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ABSTRACT

An analysis of the redistributive effect of fiscal policy on poverty reduction and income distribution in Ecuador using household survey data is described. Due to the detail and depth of the database, it is possible to single out the effects of direct transfers and taxes, indirect taxes and subsidies, and the use of public education and health services. Standard incidence analysis shows that direct taxes are progressive. Nonetheless, they have a negligible effect on both income distribution and poverty. Indirect taxes are progressive as well, due to several exemptions from the value added tax. Social spending on direct transfers, education, and health is progressive in absolute terms, except for secondary education, wherein it is neutral. Ecuador ranks first in inequality reduction effectiveness and second in poverty reduction effectiveness when compared to six other Latin American countries. However, it ranks only fourth in overall inequality and poverty reduction.

JEL Codes: H22, D31, I3

Keywords: Poverty, Inequality, Transfers and Taxes, Government Benefits, Ecuador



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1 INTRODUCTION

Like most Latin American countries, historically Ecuador has had high economic and social inequality. However in the last decade, levels of economic inequality fell, reaching their lowest values in 2011, with a Gini coefficient of 0.473 (ENEMDUR 2011). The decline may be attributed to the effects of public policy reform, such as the expansion of social protection programs, improved employment rates, and an increase in formal occupation (World Bank 2013). From 2006 to 2011, social spending doubled, with substantial investments in public education and health.

Poverty also decreased. In 2003, almost half the population (49.9 percent) was classified as income poor. However, by 2011, the official poverty headcount was 28 percent⁶, thus revealing a 21 point percentage reduction over the nine year span. Due to the worldwide recession, 2009 was the only year in which poverty increased during the overall period. According to Burgos (2013), the main causes for the decrease in poverty were economic growth, employment promotion and the reduction of income inequality. The importance of the conditional cash transfer Human Development Grant (*Bono de Desarrollo Humano*) should be noted, in 2011 it benefit approximately 40 percent of the country's poorest population (World Bank 2013).

The objective of the study is to evaluate the redistributive effect of fiscal policy in Ecuador in 2011, using the National Survey of Income and Expenditure for Urban and Rural Households, Ecuador, 2011-2012 (*Encuesta Nacional de Ingresos y Gastos de Hogares Urbanos y Rurales, Ecuador, 2011-2012* or ENIGHUR.) The effects of direct and indirect taxes, subsidies and transfers on different measures of poverty and inequality are calculated. The detail of the database allows the results to be calculated upon what households report regarding income and consumption, rather than upon imputation from other sources.

Literature on incidence analyses for Ecuador is very limited. In 2006, research on fiscal equity was undertaken for all the Andean countries. The study for Ecuador was completed by Arteta (2006), utilizing 2003-2004 ENIGHUR data. The goal was to analyze the incidence of taxes and public spending (cash transfers and contributory pensions). The author concluded the value added tax (VAT) is proportional with respect to income, and progressive with respect to consumption, and that it has positive effects on equity. Income tax is progressive, but due to its low rate of collection, the impact on inequality is low. Social security contributions are also progressive. Regarding social spending, such as the Human Development Grant (*Bono de Desarrollo Humano*), the author concludes it is progressive, while contributory pensions are regressive with respect to consumption.

Since the goal of this analysis is to assess the distributive impact of fiscal interventions in Ecuador, the use of a standardized methodology (see Lustig and Higgins 2013) allows results to be compared among countries using the same methodology. However, there is no agreement in the literature on whether contributory pensions should be treated as a government transfer or as a part of market income. Thus, two separate analyses are undertaken, wherein benchmark case pensions are treated as market income and sensitivity analysis pensions are treated as government transfers.

Results show that Ecuador has high effectiveness indicators on inequality and poverty reduction. Public health and education expenditure is progressive in absolute terms as well as direct transfers. Indirect subsidies are regressive in the sense that the share of benefits becomes larger as the income decile increases. Overall, direct taxes and transfers reduce inequality by 4.5 percent. The reduction of Gini indicators

⁶ The poverty line in 2003 was 1.76 dollars, while the poverty line in 2011 was 2.43 dollars.

between market income and final income is 15.4 percent.⁷ This figure reveals the equalizing effect of in-kind transfers (health and education). Direct transfers diminish extreme poverty in 28.5 percent⁸ and moderate poverty in 12.9 percent⁹.

The next section describes the tax and social spending system in Ecuador for 2011-2012. Section 3 describes the methodology and the data used for the study. Section 4 presents the main results of the incidence analysis. Main conclusions and policy recommendations are presented in section 5, while other methodological notes are provided in the Annexes.

2 SOCIAL SPENDING AND TAXATION IN ECUADOR, 2003-2013

Ecuador is defined as an upper-middle income country, with a GNI per capita of \$9417 (PPP constant dollars) in 2011, with a population of around 15 million. The ratio of central government primary spending to GDP was 22.3 percent in 2011. Government expenditure is medium compared to other Latin American countries, wherein total primary non-financial public spending accounted for 38.5 percent of GDP.

Public spending on education, housing, social security and cash transfers¹⁰ was equivalent to 12 percent of GDP (Table 1). The largest components corresponded to the social security system as a whole (5.9%) education (3.1%) and health (1.6%). Due to the fact that contributory pensions are treated as market income (benchmark analysis) and direct transfers (sensitivity analysis), social spending is equivalent to 5.9 percent¹¹ and 10 percent, respectively.

TABLE 1. SOCIAL SPENDING, BY COMPONENT, AS A PERCENTAGE OF GDP: 2011

Component	Millions of dollars	Percent of GDP
Social security	4,755	5.9
<i>Contributory pensions^b</i>	<i>(3,325)</i>	<i>(4.2)</i>
<i>Health insurance</i>	<i>(1,291)</i>	<i>(1.6)</i>
<i>Operational expenses</i>	<i>(139)</i>	<i>(0.2)</i>
Cash transfers ^{ab}	970	1.2
Health ^{ab}	1,273	1.6
Education ^{ab}	2,476	3.1
Total	9,474	11.9

Notes:

a. Considered as social spending in benchmark analysis

b. Considered as social spending in sensitivity analysis

Sources: Central Bank of Ecuador (BCE), Department of the Treasury (MFE), Social Security Institute (IESS).

⁷(Final Income – Market Income –Gini-) / (Market Income –Gini-)

⁸(Disposable Income - Market Income -extreme poverty rate-) / (Market Income –extreme poverty rate-)

⁹(Disposable Income - Market Income -moderate poverty rate-) / (Market Income –moderate poverty rate-)

¹⁰Human development grant (Bono de Desarrollo Humano), school uniform, school breakfast and free textbooks.

¹¹ Health insurance and operational expenses of the Social Security Institute not included in incidence analysis.

In 2011, revenues were comprised of taxes (10.9 percent of GDP), social security contributions (4.9 percent of GDP) and oil exports (7.5 percent of GDP). The most important indirect tax was the value added tax (VAT), followed by the tax on luxury goods (ICE). The most effective direct imposition was income tax, followed by the currency transfer tax (Table 2). The resource structure presented here does not include revenue from public enterprises nor others unspecified by the Central Bank. Note that social security contributions are not part of central government revenues. Instead, they are included in the non-financial public sector accounts.

TABLE 2. SELECTED GOVERNMENT REVENUES BY COMPONENT, AS A PERCENTAGE OF GDP, ECUADOR, 2012

Component	Millions of dollars	Percent of GDP
Indirect taxes	4,820	6.0
<i>Value added tax (VAT)</i>	<i>(4,202)</i>	<i>(5.2)</i>
<i>Luxury tax (ICE)</i>	<i>(618)</i>	<i>(0.8)</i>
Direct taxes	3,901	4.9
<i>Income tax (IRPF)</i>	<i>(3,030)</i>	<i>(3.8)</i>
<i>Outflow currency tax (ISD)</i>	<i>(491)</i>	<i>(0.6)</i>
<i>Motor vehicle tax</i>	<i>(175)</i>	<i>(0.2)</i>
<i>Other direct taxes</i>	<i>(205)</i>	<i>(0.3)</i>
Social security contributions*	3,971	4.9
Oil revenues	5,971	7.5
Total	14,693	18.4

*Not considered in national accounts as central government revenue, but included in the public non-financial sector.

Sources: Internal Revenue Service (SRI), Central Bank of Ecuador (BCE).

i Social Spending

Contributory social security programs:

Background, benefits and contributions

The first contributory programs of the social security system in Ecuador were implemented by the “*Caja de Pensiones*” in 1928. The objective of this institution was to provide retirement, death and charitable benefits to public sector employees and military personnel. In 1935, the “*Instituto Nacional de Previsión*” was created as an upper body of the social security system, and medical service was implemented as part of the institution. Two years later, the social security law was reformed and health insurance for contributors was added. A few months later, a second lower body institution, the “*Caja del Seguro Social*,” was formed to provide insurance to private sector workers. In 1942, the obligatory social security law was established (IESS 2013).

In 1963, the two lower body institutions were merged with the title of “*Caja Nacional del Seguro Social*.” This organization created new contributory programs for endangered laborers, artisans, professionals and domestic workers. In 1970, after the closure of the “*Instituto Nacional de Previsión*,” the “*Instituto Nacional de Seguridad Social*” (IESS), which is the current social security organization, was created. In 1986, three additional contributory programs were created: obligatory coverage for agricultural workers, a voluntary insurance fund and a marginal social security fund (IESS 2013).

In 2001, the most recent social security law was implemented and with it the current organization of the system. The law is organized under seven principles: obligatory participation, solidarity, universality, efficiency, equity, sufficiency and level of subsidy. It provides economic security to all working adults, including independent laborers, professional employees, business owners, military and the self-employed.

Social security in Ecuador is a mixed system, comprised of a pay-as-you-go (PAYG) and an individual capitalization fund. Its public administration is divided into two main functions: the Coordination of Benefits covers the pension system, health services, rural workers, and labor risk insurance. The Coordination of Accounts and Contributions handles coverage, affiliation, fund management and reserve fund investment (Ley de Seguridad Social 2009).

The contribution rates vary among different types of workers. For private employees, the personal rate is equivalent to 9.4 percent of total earnings, while employers contribute 11.15 percent. For municipal, bank and notary employees, the contribution is equal to 11.35 percent, whereas the employer rate remains the same. Public employees pay 11.35 percent of their total earnings and their employer contributes 9.15 percent. Independent workers’ pay 17.5 percent of their income while occasional workers (mainly from the sugar industry) contribute 17.1 percent, with an employer rate of 18.7 percent (IESS 2009).

The main benefit for contributors is a retirement pension that protects them under three different conditions. The first is old age; the eligibility requirements to access this contributory program are age and number of contributions. With no age limit, a person needs a total of 480 contributions, which is equivalent to forty years of work. If someone is 60 years old, a total of 360 contributions (30 years work) are necessary, while a 65 year old requires 180 contributions (15 years), and a 70 year old need 120 contributions (10 years) (IESS 2013).

The pension received equals the average of the five years of highest wages, adjusted by a coefficient that depends upon the total years of affiliation. The lowest rate is 0.4375 for five years and the maximum is 1 for forty years or more. Pensions depend on the number of years of contribution and the unified basic salary (minimum wage). In 2011, the lowest retirement pension possible was \$132, equivalent to 50 percent of the basic salary, and the highest was \$1452, or 550 percent of the unified basic salary (IESS 2013). In 2011, Ecuadorian workers contributed \$3,970 million to the social security fund, while \$3,325 million was paid out in pensions, including disability, old age, labor risks and unemployment insurance (*fondo de cesantia*).

In 2011, an estimated 62 percent of the labor force did not contribute to the Social Security Institute in their principal line of employment. If we focus solely on employees with an income higher than the basic salary, an estimated 38 percent did not contribute. For underemployed workers, the figure rises to 78 percent and for unemployed to 91 percent (ENEMDUR 2011). Retirement pensions are considered part of market income in the benchmark analysis and as a direct transfer in the sensitivity analysis. Consistently, all contributions to social security, except the portion for pensions, are considered as direct taxes in the benchmark analysis, while for the sensitivity analysis, all pensions to social security (without exception) are included.

The second condition is disability. The eligibility requirements to access this contributory program are illness and physical or mental impairment that prevents work. The last condition is the survivor pension, which is a monthly grant to widows, widowers, orphans and/or parents of the contributor for whom the benefit was attributed.

Another important benefit of the institution is health insurance, which is a specialized program that protects contributors and their families in sickness and maternity. Health and medical services are provided throughout the country in Social Security-owned facilities, and via private medical providers who maintain agreements with the institution. Eligible beneficiaries include active voluntary affiliates, retirees, rural workers, and their dependents -children under 18 and spouses- (IESS 2013).

Labor risk insurance provides a secure work place for its affiliates. The objective is to guarantee insurance coverage for negative health consequences and accidents derived from work activity. The program provides medical assistance, medicine, hospitalization, surgery, rehabilitation and reemployment. The provision and maintenance of prosthetic and orthotic devices is included (IESS 2013).

Rural worker insurance benefits the rural laborer and fishermen in the event of disability, old age, health and death. It was created in 1968 with a pilot program that included 614 families. The project eliminated the employer-employee relationship and established a system to protect working rural inhabitants. It provides contributory programs related to community development, health, and environmental sanitation. The objective of the program is to promote social participation and improve the quality of life. Eligibility requirements include residency of the insured (e.g. farmers, herders, dairymen, fishermen) in rural areas and work in either a self-employed or dependent condition. The contribution fee for rural workers is considerably less than other Social Security affiliates, and is equal to 2.5 percent of the 22.5 percent of the minimum wage (IESS 2013).

Non-contributory programs:

Human Development Grant Conditional Cash Transfer (Bono de Desarrollo Humano)

This program provides a mechanism to guarantee income security for the population not covered by social security. In 2011, beneficiaries of its \$35 monthly cash transfer included mothers who belong to the poorest population quintile and have children younger than 18 years old, seniors who don't receive any pension and belong to the poorest 40 percent of the population, and disabled persons who reside in low-income housing. In all cases, the beneficiary cannot be affiliated with any of the national social security institutions (i.e. IESS, ISSFA or ISSPOL). Mothers who receive the grant are required to take their children under five years of age to health center medical checkups twice a year and enroll them in school if they are between the ages of 5 and 17. By 2011, there were approximately 2 million beneficiaries of the human development grant, with a total expenditure of \$852 million (MIES 2013).

Disability Cash Transfer (Misión Joaquín Gallegos Lara)

This program was created in 2009 by the vice-presidency in response to the poor living conditions and poverty of many physically and/or mentally disabled persons. It provides a monthly \$240 grant to a relative responsible for taking care of the disabled person. Other benefits include the delivery of medicine and caregiver training in rehabilitation, health, nutrition, hygiene, civil rights and self-esteem. Beneficiaries also receive funeral expenses and the family caregiver receives a \$500 life insurance policy (*Vicepresidencia de la Republica* 2013).

Housing Grant (Bono de la Vivienda)

The program provides financial assistance to Ecuadorian families as a reward for saving. It may be used to buy a house or build one on family-owned land, or to improve an existing home. To access the grant, some conditions must be fulfilled. The head of household must be older than eighteen, and if single, older than thirty. In neither case may s/he already own another home in Ecuador. Beneficiaries may buy homes with a maximum value of \$60,000. For those who wish to improve their home, the cost of the remodeling may not exceed \$12,000. The grant has three components, wherein the first is private savings (10 percent of the home's purchase price), the grant itself (\$5,000 or \$20,000 in rural and urban areas, respectively), and credit from a financial institution to complete the purchase of the house (MIDUVI 2013).

Free School Breakfast

In 1999, the Ministry of Education established a school breakfast program. Currently, its objective is to enhance the quality and efficiency of basic education by providing a food supplement in areas where there is a high incidence of poverty. Other objectives include alleviating the immediate hunger of the target group, improving attendance at schools in areas affected by poverty, and enhancing the learning ability of students. Beneficiaries of the program in 2011 were children 3-5 and 6-14 years old, enrolled in an early childhood or elementary (first to ninth grade) educational establishment. During this period, only the children attending schools in either marginal urban parishes or rural locations throughout Ecuador were benefited (Ministerio de Educación 2013).

Free Pre-School and Elementary School Textbooks and Uniforms

To eliminate barriers of access to general basic education, the Ministry of Education provides free school uniforms, textbooks and workbooks to students attending public schools, as well as teaching guides to educators. Beneficiaries of the program in 2011 were children enrolled from pre-school to ninth grade of general basic education.

Other non-contributory assistance is free uniforms provision; beneficiaries of the program in 2011 were children who attend a public early childhood care center in urban and rural areas, students who attend establishments of general basic education in rural areas, or urban locations of the Amazon region, and all students participating in the Millennium Educational Program. Benefits of the program depend on whether the student attends an early childhood or elementary establishment. Early childhood education organizations provide two sports pants and two dress shirts, and general education organizations supply a pair of pants, a gabardine skirt, sport pants, a dress shirt and a polo shirt (Ministerio de Educación 2013).

Health Care

The constitutional reform of 2008 established that a citizen's good health is a right guaranteed by the state. In 2011, public expenditure on health care accounted for 1.6 percent of GDP i.e. \$1,272.7 million, of which 74 percent corresponded to current expenditure (*gasto corriente*) and 26 percent to investment expenditure. The public health network is comprised of the Ministry of Health and the National Social Security Institute and is divided into three levels.

The primary or "lower" level comprises health posts and health centers (rural and urban) and other establishments that provide emergency and pre-hospital services. This first level represents about 95 percent of the public domestic supply of health-care institutions. In the second tier are basic general hospitals, and in the third are national referral hospitals. The majority of the hospitals classified in the second and third level are private institutions, with the remainder of second and third level hospitals administered by the Ministry of Health (*Recursos y Actividades* 2011).

More than 1800 health institutions were administered and financed in 2011 by the Ministry of Health (i.e. 59 percent of public health facilities), of which 15 percent were health posts, 77 percent were health centers, 5 percent were basic and general hospitals, and almost 1 percent were specialized hospitals. The Social Security Institute was in charge of 666 facilities (i.e. 22 percent of the public health facilities). Of the public organizations not administered by either the Ministry of Health or the National Social Security Institute (IESS), 2 percent were managed by the Department of Defense, 2.5 percent by municipalities, 1 percent by the Department of Justice and Police, .4 percent by *SOLCA*¹², and 5.4 percent by other public providers¹³ (*Recursos y Actividades* 2011).

Access to health care is free of charge in hospitals and centers administered by the Ministry of Health. Centers managed by the National Social Security Institute serve only contributors and their families in cases of sickness and maternity. For the Ecuadorian government, universal health care is a strategic tool for achieving higher living standards and the country's development objectives (MSP 2011).

The education system

In 2008, with the establishment of the new constitution, primary and high school education in Ecuador was made mandatory. The system is divided into two according to the characteristics and services provided: academic and vocational. Academic institutions provide regular, special, permanent and/or artistic curriculums, while vocational schools provide a manual arts and a technical curriculum to improve work activities.

In 2011, national school attendance rates were 99 percent for children between 6 and 11 years of age, 88 percent for teenagers (12 through 17), and 42 percent for persons between 18 and 24 years. The average number of school years achieved by the population over 24 years old was 9.4 (SIISE 2014). Educational expenditure accounted for three percent of GDP (i.e. \$2,476 million), of which 78 percent corresponded to current expenditure and 22 percent to investment spending.

The following statistics provide an indicator of the new generation's educational capital. In 2011, an estimated 32 percent of the population between 19 and 24 was enrolled in a third level institution, and an estimated 49 percent had completed between 9 and 13 years of education. However, only 26 percent of the population over five years of age reported primary education as the highest level of instruction (ENEMDUR 2011). By the end of 2011, almost one half of one percent (.42 %) of the population had finished or at least started a fourth level education program.

At all levels of education, there are two educational systems: public (free) and private. The public system accounts for 78 percent of all educational institutions and 73 percent of total students, while the private sector provides 22 percent of the institutions and 28 percent of the enrolled students (AMIE).

¹² SOLCA : Sociedad de Lucha Contra el Cancer en Ecuador (Ecuadorian Society for the Struggle Against Cancer)

¹³ In the annexes: a complete table details the public health services offered by provider and type of establishment.

TABLE 3. TAX STRUCTURE FOR ECUADOR, 2011

Component	Percentage	Millions of Dollars
Total	100	8,721
Indirect taxes	55.3	4,820
<i>Value added (VAT)</i>	<i>(48.2)</i>	<i>(4,202)</i>
<i>Luxury (ICE)</i>	<i>(7.1)</i>	<i>(618)</i>
Direct taxes	44.7	3,901
<i>Income tax (IRPF)</i>	<i>(34.8)</i>	<i>(3,030)</i>
<i>Outflow currency tax</i>	<i>(5.6)</i>	<i>(491)</i>
<i>Motor vehicle tax</i>	<i>(2.0)</i>	<i>(175)</i>
<i>Other direct taxes</i>	<i>(2.3)</i>	<i>(206)</i>

Source: Internal Revenue Service (SRI)

Indirect taxes

Of the taxes collected by the government, 55 percent are indirect; with the value added tax (VAT) accounting for a predominant share (48%). In 2011, the VAT rate was 12 percent. Some goods and services considered basic necessities are exempt from the tax, such as food products (fruit, vegetables, poultry, livestock, milk, bread, sugar, and salt, among others) and basic services like water and electricity. The remaining seven percent of indirect tax revenues is derived from a tax on luxury goods (ICE) such as alcoholic beverages, automobiles, tobacco products, and various other articles. In 2011, indirect tax revenue was \$4,820 million (of which the VAT accounted for \$4,202 million).

Direct taxes on personal income

Tax on personal income (IRPF) was created in 1989; it treats income from work and business revenue separately. In 2011, income from companies was taxed at a flat 24 percent rate; deductions after payment is made are allowed in the case of undeclared expenses (although a fine is charged).

Income derived from work is taxed at progressive rates. Deductions are allowed at all levels of income and are basically associated with family-related responsibilities, such as health and education. In 2011, persons with a total annual income of less than \$9,210 dollars were not required to pay the tax. For others, the lowest rate was five percent for those who earned between \$9,210 and \$11,730 per year, while the highest was 35 percent for people who earned \$93,890 or more per year. Everyone subject to the payment of income tax must file a tax return annually.

The IRPF requires pensioned retirees under 65 to pay taxes similar to those on income derived from employment. Those who are 65 or older are exempt. For a person receiving a pension as well as employment income, the sum of both establishes the tax base (this applies only to retirees under 65 years

old). In 2011, total IRPF revenue was \$3,030 million, most of which was paid by businesses rather than natural persons.

Another important direct imposition is the outflow currency tax that is levied on the value of all international monetary transactions with or without the intervention of financial institutions. The base of the tax is the total value of the currency transferred. The rate for 2011 was two percent from January to November and 5 percent in December. Transactions for less than \$1000 are exempt. In 2011, this tax accounted for 5.6 percent (i.e. \$491 million) of total tax revenue.

Other taxes

Taxes on foreign assets, rural land, and vehicular pollution (among others charged by the IRS) account for 2.3 percent of total tax revenue.

Indirect Subsidies

TABLE 4. ENERGY SUBSIDIES STRUCTURE FOR ECUADOR 2011

	Percentages	Millions of dollars
TOTAL	100	3,158
<i>GLP (liquefied petroleum gas)</i>	20.1%	636.16
<i>Gasoline</i>	30.9%	976.26
<i>Diesel</i>	42.4%	1,337.45
<i>Electricity</i>	6.6%	207.78

Source: Central Bank

Indirect subsidies

Of the indirect subsidies granted by the central government, the Diesel subsidy accounts for a predominant share 42.4%, the gasoline subsidy for 30.9% and the liquefied petroleum gas for 20.1%. The cost of a gallon of diesel without subsidy is \$1.97 however distributors pay only \$.90. The liquefied petroleum gas 15 kilogram cylinder costs \$14.10 nonetheless the official price charged in Ecuador is \$1.60. At last, the official cost of a gallon of gasoline is \$2.47; nonetheless distributors pay \$1.31 or \$1.68 per gallon depending on the quality. The reference cost and prices presented before were provided by Petroecuador EP, the public oil company.

The total cost of the diesel subsidy in 2011 was approximately 1,337 million dollars main beneficiaries of the grant were: households who owned vehicles that use diesel, the public passenger transport system (national and local), and private transport companies. On the other hand, the total liquefied petroleum gas subsidy was 636.16 million dollars, beneficiaries of the grant were mainly households that use the gas to cook heat water and do laundry among others. The overall gasoline subsidy cost in 2011 was 976.25 million dollars, main beneficiaries were households that own cars (consumption is not limited), taxi drivers and private transport that operates with gasoline. Finally, the electricity subsidy overall cost in 2011 was 207.78 million dollars the majority of it accounted to the tariff deficit subsidy (144.41 million) that all households receive, the old age exemption (7.83 million) for people older than 65 years old and the dignity tariff (45.92 million) for poor households.

3 DATA AND METHODOLOGY

Data on household income, taxes and transfers is from the National Survey of Income and Expenditures for Urban and Rural Households, Ecuador, 2011-2012 (*Encuesta Nacional de Ingresos y Gastos de los Hogares Urbanos y Rurales, Ecuador, 2011-2012*) or ENIGHUR. The survey boasts national coverage, surveying 39,617 households, using a two-stage sample design in 9 self-represented cities, and a three-stage procedure for the rest of the country. The survey is conducted approximately once every eight years, and contains detailed information on labor, and non-labor income, direct taxes, social security contributions, transfers (public and private), public education and consumption.

Where the ENIGHUR survey does not include questions on a certain item, values are imputed. Specifically, data from the Health and Nutrition National Survey, Ecuador, 2011-2013 (*Encuesta Nacional de Salud y Nutrición*) or ENSANUT, was used to obtain public health benefits. Finally, national accounts on aggregate income and expenditure were used to scale down education and health benefits for calculations of inequality.

The values of direct transfers, taxes and social security contributions are obtained directly from the survey. It captures 1.68 million beneficiaries of the Human Development Grant (which is considered to be the government's most important cash transfer program), approximating the number reported in national accounts (i.e. around 2 million beneficiaries in 2011). Thus, no imputation was undertaken. The survey contains consumption data, permitting the calculation of indirect taxes without using a secondary source, as well as indirect subsidies for gas (liquid propane), gasoline, electricity and housing.

In-kind education benefits are equal to the average spending per student by level, with basic education (pre-school to ninth grade), and high school (tenth to twelfth grade) included. Tertiary education was not incorporated, as it was not possible to ascertain in which public university the interviewee was enrolled¹⁴. Average spending per student for basic education and high school was obtained from the Ministry of Education, and imputed for students who attend public schools. Seventy-two percent of people who enroll in a public education institution attend basic education, and 16 percent attend high school, thus 88 percent of the public offer is covered in incidence analysis.

In-kind public health benefits¹⁵ were imputed using an alternative survey methodology¹⁶. The ENSANUT 2011-2013 survey was utilized due to its detailed questioning related to the use of health services. To impute the data, all of the persons who used a health facility (public or private) were identified. Because public services are free, only people who attended private facilities reported the amount they paid for the service. To address this problem, a bootstrap simulation technique was used to impute the average costs corresponding to the service received by those who attend a public health institution.

For example, if the private average cost of maternity services is \$60, and a household in the survey used the same service in a public facility, \$60 was imputed as the in-kind health transfer. Since the ENSANUT survey includes a question on total income, health benefits are calculated by groups of one percent of the population, ranked by market income. To construct final income, it is assumed that each individual receives the average benefit taken by his or her income group.

¹⁴ Public universities in 2011 were autonomous; therefore per capita costs can differ across institutions.

¹⁵ A country specific sensitivity analysis was completed with information from the ENIGHUR 2011-2012 survey, therefore no imputation was undertaken; results are available from the authors.

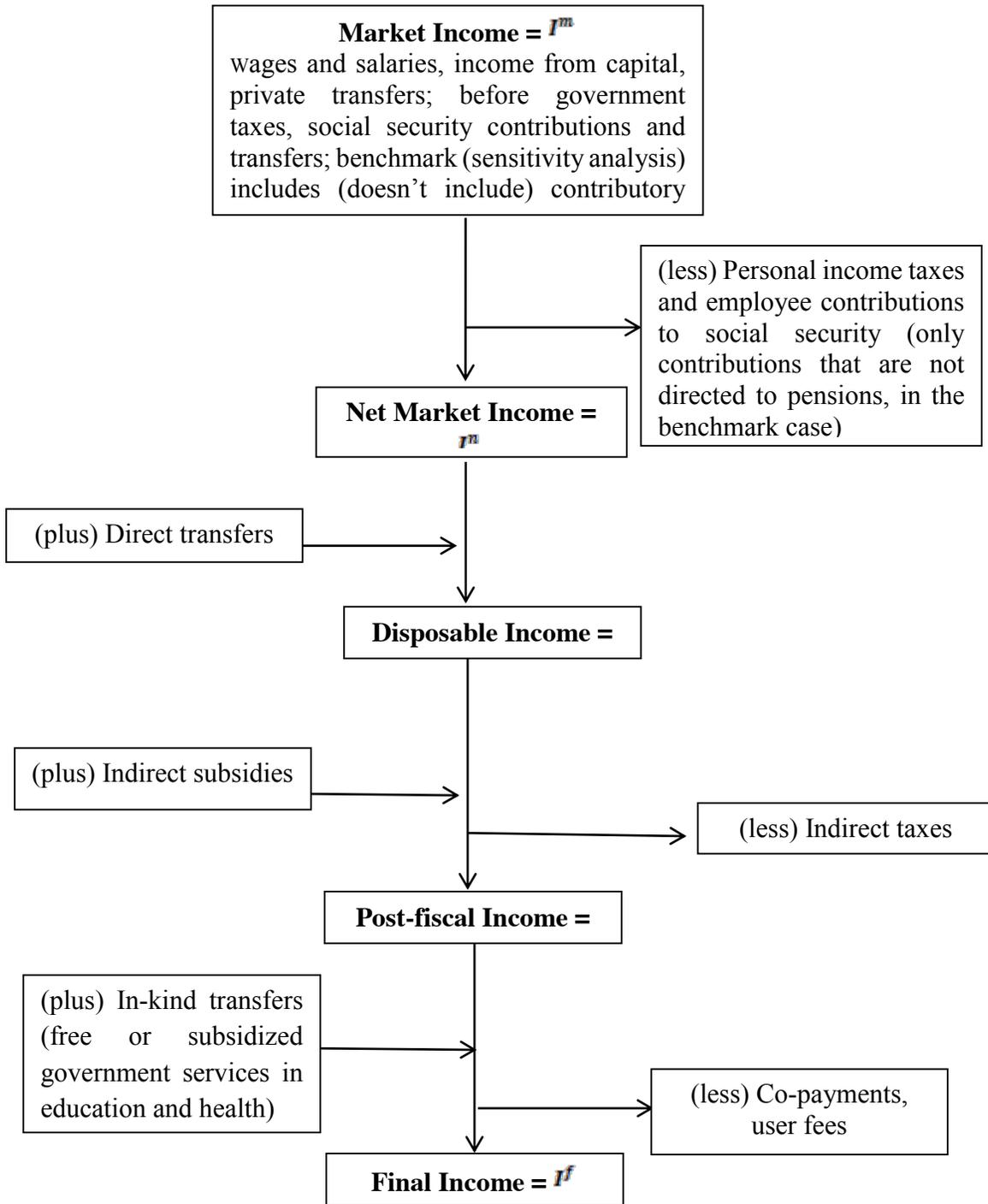
¹⁶ See Lustig and Higgins 2013.

Finally incidence analysis is based on clearly defined income concepts. The definitions used for the study are summarized below, in Diagram 1. In general, household surveys do not include all necessary information to create each income construct used in incidence analysis. Some items related to taxes and social spending had to be imputed. A description of how each income concept was constructed is shown in the Appendix.

Social spending includes direct transfers and government expenditures on health, education and housing for the benchmark scenario, while contributory pensions are considered a government transfer in the sensitivity analysis. Direct taxes comprise personal income tax and contributions to social security. Contributions to the pension fund are excluded (included) in the benchmark (sensitivity) scenario. Only payments directed to the health insurance are subtracted from market income. Indirect taxes include consumption taxes¹⁷ (no evasion is assumed).

¹⁷ Value added tax (IVA) and tax on luxury goods (ICE).

DIAGRAM 1–DEFINITIONS OF INCOME CONCEPTS



Note: In some cases, results for “final income*” are also presented and defined as disposable income plus in-kind transfers.

As per Lustig and Higgins (2013).

Source: Lustig and Higgins 2013

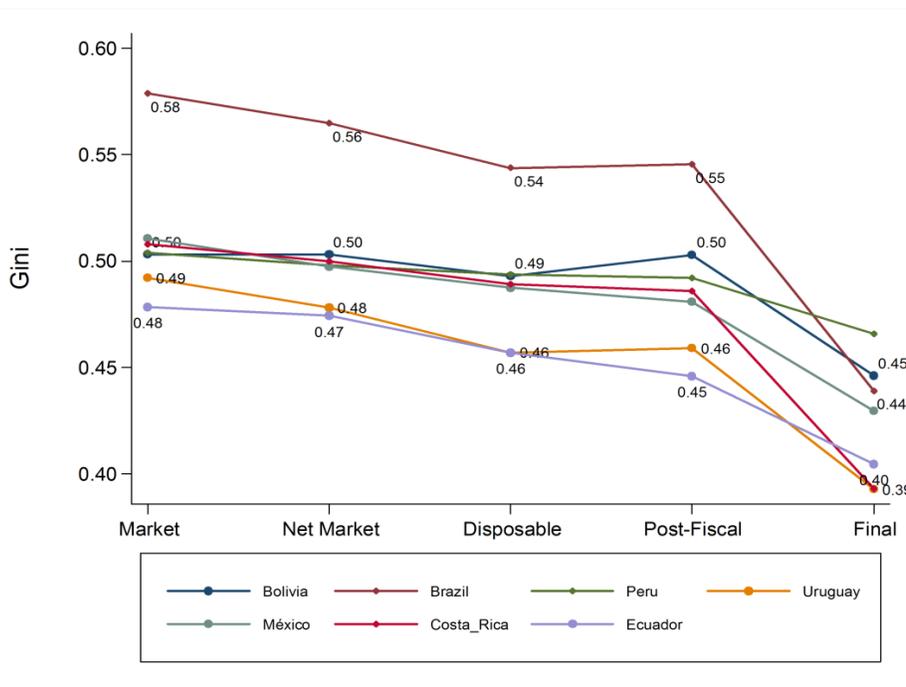
4 RESULTS

i Impact of Social Spending and Taxes on Inequality and Poverty

Figure 1 compares the Ecuador Gini coefficient with six other countries¹⁸ of the region (Bolivia, Brazil, Mexico, Uruguay, Costa Rica and Peru). Ecuador has the lowest disposable income Gini (0.46) together with Uruguay; income tax¹⁹, contributions to the social security fund and direct transfers reduce Gini by 2.2 percentage points. Respect to final income Gini; Ecuador has the lowest indicator behind Uruguay itself; however, the result is not strictly comparable with other countries that applied the same methodology, due to the fact that it was not possible to include tertiary education in incidence analysis.

On the other hand, indirect taxes, subsidies and in-kind transfers (education and health) lower the indicator by 7.4 percentage points. It is important to mention that only Ecuador and Mexico show a decrease in post-fiscal income Gini with respect to disposable income. The reasons for this result may be the various exemptions of the value added tax on food, basic necessities and medicine, as well as the propane gas subsidy²⁰ that benefits almost all of the households in Ecuador.

FIGURE 1: GINI COEFFICIENT FOR EACH INCOME CONCEPT: ARGENTINA, BOLIVIA, BRAZIL, MÉXICO, PERÚ, URUGUAY, COSTA RICA AND ECUADOR



Source: Lustig et al., 2012: For Ecuador, the authors' calculations are based on the National Survey of Income and Expenditures for Urban and Rural Households, Ecuador, 2011-2012 (*Encuesta Nacional de Ingresos y Gastos de los Hogares Urbanos y Rurales*, 2011-2012).

¹⁸ Ecuador results correspond to 2011, while Bolivia, Brazil, Peru and Uruguay to 2009 and Mexico and Costa Rica to 2010.

¹⁹ In the study, only income tax directed to people is considered. Nonetheless, in Ecuador the majority of income tax is collected from businesses.

²⁰ The official price of a 15 kilogram cylinder is \$1.60, while the official cost is \$14.10.

Table 5 and Figure 2 present the effect of social spending on the headcount ratio and the Gini coefficient (international poverty lines of \$1.25, \$2.50, and \$4.00 PPP per day and the national moderate and extreme poverty lines) for the benchmark analysis and the sensitivity case.

The low effect of direct taxes and contributions on social security for both inequality and poverty is noteworthy; results are consistent with those presented in other CEQ research for Latin America, and in Arteta's work (2006) "*Informe de Equidad Fiscal de Ecuador*²¹". However, direct transfers²² and non-contributory pensions²³ reduced the \$2.50 PPP headcount index by 3.1 percentage points and the \$4.00 PPP index by 3.2 percentage points (benchmark case). Although net indirect taxes²⁴ lower poverty, the reduction is less than one percentage point, regardless of the poverty line used. Finally, when pensions are considered part of the market income (benchmark scenario), both the Gini coefficient and the headcount index for market income are lower than when pensions are part of disposable income i.e. treated as transfers (sensitivity case). We may thus surmise that contributory pensions have an equalizing and poverty-reducing effect.

²¹Calculations determined utilizing data from the 2003-2004 Income and Expenditure Survey.

²²Human development grant, free school uniforms, free textbooks, free school breakfast, free school lunch and disability cash transfer.

²³Human development grant for seniors.

²⁴ Difference between indirect subsidies and indirect taxes.

TABLE 5. TAXES, TRANSFERS, INEQUALITY, AND POVERTY (BENCHMARK AND SENSITIVITY ANALYSES)

	Market income	Net market income	Disposable income	Post-fiscal income	Final income
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Benchmark case

Gini	0.4785	0.4743	0.457	0.4457	0.4046
<i>Headcount index (percent)</i>					
\$1.25 PPP /day	3.4	3.4	1.9	1.6	
\$2.50 PPP /day	10.8	10.8	7.7	6.9	
\$4.00 PPP /day	24.1	24.3	20.9	20.3	
\$2.08PPP / day (national extreme)	7.7	7.7	5.1	4.5	
\$3.7 PPP / day (national moderate)	21.3	21.4	18	17.2	

Sensitivity analysis : Contributory pensions as a government transfer

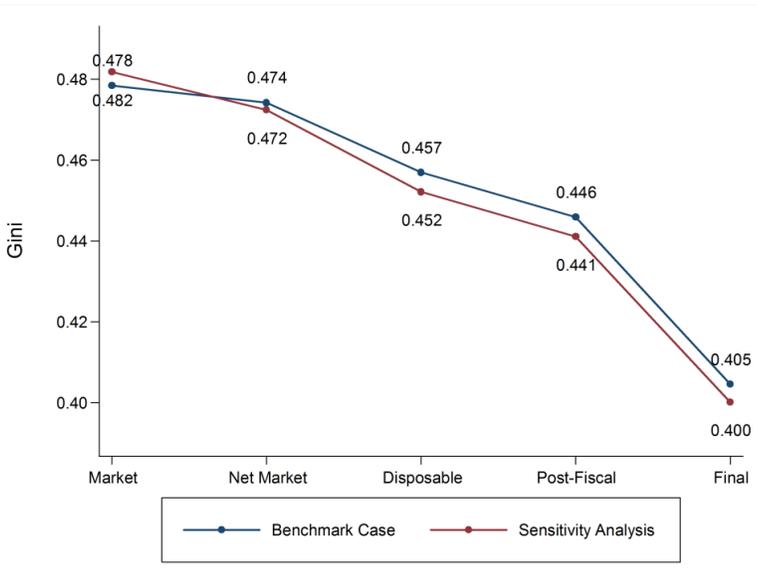
Gini	0.4818	0.4724	0.4522	0.4409	0.4002
<i>Headcount index (percent)</i>					
\$1.25 PPP/day	4.1	4.2	1.9	1.6	
\$2.50 PPP/day	11.9	12	7.7	6.9	
\$4.00 PPP/day	26	26.5	21.2	20.5	
\$2.08PPP / day (national extreme)	8.9	8.9	5.1	4.5	
\$3.7 PPP / day (national moderate)	23.1	23.5	18.2	17.4	

Note: For definitions of income concepts, see Diagram 1 and Appendix.

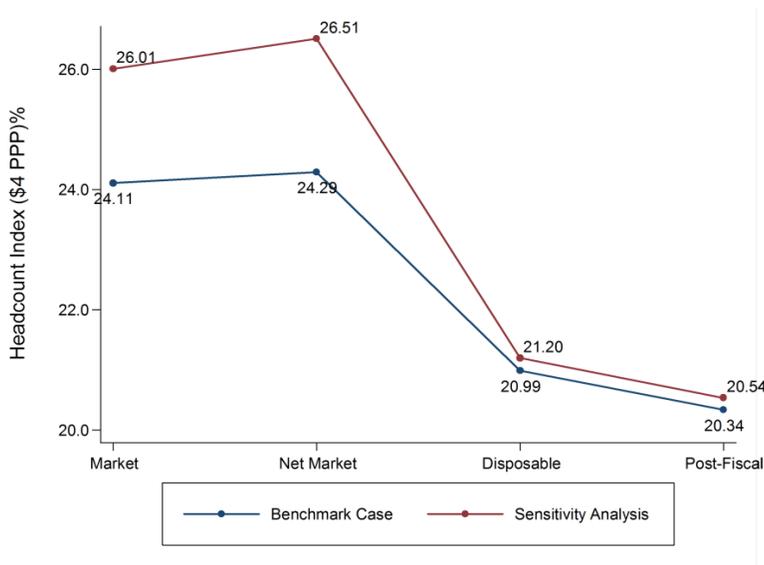
Sources: Authors' calculations based on the National Survey of Income and Expenditure for Urban and Rural Households, Ecuador, 2011-2012 (*Encuesta Nacional de Ingresos y Gastos de los Hogares Urbanos y Rurales, 2011-2012*) and the National Health and Nutrition Survey, 2011-2013 (*Encuesta Nacional de Salud y Nutrición, 2011-2013*).

FIGURE 2: GINI AND HEADCOUNT RATIO BENCHMARK VS. SENSITIVITY ANALYSIS

GINI



HEADCOUNT



Benchmark case: contributory pensions included in market income.

Sensitivity analysis: contributory pensions treated as government transfers.

Source: Authors’ calculations based on National Survey of Income and Expenditures for Urban and Rural Households, Ecuador, 2011-2012 (*Encuesta Nacional de Ingresos y Gastos de los Hogares Urbanos y Rurales*)

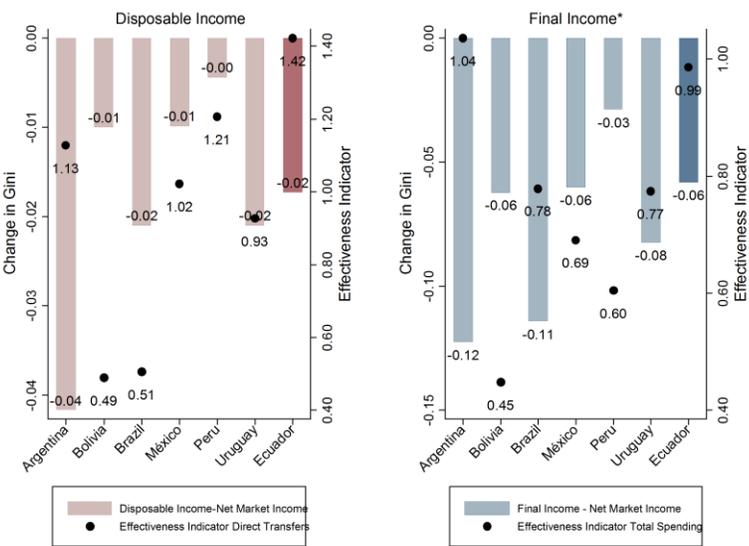
ii Redistributive Effectiveness

The effectiveness indicator equals the redistributive effect of direct and in-kind transfers included on the analysis divided by their relative size, and it can be defined with more detail as follows. For direct (in-kind) transfers, the

effectiveness indicator is the decline between net market income²⁵ and the disposable income (final income*) Gini's, divided by the size of direct transfers (in-kind transfers plus direct transfers) as a percent of GDP (Lustig et.al 2013, 57). In order to avoid overestimating the effectiveness indicator and since the budget size according to national accounts is used, only the direct transfers captured by the survey are included. This is also due to the fact that those programs create an observed change in income.

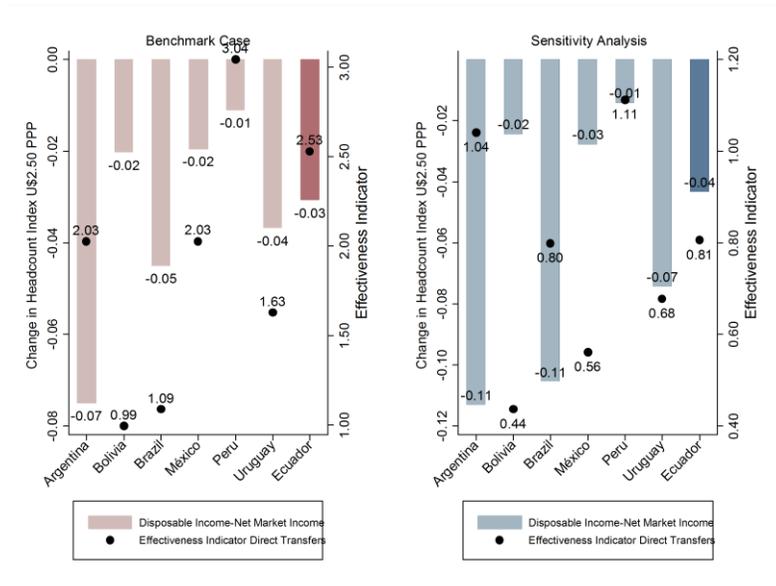
FIGURE 3: DECLINE IN GINI, HEADCOUNT RATIO (\$2.50 PPP) AND REDISTRIBUTIVE EFFECTIVENESS: ARGENTINA, BOLIVIA, BRAZIL, MÉXICO, PERU, URUGUAY AND ECUADOR

GINI



²⁵ Net market income is used instead of market income because the difference between market and disposable income inequality includes the effect of taxes as well.

HEADCOUNT



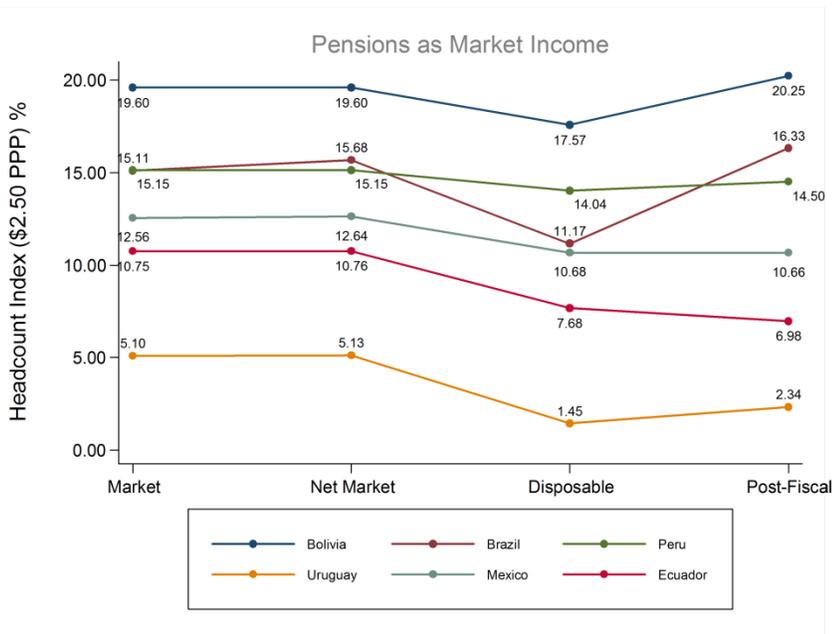
Source: Lustig et al., 2012: For Ecuador, authors' calculations based on the National Survey of Income and Expenditures for Urban and Rural Households, Ecuador, 2011-2012 (*Encuesta Nacional de Ingresos y Gastos de los Hogares Urbanos y Rurales, 2011-2012*) and National Accounts.

In Figure 3, reductions in the Gini coefficient and the headcount ratio for Ecuador and six other Latin American countries that applied the same methodology (benchmark case) are presented. Ecuador shows the highest effectiveness indicator for direct transfers and the second highest for direct transfers plus in-kind transfers, following Argentina. However, Ecuador ranks fourth in terms of inequality reduction when only direct transfers are taken into account (i.e. disposable income less net market income), behind Argentina, Brazil and Uruguay, and last when in-kind transfers are included as well (i.e final income less net market income).

In terms of poverty reduction²⁶, Ecuador ranks fourth in both the benchmark and sensitivity analysis, behind Argentina, Brazil and Uruguay. Ecuador displays the second highest effectiveness indicator, behind Peru, when contributory pensions are included in market income and it ranks third when pensions are considered a government transfer. It appears that Ecuador is able to get the most out of public spending in relation to its GDP, in terms of its effect on inequality. It has the highest effectiveness indicator, while contributing effectively to extreme poverty reduction, especially when contributory pensions are treated as market income.

²⁶The poverty reduction estimate equals Disposable Income (headcount index) less Net Market Income (headcount index).

FIGURE 4: HEADCOUNT INDEX FOR EACH INCOME CATEGORY (\$2.50 PPP): BOLIVIA, BRAZIL, PERU, URUGUAY, MEXICO AND ECUADOR



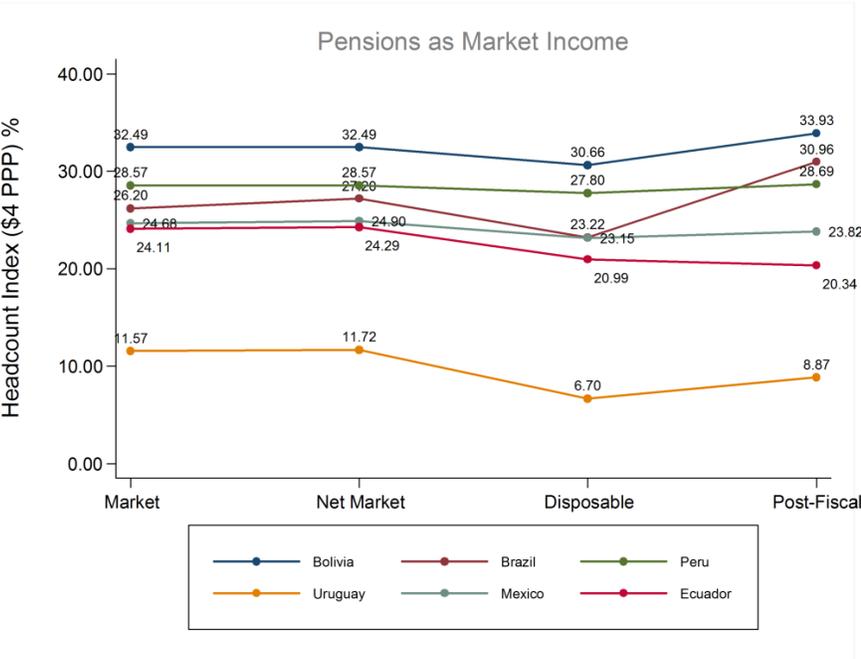
Source: Lustig et al., 2012: For Ecuador, authors' calculations based on the National Survey of Income and Expenditures for Urban and Rural Households, Ecuador, 2011-2012 (*Encuesta Nacional de Ingresos y Gastos de los Hogares Urbanos y Rurales, 2011-2012*) and National Accounts.

Prior to analyzing the incidence of taxes and social spending, a comparison of the headcount index evolution among countries²⁷ was completed.

First, extreme poverty was analyzed (i.e. at the \$2.50 PPP poverty line). As indicated in Figure 4, Ecuador has the second lowest extreme poverty headcount ratio of disposable income, surpassed only by Uruguay (7.7 percent vs. 1.5 percent). Peru (with a substantially greater population than Ecuador) has a poverty ratio considerably higher and a lower impact of direct transfers. Alternatively, Bolivia has the highest extreme poverty rate followed by Brazil. Finally, in all the countries except Mexico and Ecuador, the headcount index in the post-fiscal income is higher with respect to disposable income. However, the variations are less than one percentage point, with Bolivia and Brazil being the exception. In both countries, the impact of net indirect taxes is large enough to increase the headcount index to a value higher than market income.

²⁷Ecuador's results correspond to 2011, while Bolivia, Brazil, Peru and Uruguay to 2009 and Mexico to 2010.

FIGURE 5: HEADCOUNT INDEX FOR EACH INCOME CATEGORY (\$4.00 PPP): BOLIVIA, BRAZIL, PERU, URUGUAY, MEXICO AND ECUADOR



Source: Lustig et al., 2012: For Ecuador, authors' calculations based on the National Survey of Income and Expenditures for Urban and Rural Households, Ecuador, 2011-2012 (*Encuesta Nacional de Ingresos y Gastos de los Hogares Urbanos y Rurales, 2011-2012*).

Secondly, moderate poverty (i.e. the \$4.00 PPP poverty line) for each income category is presented in Figure 5. Even though Ecuador remains the country with less income poverty (behind Uruguay), the gap between the countries' indicators increases from six percentage points to about thirteen points on disposable income. The difference with Mexico decreases particularly in market and net market income. Nonetheless, the gap widens again for disposable income, with a result that confirms the higher effectiveness of direct transfers in Ecuador. Finally, the difference in the headcount index for all income measures between Peru and Ecuador remains practically the same as the \$2.50 PPP poverty line.

iii Incidence of taxes and social spending

In Table 6, the incidence²⁸ of taxes and social spending by decile is presented. Non-contributory pensions (the conditional cash transfer²⁹) and in-kind transfers for both health and educational services follow the Ecuadorian government prescribed policy outcome, i.e. their incidence increases as income declines. For example, the Human Development Grant cash transfer equals 18.8 percent of the first decile's market income.

²⁸For taxes and transfers, incidence is calculated as the transfer/tax total divided by total market income in each decile. For other income measures (i.e. Net Market Income, Disposable Income, Post-Fiscal Income and Final Income) the incidence indicator equals (Net Market (Disposable, Post-Fiscal, Final) Income less Market Income) / Market Income.

²⁹Human Development Grant (Bono de Desarrollo Humano).

Other direct educational benefits³⁰ are highly concentrated among the poor, including the education in-kind transfer, accounting for 46.2 percent of market income in decile 1 and almost 25 percent in decile 2.

Direct taxes show the opposite degree of incidence, i.e. a direct relationship with income. Income tax affects only the highest deciles, reflecting its progressive structure. Indirect taxes, in contrast, have a uniform pattern across different deciles³¹. The incidence is 6.4 percent on decile 1 and 6.9 percent on decile 10, unlike Uruguay, where “the two poorest deciles get hit the hardest” (Bucheli, et.al. 2012), but similar to Peru, where the incidence in decile one of indirect taxes is 6.6 percent. According to Jaramillo (2013), the low effect of indirect taxes in Peru among the poor responds to high informality especially in rural areas, while in Ecuador the uniform pattern across deciles may respond to value added tax exemptions on food and basic services (such as electricity and water).

TABLE 6. INCIDENCE OF TAXES AND TRANSFERS IN PERCENTAGES (BENCHMARK CASE)

Deciles	Direct Taxes	Net Market Income	Non-contributory Pensions	Flagship CCT	Other Direct Transfers	All Direct Transfers	Disposable Income	Indirect Subsidies	Indirect Taxes	Post-Fiscal Income	In-kind Education	In-kind Health	In-kind Transfers	Final Income
1	0.0	-0.1	10.6	18.8	4.8	34.1	34.1	15.8	-6.4	43.4	46.2	22.5	68.6	112.1
2	0.0	-0.2	2.8	8.1	1.9	12.8	12.6	8.8	-5.5	15.9	24.9	10.3	35.2	51.1
3	0.0	-0.3	1.6	5.3	1.2	8.2	7.9	6.9	-5.5	9.3	16.6	7.2	23.8	33.1
4	0.0	-0.5	1.2	3.6	0.7	5.5	5.0	6.0	-5.4	5.6	11.5	5.5	17.0	22.6
5	0.0	-0.6	0.8	2.5	0.5	3.8	3.1	5.4	-5.5	3.0	9.1	3.9	13.0	16.0
6	0.0	-0.8	0.7	1.5	0.3	2.4	1.7	4.7	-5.7	0.7	6.1	3.3	9.4	10.2
7	0.0	-0.9	0.4	0.9	0.2	1.5	0.5	4.4	-5.8	-0.9	4.5	2.5	7.0	6.1
8	-0.1	-1.1	0.3	0.5	0.1	0.9	-0.3	3.9	-6.0	-2.4	2.9	1.8	4.7	2.3
9	-0.2	-1.5	0.1	0.2	0.0	0.3	-1.2	3.5	-6.4	-4.0	1.4	1.1	2.4	-1.6
10	-1.1	-2.6	0.0	0.0	0.0	0.0	-2.6	2.7	-6.9	-6.8	0.2	0.4	0.6	-6.2
Total Population	-0.4	-1.6	0.5	1.3	0.3	2.1	0.6	4.1	-6.3	-1.6	4.6	2.4	7.0	5.4

Source: Authors' calculations based on the National Survey of Income and Expenditures for Urban and Rural Households, Ecuador, 2011-2012 (*Encuesta Nacional de Ingresos y Gastos de los Hogares Urbanos y Rurales, 2011-2012*).

In Figure 6, the difference in incidence analysis (by market income decile) between the benchmark case and the sensitivity analysis -pensions as government transfers- is revealed. In the sensitivity analysis, the change of disposable, post-fiscal and final income with respect to market income is greater in the bottom deciles, in comparison to the benchmark case. The main reason for this result is that some contributory pensions are granted to households with a very low or insignificant market income in the sensitivity case³²; the difference between disposable and market income increases dramatically especially in deciles one and two.

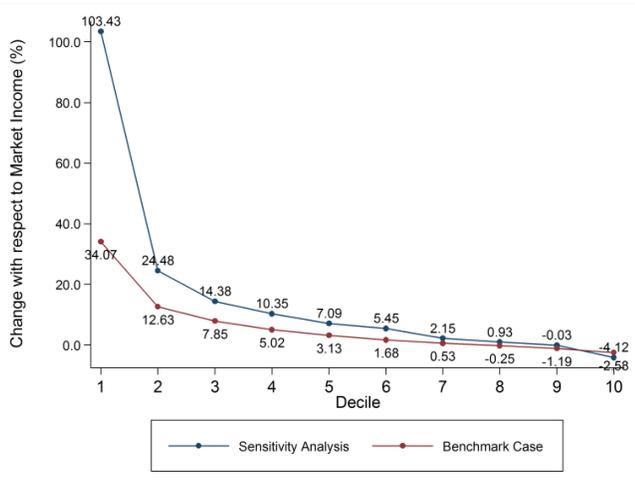
³⁰ Free school uniforms, free textbooks, free school breakfast and lunch.

³¹ Income deciles for table 6 were constructed using market income.

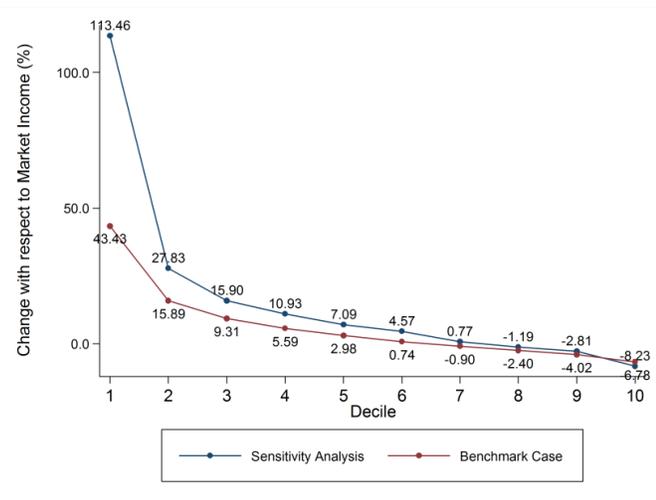
³² In the sensitivity analysis, contributory pensions are considered a direct government transfer, and therefore are not included in market income.

FIGURE 6: CHANGES IN INCOME BY DECILE

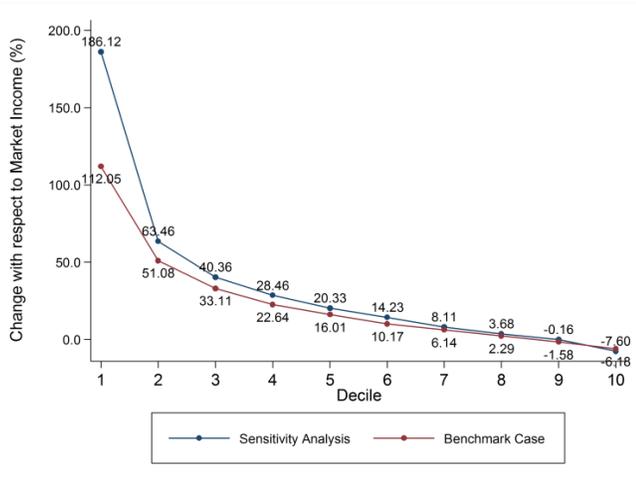
DISPOSABLE INCOME



POST-FISCAL INCOME



FINAL INCOME



Source: Authors' calculations based on the National Survey of Income and Expenditures for Urban and Rural Households, Ecuador, 2011-2012 (*Encuesta Nacional de Ingresos y Gastos de los Hogares Urbanos y Rurales, 2011-2012*).

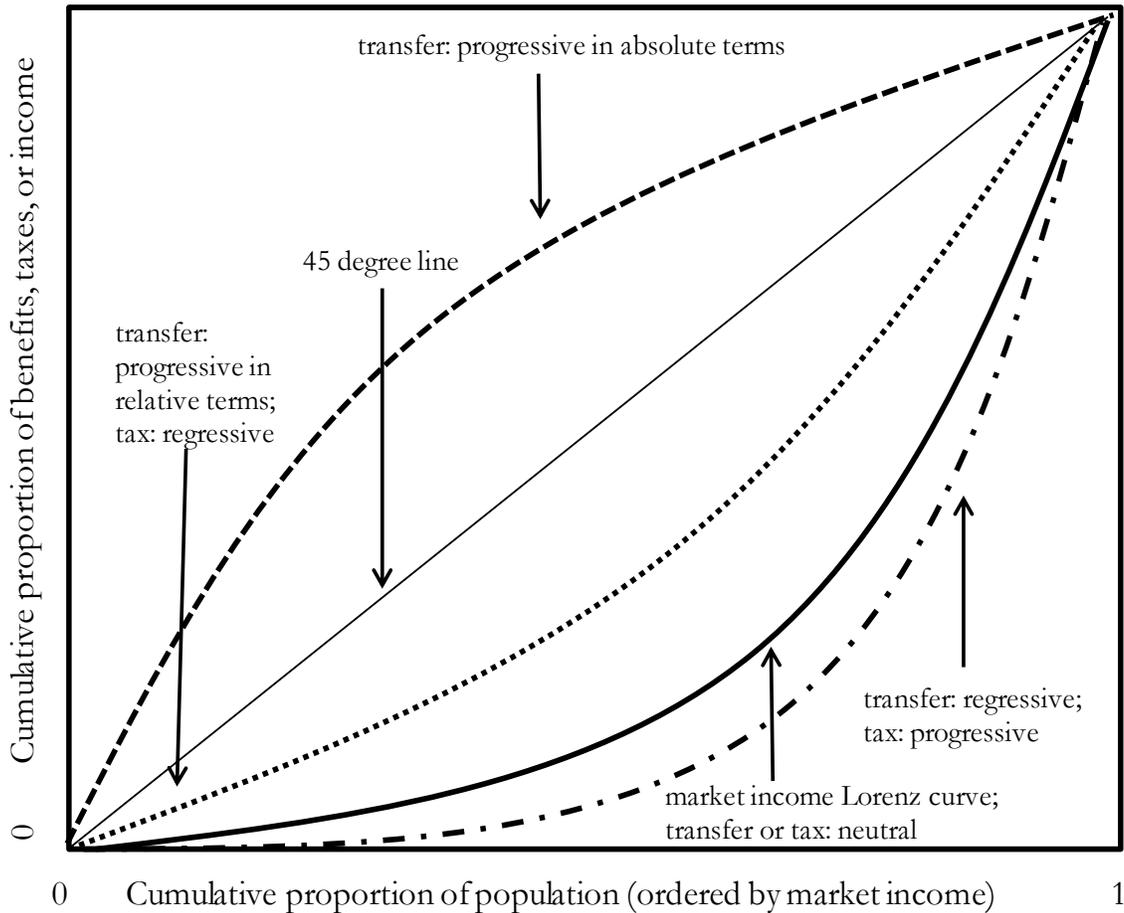
iv Progressivity of taxes and social spending

According to Lustig, Pessino and Scott (2013), the progressivity or regressivity of a tax or transfer can be measured in both absolute and relative terms. In the tax incidence literature “the fiscal application of the term progressive/regressive” is used only in the relative sense. Nevertheless for transfers, both absolute and relative concepts of progressivity are commonly utilized. Because this study comprises both taxes and transfers, the relative definition is considered. Hence, “a tax is everywhere progressive³³ (regressive) if the proportion paid –in relation to market income – increases (decreases) as income rises.” On the other hand, a transfer is “progressive when the proportion received (as a percent of market income) decreases with income” (Lustig and Higgins 2013, 44)³⁴.

³³In practice taxes are not always *everywhere* progressive, thus a tax is classified as progressive (regressive) if its “concentration curve lies everywhere below (above) the market income Lorenz curve”, and its Kakwani index is positive (negative). If the concentration curve of a tax crosses the market income Lorenz Curve, it is classified as ambiguous i.e. neither regressive nor progressive (Lustig and Higgins 2013, 44).

³⁴ A figure with concentration curves of taxes and transfers is included on the annexes.

DIAGRAM 2: CONCENTRATION CURVES FOR PROGRESSIVE AND REGRESSIVE TRANSFERS AND TAXES

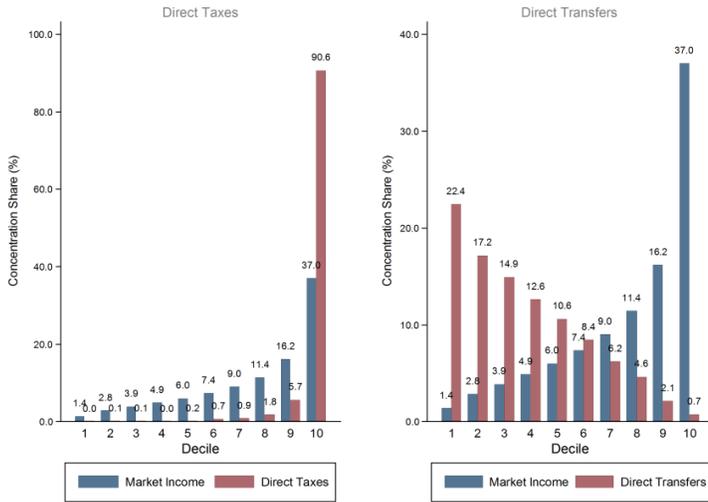


Source: Lustig and Higgins (2013)

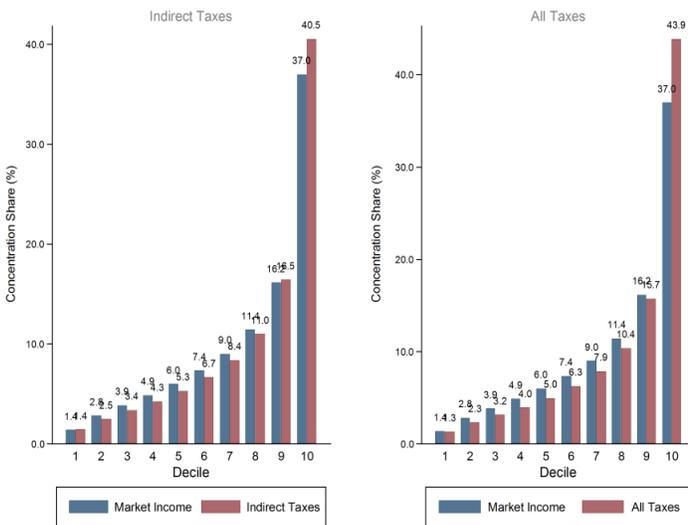
When concentration shares are used to assess the progressivity/regressivity of a tax, the proportion paid by each decile is analyzed. Then, if the paid share is lower (higher) than the fraction of income for the bottom (top) of the income scale; the tax is classified as progressive. If the opposite occurs, it is classified as regressive. A transfer is progressive in absolute terms if the proportion received is higher not only than the income share, but also the population share, for the poorest decile, and this relationship declines as we move up to higher deciles. (Bucheli et al 2012, 21). In the following figure, both transfer and tax progressivity for the benchmark scenario is presented with the use of concentration shares.

FIGURE 7: CONCENTRATION SHARES (MARKET INCOME DECILES)

DIRECT TAXES AND DIRECT TRANSFERS



INDIRECT TAXES AND ALL TAXES



Source: Authors' calculations based on the National Survey of Income and Expenditures for Urban and Rural Households, Ecuador, 2011-2012 (*Encuesta Nacional de Ingresos y Gastos de los Hogares Urbanos y Rurales, 2011-2012*).

In Figure 7, one may observe that direct, indirect and overall (direct plus indirect) taxes are progressive³⁵. The direct transfers³⁶ are highly progressive because they accomplish both of the conditions listed above. Spending on education and health is progressive (in absolute terms), however the relationship is not as clear as with

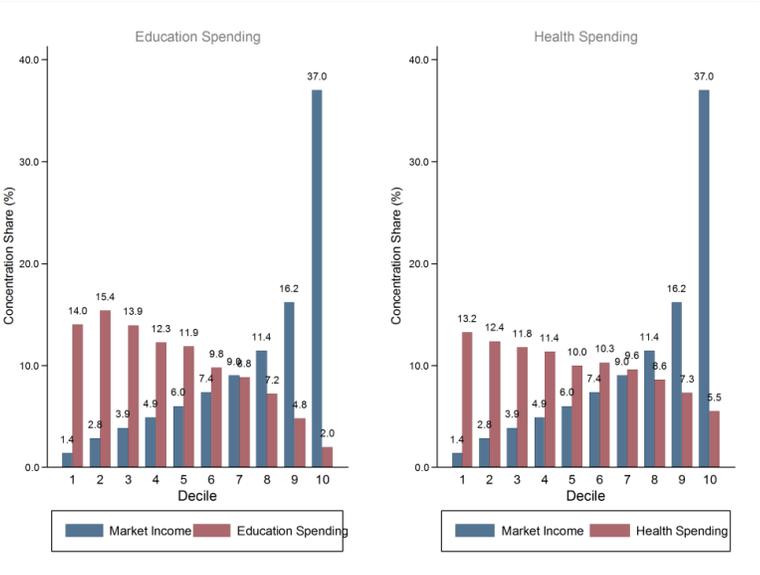
³⁵ The Kakwani indexes for indirect, direct and all taxes are positive, and the concentration curve lies below the market income Lorenz curve for all cases with the exception of direct taxes.

³⁶ Human development grant, free school uniforms, free textbooks, free school breakfast and lunch, and disability cash transfer (Bono Joaquin Gallegos Lara).

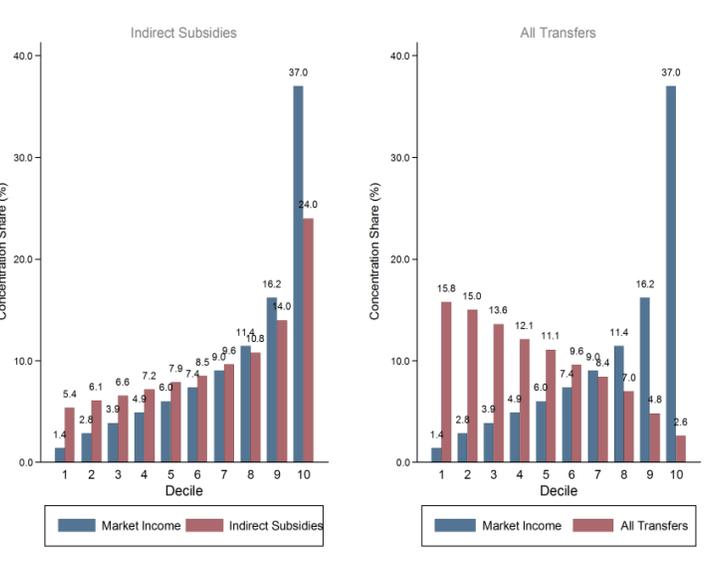
direct transfers. Hence total social spending is progressive. Finally, indirect subsidies³⁷ are regressive in the sense that the benefit share becomes larger as the income decile increases.

FIGURE 7: CONCENTRATION SHARES (CONTINUED)

EDUCATION SPENDING AND HEALTH SPENDING



INDIRECT SUBSIDIES AND ALL TRANSFERS



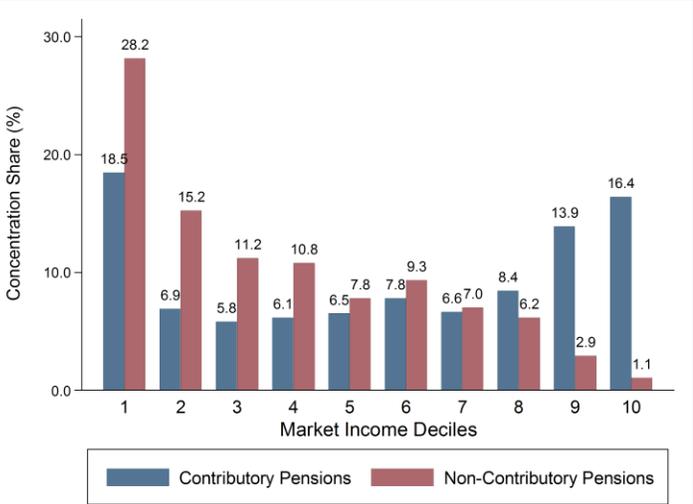
Source: Authors' calculations based on the National Survey of Income and Expenditures for Urban and Rural Households, Ecuador, 2011-2012 (*Encuesta Nacional de Ingresos y Gastos de los Hogares Urbanos y Rurales, 2011-2012*).

The concentration share of pensions, when considered as transfers (sensitivity case) is presented in Figure 8. Non-contributory pensions are somewhat progressive in absolute terms, yet decile six has a concentration

³⁷ Gasoline, propane gas, diesel fuel, electricity and housing.

share larger than decile five. Thus, it is not possible to determine that benefits decrease with income. On the other hand, it cannot be established that contributory pensions are progressive in absolute terms. It seems that per capita transfers are similar in deciles two through seven, but they increase in the next three deciles. The largest share of benefits is received by decil one, since in the sensitivity case, some households have a very low market income (in the absence of contributory pensions) and the deciles for this case do not consider re-ranking and are calculated with respect to that income of the sensitivity analysis.

FIGURE 8: NON-CONTRIBUTORY PENSIONS AND CONTRIBUTORY PENSION'S CONCENTRATION SHARE (SENSITIVITY ANALYSIS)

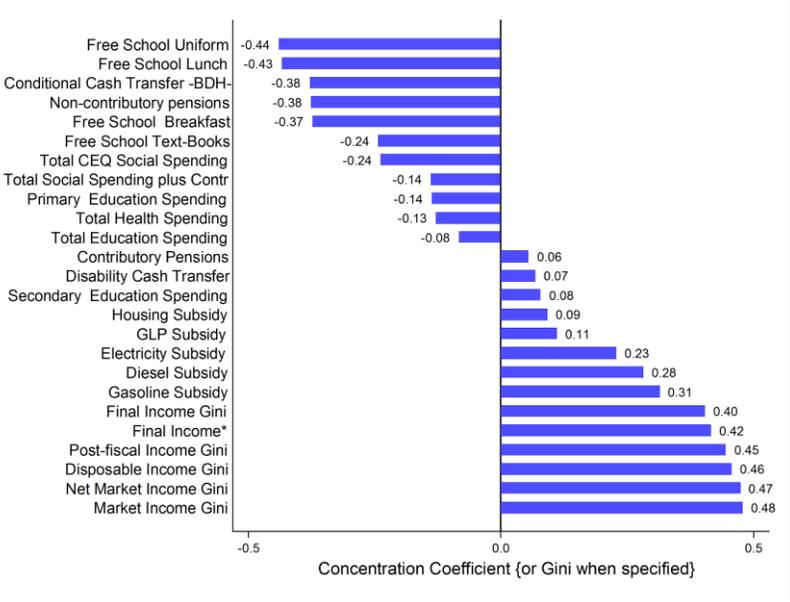


Source: Authors' calculations based on the National Survey of Income and Expenditures for Urban and Rural Households, Ecuador, 2011-2012 (*Encuesta Nacional de Ingresos y Gastos de los Hogares Urbanos y Rurales, 2011-2012*).

Ecuador's concentration coefficient for total social spending (benchmark scenario) equals -0.24 (Figure 9) and it is the most progressive among Uruguay, Peru, Brazil, Mexico and Bolivia. When contributory pensions are included in total social spending (sensitivity case) the coefficient decreases to -0.14. The concentration coefficients for some education programs³⁸ are robustly progressive and among the highest in the region. The conditional cash transfer is moderately progressive because the concentration coefficient is greater than -0.40 and therefore overcome in terms of progressivity by the same indicators in Uruguay, Peru and Brazil. Based on Figure 9, the only components of social spending that are not progressive but rather absolutely neutral³⁹ are the disability cash transfer, the secondary education spending, and the housing subsidy. The indirect subsidies i.e. propane gas, gasoline, diesel and electricity are absolutely regressive⁴⁰. However, no programs are overtly regressive because all the transfers (direct or in-kind) or subsidies have a concentration coefficient greater than the market income Gini.

³⁸Free school uniform and lunch.
³⁹ A program or transfer is classified as absolutely neutral if its concentration coefficient (CC) falls between the interval (-0.1 < CC > 0.1)
⁴⁰ A transfer is classified as absolutely regressive if its concentration coefficient is greater than 0.1 and lower than market income Gini.

FIGURE 9: CONCENTRATION COEFFICIENT BY SPENDING CATEGORY AND FOR TOTAL SOCIAL SPENDING



Source: Authors' calculations based on the National Survey of Income and Expenditures for Urban and Rural Households, Ecuador, 2011-2012 (*Encuesta Nacional de Ingresos y Gastos de los Hogares Urbanos y Rurales, 2011-2012*).

Note: According to CEQ (Commitment to Equity) a multi-country project, social spending includes all cash transfers (except for contributory pensions) and other direct transfers plus public spending on education and health. The concentration coefficients of Contributory Pensions after taxes and Total CEQ Social Spending plus Contributory Pensions after taxes are calculated with respect to sensitivity analysis market income (to avoid calculating the concentration coefficient with respect to an income definition that includes that component) while the concentration coefficients for the other components are calculated with respect to benchmark case market income.

v Enhancing redistributive capacity: where to look

Since the standard incidence analysis undertaken here does not include inter-temporal behaviors, marginal effects, or macro-sustainability, conclusions in terms of policy implications should be made cautiously. Nonetheless, policy makers may wish to examine several of the findings, in order to improve anti-poverty and redistributive capability, without affecting efficiency growth and macroeconomic stability.

Of primary importance are the social protection programs (direct transfers). This analysis indicates that direct transfers in Ecuador, mainly via the Human Development Grant, are associated with the reduction of extreme poverty by about 3 percentage points. The use of resources in Ecuador is revealed as relatively more effective with respect to some other Latin American countries and most (but not all) government social spending is progressive. In order to assess whether or not this outcome could be improved, three indicators will be considered: the coverage of direct transfers among the poor, the percentage of benefits from direct transfers

going to people above the poverty threshold, and the per capita benefit for the extreme⁴¹ and moderately poor⁴².

In Table 7, the average per capita transfers among beneficiary households in \$PPP for different income groups is presented. The average per capita direct transfer received by the extreme poor is \$0.61 PPP, accounting for 88 percent of their market income. On the other hand, Figure 10 indicates in the last panel that 5.6 percent of the extremely poor and 7.5 percent of the moderately poor do not receive any transfers. Alternatively, it is worth noting that 54.1 percent of the direct transfer benefits are received by non-poor households and that 65.4 percent of beneficiaries are not even moderately poor, nonetheless the poor population (extreme and moderate) represents approximately 25 percent of the total population (market income). Therefore per capita transfers may be low due to the persistence of poverty and extreme poverty in disposable income (considering the high coverage).

Policy makers may therefore wish to evaluate whether or not to increase the size of transfers or whether increased effectiveness may be accomplished by enhancing both direct transfers and improved targeting of beneficiaries⁴³. Following Bucheli (et. al 2012), policy makers should assess fiscal and other factors before making a decision. For example, “would extreme poverty be eradicated by simply giving more money to the extreme poor?” Or alternatively, do people who remain economically and socially vulnerable after transfers require additional or other types of assistance, focused on other issues. The results also suggest additional analysis to determine whether or not increasing the amount of transfers would be counterproductive (e.g. decrease adult labor force participation).

TABLE 7. PER CAPITA TRANSFERS IN TRANSFER RECIPIENT HOUSEHOLDS BY MARKET INCOME GROUPS

SPENDING CATEGORY	BENEFITS PER CAPITA IN TRANSFER RECEIPT HOUSEHOLDS IN DAILY US\$ (PPP 2005)										
	Groups:	y < 1.25	1.25 < y < 2.5	y < 2.5	2.5 < y < 4	y < 4	4 < y < 10	10 < y < 50	y > 50	y > 4	Total
Conditional Cash Transfer (BDH)		0.38	0.36	0.37	0.36	0.37	0.40	0.52	0.00	0.42	0.39
Non-contributory pensions		0.90	0.64	0.74	0.61	0.68	0.63	0.68	0.44	0.64	0.66
Free School Breakfast		0.05	0.05	0.05	0.05	0.05	0.05	0.04	0.05	0.04	0.05
Free School Lunch		0.05	0.05	0.05	0.05	0.05	0.05	0.04	0.05	0.05	0.05
Free Text-Books		0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Free Uniforms		0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Disability Cash Transfer (Joaquín Gallegos Lara)		2.31	1.99	2.10	2.00	2.05	2.71	3.15	0.00	2.78	2.36
All above for benefits, at least one for beneficiaries		0.60	0.48	0.52	0.40	0.46	0.31	0.19	0.07	0.28	0.34
Education: primary		0.77	0.78	0.78	0.77	0.77	0.68	0.63	0.60	0.67	0.71
Education: secondary		0.63	0.63	0.63	0.66	0.65	0.71	0.77	0.91	0.73	0.71
Education: all except tertiary		0.87	0.90	0.89	0.90	0.89	0.83	0.80	0.81	0.82	0.85
Contributory pensions		0.57	0.70	0.67	0.88	0.79	1.86	5.97	17.60	4.47	4.02
Health		0.27	0.35	0.33	0.30	0.31	0.26	0.18	0.10	0.23	0.25
Income		0.68	1.92	1.52	3.23	2.47	6.53	18.23	82.22	12.93	10.41
Population Shares		0.03	0.07	0.11	0.13	0.24	0.43	0.31	0.02	0.76	1.00

⁴¹ People with a per capita income lower than \$2.50 PPP.

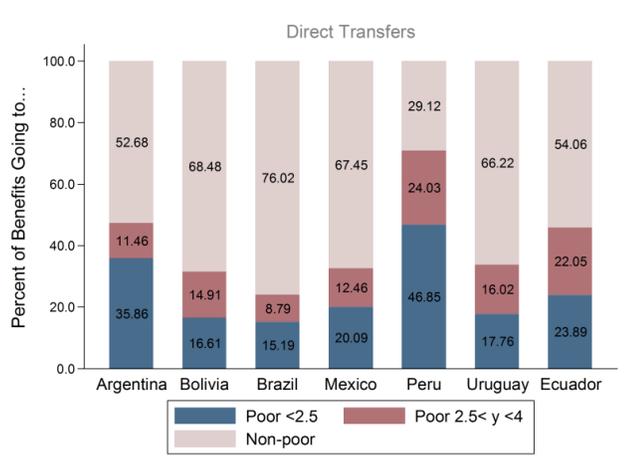
⁴² People with a per capita income lower than \$4 PPP.

⁴³ The study’s incidence analysis reveals that 55.3 percent of total benefits of the Human Development Grant conditional cash transfer and 52.3 percent of the Non-Contributory Pensions are received by people whose market income exceeds the \$4.00 PPP threshold.

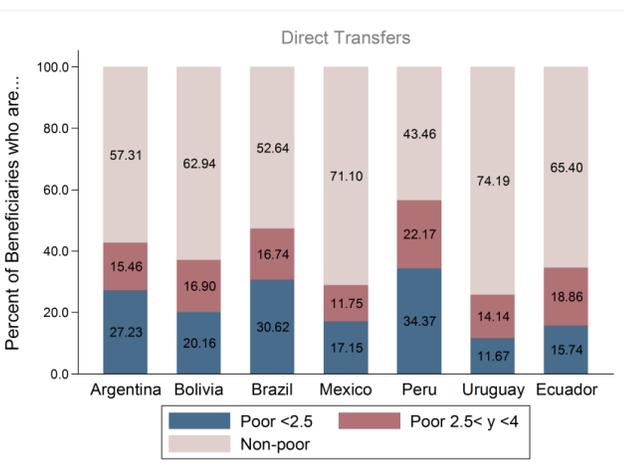
Source: Authors' calculations based on the National Survey of Income and Expenditures for Urban and Rural Households, Ecuador, 2011-2012 (*Encuesta Nacional de Ingresos y Gastos de los Hogares Urbanos y Rurales, 2011-2012*) and the National Survey of Health and Nutrition, Ecuador, 2011-2013 (*Encuesta Nacional de Salud y Nutrición, 2011-2013*).

FIGURE 10: LEAKAGE AND COVERAGE OF DIRECT TRANSFERS (BENCHMARK CASE): ARGENTINA, BOLIVIA, BRAZIL, MEXICO, PERU, URUGUAY AND ECUADOR

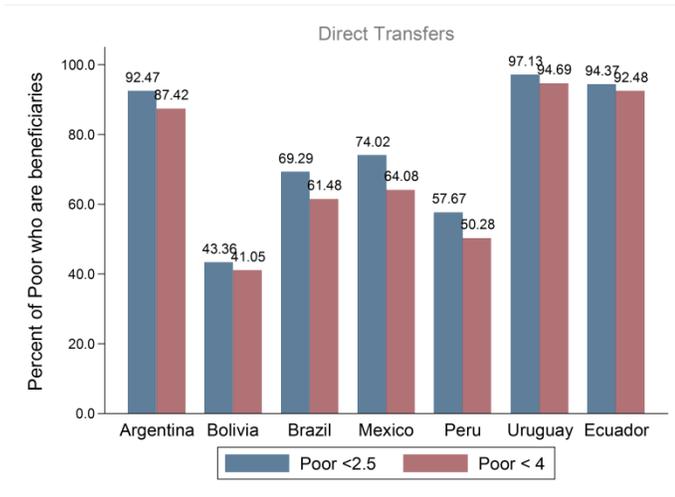
PERCENT OF BENEFITS GOING TO EXTREME POOR MODERATE POOR AND NON POOR



PERCENT OF BENEFICIARIES WHO ARE EXTREME POOR MODERATE POOR AND NON POOR



PERCENT OF POOR WHO ARE BENEFICIARIES



Source: Authors' calculations based on the National Survey of Income and Expenditures for Urban and Rural Households, Ecuador, 2011-2012 (*Encuesta Nacional de Ingresos y Gastos de los Hogares Urbanos y Rurales, 2011-2012*).

5 CONCLUSIONS

The main findings of this standard incidence analysis of taxes and social spending in Ecuador, using the National Survey of Income and Expenditures for Urban and Rural Households, Ecuador, 2011-2012 (*Encuesta Nacional de Ingresos y Gastos Urbanos y Rurales, 2011-2012*)⁴⁴, are as follows:

1. Ecuador has achieved an important reduction in poverty and in inequality due to direct and in-kind transfers.
2. In comparison with six other Latin American countries⁴⁵, Ecuador ranks first in terms of inequality reduction effectiveness and second in poverty reduction effectiveness for the indicated period.
3. Direct and indirect taxes have been progressive, while total social spending has been progressive in absolute terms.
4. Spending on health and primary education is moderately progressive, while secondary education expenditure is absolutely neutral. However, all the previous results are at specific points in time, thus it will be useful to analyze their evolution over time to determine their sustainability.
5. When contributory pensions are treated as part of market income, they are absolutely regressive. Nonetheless, when considered a government transfer, they are absolutely neutral.
6. Even though extreme poverty is low by international standards, it has not been eradicated, despite the positive effect of direct transfers. The persistence of this social phenomenon may in fact respond to the

⁴⁴The analysis was carried out for a benchmark scenario in which contributory pensions are included in market income and a sensitivity case in which they are considered a government transfer.

⁴⁵Argentina, Bolivia, Brazil, México, Perú and Uruguay.

size of transfers or to other factors such as lack of opportunity or underdeveloped labor markets, considerations which were beyond this investigation's scope.

7. Authorities may wish to analyze the incidence of indirect subsidies (propane gas, gasoline, electricity, diesel fuel) in depth. According to the concentration coefficient, they are absolutely regressive⁴⁶. In addition, the highest economic category (decile ten) receives a quarter of all benefits, while the lowest (decile one) receives only five percent.

⁴⁶Concentration coefficient higher than 0.10 and lower than market income Gini (0.479).

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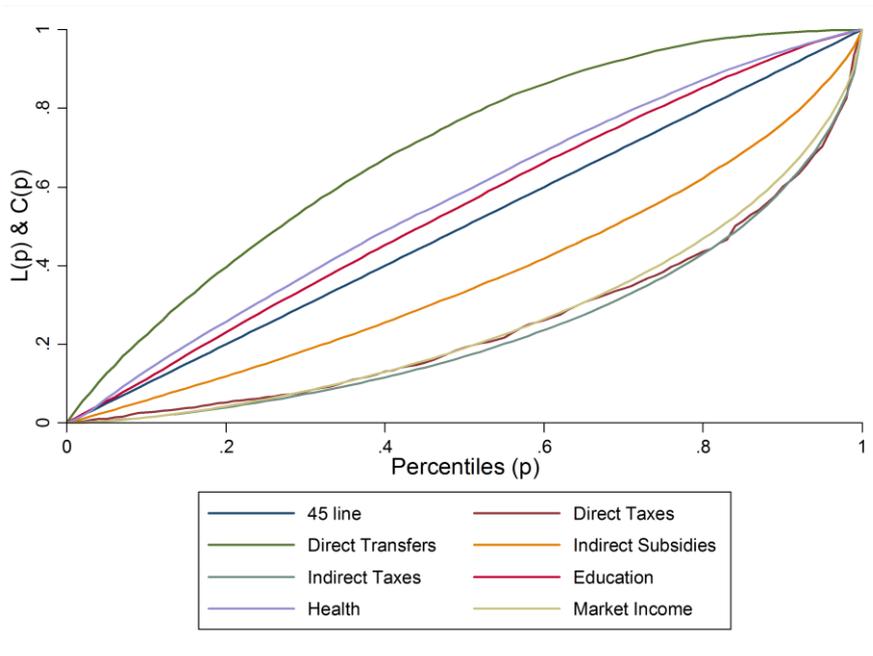
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ANNEXES

A1. Concentration curves

FIGURE 11 CONCENTRATION CURVES WITH RESPECT TO MARKET INCOME



As detailed before a tax is progressive “if its concentration curve lies everywhere below the market income Lorenz curve”, however if the concentration curve crosses the market income Lorenz curve the tax is classified as ambiguous, neither progressive nor regressive. Therefore, as evidence on figure 11, indirect taxes are progressive and direct taxes ambiguous. On the other hand, direct transfers and in kind transfers (both education and health) are progressive in absolute terms due to the fact that the concentration curves lie above the 45-degree line, as represented on figure 11.

A2. Market, Net Market, Disposable, Post-fiscal and Final Income: Definitions and Measurement

Any incidence study must define income concepts in a clear manner. Following Lustig and Higgins (2013) five income concepts are considered in this study: market, net market, disposable, post-fiscal and final income. On the other hand, since there is no agreement on whether or not to treat contributory pensions as part of market income or as a government transfer, a benchmark case (market income) and sensitivity analysis (government transfer) is undertaken to address this issue.

Market income is defined as:

$$I^m = W + IC + SC + IROH + PT + SSP \text{ (benchmark)}$$

$$I^{ms} = W + IC + SC + IROH + PT \text{ (sensitivity analysis)}$$

Where,

I^m, I^{ms} = market income in benchmark and sensitivity analysis, respectively.

W = gross (pre-tax) wages and salaries in formal and informal sector; also known as earned income.

IC = income from capital (dividends, interest, profits, rents, etc.) in formal and informal sector; excludes capital gains and gifts.

SC = self-consumption, also known as production for own consumption or self-production;

IROH = imputed rent for owner occupied housing; also known as income from owner occupied housing.

PT = private transfers (remittances and other private transfers such as alimony).

SSP = retirement pensions from contributory social security system.

Net Market income is defined as:

$$I^n = I^m - DT - SSC \text{ (benchmark)}$$

$$I^{ns} = I^{ms} - DT - SSC^s \text{ (sensitivity analysis)}$$

Where,

I^n, I^{ns} = net market income in benchmark and sensitivity analysis, respectively.

DT = direct taxes on all income sources (included in market income) that are subject to taxation.

SSC, SSC^s = respectively, all contributions to social security except portion going towards pensions⁴⁷ and all contributions to social security without exceptions.

Disposable income is defined as:

$$I^d = I^n + GT \text{ (benchmark)}$$

$$I^{ds} = I^{ns} + GT + SSP \text{ (sensitivity analysis)}$$

Where,

I^d, I^{ds} = disposable income in benchmark and sensitivity analysis, respectively.

GT = direct government transfers; mainly cash but can include transfers in kind such as food.

SSP = retirement pensions from contributory social security system.

Post-fiscal income is defined as:

$$I_{pf} = I_d + IndS - IndT \text{ (benchmark)}$$

$$I_{pfs} = I_{ds} + IndS - IndT \text{ (sensitivity analysis)}$$

Where,

I_{pf}, I_{pfs} = post-fiscal income in benchmark and sensitivity analysis, respectively.

IndS = indirect subsidies (e.g., lower electricity rates for small-scale consumers).

⁴⁷ Since contributory pensions are treated as part of market income, the portion of the contributions to social security going towards pensions is treated as 'savings.'

IndT = indirect taxes (e.g., value added tax or VAT, sales tax, etc.).

Final income is defined as:

$$If = I_{pf} + InkindT - CoPaym \text{ (benchmark)}$$

$$Ifs = I_{pfs} + InkindT - CoPaym \text{ (sensitivity)}$$

Where,

If, Ifs = final income in benchmark and sensitivity analysis, respectively.

InkindT = government transfers in the form of free or subsidized services in education and health; urban and housing.

CoPaym = co-payments, user fees, etc., for government services in education and health.⁸

Because some countries do not have data on indirect subsidies and taxes, we also defined $Final\ income^* = If^* = Id + InkindT - CoPaym$.

A3. Construction of income concepts

Information on direct and indirect taxes, transfers in cash and in-kind, and subsidies cannot always be obtained directly from household surveys. Thus, one of the most important aspects of the CEQ is a detailed description of how each component of income is calculated (for example, directly drawn from the survey or simulated) and the methodological assumptions that are made. The possible methods to identify the different components for the study are:

Direct Identification Method

In some surveys, questions specifically ask if households received benefits from (paid taxes) certain social programs (tax and social security systems), and how much they received (paid). When this is the case, it is easy to identify transfer recipients and taxpayers, and add or remove the value of the transfers and taxes from their income, depending on the definition of income being used.

Imputation Method

The imputation method uses some information from the survey, such as the respondent reporting attending public school or receiving a direct transfer in a survey that does not ask for the amount received, and some information from either public accounts, such as per capita public expenditure on education by level, or from the program regulations.

Inference Method

Not all surveys have the information necessary to use the direct identification method. In some cases, transfers from social programs are grouped with other income sources (in a category for “other income,” for example). In this case, it may be possible to infer which families received a transfer based on whether the value they report in that income category matches a possible value of the transfer in question.

Simulation Method

In the case that neither the direct identification nor the inference method can be used, transfer benefits may sometimes be simulated, determining beneficiaries (taxpayers) and benefits received (taxes paid) based on the program (tax) rules. For example, in the case of a conditional cash transfer that uses a proxy means test to identify eligible beneficiaries, one can replicate the proxy means test using survey data, identify eligible families, and simulate the program's impact. However, this method gives an upper bound, as it assumes perfect targeting and no errors of inclusion or exclusion. In the case of taxes, estimates usually make assumptions about informality and evasion.⁴⁸

The four methods described above rely on at least some information taken directly from the household survey being used for the analysis. As a result, some households receive benefits, while others do not, which is an accurate reflection of reality. However, in some cases the household survey analyzed lacks the necessary questions to assign benefits to households. In these cases, there are two additional methods.

Alternate Survey

When a survey lacks the necessary questions, such as a question on the use of health services or health insurance coverage that is necessary to impute the value of in-kind health benefits to households, an alternative survey may be used by the author to determine the distribution of benefits. In the alternative survey, any of the four methods above could be used to identify beneficiaries and assign benefits. Subsequently, the distribution of benefits according to the alternate survey is used to impute benefits to all households in the primary survey analyzed, and the size of each household's benefits depends on the quantile to which the household belongs. Note that this method is more accurate than the secondary sources method below because although the alternate survey is somewhat of a "secondary source," the precise definitions of income and benefits used in CEQ can be applied to the alternate survey.

Secondary Sources Method

When none of the above methods are possible, secondary sources that provide the distribution of benefits (taxes) by quantile may be used. These benefits (taxes) are then imputed to all households in the survey being analyzed, and the size of each household's benefits (taxes) depends on the quantile to which the household belongs.

A4. Effectiveness Indicators

Let $X(I^j)$ be the poverty or inequality measure of interest (headcount index or Gini coefficient) which is calculated at each income concept. Let S^D be total public spending on direct transfers programs captured by the survey measured by budget size in national accounts, and let S^H and S^E be the total public spending on health and education, respectively. The effectiveness indicator for direct transfers is defined as:

$$\frac{X(I^n) - X(I^d)}{S^D / GDP}$$

While the effectiveness indicator for direct and in-kind transfers is defined as:

$$\frac{X(I^n) - X(I^{f*})}{S^D + S^H + S^E / GDP}$$

⁴⁸For more on tax avoidance and evasion in developing countries, see Alm, Bahl, and Murray (1991).

A5. Public Health Facilities, Ecuador 2014

TABLE 8. PUBLIC HEALTH FACILITIES IN ECUADOR

Public Health Facilities 2011		
Insitution	Number of Facilities	Percentage
Health Ministry	1828	59.12%
Hospital (Basic and General)	101	5.53%
Specialized Hospitals	15	0.82%
Health Post	286	15.65%
Health Center and Sub Center	1406	76.91%
Other	20	1.09%
National Social Security Institute	666	21.54%
Hospital (Basic and General)	16	2.40%
Specialized Hospitals	4	0.60%
Health Post	0	0.00%
Health Center and Sub Center	49	7.36%
Other	600	90.09%
Department of Defense	62	2.01%
Hospital (Basic and General)	10	16.13%
Specialized Hospitals	1	1.61%
Health Post	0	0.00%
Health Center and Sub Center	4	6.45%
Other	47	75.81%
Municipalities	76	2.46%
Hospital (Basic and General)	8	10.53%
Specialized Hospitals	1	1.32%
Health Post	0	0.00%
Health Center and Sub Center	7	9.21%
Other	60	78.95%
Department of Justice and Police	35	1.13%
Hospital (Basic and General)	2	5.71%
Specialized Hospitals	0	0.00%
Health Post	0	0.00%
Health Center and Sub Center	0	0.00%
Other	33	94.29%
SOLCA	12	0.39%
Hospital (Basic and General)	0	0.00%
Specialized Hospitals	8	66.67%
Health Post	0	0.00%
Health Center and Sub Center	1	8.33%
Other	3	25.00%
Junta de Beneficiencia de Guayaqu	5	0.16%
Hospital (Basic and General)	1	20.00%
Specialized Hospitals	3	60.00%
Health Post	0	0.00%
Health Center and Sub Center	0	0.00%
Other	1	20.00%
Other Public Providers	162	5.24%
Hospital (Basic and General)	5	3.09%
Specialized Hospitals	1	0.62%
Health Post	0	0.00%
Health Center and Sub Center	1	0.62%
Other	155	95.68%
Annexes to Social Security	246	7.96%
Total	3092	100.00%

Source: Recursos y Actividades de Salud



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WHAT IS CEQ?

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

Since its inception, the CEQ has received financial support from Tulane University's Center for Inter-American Policy and Research, the School of Liberal Arts and the Stone Center for Latin American Studies as well as the Bill & Melinda Gates Foundation, the Inter-American Development Bank (IADB), the World Bank, the United Nations Development Programme's Regional Bureau for Latin America and the Caribbean (UNDP/RBLAC), the Development Bank of Latin America (CAF), the African Development Bank, the International Fund for Agricultural Development (IFAD), the Canadian International Development Agency (CIDA), the Norwegian Ministry of Foreign Affairs, and the General Electric Foundation.
www.commitmenttoequity.org



**COMMITMENT
TO EQUITY**

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