Tulane University

COMMITMENT TO EQUITY

Fiscal Redistribution: Analytical Dimensions and Results for Middle Income Countries

Nora Lustig

Tulane University, CGD, IAD

Fiscal Redistribution in Developing Countries

Institute for Fiscal Studies

London, UK

July 10, 2015

COMMITMENT TO EQUITY

OUTLINE

- Brief description of CEQ project
- Methodological highlights
- Results
  - Middle-income countries
  - Ethiopia

COMMITMENT TO EQUITY

What is CEQ?

Nora Lustig

What is CEQ: Description of Project

- The CEQ project is an initiative of:
  - The Center for Inter-American Policy and Research (CIPR) and the Department of Economics, Tulane University, Center for Global Development and the Inter-American Dialogue
- CEQ's goals are to:
  - Foster evidence-based policy discussion on fiscal redistribution
  - Assist governments, multilateral institutions, and nongovernmental organizations in their efforts to build more equitable societies

COMMITMENT TO EQUITY

What is CEQ: Core Team

- Director: Nora Lustig
- Technical Coordinator: Sean Higgins
- Project Coordinator: Samantha Greenspun
- Team: Rodrigo Aranda, Ali Enami, and Yang Wang
- Advisory Board: list on CEQ homepage
- Consultants: Jim Alm, Francois Bourguignon, Jean-Yves Duclos, Peter Lambert, Anthony Shorrocks and Stephen Younger
- Country teams: listed at the end of presentation

What is CEQ: Funding

- Tulane University (2008 -)
  - Center for Inter-American Policy and Research
  - School of Liberal Arts
  - Stone Center for Latin American Studies

- Bill & Melinda Gates Foundation
  - CEQ Handbook (text, master workbook and *ado* files)
  - CEQ Assessments in Ghana and Tanzania

- Canadian International Development Agency (CIDA), the Norwegian Ministry of Foreign Affairs, and the General Electric Foundation

What is CEQ: Partnerships and Collaborations

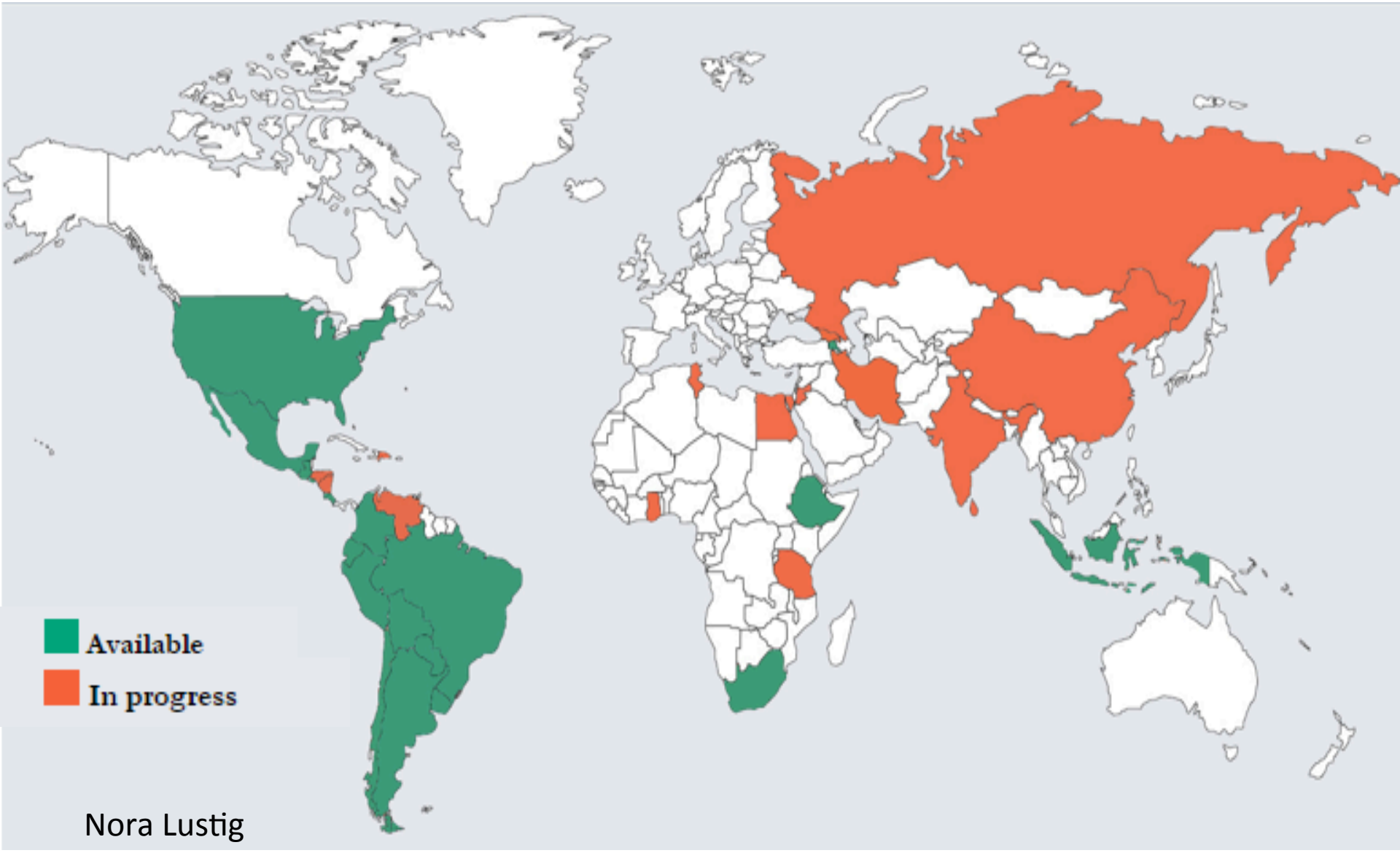
- **World Bank:** 11 countries, background papers, joint papers, policy briefs and LEL (Equity Lab)
- I**DB:** 10 countries in LAC, by ethnicity and race, overview papers for LA
- **ICEFI:** 4 countries in Central America, rural-urban
- **IFAD:** 4 countries, rural-urban
- **UNDP:** Ecuador (top incomes) and Venezuela
- **Economic Research Forum:** Egypt and Iran
- **AfDB:** Tunisia
- **CADEP:** Paraguay
- **CBGA:** India
- **FUSADES:** El Salvador
- **REPOA:** Tanzania
- **University of Ghana:** Ghana
- **OECD:** chapter for flagship publication and project on redistribution and the middle-class
- **IMF:** chapter for edited volume
- **CAF:** background paper
- **ADB**: box for flagship publication
- **CEPAL**: box for flagship publication

What is CEQ: Country Coverage

- 33 countries at different stages of completion
  - Asia…… 4
  - ECA……3
  - LAC……17
  - MENA……4
  - SSA…… 4
  - United States
- 17 CEQ Assessments have been completed

COMMITMENT TO EQUITY

www.commitmentoequity.org



Nora Lustig

CEQ Assessment: Tools

- **Handbook:** Lustig and Higgins, current version Sept 2013; includes sample Stata code => available on CEQ website
- **Master Workbook**: Excel Spreadsheet to present background information, assumptions and results. Lustig and Higgins, version Feb 2015 (available with permission)
- **Diagnostic Questionnaire: = >** available on website
- **Ado Stata Files**: (available with permission)
- **CEQ Handbook 2016 (forthcoming)**

  Lustig and Higgins, editors. *Commitment to Equity Handbook: Estimating the Redistributive Impact of Fiscal Policy*

NEW! CEQ Institute

- Research-based policy tools
- CEQ database and informational resources
- Advisory and training services
- Bridges to policy

COMMITMENT TO EQUITY

Methodological Highlights: The Net Fiscal System, Inequality and Poverty

Based on:
Duclos & Araar (2006)
Higgins & Lustig (2015)
Lambert (2001)
Lustig, Enami & Aranda (forthcoming)
Lustig & Higgins (2013)

Nora Lustig

COMMITMENT TO EQUITY

Fiscal Policy, Inequality and Poverty Main Questions

- Does the net fiscal system decrease inequality?
- Is a particular fiscal intervention equalizing or unequalizing?
- Does the net fiscal system decrease poverty?
- Does the net fiscal system make some of the poor poorer?

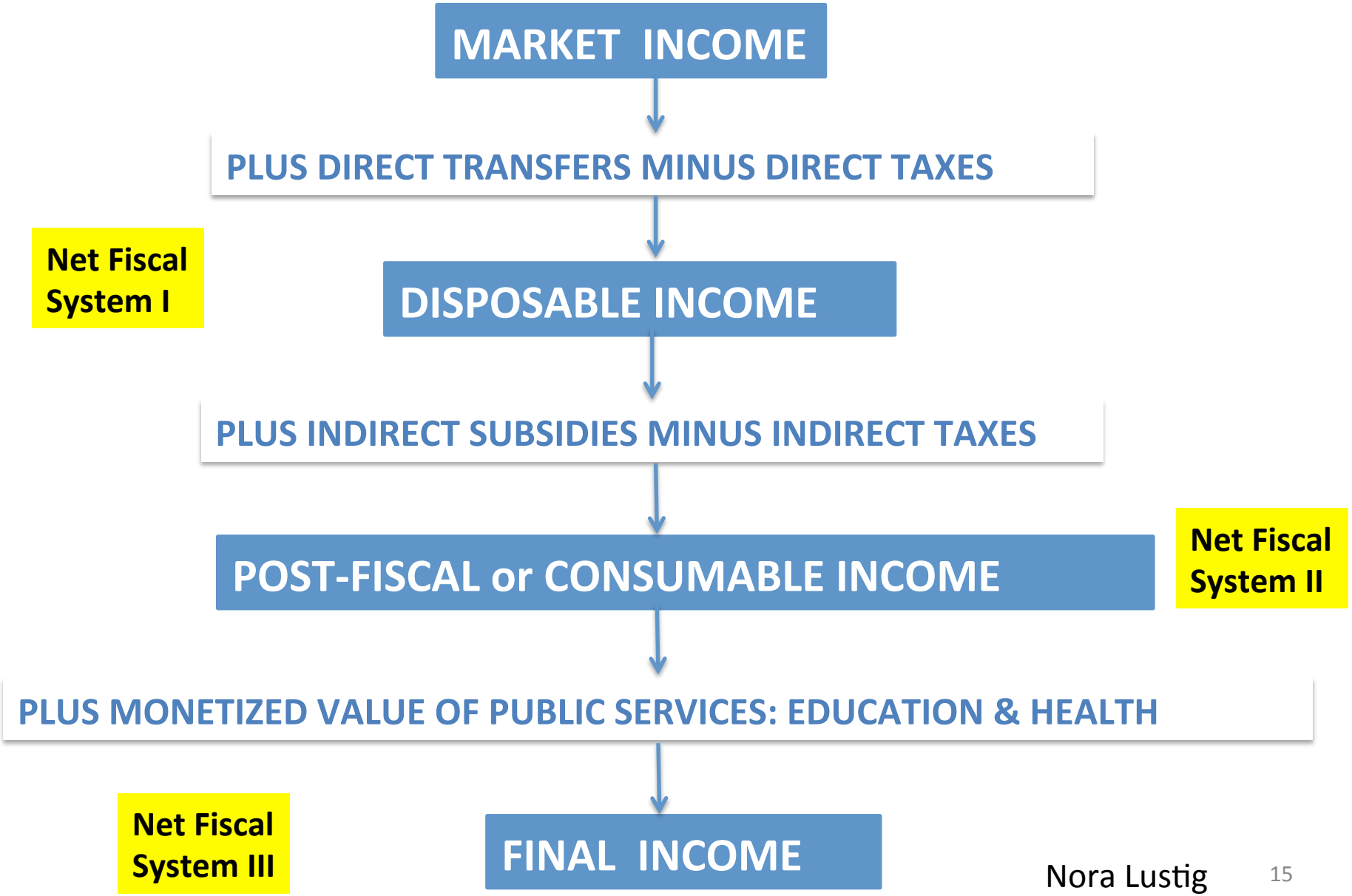
What is the "net fiscal system"?

In literature:

- From market to disposable income: direct taxes and direct transfers
- From market to consumable income: direct *and* indirect taxes, direct transfers and indirect subsidies
- From market to extended disposable income: direct taxes and direct transfers plus valuation of in-kind services
- From market to final income: direct *and* indirect taxes, direct transfers and indirect subsidies plus valuation of in-kind services

CEQ Assessment: Income Concepts

COMMITMENT TO EQUITY



Main messages

1. Analyzing the tax without the spending side, or vice versa, is not really useful
   - Taxes can be unequalizing but spending so equalizing that the unequalizing effect of taxes is more than compensated
   - **Taxes can be unequalizing by themselves but when combined with transfers make the system more equalizing than without the regressive taxes**

Main messages

2. Analyzing the progressivity or regressivity of individual interventions can lead to the wrong conclusions about their contribution
   - Regressive taxes can exert an equalizing influence, under certain conditions **which involve the size and progressivity of ALL fiscal interventions simultaneously**

ALSO

- Progressive transfers in a system with progressive taxes can exert an unequalizing influence, under certain conditions **which involve the size and progressivity of ALL fiscal interventions simultaneously**
- Regressive transfers in a system with regressive taxes can exert an equalizing influence, under certain conditions **which involve the size and progressivity of ALL fiscal interventions simultaneously**

Main messages

3. Analyzing the impact on inequality only can be misleading
   - ➢ Fiscal systems can be equalizing but poverty increasing

Main messages

4. Analyzing the impact on traditional poverty indicators can be misleading
   - 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

COMMITMENT TO EQUITY

Methodological Highlights: The Analytics of Fiscal Income Redistribution

Based on

Duclos & Araar (2006)

Lambert (2001)

Lustig, Enami and Aranda (forthcoming)

Nora Lustig

Main messages

1. Analyzing the tax without the spending side, or vice versa, is not really useful
   - Taxes can be unequalizing but spending so equalizing that the unequalizing effect of taxes is more than compensated
   - **Taxes can be unequalizing by themselves but when combined with transfers make the system more equalizing than without the regressive taxes**

Main messages

2. Analyzing the progressivity or regressivity of individual interventions can lead to the wrong conclusions about their contribution
   - Regressive taxes can exert an equalizing influence, under certain conditions **which involve the size and progressivity of ALL fiscal interventions simultaneously**
   - Progressive transfers in a system with progressive taxes can exert an unequalizing influence, under certain conditions **which involve the size and progressivity of ALL fiscal interventions simultaneously**
   - Regressive transfers in a system with regressive taxes can exert an equalizing influence, under certain conditions **which involve the size and progressivity of ALL fiscal interventions simultaneously**

Fiscal Policy and Inequality
Four Key Questions

- Does the net fiscal system decrease inequality?
- Is a particular tax or transfer equalizing or unequalizing?
- What is the contribution of a particular tax or transfer (or any combination of them) to the change in inequality?
- What is the inequality impact if one increases the size of a tax (transfer) or its progressivity?

In a world with a single intervention, the impact on inequality depends on…

- Progressivity of a tax (transfer)
- Size of the tax (transfer), where size equals the total tax (transfer) divided by total pre-tax (pre-transfer) income
  - ➢ A large regressive tax can be more equalizing than a small progressive one

Kakwani Index

- Progressive Tax: $K_t = CC_t - G_x > 0$
- Proportional Tax: $K_t = CC_t - G_x = 0$
- Regressive Tax: $K_t = CC_t - G_x < 0$

- In a world with more than one intervention, the one-to-one mapping from the combination of size and progressivity to the induced change in inequality **breaks down**
- Will illustrate for the one-tax-one-transfer case but results apply to *m* taxes and *n* transfers (Lustig, Enami and Aranda, forthcoming)

Does the net fiscal system decrease inequality?

Let's define the Redistributive Effect of the net fiscal system as

$$RE_N = G_x - G_N$$

Where G_x *and* G_N are the pre-tax-pre-transfer Gini coefficient post-tax-post-transfer Gini, respectively

Does the net fiscal system decrease inequality?

From Lambert (2001), we know that $\boldsymbol{RE_N}$ is equal to the weighted sum of the redistributive effect of taxes and transfers

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

Where

- $\boldsymbol{RE_t}$ and $\boldsymbol{RE_B}$ are the Redistributive Effect of the tax and the transfer, respectively
- **g** and **b**: size of tax and transfer, respectively.
  That is, total taxes and total transfers divided by total pre-tax and pre-transfer income, respectively

Does the net fiscal system decrease inequality?

For the net fiscal system to be equalizing:

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

Condition 1:

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

Does the net fiscal system decrease inequality?

		Transfer		
		Regressive $K_B < 0$	**Neutral** $K_B = 0$	**Progressive** $K_B > 0$
Tax	**Regressive** $K_T < 0$	Always Unequalizing	Always Unequalizing	Equalizing only if Condition 1 holds
	Neutral $K_T = 0$	Always Unequalizing	No Change in Equality	Always Equalizing
	Progressive $K_T > 0$	Equalizing only if Condition 1 holds	Always Equalizing	Always Equalizing

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
- However, Lambert's equation has more fundamental implications

Fiscal Policy and Inequality
Four Key Questions

- Does the net fiscal system decrease inequality?
- Is a particular tax or transfer equalizing or unequalizing?
- What is the contribution of a particular tax or transfer (or any combination of them) to the change in inequality?
- What is the inequality impact if one increases the size of a tax (transfer) or its progressivity?

Is a particular tax or transfer equalizing?

- If there is a single intervention in the system, any of the progressivity measures discussed earlier will give an unambiguous answer

- If there is a tax **and** a transfer (or more than one tax or one transfer), then this is no longer the case
  - A regressive tax can be equalizing in the sense that the reduction in inequality can be larger with the tax than without it

Lambert's Conundrum

	1	2	3	4	Total
Original Income x	10	20	30	40	100
Tax *t*	6	9	12	15	42
Transfer *B*	21	14	7	0	42
Net Income *N*	25	25	25	25	100

Source: Lambert, 2001, Table 11.1, p. 278

Lambert's Conundrum

- The Redistributive Effect of the tax only in this example is equal to -0.05, highlighting its regressivity

- The Redistributive Effect of the transfer is equal to 0.19

➢ Yet, the Redistributive Effect of the net fiscal system is 0.25, higher than the effect without the taxes!

Lambert's Conundrum

	1	2	3	4	Total
Original Income x	10	20	30	40	100
Transfer *B*	21	14	7	0	42
Post-Transfer Income	31	34	37	40	142
Tax *t*	6	9	12	15	42
Net Income *N*	25	25	25	25	100

Source: Lambert, 2001, Table 11.1, p. 278

Lambert's Conundrum Path Dependency

- If a tax is regressive vis-à-vis the original income but progressive with respect to the less unequally distributed post-transfer income

➢ Regressive taxes *can* exert an equalizing effect over an above the effect of progressive transfers

➢ Note that institutional path dependency is not the same as mathematical path dependency

When could a regressive tax exert an equalizing force?

For the reduction in inequality to be higher with the tax than without it, the following condition must hold:

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

Condition 2

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

Is a tax equalizing?
Answer for a system with a tax and a transfer

		System with a Transfer that is		
		Regressive $K_B < 0$	**Neutral** $K_B = 0$	**Progressive** $K_B > 0$
Adding a Tax that is	**Regressive** $K_T < 0$	Always More Unequalizing	Always Unequalizing	More Equalizing only if Condition 2
	Neutral $K_T = 0$	Always More Unequalizing	No Change in Inequality	Always More Equalizing
	Progressive $K_T > 0$	More Equalizing only if Condition 2	Always Equalizing	Always More Equalizing

Condition 2

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

Equalizing Regressive Taxes Exist in Real Life

- The US and the UK had regressive equalizing taxes in the past (O'Higgins & Ruggles, 1981 and Ruggles & O'Higgins, 1981)
- Chile's 1996 fiscal system had equalizing regressive taxes (Engel et al., 1999)
  - Redistributive Effect of Net Fiscal System (taxes and transfers together = 0.0583 (decline in Gini points)
  - Redistributive Effect of System with Taxes only = - 0.0076
  - Redistributive Effect of System with Transfers but without Taxes = 0.0574
- ➢ Note that 0.0583 > 0.0574
- CEQ Assessments for Chile 2009 and South Africa 2010 show that regressive consumption taxes are equalizing

Fiscal Policy and Inequality
Four Key Questions

- Does the net fiscal system decrease inequality?
- Is a particular tax or transfer equalizing or unequalizing?
- What is the contribution of a particular tax or transfer (or any combination of them) to the change in inequality?
- What is the inequality impact if one increases the size of a tax (transfer) or its progressivity?

What is the 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" but 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)
- Average Contribution with all possible paths considered (Shapley value)
  - Fulfills the principle of aggregation, takes care of path dependency but the sign may be different from the marginal contribution => problematic?

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

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

Sequential vs. Marginal Contribution
Why the sequential method can be misleading

Chile's 1996 fiscal system (Engel et al., 1999)

- Sequential contribution method: -0.0076
- Marginal contribution method: 0.009

Fiscal Policy and Inequality
Four Key Questions

- Does the net fiscal system decrease inequality?
- Is a particular tax or transfer equalizing or unequalizing?
- What is the contribution of a particular tax or transfer (or any combination of them) to the change in inequality?
- What is the inequality impact if one increases the size of a tax (transfer) or its progressivity?

Progressivity vs. Size of Intervention: A System with One Tax and One Transfer

- In a system with one tax and one transfer:

$$MC_T = G_{X+B} - G_{X-T+B} = \ldots = \frac{g K_T + b K_B}{1 - g + b} - \frac{b}{1+b} K_B$$

- Getting the partial derivatives:

$$\frac{\partial MC_T}{\partial g} = \frac{(1+b) K_T + b K_B}{(1-g+b)^2}$$

$$\frac{\partial MC_T}{\partial K_T} = \frac{g}{1 - g + b}$$

Next Steps: Path Dependency

- Shapley Value

- Where the Shapley value is the weighted average of all posible cases so that we can demostrate the effect of adding one source to the value function

Next Steps: Relaxing Assumptions

- **Reranking**: individuals can swap positions in the post-fiscal income ordering; true of all systems in the real world

- **No dominance:** post-fiscal Lorenz curve crosses the pre-fiscal Lorenz curve; normative parameter must be explicitly introduced (will not be covered today)

- **Different pre-fiscal (original) distributions:** comparing the inequality- and poverty-reducing capacity of fiscal systems across countries and over time (will not be covered today)

COMMITMENT TO EQUITY

Methodological Highlights: Poverty and Impoverishment

Based on Higgins & Lustig (2015)
Can a poverty-reducing and progressive tax and transfer system hurt the poor? ECINEQ Working Paper No. 363, April.

Nora Lustig

Main messages

3. Analyzing the impact on inequality only can be misleading
   - ➢ Fiscal systems can be equalizing but poverty increasing

Lustig (2015a and b)

Fiscal Policy, Inequality, and Poverty

- A tax and transfer system can be equalizing but poverty-increasing
- In Ethiopia (World Bank, 2015)
  - Taxes and transfers ↓ inequality
    - Gini ↓ 2 percentage points or 6.2%
  - But ↑ poverty headcount
    - $1.25 PPP per day headcount ↑ 4.2%
    - $2.50 PPP per day headcount ↑ 3.1%
- Caution: Better not to use "regressive" for a poverty-increasing intervention
  - Call it poverty increasing

Higgins & Lustig (2015)

Main messages

4. Analyzing the impact on traditional poverty indicators can be misleading
   - 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

Higgins & Lustig (2015)

Can a Poverty-Reducing and Progressive Tax and Transfer System Hurt the Poor?

Higgins and Lustig, 2015

1. Measures of whether taxes and transfers hurt the poor
   - Poverty comparisons and stochastic dominance tests
   - Horizontal inequity among the poor
   - Tests for progressivity

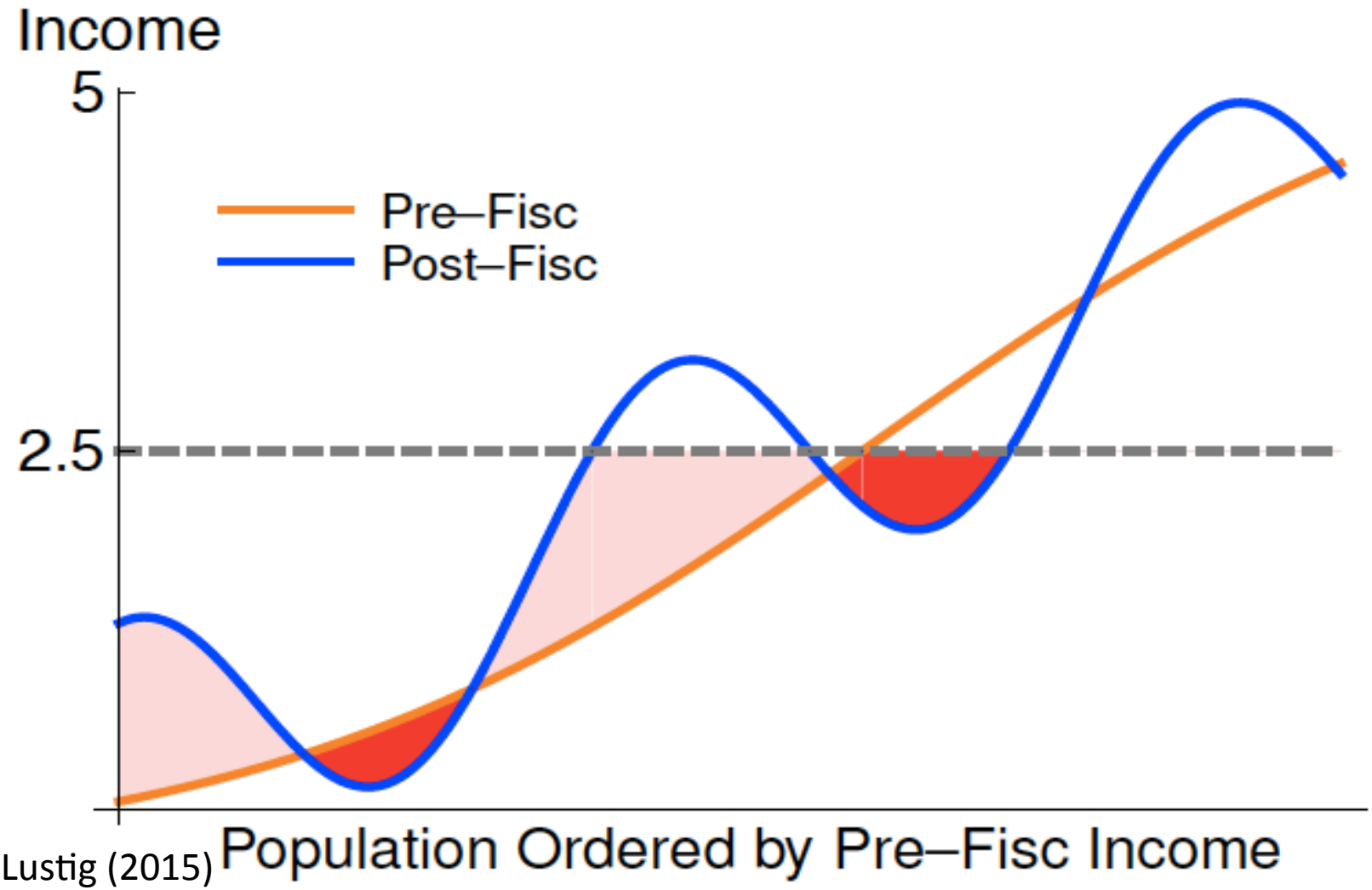
   do not tell us if some poor made poorer
   (fiscal impoverishment)

2. Axiomatic measure that *does* capture impoverishment
   - Also: measure of fiscal gains of the poor

3. Illustration with Brazilian data

Higgins & Lustig (2015)

Fiscal Impoverishment and Fiscal Gains to the Poor



Higgins & Lustig (2015)

Fiscal Policy and Impoverishment

- Even if poverty ↓
  - Poor can be made poorer
  - Or non-poor made poor
- In Brazil ($2.50 PPP per day poverty line)
  - Inequality ↓
  - Poverty ↓
  - 40% of post-fisc poor were made poorer (or poor) by the tax and transfer system

Higgins & Lustig (2015)

Fiscal Impoverishment and Fiscal Gains to the Poor

- There is **fiscal impoverishment** if

Income after taxes and transfers

Poverty line

$$y_i^1 < y_i^0 \text{ and } y_i^1 < z \text{ for some } i$$

Income before taxes and transfers

- There are **fiscal gains to the poor** if

$$y_i^1 > y_i^0 \text{ and } y_i^0 < z \text{ for some } i$$

Higgins & Lustig (2015)

Axiomatic Measure

$$f(y^0, y^1; z) = k \sum_{i=1}^{n} (\min\{y_i^0, z\} - \min\{y_i^0, y_i^1, z\})$$

- Pre-fisc poor and impoverished ($y_i^1 < y_i^0 < z$) contributes fall in income, $y_i^0 - y_i^1$
- Pre-fisc non-poor and impoverished ($y_i^1 < z \leq y_i^0$) contributes amount to transfer her back to poverty line, $z - y_i^1$
- Non-impoverished pre-fisc non-poor ($y_i^0 \geq z$ and $y_i^1 \geq z$) contributes $z - z = 0$
- Non-impoverished pre-fisc poor ($y_i^0 < z$ and $y_i^1 \geq y_i^0$) contributes $y_i^0 - y_i^0 = 0$

Higgins & Lustig (2015)

Fiscal Impoverishment: Brazil

$z =$ \$2.50 per person per day

- With $k = 1$, total fiscal impoverishment over \$900 million
  - or 14% of budget of large antipoverty program that reaches 1/4 of population
- With $k = 1/n$, per capita fiscal impoverishment of \$0.01 per day
- Average amount for an *impoverished person* is \$0.19 per day
  - 9% of their income on average

Who are the impoverished? How much would it cost to eliminate?

- Not all excluded from safety net
  - 65% receive Bolsa Família
- On average, more likely to consume highly taxed "vice" goods
- With perfect targeting, elimination would cost 14% of Bolsa Família (a program that costs 0.5% of GDP)
- Issue: How to reach non-Bolsa Família recipients

Higgins & Lustig (2015)

Main messages: summing up

- To determine whether a fiscal intervention is equalizing or not, one must assess its contribution with the other interventions in place
  - A regressive tax, for example, can exert an equalizing force that is over and above a system without that regressive tax
- To measure the size of the contribution, use the marginal contribution method but remember that adding the marginal contributions will not be equal to the total change
- The impact of a tax on inequality and poverty can go in opposite directions: e.g., equalizing and poverty increasing
- An important proportion of the poor may be left poorer (in cash) by the fiscal system, and current measures may not alert us to this: new measure of *fiscal impoverishment* does

Lustig, Enami and Aranda, forthcoming; Higgins & Lustig (2015)

COMMITMENT TO EQUITY

Methodological Highlights: Fiscal Incidence Analysis in the (current) Commitment to Equity Assessments

Based on Lustig, Nora and Sean Higgins. 2013 Commitment to Equity Assessment (CEQ): Estimating the Incidence of Social Spending, Subsidies andTaxes. Handbook. CEQ Working Paper No. 1, Center for Inter-American Policy and Research and Department of Economics, Tulane University, New Orleans, Lousiana and Inter-American Dialogue, Washington, DC, Revised, September.

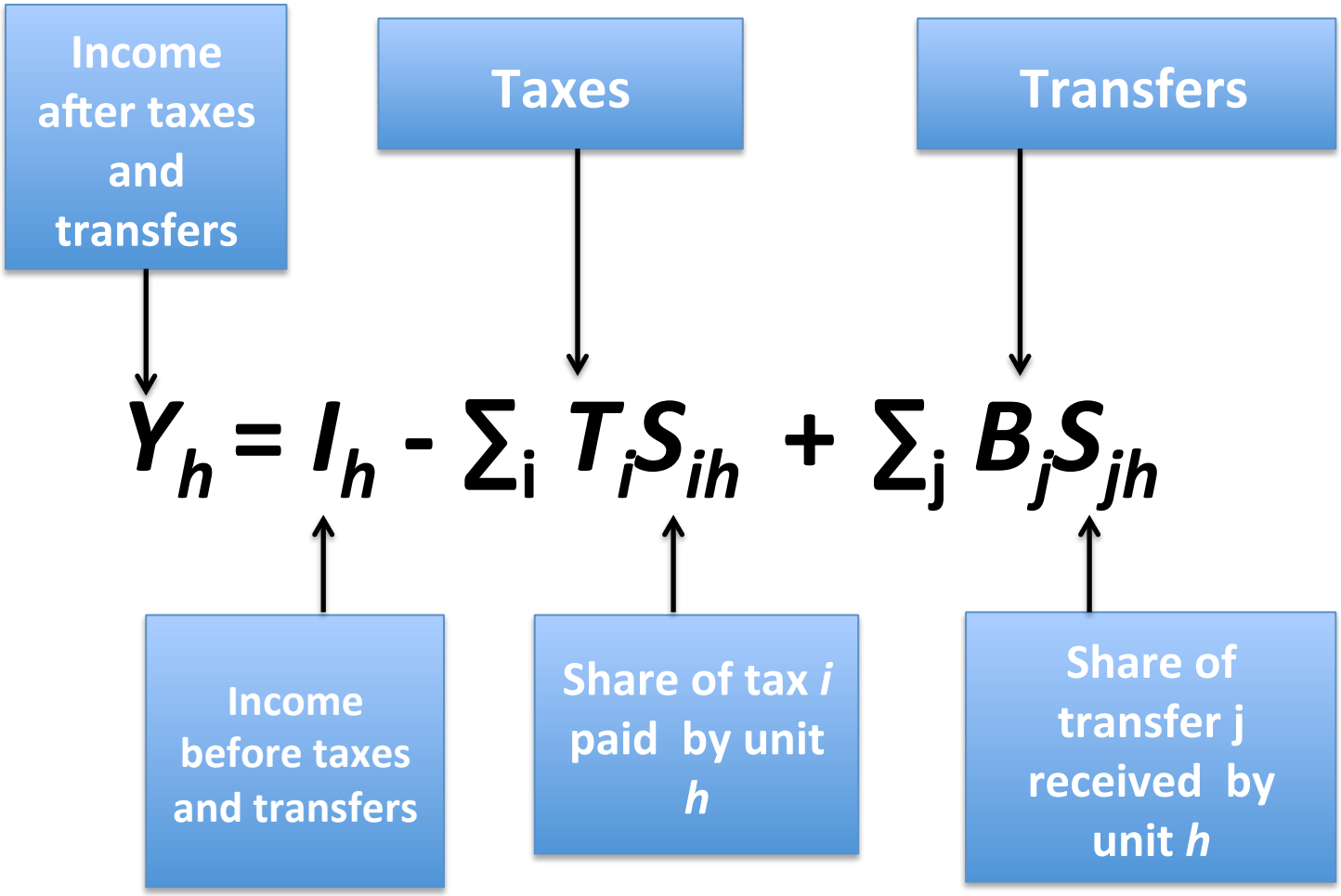
Nora Lustig

CEQ Assessment: Method

- Relies on state-of-the art tax and benefit incidence analysis
  - Ongoing consultation with experts to improve economic incidence estimates
- Uses conventional and newly developed indicators to assess progressivity, pro-poorness and effectiveness of taxes and transfers
- Allows to identify the contribution of individual fiscal interventions to equity and poverty reduction objectives

Lustig & Higgins (2013)

CEQ Assessment: Fiscal Incidence Analysis



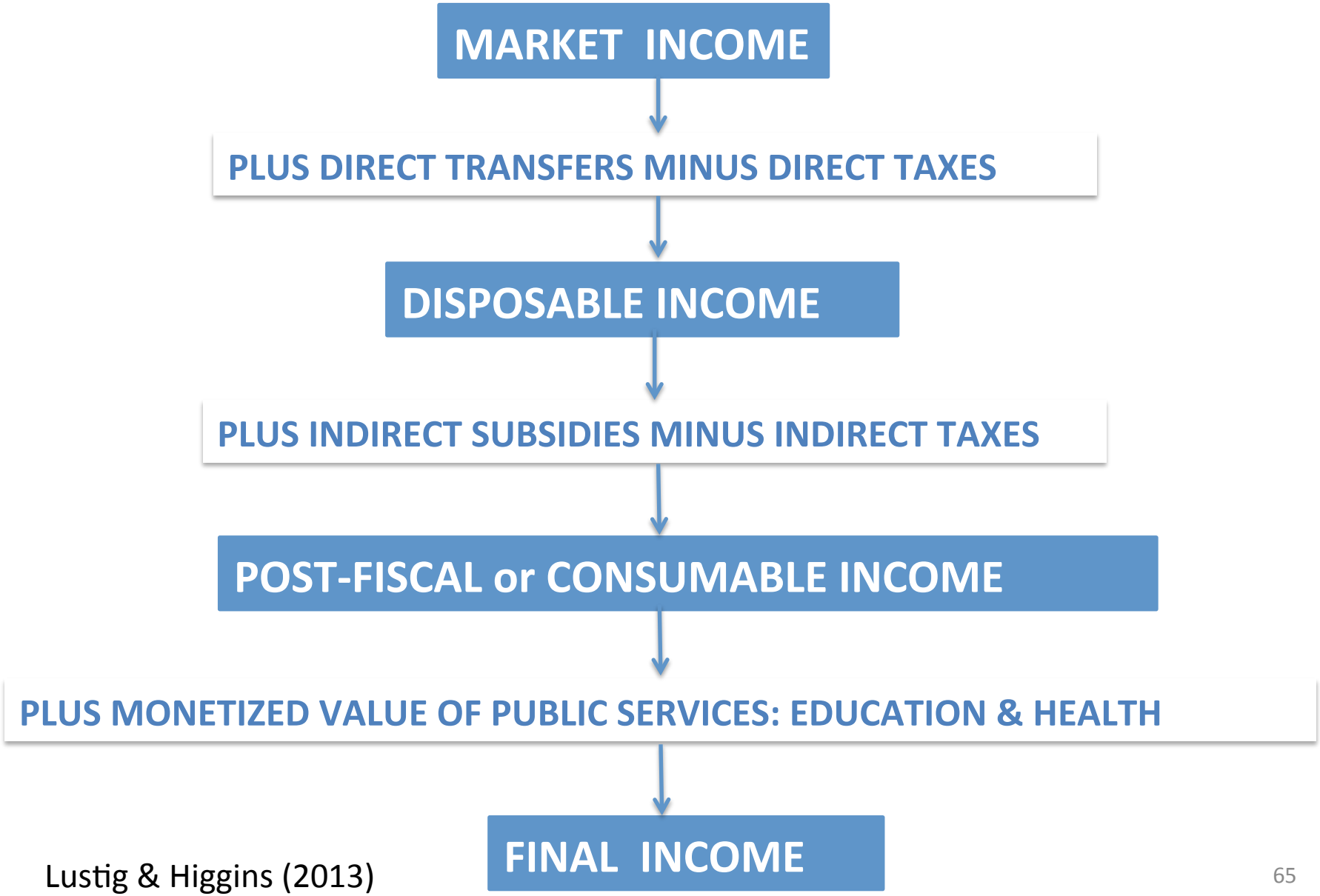
Lustig & Higgins (2013)

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
- Working on:
  - Corporate taxes
  - Housing subsidies

Lustig & Higgins (2013)

CEQ Assessment: Income Concepts



Lustig & Higgins (2013)

Fiscal Incidence in CEQ Assessments

- Accounting approach
  - no behavioral responses
  - no general equilibrium effects and
  - no intertemporal effects
  - but it incorporates assumptions to obtain economic incidence (not statutory)
- Point-in-time
- Mainly average incidence; a few cases with marginal incidence

Lustig & Higgins (2013)

Fiscal Incidence in CEQ Assessments

- Comprehensive standard fiscal incidence analysis of current systems: direct personal and indirect taxes (no corporate 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

Lustig & Higgins (2013)

Allocation Methods

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

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

Lustig & Higgins (2013)

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 (with important exceptions such as when examining effect of VAT reforms), and they are commonly used

Lustig & Higgins (2013)

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

Lustig & Higgins (2013)

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?

Lustig & Higgins (2013)

Treatment of Contributory Social Insurance Pensions

- Deferred income in actuarially fair systems: pensions included in *market income* and contributions treated as mandatory savings

- Government transfer: pensions included among direct transfers and contributions treated as a direct tax

Lustig & Higgins (2013)

Indicators

- Inequality and poverty:
  - Gini, Theil, Kuznetz ratios, ineq of opportunity
  - Headcount, poverty gap, squared poverty gap (international and national poverty lines)
  - Impoverishment and fiscal mobility
  - Inequality of Opportunity
- Effectiveness and Efficiency
  - Change in inequality or poverty divided by corresponding budget share or total spent
  - Poverty-reduction efficiency indicators
  - Tax productivity indicators

Lustig & Higgins (2013)

Indicators

- Progressivity
  - Incidence by quantile or income group
  - Concentration Shares
  - Concentration Curves
  - Concentration Coefficients, Kakwani, and Reynolds-Smolensky Index
- Marginal contributions and their derivatives
- Vertical Equity and Reranking Effects

Lustig & Higgins (2013)

Indicators

- Measuring Contribution to Redistribution and Poverty-reduction
  - Classifying interventions by whether they are equalizing or unequalizing
  - Classifying interventions by whether they are epoverty increasing or poverty reducing
  - Ranking interventions by their marginal contribution to changes in inequality
  - Ranking interventions by their marginal contribution to changes in poverty

Lustig & Higgins (2013)

Indicators

- Coverage of social programs by quantile and income group
- Average per capita transfer received by the poor
- Share of benefits going to the nonpoor
- Average per capita transfer received by the nonpoor
- Gross and net enrollment indicators by income group

Lustig & Higgins (2013)

Scenarios and Robustness Checks

- Benchmark scenario
- Sensitivity to:
  - Changing the original income by which hh are ranked: e.g., market income plus contributory pensions and disposable income
  - Using consumption vs. income
  - Per capita vs. equivalized income or consumption
  - Different assumptions on scaling-down or up
  - Different assumptions on take-up of transfers and tax shifting and evasion
  - Alternative valuations of in-kind services
  - Other sensitivity scenarios: country-specific

Lustig & Higgins (2013)

Robustness Check
Example from South Africa: Income vs. Consumption-based Analysis

South Africa Gini estimates

	Income based scenario	Consumption based scenario
Market income	0.771	0.723
Disposable income	0.704	0.634
Post-fiscal income	0.700	0.628
Final income	0.601	0.514

Lustig & Higgins (2013)

COMMITMENT TO EQUITY

Fiscal Policy, Inequality and Poverty in Middle Income Countries: Brazil, Chile, Colombia, Indonesia, Mexico, Peru and South Africa

Lustig, Nora. 2015b. "Fiscal Policy and Income Redistribution in Brazil, Chile, Colombia, Indonesia, Mexico, Peru and South Africa." Chapter 7, Section 7.3 in OECD In It Together. Why Less Inequality Benefits All.

Citations by country:
(Year of Survey; C=consumption & I=income)
(Master Workbook, MWB, Version #)

1. **Armenia (2011; I):** Stephen Younger and Artsvi Khachatryan (March 12, 2014)
2. **Bolivia (2009; I)**: Paz Arauco, Verónica, George Gray Molina, Wilson Jiménez Pozo, and Ernesto Yáñez Aguilar. 2014. "Explaining Low Redistributive Impact in Bolivia." In Lustig, Nora, Carola Pessino and John Scott. 2014. Editors. *The Redistributive Impact of Taxes and Social Spending in Latin America. Special Issue. Public Finance Review*, May, Volume 42, Issue 3. (September 22, 2014)
3. **Brazil (2009; I)**: Higgins, Sean and Claudiney Pereira. 2014. "The Effects of Brazil's Taxation and Social Spending on the Distribution of Household Income." In Lustig, Nora, Carola Pessino and John Scott. 2014. Editors. *The Redistributive Impact of Taxes and Social Spending in Latin America. Special Issue. Public Finance Review*, May, Volume 42, Issue 3. (November 4, 2014)
4. **Chile (2009, I):** Ruiz-Tagle, Jaime and Dante Contreras. 2014. CEQ Masterworkbook, Tulane University (August 27, 2014)
5. **Colombia (2010, I):** Melendez, Marcela and Nora Lustig. 2014. CEQ Masterworkbook, Tulane University (November 21, 2014)
6. **Costa Rica (2010; I)**: Sauma, Juan and Diego Trejos. 2014. *Social Public Spending, Taxes, Redistribution of Income, and Poverty in Costa.* CEQ Working Paper No. 18, Center for Inter-American Policy and Research and Department of Economics, Tulane University and Inter-American Dialogue, January. (February 2014)

7. **El Salvador (2011; I)**: Beneke, Margarita, Nora Lustig y José Andrés Oliva. 2015. *El impacto de los impuestos y el gasto social en la desigualdad y la pobreza en El Salvador.* CEQ Working Paper No. 26, Center for Inter-American Policy and Research and Department of Economics, Tulane University and Inter-American Dialogue, February. (March 11, 2014)
8. **Ethiopia (2010/11; C):** Tassew Woldehanna, Ruth Hill, Gabriela Inchauste, EyasuTsehaye, and Nora Lustig. 2014. Chapter 5, Ethiopia Poverty Assessment, World Bank (April 30, 2014)
9. **Guatemala (2011; I)**: Cabrera, Maynor, Nora Lustig and Hilcías Morán. 2014. *Fiscal Policy, Inequality and the Ethnic Divide in Guatemala.* CEQ Working Paper No. 20, Center for Inter-American Policy and Research and Department of Economics, Tulane University and Inter-American Dialogue, October. (April 13, 2014)
10. **Indonesia (2012; C) :** Jon Jellema and Matthew Wai-Poi. 2014. CEQ Master Workbook, Tulane University and The World Bank (February 18, 2014)
11. **Mexico (2010; I):**Scott, John. 2014. "Redistributive Impact and Efficiency of Mexico's Fiscal System." In Lustig, Nora, Carola Pessino and John Scott. 2014. Editors. *The Redistributive Impact of Taxes and Social Spending in Latin America. Special Issue. Public Finance Review*, May, Volume 42, Issue 3. (September 2013)
12. **Peru (2009; I):** Jaramillo, Miguel. 2014. "The Incidence of Social Spending and Taxes in Peru." In Lustig, Nora, Carola Pessino and John Scott. 2014. Editors. *The Redistributive Impact of Taxes and Social Spending in Latin America. Special Issue. Public Finance Review*, May, Volume 42, Issue 3. (May 1, 2013)

13. **South Africa (2010; I)**: Inchauste, Gabriela, Nora Lustig, Mashekwa Maboshe, Catriona Purfield and Ingrid Wollard. 2015. *The Distributional Impact of Fiscal Policy in South Africa.* Policy Research Working Paper 7194, The World Bank, February. (May 5, 2014)

14. **United States (2011; I):** Higgins, Sean, Nora Lustig, Whitney Ruble and Timothy Smeeding (forthcoming) *Comparing the Incidence of Taxes and Social Spending in Brazil and the United States*, Review of Income and Wealth

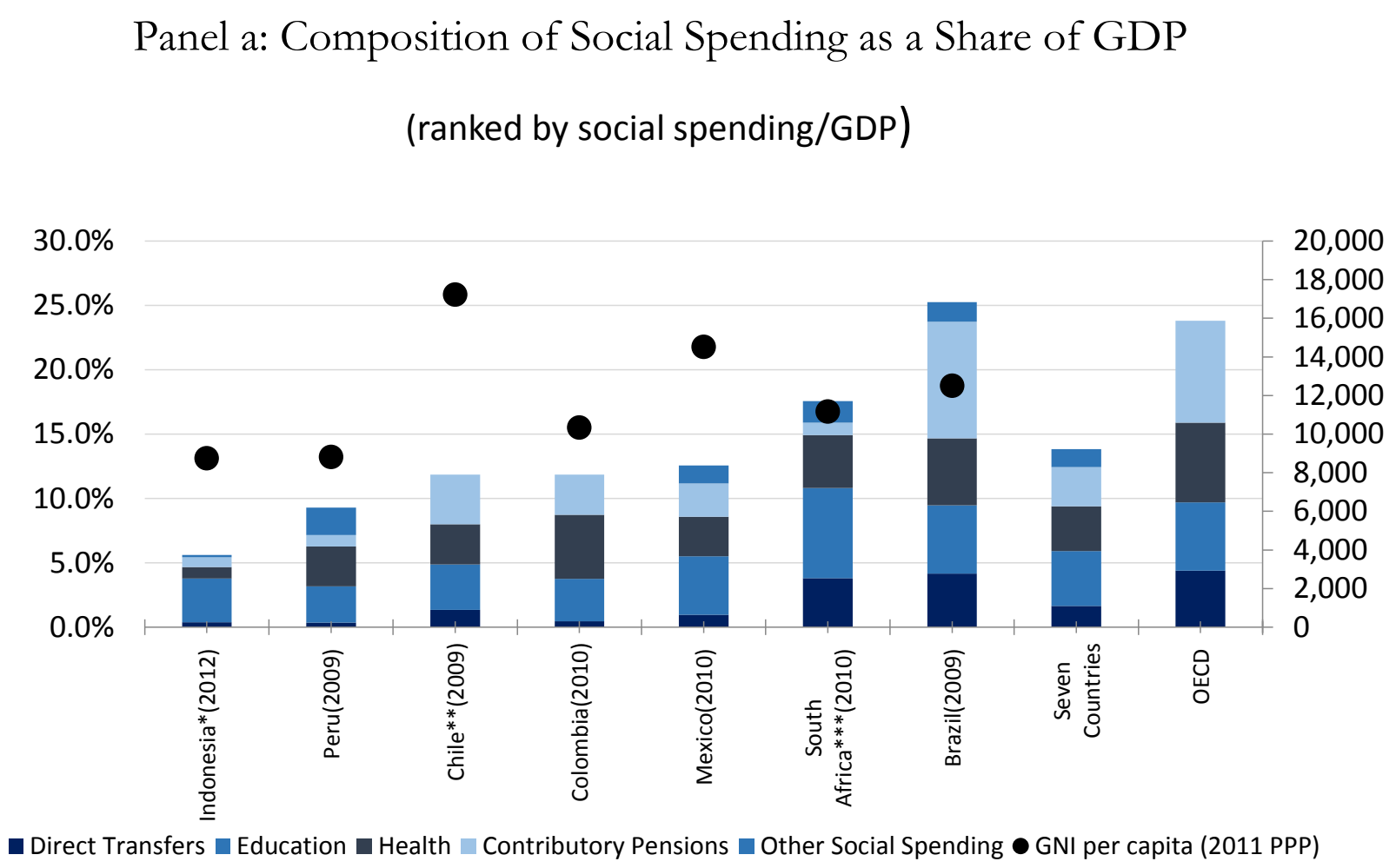
15. **Uruguay (2009; I):** Bucheli, Marisa, Nora Lustig, Máximo Rossi, and Florencia Amábile. 2014. "Social Spending, Taxes and Income Redistribution in Uruguay." In Lustig, Nora, Carola Pessino and John Scott. 2014. Editors. *The Redistributive Impact of Taxes and Social Spending in Latin America. Special Issue. Public Finance Review*, May, Volume 42, Issue 3. (August 18, 2014)

Household Surveys Used in Country Studies

1. **Armenia:** Integrated Living Conditions Survey, 2011 (I)
2. **Bolivia:** Encuesta de Hogares, 2009 (I)
3. **Brazil:** Pesquisa de Orçamentos Familiares, 2009 (I)
4. **Chile:** Encuesta de Caracterización Social (CASEN), 2009 (I)
5. **Colombia:** Encuesta de Calidad de Vida, 2010 (I)
6. **Costa Rica:** Encuesta Nacional de Hogares, 2010 (I)
7. **Ecuador:** Encuesta Nacional de Ingresos y Gastos de los Hogares Urbano y Rural, 2011-2012 (I)
8. **El Salvador:** Encuesta De Hogares De Propositos Multiples, 2011 (I)
9. **Ethiopia:** Ethiopia Household Consumption Expediture Survey and Ethiopia Welfare Monitoring survey, 2011 (C)
10. **Guatemala:** Encuesta Nacional de Ingresos y Gastos Familiares, 2010 (I)
11. **Indonesia:** Survei Sosial-Ekonomi Nasional, 2012 (C)
12. **Mexico:** Encuesta Nacional de Ingreso y Gasto de los Hogares, 2010 (I)
13. **Peru:** Encuesta Nacional de Hogares, 2009 (I)
14. **South Africa:** Income and Expenditure Survey and National Income Dynamics Study, 2010-2011 (I)
15. **Uruguay:** Encuesta Continua de Hogares, 2009 (I)

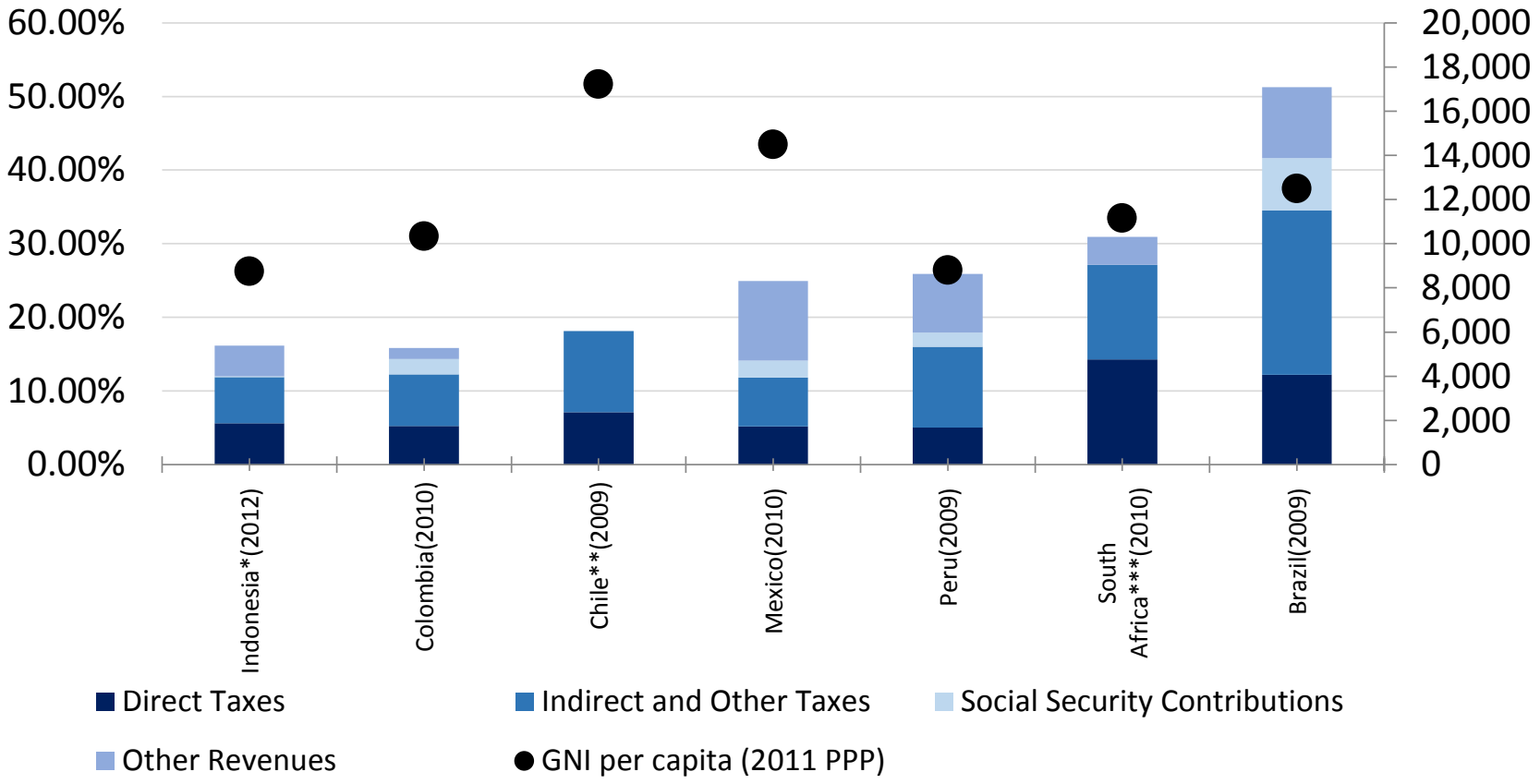
Note: The letters "I" and "C" indicate that the study used income or consumption data, respectively.

Figure 1: Size and composition of government budgets (circa 2010)



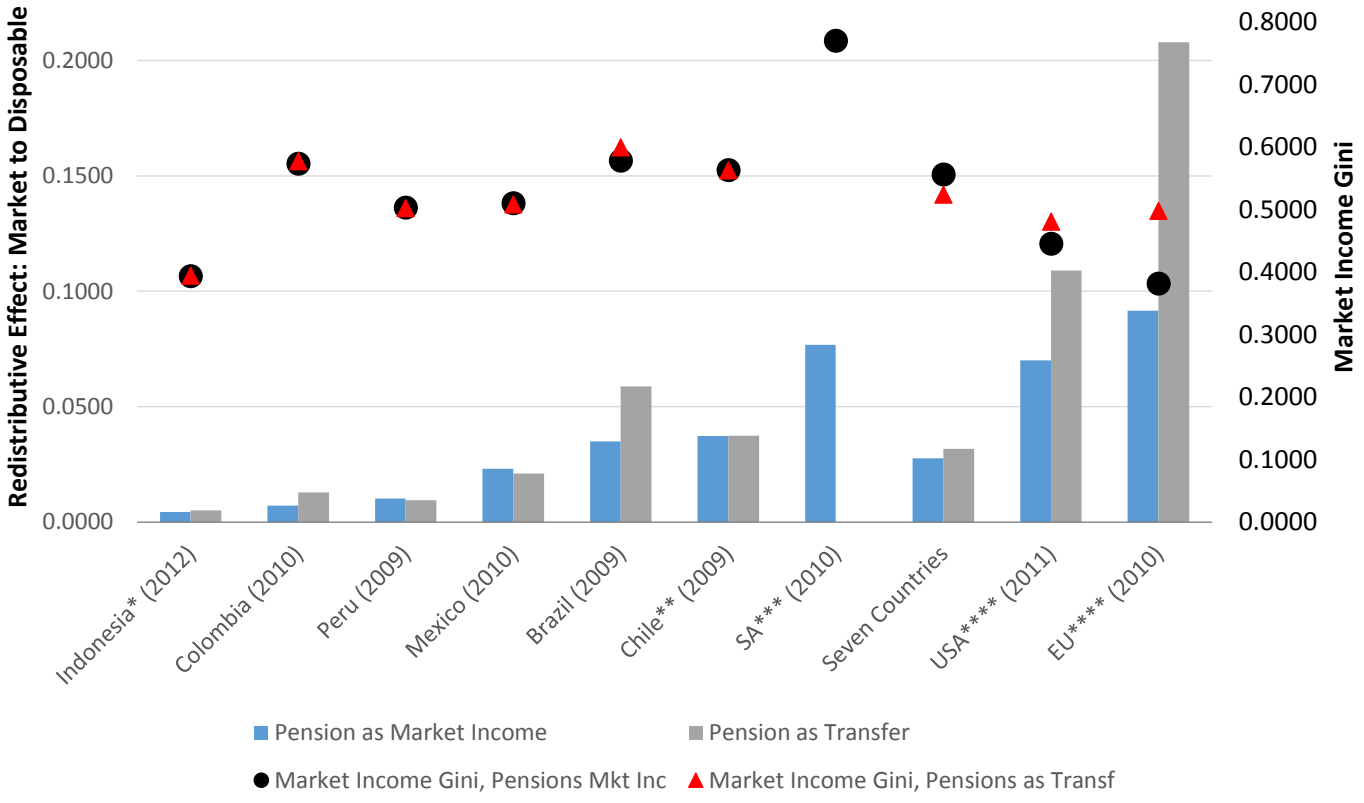
Panel b: Composition of Total Government Revenues as a Share of GDP

(ranked by total government revenue/GDP)



Redistributive Effect: Brazil, Chile, Colombia, Indonesia, Mexico, Peru, South Africa EU and the United States

(Change in Gini Points: Market to Disposable Income; circa 2010)



Redistributive Effect from Market to Post-Fiscal AND Marginal Contributions by Fiscal Component

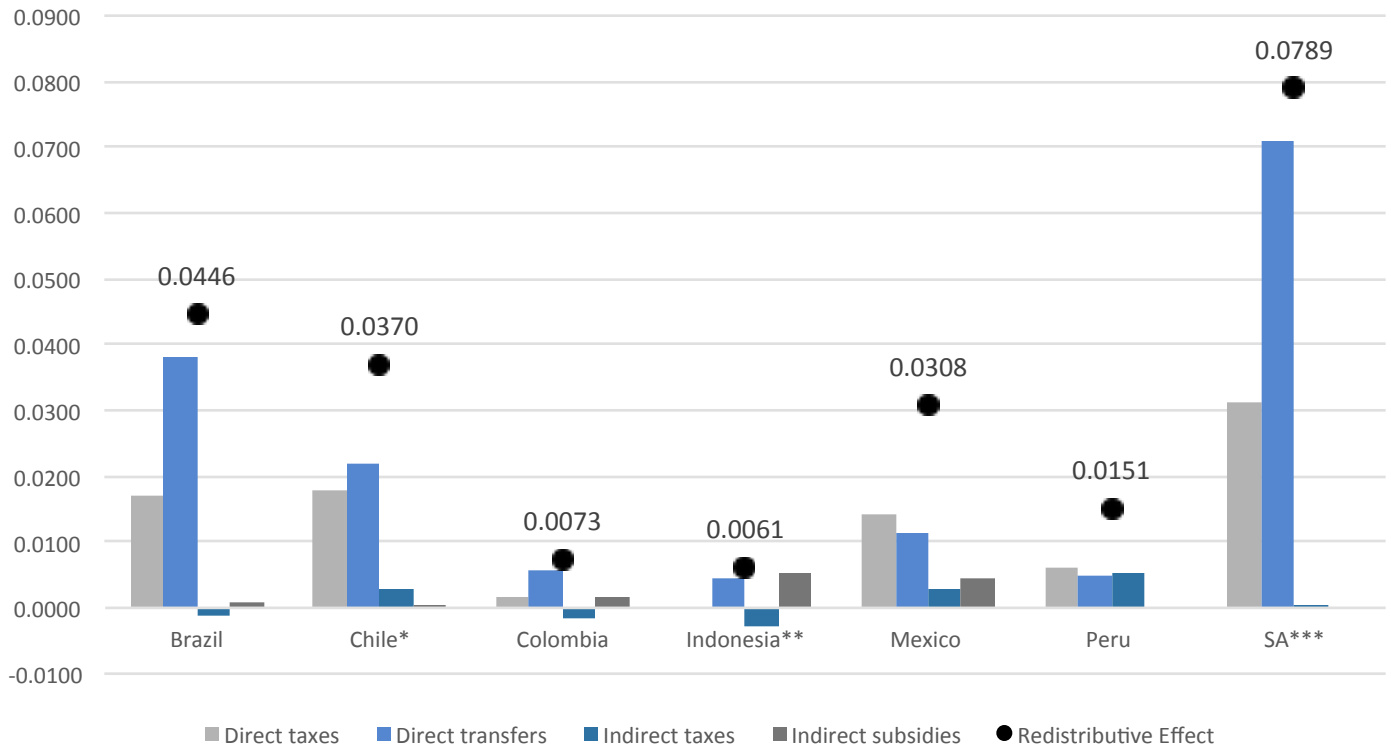
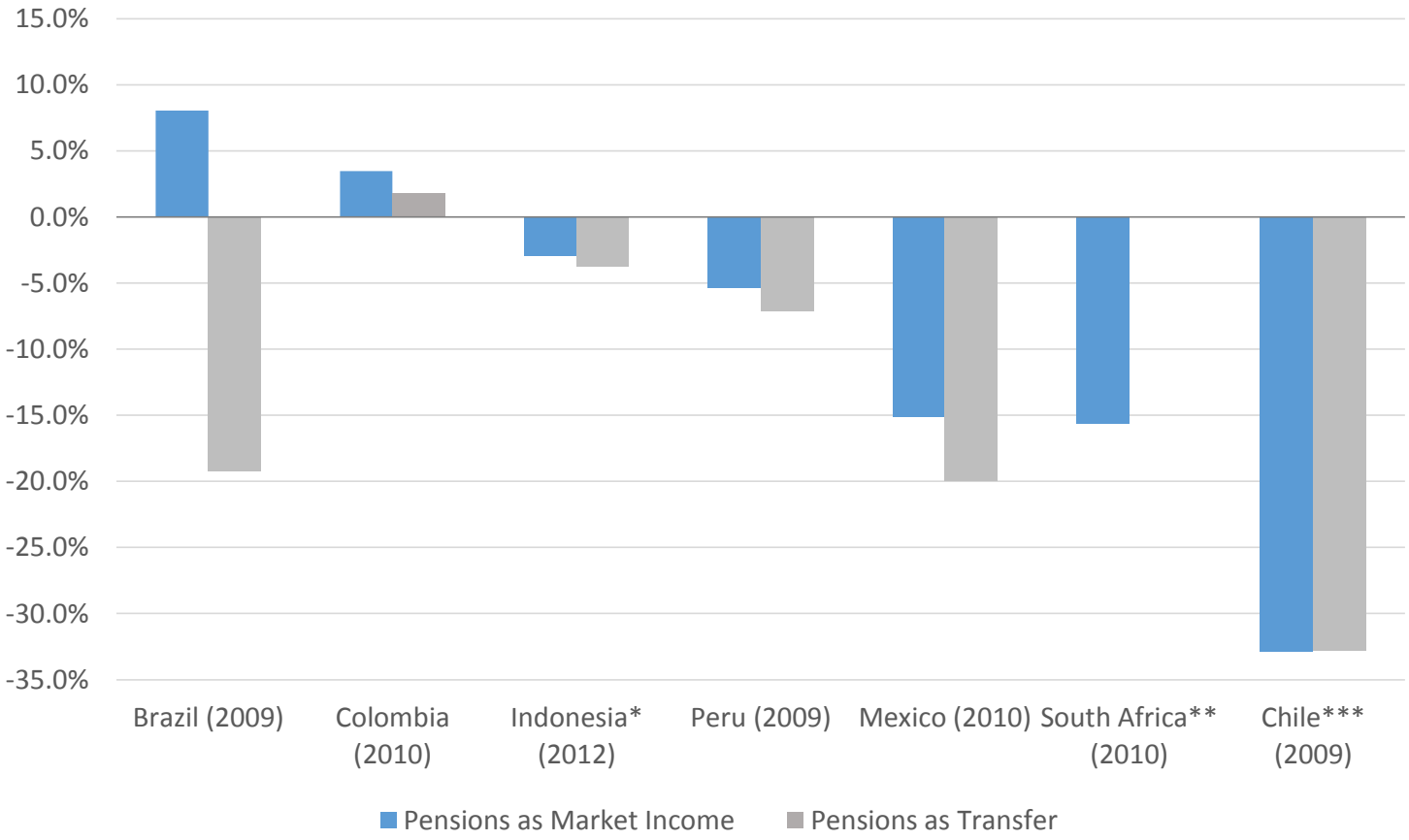


Table 4: Marginal Contribution of Taxes and Transfers (circa 2010) (Pensions as Market Income)

	Brazil	Chile*	Colombia	Indonesia**	Mexico	Peru	SA***	Average
Marginal Contributions								
From Market to Disposable Income								
Redistributive Effect	0.0453	0.0340	0.0075	0.0044	0.0236	0.0099	0.0788	0.0291
Direct taxes	0.0148	0.0154	0.0018	-	0.0131	0.0055	0.0269	0.0129
Direct transfers	0.0320	0.0190	0.0057	0.0044	0.0109	0.0045	0.0593	0.0194
From Market to Post-fiscal Income								
Redistributive Effect	0.0446	0.0370	0.0073	0.0061	0.0308	0.0151	0.0789	0.0314
Direct taxes	0.0171	0.0179	0.0019	-	0.0140	0.0060	0.0311	0.0147
Direct transfers	0.0382	0.0220	0.0057	0.0043	0.0113	0.0048	0.0711	0.0225
Indirect taxes	-0.0014	0.0027	-0.0017	-0.0028	0.0027	0.0052	0.0000	0.0007
Indirect subsidies	0.0008	0.0004	0.0015	0.0052	0.0047	-	-	0.0025
Kakwani								
Direct taxes	0.1738	0.3481	0.1373	0.0000	0.2411	0.3853	0.1109	0.1995
Direct transfers	0.5310	0.9064	0.9233	0.6248	0.7931	0.9612	1.0165	0.8223
Indirect taxes	-0.0536	-0.0172	-0.1986	-0.0513	0.0129	0.0527	-0.0788	-0.0477
Indirect subsidies	0.8295	0.7978	0.5034	0.0645	0.2457	0.0000	0.0000	0.3487

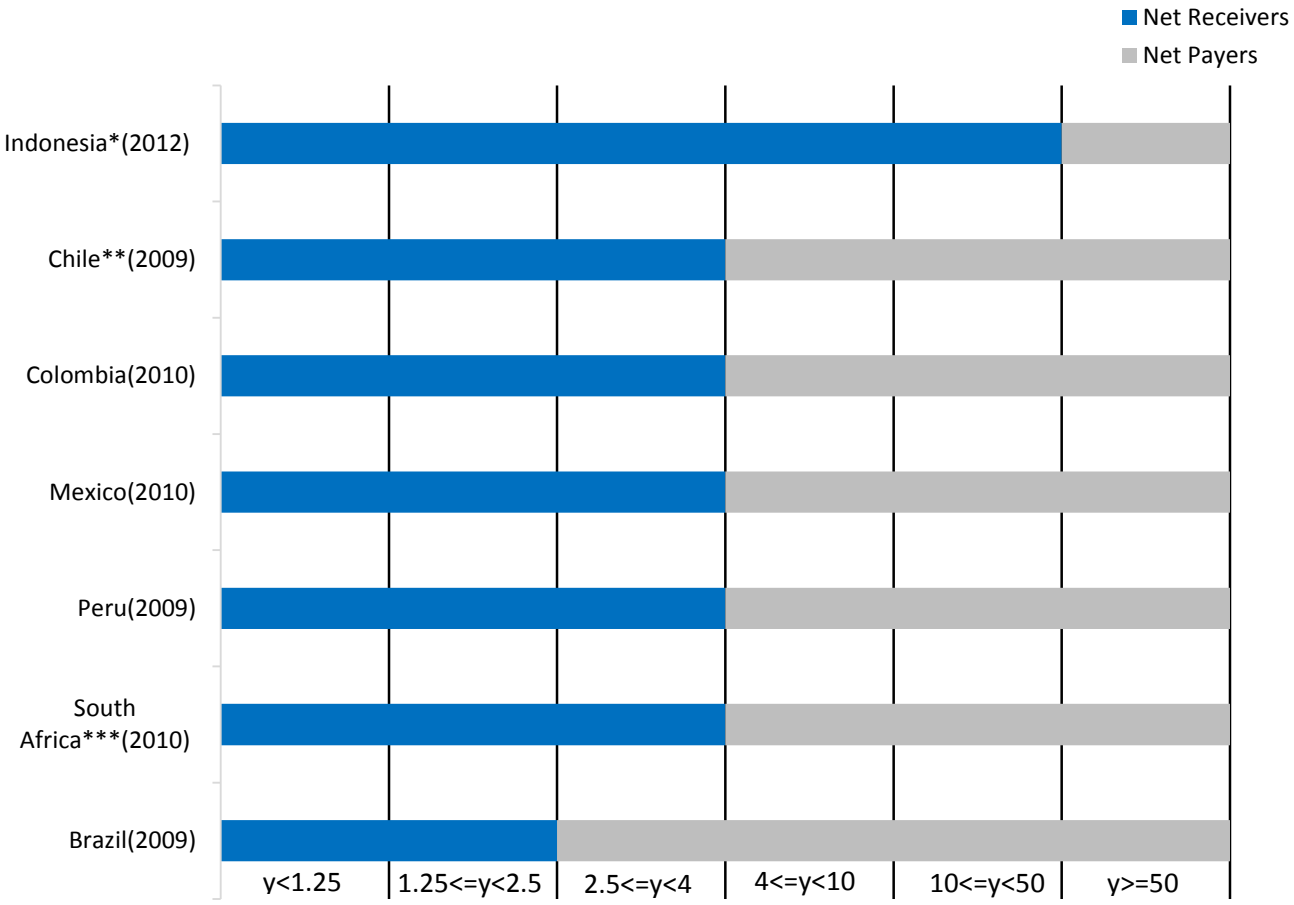
Fiscal Policy and Poverty Reduction (circa 2010)

(Change in Headcount Ratio from Market to Post-fiscal Income for Pensions in Market Income and Pensions in Transfers; in %) [a]

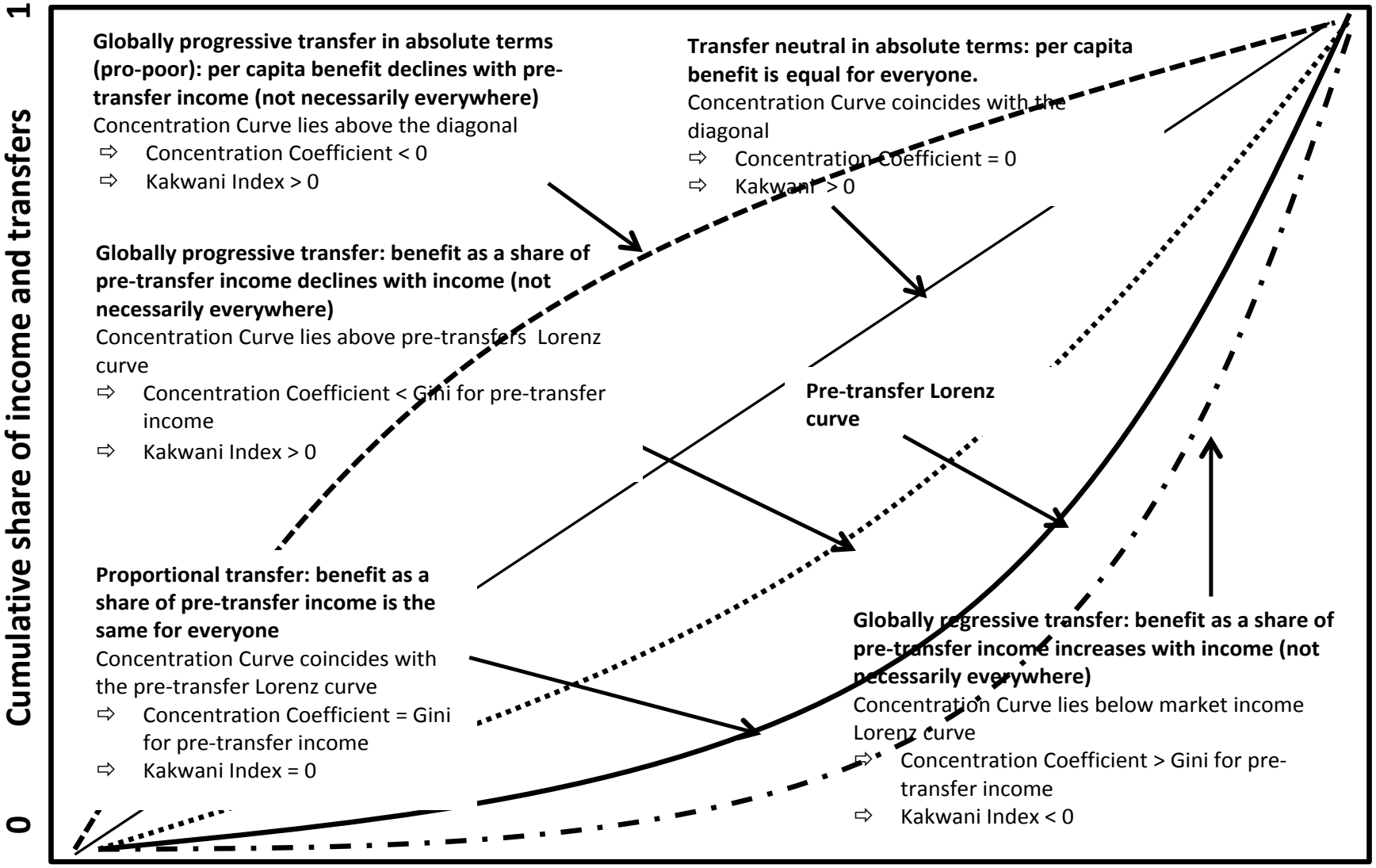


Net Payers to the Fiscal System (circa 2010)

Panel a: Pensions as Market Income



Progressivity of Transfers: A Diagrammatic Representation



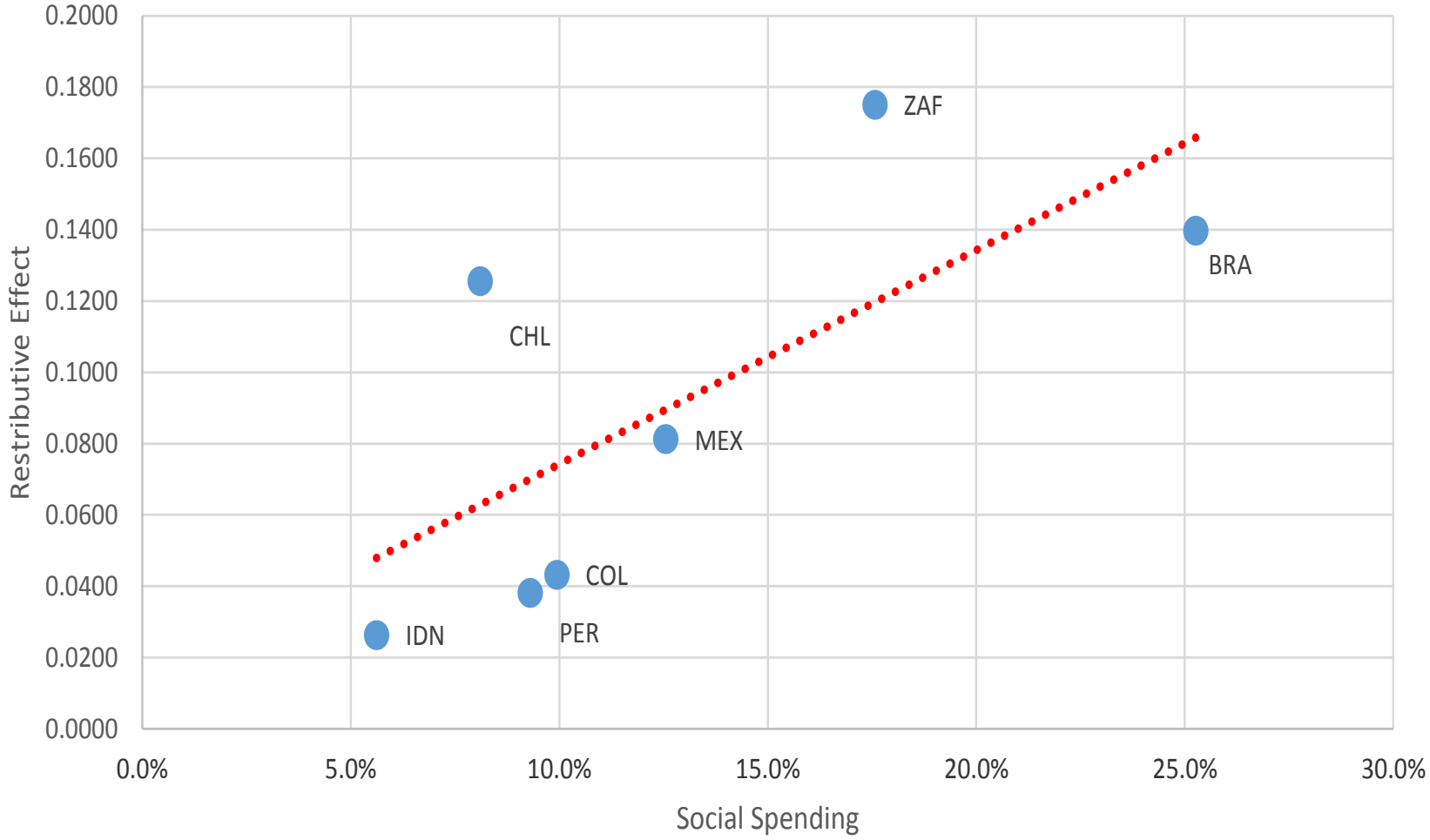
Progressivity and Pro-poorness of Education and Health Spending. Summary of Results

	Educ Total			Pre-school			Primary			Secondary			Tertiary				Health		
	Pro-poor CC is negative	Same per capita for all; CC =0	Progressive CC positive but lower than market income Gini	Pro-poor CC is negative	Same per capita for all; CC =0	Progressive CC positive but lower than market income Gini	Pro-poor CC is negative	Same per capita for all; CC =0	Progressive CC positive but lower than market income Gini	Pro-poor CC is negative	Same per capita for all; CC =0	Progressive CC positive but lower than market income Gini	Pro-poor CC is negative	Same per capita for all; CC =0	Progressive CC positive but lower than market income Gini	Regressive CC positive AND higher than market income Gini	Pro-poor CC is negative	Same per capita for all; CC =0	Progressive CC positive but lower than market income Gini
Brazil (2009)	+			+			+			+					+		+		
Chile (2009)	+			+			+			+					+		+		
Colombia (2010)	+			+			+			+					+		+		
Indonesia (2012)		+		na			+				+					+			+
Mexico (2010)	+			+			+			+					+			+	
Peru (2009)	+			+			+			+					+				+
South Africa (2010)	+			+			+			+					+		+		

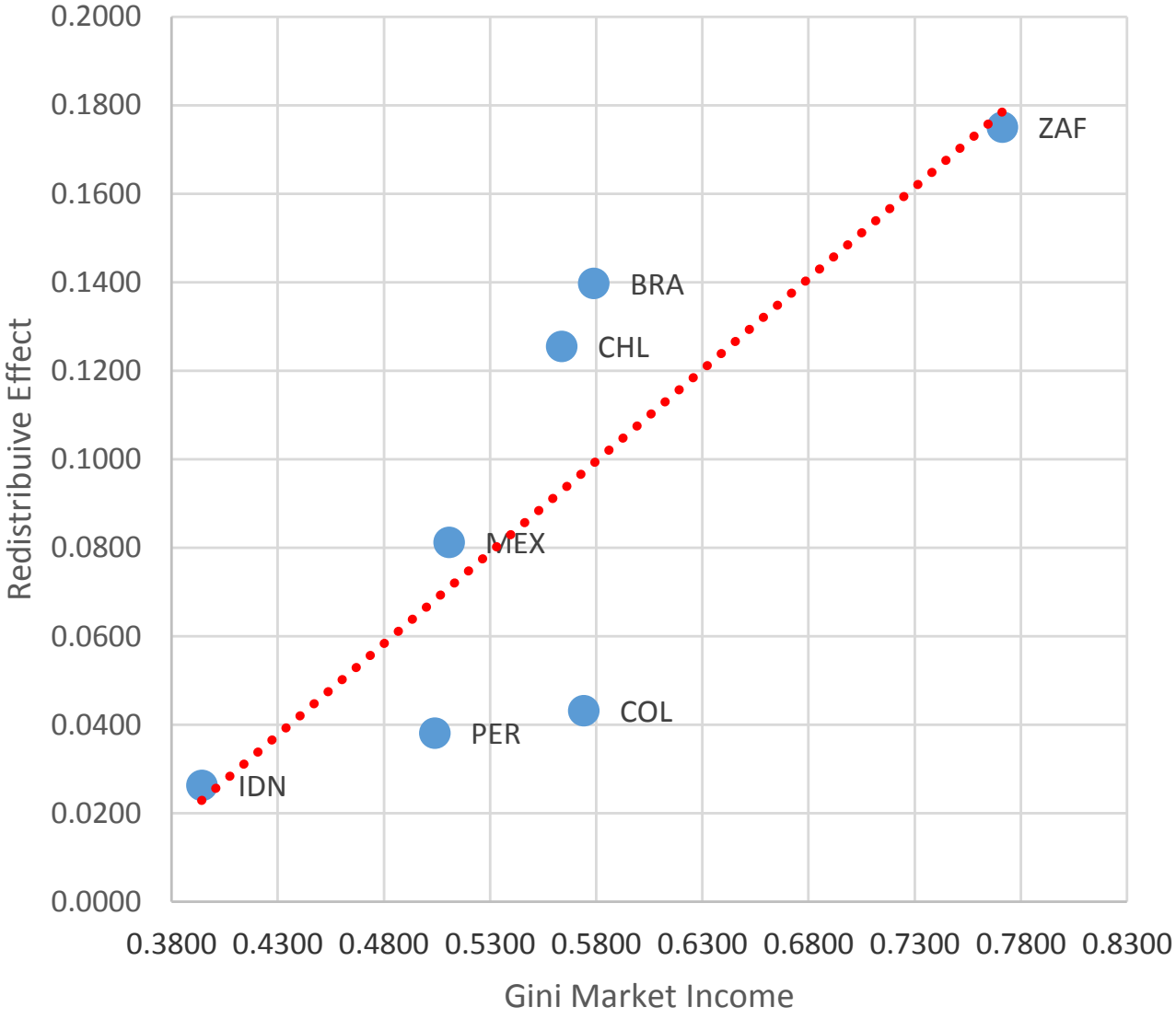
*CC is almost equal to market income Gini coefficient

If the Concentration Coefficient is higher or equal to -0.5 but not higher than 0.5, it was considered equal to 0.

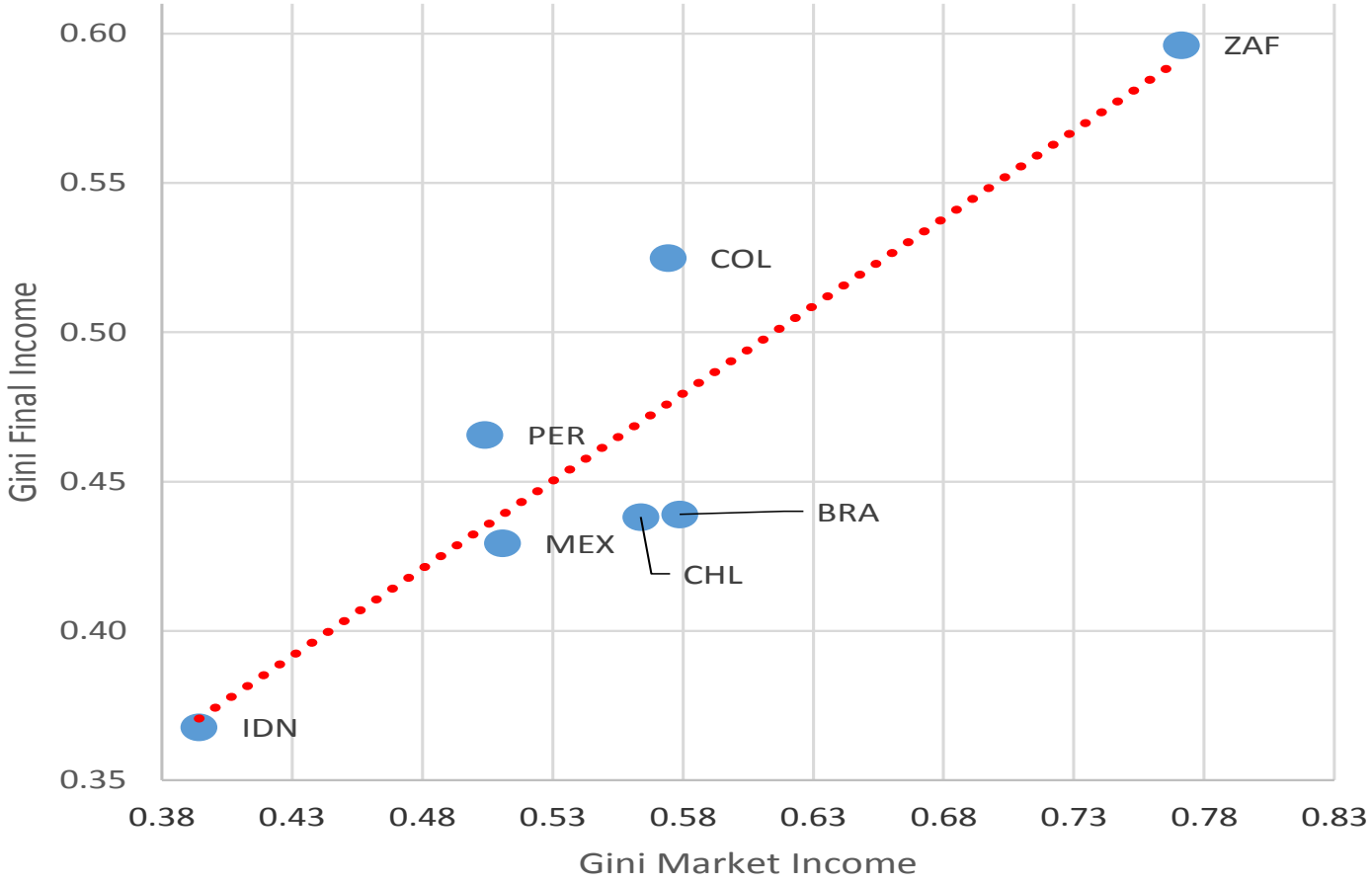
Figure 4. Redistribution and social spending, 2010



A. Redistribution and market income inequality



B. Final income inequality and market income inequality



COMMITMENT TO EQUITY

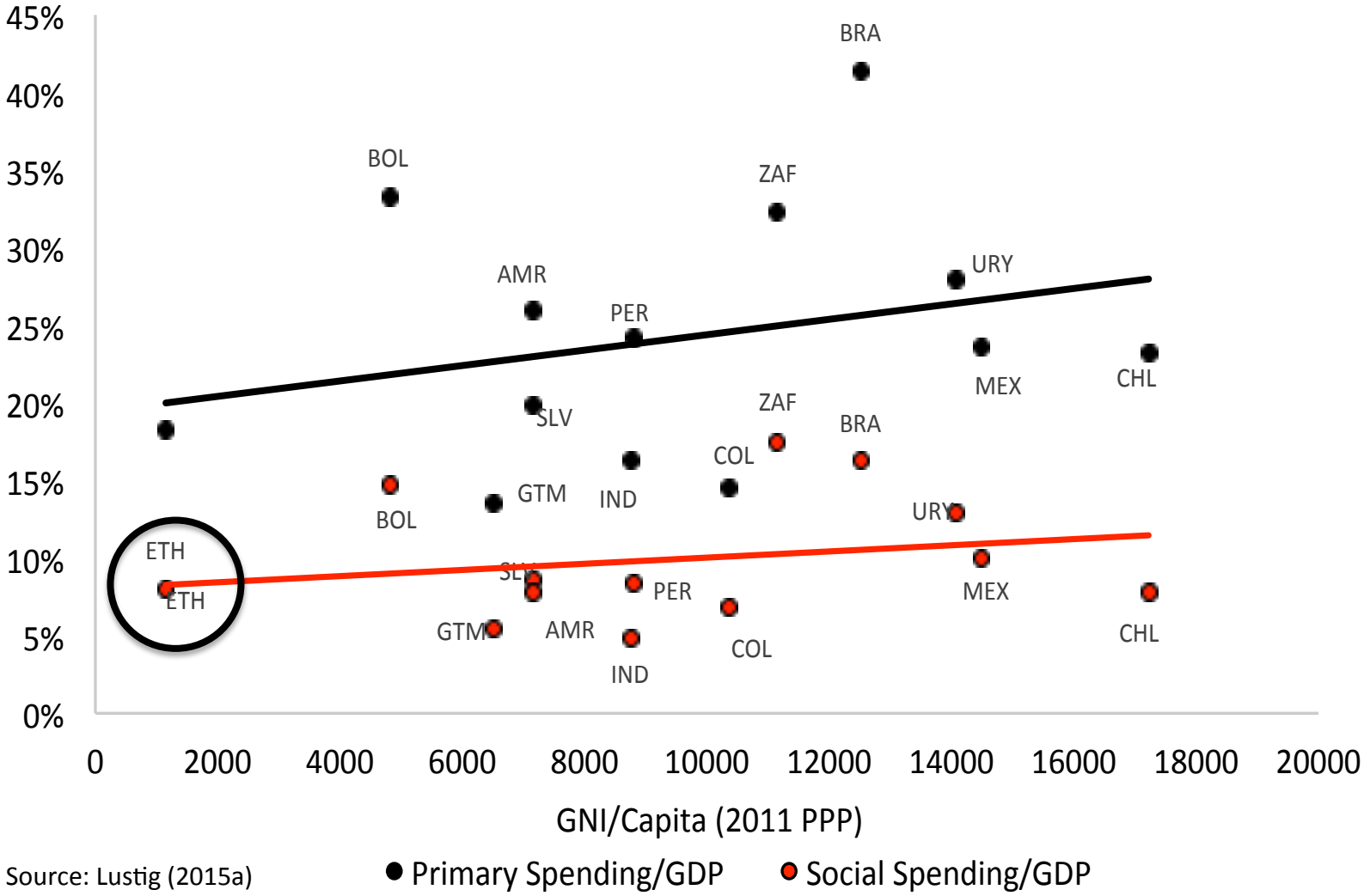
Fiscal Policy, Inequality and Poverty in Low Income Countries: Ethiopia

Based on:

Lustig, Nora. 2015a. "The Redistributive Impact of Government Spending on Education and Health Evidence from Thirteen Developing Countries." Chapter 17 in Inequality and the Role of Fiscal Policy: Trends and Policy Options, edited by Benedict Clements, Ruud de Mooij, Sanjeev Gupta, and Michael Keen (Washington: International Monetary Fund, forthcoming)

World Bank. 2014. Ethiopia. Poverty Assessment, Chapter 5. (Based on CEQ Assessment for Ethiopia)

Primary and Social Spending/GDP vs GNI/capita



Source: Lustig (2015a)

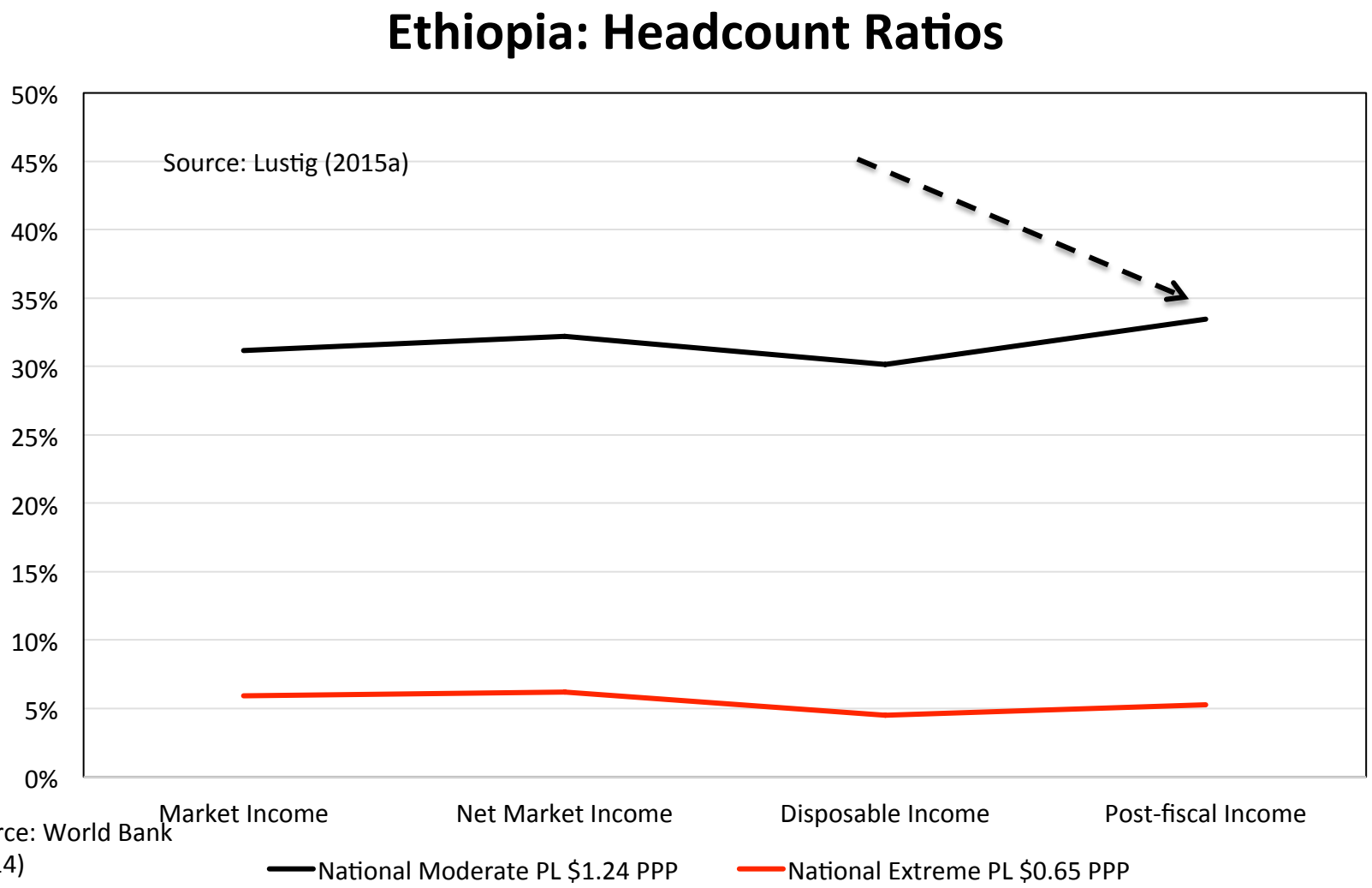
CEQ Assessment for Ethiopia

(World Bank, 2014, Ch. 5)

TABLE 5.5: Poverty and inequality indicators before and after taxes and spending

	Market Income	Disposable Income	Post-fiscal Income
National Poverty Line			
Incidence	31.2%	30.2%	32.4%
Gap	9.0%	7.9%	8.7%
Severity	4.3%	3.1%	3.4%
US $1.25 a day			
Incidence	31.9%	30.9%	33.2%
Gap	9.2%	8.2%	8.9%
Severity	3.9%	3.2%	3.5%
Gini coefficient	0.322	0.305	0.302

In Ethiopia, post-fiscal poverty is higher than pre-fisc poverty even when using the official US $1.24 (daily ppp) moderate poverty (black line)

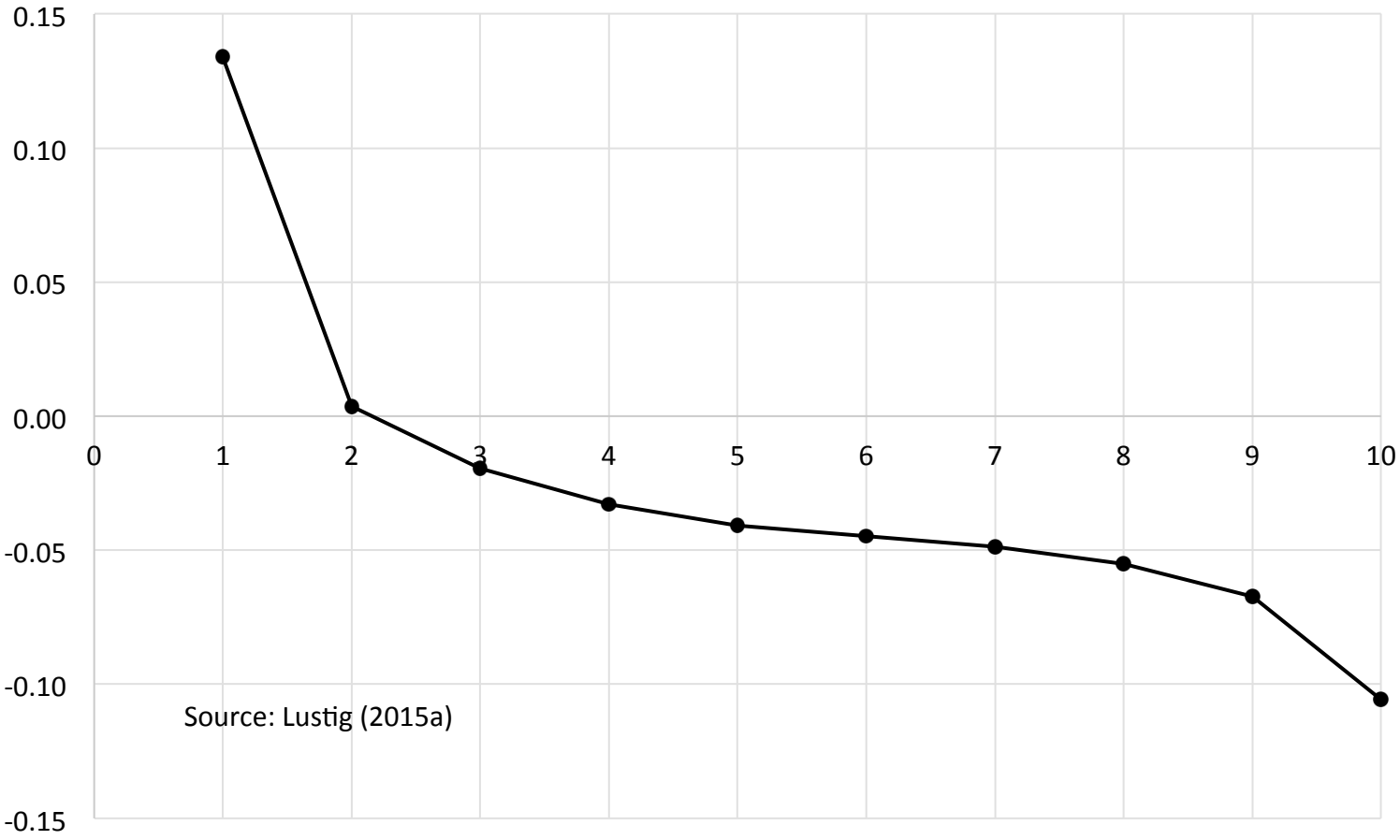


Source: World Bank (2014)

However, except for the bottom 10 percent, all deciles are neutral (2nd) or net payers to the fisc…

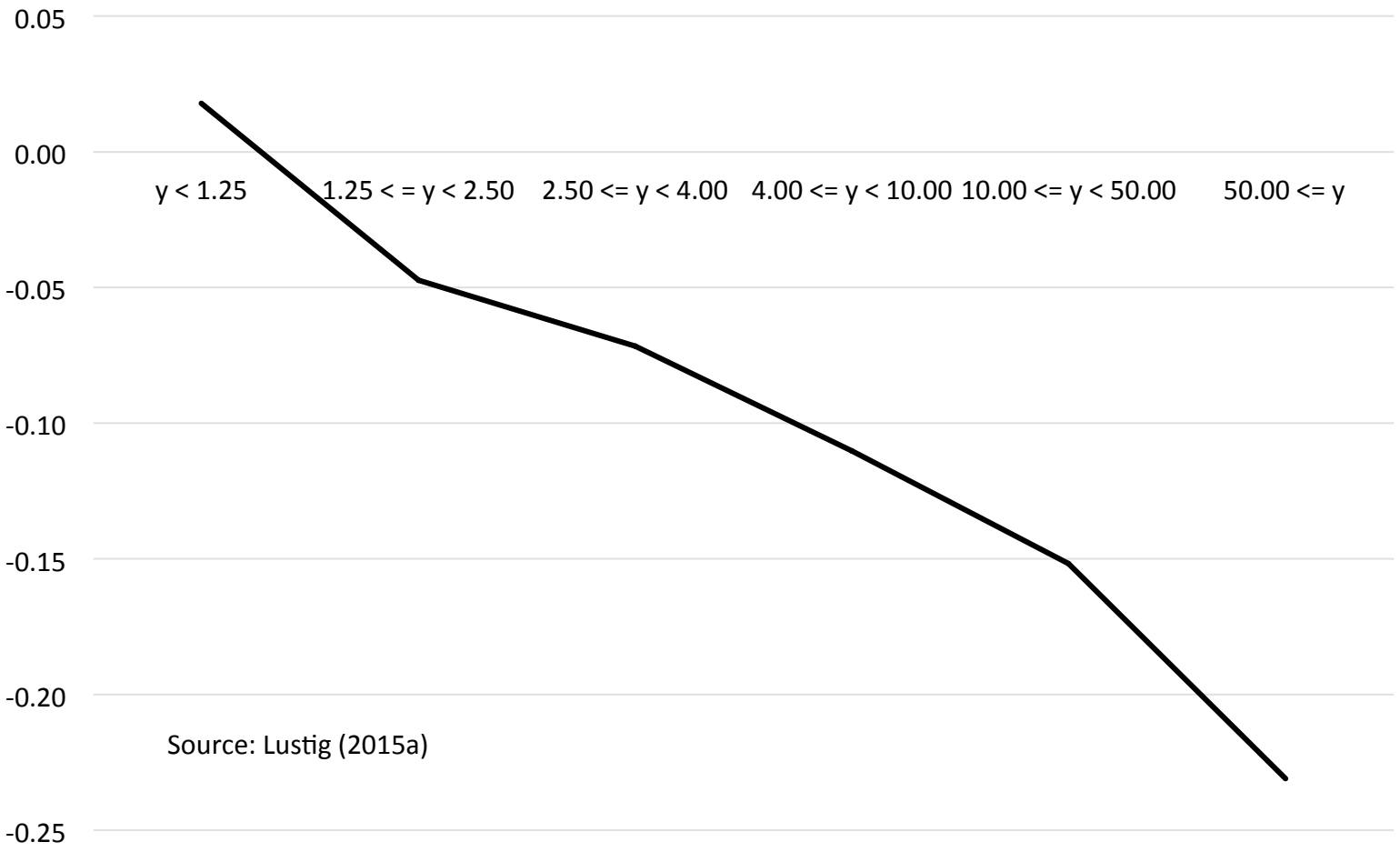
COMMITMENT TO EQUITY

Ethiopia: Net Payers to the Fiscal System Start at Decile...

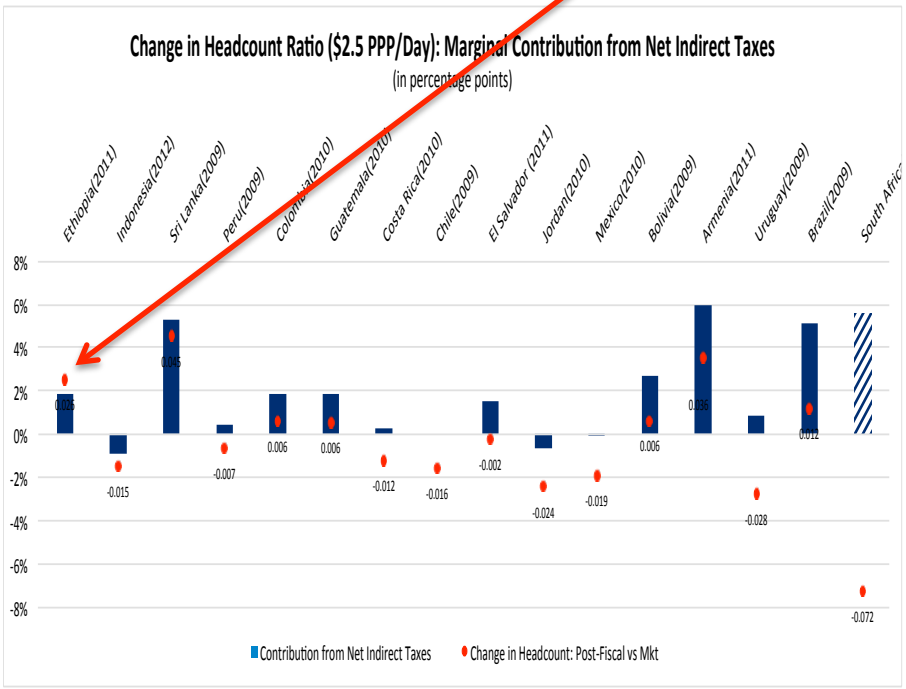


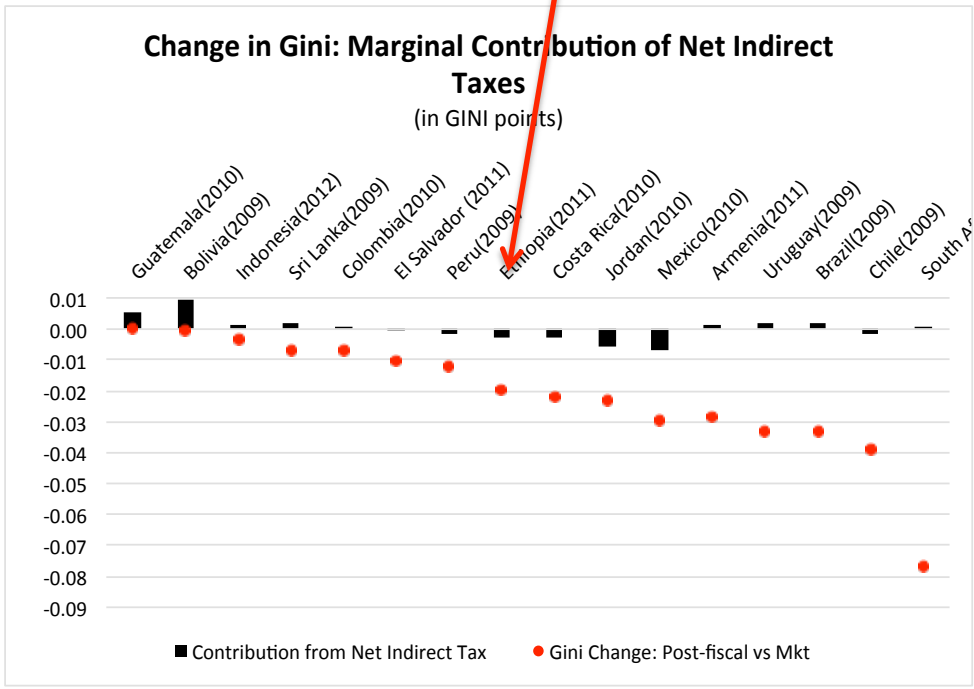
Except for the bottom income category (<US$1.25/day), the rest are net payers to the fisc…

Ethiopia: Net Payers to the Fiscal System Start at Income Category...



Note that Net Indirect Taxes can be equalizing and yet poverty increasing: Ethiopia





Source: Lustig (2015a)

Pro-poorness of Education Spending

	Primary			Secondary			Tertiary			
	Pro-poor CC is negative	Same per capita for all; CC =0	Progressive CC positive but lower than market income Gini	Pro-poor CC is negative	Same per capita for all; CC =0	Progressive CC positive but lower than market income Gini	Pro-poor CC is negative	Same per capita for all; CC =0	Progressive CC positive but lower than market income Gini	Regressive CC positive AND higher than market income Gini
Armenia (2011)	+			+					+	
Bolivia (2009)	+			+					+	
Brazil (2009)	+			+					+	
Chile (2009)	+			+					+	
Colombia (2010)	+			+					+	
El Salvador (2011)	+				+				+*	
Ethiopia (2011)		+				+				+
Guatemala (2010)	+				+					+
Indonesia (2012)	+				+					+
Mexico (2010)	+			+					+	
Peru (2009)	+			+					+	
South Africa (2010)	+			+					+	
Uruguay (2009)	+			+					+*	

Source: Lustig (2015a)

Pro-poorness of Health Spending

	Health		
	Pro-poor CC is negative	Same per capita for all; CC =0	Progressive CC positive but lower than market income Gini
Armenia (2011)		+	
Bolivia (2009)		+	
Brazil (2009)	+		
Chile (2009)	+		
Colombia (2010)	+		
El Salvador (2011)			+
Ethiopia (2011)			+
Guatemala (2010)			+
Indonesia (2012)			+
Mexico (2010)		+	
Peru (2009)			+
South Africa (2010)	+		
Uruguay (2009)	+		

Source: Lustig (2015a)

References

- Duclos, Jean-Yves and Abdelkrim Araar. 2007. *Poverty and Equity: Measurement, Policy and Estimation with DAD* (Vol. 2). Springer. Chapters 7 and 8. (available online)
- Higgins, Sean and Nora Lustig. 2015. Can a poverty-reducing and progressive tax and transfer system hurt the poor? ECINEQ Working Paper No. 363, April.
- Lambert, Peter J. (2001). *The Distribution and Redistribution of Income: A Mathematical Analysis*. Manchester University Press. Third Edition. Chapter 11. (not available online)
- Lustig, Nora, Ali Enami and Rodrigo Aranda. "The Analytics of Fiscal Redistribution." Chapter in Lustig, Nora and Sean Higgins, editors, Commitment to Equity Handbook: Estimating the Redistributive Impact of Fiscal Policy. (Forthcoming)
- Lustig, Nora and Sean Higgins. 2013 Commitment to Equity Assessment (CEQ): Estimating the Incidence of Social Spending, Subsidies andTaxes. Handbook. CEQ Working Paper No. 1, Center for Inter-American Policy and Research and Department of Economics, Tulane University, New Orleans, Lousiana and Inter-American Dialogue, Washington, DC, Revised, September.
- Lustig, Nora. 2015a. "The Redistributive Impact of Government Spending on Education and Health Evidence from Thirteen Developing Countries." Chapter 17 in Inequality and the Role of Fiscal Policy: Trends and Policy Options, edited by Benedict Clements, Ruud de Mooij, Sanjeev Gupta, and Michael Keen (Washington: International Monetary Fund, forthcoming)
- Lustig, Nora. 2015b. "Fiscal Policy and Income Redistribution in Brazil, Chile, Colombia, Indonesia, Mexico, Peru and South Africa." Chapter 7, Section 7.3 in OECD In It Together. Why Less Inequality Benefits All.
- World Bank. 2014. Ethiopia. Poverty Assessment, Chapter 5. (Based on CEQ Assessment for Ethiopia)

Thank you!