

Does Fiscal Policy Reduce Inequality and Poverty? Evidence from Low and Middle Income Countries

Nora Lustig

**Samuel Z. Stone Professor and Director of CEQ Institute
Tulane University**

Nonresident Senior Fellow CGD and IAD

www.ceqinstitute.org

New Approaches to Economic Challenges (NAEC) Seminar

OECD

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Outline

- Commitment to Equity (CEQ) Institute: Brief Description
- Methodological Highlights of the CEQ Approach
- Analytics of Fiscal Redistribution
- CEQ Assessments: A Glance at Results

The CEQ Institute: a brief description

Mission: The CEQ Institute works to reduce inequality and poverty through comprehensive and rigorous tax and benefit incidence analysis, and active engagement with the policy community

Workstreams:

- Research-based policy tools ([CEQ Handbook](#)) and [country studies](#)
- [Data Center](#)
- Advisory and [training](#) services
- [Bridges to policy](#)

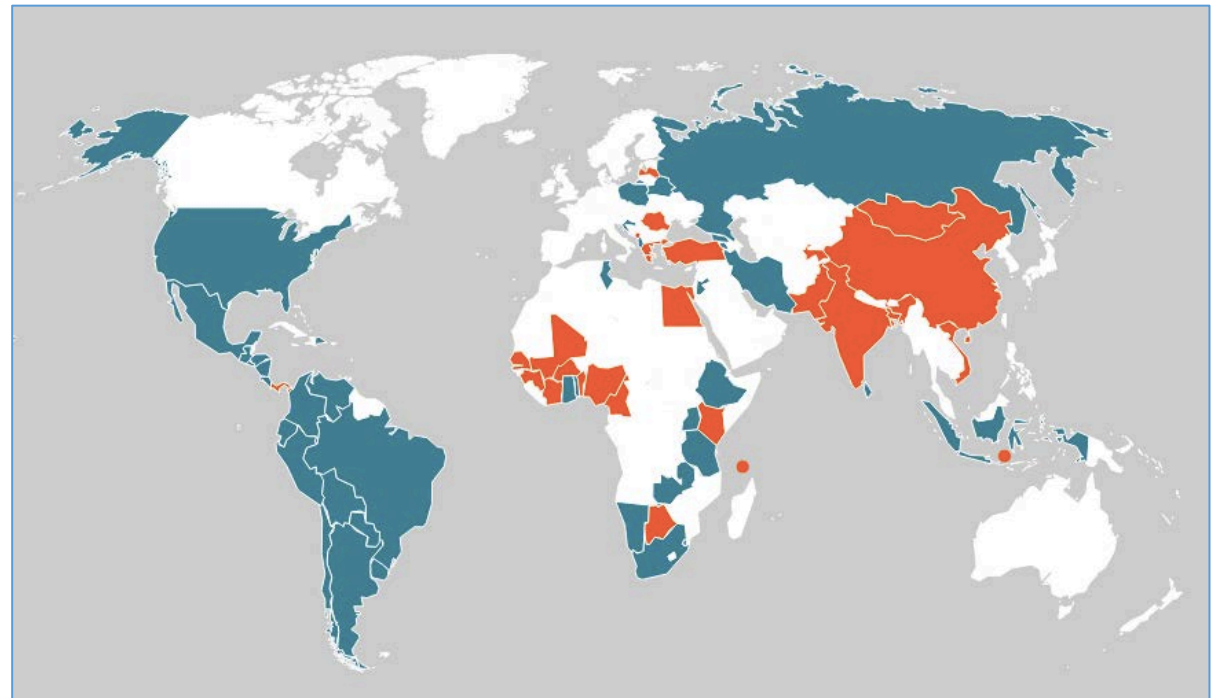
Funding:

- Bill & Melinda Gates Foundation U\$4.9 million for 5 years (2016 – 2020)
- National Science Foundation for U\$240,000 for 2 years (2018-2020)

CEQ in numbers: country coverage

- 42 finished
- 23 in progress

➤ Nearly 80%
of world's
extreme poor



CEQ in numbers: collaborators and partners

- Over 50 [Research Associates](#)
- 25 [partners](#) including:
 - World Bank
 - IMF
 - Inter-American Development Bank
 - OECD
 - AfDB
 - ADB
 - Global Development Network
 - Oxfam
 - Universities, institutes and nonprofits

PFR 2014
Special Issue



WD 2014



WD 2015



ROIW 2016



JGD 2016



RHPE 2016



JDE 2016



RDE 2017



ADR 2017



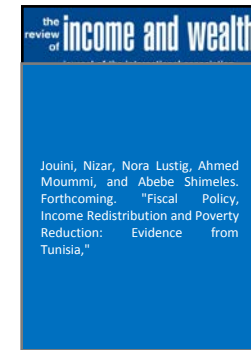
ETE 2017



LARR 2017



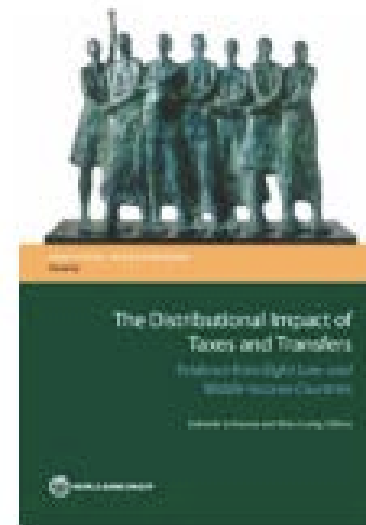
ROIW 2018
(forthcoming)



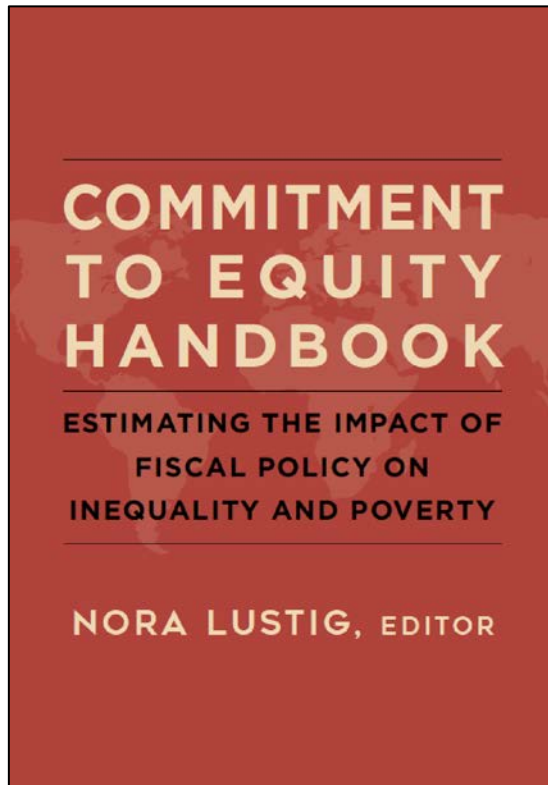
CEQ Publications in peer-reviewed journals

Book

- Gabriela Inchauste and Nora Lustig, eds. 2017. [*The Distributional Impact of Taxes and Transfers. Evidence from Eight Low- and Middle-Income Countries*](#), Washington DC: World Bank



CEQ in numbers: publications



[CEQ Handbook](#) Forthcoming, Brookings
Institution Press

Unique step-by-step guide for determining
the impact of taxation and public spending
on inequality and poverty

Contains methods, applications, and a
software package for conducting the CEQ
Assessments, along with examples of
these assessments from several countries

Open source: digital version will be **FREE**

Outline

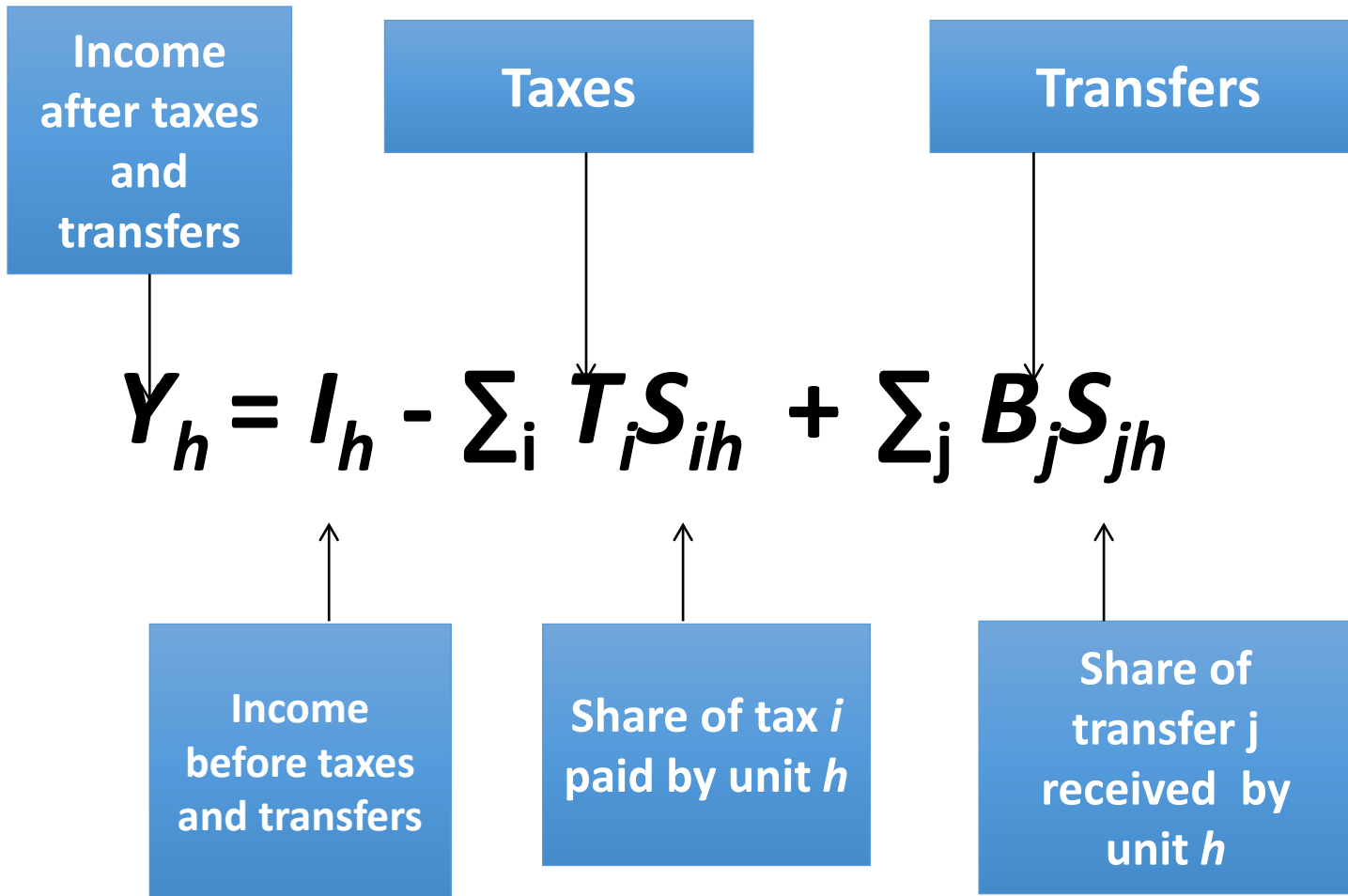
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Chapters 1 (Lustig & Higgins), 6 (Higgins & Lustig), 7 (Jellema & Inchauste), and 8 (Higgins) in Lustig, Nora (editor). Forthcoming. [Commitment to Equity Handbook. Estimating the Impact of Fiscal Policy on Inequality and Poverty](#). CEQ Institute and Brookings Institution Press.

CEQ Assessment

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

CEQ Assessment: Fiscal Incidence Analysis



CEQ Assessment: Income Concepts

MARKET INCOME



PLUS DIRECT TRANSFERS MINUS DIRECT TAXES



DISPOSABLE INCOME



PLUS INDIRECT SUBSIDIES MINUS INDIRECT TAXES



CONSUMABLE INCOME



PLUS MONETIZED VALUE OF PUBLIC SERVICES: EDUCATION & HEALTH



FINAL INCOME

CEQ Assessment: Data Requirements

- A recent Household Survey (possible options: expenditure-income, expenditure, employment, LSMS, etc.) representative at the national level
 - Detailed description of the characteristics of each tax and spending item to be included in the analysis
 - Audited or confirmed budget and administrative data for year of the survey
 - Input-output table, SAM (Social Accounting Matrix), or SUT (Supply and Use table)
- Stata 13 or higher

CEQ Assessment: Fiscal Interventions

- Currently included:
 - 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
 - In-kind transfers such as spending on education and health at average government costs

Fiscal Incidence in CEQ Assessments

- Comprehensive standard fiscal incidence analysis of current systems: direct personal taxes (no corporate taxes) and indirect taxes; cash and in-kind transfers (public services); indirect subsidies
- Harmonized definitions and methodological approaches to facilitate cross-country comparisons
- Uses income/consumption per capita as the welfare indicator
- Allocators vary => full transparency in the method used for each category, tax shifting assumptions, tax evasion
- Secondary sources are used to a minimum

Allocation Methods

- Direct Identification in microdata
 - However, results must be checked: how realistic are they?

- If information not directly available in microdata, then:
 - Imputation
 - Simulation
 - Inference
 - Prediction
 - Alternate survey
 - Secondary sources

Fiscal Incidence in CEQ Assessments

- Accounting approach
 - no behavioral responses
 - no general equilibrium effects
 - no intertemporal effects
 - However, economic rather than statutory incidence
- Point-in-time
- Mainly average incidence; a few cases with marginal incidence

Tax Shifting Assumptions

- Economic burden of direct personal income taxes is borne by the recipient of income
- Burden of payroll and social security taxes is assumed to fall entirely on workers
- Consumption taxes are assumed to be shifted forward to consumers
- These assumptions are strong because they imply that labor supply is perfectly inelastic and that consumers have perfectly inelastic demand
- In practice, they provide a reasonable approximation for short-run effects

Tax Evasion Assumptions: Case Specific

- Income taxes and contributions to SS
 - Individuals who do not participate in the contributory social security system are assumed not to pay them

- Consumption taxes
 - Place of purchase: informal markets are assumed not to charge them
 - Some country teams assumed small towns in rural areas do not to pay them

Monetizing In-Kind Transfers

- Incidence of public spending on education and health followed so-called “benefit or expenditure incidence” or the “government cost” approach
- In essence, we use per beneficiary input costs obtained from administrative data as the measure of average benefits
- This approach amounts to asking the following question:

How much would the income of a household have to be increased if it had to pay for the free or subsidized public service at the full cost to the government?
- New methods under development

Treatment of Contributory Social Insurance Pensions in CEQ

Two extreme scenarios:

- Deferred income in actuarially fair systems: pensions included in *pre-fiscal income* and contributions treated as mandatory savings
- Government transfer: pensions included among direct transfers and contributions treated as a direct tax

Scenarios and Robustness Checks

- Benchmark scenario
- Sensitivity to:
 - Using consumption vs. income
 - Alternative methods of adjusting for missing top incomes
 - Per capita vs. equivalized income or consumption
 - Using administrative totals
 - Different assumptions on take-up of transfers and tax shifting and evasion
 - Alternative valuations of in-kind services
 - Other sensitivity scenarios: country-specific

CEQ Methodology: Work in-progress

- Adjusting for under-reporting and under-coverage of top incomes
- Corporate taxes
- Gender-sensitive fiscal incidence analysis
- Alternative methods to value education and health spending
- Implicit taxes and subsidies in contributory pensions
- Incorporating some pre-selected behavioral responses
- Complementary sustainability indicators: macro, demographic, natural resources

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Fiscal Policy and Inequality

Four Key Questions

- Does the net fiscal system decrease inequality?
 - Lambert (2001): Fundamental equation of redistributive effect for the fiscal system; redistribution needs to be measured with the Gini coefficient

- Is a particular tax or transfer equalizing or unequalizing?
 - Sign of marginal contribution

- What is the contribution of a particular tax or transfer (or any combination of them) to the change in inequality?
 - Size of the marginal contribution

- What is the inequality impact if one increases the size of a tax (transfer) or its progressivity?
 - Derivative of the marginal contribution

Does the net fiscal system decrease inequality?

For the net fiscal system to be equalizing:

RE = Redistributive effect (e.g., change in Gini)

g = taxes as a share of GDP
 b = transfers as a share of GDP

$$RE_N = \frac{(1-g)RE_t + (1+b)RE_B}{1-g+b} > 0$$

Condition 1:

$$\rightarrow RE_t > -\frac{(1+b)}{(1-g)} RE_B$$

- The above result is well-known in the literature:
 - A fiscal system with a regressive tax can be equalizing as long as transfers are progressive and the condition above is fulfilled
 - A fiscal system with a regressive tax that collects more revenues than a less regressive one may be more equalizing if the additional resources are spent on benefits with a given progressivity
- However, Lambert's equation has more fundamental implications

Is a particular tax or transfer equalizing?

- If there is a single intervention in the system, any of the progressivity measures such as the Kakwani index will give an unambiguous answer
- If there is a tax and a transfer (or, more generally, more than one intervention such as two taxes), then this is no longer the case (see Lambert 2001, p. 278, for proof)

What is the sign and contribution of a particular tax or transfer to the change in inequality?

- Sequential method

- May give the wrong answer to the “without vs. with comparison” because it ignores path dependency

- **Marginal contribution method (same for poverty)**

- Gives correct answer to the “without vs. with comparison”
- Caveat: does not fulfill the principle of aggregation: i.e., the sum of the marginal contributions will not equal the total change in inequality (except by coincidence)

Calculating the Marginal Contribution of a Tax

The marginal contribution of a tax is defined as

$$MC_t = G_{x+B} - G_{x+B-t}$$

Where G_{x+B} , and G_{x+B-t} are the Gini coefficient of income with the transfer but **without** the tax and the Gini coefficient with the transfer **with** the tax, respectively

If $MC_t > 0$, remember, the tax is equalizing

Main Messages

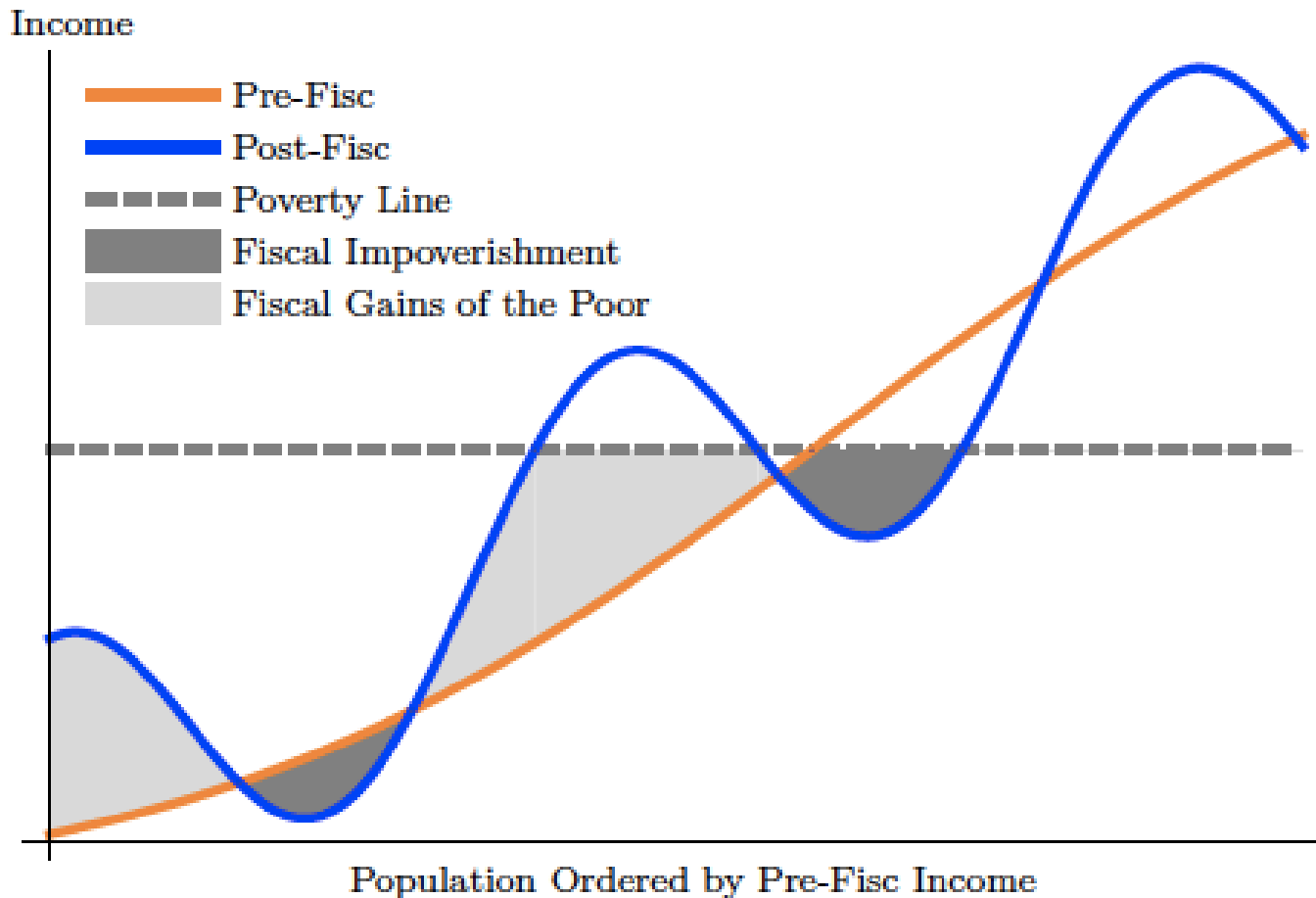
1. Analyzing the tax side without the spending side, or vice versa, is not very useful
 - Taxes can be unequalizing but spending so equalizing that the unequalizing effect of taxes is more than compensated [we knew this]
 - Taxes can be regressive but when combined with transfers make the system more equalizing than without the regressive taxes (Lambert, 2001) [surprised?]
 - VAT in Chile, for example

Fiscal Policy and Poverty

Three Key Questions

- Does the net fiscal system decrease poverty?
 - Empirical evidence shows that this is not always the case
- What is the contribution of a particular transfer (or any combination of them) to the decrease in poverty?
 - Size of the marginal contribution
- Does the net fiscal system impoverish the poor?
 - Cannot rely on traditional poverty indicators; use axiomatically derived Fiscal Impoverishment measure (Higgins & Lustig, 2016)

Fiscal Impoverishment and Fiscal Gains to the Poor



Main Messages

2. Analyzing the impact on inequality only can be misleading
 - Fiscal systems can be equalizing but poverty increasing [surprised?]

3. Analyzing the poverty impact with traditional indicators can be misleading [surprised?]
 - The headcount ratio or other typical poverty measures may decline while at the same time a substantial proportion of poor people are made poorer

Effectiveness indicators

(Chapter 5 by Ali Enami in [CEQ Handbook](#))

- Impact Effectiveness Indicator
 - How much more would one be able to reduce inequality/poverty if tax collection and spending occurred optimizing the redistributive effect (lexicographic collection of taxes and allocation of benefits)?
- Spending Efficiency Indicator
 - How much less would one have to collect in taxes (or other forms of financing) to obtain same redistributive/poverty-reduction effects if spending occurred optimizing the redistributive effect (lexicographic collection of taxes and allocation of benefits)?

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- Empirical results for 31 countries based on fiscal incidence studies from the Commitment to Equity Institute for around 2010
 - *Advanced countries*: United States
 - *East & South Asia*: Indonesia and Sri Lanka
 - *Europe and Central Asia*: Armenia, Georgia and Russia
 - *Latin America & the Caribbean*: Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Paraguay, Peru, Uruguay and Venezuela
 - *Middle East and North Africa*: Iran, Jordan, and Tunisia
 - *Sub-Saharan Africa*: Ethiopia, Ghana, South Africa, Tanzania, and Uganda

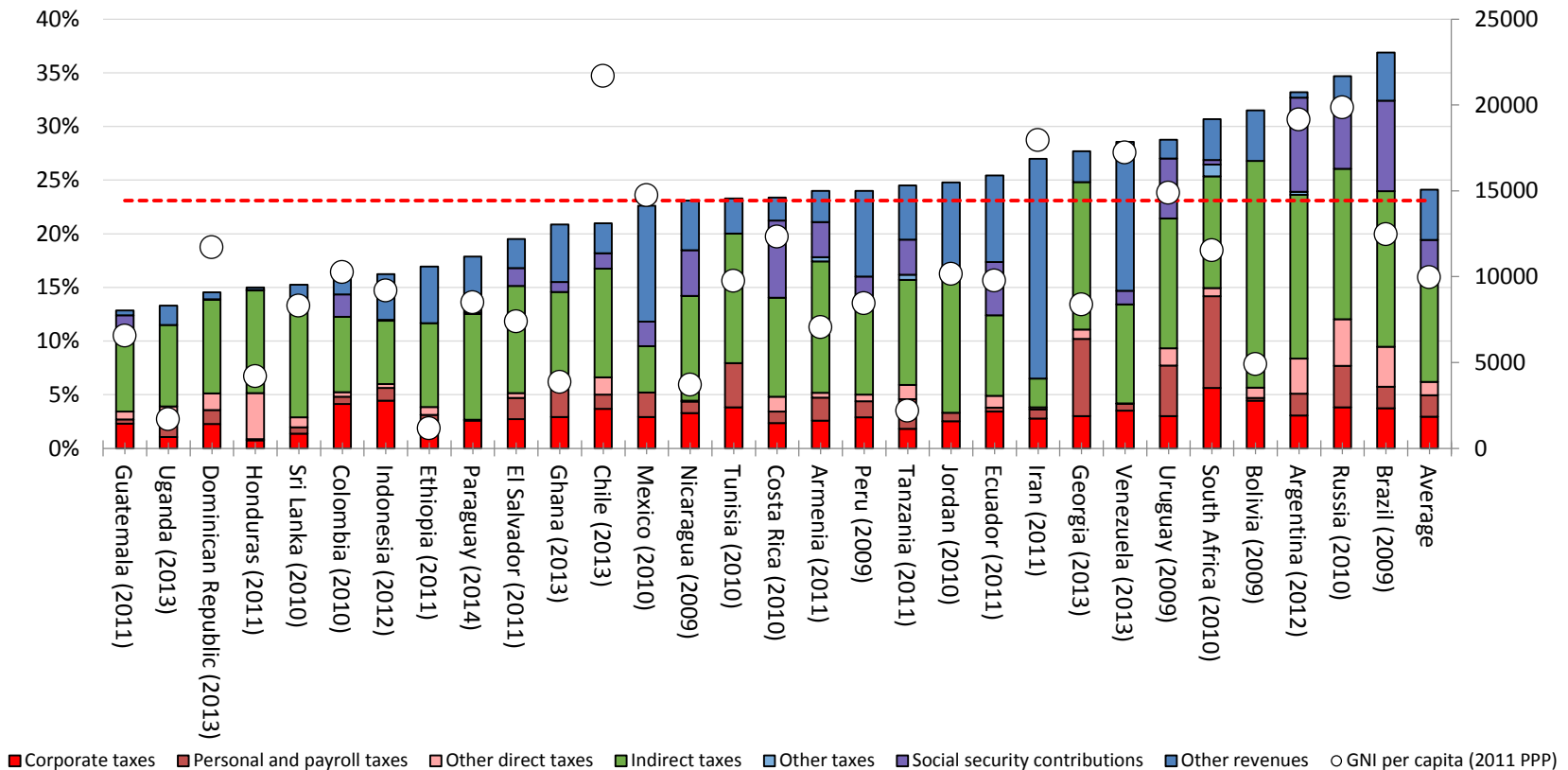
Key Questions

- How much income redistribution and poverty reduction is being accomplished through fiscal policy?
- How significant is the assumption made about contributory pensions?
- What is the relationship between pre-fisc inequality and “effort” measured by social spending as a share of GDP?
- How equalizing and pro-poor are specific taxes and government spending?
- Is spending on education and health equalizing; is it pro-poor (that is, per capita transfer declines with income)?

Size and Composition of Government Revenues and spending

Composition of Total Government Revenues as a Share of GDP (circa 2010)

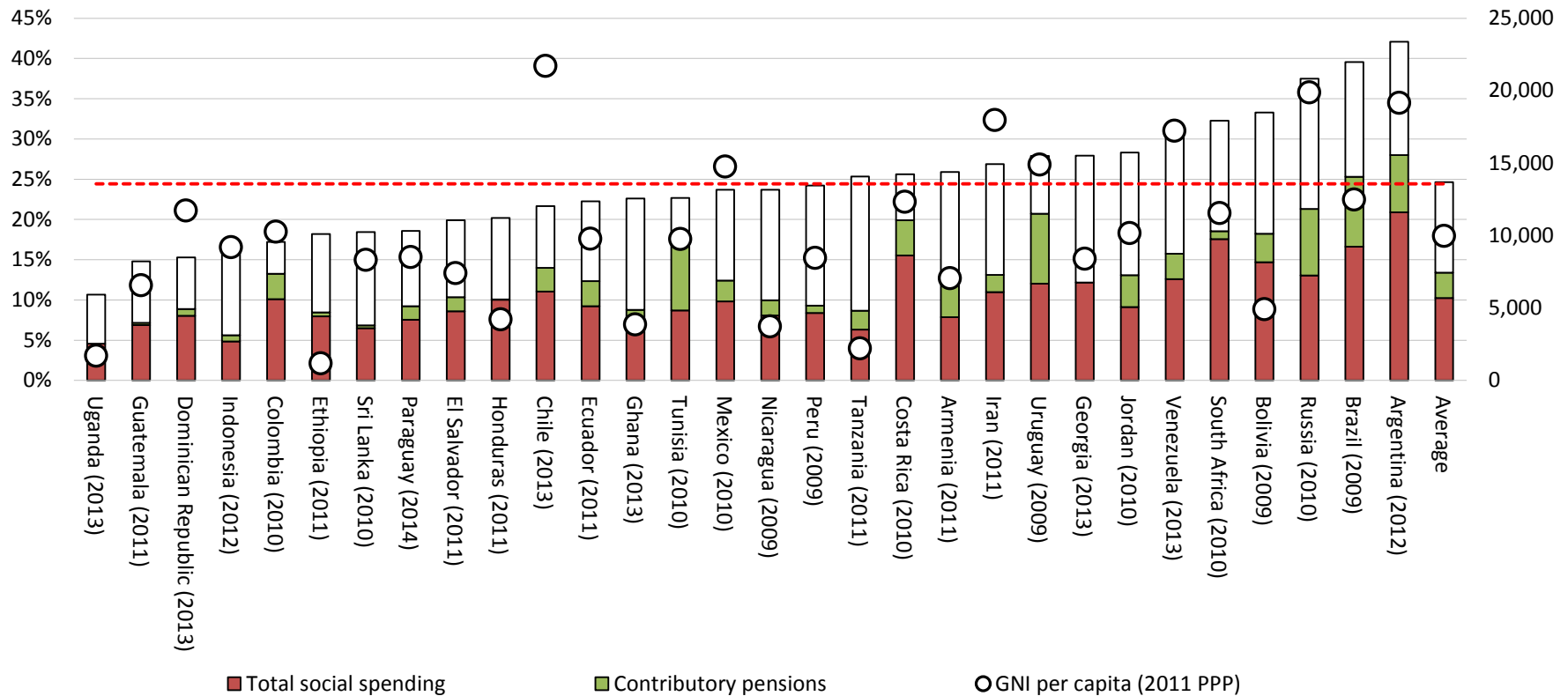
(ranked by total government revenue/GDP; GNI right hand scale)



Source: Lustig (2018)

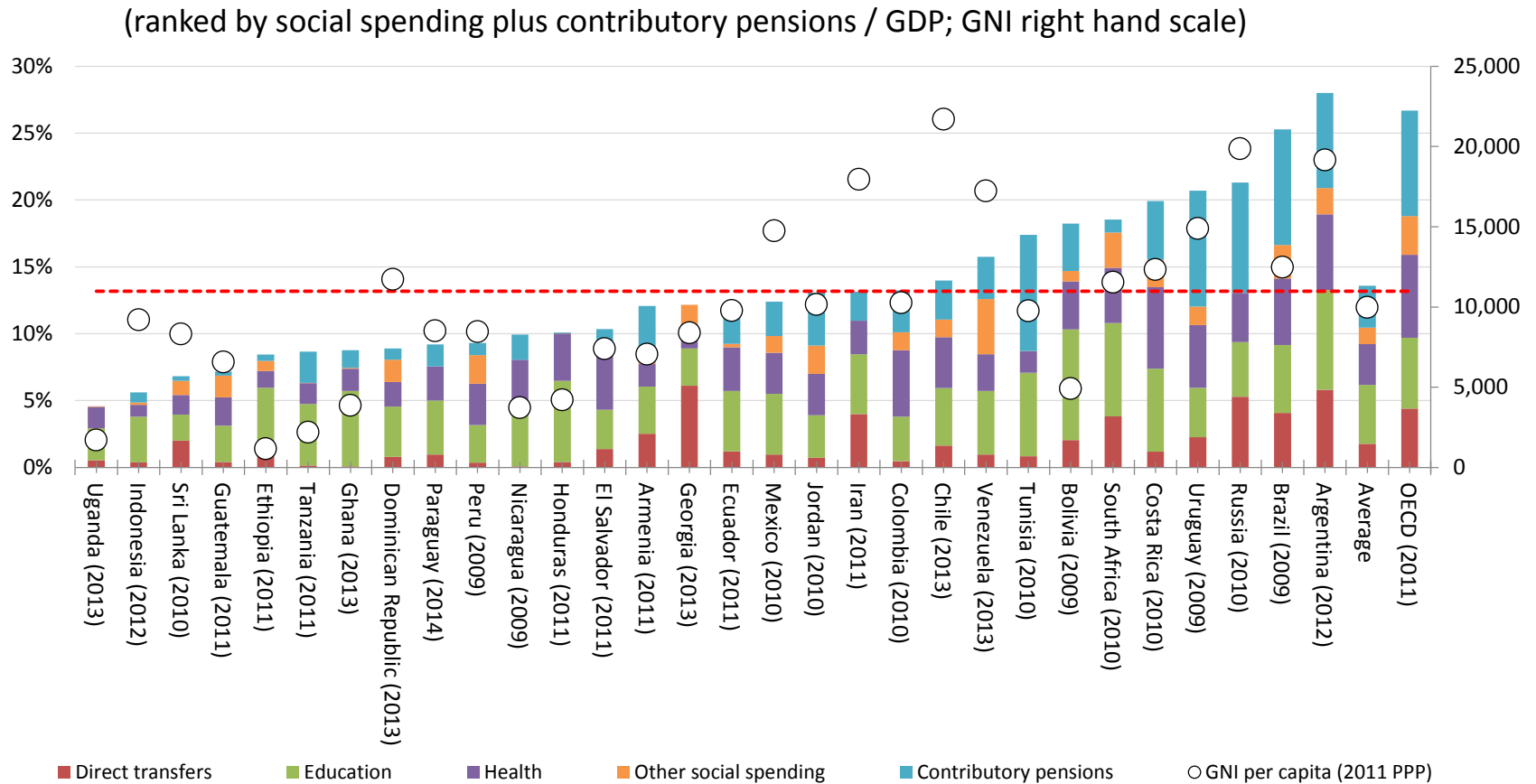
Primary and Social Spending as a Share of GDP (circa 2010)

(ranked by primary spending / GDP; GNI right hand scale)



Source: Lustig (2018)

Composition of Social Spending as a Share of GDP (circa 2010)



Inequality

Key Questions

- How much reduction in inequality is being accomplished through fiscal policy?
- How significant is the assumption made about contributory pensions?
- What is the relationship between pre-fisc inequality and “effort” measured by social spending as a share of GDP?
- Which interventions are equalizing/unequalizing?
- How equalizing and pro-poor are specific taxes and government spending?
- Is spending on education and health equalizing; is it pro-poor (that is, per capita transfer declines with income)?

CEQ Assessment: Income Concepts

MARKET INCOME



PLUS DIRECT TRANSFERS MINUS DIRECT TAXES



DISPOSABLE INCOME



PLUS INDIRECT SUBSIDIES MINUS INDIRECT TAXES



CONSUMABLE INCOME



PLUS MONETIZED VALUE OF PUBLIC SERVICES: EDUCATION & HEALTH

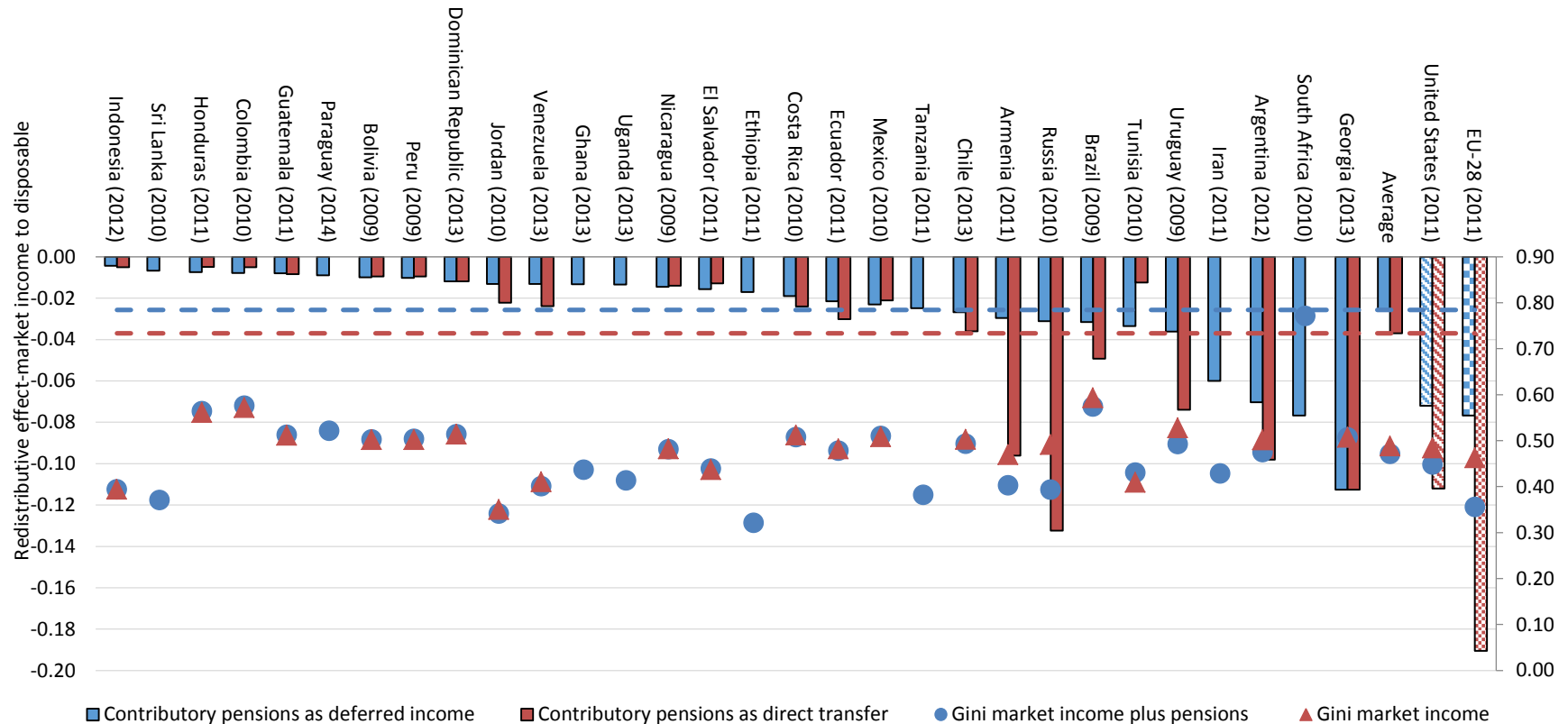


FINAL INCOME

Fiscal Policy and Inequality: Comparison of Pensions as Deferred Income vs. Pensions as Transfers

(Change in Gini: market income plus pensions and market income to disposable income, circa 2010)

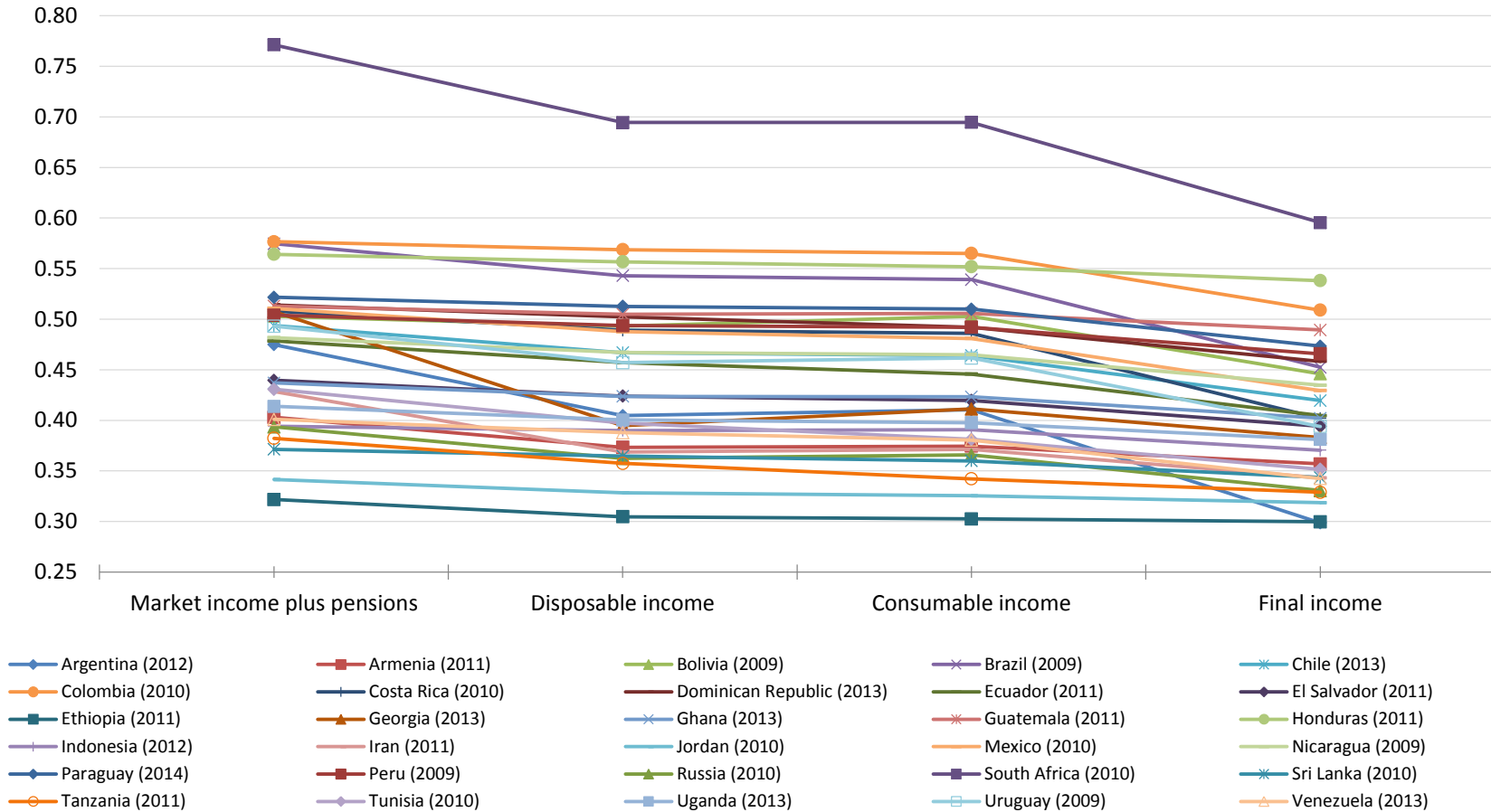
(ranked by redistributive effect (left hand scale); Gini coefficients right hand scale)



Source: Lustig (2018)

Fiscal Policy and Inequality

Contributory pensions as deferred income



Source: Lustig (2018)

Fiscal Policy and Inequality

- In order to analyze the impact of fiscal policy on income inequality and poverty, it is useful to separate the “cash portion” of the system
 - The cash portion includes direct taxes, direct transfers, indirect taxes, and indirect subsidies
 - The noncash or “in kind” portion includes the monetized value of the use of government education and health services
- 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

Fiscal Policy and Inequality

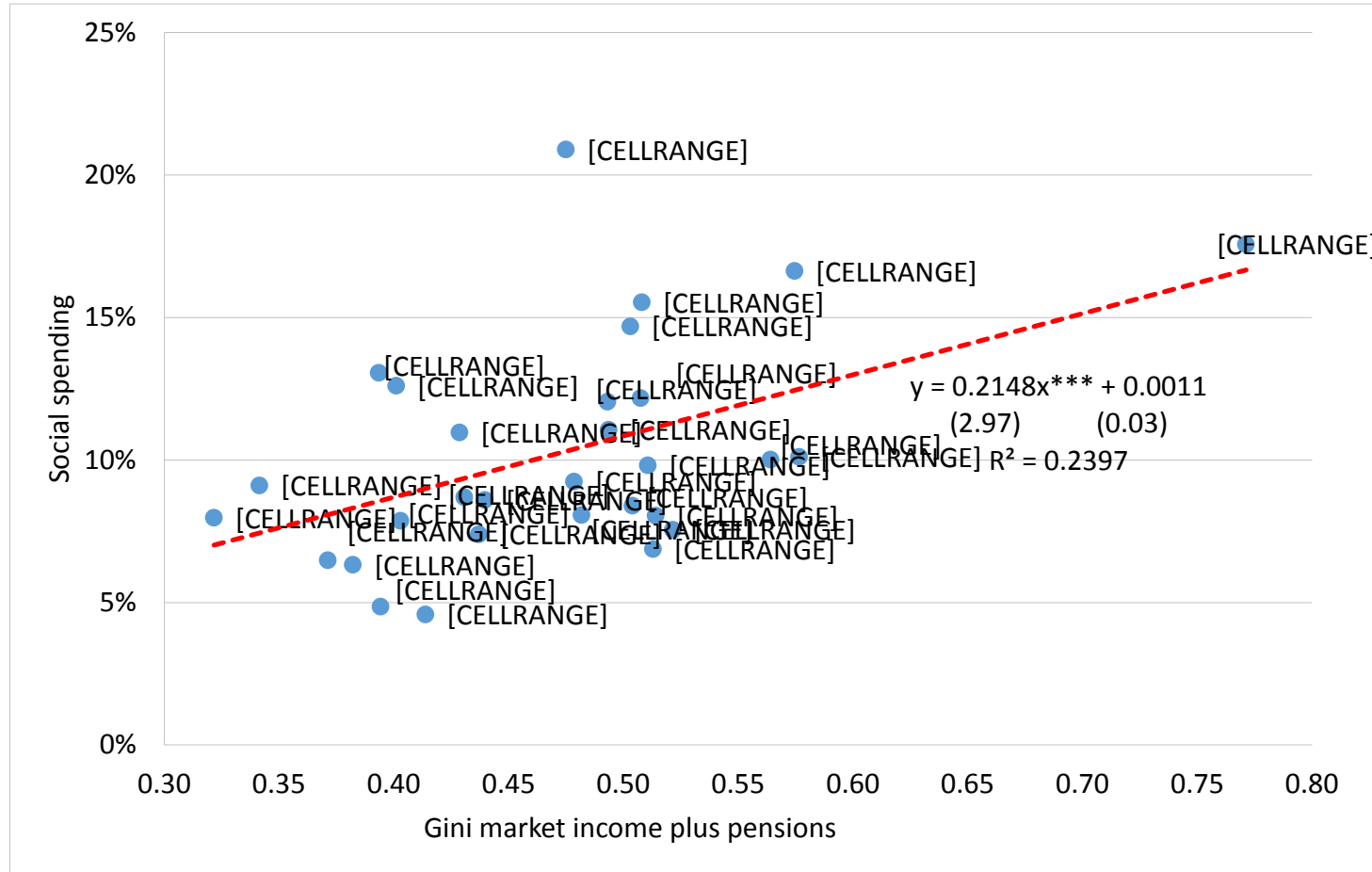
- Ethiopia, Jordan, Guatemala, and Indonesia, fiscal income redistribution is quite limited while in Argentina, Georgia, South Africa, and Brazil, it is of a relevant magnitude
- Argentina and South Africa are the countries that redistribute the most; South Africa, however, remains the most unequal even after redistribution
- 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 less unequal of all twenty-nine and fiscal redistribution is also the smallest in order of magnitude

Fiscal Policy and Inequality

- 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
 - these services are valued at government cost
 - “opting out” by middle classes and the rich (Daude, Lustig, Melguizo and Perea, 2017, [CEQ WP 72](#))

More Unequal, More Social Spending/GDP

Contributory pensions as deferred income



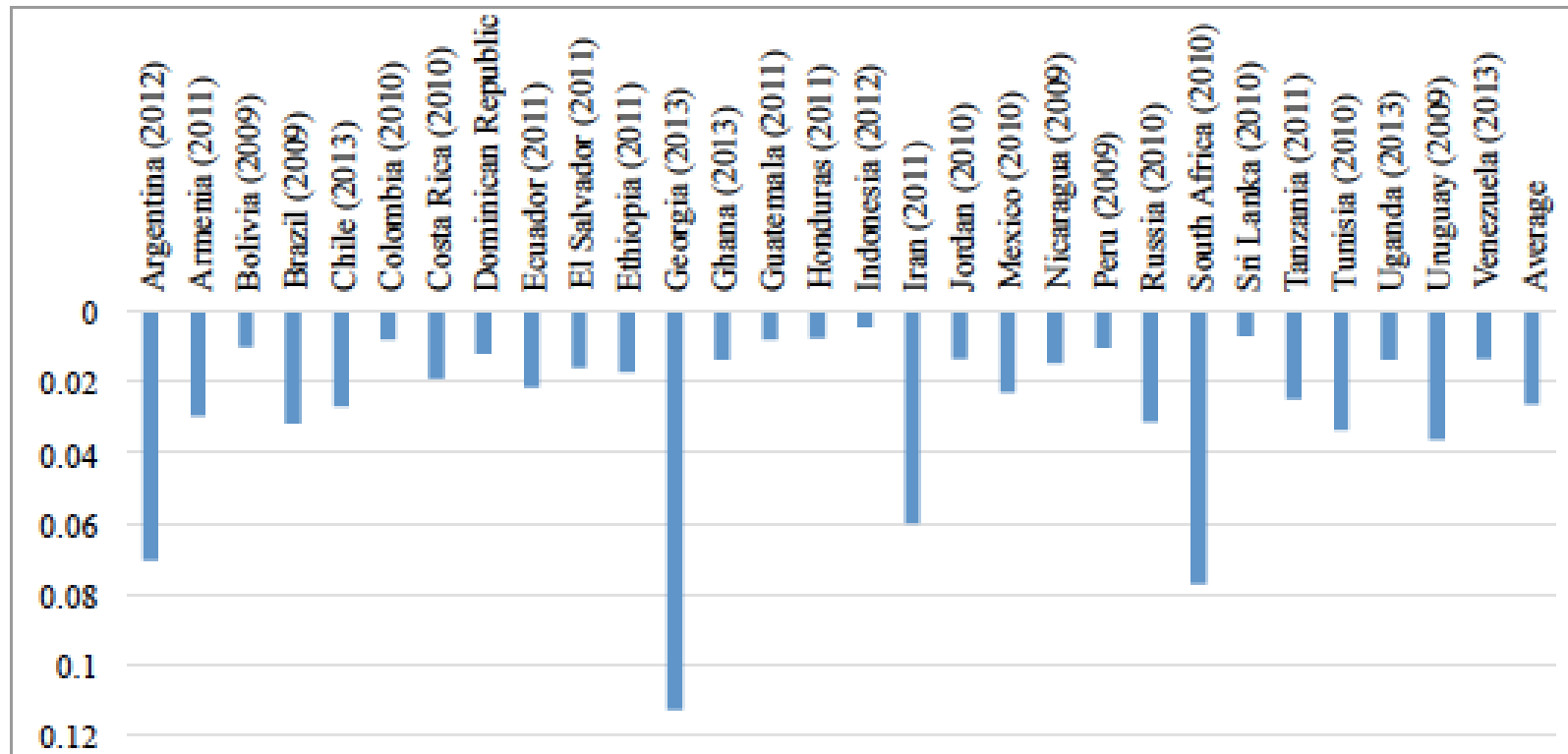
In sum...

- In **NO** country, inequality increases as a result of taxes, subsidies and social spending
 - Fiscal policy is always equalizing
- Assumptions about contributory pensions can make a big difference in countries with large social security systems and a high proportion of retirees
 - Pensions, however, can be equalizing or unequalizing
 - :
- More unequal, higher share of social spending to GDP (different from Lindert's results from history; Lindert, 2004)

Marginal Contributions of Net Direct Taxes

➤ Equalizing for all countries

Panel A: Marginal Contributions of Net Direct Taxes (Contributory Pensions as Deferred Income)

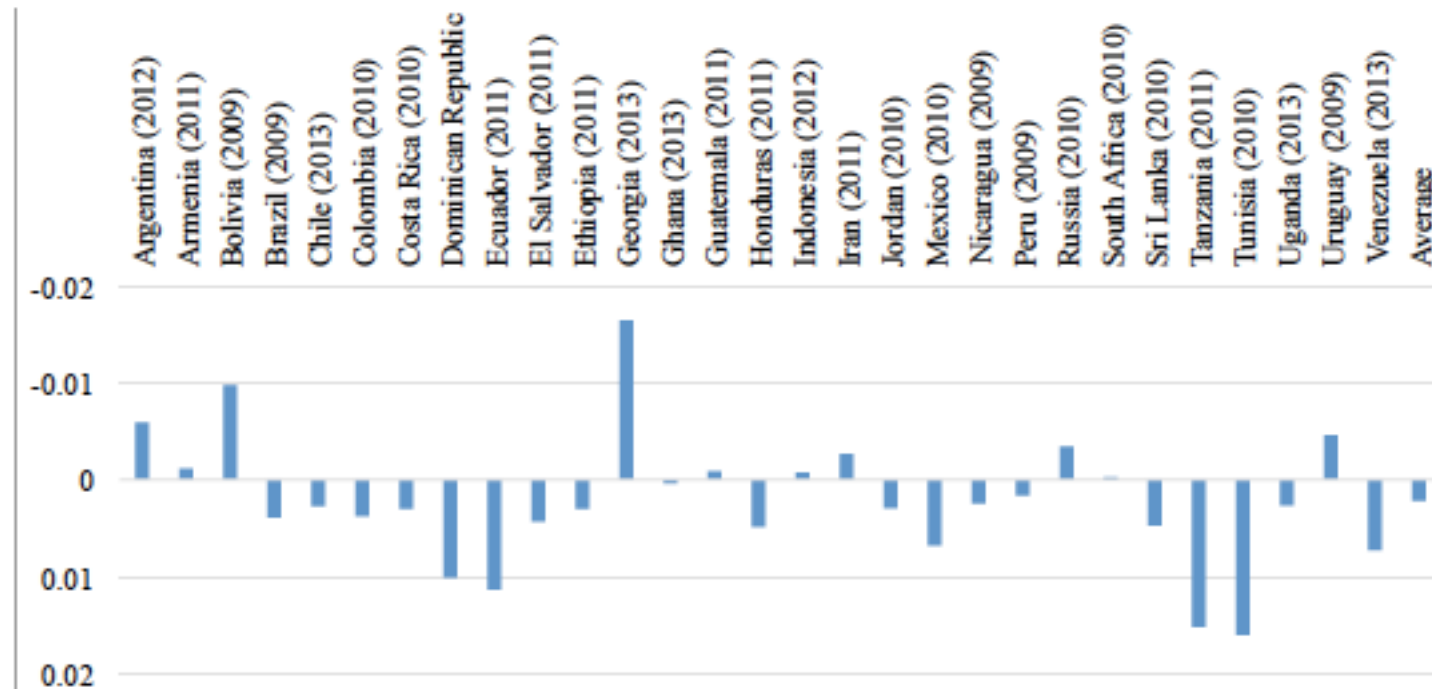


Source: Lustig (2018)

Marginal Contributions of Net Indirect Taxes

➤ Equalizing (!) in 19 out of 29

Panel B: Marginal Contributions of Net Indirect Taxes (Contributory Pensions as Deferred Income)



Source: Lustig (2018)

In sum...

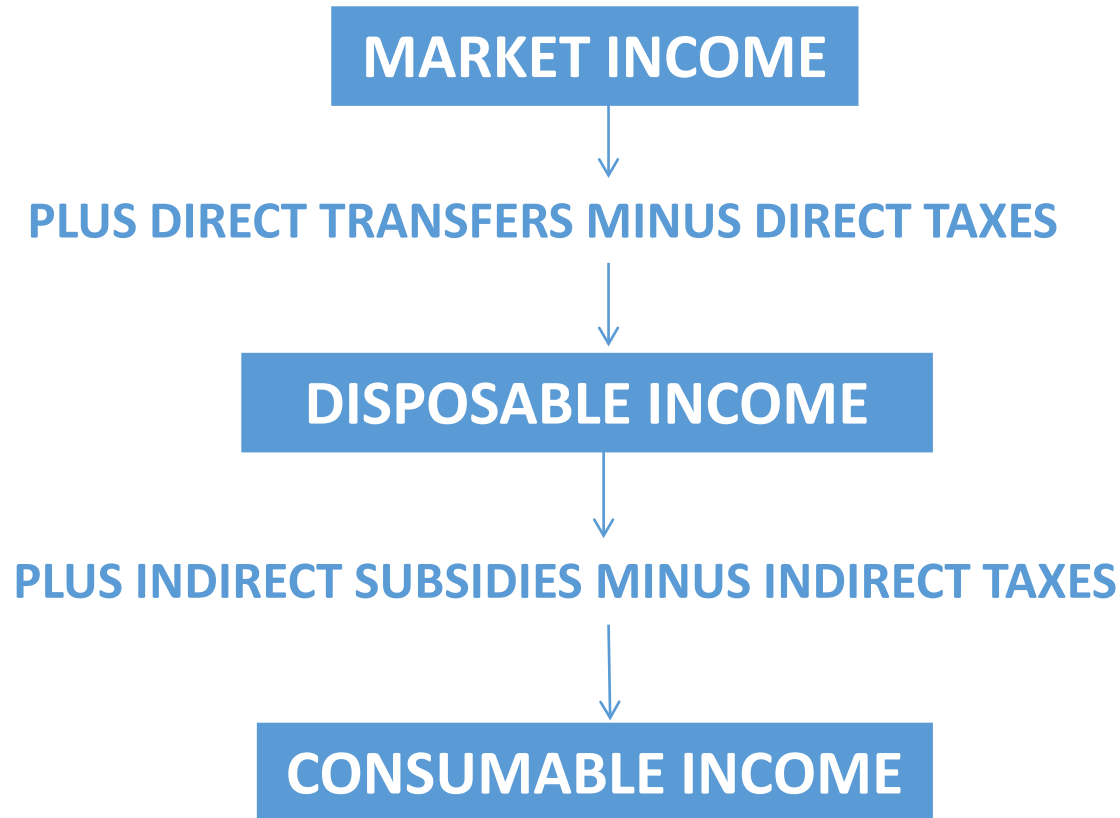
- Direct taxes are equalizing
- Direct transfers are always equalizing
- Indirect taxes can be equalizing (surprised?),
- Indirect subsidies are often equalizing (surprised?)
- Education spending is always equalizing
- Health spending is always equalizing

Poverty

Key Questions

- How much poverty reduction is being accomplished through fiscal policy?
- Do fiscal systems ever *increase* poverty?
- Which socio-economic groups are net payers?

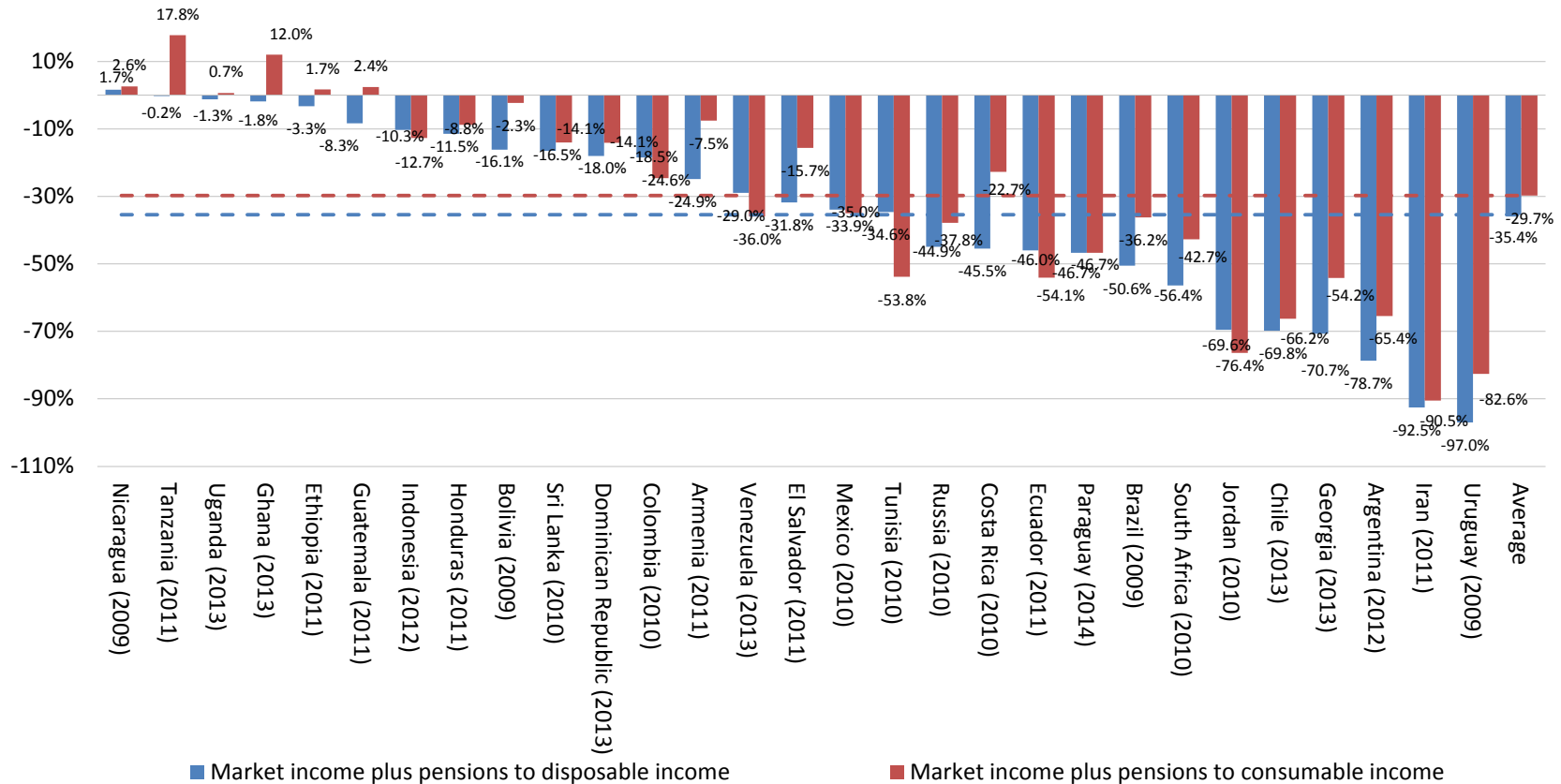
CEQ Assessment: Income Concepts



Fiscal Policy and Poverty Reduction

Poverty line 1.25 dollars 2005 PPP/day; in % and for the scenario of contributory pensions as deferred income

(ranked by poverty reduction in %; poverty line 1.25 dollars 2005PPP/day)

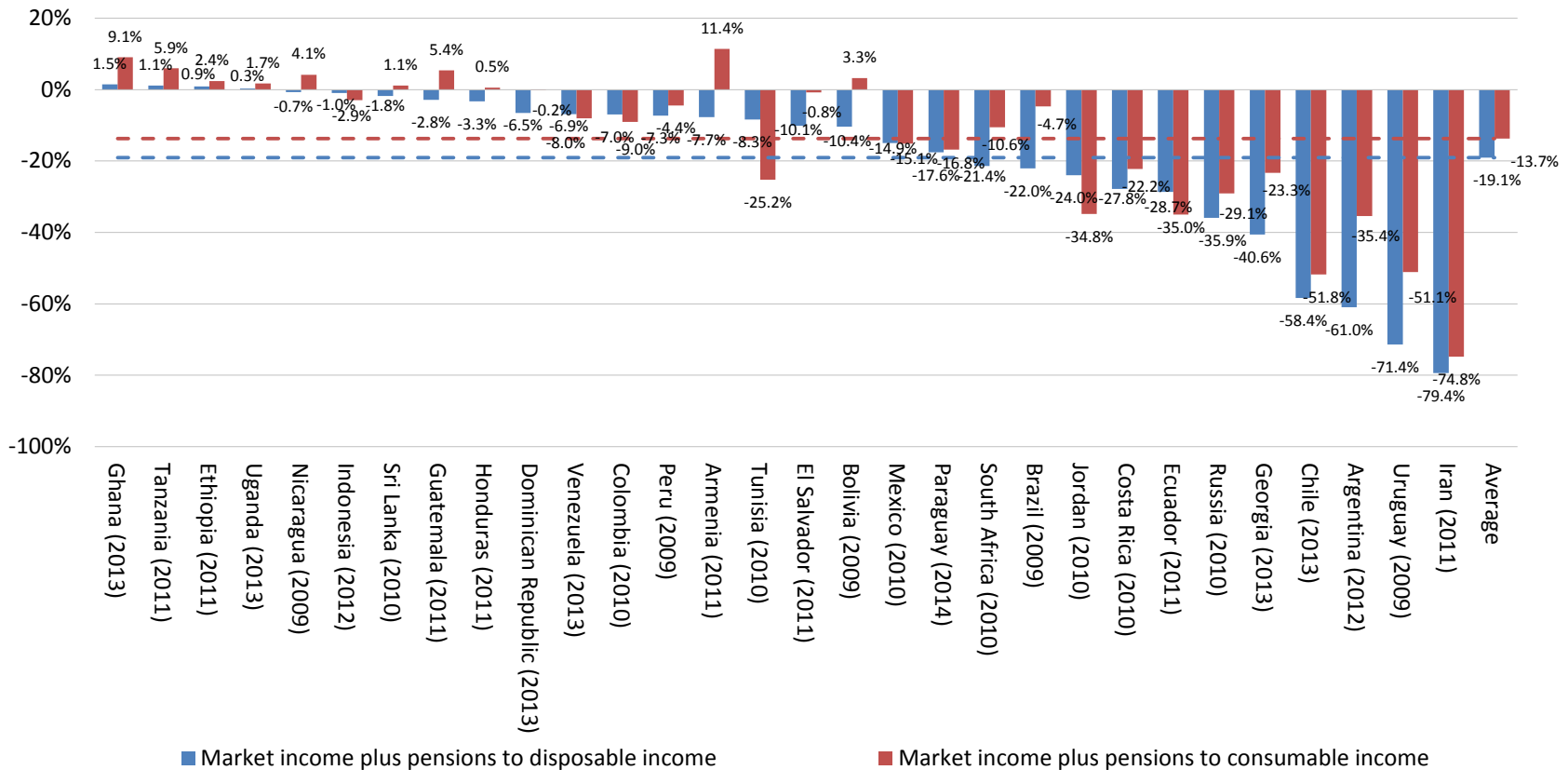


Source: Lustig (2018)

Fiscal Policy and Poverty Reduction

Poverty line 2.5 dollars 2005 PPP/day; in % and for the scenario of contributory pensions as deferred income

(ranked by poverty reduction in %; poverty line 2.5 dollars 2005PPP/day)

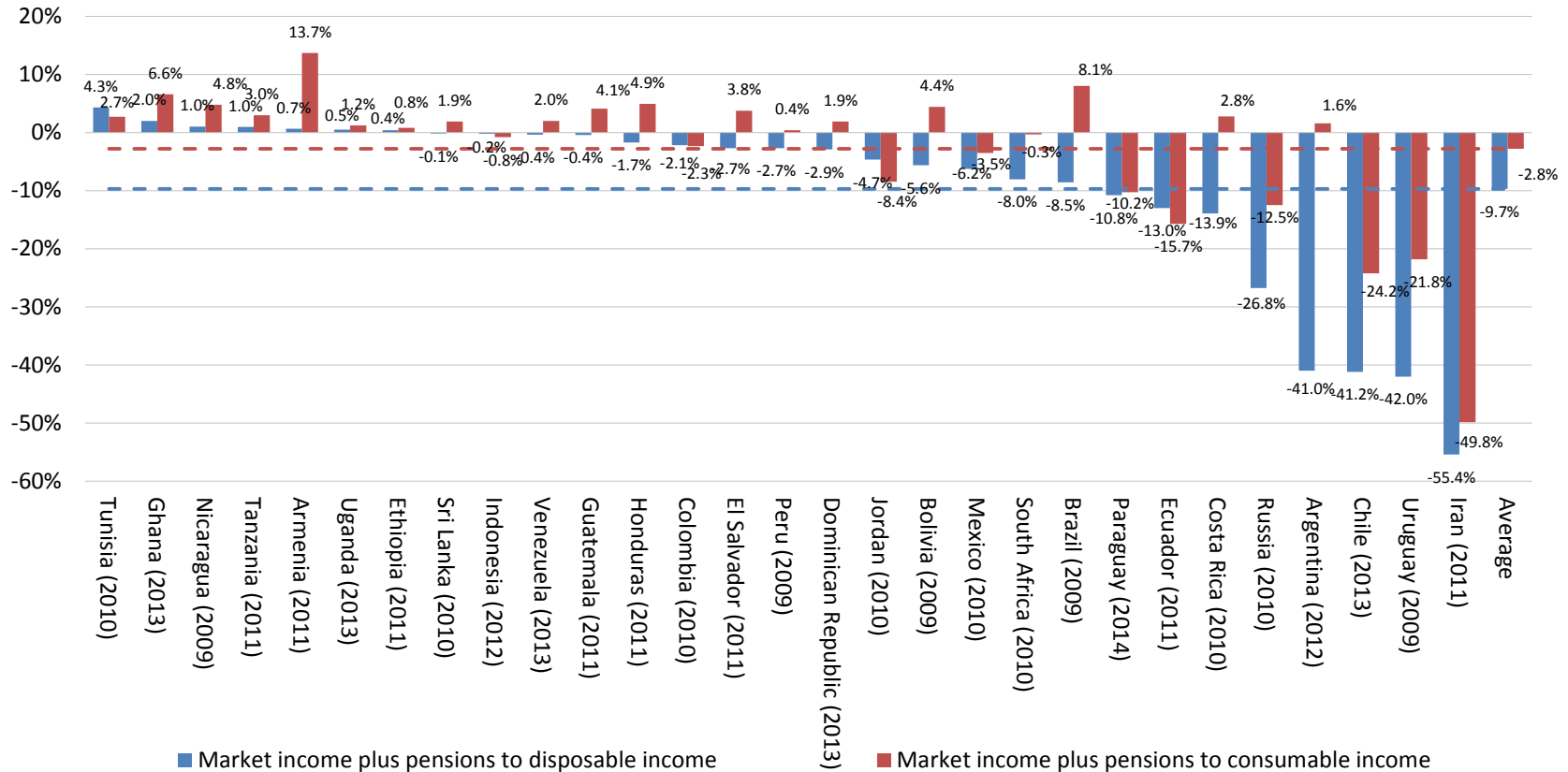


Source: Lustig (2018)

Fiscal Policy and Poverty Reduction

Poverty line 4 dollars 2005 PPP/day; in % and for the scenario of contributory pensions as deferred income

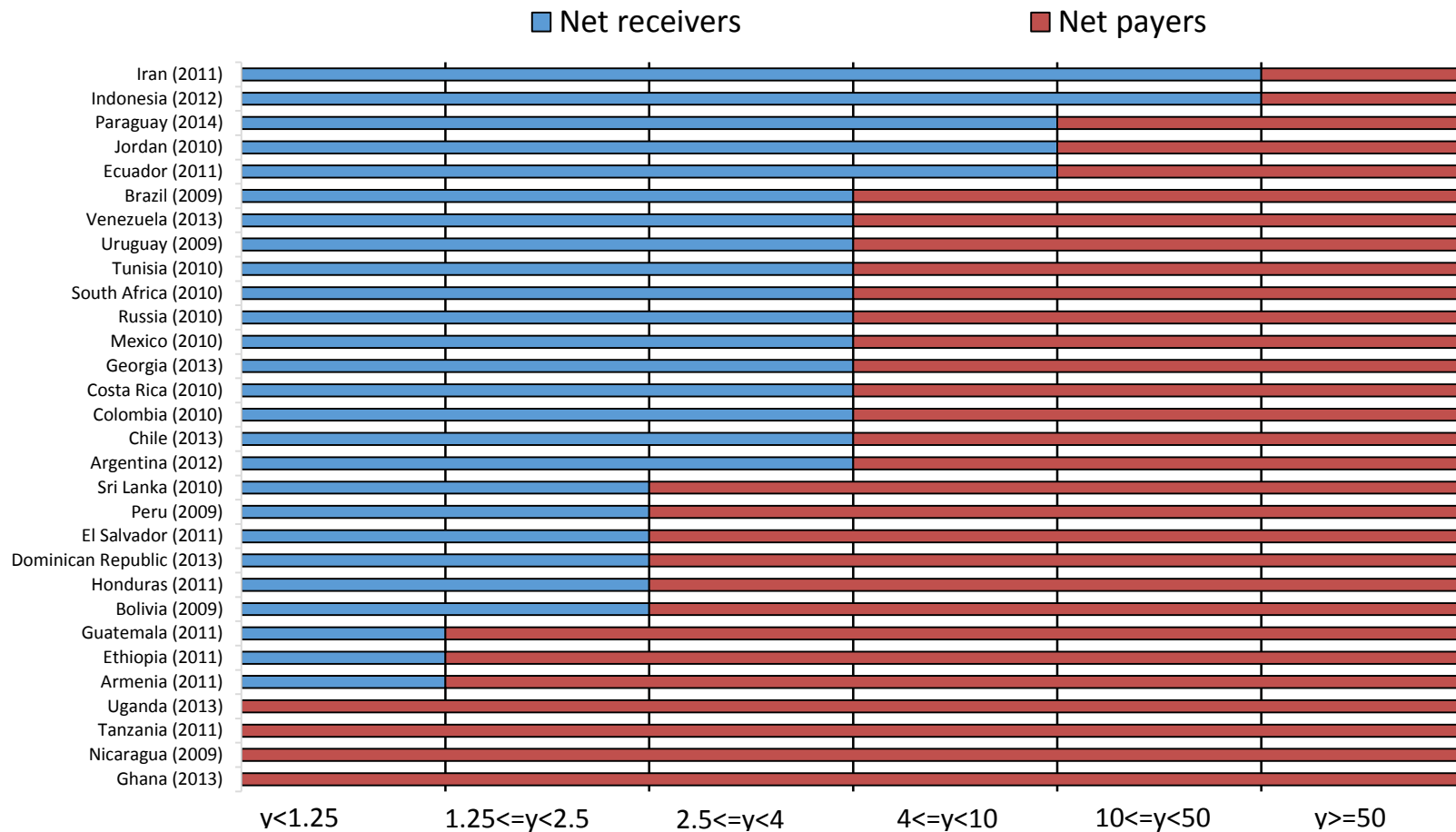
(ranked by poverty reduction in %; poverty line 4 dollars 2005PPP/day)



Source: Lustig (2018)

Net Payers and Net Receivers

(by Income Groups; in dollars 2005 PPP/ day)
Contributory pensions as deferred income



**Fiscal Impoverishment (circa 2010): Contributory Pensions as Deferred
Income; in Percentage**

Country (survey year)	Market income plus contributory pensions Poverty headcount (%)	Change in poverty headcount (p.p.)	Market income plus contributory pensions inequality (Gini)	Reynolds-Smolensky	Change in inequality (▲ Gini)	Fiscally impoverished as % of population	Fiscally Impoverished as % of consumable income poor
<i>Panel A: Upper-middle income countries, using a poverty line of \$2.5 PPP 2005 per day</i>							
Brazil (2009)	16.8	-0.8	57.5	4.6	-3.5	5.6	34.9
Chile (2013)	2.8	-1.4	49.4	3.2	-3.0	0.3	19.2
Ecuador (2011)	10.8	-3.8	47.8	3.5	-3.3	0.2	3.2
Mexico (2012)	13.3	-1.2	54.4	3.8	-2.5	4.0	32.7
Peru (2011)	13.8	-0.2	45.9	0.9	-0.8	3.2	23.8
Russia (2010)	4.3	-1.3	39.7	3.9	-2.6	1.1	34.4
South Africa (2010)	49.3	-5.2	77.1	8.3	-7.7	5.9	13.3
Tunisia (2010)	7.8	-0.1	44.7	8.0	-6.9	3.0	38.5
<i>Panel B: Lower-middle income countries, using a poverty line of \$1.25 2005 PPP per day</i>							
Armenia (2011)	21.4	-9.6	47.4	12.9	-9.3	6.2	52.3
Bolivia (2009)	10.9	-0.5	50.3	0.6	-0.3	6.6	63.2
Dominican Republic (2013)	6.8	-0.9	50.2	2.2	-2.2	1.0	16.3
El Salvador (2011)	4.3	-0.7	44.0	2.2	-2.1	1.0	27.0
Ethiopia (2011)	31.9	2.3	32.2	2.3	-2.0	28.5	83.2
Ghana (2013)	6.0	0.7	43.7	1.6	-1.4	5.1	76.6
Guatemala (2010)	12.0	-0.8	49.0	1.4	-1.2	7.0	62.2
Indonesia (2012)	12.0	-1.5	39.8	1.1	-0.8	4.1	39.2
Sri Lanka (2010)	5.0	-0.7	37.1	1.3	-1.1	1.6	36.4
Tanzania (2011)	43.7	7.9	38.2	4.1	-3.8	50.9	98.6

Source: Higgins and Lustig (2016).

Fiscal Policy and Poverty


- Results indicate that, on average, the ultra-poor in Ghana, Nicaragua, Tanzania, and Uganda, the extreme poor in Armenia, Ethiopia, and Guatemala and the moderate poor in Brazil, Bolivia, Dominican Republic, El Salvador, Honduras, Peru and Sri Lanka are net payers into the fiscal system
- In the case of Brazil, the cause is the high consumption taxes paid on staple goods. In the case of Peru, cash transfers are too small to compensate for what the poor pay in taxes.
- Furthermore, fiscal impoverishment can be quite pervasive and, in low-income countries, larger in magnitude than fiscal gains to the poor.

How pro-poor is spending on education and health


Key Questions


- Is spending on education and health equalizing; is it pro-poor (that is, per capita transfer declines with income)?

Classification

 **A** = Pro-poor and equalizing, per capita spending declines with income

 **B** = Neutral in absolute terms and equalizing, same per capita for all

 **C** = Equalizing but not pro-poor, per capita spending as a share of market income declines with income

 **D** = Unequalizing, per capita spending as a share of market income increases with income

	Total Education	Pre-school	Primary	Secondary	Tertiary	Health
Argentina (2012)	A	A	--	--	C	A
Armenia (2011)	A	A	A	--	C	B
Bolivia (2009)	B	A	A	A	C	B
Brazil (2009)	A	A	A	A	C	A
Chile (2013)	A	A	A	A	C	A
Colombia (2010)	--	A	A	A	C	--
Costa Rica (2010)	--	A	A	A	C	--
Dominican Republic (2013)	A	A	A	--	C	A
Ecuador (2011)	A	--	A	A	--	A
El Salvador (2011)	A	A	A	B	C	C
Ethiopia (2011)	C	--	B	C	D	C
Georgia (2013)	B	B	A	--	C	A
Ghana (2013)	C	A	A	C	D	B
Guatemala (2011)	B	A	A	B	D	C
Honduras (2011)	B	A	A	B	C	B
Indonesia (2012)	B	--	A	B	D	C
Iran (2011)	B	--	A	A	C	B
Jordan (2010)	A	A	A	A	C	C
Mexico (2010)	A	A	A	C	C	B
Nicaragua (2009)	B	A	A	B	C	B
Paraguay (2014)	A	A	A	A	C	B
Peru (2009)	A	A	A	A	C	C
Russia (2010)	A	--	--	--	--	B
South Africa (2010)	B	A	A	A	C	A
Sri Lanka (2010)	B	A	--	--	C	B
Tanzania (2011)	C	A	A	C	D	C
Tunisia (2010)	B	--	--	--	C	B
Uganda (2013)	C	--	A	C	D	B
Uruguay (2009)	A	A	A	A	C	A
Venezuela (2013)	A	A	A	A	B	A

In-kind Transfers: Education and Health

- Total spending on education is pro-poor (that is, per capita spending declines with income) except in Ethiopia, Ghana, Tanzania, and Uganda where it is progressive only in relative terms
- Pre-school tends to be pro-poor in all countries for which there is data except for Georgia
- Primary school is pro-poor in all countries other than Ethiopia
- For secondary school, spending is pro-poor in all upper-middle-income countries except in Ethiopia, Ghana and Uganda where it is progressive only in relative terms
- Government spending on tertiary education is regressive in Ethiopia, Ghana, Guatemala, Indonesia, Uganda, and Tanzania, and progressive only in relative terms in various degrees in the rest.
- Health spending is always progressive

In Conclusion...

- Fiscal systems are always equalizing but can often reduce the purchasing power of the poor
 - Warning: unintended consequence of the domestic resource mobilization agenda can be making the poor worse off
- Spending on education and health is often pro-poor and almost universally equalizing
 - Warning: is this favorable result because middle-classes and the rich are opting out?

(Daude, Lustig, Melguizo and Perea, 2017, CEQ WP 72)

Implications for Public Policy

Regarding policy prescriptions, one fundamental lesson emerges:

- Governments should design their tax and transfers system so that their purchasing power is not reduced due to fiscal policy
- The poor, especially the extreme poor, should not be net payers into the fiscal system

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Merci!