS and 12% used private services.

The IGSS provides health coverage to formal sector workers and their families, as well as pensions to retirees and individuals with permanent or transitory disability. Only 8% of the total population of Guatemala is affiliated to IGSS. The IGSS provides health services in only 11 of Guatemala's 22 departments, and its expenditures are disproportionately concentrated in the metropolitan area of the capital City of Guatemala. Spending on noncontributory public health, as a percentage of GDP, (1.3%) is higher than contributory health spending (1.1%); however, in per capita terms the amount is much smaller given that – per PAHO's figures – the Health Ministry provides healthcare services to a population that is more than three times larger than the population covered by the contributory system.

(v) *Social security system*

The social security system comprises the majority of social insurance programs in Guatemala, most of which are administered by the Guatemalan Institute of Social Security (IGSS). The social security system under the IGSS includes two programs: a health, maternity, and accidents insurance program called Sickness, Maternity and Accidents (or, EMA, the acronym for Enfermedad, Maternidad y Accidentes) and a pension program for Disability, Old Age and Alimony (or, IVS, the acronym for Invalidez, Vejez y Sobrevivencia). As the social security system is based on contributions from formal employees and employers, the majority of its affiliates are formal workers. By 2011, approximately 25% of the economically active population was a member of the social security system.

The public sector pension system (IGSS) is organized on a pay-as-you-go basis. The contribution rates to the pension program (IVS) are 1.83% from employees and 3.67% from employers. The contributions to the health program (EMA) are 3% from employees and 7% from employers. Overall, public and private institutions must contribute to the system at the same contribution rates, but the government has not fulfilled all its liabilities for a long time.[22] However, revenues are still above expenditures and hence, the system is not (at least not yet) subsidized by general revenues from other sources. Thus, the system was assumed to be "actuarially fair" on average and contributory pensions were treated as deferred income rather than a transfer (and contributions to old age pensions as mandatory savings and not a tax).

(b) *Taxes*

In spite of the efforts made by successive governments to introduce revenue-raising tax reforms since the Peace Accords were signed in 1996, one of the structural features of the Guatemalan tax system is the low level of tax revenues. The tax structure for 2010, the year of the survey is shown in Table 2. Total tax revenue as a percentage of GDP (including contributions to the social security system) is only 12.2%. Direct taxes comprised almost 27% of the total, while indirect taxes little over 60%. Of total direct taxes, personal income tax is only 2.9%.[23] The VAT is over 40% of total tax revenues. The VAT general rate is 12% and zero for exports. Generic medicines, certain financial services, education, low value sales of food bought in cantonal and municipal markets (value less than 100 quetzals, approximately $13 dollars) and resale of real estate property are exempt. Other indirect taxes, which include excise taxes on consumption of gasoline and diesel, beverages, tobacco, stamp tax, and cement, amount to 12.6% of total tax revenues.

3. METHODOLOGY, DATA AND ASSUMPTIONS

(a) *Methodology*

We estimate the impact of taxes and transfers on inequality and poverty by using fiscal incidence analysis. As described in Lustig and Higgins (2013), fiscal incidence analysis consists of allocating taxes and government spending to households so that one can compare incomes before taxes and transfers with incomes after taxes and transfers, where the latter may include the monetized value of free public services. The most common fiscal incidence analysis examines what is paid and received without assessing the behavioral responses that taxes and public spending may trigger. This is often referred to as the accounting approach. Although not modeled, behavioral responses can be taken into account by imbedding them in the assumptions of who bear the burden of a tax or receive the benefit of a transfer. Put simply, the accounting approach consists of starting from a pre-fiscal income and, depending on the fiscal intervention under study, allocating the proper amount of a tax or a transfer to each household or individual. If the fiscal intervention is a direct tax (transfer) and one starts the analysis from pre-tax (pre-transfer) income, the post-tax (post-transfer) income is calculated by subtracting (adding) the tax paid (transfer received).

More formally, let us define the before taxes and transfers income of unit h as I_h, and net taxes of type i as T_i. Let us define the "allocator" of tax i to unit h as Sih (or the share of net tax i borne by unit h).

Then, post-tax income of unit h, Y_h, can be defined as:

$$Y_h = I_h - \sum_i T_i S_{ih} \tag{1}$$

Although the theory is quite straightforward, its application can be fraught with complications. Most of the complications arise because actual incidence can be quite different from statutory incidence due to tax evasion or tax shifting and the data to calculate the actual incidence is incomplete or absent (Lustig & Higgins, 2013).

Following this approach, we constructed five income concepts that allow us to trace the incidence of the various taxes, transfers and subsidies: market, net market, disposable, post-fiscal, and final income (Figure 2).[24]

Market income[25] is total current income before direct taxes,[26] 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; imputed rent for owner-occupied housing; and, private transfers (remittances and other private transfers such as alimony). 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, see Lustig and Higgins (2013) for references on both sides. 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. We present results for both.

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 toward pensions.[27] *Disposable income* is equal to the sum of net market income plus direct government transfers (mainly cash transfers but can include food transfers). *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 the monetized value of government in-kind transfers in the form of free or subsidized services in primarily education and health minus co-payments or user fees.[28]

(b) *Data*

The income concepts are constructed using the 2009–10 National Survey of Family Income and Expenditures (or, ENIGFAM, an acronym for Encuesta Nacional de Ingresos y Gastos Familiares). Collected by the National Institute of

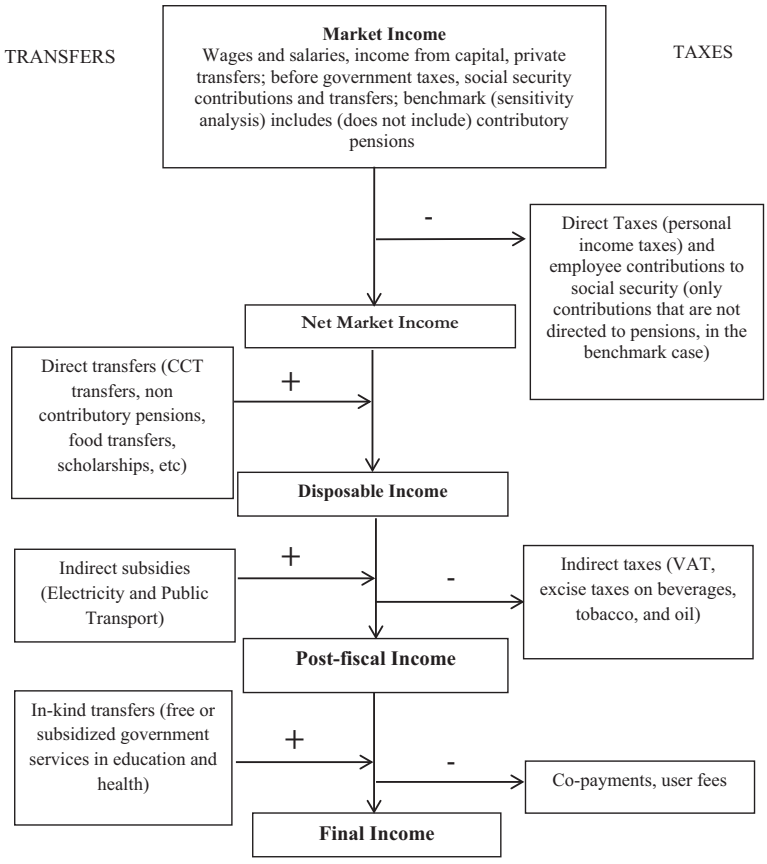

Figure 2. *Income concepts used in the fiscal incidence analysis. Source: Lustig and Higgins (2013).*

Statics during 2009–10, the sample covered 10,762 households and 53,432 individuals. The survey is representative at the national level, for rural and urban areas, and at the departmental level (the country is geographically divided in 22 departments). However, because the ENIGFAM does not have information on usage of health services, we obtained this information from the National Survey on Living Conditions (Encuesta Nacional de Condiciones de Vida, ENCOVI) 2011. The ENCOVI 2011 is used for mapping the coverage of public health services (details described below). Although the ENCOVI is for 2011 while ENIGFAM is for 2010, it is safe to assume that usage of health services did not change much from 1 year to the next since there were no extraordinary events such as an economic crisis, widespread epidemic or a large natural disaster or any change in the delivery of public health benefits. Data on government revenues and public spending for 2010 come from the statistics published by the Ministry of Finance and IGSS. Aggregate data on the main macroeconomic variables come from the Central bank of Guatemala and data on education spending and enrollments come from the Ministry of Education.

For the incidence analysis by ethnic group, the population was classified into indigenous and nonindigenous groups based on self-reporting. [29] By this definition, 40.7% of the surveyed population in Guatemala is classified as indigenous and 59.3% as nonindigenous, roughly equal to the proportions obtained from the 2002 Population Census. The incidence analysis by rural and urban areas used the definition of urban areas in ENIGFAM. Urban areas include the entire municipality of Guatemala, cities, villages and townships (capitals of departments and municipalities) with more than 2000 inhabitants as long as at least 51% of the household had access to electricity and piped water. The rest of the population is classified as rural. Based on this definition, 52% of the population is classified as rural and 48% as urban.

(c) *Assumptions*

(i) *Taxes*

Tax shifting assumptions are as follows. The burden of direct personal income taxes is borne entirely by the recipient of income. The burden of payroll and social security taxes (paid both by the employee and the employer) is assumed to fall entirely on workers. [30] Consumption taxes are 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 the incidence literature, these assumptions are considered appropriate for first-round estimates and the short-run effects. [31]

In order to calculate Net Market Income, we had to simulate personal income taxes (PIT) and contributions to social security. In the case of PIT, we computed it according to the tax regime and assumptions about informality (that is, noncompliance). In 2010, the PIT had three regimes: (i) the wage earners' regime under which there was a progressive schedule with rates going from 15% to 31%; individuals could apply for deductions and credit on VAT payments; (ii) the net income regime (defined as gross income minus cost deductions) with a single tax rate of 31%; and (iii) the gross income regime with a flat tax rate of 5%. Regimes (ii) and (iii) include the self-employed or employees who do not contribute to social

security (that is, those who work under "quasi-informal" conditions).[32] Based on the information in the survey, we identify individuals who belong to each regime and simulate taxes paid based on but introducing some assumptions regarding informality. In the case of wage earners, we assume that employees and self-employed in firms with less than 10 workers do not pay PIT, unless they contributed to the social security system.[33] Also, we assumed that neither agricultural workers hired on a daily basis (*jornaleros*) nor those underemployed (individuals who reported working less than 40 h per week) pay PIT.

In the case of social security contributions, we identify the individuals who contribute to the social security system directly from the survey and estimate the value of their contribution by applying the statutory rate to their labor income.[34] Estimates of employee contributions to social security were obtained by simulation based on reported income in the household survey and contributions established by Law.

In the case of the VAT, we calculated how much each household paid by multiplying expenditures by the statutory rate. Of course, we assume that goods that are exempt by law do not pay this tax.[35] We also assume that goods that more likely to be sold in informal markets like unprocessed food (meat, vegetables, fruits, tortillas) in rural areas and in some small stores in urban areas (e.g., community markets, street vendors and local groceries) and some private services (i.e., gardening and house repair) do not pay VAT.[36]

Other indirect taxes included in the fiscal incidence analysis are excise taxes on tobacco, alcoholic beverages, nonalcoholic beverages, petroleum derivatives, cement and stamps tax. The incidence of excise taxes on tobacco, alcoholic and nonalcoholic beverages, and petroleum derivatives was calculated by applying the statutory rate on the consumption of these goods as they appear in the 2010 ENIGFAM. Fiscal stamps were imputed to households who spent on legal services. The excise on cement was allocated to households based on how much they spent on construction of new dwellings or refurbishing of existing one. As with VAT, we assumed that the burden of excise taxes was shifted forward to consumers.

(ii) *Transfers*

The amount of direct transfers received by each household from *Mi Familia Progresa*, non-contributory pensions, transportation and scholarships programs are directly reported in the household survey. In-kind education benefits are equal to the average spending per student by level (pre-school, primary, lower secondary, upper secondary, and tertiary), which is obtained from data on government spending from the Ministry of Finance and enrollment data from the administrative records of the Ministry of Education.[37] To estimate in-kind health benefits, first we split the public health services into two categories: health services provided by social security facilities and health services provided by public health facilities. In the first case, we divide the total expenditure in health of the social security institute by the number of affiliates that were reported in the survey and then, we allocate this amount to each individual who lives in households that reported being part of the contributory health system.[38] In the second case, we estimate the in-kind benefits of health expenditure of the Ministry of Health in outpatient services and hospital services by using as a secondary source the 2011 ENCOVI survey. To impute the results from the 2011 ENCOVI survey, we calculate the average benefit for 20 income groups in each of the eight administrative regions of the country by residence (urban or rural) and ethnic group (indigenous/nonindigenous). These values were imputed to equivalent population groups in the ENIGFAM. With this method, we are able to distinguish between households who are beneficiaries of the contributory health system, households who receive benefits from the non-contributory health system and households who do not receive any health services from the public system (although we cannot distinguish which of the latter used private services or simply did not need to use healthcare services).

We use imputation method to obtain the residential electricity subsidy and the urban transport subsidy. By using the prices of electricity in 2010 and the household electricity spending reported in the survey, we estimate the consumption of kilowatt per hour and calculate the implicit subsidy. The urban transport subsidy is imputed using the household spending on public transportation as reported in the survey (only for the metropolitan area of Guatemala City – i.e., the Department of Guatemala).

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, see Lustig and Higgins (2013) for references on both sides. Since this is an unresolved issue, in our study we defined a benchmark case in which contributory pensions are part of market income and contributions to the old-age component of the social security system are treated as mandatory savings. We also performed a sensitivity analysis where pensions are classified under government transfers and contributions are treated as any other direct tax. We present results for both scenarios in the discussion of results.[39]

4. MAIN RESULTS

(a) *Income inequality and poverty*

Table 3 reports the Gini coefficient and the headcount ratio for the (defined above) income concepts at the national level, urban and rural areas, and for the indigenous and nonindigenous population.[40] At 0.551 (0.55), the market income plus contributory pensions (market income without contributory pensions) Gini coefficient stands quite high. The effect of direct and indirect taxes and transfers on inequality is small even when the monetized value of education and health spending is taken into account: the reduction is a mere 0.024 Gini points (0.023 when contributory pensions are treated as a government transfer). When we compare inequality within indigenous and nonindigenous populations in Guatemala, our results show that inequality is higher within nonindigenous than indigenous individuals, market income Gini for nonindigenous is 0.541 whereas for indigenous it is 0.487. Fiscal policy (tax and transfers) appears to be almost neutral for indigenous (post-fiscal income Gini decline mildly to 0.485). Here, the positive redistributive effect of transfers mildly dominates the negative effect of indirect taxes and subsidies. For the nonindigenous population, however, the opposite happens: the mild redistributive impact of transfers is more than offset by regressive indirect taxes.

Compared to the most recent study on Guatemala, however, our results show that fiscal policy was significantly more redistributive in 2010 than it was in 2000. Barreix *et al.* (2009) found a considerably smaller reduction in the Gini: 0.0053 points. The higher redistributive effect found in our study is likely to be due to the introduction of the two targeted cash transfers programs discussed above, especially "My Family Progresses." For the year in which Barreix *et al.* analyzed

Table 3. *Fiscal policy, inequality, and poverty in Guatemala (Gini coefficient and headcount ratio, 2010)*

Concept	Ethnicity/area	Income concepts				
		Market	Net market	Disposable	Post-fiscal	Final
Gini coefficient	National	0.551	0.550	0.546	0.551	0.523
	Rural	0.515	0.515	0.508	0.515	0.484
	Urban	0.531	0.53	0.528	0.533	0.514
	Indigenous	0.487	0.487	0.478	0.485	0.455
	Non-indigenous	0.541	0.541	0.539	0.544	0.518
Poverty US$2.5 PPP	National	40.3%	40.5%	39.1%	40.9%	
	Rural	57.3%	57.7%	55.5%	58.0%	
	Urban	21.8%	21.9%	21.2%	22.4%	
	Indigenous	58.6%	59.0%	56.6%	58.5%	
	Non-indigenous	27.7%	27.9%	27.0%	28.9%	
Poverty US$4 PPP	National	61.6%	61.9%	61.4%	62.8%	
	Rural	79.7%	80.0%	79.2%	80.8%	
	Urban	41.9%	42.3%	42.0%	43.4%	
	Indigenous	81.7%	81.9%	81.0%	82.2%	
	Non-indigenous	47.8%	48.2%	47.9%	49.6%	
National extreme PL	National	31.2%	31.4%	29.8%	31.2%	
	Rural	45.1%	45.4%	43.1%	44.9%	
	Urban	16.1%	16.3%	15.3%	16.3%	
	Indigenous	46.6%	46.8%	44.1%	45.9%	
	Non-indigenous	20.6%	20.9%	20.0%	21.1%	
National moderate PL	National	59.2%	59.5%	59.0%	60.5%	
	Rural	77.4%	77.8%	77.1%	78.8%	
	Urban	39.4%	39.7%	39.2%	40.6%	
	Indigenous	79.3%	79.6%	78.8%	79.7%	
	Non-indigenous	45.3%	45.7%	45.3%	47.3%	

Source: Own calculations based on ENIGFAM 2010. For Income definitions see Figure 2. Headcount ratios are not available for Final Income.

the impact of fiscal policy, the only existing transfers were public education and health spending. Another factor could be the expansion of education services to the indigenous groups and the rural and urban poor. There is evidence that the net enrollment rate for primary schooling augmented from 85.4% in 2000 to 98.7% in 2009 (Source: Ministry of Education Statistics). It is important to note that the difference between our results on the redistributive effect of the fiscal system and those of Barreix *et al.*'s may have been even larger if the VAT rate had not changed from 10% to 12% in 2002. VAT dominates the regressive effect of the tax system in Guatemala and their analysis was done while the VAT rate was 10%.

Guatemala is less redistributive when compared with countries that have similar per capita income like Bolivia and El Salvador (Table 4).[41] Both Bolivia and El Salvador devote a higher share of fiscal resources to social spending (as a share of GDP) than Guatemala.[42] Around 2010, social spending was 13.9% and 6.8% of GDP in Bolivia and El Salvador, respectively; in Guatemala, the share equaled 5.5%.[43] Redistribution is lower in Guatemala even though inequality is considerably higher than in both Bolivia (where the market income plus contributory pensions Gini equals 0.503) and, above all, El Salvador (0.44). If we leave out the contribution of education and health and focus on the effect on inequality of direct taxes and cash transfers exclusively, Guatemala comes out as the least redistributive as well. If we add the effect of net indirect taxes, redistribution becomes nil in both Bolivia and Guatemala while El Salvador still shows an equalizing effect (Table 4). Both Bolivia and Guatemala feature no decline in the post-fiscal income Gini vis-à-vis the market income Gini. That is, most of the difference between Bolivia and El Salvador vis-à-vis Guatemala is accounted after imputing the monetized value of government spending on education and health.

The incidence of poverty in Guatemala is also quite high, as shown in Table 3. Cash transfers (net of direct taxes) reduce poverty rates somewhat. However, net indirect taxes completely wipe out the poverty reducing effect of net cash transfers: poverty rates for post-fiscal income are even slightly higher than market income poverty rates.

(b) *Progressivity, marginal contributions and pro-poorness of taxes and transfers*

Table 5 shows the Kakwani progressivity index for taxes and transfers and their respective marginal contributions.[44] As indicated in the previous section, the distributive effect is small. Our findings show that direct taxes are progressive and indirect taxes are quite regressive (the Kakwani index equals −0.12). Although not shown here, overall, the tax system is slightly regressive (−0.09). Direct cash transfers are progressive in absolute terms and so is the sum of direct and in-kind transfers.[45] As argued by Lambert (2001), in a world with more than one intervention, the sign of the Kakwani index is not sufficient to establish whether an intervention is equalizing or not. Based on their marginal contribution, however, we can conclude that direct taxes, cash transfers, indirect subsidies and in-kind transfers (education and health) are equalizing while indirect taxes are quite unequalizing.

The marginal contribution of cash transfers to the reduction in the incidence of poverty induced by fiscal policy (obtained by subtracting the headcount ratio for disposable income with the US$2.50 ppp dollars a day poverty line from the headcount ratio of disposable income minus the cash transfers)

Table 4. *Fiscal policy and inequality: Bolivia, El Salvador and Guatemala (Gini coefficient)*

Country	Year	Income concepts					Disposable *vs.* market	Final *vs.* market
		Market	Net market	Disposable	Post-fiscal	Final		
Bolivia	2009	0.503	0.503	0.493	0.503	0.446	−0.010	−0.057
El Salvador	2011	0.440	0.436	0.430	0.429	0.404	−0.010	−0.036
Guatemala	2010	0.551	0.550	0.546	0.551	0.527	−0.005	−0.024

Source: For Guatemala own calculations based on ENIGFAM 2010. Bolivia: Paz-Arauco *et al.* (2014); El Salvador: Beneke *et al.* (2015).

Table 5. *Measures of progressivity (2010)*

	Kakwani	Marginal contributions		
		Market to disposable	Market to post-fiscal	Market to final
Redistributive effect	–	0.0052	0.0008	0.0246
Direct taxes	0.2664	0.0007	0.0007	0.0008
Direct transfers	0.8100	0.0045	0.0048	0.0044
Indirect taxes	−0.1084	–	−0.0051	−0.0038
Indirect subsidies	0.2205	–	0.0007	0.0006
In-kind education	0.5404	–	–	0.0160
In-kind health	0.3566	–	–	0.0073

Source: Own calculations based on ENIGFAM 2010.
Note: The Redistributive Effect equals the difference between the Gini coefficient measured with market income and the Gini coefficient of the corresponding income concept (i.e., disposable, post-fiscal or final). The marginal contribution equals the difference of the Gini coefficient for the relevant income concept but without the intervention in question and the Gini coefficient for the relevant income concept. A positive (negative) marginal contribution, thus, implies that the fiscal intervention in question has an equalizing (unequalizing) effect. Note that the sum of the marginal contributions does not equal the total redistributive effect (it would happen only by coincidence).

equals 1.3 percentage points (1.6 percentage points if contributory pensions are considered a government transfer). Though small, the marginal contribution of cash transfers is higher for Guatemala than Bolivia and El Salvador.

The unequalizing effect of indirect taxes is not their most problematic trait. After all, if regressive taxes are used to redistribute benefits to the poor, their regressive character may not be so reprehensible. However, as can be seen in Figure 3, indirect taxes are hurtful to the poor in terms of their purchasing power capacity because Guatemalan individuals with income between US$1.25 and US$2.50 on average become net payers to the fiscal system (in cash terms). Recall that in Table 3 we saw that extreme poverty measured by the US$2.50 ppp a day line was higher for post-fiscal income than that for market income. That is, so many poor and near poor individuals are impoverished by, in particular, consumption taxes, that poverty ends up higher after fiscal interventions. This is the case in rural and urban areas and for nonindigenous population. For indigenous individuals the overall effect of taxes and direct transfers is almost nil.

One could argue that, still, even if in cash terms the poor are hurt, the regressive and poverty-increasing taxes are funding the access of the poor to education and health. True, as seen in Figure 3, final income shows that the poor are benefited – and benefited relatively more – by the in-kind transfers in education and health. However, as we shall see in the next section, the usage of services is not universal, and many of the poor are still excluded.

The concentration coefficients in Figure 4 show that the CCT program *Mi Familia Progresa*, primary education and pre-school education are the most progressive and pro-poor spending categories. Lower secondary school, noncontributory pensions, and overall education spending are poverty neutral. The rest of the spending categories are progressive in relative terms in various degrees.

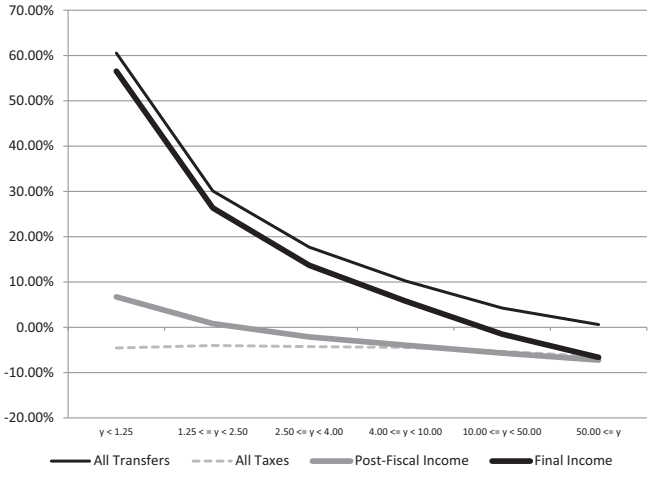

Figure 3. *Post fiscal and final income. Source: Own calculations based on ENIGFAM 2010.*

Spending on tertiary education is outright regressive.[46] The regressivity of tertiary education might be associated with low completion rates of primary and secondary education (Chamarbagwala & Morán, 2011), which implies that a lower share of population may attend tertiary education. The budget allocated to tertiary education is higher than the budget allocated to upper secondary so this result is likely to persist as long as completion rates of primary and secondary education do not improve. It is important to note that spending on tertiary education is not regressive in general in developing countries. As shown by Lustig (2015, Table 3), of thirteen developing and middle income countries, spending on tertiary education around 2010 is unequalizing in Ethiopia, Indonesia, and Guatemala.

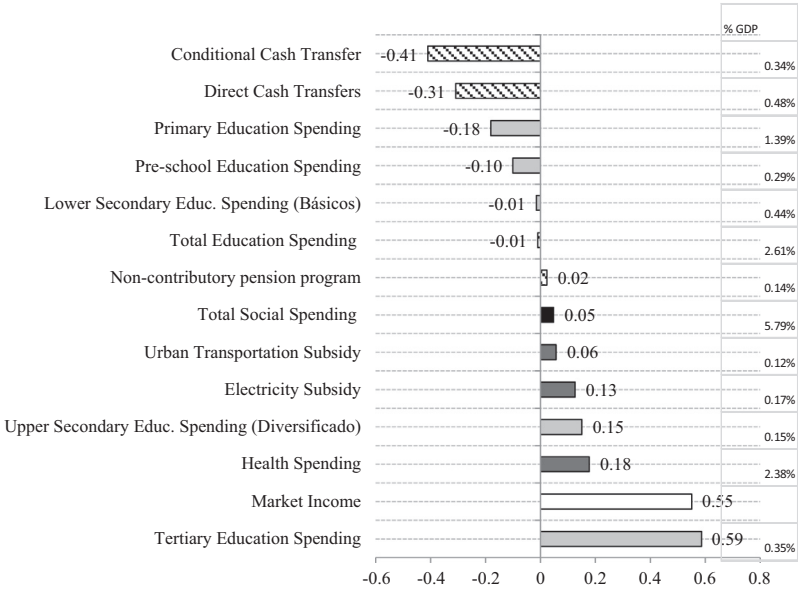

Figure 4. *Concentration coefficients by spending category. Source: Own calculations based on ENIGFAM 2010. Note: The last column presents spending as a share of GDP. Definition of CEQ Social Spending: Sum of health spending, education spending, and social assistance spending. For this figure CEQ Social Spending does not include spending on contributory pensions from Social Security since contributory pensions are part of market income in the benchmark case.*

(c) *Taxes and transfers and the ethnic divide*

As we observe in Table 3, while overall poverty is quite high, the probability of being poor (and extremely poor) is disproportionately higher for the indigenous population. Not surprisingly, the incidence of poverty is close to three times as high in rural areas and twice as high for the indigenous population. The indigenous population living with less than US$2.5 ppp dollars per day (taken here as the international extreme poverty line for Latin America) is 58.6%, while the proportion of poor nonindigenous population is only 27.7%. The difference is even higher when we compare the rural and urban population: 57.3% *vs.* 21.8%, respectively.[47] Although the indigenous population represents around 40% of the total population, 60% of the extreme poor are indigenous. The rural population is 52% of the total population and 78% of the extreme poor.

Table 3 shows that cash transfers (net of direct taxes) reduce poverty by more for rural than urban areas and for indigenous than nonindigenous population. This means that the resources are more targeted to the groups with the highest incidence of poverty, a desirable characteristic of anti-poverty policy. However, the reduction is still very small and hence the probability of being poor after cash transfers continues to be between twice and almost three times as high for the indigenous and rural population, respectively. Furthermore, when one takes into account the impact of indirect taxes, the poverty reducing effect of cash transfers is not only completely offset but post-fiscal income poverty is higher than market income poverty even in rural areas (where we assumed that people do not pay the VAT for food purchases).

Although the two main cash transfers program aim to target resources to the indigenous groups and the rural population, fiscal policy in Guatemala does little to equalize opportunities measured by the extent to which taxes and benefits reduce the inequality that can be attributed to circumstances beyond the individuals' control. Based on the framework first developed by Roemer (1998), we consider that equality of opportunities is based on three key concepts: objective, circumstances and effort. Equality of opportunities prevails when an objective or opportunity is achieved with the same level of effort across different circumstances (Cuesta, 2014; De Barros *et al.*, 2009). Ideally, one would like to include characteristics of parents (e.g., education) among the pre-determined circumstances. In the case of Guatemala – and given data limitations – the "circumstances" that could be used to measure inequality of opportunity are the head of household's gender, his or her ethnicity (indigenous *vs.* nonindigenous) and the current location of the household (rural *vs.* urban).[48] We do not have a measure that differentiates effort; in essence, we assume that effort across the gender of the head, ethnicity and location are the same. Using the Mean Log Deviation (MLD) as the inequality measure, in Table 6 one can observe that fiscal policy is not opportunity equalizing because inequality of opportunity stays approximately constant across all income concepts.[49] In contrast, in other countries (Brazil, for example), the fiscal system is opportunity-equalizing as inequality of opportunity falls from 0.0963 to 0.0496 as we move from market to final income (Higgins & Pereira, 2014).

Table 6. *Inequality of opportunity (2010)*

MLD of smoothed distribution	
Income concept	Inequality of opportunity
Market	0.198903
Net market	0.197078
Disposable	0.196677
Post-fiscal	0.189318
Final	0.197449

Source: Own calculations based on ENIGFAM 2010. *Note:* MLD means mean log deviation.

In Table 7 we show another indicator of the ethnic divide: the distribution of income between the indigenous and nonindigenous population. The average market income per capita of the nonindigenous population is more than twice as high as that for the indigenous population. Taxes and transfers do almost nothing to change this dramatic difference in average

Table 7. *Comparison of income taxes and transfers by ethnic group (2010)*

Concept	% National		Nonindigenous/indigenous
	Indigenous (%)	Nonindigenous (%)	Per Capita
Population	41	59	–
Market income	24	76	2.13
Direct taxes	8	92	8.25
Net market income	24	76	2.12
All direct transfers	65	35	0.37
Non-contributory pension	38	62	1.12
CCT	76	24	0.22
Other direct transfers	24	76	2.13
Disposable income	25	75	2.09
Indirect subsidies	22	78	2.42
Indirect taxes	24	76	2.23
Net indirect taxes	23	77	2.24
Post-fiscal income	25	75	2.09
In-kind education	40	60	1.01
Education: preschool	40	60	1.05
Education: primary	49	51	0.73
Education: secondary	39	61	1.09
Lower secondary	41	59	0.97
Upper secondary	31	69	1.51
Education: all except tertiary	44	56	0.87
Education: tertiary	14	86	4.25
In-kind health	27	73	1.82
All transfers	38	62	1.27
All taxes	23	77	2.35
Final income	25	75	2.03

Source: Own calculations based on ENIGFAM 2010. *Note:* It is important to mention that some of the items included in this table and in the incidence analysis of this study were scaled-up to make the totals match those from administrative accounts. The scaled-up items include: contributory pensions, electricity subsidy, transport subsidy, and VAT.

living standards between the two ethnic groups. After all taxes and transfers are considered (including the monetized value of education and health), the ratio of per capita income between nonindigenous and indigenous individuals decreased from 2.13 to 2.03.

To determine whether a tax is pro-indigenous, we examine whether the share of the tax is lower than the share of the indigenous population's market income in the total. By this measure, the tax burden of direct taxes falls largely on the nonindigenous population and the burden of indirect (consumption) taxes is proportional to their income. For public spending we use a more demanding measure to define an item as "pro-indigenous." We compare the share received by the indigenous group with their share in total population: the higher (lower) the former with respect to the latter, the more (less) pro-indigenous. In terms of direct transfers and subsidies, the only clearly pro-indigenous program is the CCT *Mi Familia Progresa*; its scale, however, is too small to make any significant inroads into the ethnic divide. Primary education spending is somewhat pro-indigenous and spending on pre-school and secondary are practically neutral: per capita benefits are roughly the same for each group. In contrast, tertiary education spending is highly pro-nonindigenous and regressive along ethnicity lines. Spending on health is outright not pro-indigenous.

In cash terms (i.e., total taxes minus cash transfers and subsidies), both the indigenous and the nonindigenous population are net payers to the fiscal system. True, the nonindigenous share of the net payments to the government is 95% but, given the very high difference in average per capita incomes, one would have expected the nonindigenous population to subsidize the indigenous group to turn them – on average – into net beneficiaries (again, in cash terms) of the fiscal system.[50] In other words, the redistribution of cash between the two groups is not sufficient to reduce the income gap (see Table 7). The net payments of both groups might be used to pay for public education and public health. With these in-kind benefits, both groups become net beneficiaries of the fiscal system, which means that the funding for this comes from other sources of government revenue (corporate income taxes, import duties and other indirect taxes). Once the education and health benefits are taken into account, the average benefit is higher for the indigenous population than for the nonindigenous. That is, the indigenous get a share of benefits of in-kind transfers that is higher than the benefits received by the nonindigenous. Now, the question that arises is: are these in-kind transfers to the indigenous groups large "enough"? One way to answer this question is by looking at the coverage rates for education and health by income group for the indigenous and nonindigenous population to which we now turn.

In Table 8 we present the coverage of the CCT and education spending by income group and indigenous and nonindigenous groups. These coverage rates are calculated as follows. The numerator is the total number of individuals living in households where at least one individual who meets the program's criteria (age and educational level) received the benefit. The denominator is the total target population: for example, for MIFAPRO, the denominator is the total number of individuals living in households with children of the age that makes them eligible for the benefit. As one can observe,

Table 8. *Coverage by Income Group: Indigenous and Nonindigenous (2010)*

	Income groups (US$ PPP Per Day)						
	<2.5 (%)	2.5–4 (%)	4–10 (%)	10–50 (%)	>50 (%)	>4 (%)	Total (%)
Panel A: Indigenous							
CCT for individuals in households with children	49	33	13	3	0	12	39
Noncontributory pensions for 65 and older	22	17	20	11	na	18	20
Education for pre-school-aged children	24	28	30	27	na	30	25
Education for primary school-aged children	96	94	88	63	100	85	94
Education for secondary school-aged children	35	39	49	43	na	49	38
Education for tertiary school-aged children	1	1	10	25	na	11	3
Income shares	31	25	31	14	1	45	100
Population shares	59	23	16	3	0	18	100
Panel B: Nonindigenous							
CCT for individuals in households with children	22	7	2	0	0	1	9
Noncontributory pensions for 65 and older	24	22	16	6	0	13	18
Education for pre-school-aged children	33	35	31	12	5	27	31
Education for primary school-aged children	96	92	78	38	27	69	84
Education for secondary school-aged children	40	43	50	31	39	46	43
Education for tertiary school-aged children	2	4	13	34	10	18	11
Income shares	7	10	36	40	6	83	100
Education for primary school-aged children	28	20	37	15	0	52	100

Source: Own calculations based on ENIGFAM 2010. *Note:* na is not available.

MIFAPRO has a higher coverage for poor indigenous households than for equally poor nonindigenous ones. While this speaks to the pro-indigenous characteristic of this benefit, from a normative point of view one is left wondering why the transfer should not provide the same coverage to equally poor nonindigenous households. In terms of education, coverage for primary is similar for both groups but not for the other educational categories. In particular, the difference in coverage of secondary education for equally poor indigenous and nonindigenous groups probably reflects the higher drop-out rate among the indigenous. [51] One result to note is that the coverage of education among the nonindigenous falls with income for all categories except for tertiary (and for some categories among the indigenous). This may be a consequence of the middle-classes opting out of public education due to quality issues and returning to use the public option at the free tertiary level. This phenomenon was observed in other countries in the region as well. [52]

5. CONCLUDING REMARKS

Guatemala is characterized by having high levels of inequality and poverty, and a large gap in living standards between the indigenous and nonindigenous population. The needs for lowering poverty, equalizing opportunities and closing the ethnic divide are huge but Guatemala's fiscal resources for redistribution are small. As noted before, in addition to low revenues, the government faces a series of rigidities embedded in the Constitution or in its interpretation given by the justice system. Social spending (without contributory pensions) is around 6.9 of GDP in Guatemala – one of the lowest in Latin America.

In this paper, we present a detailed and comprehensive fiscal incidence analysis and assess the impact of fiscal policy on inequality, poverty and the welfare gap between the indigenous and nonindigenous population. Our analysis includes direct and indirect taxes, direct transfers, indirect subsidies, and transfers in-kind (education and health). Unsurprisingly, given the limited budget, we find that the tax and transfer system does little to reduce inequality and poverty. The Gini coefficient after direct taxes and cash transfers declines from 0.551 to 0.546, a mere 0.005 points. When the monetized values (at government cost) of education and health services are incorporated, the decline equals 0.024, still very small. When compared to Bolivia and El Salvador, two countries whose income per capita is similar to that of Guatemala, the tax and transfers system is more redistributive in the first two. Although direct taxes are somewhat progressive, their impact is very limited because the share of direct taxes to GDP is painstakingly low. In contrast, consumption taxes are outright regressive and income inequality after direct and consumption taxes and direct transfers (which we call post-fiscal income) is the same as market income inequality. Even worse, consumption taxes are so burdensome for the poor that they more than offset the benefits of the well-targeted cash transfers. As a result, the post-fiscal headcount ratio is practically the same as market income poverty.

Fiscal policy does also very little to reduce the ethnic divide. The average market income per capita of the nonindigenous population is 2.13 times that for the indigenous population, after taxes and transfers (including the monetized values of public education and health) the final ratio falls to 2.03. While the conditional cash transfers program My Family Progresses is pro-poor and pro-indigenous, the size of the per capita transfer is too small to make a significant difference. Education spending is not pro-poor or pro-indigenous enough and health spending reaches only a fraction of the poor. Inequality of opportunity (i.e., inequality due to circumstances such as gender, ethnicity and location) is not reduced at all.

In sum, this paper shows that fiscal policy does almost nothing to change the high levels of market income inequality and poverty and the stark ethnic welfare gaps in Guatemala. Low (especially *direct)* tax revenues are the limiting factor for using fiscal policy as an effective tool to promote a more egalitarian society, provide a minimum standard of living and equalize opportunities. The Guatemalan fiscal system – in particular, its smallness and limited redistributive effect – are the reflection of a policy that perpetuates deep inequities, in particular along ethnic and geographic lines. In their book on the 1990s Guatemalan tax reform, Bahl *et al.* state "The government's objective in this tax reform program was more in the direction

of investment enhancement and job creation than in establishing a large direct fiscal transfer of income to the poor. The net effect of the tax system changes was consistent with this objective" (Bahl *et al*., 1996, p. 142). Twenty years later, and judging by the results discussed in this paper, the objective seems to have remained unchanged. Guatemala is a textbook case of the power of elites to block pro-poor tax reforms.[53]

Perhaps the one and only encouraging sign is that fiscal policy became more redistributive in 2010 than it was in 2000. A reduction of the Gini coefficient equal to .024 looks much better than the .0053 reduction found by Barreix *et al*. (2009). The improvement is probably due to two main factors: the introduction of the targeted cash transfers programs My Family Progresses and Economic Assistance Program for the Elderly and the expansion of education and health services to the indigenous and rural population. In light of the cuts to the targeted cash transfers programs since 2010, this improvement in the redistributive effect is likely to have been short-lived.

NOTES

1. Clearly, one of the key factors for the slow progress in reducing poverty has been low economic growth: for the last 20 years, GDP per capita grew at an average of only 1% per year. Among the potential causes behind this poor performance, low levels of investment in physical capital and basic infrastructure and high levels of social conflict and crime stand out. Guatemala ranks 142nd and 144th out of 144 countries in terms of costs of crime and organized crime, respectively (World Economic Forum's Global Competitiveness Index Report 2014–2015).

2. Measured with the international poverty line of US$2.5 in purchasing power parity per day. Guatemala's data reported by CEDLAS and World Bank (2015) are generated with the National Survey on Living Conditions (Encuesta Nacional de Condiciones de Vida, ENCOVI) 2011 while data for this article are calculated with the National Survey of Family Income and Expenditures 2009–10 (ENIGFAM). This explains the difference in the results. Measured with market income (i.e., before taxes and government transfers), the Gini coefficient in our study equals 0.551 and the incidence of extreme poverty 40.3% (for the US$2.50 ppp per day international poverty line).

3. The incidence of poverty for the nonindigenous group is equal to 27.7% (see Table 3, US$2.50 ppp per day international poverty line).

4. According to the 2002 National Population Census, more than 40% of the population is indigenous, a figure that is practically the same as that obtained from the household survey used in this paper.

5. Whereas in 2002 the average years of schooling and educational attainment (high school level) for nonindigenous were 5.39 and 0.19, the numbers for indigenous groups were 2.24 and 0.04, respectively (Chamarbagwala & Morán, 2011). For an overview of welfare levels of indigenous populations in Latin America including Guatemala, see Hall and Patrinos (2012).

6. For example, the government of president Alvaro Colom (2008–11) created the Council of Social Cohesion and established several social programs such as "My family progresses" (MIFAPRO).

7. The Constitution has also been used to block revenue raising reforms: for example, the attempt to increase the VAT paid on alcoholic beverages was struck down after the Constitutional Court declared the increase was unconstitutional (see Fernández & Naveda, 2011).

8. Throughout Latin America, conditional cash transfers (CCTs) and noncontributory (or social) pensions have become quite generalized. Levy and Schady (2013) argue that the expansion of targeted cash transfers has been driven by three main factors: first, the emergence of more democratic regimes in the 1990s renewed political pressures to respond to unacceptable levels of poverty and inequality; second, greater macroeconomic stability facilitated growth, providing fiscal revenues to increase spending; and third, a recognition that traditional social programs had had only limited success. The authors argue that in the presence of high informal labor markets, contributory social insurance had failed to protect the majority of households from risks. High-income inequality meant that higher income groups captured the bulk of price subsidies. To address these two fundamental limitations of social policy, most of Latin American governments replaced general price subsidies by targeted cash transfer programs of two main kinds: conditional cash transfer programs such *Progresa* in Mexico and noncontributory pension programs such *Previdencia Rural* in Brazil. As discussed by Lustig, Lopez-Calva, and Ortiz-Juarez (2013), more progressive government transfers are one of the two key determinants behind the observed inequality decline (the other factor being the fall in the skills premium).

9. In Spanish, Programa de Aporte Económico del Adulto Mayor.

10. In Spanish, Mi Familia Progresa.

11. See special issue of *Public Finance Review*. Specifically, see Lustig *et al*. (2014) for an overview, Lustig and Pessino (2014) for Argentina, Paz-Arauco, Gray-Molina, Jiménez-Pozo, and Yáñez-Aguilar (2014) for Bolivia, Higgins and Pereira (2014) for Brazil, Scott (2014) for Mexico, Jaramillo (2014) for Peru, and Bucheli, Lustig, Rossi, and Amábile (2014) for Uruguay. A study by Devarajan and Hossain (1998) evaluates the combined effect of taxes and government expenditure in the Philippines; the authors find that the combined effect of taxation and spending is progressive.

12. For Guatemala's analysis, the Central American Institute prepared two background studies for Fiscal Studies (ICEFI).

13. Cubero and Hollar (2010) base their analysis on secondary sources, so we decided not to review it here.

14. The common methodology is described in Lustig and Higgins (2013).

15. Our incidence analysis uses two scenarios. In the benchmark scenario, contributory pensions are treated as part of market income (assuming they are part of an actuarially fair system). A sensitivity analysis is done with contributory pensions included with the rest of government transfers. Qualitatively, the results with pensions as a transfer remain broadly the same.

16. The fiscal data used in this study correspond to central government plus Social Security. Data on local governments include transfers from Central Government to Municipalities (in 2010 close to 45% of total expenditure of local governments, according to Ministry of Finance). Official Government Financial Statistics of Guatemala only covered Central Government.

17. For the share of primary spending in other countries in similar years, see Commitment to Equity/CEQ Standard Indicators (http://www.commitmentoequity.org/indicators.php). In countries like Brazil and Argen-

tina, which have the highest government expenditure, the primary government expenditure reaches more than 40% of GDP (Lustig *et al.*, 2014).

18. The difference between taxes and government expenditure is mostly financed with domestic and external debt. According to the data published by Ministry of Finance, fiscal deficit of Central Government in 2010 represented 3.3% of GDP.

19. Total cash transfers include other direct transfers, which are almost cero as a share of GDP.

20. Results with pensions included among the cash transfers are available upon request.

21. Official data state that in 2011 the number of beneficiary households was equal to 887,972 and the population covered by the program was roughly equal to 4.8 million (or, about a third of Guatemala's total population of 14.7 million in 2011), of which about 2.42 million were children aged 0–15 years old (Secretaría de Planificación y Programación de la Presidencia, 2012). Thus, the survey-based totals are different from totals in administrative records. Given the lack of transparency and reliability of administrative records, we decided to use the numbers recorded in the survey.

22. Actually, the financial situation of the social security system is precarious because the government has not paid its dues for more than 10 years. According to a press release published in the newspaper Siglo XXI on December 30th 2012, the debt accumulated by the government amounted $2.7 billion dollars by October 31st, 2012. This amount is equivalent to 6.5% of the 2012 GDP.

23. Import taxes (tariffs) have been reduced in recent years due to trade liberalization. The Guatemala's trade regime is essentially an open one. The average tariff fell from 21.7% in 1990 to 5.9% in 2007 (Barreix *et al.*, 2009).

24. A detailed description of how each income concept was constructed for Guatemala (that is, which method was used to allocate each tax and spending category) is available upon request.

25. Market income is sometimes also called primary income.

26. Taxes include all social security contributions except those for old-age pensions in the benchmark analysis and all social security contributions in the sensitivity analysis.

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

28. 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.

29. The surveys ask the question: "To which indigenous group do you belong? 1. K'iche'; 2. Q'eqchi'; 3. Kaqchikel; 4. Mam; 5. Q'anjob';... 29. Nonindigenous; and 30. Foreigner."

30. Since our incidence analysis starts with the reported labor market income before taxes and transfers, if employers transfer the burden of this contribution to the workers, this is captured implicitly as a lower market labor income received by employees. We do not include, however, an incidence analysis of the contributions paid by the employers and born by the employees in the form of lower wages.

31. Some authors take a stronger view. For example, Martínez-Vazquez (2008, p. 123) argues that "the results obtained with more realistic and laborious assumptions on elasticities tend to yield quite similar results".

32. In some cases firms might belong to the formal sector, but some employees may be hired under gross personal income tax regime. Hence, they are not covered by social security and other labor benefits received by regular employees.

33. It was necessary to make additional assumptions because in Guatemala some formal workers or independent high-skilled workers who fall under the flat income tax regime do not pay social security contributions. In our incidence analysis we do assume that these individuals pay personal income tax.

34. Contributions by employees are 4.83% of wage income: 2.0% is for pensions and 2.83% for contributory health system.

35. The VAT rate is 12%; exempted goods of this tax are those goods bought in cantonal markets (value less than $12.5 dollars), generic medicines and education fees.

36. There are no published official estimates on evasion of VAT and PIT for the recent period. Pecho Trigueros, Peláez Longinotti, and Sánchez Vecorena (2012) estimate that VAT evasion during 2001–10 was 34.2%. Our own estimate is around 37%. Thus, we think that our assumptions about tax evasion are reasonable.

37. Spending on education includes administrative and capital expenditures.

38. The method followed to compute the value of benefits for contributory health services (known as "insurance value") may underestimate the size of the benefit received by individuals who actually use the health services provided by the contributory health system. This is because a fraction of individuals who contribute to social security system not necessarily use that health system. In some cases, when the individual has private health insurance, they would rather to use private health services. At this way, the effect on final income is a lower bound for those individuals that effectively use the contributive health services.

39. Although they are not shown in the tables and graphs, additional results for the case in which pensions are a transfer are available upon request.

40. Here we report the Gini coefficient and the headcount ratios. Other measures (such as the Theil index and quantile ratios; poverty gap and squared poverty gap ratios, and, poverty measures for different poverty lines) are available upon request.

41. Data for Bolivia are from Paz-Arauco *et al.* (2014)and for El Salvador from Beneke *et al.* (2015). According to the World Bank World Development Indicators, GNI per capita was US$3,919 ppp per year in Bolivia (2009) and US$3,618 ppp in El Salvador (2011).

42. Lindert (2004) argues that one of the main drivers of tax-based redistribution (measured by the share of GDP devoted to social spending) is the level of development measured by per capita income. The other two are democratization and demographic structure. Determining the weight of each factor in explaining the differences across these three countries is beyond this paper's scope.

43. Social spending plus contributory pensions as a share of GDP around 2010 equaled 17.9% (Bolivia), 10.3% (El Salvador) and 7.4% (Guatemala).

44. The Kakwani index of tax (transfer) progressivity is twice the area between the market income Lorenz curve and the tax (transfer) concentration curve. If the tax (transfer) concentration curve is below (above) the Lorenz curve, the Kakwani index will be positive, which indicates that taxes (transfers) are progressive. If the tax (transfer) concentration curve is above (below) the Lorenz curve, the Kakwani index will be negative, which indicates that taxes (transfers) are regressive.

45. Transfers are defined as progressive in absolute terms when the per capita benefit declines with income. Transfers that are progressive in absolute terms are called "pro-poor" (Davoodi, Tiongson, & Asawanuchit, 2010). Transfers are defined as progressive in relative terms when the benefit as a proportion of market income declines with income (note that in this case the per capita benefit increases with income). When the per capita benefit is the same for everybody – a special case of a transfer that is progressive in relative terms – it is often called "poverty neutral." Transfers are defined as regressive when the benefit as a proportion of market income increases with income.

46. This is a very general result in the literature on social public spending incidence on inequality. Among others, see Barreix *et al.* (2009), Chu *et al.* (2000), Lindert *et al.* (2006).

47. The definition of urban and rural area in these surveys is based on the criteria of the 2002 National Population Census. Urban areas include cities, villages and towns (capitals of departments and municipalities) as well as places with the category of *colonia* or *condominio* and all places with more than 2000 habitants if in those places more than 51% of the households have electrical and piped water supply. Like in previous census, the whole territory of Guatemala City is considered as urban area. On the other hand, rural area is a residual area, defined as those places not included in the urban areas.

48. Inequality of opportunities, which create unfair differences at starting points, can be a serious social threat; particularly, if opportunities are systematically denied to an ethnic or social group. In Guatemala indigenous population have faced a systematic social exclusion, the chronic status quo of inequality and social exclusion again indigenous population was inherited from the colonial period. Thus, in Guatemala ethnicity is a conditional factor to equality of opportunities.

49. 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 using the mean log deviation, which gives the measure of inequality of opportunity in levels by income concept. Note that this measure of inequality of opportunity is different from Roemer *et al.* (2003) and De Barros *et al.* (2009). The Human Opportunity Index developed by Barros *et al.* measures the extent to which a society progresses toward universal access of basic opportunities. The index synthesizes in a single indicator how close a society is to universal coverage of a given opportunity and how equitably coverage of that opportunity is distributed. An equitable policy ensures that a child's chance of accessing these key goods and services is not correlated with circumstances that are beyond his or her control, such as gender, parental background, ethnicity or location.

50. The numbers for these calculations are not shown here but are available upon request.

51. These numbers are consistent with the disparities in education attainment between nonindigenous and indigenous. According to data from the 2002 National Population Census, the average years of schooling for nonindigenous and indigenous populations are 5.39 and 2.24, respectively. As shown by Chamarbagwala and Morán (2011), among individuals born during 1920–83, only 18%, 7% and 4% of indigenous individuals were able to complete primary, secondary and high school, respectively. In contrast, the proportions of nonindigenous that completed primary, secondary and high school were 50%, 29% and 19%, respectively. In addition, when we compare urban and rural population the differences are even more significant (for a complete data on education attainment by gender, region, sector and ethnicity see Table 2 in Chamarbagwala and Morán (2011, p. 44).

52. See, for example, Lustig *et al.* (2014).

53. See Sanchez (2009) for a discussion on the reasons behind the lack of progress on taxation reforms in Guatemala.

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