

Fiscal Policy Incidence on Inequality and Poverty in Low- and Middle-Income Countries¹

Working Paper commissioned by the Group of 24 and Friedrich-Ebert-Stiftung New York

January 2019

Nora Lustig and Hilcías E. Morán²

This paper is part of the Growth and Reducing Inequality Working Paper Series, which is a joint effort of the G-24 and Friedrich-Ebert-Stiftung New York to gather and disseminate a diverse range of perspectives and research on trends, drivers and policy responses relevant to developing country efforts to boost growth and reduce inequality. The series comprises selected policy-oriented research papers contributed by presenters at a Special Workshop the G-24 held in Geneva (September 2017) in collaboration with the International Labour Organization and the Friedrich-Ebert-Stiftung, as well as relevant sessions in G-24 Technical Group Meetings.

¹ Based on Lustig (2018b). While the chapter was authored by Nora Lustig, Estuardo Moran took responsibility for summarizing the results for this abridged version.

² Nora Lustig is Samuel Z. Stone Professor of Latin American Economics and director of the Commitment to Equity Institute at Tulane University. She is also a nonresident senior fellow at the Center for Global Development and the Inter- American Dialogue, and non-resident senior research fellow at UNU-WIDER. Hilcías E. Morán is a consultant at Análisis Cuantitativo sobre Economía y Finanzas (ACEF).

Abstract

Using comparative fiscal incidence analysis, this paper examines the impact of fiscal policy on inequality and poverty in 29 low-and middle-income countries for *circa* the year 2010. Country specific results indicate that, as expected, direct taxes, direct transfers and spending on education and health are equalizing. Perhaps contrary to expectations, the combined effect of indirect taxes and indirect subsidies is equalizing in two-thirds of the countries. While the cash portion of the net fiscal system is always equalizing, the same cannot be said for poverty. In Ethiopia, Ghana, Guatemala, Nicaragua, Uganda and Tanzania, for instance, the headcount ratio measured with the international extreme poverty line of US\$1.25 (in purchasing power parity terms (PPP) 2005 per day) is higher for Consumable Income than for Market Income.

1. Introduction

With a long tradition in applied public finance, fiscal incidence analysis is designed to respond to the question of who benefits from government transfers and who ultimately bears the burden of taxes in the economy. In this note, we briefly discuss the Commitment to Equity (CEQ)³ fiscal incidence methodology and the results of applying that methodology to examine the impact of fiscal policy on inequality and poverty in 29 low- and middle-income countries from around 2010.⁴ The findings presented here were taken from Chapter 10 of the CEQ Handbook (Lustig, 2018b).⁵

2. CEQ Methodology

The method CEQ is a quantitative and analytical tool to evaluate the impact of taxation and social spending on inequality and poverty in individual countries. It provides a roadmap for governments, multilateral institutions, and nongovernmental organizations in their efforts to build more equitable societies. The use of a common methodology makes the results comparable across countries. The CEQ Assessment is a diagnostic tool that uses fiscal incidence analysis to determine the extent to which fiscal policy reduces inequality and poverty in a country. The CEQ Assessment is designed to address the following four main questions:

1. How much income redistribution and poverty reduction is being accomplished through fiscal policy?
2. How equalizing and pro-poor are specific taxes and government spending?
3. How effective are taxes and government spending in reducing inequality and poverty?
4. What is the impact of fiscal reforms that change the size and/or progressivity of a particular tax or benefit?

The CEQ methodology takes into account the whole fiscal system. It means that the incidence analysis is about the impact of taxation (direct and indirect taxes), and social spending on inequality and poverty. Why is so important to take into account whole fiscal system? Analyzing the tax side without the spending side, or vice versa, might not be very useful. Taxes can be unequalizing, but spending so equalizing that the unequalizing effect of taxes is more than compensated. Taxes can be regressive, but when combined with transfers, make the system more equalizing than without the regressive taxes. Also, transfers can be equalizing but, when combined with taxes, post-fiscal poverty can be higher. Why do we do a joint fiscal policy

³ Launched in 2008, the 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 CEQ project is housed in the Commitment to Equity Institute at Tulane. For more details, visit www.commitmenttoequity.org.

⁴ The short description of the CEQ methodology presented here is based in Chapter 1 of the CEQ Handbook (Lustig, 2018a), more details on the CEQ methodology can be seen in Lustig & Higgins (2018), in which the authors present key analytical insights in fiscal redistribution theory such as the fundamental equation that links the redistributive effect to the size and redistributive effects of taxes and benefits; how to calculate the contribution of each fiscal instrument (or combinations of them) to the change in inequality and poverty; and the implications of reranking (for the interested reader, their mathematical formulation is presented in detail in chapters 2 and 3 in the Handbook). Lustig & Higgins (2018) also discuss the basics of fiscal incidence analysis used in CEQ Assessments. Finally, the authors describe the set of indicators used to answer the four key questions outlined below, and illustrates with examples from existing CEQ Assessments.

⁵ The Handbook is a unique manual that explains in detail the theory and practice of fiscal incidence analysis. It also includes multiple new contributions developed by the Commitment to Equity (CEQ) Institute for determining the impact of fiscal policy on inequality and poverty. Policymakers, social planners, and economists are presented with a step-by-step guide to applying fiscal incidence analysis as well as country studies (called CEQ Assessments) to illustrate.

incidence analysis on inequality and poverty? Analyzing only the impact on inequality might be misleading. Fiscal systems can be equalizing but poverty increasing and, in addition, analyzing the impact on traditional poverty indicators can be misleading. The assessment should not only look at whether taxes are sufficiently progressive, but also ensures that they do not make the poor poorer, even after cash transfers are considered. Fiscal systems can show a reduction in poverty for all possible poverty lines and, yet, a substantial share of the poor could have been impoverished by the combined effect of taxes and transfers (See Higgins & Lustig, 2016).

Information used in CEQ country assessments comes from combining data from household surveys with national accounts. It usually includes almost all characteristics of the tax system, transfer programs, education systems, social security and health and consumer subsidies. Currently, the methodology includes: direct taxes, direct cash transfers, non-cash direct transfers such as school uniforms and breakfast, contributions to pensions and social insurance systems, indirect taxes on consumption, indirect subsidies and in-kind transfers such as spending on education and health.⁶ For tax incidence analysis, CEQ uses the "accounting approach". It does not take into account the behavioral responses or the general equilibrium effects. For each country CEQ assessment there are at least two scenarios: the benchmark scenario where contributory social insurance pensions are treated as deferred income in actuarially fair systems, with pensions included in market income and contributions treated as mandatory savings; and a sensibility analysis where pensions are treated as government transfers: pensions included among direct transfers with contributions treated as a direct tax.⁷

As described in Lustig & Higgins (2018), 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. By applying the CEQ methodology, we have to construct five main income concepts, namely, Market Income plus Pensions, Disposable Income, Consumable Income and Final Income.

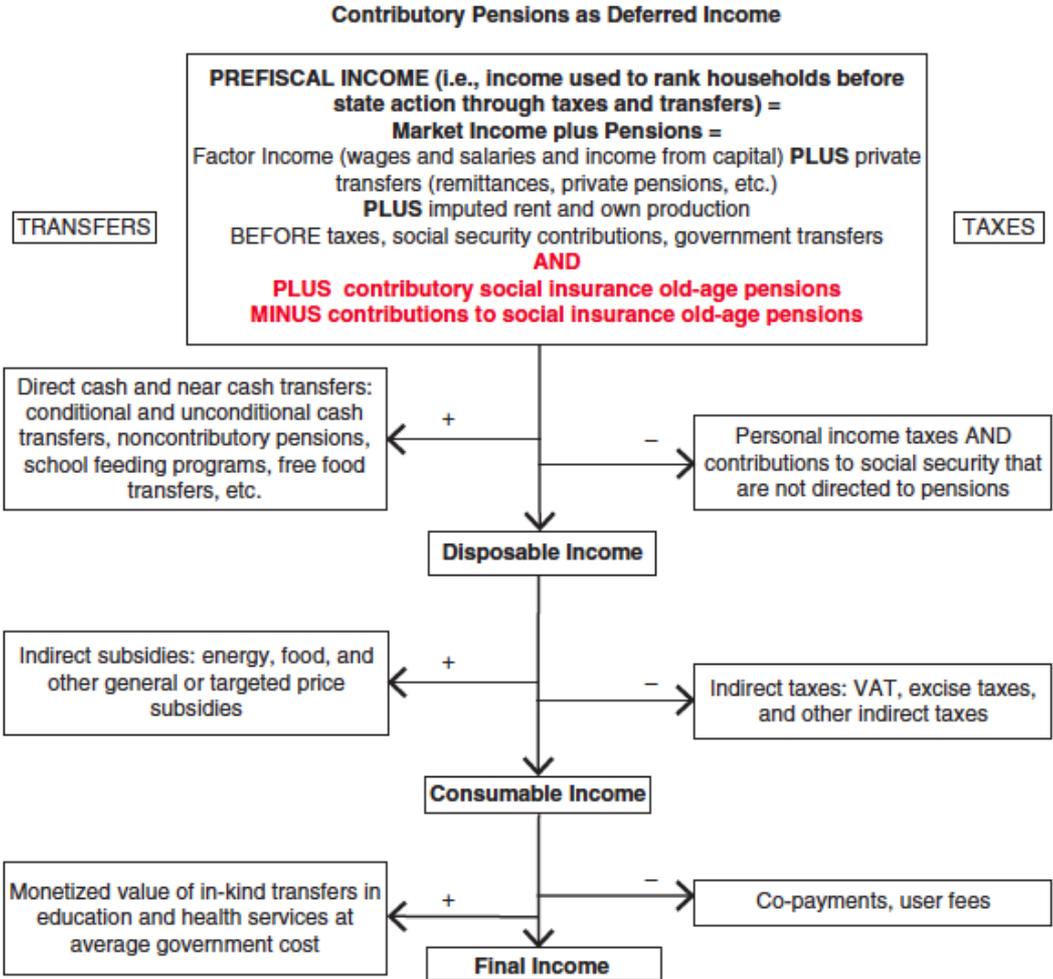
Diagram 1 describes step by step how to construct each income concept going from Pre-Fiscal Income to Final Income. *Market Income plus Pensions* is total current income (before taxes, social security contributions and government transfers) equal to the sum of gross (pre-tax) wages and salaries in the 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); own production; imputed rent for owner-occupied housing; and, private

⁶ As noted by Lustig (2018), it is important to recognize some important caveats. First, the analysis excludes some important categories of taxes and spending, such as spending on infrastructure, corporate income taxes, defense, and other public goods, because it is difficult to assign these benefits or burdens to any single individual, as the economic burden (in the case of corporate taxes) or benefit (in the case of spending on public goods) are diffuse. Second, by considering only the redistributive effects of taxes and transfers, at this point the CEQ framework does not offer a full analysis of whether specific taxes or expenditures are desirable. When one type of tax or expenditure is found to be more progressive than another, the temptation is to conclude that the former is preferable. However, redistribution is only one of many criteria that matter when making public policy. Good tax policy will aim to be efficient in addition to equitable, and public spending will aim to meet a state's minimal functions by investing in necessary public goods in addition to improving equity. By assessing the equity of taxes and spending, the results of the approach are one input to public policymaking—one that should be weighed with other evidence before deciding whether a tax or a benefit is desirable in its present form or should be reformed. It is important to keep in mind that the fiscal incidence analysis used in the CEQ Assessments is point-in-time and does not incorporate behavioral or general equilibrium effects. That is, no claim is made that the pre-fiscal income (i.e., the income before taxes and transfers) equals the true counterfactual income in the absence of taxes and transfers. It is a first-order approximation that measures the average incidence of fiscal interventions.

⁷ A detailed description of the method CEQ can be found in Lustig & Higgins (2018).

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. As mentioned before, for the benchmark case, contributory pensions are treated as part of market income because they are deferred income. For all CEQ assessments, the authors also perform a sensitivity analysis where pensions are classified under government transfers (see Figure 1-1 in Lustig & Higgins, 2018). *Disposable Income* equals market income plus pensions minus direct personal income taxes on all income sources (included in market income) that are subject to taxation and all contributions to social security except for the portion going towards pensions; plus direct and near direct cash transfers (conditional and unconditional cash transfers, noncontributory pensions, school feeding programs, free food transfers, etc.). *Consumable Income* is defined as disposable income plus indirect subsidies minus indirect taxes (value added tax, excise taxes and other indirect taxes). *Final Income* is defined as consumable income plus the monetized value of government in-kind transfers in the form of free or subsidized services primarily in education and health minus co-payments or user fees. After briefly describing the CEQ methodology, we present the results of applying the method to examine the fiscal policy incidence on inequality and poverty in 29 countries.

Diagram 1: Income Concept in CEQ Assessment, Contributory Pensions as Deferred Income (PDI)



Source: (Lustig, 2018b).

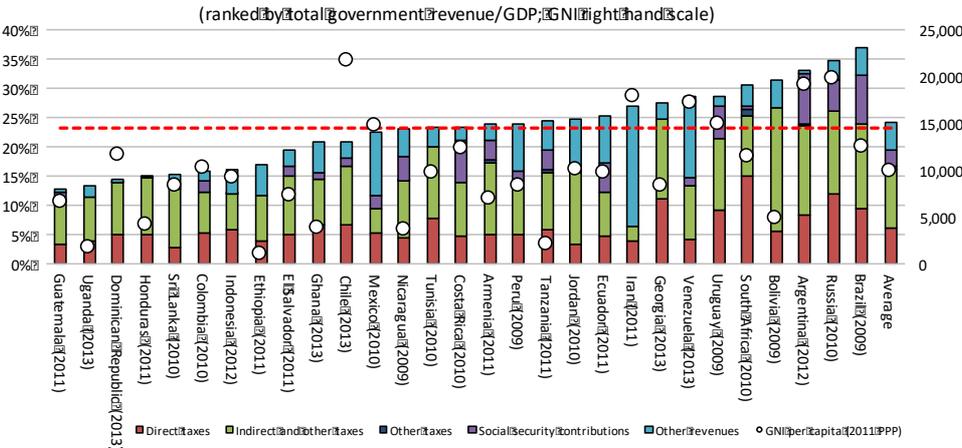
3. Main Findings of Applying the CEQ Methodology in 29 Countries⁸

Two key indicators for a government’s (or society’s) commitment to equalizing opportunities and reducing poverty and social exclusion are the share of total income devoted to social spending and how equalizing and pro-poor this spending is (Barr, 2012; Lindert, 2004).

3.1 Government revenues and social spending: level and composition

Figure 1 shows government revenues as share of GDP for 29 low- and middle-income countries around the year 2010. The revenues collection patterns are heterogeneous with the average at about 23 percent (as a percentage of GDP). While Brazil, Russia and Argentina are the countries with the largest government revenues, Guatemala, Uganda and Dominican Republic are the countries with the lowest government revenues. In general, indirect taxes are the largest component of government revenues, except for Iran, Mexico and Venezuela, where nontax revenues from oil-producing companies are the largest, and South Africa, where the share of direct taxes is the largest. Iran, Venezuela, and Mexico rely very heavily on oil-related non-tax revenues; these revenues represent around 50 percent or more of total revenues. The proportion of indirect taxes is more than 50 percent in several countries (i.e. Bolivia, Sri Lanka, Honduras, Guatemala and El Salvador).

Figure 1: Size and Composition of Government Revenues (as a % of GDP, circa 2010)



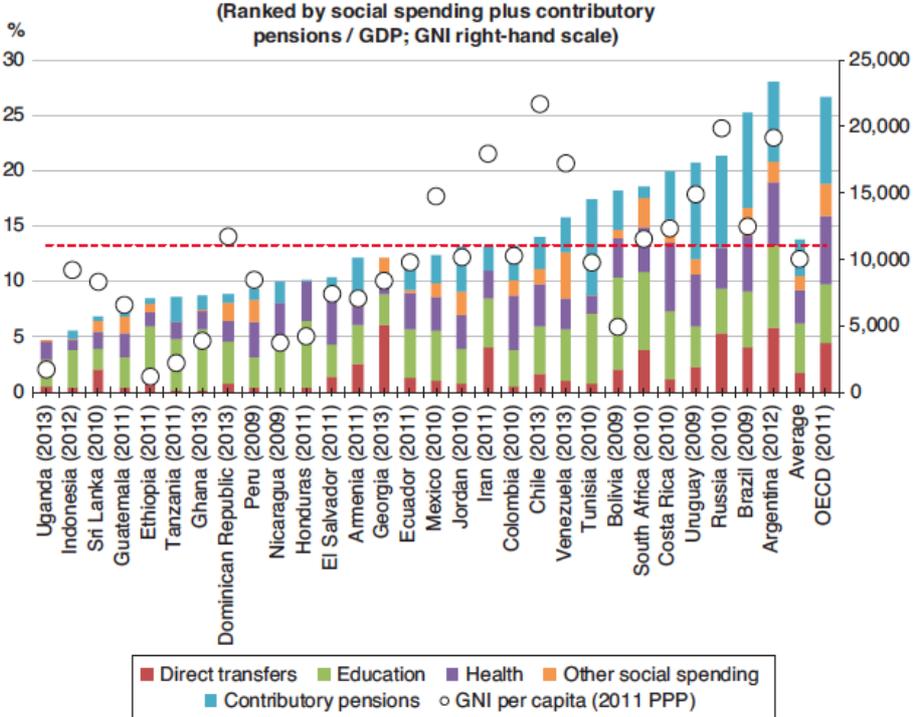
Source: CEQ Data Center on Fiscal Redistribution. Based on the following Master Workbooks of Results: Argentina (Rossignolo, 2018); Armenia (S. D. Younger & Khachatryan, 2014); Bolivia (Paz Arauco, Gray-Molina, Yañez, & Jimenez, 2014); Brazil (Higgins & Pereira, 2017); Chile (Martinez-Aguilar & Ortiz-Juarez, 2016); Colombia (Melendez & Martinez, 2015); Costa Rica (Sauma & Trejos, 2014); Dominican Republic (Aristy-Escuder, Cabrera, Moreno-Dodson, & Sanchez-Martin, 2016); Ecuador (Llerena Pinto, Llerena Pinto, Saa Daza, & Llerena Pinto, 2017); El Salvador (Beneke, Lustig, & Oliva, 2014); Ethiopia (Hill, Tsehaye, & Woldehanna, 2014); Georgia (Cancho & Bondarenko, 2015); Ghana (S. Younger, Osei-Assibey, & Oppong, 2016); Guatemala (Cabrera & Moran, 2015a); Honduras (Castaneda & Espino, 2015); Indonesia (Afkhar, Jellema, & Wai-Poi, 2015); Iran (Enami, Lustig, & Taqdiri, 2017); Jordan (Abdel-Halim, Alam, Mansur, Serajuddin, & Verme, 2016); Mexico (Scott, 2013); Nicaragua (Cabrera & Moran, 2015b); Peru (Jaramillo, 2015); Russia (Malytsin & Popova, 2016); South Africa (Inchauste *et al.*, 2016); Sri Lanka (Arunatilake, Gomez, Perera, & Attygalle, 2016); Tanzania (S. Younger, Myamba, & Mdadila, 2016); Tunisia (Jouini, Lustig, Moumami, & Shimeles, 2015); Uganda (Jellema, Haas, Lustig, & Wolf, 2016); Uruguay (Bucheli, Lustig, Rossi, & Amabile, 2014); and Venezuela (Molina, 2016).

Notes: The year for which the analysis was conducted is in parenthesis. Data shown here is administrative data as reported by the studies cited; the numbers do not necessarily coincide with those found in databases from multilateral organizations (e.g., World Bank’s WDI). Bolivia does not have personal income taxes. For Tanzania, fiscal year runs from July 2011 to June 2012. Gross National Income per capita on right axis is in 2011 PPP from World Development Indicators, August 29, 2016, <http://data.worldbank.org/indicator/NY.GNP.PCAP.PP.CD>. The dotted line in red is the average for the 29 countries.

⁸ The main results in this section are based in Lustig (2018b).

Figure 2 shows the level and composition of social spending plus contributory pensions. The composition of social spending is shown for the following categories: direct transfers, education, health, other social spending, and contributory pensions. On average, and excluding contributory pensions, the 29 low-income and middle-income countries analyzed allocate 10.3 percent of GDP to social spending, while the advanced countries in the OECD group allocate 18.8 percent of GDP, almost twice as much. The 29 countries on average spend 1.8 percent of GDP on direct transfers, 4.4 percent on education, and 3.1 percent on health. In comparison, the OECD countries spend on average 4.4 percent of GDP on direct transfers, 5.3 percent on education, and 6.2 percent on health. The largest difference between the OECD group and our sample occurs in direct transfers. Regarding spending on contributory pensions (which includes contributory pensions only and not social or noncontributory pensions, which are part of direct transfers), the 29 low- and middle-income countries spend 3.2 percent of their GDP, while OECD countries, spend 7.9 percent.

Figure 2: Composition of Social Spending plus Contributory Pensions (as a % of GDP, circa 2010)



Source: CEQ Data Center on Fiscal Redistribution. Based on the following Master Workbooks of Results: Argentina (Rossignolo, 2018); Armenia (S. D. Younger & Khachatryan, 2014); Bolivia (Paz Arauco *et al.*, 2014); Brazil (Higgins & Pereira, 2017); Chile (Martinez-Aguilar & Ortiz-Juarez, 2016); Colombia (Melendez & Martinez, 2015); Costa Rica (Sauma and Trejos, 2014); Dominican Republic (Aristy-Escuder *et al.*, 2016); Ecuador (Llerena Pinto *et al.*, 2017); El Salvador (Beneke *et al.*, 2014); Ethiopia (Hill *et al.*, 2014); Georgia (Cancho & Bondarenko, 2015); Ghana (S. Younger, Osei-Assibey, *et al.*, 2016); Guatemala (Cabrera & Moran, 2015a); Honduras (Castaneda & Espino, 2015); Indonesia (Afkar *et al.*, 2015); Iran (Enami *et al.*, 2017); Jordan (Abdel-Halim *et al.*, 2016); Mexico (Scott, 2013); Nicaragua (Cabrera & Moran, 2015b); Peru (Jaramillo, 2015); Russia (Malytsin & Popova, 2016); South Africa (Inchauste *et al.*, 2016); Sri Lanka (Arunatilake *et al.*, 2016); Tanzania (S. Younger, Myamba, *et al.*, 2016); Tunisia (Jouini *et al.*, 2015); Uganda (Jellema *et al.*, 2016); Uruguay (Bucheli *et al.*, 2014); and Venezuela (Molina, 2016).

Notes: The year for which the analysis was conducted is in parenthesis. Data shown here is administrative data as reported by the studies cited; the numbers do not necessarily coincide with those found in databases from multilateral organizations (e.g., World Bank's World Development Indicators [WDI]). The scenario for South Africa assumed free basic services are direct transfers. For Tanzania, fiscal year runs from July 2011 to June 2012. Figure for OECD average (includes only advanced countries) was directly provided by the statistical office of the organization. Other social spending includes expenditures on housing and community amenities; environmental protection; and recreation, culture, and religion. The only contributory pensions in South Africa are for public servants who must belong to the Government Employee Pension Fund (GEPF). The government made no transfers to the GEPF in 2010/11. The only contributory pensions in Sri Lanka are for public servants, and income from pensions has been considered as part of the public employees' labor contract, rather than a transfer in spite of the fact that the funding comes from general revenues. Gross National Income per capita on right axis is in 2011 PPP from World Development Indicators, August 29, 2016, <http://data.worldbank.org/indicator/NY.GNP.PCAP.PP.CD>.

Given the size of social spending (excluding contributory pensions), Argentina, South Africa and Brazil (from highest to lowest) show the largest amount of resources at their disposal to engage in fiscal redistribution. At the other end of the spectrum are Uganda, Indonesia, Sri Lanka and Guatemala (from lowest to highest). Whether the first group achieves its higher redistributive potential, however, depends on how the burden of taxation and the benefits of social spending are distributed. This shall be discussed below.

3.2 Fiscal Policy and Inequality

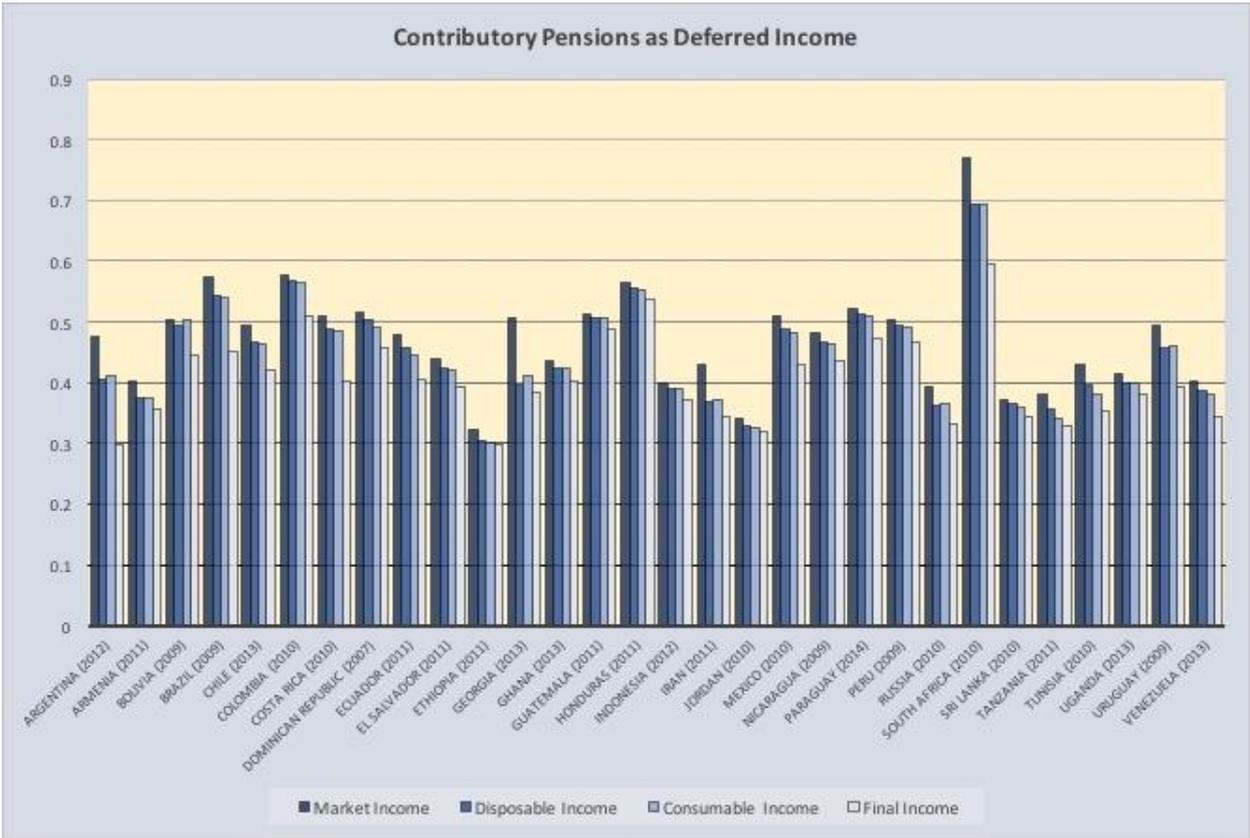
To measure the redistributive effect, each *CEQ Assessment* constructs four income concepts, namely, Market Income or Market Income plus Pensions (depending on the treatment of contributory pensions), Disposable Income, Consumable Income, and Final Income. An indicator of the redistributive effect of fiscal policy is the difference between the Market Income Gini and the Gini of the rest income concepts (after fiscal interventions). For example, the difference between the Market Income Gini and Disposable Income (market income plus direct taxes and direct transfers) Gini shows the redistributive effect of direct taxes and direct transfers. The difference between the Market Income Gini and the Consumable Income Gini shows the redistributive effect of taxes (direct and indirect), direct transfers and indirect subsidies. Thus, the difference between Market Income Gini and the Final Income Gini shows the total effect of net direct taxes, net indirect taxes and in-kind transfers (spending on education and health). If the redistributive effect is positive (negative), fiscal policy is equalizing (unequalizing). **Figure 3** shows the Gini coefficient for Market Income and the other three income concepts shown in **Diagram 1**: Disposable, Consumable and Final Income. **Figure 4** shows the difference between the Market Income Gini and the other three income concepts.

As noted by Lustig (2018b), in Ethiopia, Jordan, Guatemala and Indonesia, fiscal income redistribution is quite limited. In Argentina, Georgia, South Africa and Brazil, it is of a relevant magnitude. One can observe that Argentina and South Africa are the countries that redistribute the most; South Africa, however, remains the most unequal, even after redistribution. It is interesting to note that although Brazil and Colombia start out with similar Market Income inequality, Brazil reduces inequality considerably while Colombia does not. Similarly, Mexico, Costa Rica and Guatemala start out with similar levels of Market Income inequality, but Mexico and Costa Rica reduce inequality by more. Ethiopia is the least unequal of all 29 countries, and fiscal redistribution is also the smallest in order of magnitude. In almost all cases, the largest change in inequality occurs between Consumable and Final Income. This is not surprising given the fact that governments spend more on education and health than on direct transfers and pensions. However, one should not make sweeping conclusions from this result because, as explained in the *CEQ Handbook* (Lustig, 2018a), in-kind transfers are valued at average government cost, which is not really a measure of the “true” value of these services to the individuals who use them.

As indicated in Lustig & Higgins (2018), the *CEQ Assessments* produce results for both “extreme” assumptions: contributory pensions as pure deferred income (in which contributions are a form of mandatory savings) and as pure government transfer (in which contributions are treated as any other direct tax). The patterns of inequality decline are similar whether one looks at the scenario in which contributory pensions are considered deferred income (and, thus, part of

Market Income) or with pensions as transfers (see Lustig, 2018b). In Argentina, Armenia, Brazil, Russia and Uruguay, the redistributive effect is considerably larger when contributory pensions are treated as a transfer. These are countries with higher coverage and an older population. In Chile, Costa Rica, Ecuador, Jordan and Venezuela, the effect is larger, but only very slightly. Interestingly, in Bolivia, Colombia, El Salvador, Honduras, Mexico, Nicaragua and Tunisia, the redistributive effect is smaller when contributory pensions are considered a government transfer versus deferred income.

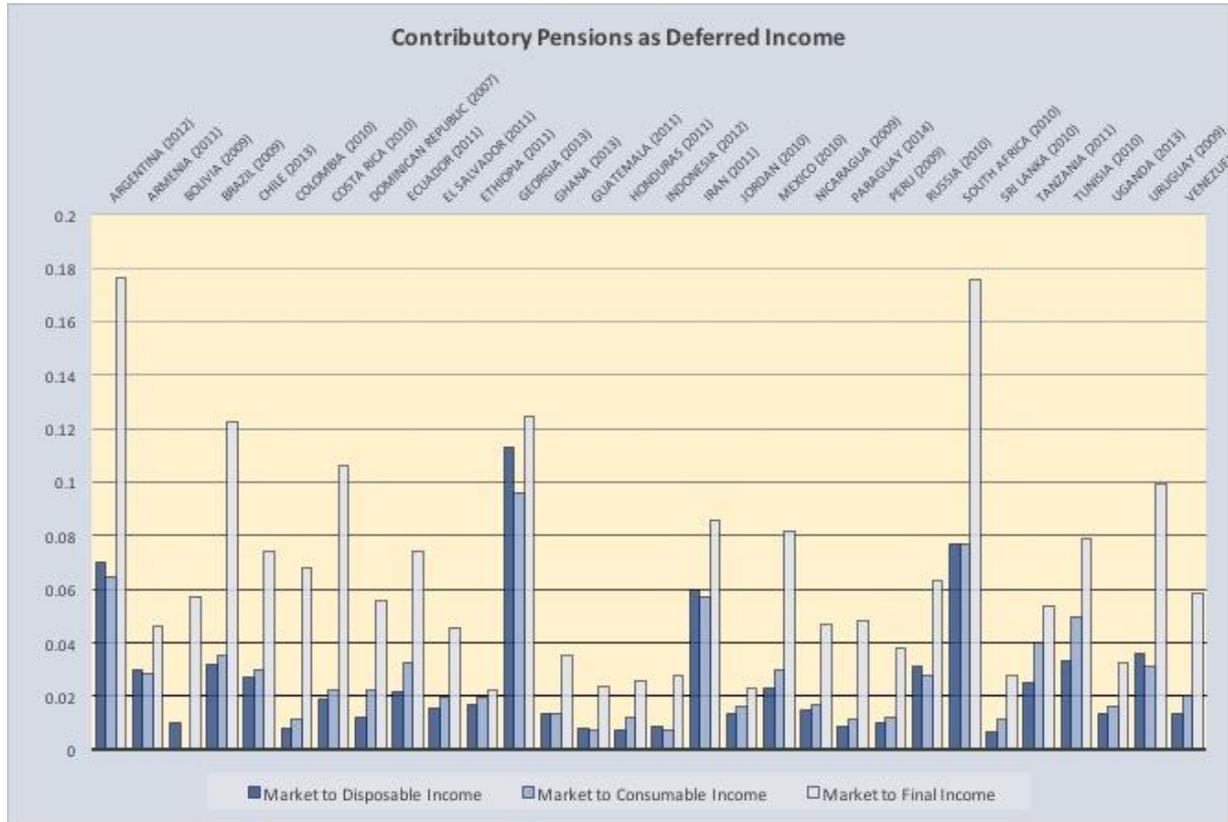
Figure 3: Gini Coefficient of Market, Disposable, Consumable and Final Income (circa 2010)



Source: CEQ Data Center on Fiscal Redistribution. Based on the following Master Workbooks of Results: Argentina (Rossignolo, 2018); Armenia (S. D. Younger & Khachatryan, 2014); Bolivia (Paz Arauco *et al.*, 2014); Brazil (Higgins & Pereira, 2017); Chile (Martinez-Aguilar & Ortiz-Juarez, 2016); Colombia (Melendez & Martinez, 2015); Costa Rica (Sauma and Trejos, 2014); Dominican Republic (Aristy-Escuder *et al.*, 2016); Ecuador (Llerena Pinto *et al.*, 2017); El Salvador (Beneke *et al.*, 2014); Ethiopia (Hill *et al.*, 2014); Georgia (Cancho & Bondarenko, 2015); Ghana (S. Younger, Osei-Assibey, *et al.*, 2016); Guatemala (Cabrera & Moran, 2015a); Honduras (Castaneda & Espino, 2015); Indonesia (Afkar *et al.*, 2015); Iran (Enami *et al.*, 2017); Jordan (Abdel-Halim *et al.*, 2016); Mexico (Scott, 2013); Nicaragua (Cabrera & Moran, 2015b); Peru (Jaramillo, 2015); Russia (Malytsin & Popova, 2016); South Africa (Inchauste *et al.*, 2016); Sri Lanka (Arunatilake *et al.*, 2016); Tanzania (S. Younger, Myamba, *et al.*, 2016); Tunisia (Jouini *et al.*, 2015); Uganda (Jellema *et al.*, 2016); Uruguay (Bucheli *et al.*, 2014); and Venezuela (Molina, 2016).

Notes: For some relevant methodological details for each country CEQ assessment see notes to figure 10-4 in (Lustig, 2018b).

Figure 4: Differences of the Gini Coefficient after Fiscal Policy Interventions and Market Income (circa 2010)



Source: CEQ Data Center on Fiscal Redistribution. Based on the following Master Workbooks of Results: Argentina (Rossignolo, 2018); Armenia (S. D. Younger & Khachatryan, 2014); Bolivia (Paz Arauco *et al.*, 2014); Brazil (Higgins & Pereira, 2017); Chile (Martinez-Aguilar & Ortiz-Juarez, 2016); Colombia (Melendez & Martinez, 2015); Costa Rica (Sauma and Trejos, 2014); Dominican Republic (Aristy-Escuder *et al.*, 2016); Ecuador (Llerena Pinto *et al.*, 2017); El Salvador (Beneke *et al.*, 2014); Ethiopia (Hill *et al.*, 2014); Georgia (Cancho & Bondarenko, 2015); Ghana (S. Younger, Osei-Assibey, *et al.*, 2016); Guatemala (Cabrera & Moran, 2015a); Honduras (Castaneda & Espino, 2015); Indonesia (Afkar *et al.*, 2015); Iran (Enami *et al.*, 2017); Jordan (Abdel-Halim *et al.*, 2016); Mexico (Scott, 2013); Nicaragua (Cabrera & Moran, 2015b); Peru (Jaramillo, 2015); Russia (Malytsin & Popova, 2016); South Africa (Inchauste *et al.*, 2016); Sri Lanka (Arunatilake *et al.*, 2016); Tanzania (S. Younger, Myamba, *et al.*, 2016); Tunisia (Jouini *et al.*, 2015); Uganda (Jellema *et al.*, 2016); Uruguay (Bucheli *et al.*, 2014); and Venezuela (Molina, 2016).

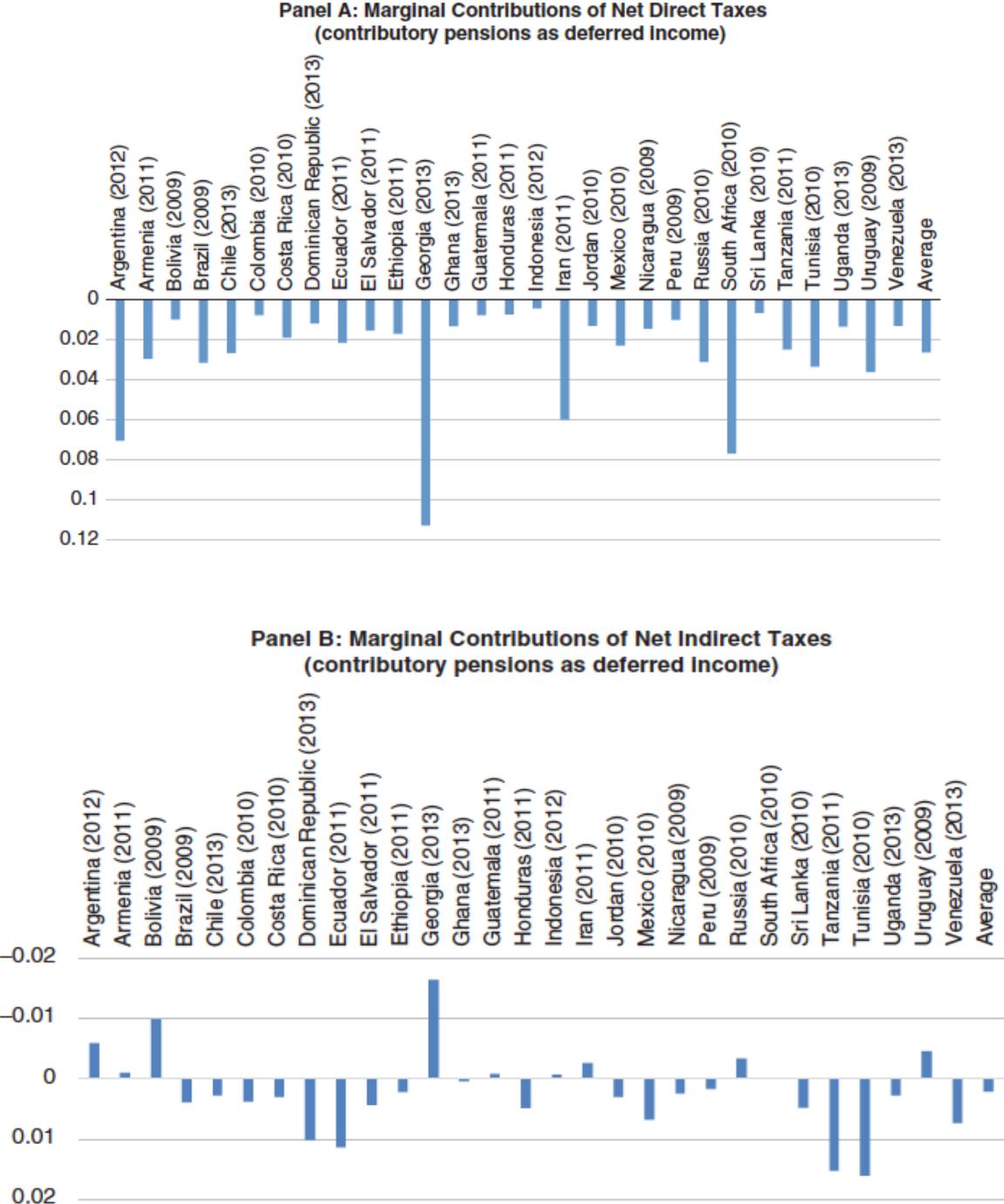
Notes: For some relevant methodological details for each country CEQ assessment see notes to figure 10-4 in (Lustig, 2018b).

3.3 Marginal Contribution of Taxes and Transfers

The CEQ methodology measures the impact of a tax or a transfer by relying on the marginal contribution, which, as formally discussed in chapter 2 of the CEQ Handbook (Enami, Lustig, & Aranda, 2018), is equal to the difference between the Gini (or other inequality measures) for a post-fiscal income concept without the fiscal intervention of interest (for example, a particular tax) and the post-fiscal income which includes it. **Figure 4** shows the marginal contribution on net direct taxes (direct taxes net of direct transfers), net indirect taxes (indirect taxes net of subsidies), and spending on education and health. Note that an equalizing (unequalizing) effect is presented with a positive (negative) sign but with downward point bars. The first result to note is that net direct taxes are, as expected, always equalizing. The second result to note is that net indirect taxes (indirect taxes net of indirect subsidies) are equalizing in 19 of the 29 countries. The marginal contribution of government spending on education and health combined is always equalizing.

Country specific results indicate that, as expected, direct taxes, direct transfers and spending on education and health are equalizing. However, contrary to expectations, indirect taxes, indirect subsidies and spending on tertiary education are more frequently equalizing than unequalizing. Results also show the presence of Lambert’s conundrum (Enami *et al.*, 2018; Lustig & Higgins, 2018) in the case of Chile, where the VAT is regressive—the Kakwani coefficient is negative—and, yet, its marginal contribution is equalizing.

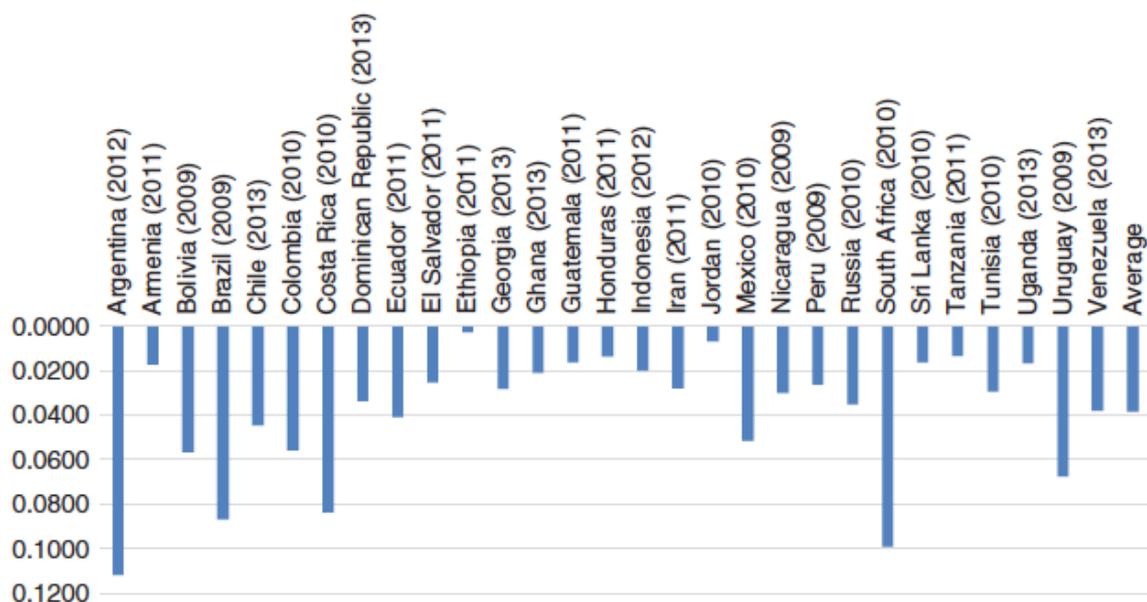
Figure 5: Marginal Contribution of Taxes and Transfers (circa 2010)



(continued)

Figure 5: (continued)

Panel C: Marginal Contributions of In-Kind Transfers in Education and Health
(contributory pensions as deferred income)



Source: CEQ Data Center on Fiscal Redistribution. Based on the following Master Workbooks of Results: Argentina (Rossignolo, 2018); Armenia (S. D. Younger & Khachatryan, 2014); Bolivia (Paz Arauco *et al.*, 2014); Brazil (Higgins & Pereira, 2017); Chile (Martinez-Aguilar & Ortiz-Juarez, 2016); Colombia (Melendez & Martinez, 2015); Costa Rica (Sauma and Trejos, 2014); Dominican Republic (Aristy-Escuder *et al.*, 2016); Ecuador (Llerena Pinto *et al.*, 2017); El Salvador (Beneke *et al.*, 2014); Ethiopia (Hill *et al.*, 2014); Georgia (Cancho & Bondarenko, 2015); Ghana (S. Younger, Osei-Assibey, *et al.*, 2016); Guatemala (Cabrera & Moran, 2015a); Honduras (Castaneda & Espino, 2015); Indonesia (Afkar *et al.*, 2015); Iran (Enami *et al.*, 2017); Jordan (Abdel-Halim *et al.*, 2016); Mexico (Scott, 2013); Nicaragua (Cabrera & Moran, 2015b); Peru (Jaramillo, 2015); Russia (Malytsin & Popova, 2016); South Africa (Inchauste *et al.*, 2016); Sri Lanka (Arunatilake *et al.*, 2016); Tanzania (S. Younger, Myamba, *et al.*, 2016); Tunisia (Jouini *et al.*, 2015); Uganda (Jellema *et al.*, 2016); Uruguay (Bucheli *et al.*, 2014); and Venezuela (Molina, 2016).

Notes: The marginal contribution of net direct taxes is calculated as the difference between the Gini of market income plus contributory pensions and disposable income (panel A). The marginal contribution of net indirect taxes is calculated as the difference between the Gini of disposable income and consumable income (panel B). The marginal contribution of in-kind transfers is calculated as the difference between the Gini of consumable income and final income (panel C). Also, see notes to figure 10-4 in (Lustig, 2018b).

3.4 Fiscal Policy and Poverty Reduction

The above discussion has concentrated on the impact of fiscal policy on inequality. As important is the impact of fiscal policy on poverty, particularly, because the results do not necessarily go in the same direction: in other words, an inequality-reducing fiscal system could be poverty-increasing. The effect of fiscal policy on poverty can be measured using the typical indicators such as the headcount ratio for Market Income and income after taxes and transfers. Another measure that one can use to assess the impact of fiscal policy on the poor is the extent to which Market Income poor end up being net payers to the fiscal system in cash terms (leaving out in-kind services). A third measure is that of fiscal impoverishment (Higgins & Lustig, 2016), or the extent to which fiscal policy makes the poor (non-poor) poorer (poor).

When analyzing the impact of fiscal interventions on poverty, it is useful to distinguish between the net benefits in cash from the benefits received in the form of free government services in education and health. The cash component of fiscal policy impact is measured by comparing the indicators for Consumable Income with the same indicators using Market Income. The level of Consumable Income will tell whether the government has enabled an individual to be able to purchase private goods and services above his or her original Market Income. As shown in **Figure**

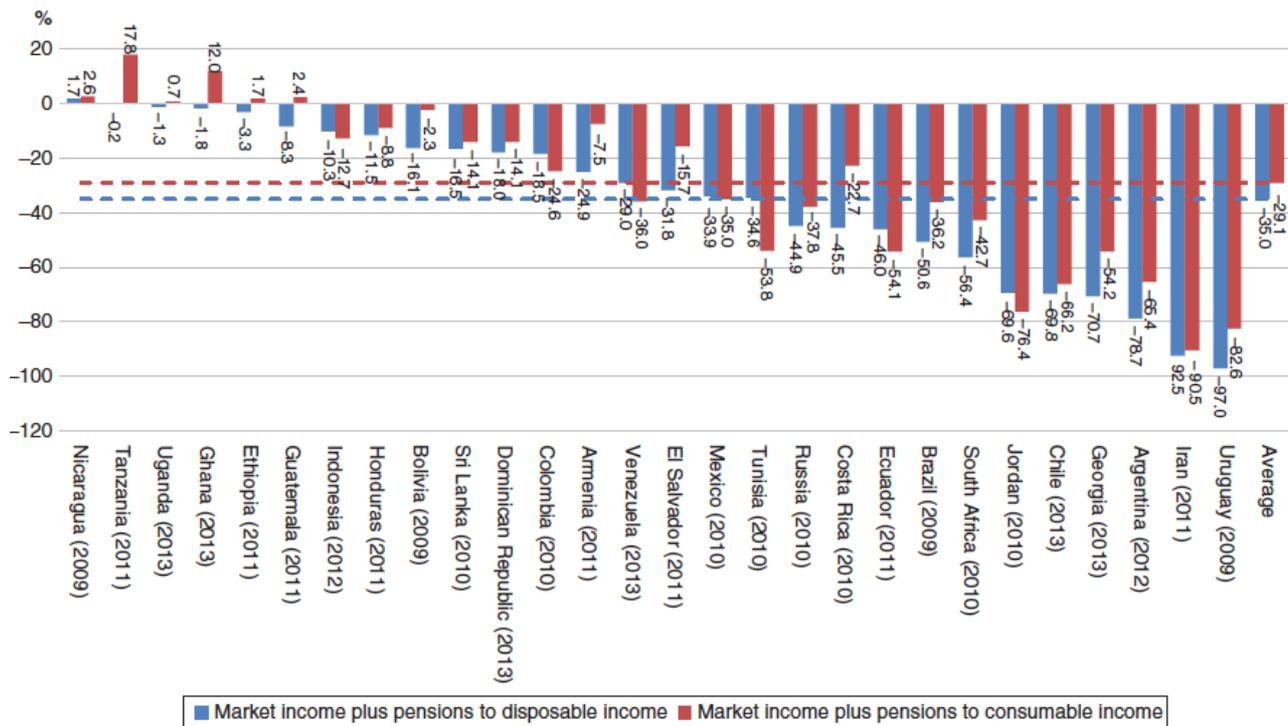
6, using the \$1.25 (PPP 2005 per day) poverty line,⁹ fiscal policy reduces the headcount ratio for Consumable Income in most countries. However, there is a startling result. In the scenario in which pensions are considered deferred income, the Consumable Income headcount ratio for Ethiopia, Ghana, Guatemala, Nicaragua, Uganda and Tanzania is higher than the headcount ratio for Market Income. This is a worrisome result. Poverty should not be higher because of fiscal policy. Note that this result occurs despite the fact that the net fiscal system (even without including in-kind transfers) reduces inequality. This emphasizes the fact that the impact of fiscal interventions on inequality and poverty should be studied separately, as indicated in Lustig & Higgins (2018). Of course, at the higher \$2.50 a day poverty line, the number of countries in which the headcount for Consumable Income is higher than that for Market Income rises.

In principle, it would be desirable for the poor—especially the extreme poor—to be net receivers of fiscal resources in cash so that poor individuals can buy/consume the minimum amounts of food and other essential goods embedded in the selected poverty line. **Figure 7** shows at which Market Income category, individuals—on average—become net payers to the fiscal system (again, this calculation considers only the cash portion of the fiscal system and excludes in-kind transfers such as access to free public education and healthcare).¹⁰ In Ghana, Nicaragua, Tanzania and Uganda, net payers to the fiscal system begin in the “ultra-poor” income category with US\$0–US\$ 1.25/day in purchasing power parity. In Armenia, Ethiopia and Guatemala, net payers begin in the “extreme poor” income group with US\$1.25–US\$ 2.50/day. In Bolivia, the Dominican Republic, El Salvador, Honduras, Peru and Sri Lanka, net payers to the fiscal system begin in the income category US\$2.50–US\$ 4/day in purchasing power parity—that is, in the group classified as moderately poor. In twelve countries, the net payers start in the group known as “vulnerable.” In Iran and Indonesia, only the “rich” are net payers to the fiscal system (on average). If contributory pensions are considered a government transfer (not shown), net payers to the fiscal system start in the extreme poor income group in Guatemala and Nicaragua and in the moderately poor group in Armenia, Bolivia, the Dominican Republic, El Salvador, Honduras, and Peru.

⁹ The \$1.25 is the World Bank global extreme poverty line until 2015, when it was updated with the 2011 PPP to \$1.90 per day. The \$2.50 a day poverty line is a reasonable international extreme poverty line for middle income countries: for example, in the case of Latin America, this poverty line is close to the average of the local extreme poverty lines.

¹⁰ Note that this graph presents a non-anonymous result: it looks at the extent to which the Market Income poor become net payers to the fiscal system on average. This information cannot be extrapolated from the typical poverty measures, where winners and losers are not tracked.

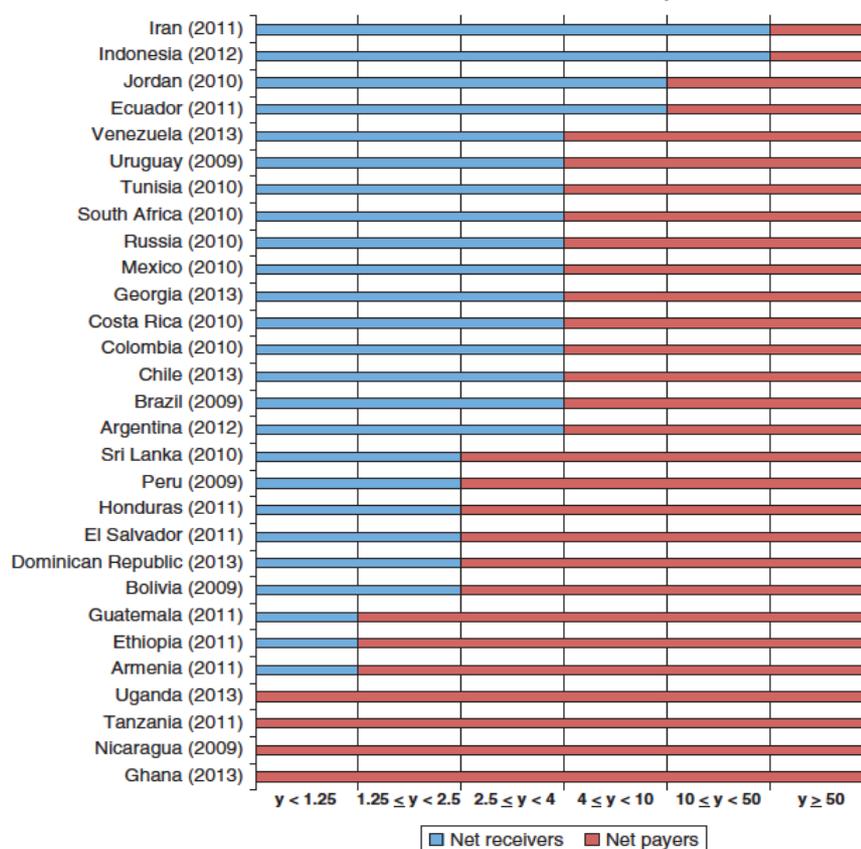
Figure 6: Fiscal Policy and Poverty Reduction (circa 2010, Contributory Pensions as Deferred Income): Change in Headcount Ratio from Market to Disposable and Consumable Income (%)



Source: CEQ Data Center on Fiscal Redistribution. Based on the following Master Workbooks of Results: Argentina (Rossignolo, 2018); Armenia (S. D. Younger & Khachatryan, 2014); Bolivia (Paz Arauco *et al.*, 2014); Brazil (Higgins & Pereira, 2017); Chile (Martinez-Aguilar & Ortiz-Juarez, 2016); Colombia (Melendez & Martinez, 2015); Costa Rica (Sauma and Trejos, 2014); Dominican Republic (Aristy-Escuder *et al.*, 2016); Ecuador (Llerena Pinto *et al.*, 2017); El Salvador (Beneke *et al.*, 2014); Ethiopia (Hill *et al.*, 2014); Georgia (Cancho & Bondarenko, 2015); Ghana (S. Younger, Osei-Assibey, *et al.*, 2016); Guatemala (Cabrera & Moran, 2015a); Honduras (Castaneda & Espino, 2015); Indonesia (Afkar *et al.*, 2015); Iran (Enami *et al.*, 2017); Jordan (Abdel-Halim *et al.*, 2016); Mexico (Scott, 2013); Nicaragua (Cabrera & Moran, 2015b); Peru (Jaramillo, 2015); Russia (Malytsin & Popova, 2016); South Africa (Inchauste *et al.*, 2016); Sri Lanka (Arunatilake *et al.*, 2016); Tanzania (S. Younger, Myamba, *et al.*, 2016); Tunisia (Jouini *et al.*, 2015); Uganda (Jellema *et al.*, 2016); Uruguay (Bucheli *et al.*, 2014); and Venezuela (Molina, 2016).

Notes: Percentage of poverty reduction is defined as percentage change in headcount ratio from Market Income (or Market Income plus Contributory Pensions) to Consumable Income. For South Africa, the poverty results differ from the chapter by Inchauste *et al.* (2017). For Sri Lanka, the poverty results differ from the chapter by Arunatilake, Inchauste, and Lustig (2017). Also, see notes to figure 10-4 in (Lustig, 2018b).

Figure 7: Net Payers to the Fiscal System by Income Groups (circa 2010, Contributory Pensions as Deferred Income)



Source: CEQ Data Center on Fiscal Redistribution. Based on the following Master Workbooks of Results: Argentina (Rossignolo, 2018); Armenia (S. D. Younger & Khachatryan, 2014); Bolivia (Paz Arauco *et al.*, 2014); Brazil (Higgins & Pereira, 2017); Chile (Martinez-Aguilar & Ortiz-Juarez, 2016); Colombia (Melendez & Martinez, 2015); Costa Rica (Sauma and Trejos, 2014); Dominican Republic (Aristy-Escuder *et al.*, 2016); Ecuador (Llerena Pinto *et al.*, 2017); El Salvador (Beneke *et al.*, 2014); Ethiopia (Hill *et al.*, 2014); Georgia (Cancho & Bondarenko, 2015); Ghana (S. Younger, Osei-Assibey, *et al.*, 2016); Guatemala (Cabrera & Moran, 2015a); Honduras (Castaneda & Espino, 2015); Indonesia (Afkar *et al.*, 2015); Iran (Enami *et al.*, 2017); Jordan (Abdel-Halim *et al.*, 2016); Mexico (Scott, 2013); Nicaragua (Cabrera & Moran, 2015b); Peru (Jaramillo, 2015); Russia (Malytsin & Popova, 2016); South Africa (Inchauste *et al.*, 2016); Sri Lanka (Arunatilake *et al.*, 2016); Tanzania (S. Younger, Myamba, *et al.*, 2016); Tunisia (Jouini *et al.*, 2015); Uganda (Jellema *et al.*, 2016); Uruguay (Bucheli *et al.*, 2014); and Venezuela (Molina, 2016).

Notes: For some relevant methodological details for each country CEQ assessment see notes to figure 10-4 in (Lustig, 2018b).

4. Final Comments

The results show that the reduction in inequality induced by the cash portion of the fiscal system in the 29 countries analyzed here is quite heterogeneous. Redistributive success is broadly determined primarily by the amount of resources and their combined progressivity. Net direct taxes are always equalizing. The effect of indirect taxes net of indirect subsidies is equalizing in 19 of the 29 countries.

While the cash portion of the net fiscal system is always equalizing, the same cannot be said for poverty. In Ethiopia, Ghana, Guatemala, Nicaragua, Uganda and Tanzania, for instance, the headcount ratio measured with the international extreme poverty line of US\$1.25 (PPP 2005 per day) is higher for Consumable Income than for Market Income. In these countries, fiscal policy increases poverty, meaning that a larger number of the Market Income poor (non-poor) are made poorer (poor) by taxes and transfers than the number of people who escape poverty (Higgins & Lustig, 2016). This startling result is primarily the consequence of high consumption taxes on basic goods.

5. References

- Abdel-Halim, Alam, M. S. A., Mansur, Y., Serajuddin, U., & Verme, P. (2016). CEQ Master Workbook: Jordan (2010-2011). *CEQ Data Center on Fiscal Redistribution (CEQ Institute, Tulane University and the World Bank)*, (version: March 8, 2016). Retrieved from <http://commitmentoequity.org/datacenter>
- Afkar, R., Jellema, J., & Wai-Poi, M. (2015). CEQ Master Workbook: Indonesia (2012). *CEQ Data Center on Fiscal Redistribution (CEQ Institute, Tulane University and the World Bank)*, (version: August 5, 2015). Retrieved from <http://commitmentoequity.org/datacenter>
- Aristy-Escuder, J., Cabrera, M., Moreno-Dodson, B., & Sanchez-Martin, M. (2016). CEQ Master Workbook: Dominican Republic (2006-2007). *CEQ Data Center on Fiscal Redistribution (CEQ Institute, Tulane University and the World Bank)*, (version: October 5, 2016). Retrieved from <http://commitmentoequity.org/datacenter>
- Arunatilake, N., Gomez, C., Perera, N., & Attygalle, K. (2016). CEQ Master Workbook: Sri Lanka (2009-2010). *CEQ Data Center on Fiscal Redistribution (CEQ Institute, Tulane University and the World Bank)*, (version: March 10, 2016). Retrieved from <http://commitmentoequity.org/datacenter>
- Barr, N. (2012). *Economics of the Welfare State* (5th ed.). Oxford University Press.
- Beneke, M., Lustig, N., & Oliva, J. A. (2014). CEQ Master Workbook: El Salvador CEQ. *Data Center on Fiscal Redistribution (CEQ Institute, Tulane University and Inter-American Development Bank)*, (version: October 7, 2015). Retrieved from <http://commitmentoequity.org/datacenter>
- Bucheli, M., Lustig, N., Rossi, M., & Amabile, F. (2014). CEQ Master Workbook: Uruguay (2009). *CEQ Data Center on Fiscal Redistribution (CEQ Institute, Tulane University)*, (Version: August 28). Retrieved from <http://commitmentoequity.org/datacenter>
- Cabrera, M., & Moran, H. E. (2015a). CEQ Master Workbook: Guatemala (2011). *CEQ Data Center on Fiscal Redistribution (CEQ Institute, Tulane University, Instituto Centroamericano de Estudios Fiscales (ICEFI) and International Fund for Agricultural Development (IFAD)*, (version: October 4, 2016). Retrieved from <http://commitmentoequity.org/datacenter>
- Cabrera, M., & Moran, H. E. (2015b). CEQ Master Workbook: Nicaragua (2009). *CEQ Data Center on Fiscal Redistribution (CEQ Institute, Tulane University, Instituto Centroamericano de Estudios Fiscales (Icefi) and International Fund for Agricultural Development (IFAD)*, (version: October 14, 2015). Retrieved from <http://commitmentoequity.org/datacenter>
- Cancho, C., & Bondarenko, E. (2015). CEQ Master Workbook: Georgia (2013). *CEQ Data Center on Fiscal Redistribution (CEQ Institute, Tulane University and the World Bank)*, (version: December 31, 2015). Retrieved from <http://commitmentoequity.org/datacenter>
- Castaneda, R., & Espino, I. (2015). CEQ Master Workbook: Honduras (2011). *CEQ Data Center on Fiscal Redistribution (CEQ Institute, Tulane University, Instituto Centroamericano de Estudios Fiscales (Icefi) and International Fund for Agricultural Development (IFAD)*, (version: July 27, 2015). Retrieved from <http://commitmentoequity.org/datacenter>
- Enami, A., Lustig, N., & Aranda, R. (2018). Analytical Foundations: Measuring the Redistributive Impact of Taxes and Transfers. In N. Lustig (Ed.), . Brookings Institution, Washington, D.C. and CEQ Institute, Tulane University.
- Enami, A., Lustig, N., & Taqdiri, A. (2017). CEQ Master Workbook: Iran (2011-2012). *CEQ Data Center on Fiscal Redistribution (CEQ Institute, Tulane University and Economic Research Forum)*, (May 5, 2017). Retrieved from <http://commitmentoequity.org/datacenter>
- Higgins, S., & Lustig, N. (2016). Can a poverty-reducing and progressive tax and transfer system

- hurt the poor? *Journal of Development Economics*, 122, 63–75.
<http://doi.org/10.1016/j.jdeveco.2016.04.001>
- Higgins, S., & Pereira, C. (2017). CEQ Master Workbook: Brazil (2008-2009). *CEQ Data Center on Fiscal Redistribution (CEQ Institute, Tulane University)*, (version: April 19, 2017). Retrieved from <http://commitmentoequity.org/datacenter>
- Hill, R., Tsehaye, E., & Woldehanna, T. (2014). “CEQ Master Workbook: Ethiopia (2010-2011),” *CEQ Data Center on Fiscal Redistribution (CEQ Institute, Tulane University and the World Bank)*, (version: September 28, 2014). Retrieved from <http://commitmentoequity.org/datacenter>
- Inchauste, G., Lustig, N., Maboshe, M., Purfield, C., Woolard, I., & Zikhali, P. (2016). CEQ Master Workbook: South Africa (2010-2011). *CEQ Data Center on Fiscal Redistribution (CEQ Institute, Tulane University and the World Bank)*, (version: March 6, 2016). Retrieved from <http://commitmentoequity.org/datacenter>
- Jaramillo, M. (2015). CEQ Master Workbook: Peru (2009). *CEQ Data Center on Fiscal Redistribution (CEQ Institute, Tulane University)*, (version: August 7, 2015). Retrieved from <http://commitmentoequity.org/datacenter>
- Jellema, J., Haas, A., Lustig, N., & Wolf, S. (2016). CEQ Master Workbook: Uganda (2012-2013). *CEQ Data Center on Fiscal Redistribution (CEQ Institute, Tulane University and International Growth Center)*, (July 28, 2016). Retrieved from <http://commitmentoequity.org/datacenter>
- Jouini, N., Lustig, N., Moumimi, A., & Shimeles, A. (2015). CEQ Master Workbook: Tunisia (2010). *CEQ Data Center on Fiscal Redistribution (CEQ Institute, Tulane University and African Development Bank)*, (May 5, 2017). Retrieved from <http://commitmentoequity.org/datacenter>
- Lindert, P. H. (2004). *Growing Public: Social Spending and Economic Growth since the Eighteenth Century*. Cambridge University Press.
- Llerena Pinto, F. P., Llerena Pinto, M. C., Saa Daza, R. C., & Llerena Pinto, M. A. (2017). CEQ Master Workbook: Ecuador (2011-2012). *CEQ Data Center on Fiscal Redistribution (CEQ Institute, Tulane University)*, (version: June 9, 2016). Retrieved from <http://commitmentoequity.org/datacenter>
- Lustig, N. (Ed.). (2018a). *Commitment to Equity Handbook. Estimating the Impact of Fiscal Policy on Inequality and Poverty*. CEQ Institute and Brookings Institution Press.
- Lustig, N. (2018b). Fiscal Policy, Income Redistribution, and Poverty Reduction in Low- and Middle-Income Countries. In *Commitment to Equity Handbook*. Brookings Institution, Washington, D.C. and CEQ Institute, Tulane University.
- Lustig, N., & Higgins, S. (2018). The CEQ Assessment: Measuring the Impact of Fiscal Policy on Inequality and Poverty. In *Commitment to Equity Handbook*. Brookings Institution, Washington, D.C. and CEQ Institute, Tulane University.
- Malytsin, M., & Popova, D. (2016). CEQ Master Workbook: Russia (2010),” *CEQ Data Center on Fiscal Redistribution (CEQ Institute, Tulane University and the World Bank)*, (version: March 17, 2016).
- Martinez-Aguilar, S., & Ortiz-Juarez, E. (2016). CEQ Master Workbook: Chile (2013). *CEQ Data Center on Fiscal Redistribution (CEQ Institute, Tulane University and the World Bank)*, (version: October 7, 2016). Retrieved from <http://commitmentoequity.org/datacenter>
- Melendez, M., & Martinez, V. (2015). CEQ Master Workbook: Colombia (2010). *CEQ Data Center on Fiscal Redistribution (CEQ Institute, Tulane University and Inter-American Development Bank)*, (version: December 5, 2015). Retrieved from

- <http://commitmentoequity.org/datacenter>
- Molina, E. (2016). CEQ Master Workbook: Venezuela (2012). *CEQ Data Center on Fiscal Redistribution (CEQ Institute, Tulane University)*, (Version: April 5, 2018). Retrieved from <http://commitmentoequity.org/datacenter>
- Paz Arauco, V., Gray-Molina, G., Yañez, E., & Jimenez, W. (2014). CEQ Master Workbook: Bolivia (2009). *CEQ Data Center on Fiscal Redistribution (CEQ Institute, Tulane University)*, (version: September 22, 2014). Retrieved from <http://commitmentoequity.org/datacenter>
- Rossignolo, D. (2018). CEQ Master Workbook: Argentina (2012-2013). *CEQ Data Center on Fiscal Redistribution (CEQ Institute, Tulane University)*, (version: June 8, 2018). Retrieved from <http://commitmentoequity.org/datacenter>
- Sauma, P., & Trejos, J. D. (2014). CEQ Master Workbook: Costa Rica (2010). *CEQ Data Center on Fiscal Redistribution (CEQ Institute, Tulane University)*, (version: February 14, 2014). Retrieved from <http://commitmentoequity.org/datacenter>
- Scott, J. (2013). CEQ Master Workbook: Mexico (2010). *CEQ Data Center on Fiscal Redistribution (CEQ Institute, Tulane University)*, (September 2, 2013). Retrieved from <http://commitmentoequity.org/datacenter>
- Younger, S. D., & Khachatryan, A. (2014). CEQ Master Workbook: Armenia (2011). *CEQ Data Center on Fiscal Redistribution (CEQ Institute, Tulane University and the World Bank)*, (version: May 31, 2014). Retrieved from <http://commitmentoequity.org/datacenter>
- Younger, S., Myamba, F., & Mdadila, K. (2016). CEQ Master Workbook: Tanzania (2011-2012). *CEQ Data Center on Fiscal Redistribution (CEQ Institute, Tulane University)*, (version: April 3, 2018). Retrieved from <http://commitmentoequity.org/datacenter>
- Younger, S., Osei-Assibey, E., & Oppong, F. (2016). CEQ Master Workbook: Ghana (2012-2013). *CEQ Data Center on Fiscal Redistribution (CEQ Institute, Tulane University)*, (version: February 10, 2016). Retrieved from <http://commitmentoequity.org/datacenter>