

The Distributional Impact of Taxes and Transfers

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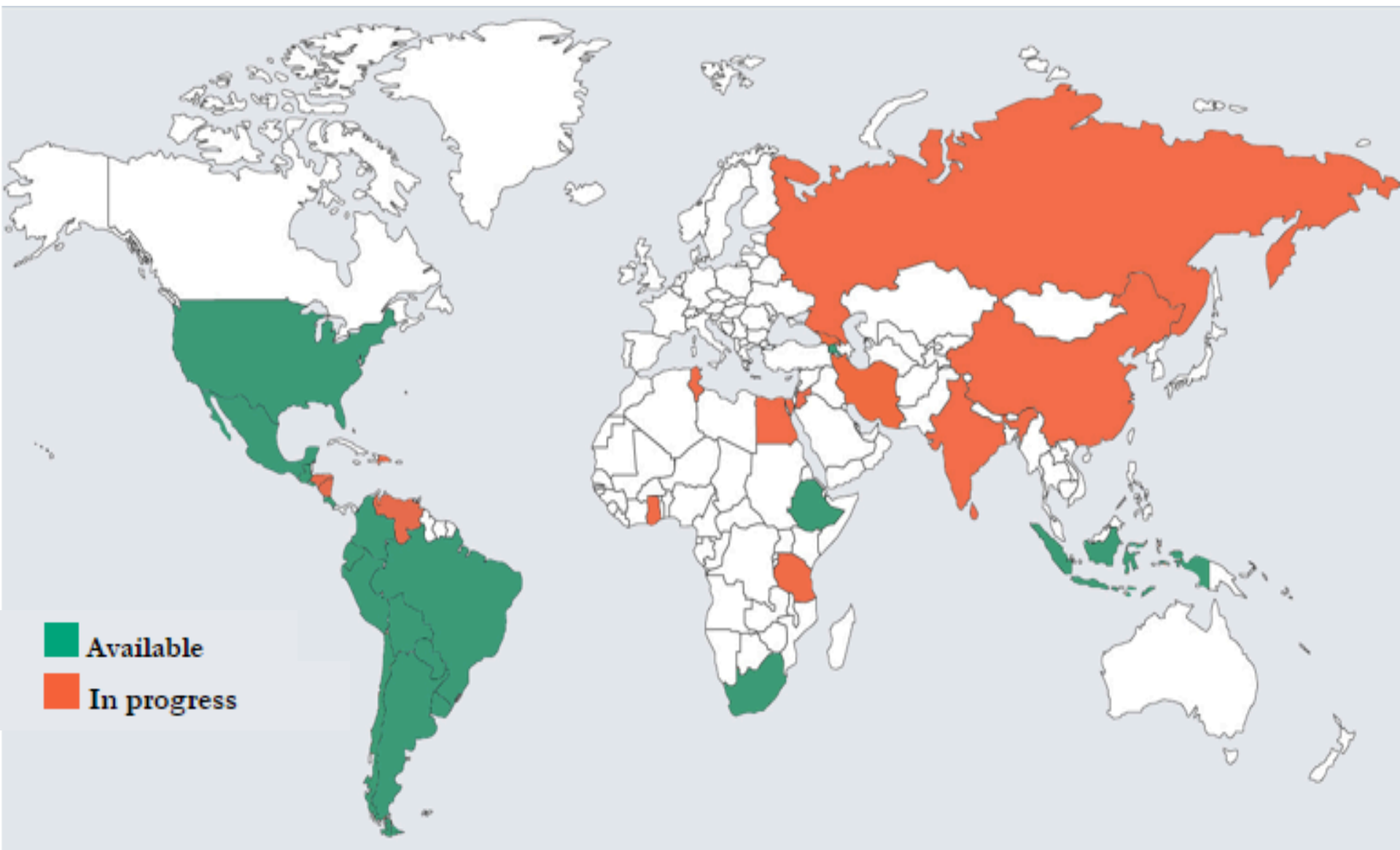
OUTLINE

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

What is CEQ?

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



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

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)

Fiscal Policy, Inequality and Poverty

Three Main Questions

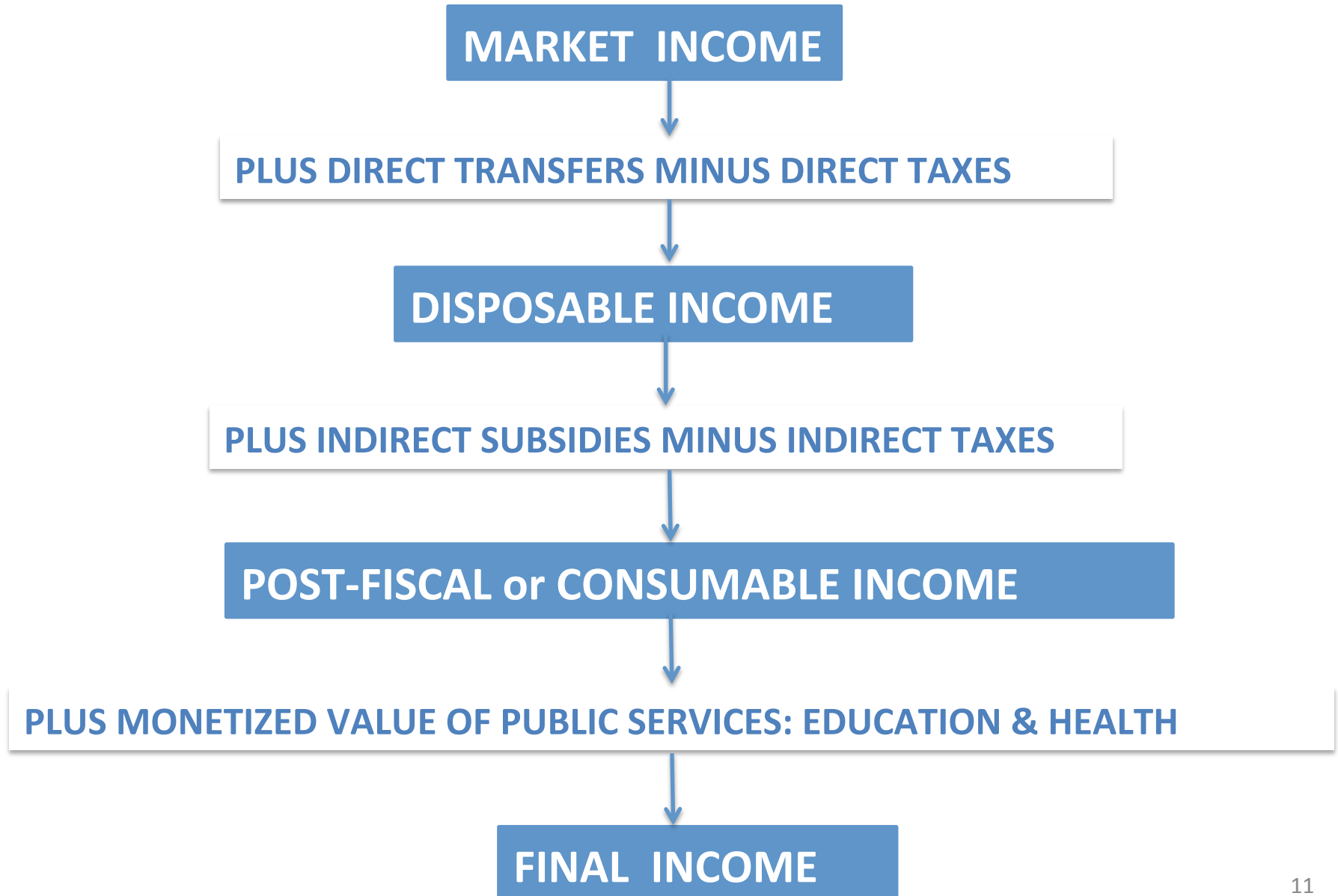
- Does the net fiscal system decrease inequality?
- Does the net fiscal system decrease poverty?
- Is the distribution of the use of public services “pro-poor”?

What is the “net fiscal system”?

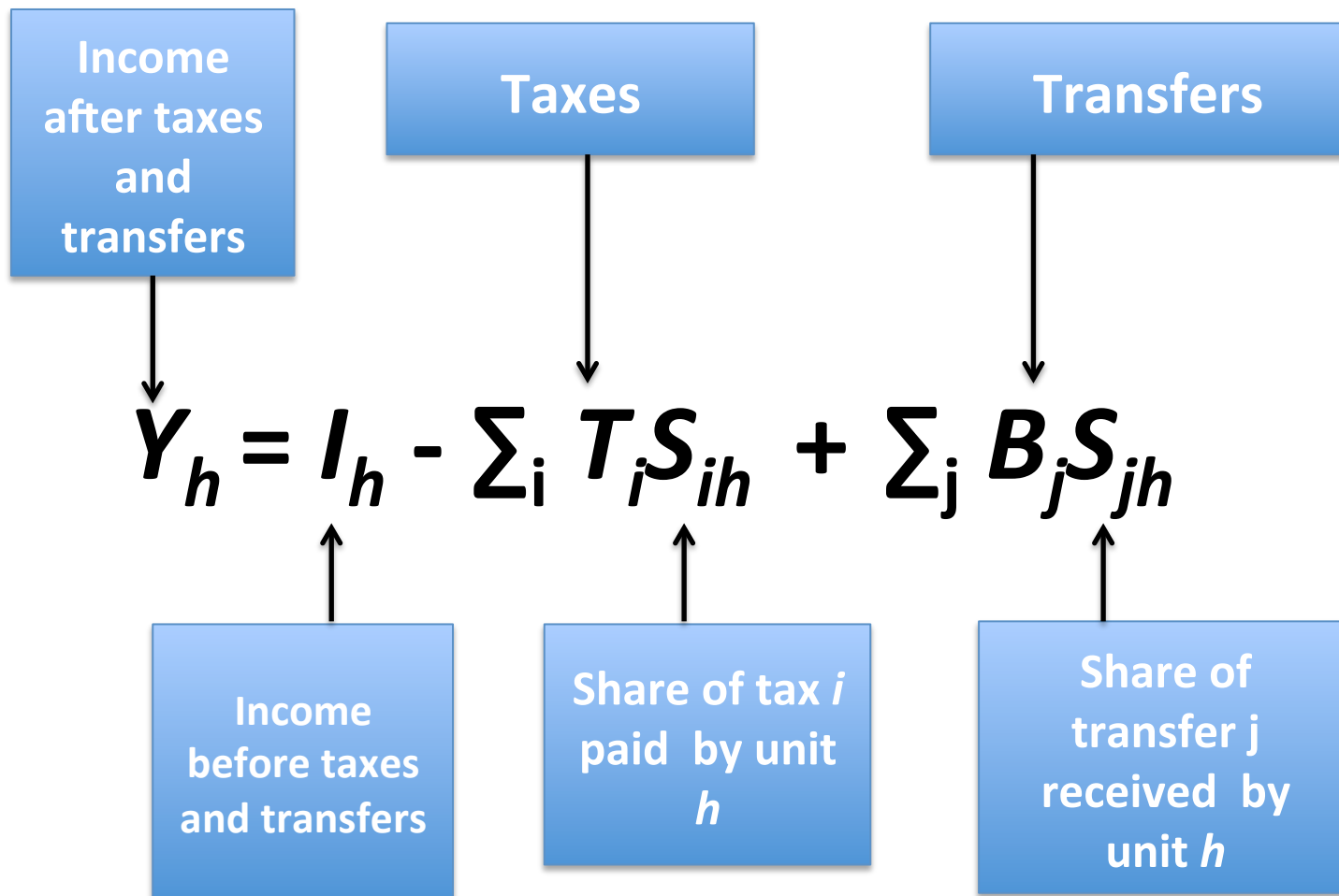
In literature:

- 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



CEQ Assessment: Fiscal Incidence Analysis



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**

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, 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!

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 $0.0583 > 0.0574$
- CEQs for Chile 2009 and South Africa 2010 also show that regressive consumption taxes are equalizing

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?

Main messages

2. Analyzing the impact on inequality only can be misleading

➤ Fiscal systems can be equalizing but poverty increasing

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

Main messages

3. 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

Fiscal Policy, Inequality, and Poverty

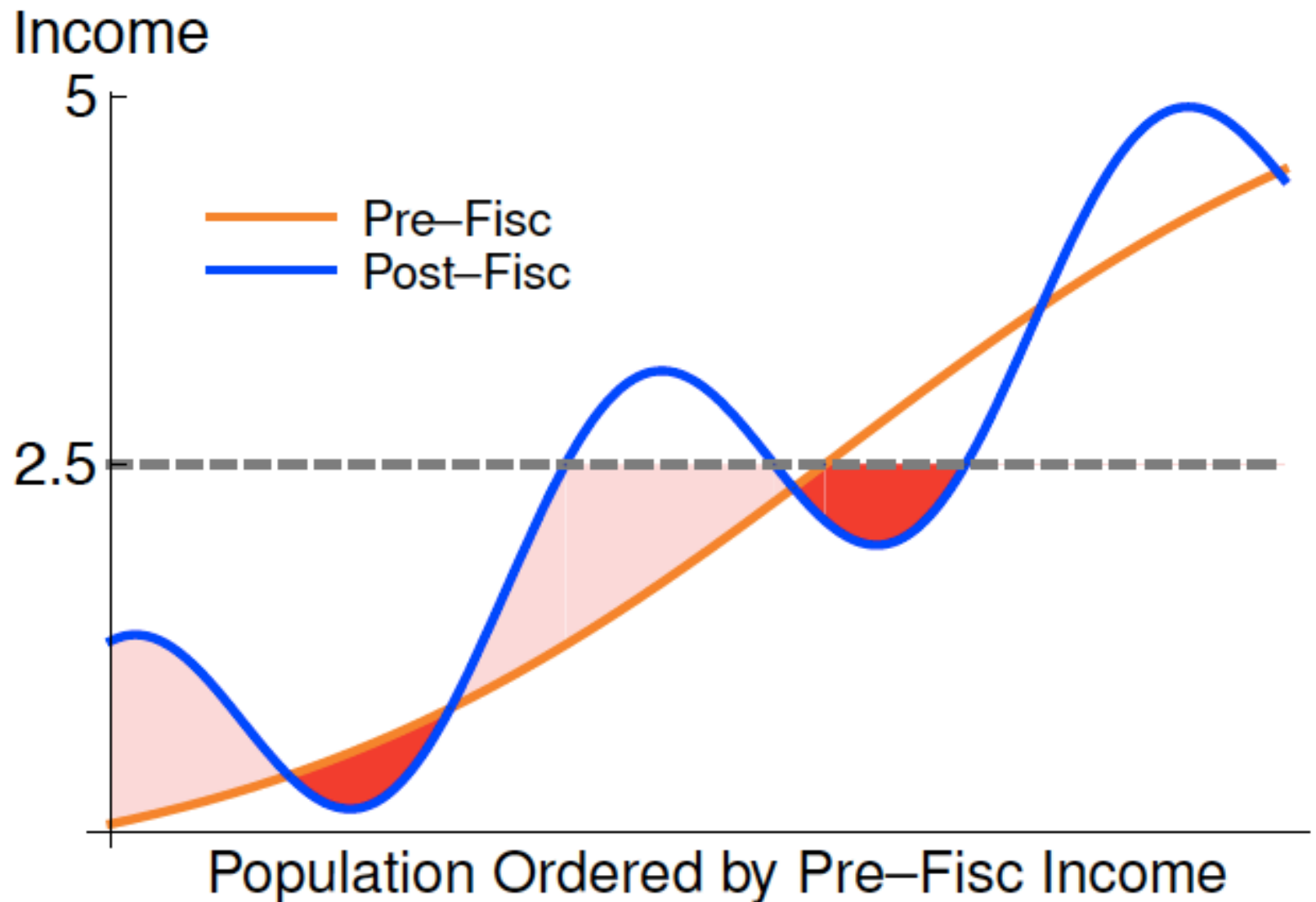
- Three distinct questions
 1. What is the impact of taxes and government transfers on inequality?
 2. What is the impact of taxes and government transfers on poverty?
 3. Are the poor impoverished by taxes, net of cash transfers they receive?

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

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

Fiscal Impoverishment and Fiscal Gains to the Poor



CEQ Assessment for Ethiopia

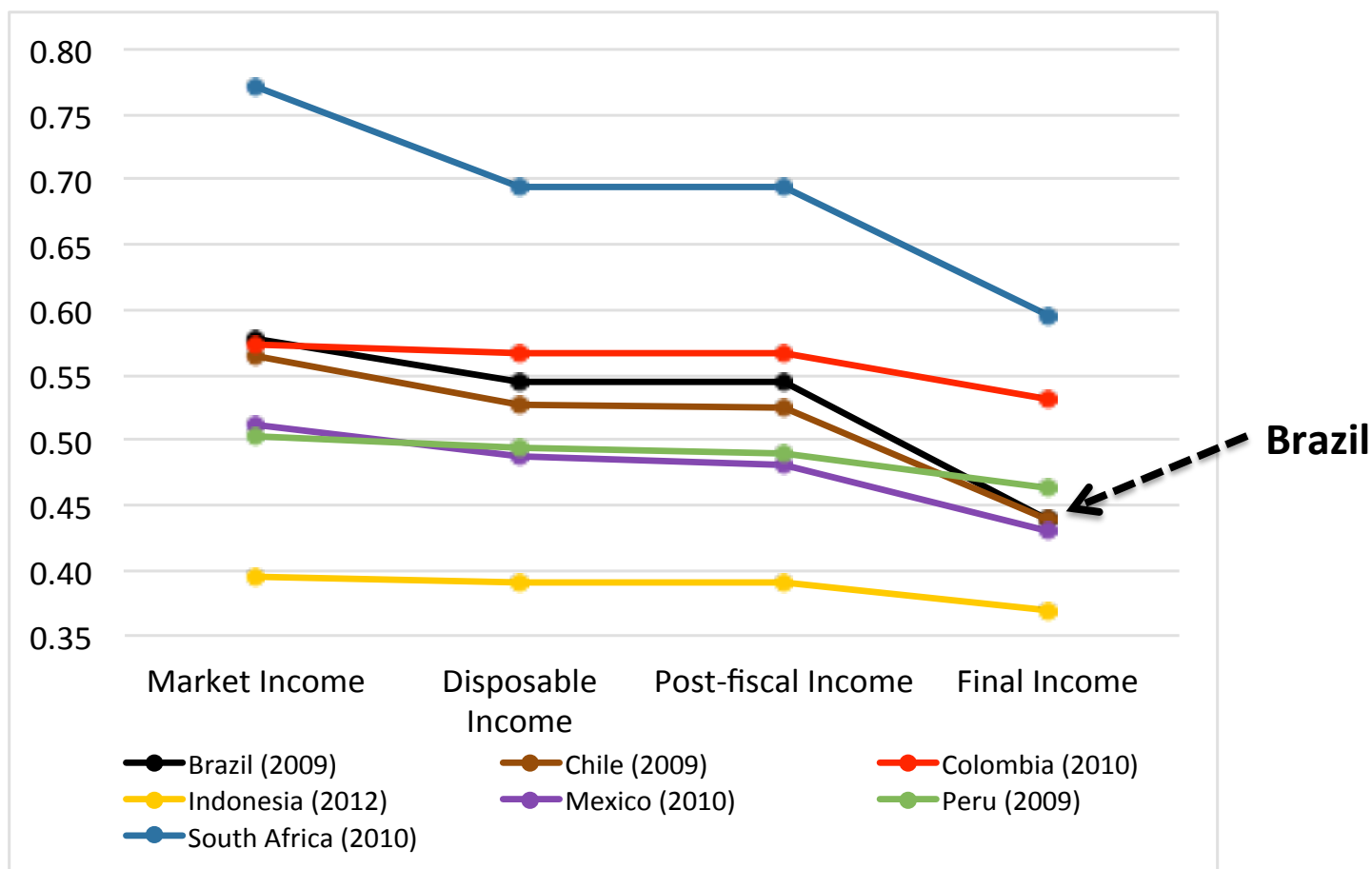
(World Bank, 2014, Ch. 5)

TABLE 5.6: Impoverishment and fiscal policy in Ethiopia

	National	US\$1.25 PPP
Impoverishment Headcount Index (% of population impoverished)		
Market income to disposable income	25.0	25.6
Market income to final income	9.1	9.3

Fiscal Redistribution: Brazil, Chile, Colombia, Indonesia, Mexico and South Africa

Gini Coefficient, circa 2010



Source: Lustig (2015a)

- Are the poor impoverished by taxes net of cash transfers?
- Yes
 - 36.8% of post-fisc poor are fiscally impoverished
 - Total fiscal impoverishment over USD \$700 million
 - Impoverished pay \$0.19 per person per day (10% of their incomes) in net taxes 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

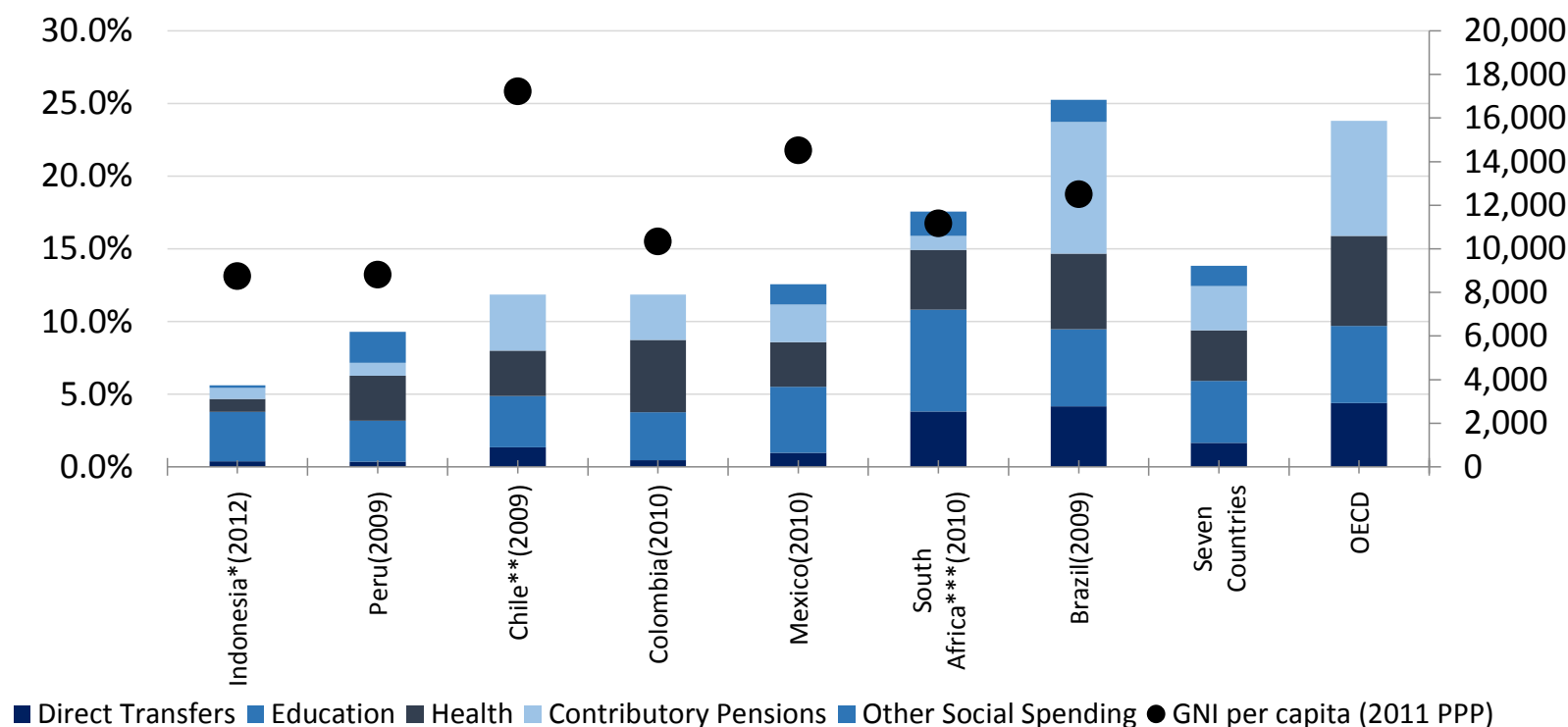
Fiscal Policy, Inequality and Poverty in Middle Income Countries: Brazil, Chile, Colombia, Indonesia, Mexico, Peru and South Africa

Based on: Lustig (2015b)

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

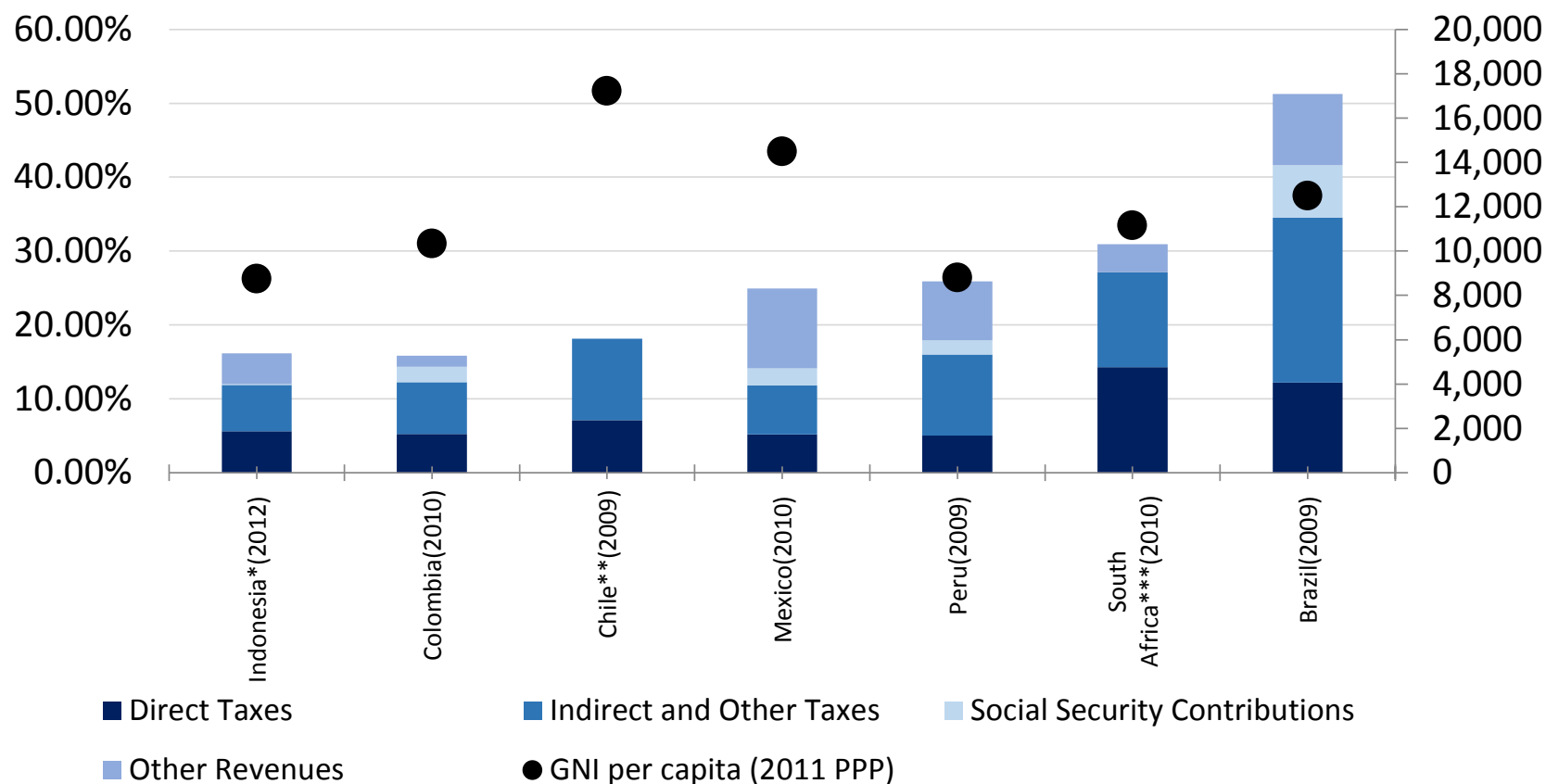
Panel a: Composition of Social Spending as a Share of GDP

(ranked by social spending/GDP)



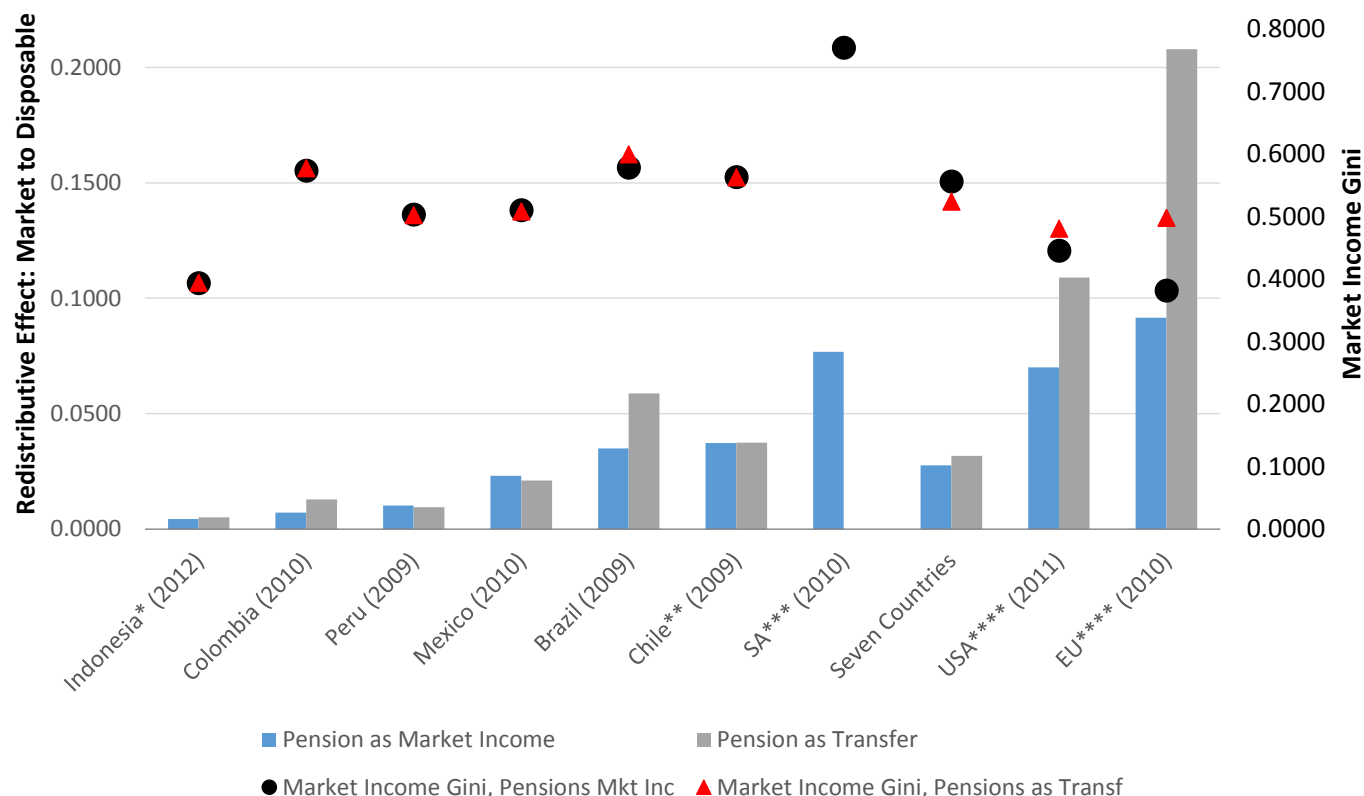
Panel b: Composition of Total Government Revenues as a Share of GDP

(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

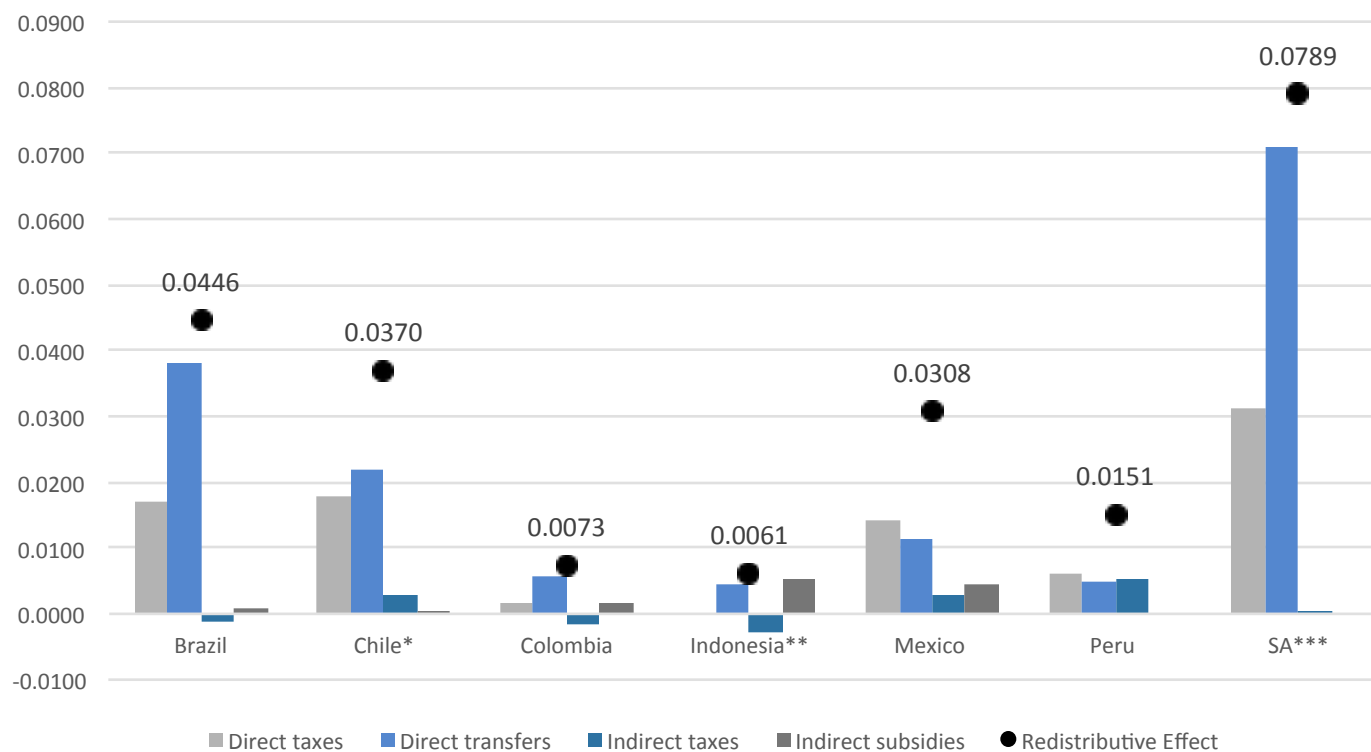
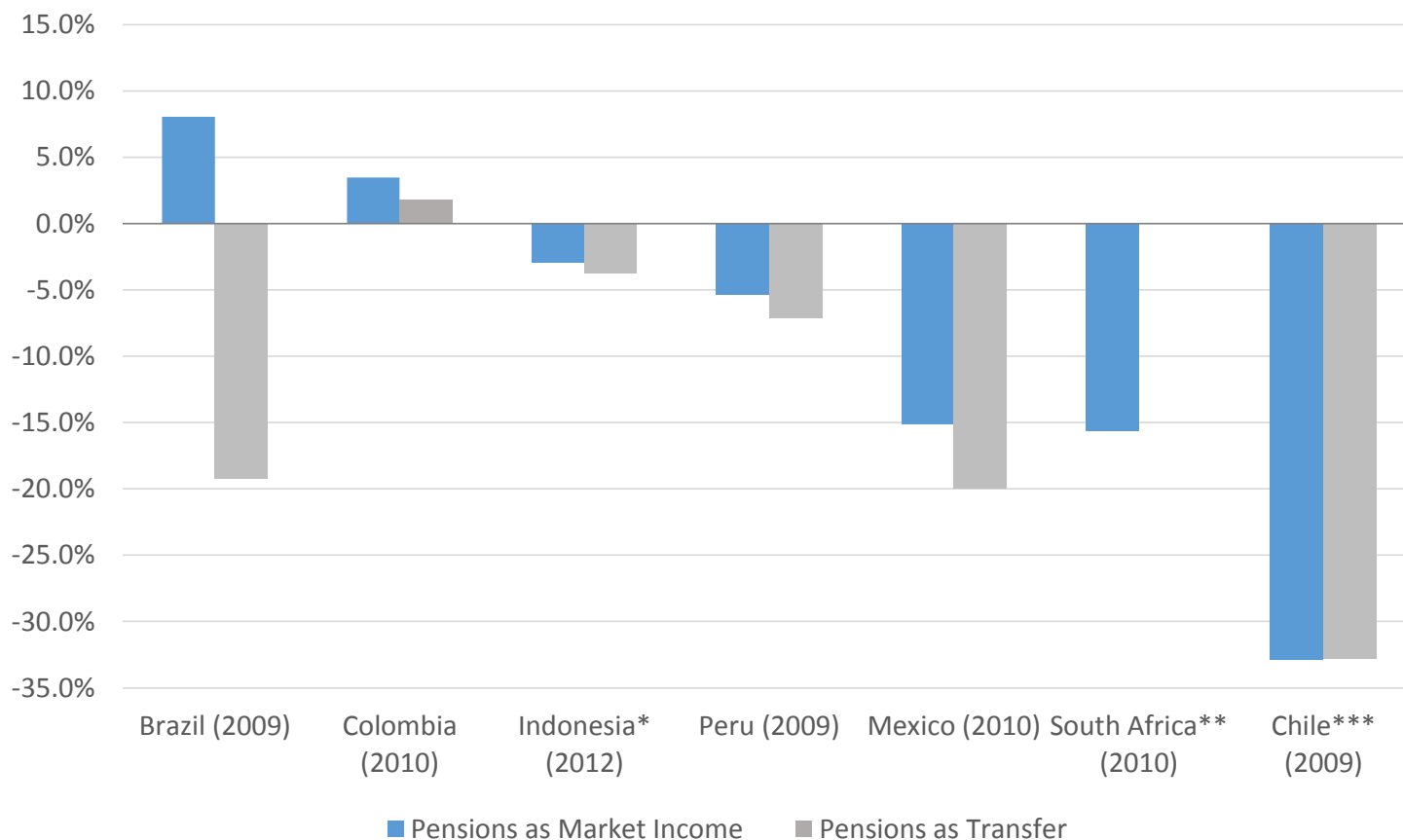


Table 4: Marginal Contribution of Taxes and Transfers (circa 2010)
(Pensions as Market Income)

	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

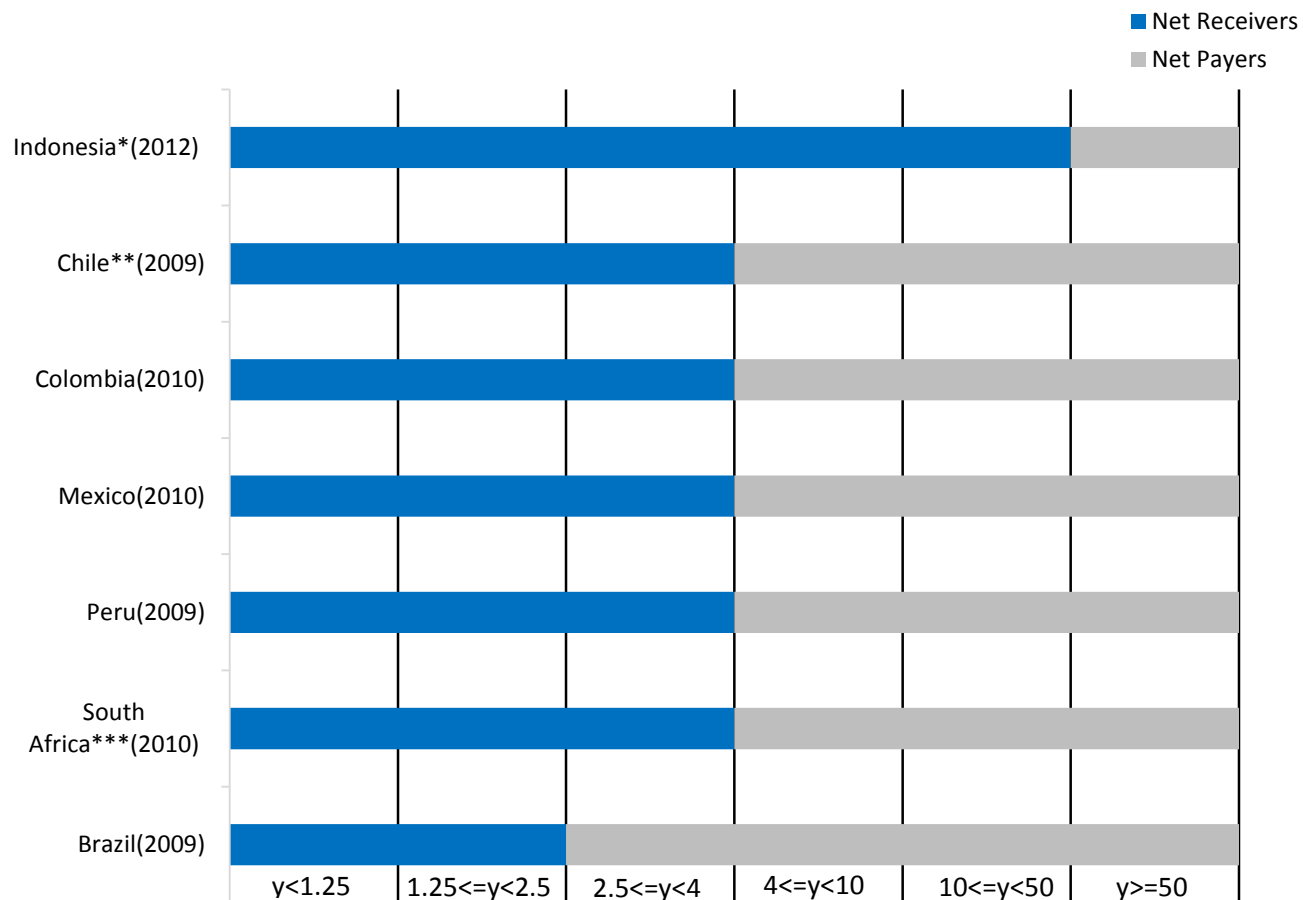
Fiscal Policy and Poverty Reduction (circa 2010)

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

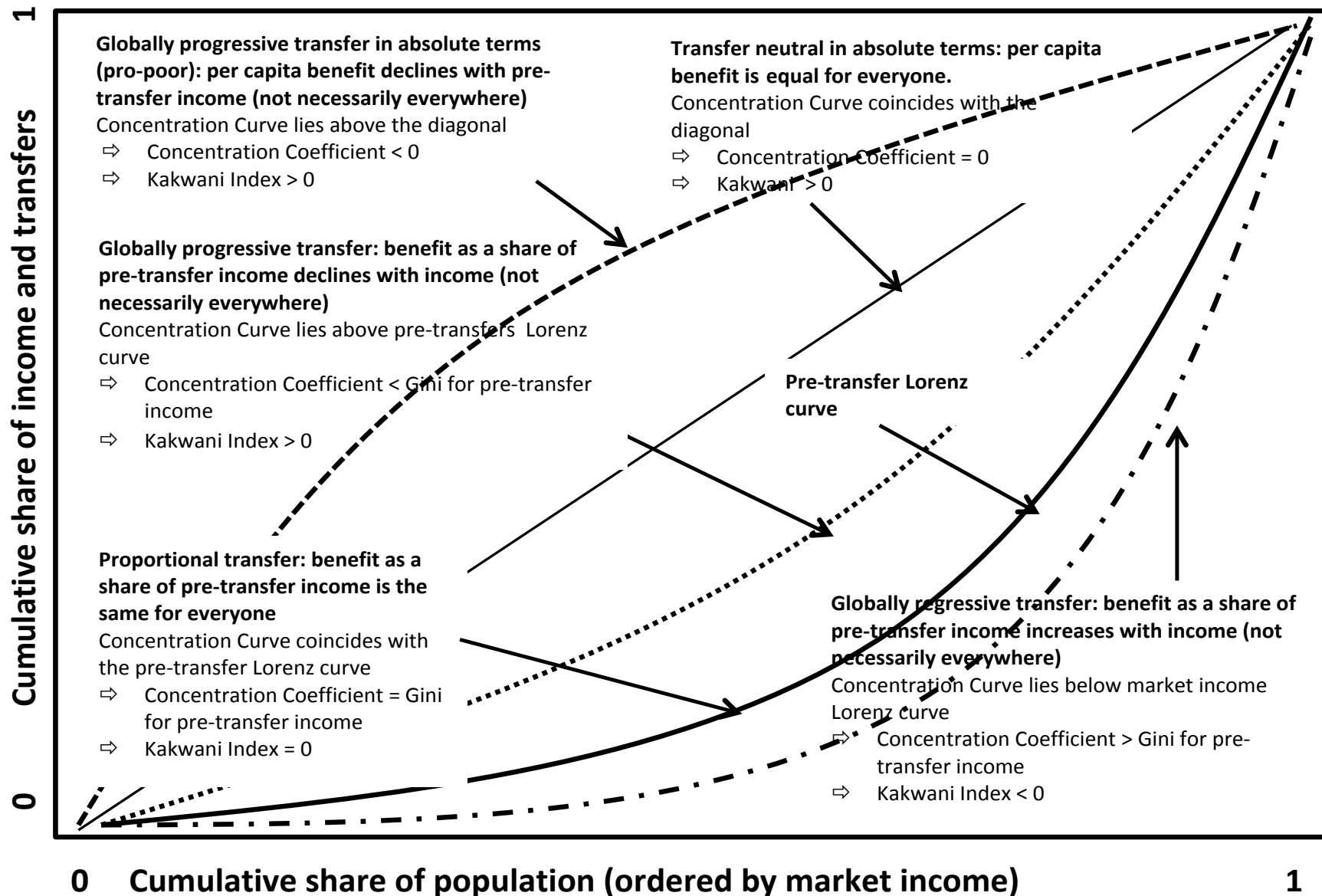


Net Payers to the Fiscal System (circa 2010)

Panel a: Pensions as Market Income



Progressivity of Transfers: A Diagrammatic Representation



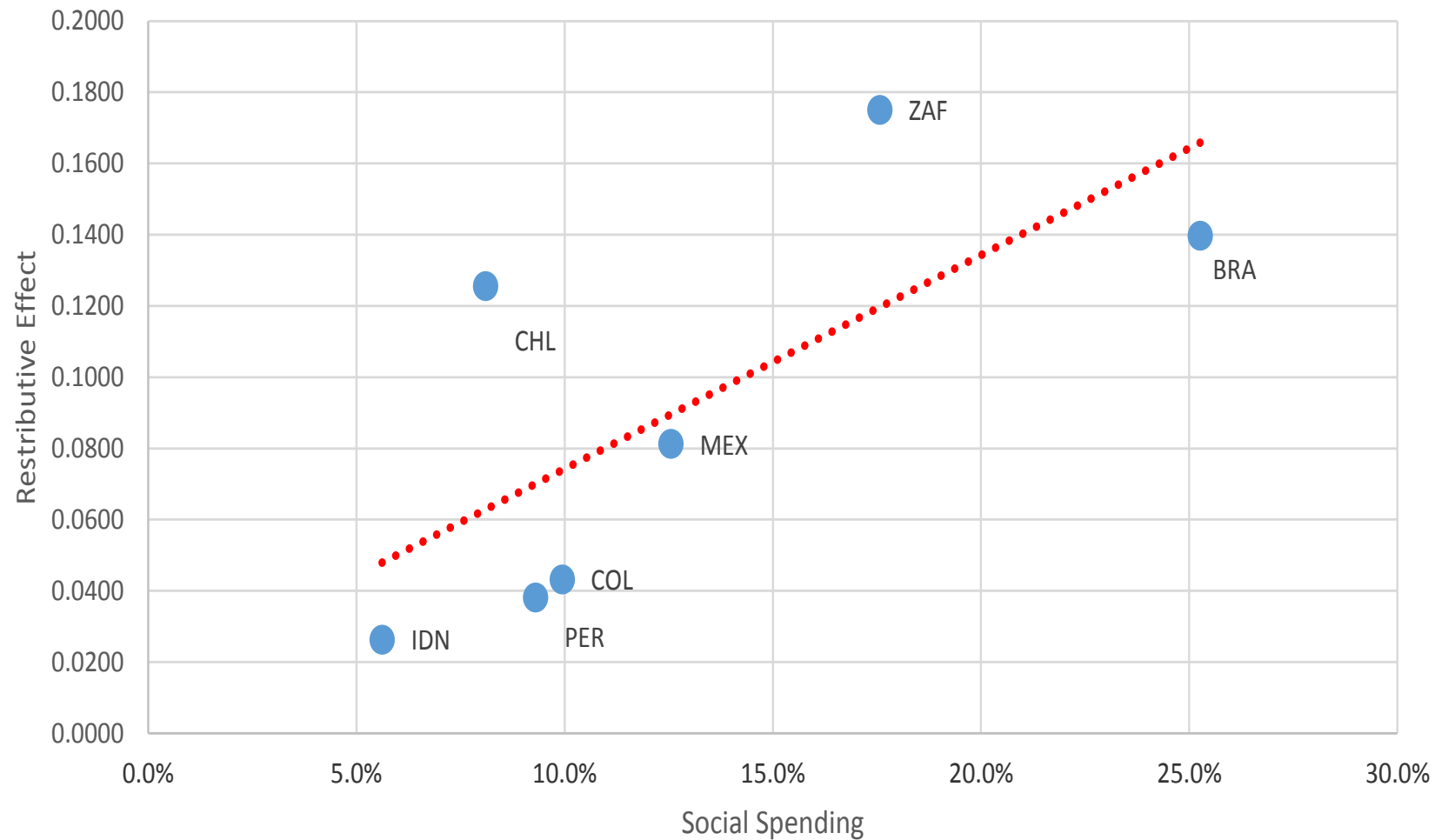
Progressivity and Pro-pooriness of Education and Health Spending. Summary of Results

	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)	+			+			+			+					+		+		

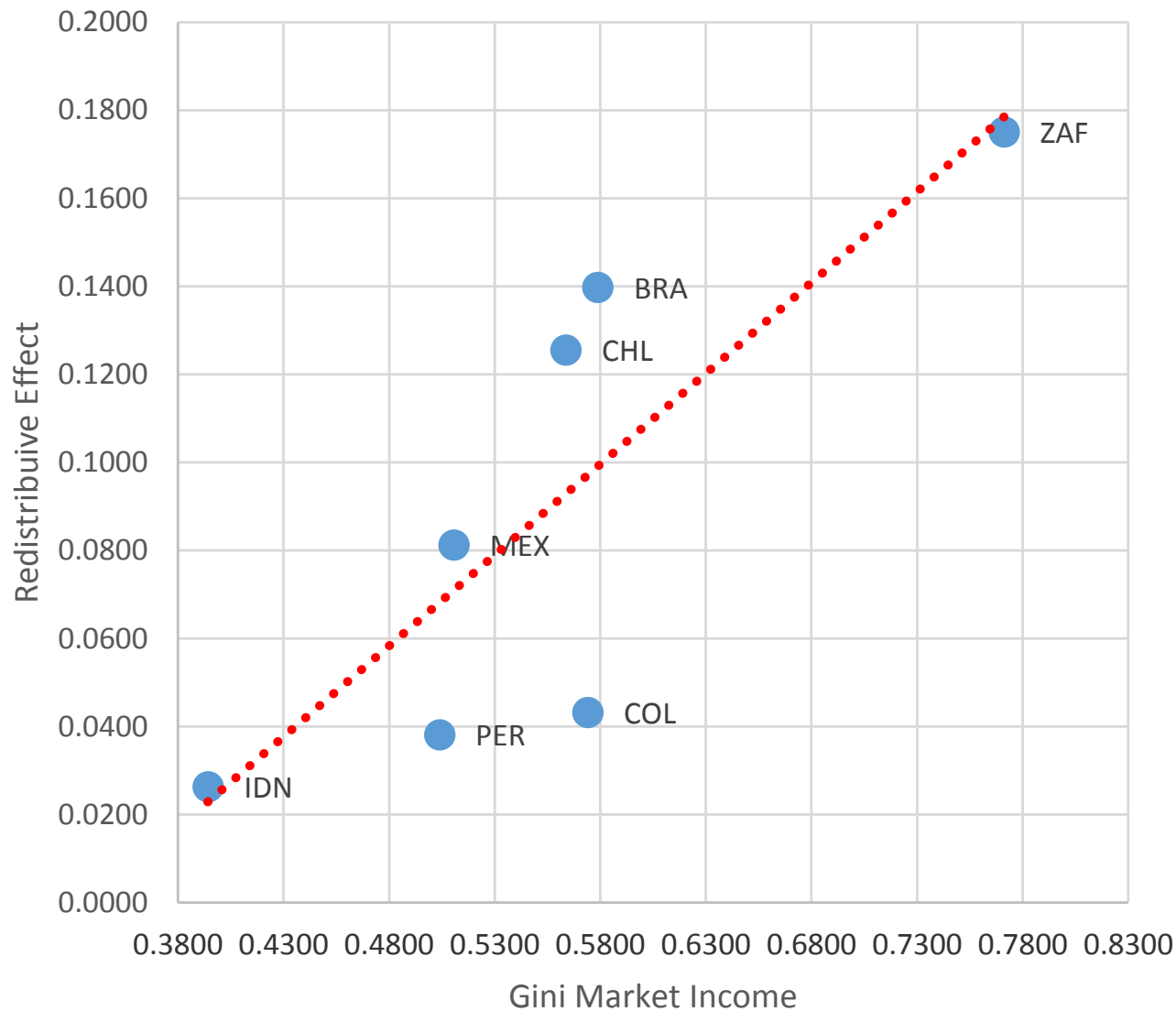
*CC is almost equal to market income Gini coefficient

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

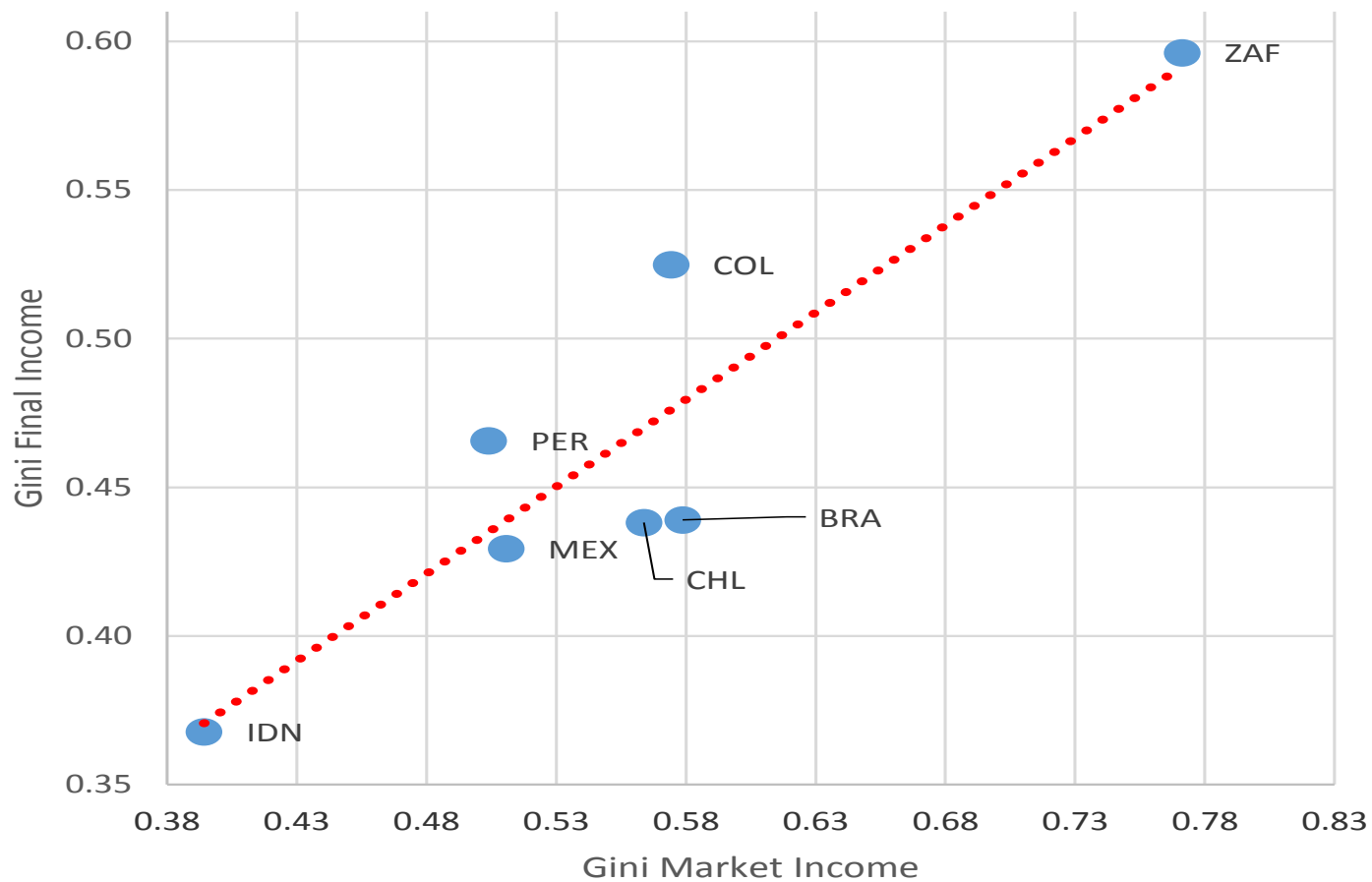
Figure 4. Redistribution and social spending, 2010



A. Redistribution and market income inequality



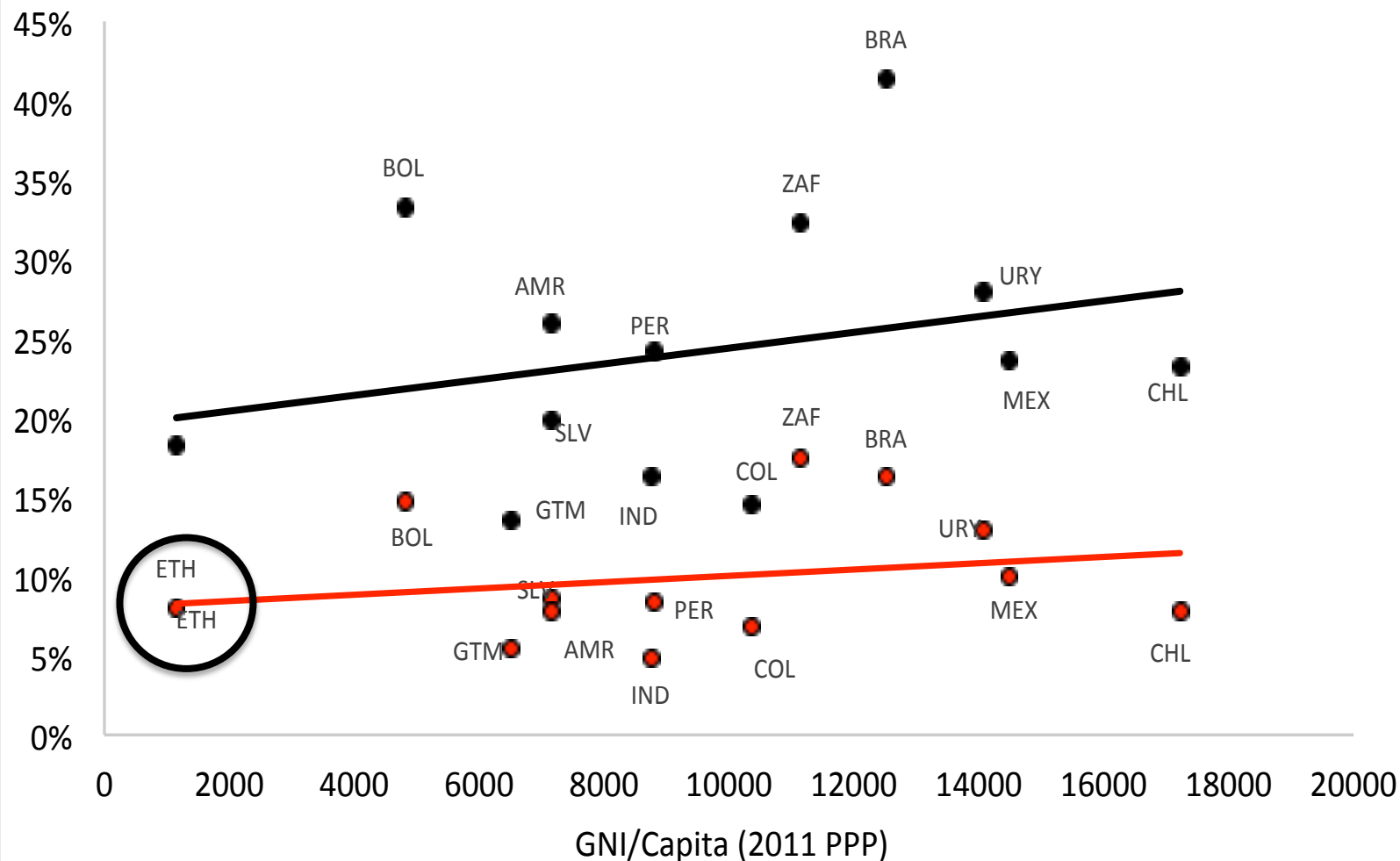
B. Final income inequality and market income inequality



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

Based on: Lustig (2015b)

Primary and Social Spending/GDP vs GNI/capita



Source: Lustig (2015a)

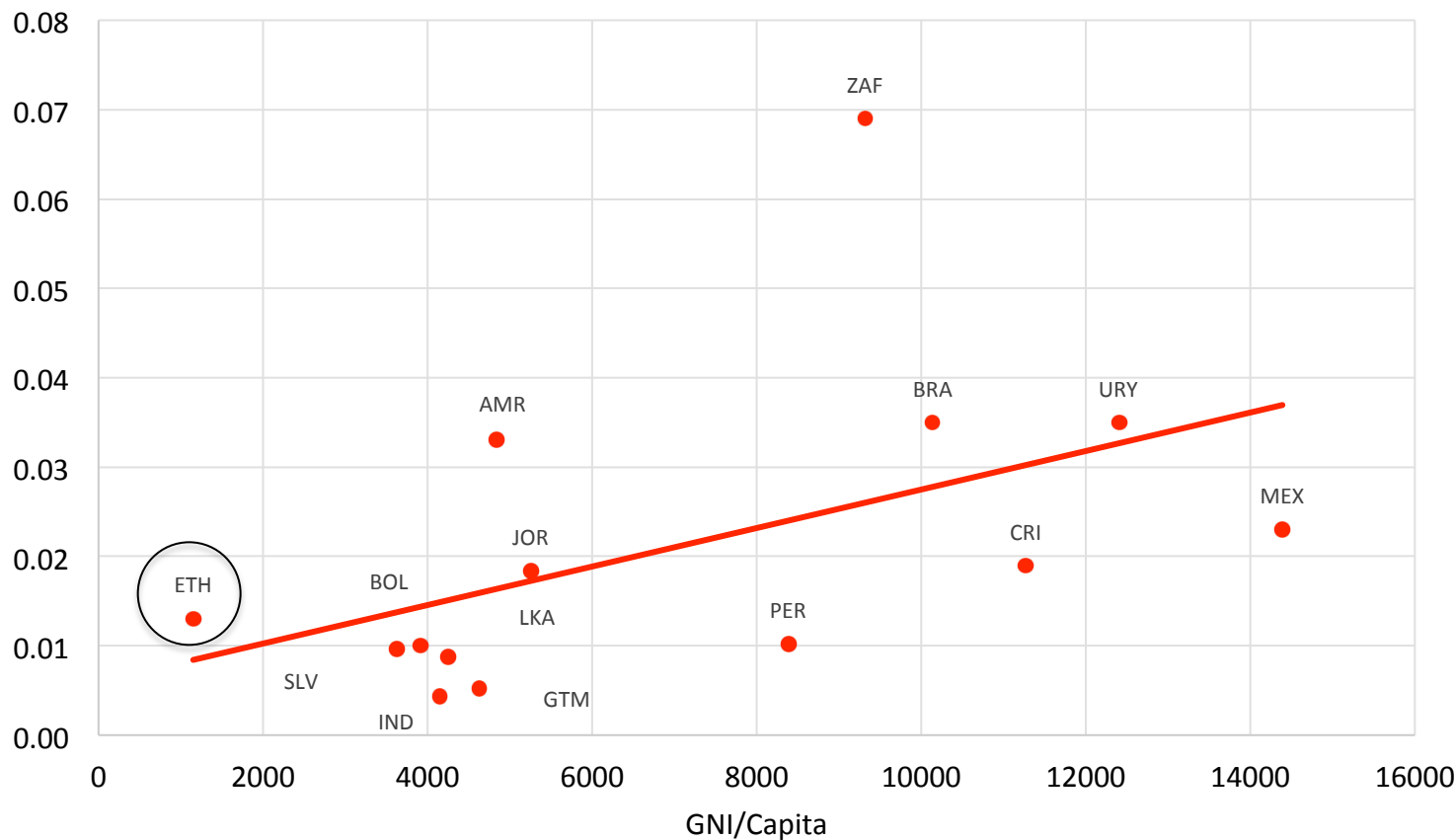
● Primary Spending/GDP ● Social Spending/GDP

Suppose you want to know...

- What is the impact of taxes and government transfers on inequality and poverty?
- Who are the net tax payers to the “fisc”?
- Are the poor impoverished by taxes net of cash transfers?

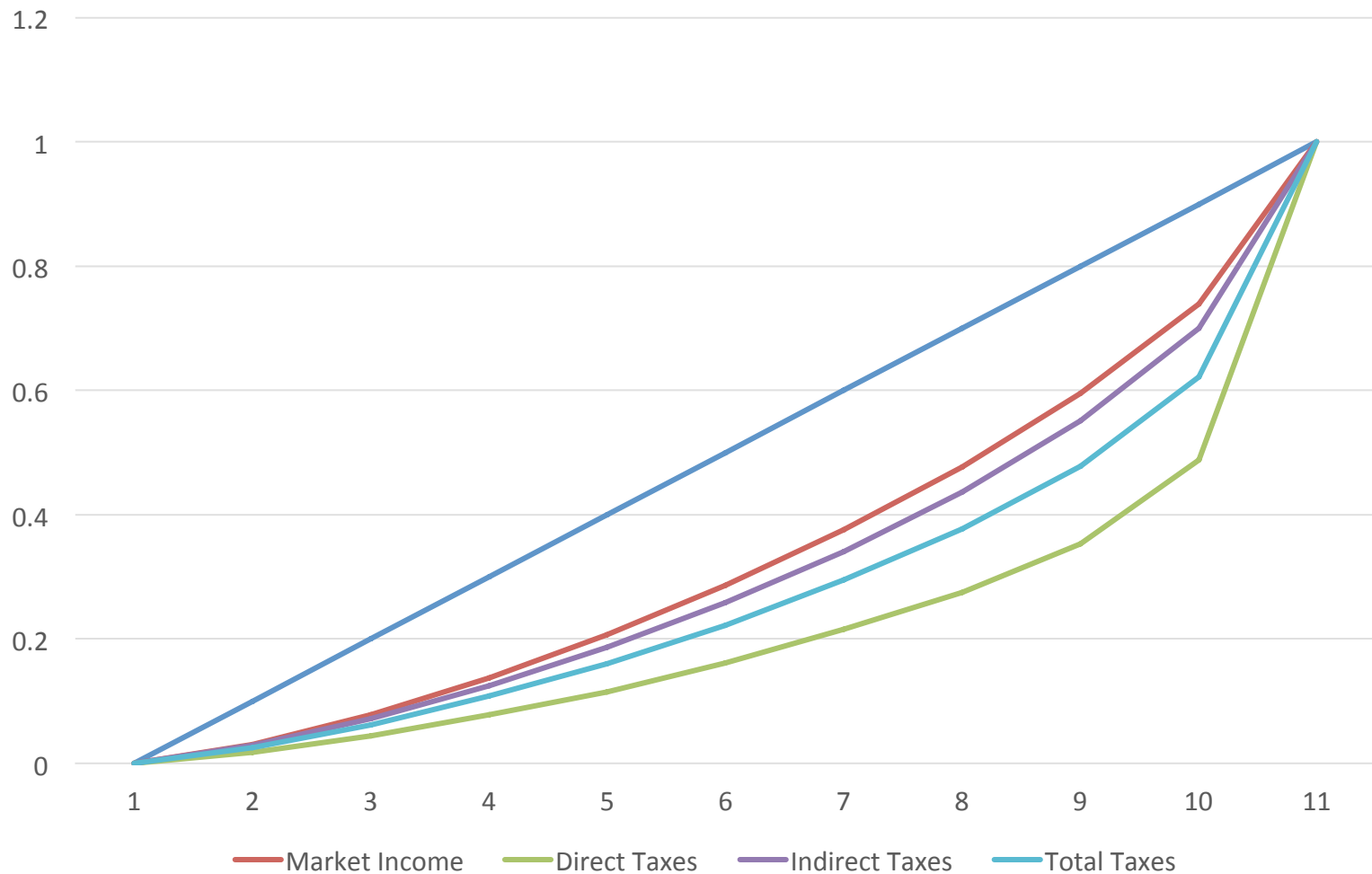
Redistribution in Ethiopia is above prediction...

Change in Gini: Disposable vs Market
(in GINI points)



Source: Lustig (2015b)

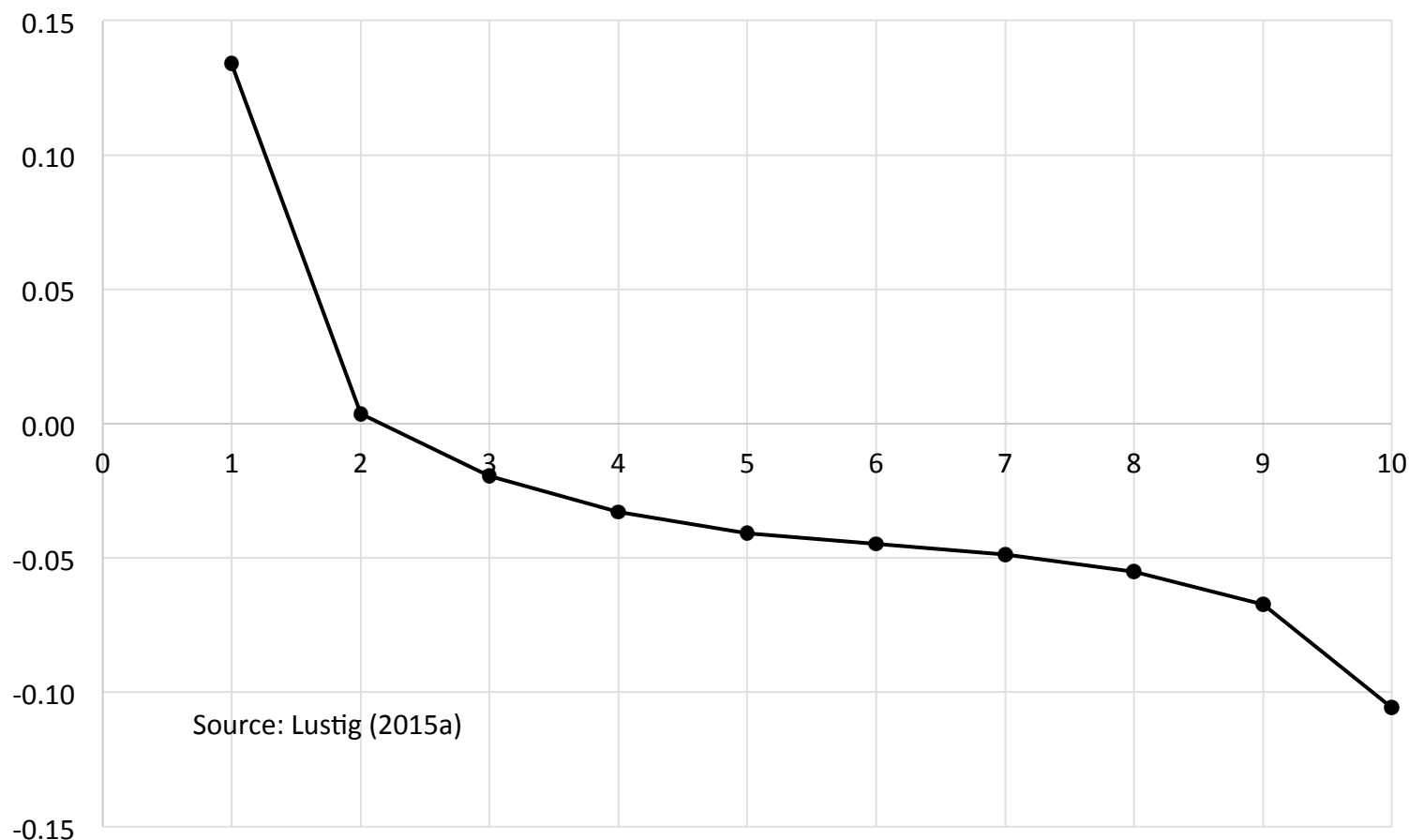
Direct taxes AND consumption taxes are PROGRESSIVE and EQUALIZING



Source: Lustig (2015a)

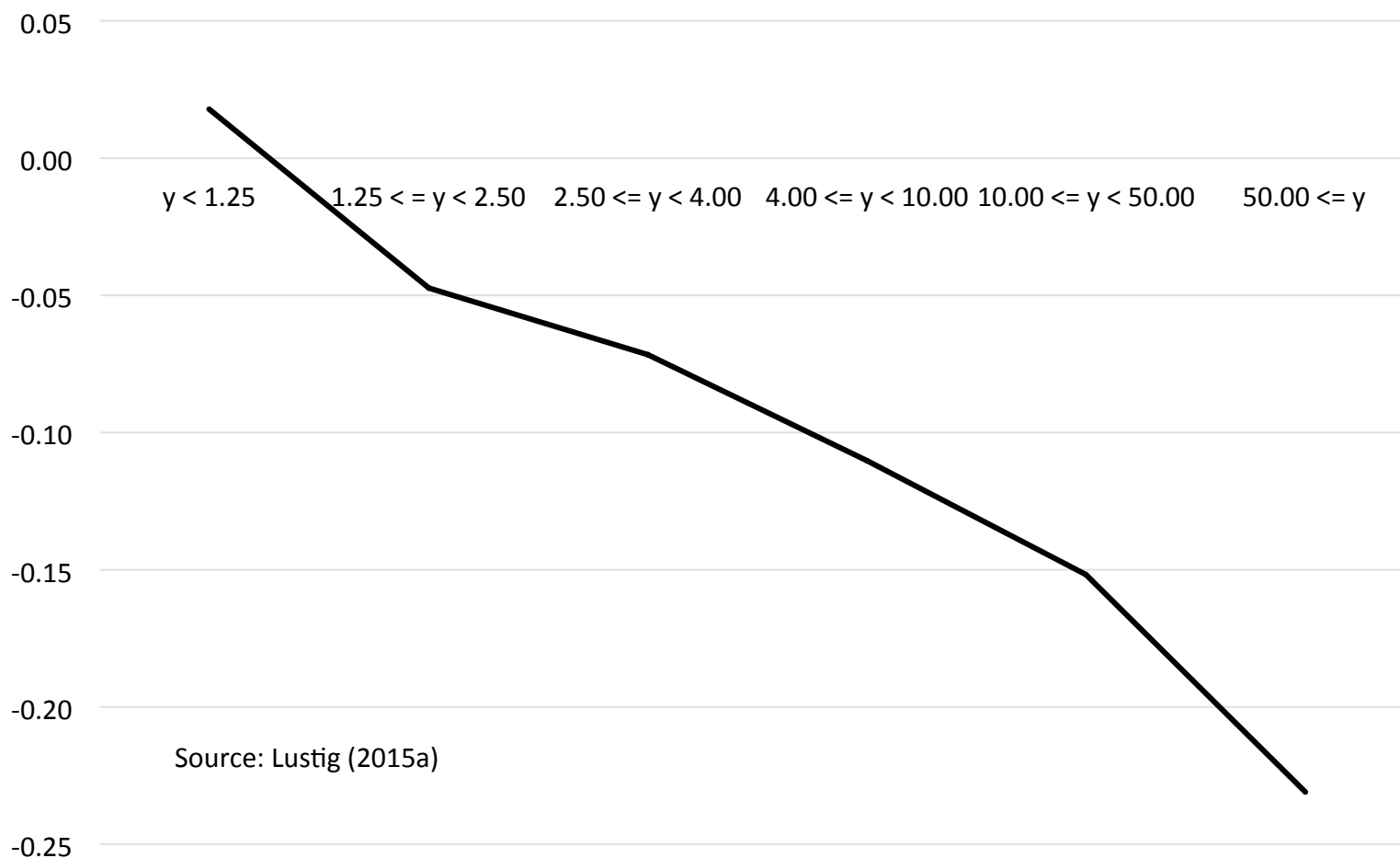
**However, except for the bottom 10 percent,
all deciles are neutral (2nd) or net payers to
the fisc...**

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



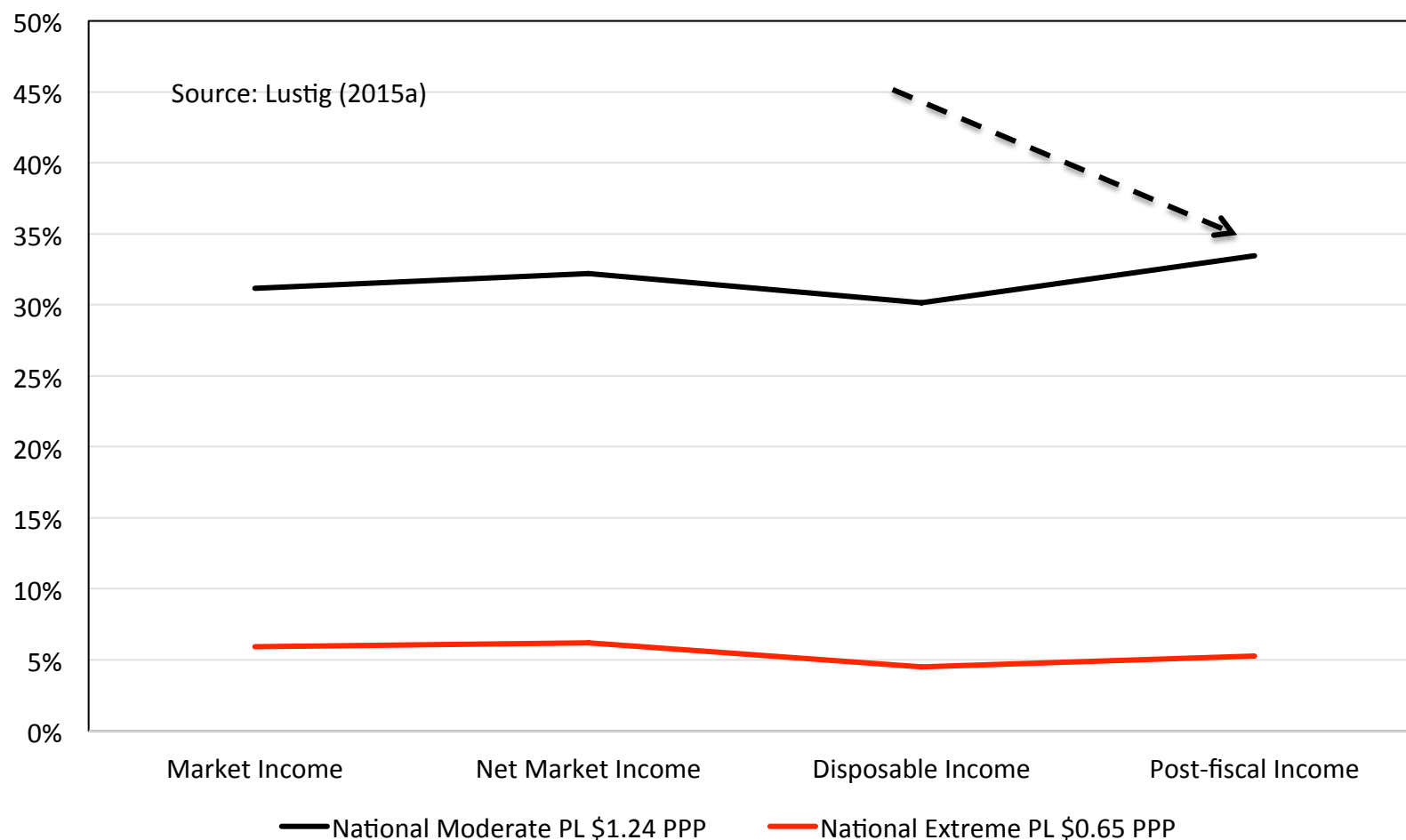
Except for the bottom income category (<US\$1.25/day), the rest are net payers to the fisc...

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

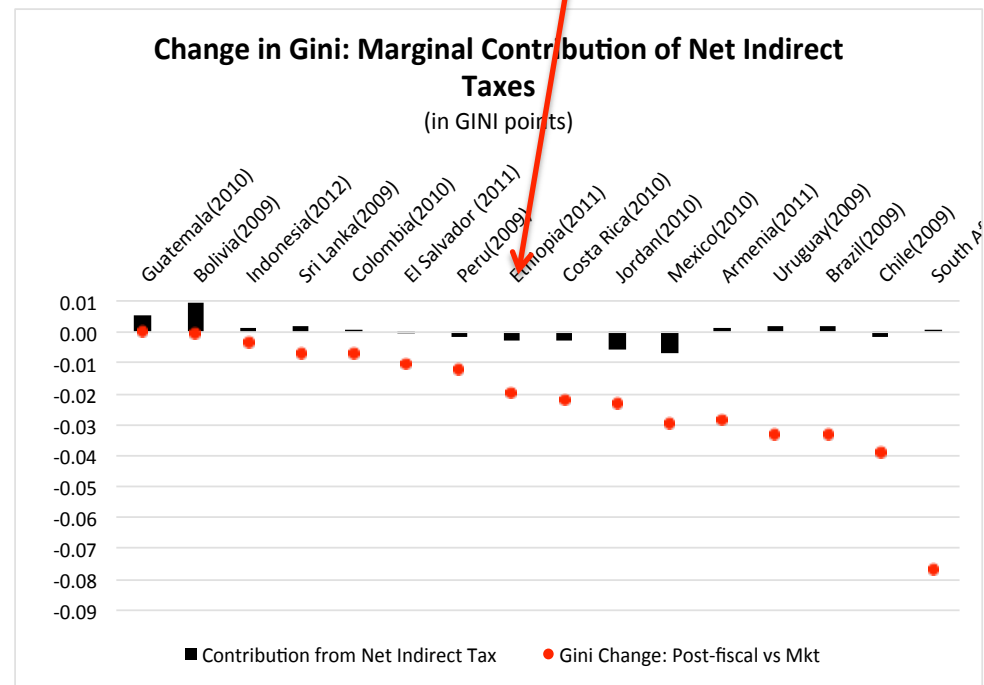
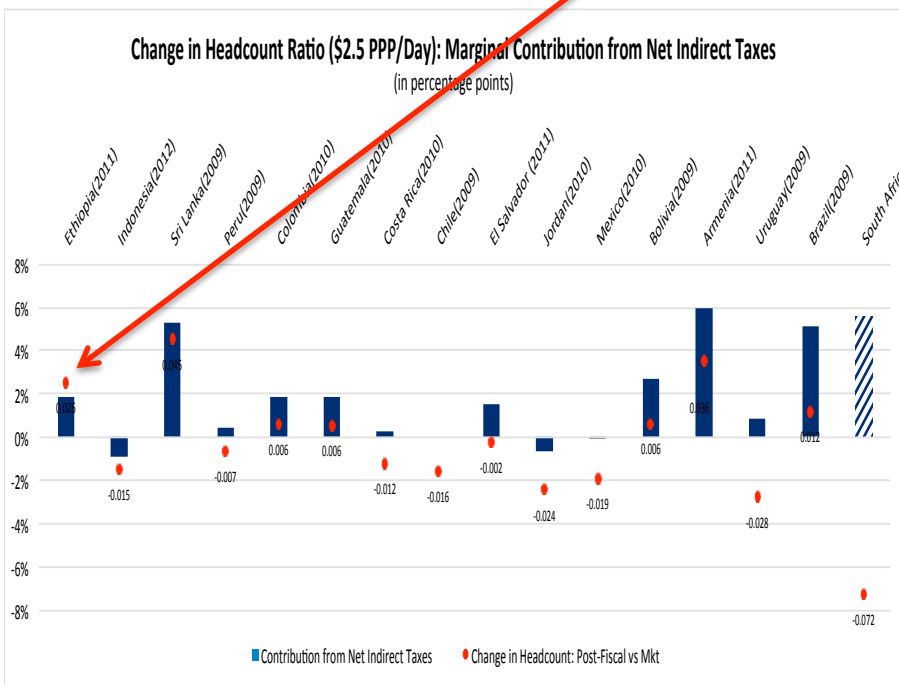


In Ethiopia, post-fiscal poverty is higher than pre-fisc poverty even when using the official US \$1.24 (daily ppp) moderate poverty (black line)

Ethiopia: Headcount Ratios



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



Source: Lustig (2015a)

Suppose you want to know...

Since many of the poor are net payers into the fiscal system:

- How pro-poor is the use of government education and health services?

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)	+			+					+	

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)	+		

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. 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)

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 Propósitos Múltiples, 2011 (I)
9. **Ethiopia:** Ethiopia Household Consumption Expenditure 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.

Thank you!