The Distributional Impact of Fiscal Policy
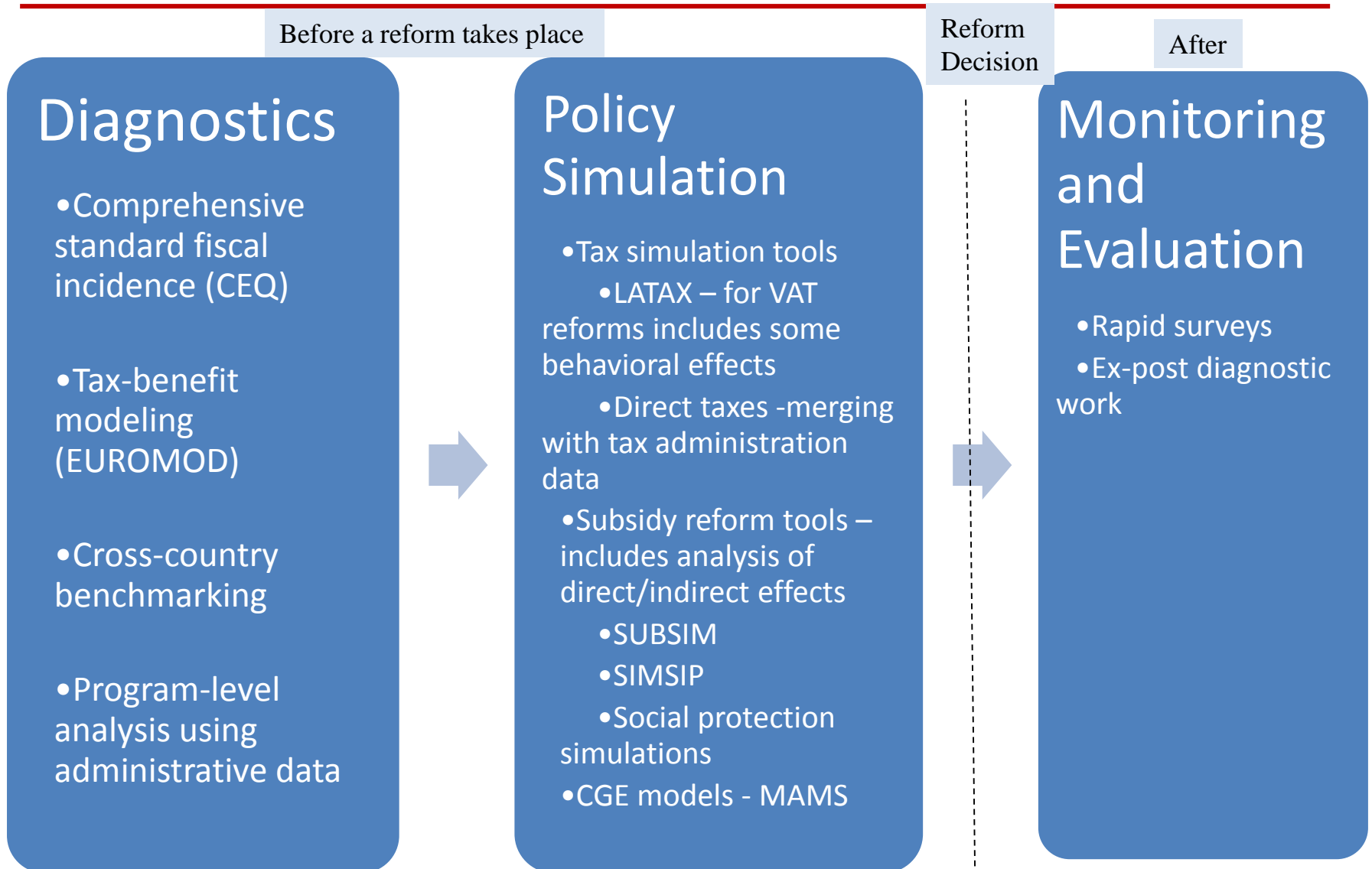
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The World Bank

July 23, 2015

The distributional impacts of fiscal policy

Before a reform takes place

Reform Decision

After

Diagnostics

- Comprehensive standard fiscal incidence (CEQ)

- Tax-benefit modeling (EUROMOD)

- Cross-country benchmarking

- Program-level analysis using administrative data

Policy Simulation

- Tax simulation tools
  - LATAX – for VAT reforms includes some behavioral effects
  - Direct taxes -merging with tax administration data
- Subsidy reform tools – includes analysis of direct/indirect effects
  - SUBSIM
  - SIMSIP
  - Social protection simulations
- CGE models - MAMS

Monitoring and Evaluation

- Rapid surveys
- Ex-post diagnostic work

Diagnostics: CEQ Approach

1. Incidence analysis
   - How progressive are taxes and spending overall and by individual categories?
   - How much redistribution and poverty reduction is being accomplished through social spending, subsidies and taxes?
   - Which socioeconomic groups bear the burden of taxes and who receives the benefits?
2. Effectiveness of tax and transfer policies.
3. Policy options

This approach is based on the methodology and findings of the Commitment to Equity project (CEQ) led by Nora Lustig, Professor of Economics at Tulane University.

www.commitmentoequity.org
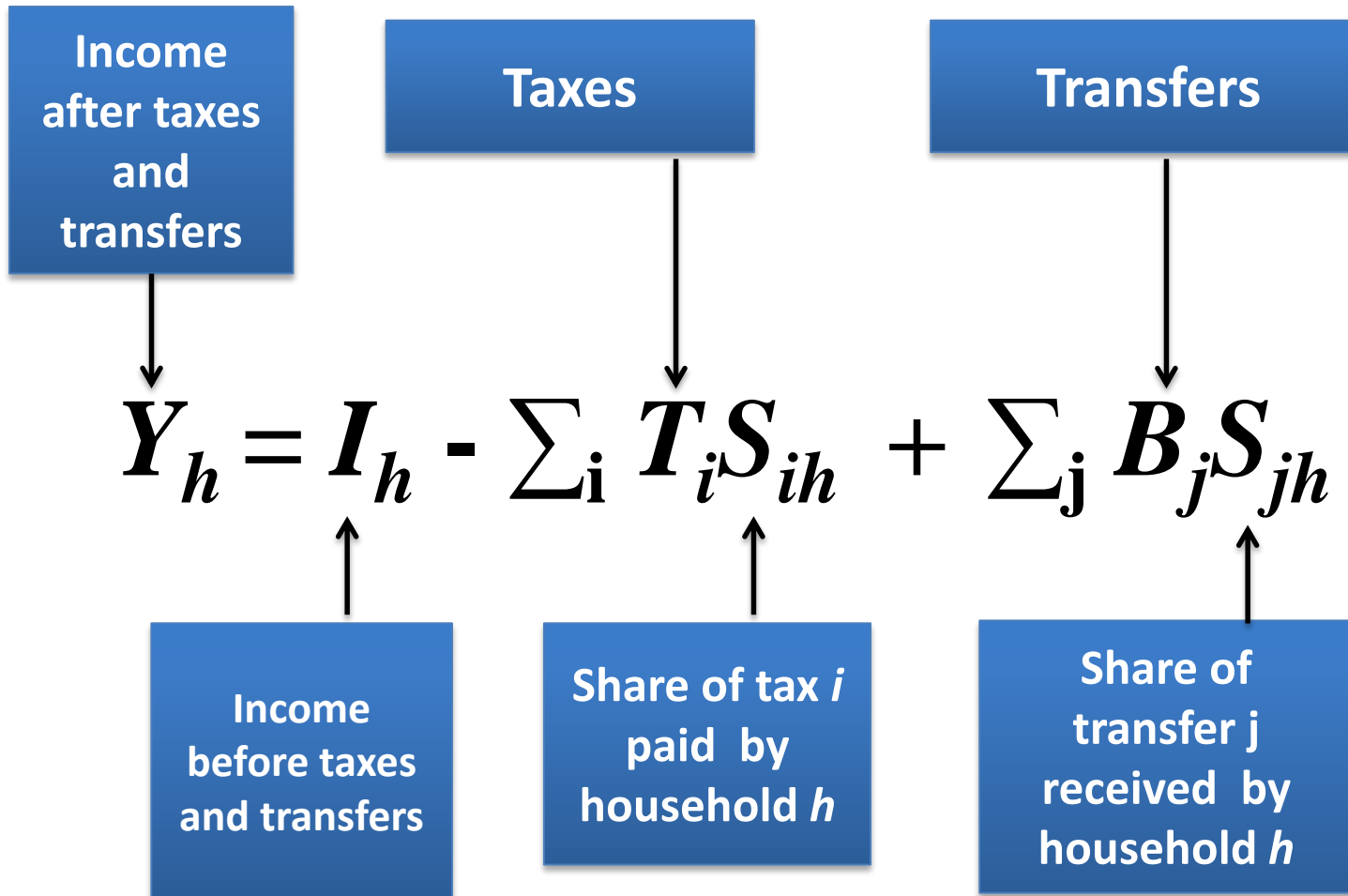
What is new?

3 C's:

- **C**omprehensiveness: assess both tax and expenditure policies
  - Including indirect subsidies and taxes and in-kind benefits in the form of free education and health care;

- **C**omparability: standard methodology across countries & over time.

- **C**redibility: Independent WB analysis with local academics/think tanks and Tulane University

Although the results are very recent, in some cases they have successfully informed the debate on fiscal and social policy reforms.
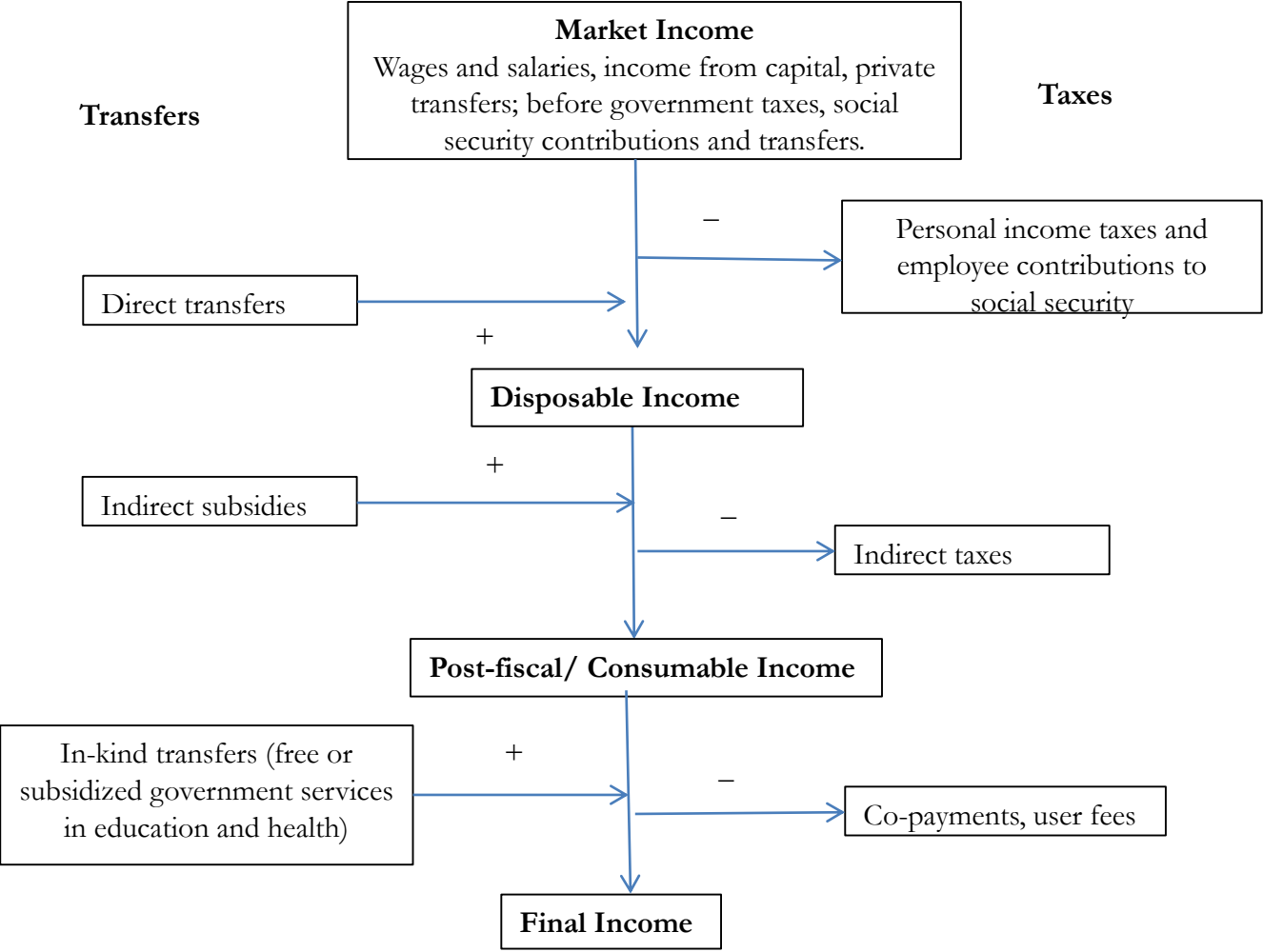
Incidence Analysis

- Standard incidence analysis without behavioral, lifecycle or general equilibrium effects.

- The focus is on average incidence rather than incidence at the margin.

- The analysis excludes some important taxes/other revenues and spending categories where methodologies are still to be fully developed.

Fiscal Incidence Equation

Income after taxes and transfers

Taxes

Transfers

$$Y_h = I_h - \sum_i T_i S_{ih} + \sum_j B_j S_{jh}$$

Income before taxes and transfers

Share of tax i paid by household h

Share of transfer j received by household h

6

Construction of Income Concepts

Market Income
Wages and salaries, income from capital, private transfers; before government taxes, social security contributions and transfers.

Transfers

Taxes

Direct transfers

Personal income taxes and employee contributions to social security

−

+

Disposable Income

+

Indirect subsidies

Indirect taxes

−

Post-fiscal/ Consumable Income

In-kind transfers (free or subsidized government services in education and health)

+

Co-payments, user fees

−

Final Income

Source: Lustig and Higgins (2013).

CEQ Assessment: Fiscal Interventions

- Typically includes:
  - Direct taxes
  - Direct cash transfers
  - Non-cash direct transfers such as school uniforms and breakfast
  - Contributions to pensions and social insurance systems
  - Indirect taxes on consumption
  - Indirect subsidies
  - In-kind transfers such as spending on education and health

Valuation of Public Services: Education and Health

- Valuation of public spending on education and health follows the so-called 'government cost' approach.

- Uses per beneficiary input costs obtained from administrative data as the measure of marginal benefits.

- This approach—also known as 'classic' or 'nonbehavioral 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 full cost?

Source: Lustig and Higgins (2013).
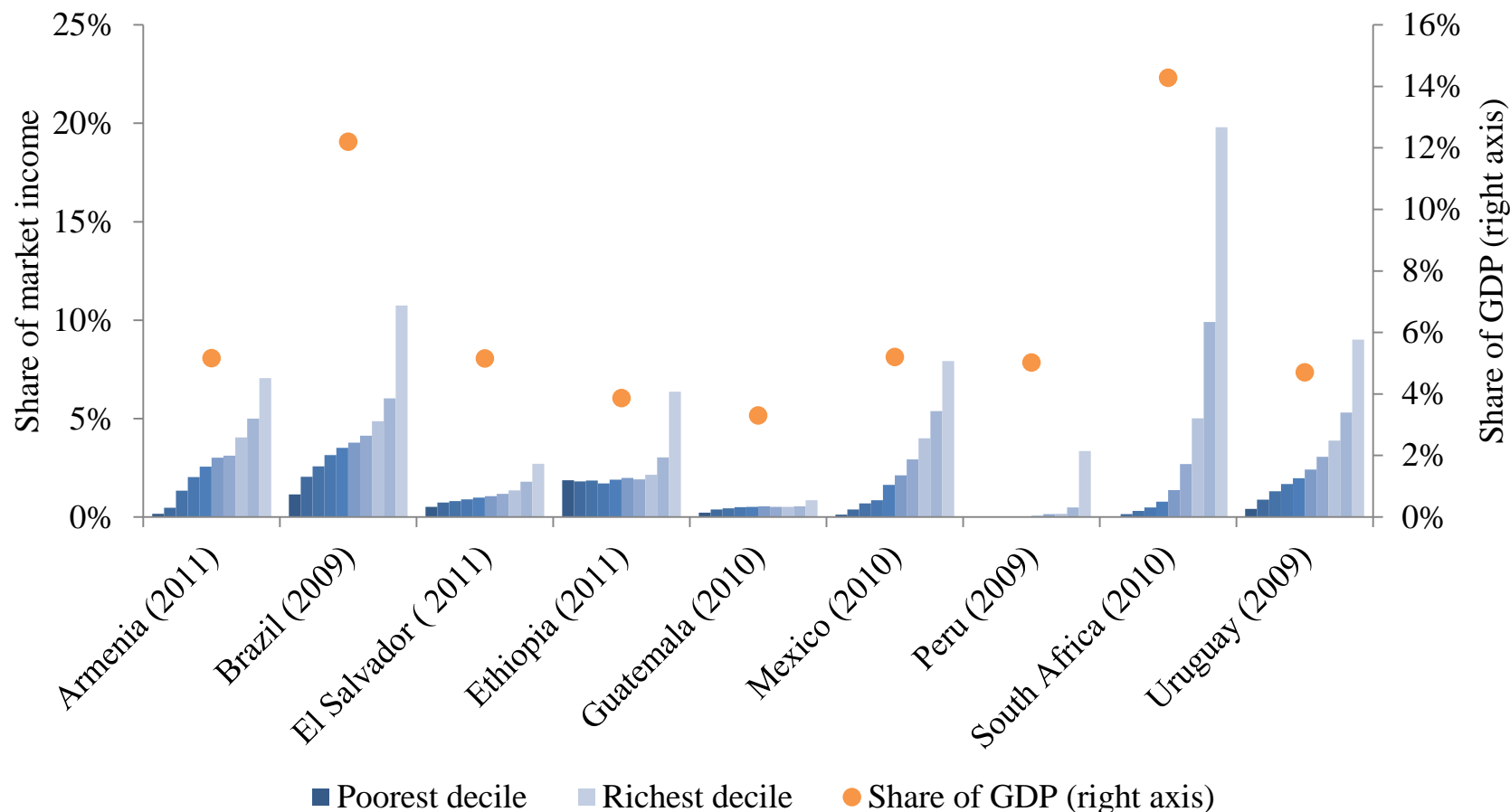
Challenges

- How to treat contributory pensions?

- How to account for informality?

- How to account for the difference between national income accounts and household surveys?

- Estimating the direct/indirect effects of indirect taxes and subsidies

Single Intervention: Tax

- Progressivity measures

  ➢ Concentration curve

  ➢ Concentration coefficient

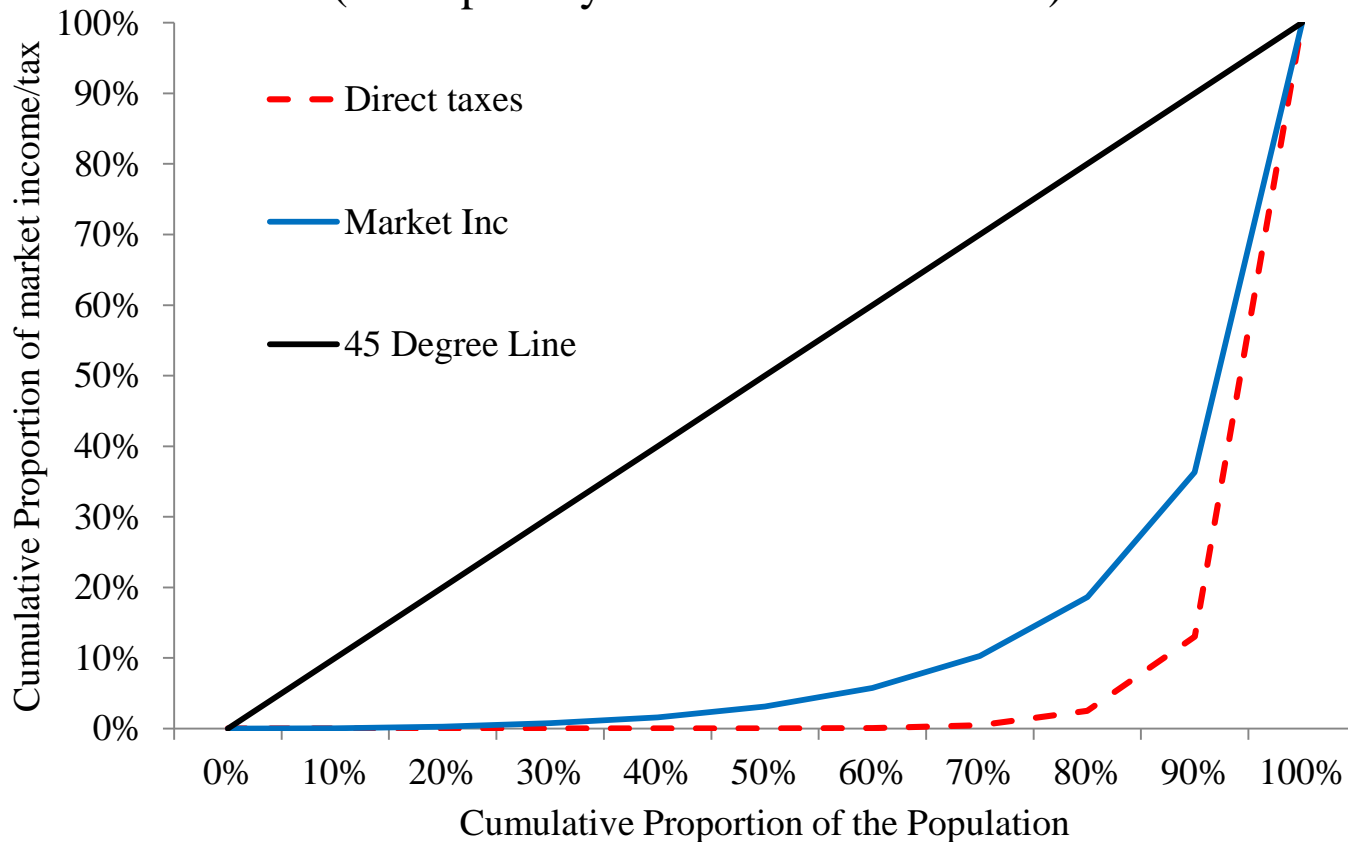 ➢ Kakwani Index

Direct taxes are typically progressive,…

Incidence of direct taxes by market income deciles

Legend: ■ Poorest decile ■ Richest decile ● Share of GDP (right axis)

…with most of the tax burden falling at the top of the distribution…

South Africa Concentration Curves of Direct Taxes
(share paid by market income deciles)

Legend:
- Direct taxes (red dashed)
- Market Inc (blue)
- 45 Degree Line (black)

Y-axis: Cumulative Proportion of market income/tax
X-axis: Cumulative Proportion of the Population

Concentration Coefficient: CC

Vertical Axis:
Cumulative proportion of income, tax or transfer

$$\text{Gini} = A/(A+B)$$

$$CC = A/(A+B)$$

Line of equality

Gini coefficient/concentration index

Lorenz/concentration curve

A

B

Cumulative proportion of population ranked by income
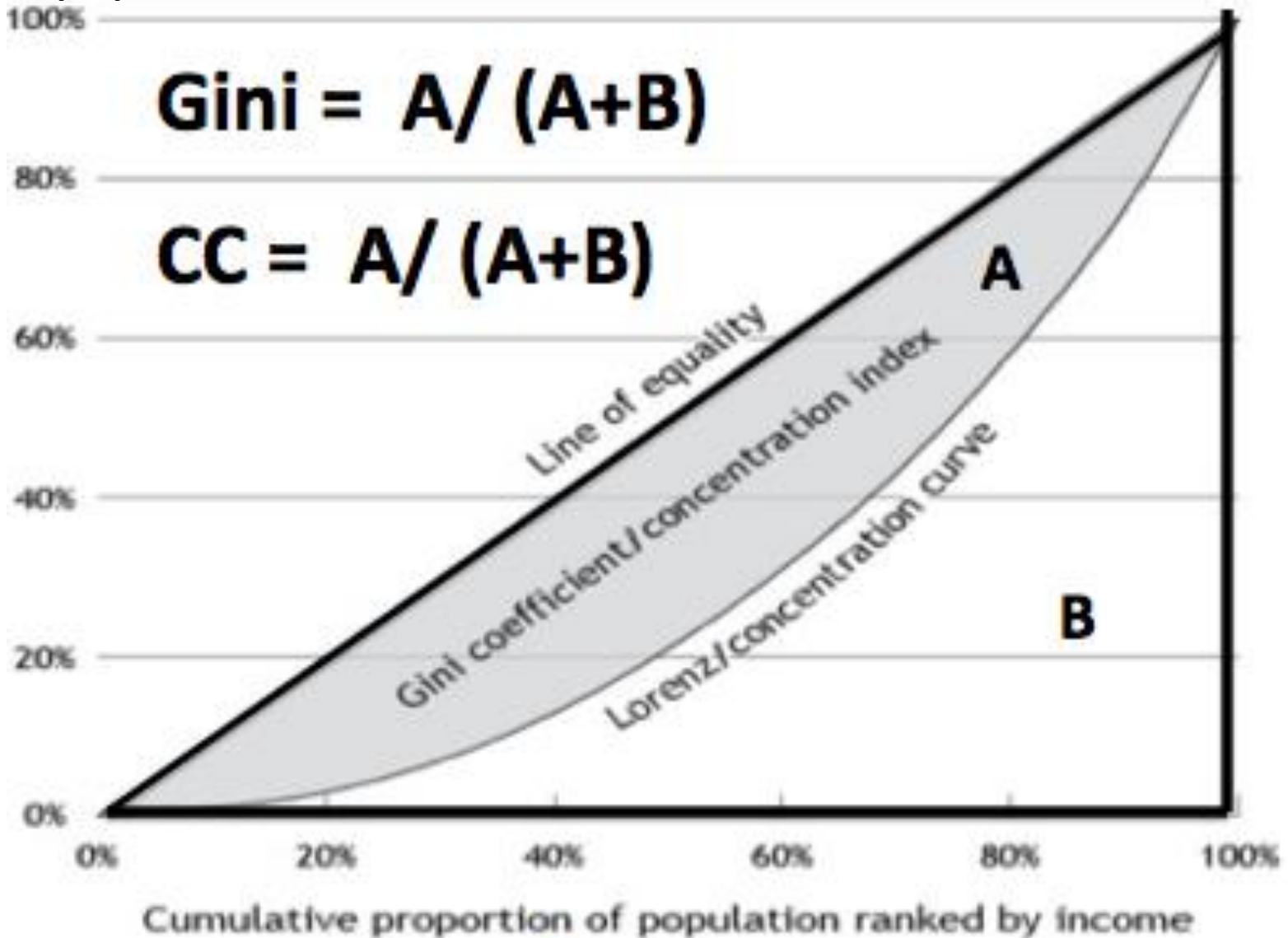
Kakwani Index: Tax

The Kakwani index of progressivity of a tax t is defined as:

$$K_t = CC_t - G_x$$

Where:

- G_x is the Gini coefficient of pre-tax income

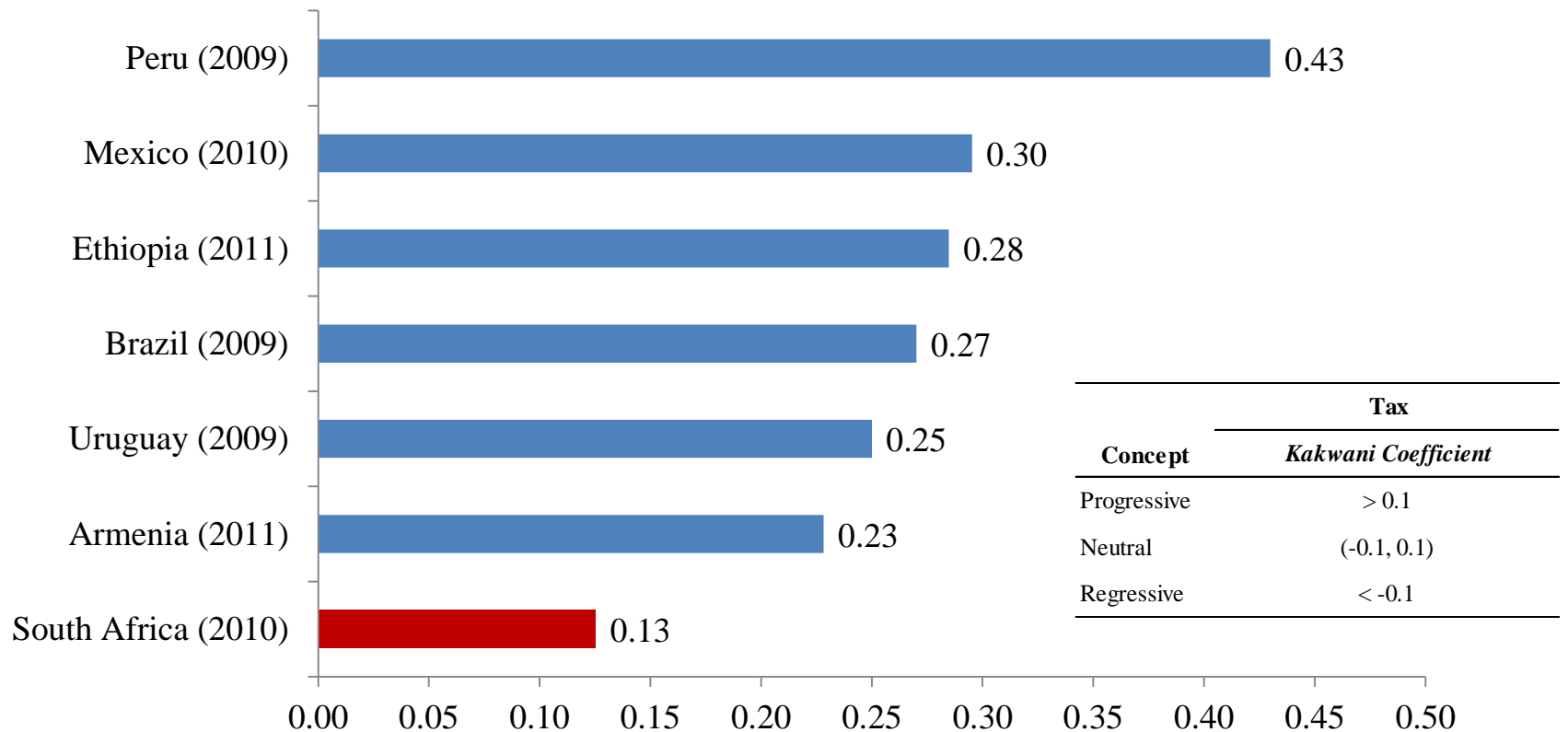- CC_t is the concentration coefficient of the tax t

Kakwani Index

➢**Progressive Tax:** $\quad K_t = CC_t - G_x > 0$

➢**Proportional Tax:** $\quad K_t = CC_t - G_x = 0$

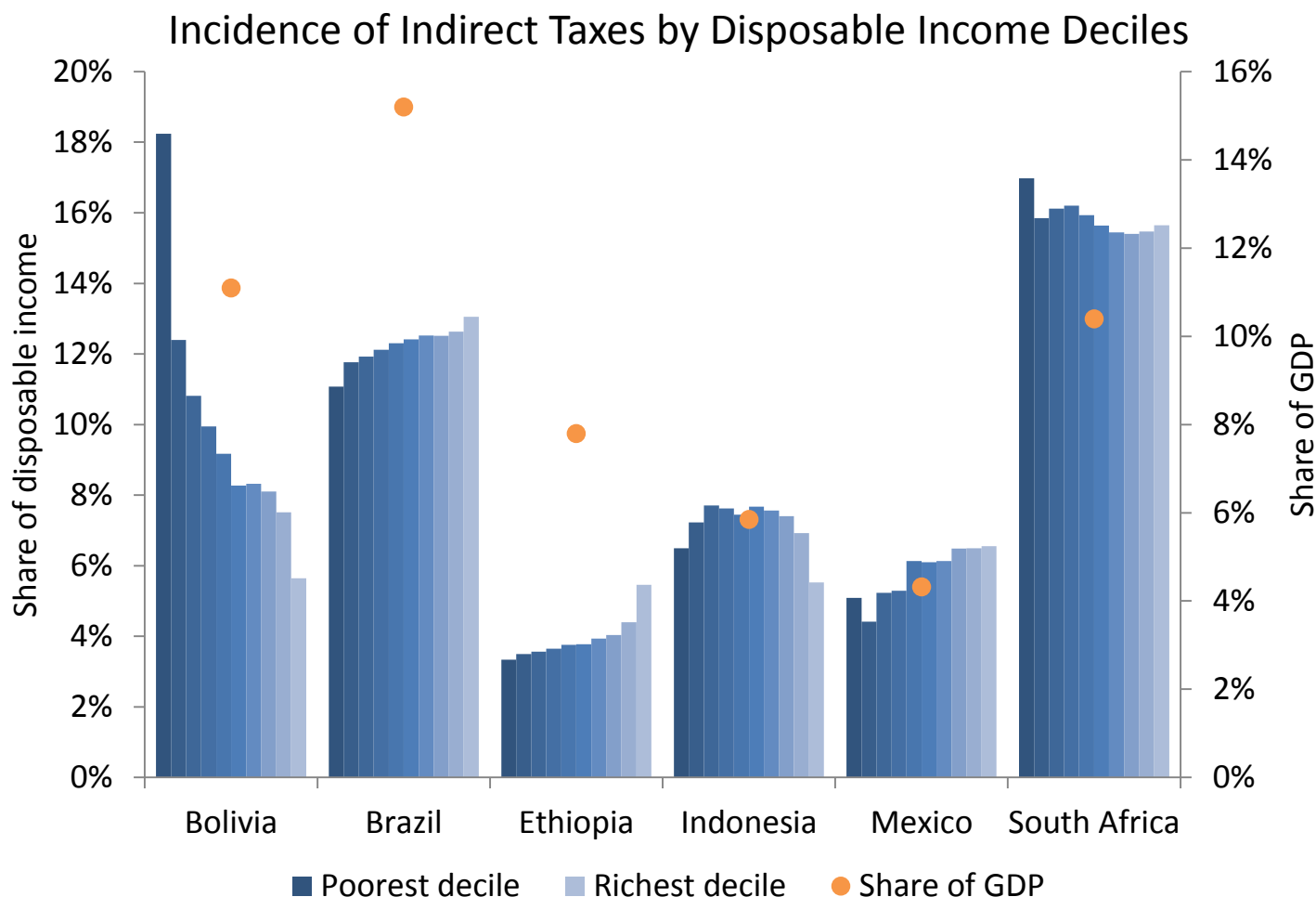➢**Regressive Tax:** $\quad K_t = CC_t - G_x < 0$

…but relative to its market income inequality, it is less so than in other countries.

Progressivity of South Africa's Direct Tax System: The Kakwani Coefficient

Concept	Tax Kakwani Coefficient
Progressive	> 0.1
Neutral	(-0.1, 0.1)
Regressive	< -0.1

Chart values:
- Peru (2009): 0.43
- Mexico (2010): 0.30
- Ethiopia (2011): 0.28
- Brazil (2009): 0.27
- Uruguay (2009): 0.25
- Armenia (2011): 0.23
- South Africa (2010): 0.13

Sources: Armenia (Younger et al, 2014), Brazil (Higgins and Pereira, 2014), Ethiopia (Woldehanna et al, 2014), Mexico (Scott, 2014), Peru (Jaramillo, 2014), Uruguay (Bucheli et al, 2014), and South Africa (Inchauste et al, 2015).

In contrast, indirect taxes are slightly regressive on account of excise taxes

Incidence of Indirect Taxes by Disposable Income Deciles

Legend: ■ Poorest decile ■ Richest decile ● Share of GDP
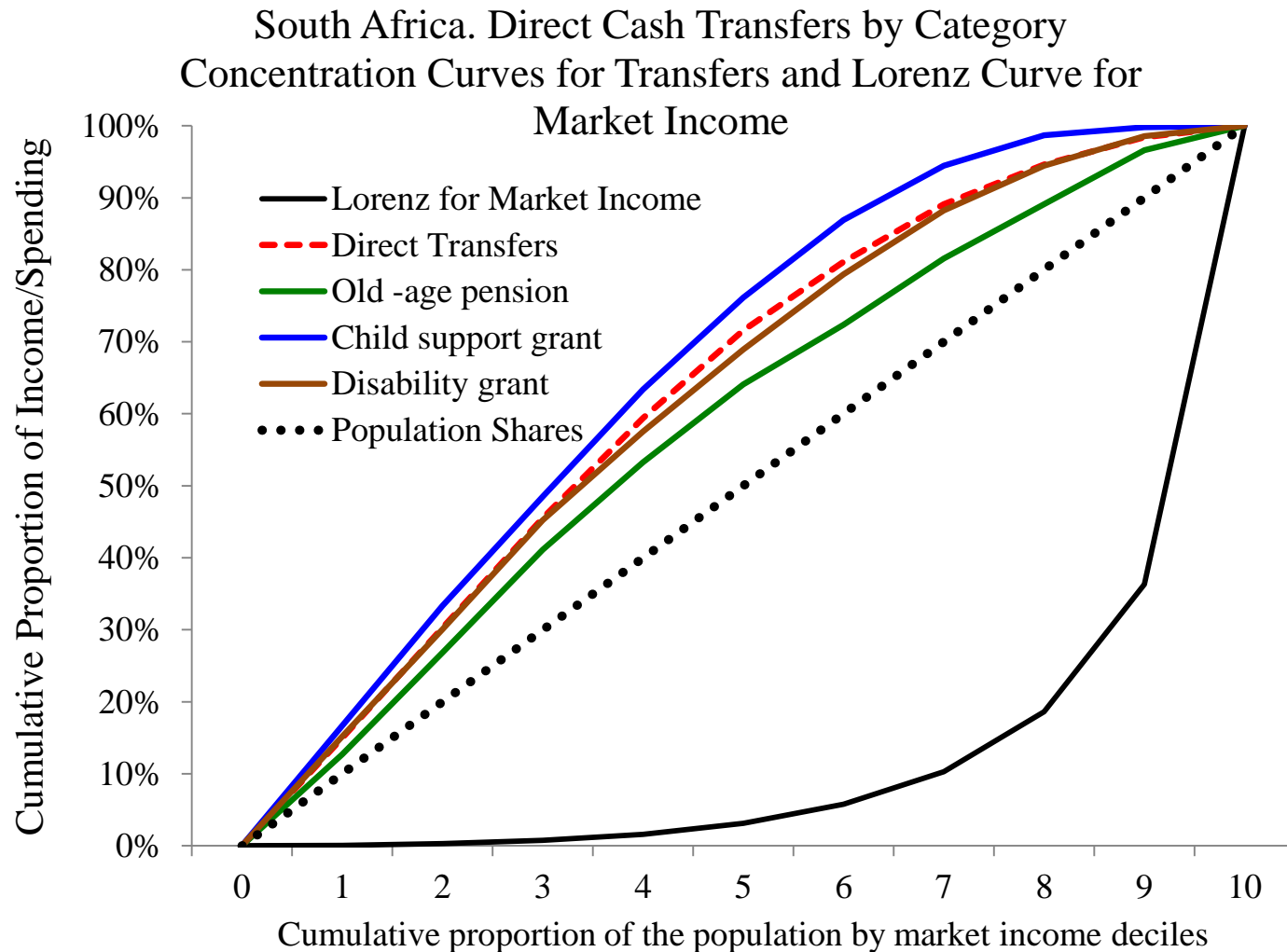
Impact on Inequality Depends On…

o Progressivity of the tax or the transfer

o Level of the tax or the transfer

➢ A large regressive tax can be more equalizing than a small progressive –see next slide

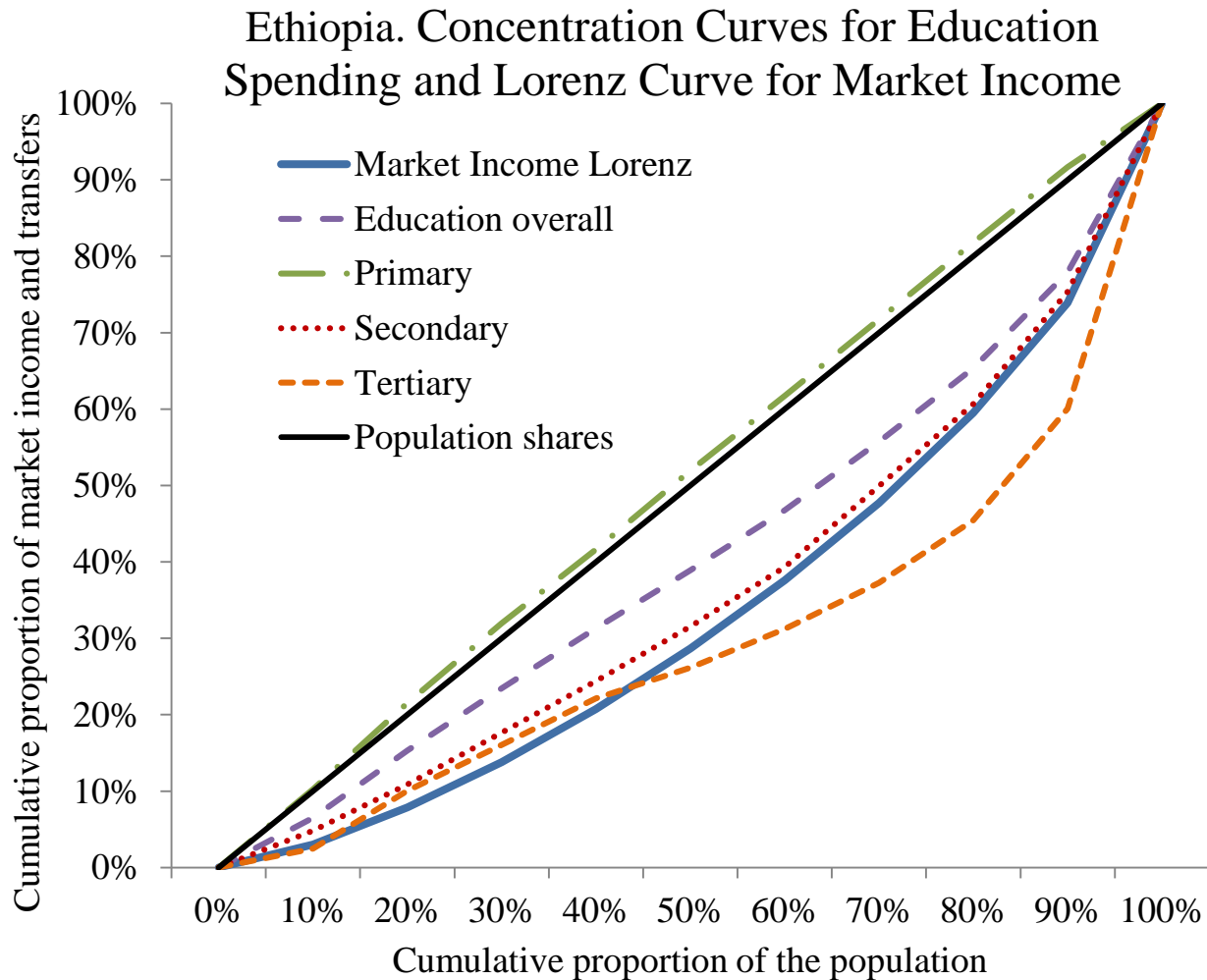## Redistributive Effect and the Progressivity and Level of Taxes

	Gross Income		Tax A=50.5%		Net Income under A		Tax B=1%		Net Income under B	
	Income	Distribution	Tax	Distribution	Income	Distribution	Tax	Distribution	Income	Distribution
1	21	21%	1	2%	20	40%	0	0%	21	21%
2	80	79%	50	98%	30	60%	1	100%	79	79%
Total	101	100%	51	100%	50	100%	1	100%	100	100%

Source: Duclos and Tabi, 1996, Table 1.

Direct cash transfers are absolutely progressive…

South Africa. Direct Cash Transfers by Category
Concentration Curves for Transfers and Lorenz Curve for
Market Income

Legend:
- Lorenz for Market Income
- Direct Transfers
- Old -age pension
- Child support grant
- Disability grant
- Population Shares

Y-axis: Cumulative Proportion of Income/Spending
X-axis: Cumulative proportion of the population by market income deciles

Sources: Inchauste et al (2015)

However, that is not always the case for health and education spending,…

Ethiopia. Concentration Curves for Education Spending and Lorenz Curve for Market Income

Legend:
- Market Income Lorenz
- Education overall
- Primary
- Secondary
- Tertiary
- Population shares

X-axis: Cumulative proportion of the population
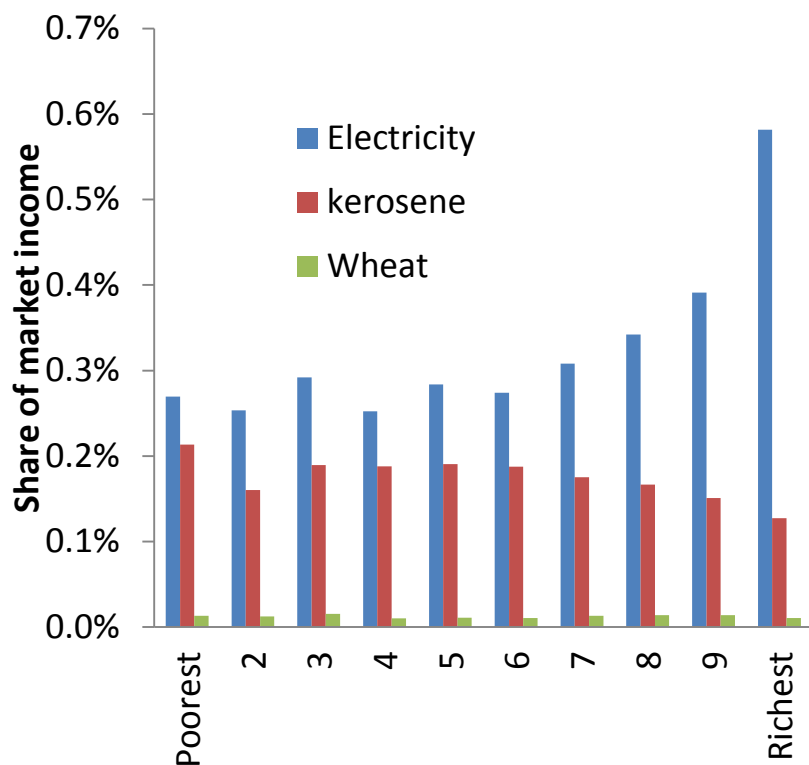Y-axis: Cumulative proportion of market income and transfers
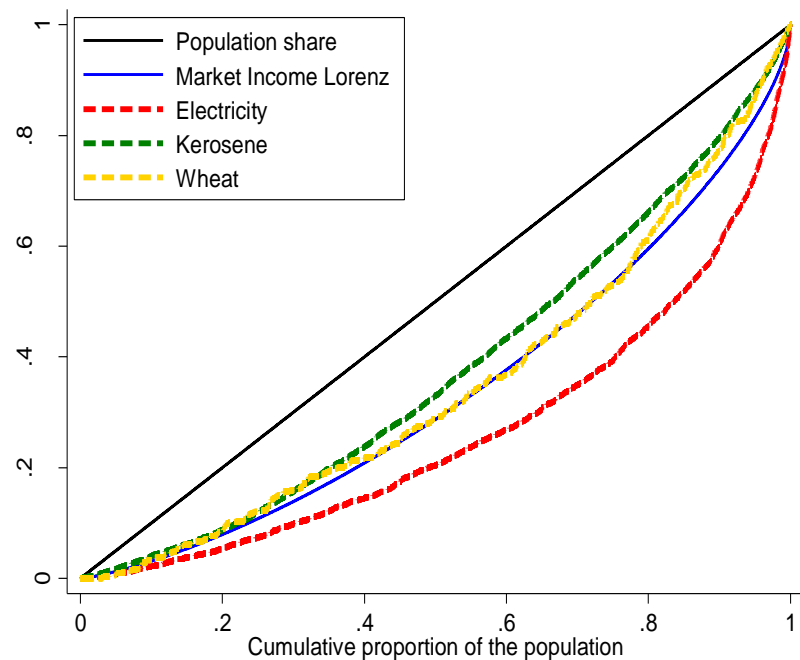
Source: Woldehanna et al (2014)

Ethiopia. Incidence and Concentration Curves for Indirect subsidies

Incidence of Indirect Subsidies
**(share of benefits by market income decile)**

Concentration curves

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 and the reduction in inequality be larger with the tax than without it
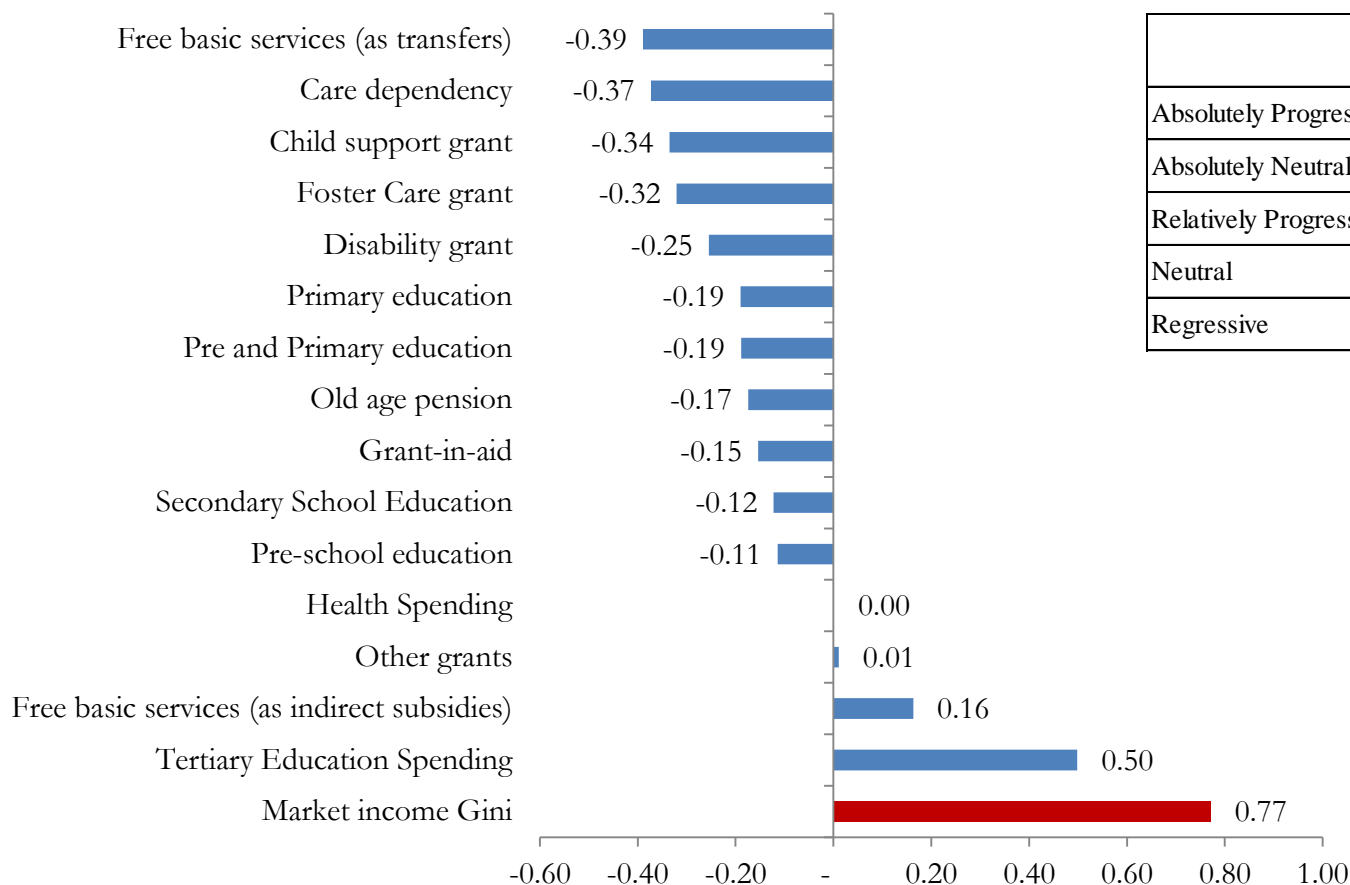
Who benefits from health spending?
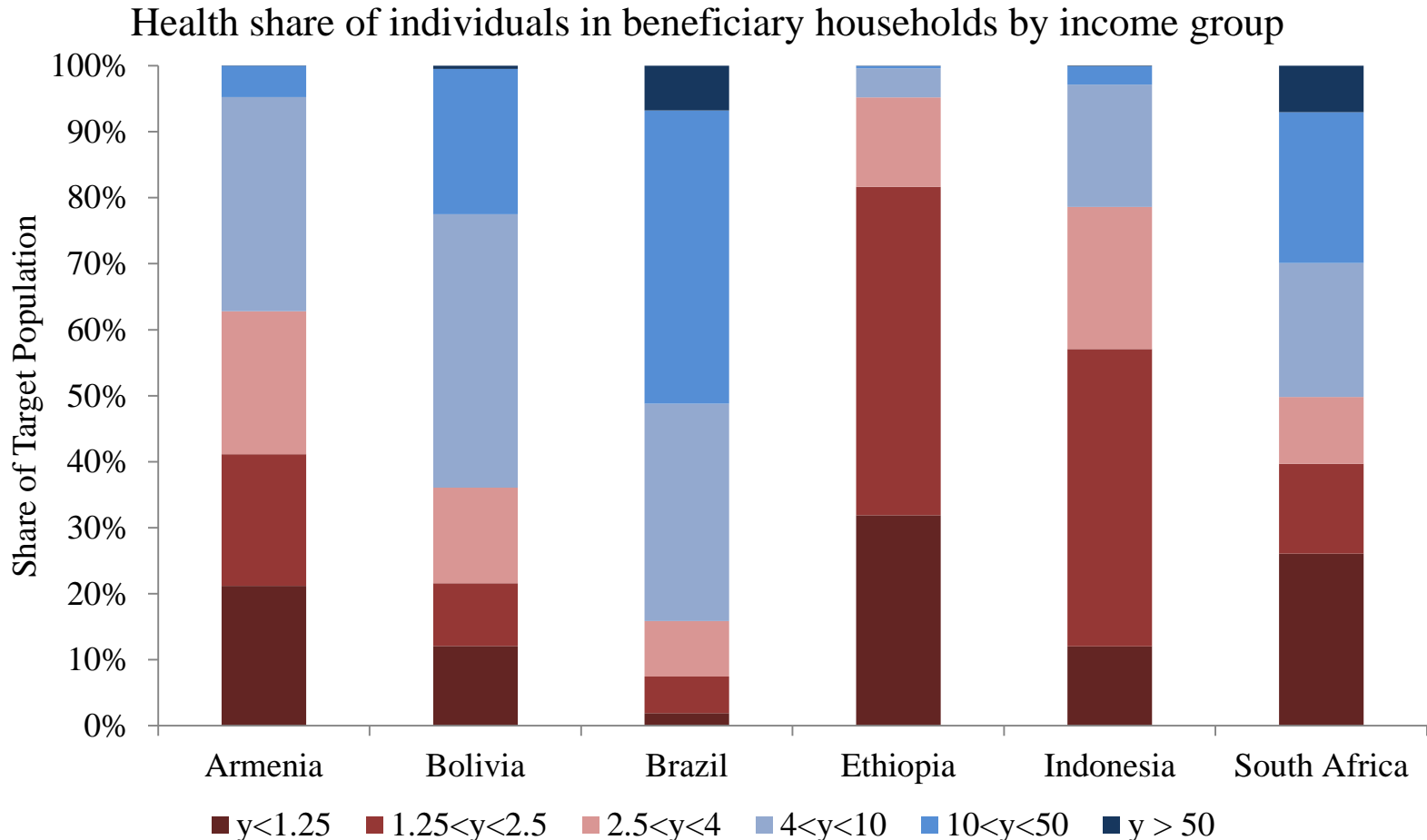
Health share of individuals in beneficiary households by income group

Understanding the incidence of social spending as a whole

South Africa. Concentration coefficients for Spending

	Concentration Coefficient
Absolutely Progressive	<-0.1
Absolutely Neutral	(-0.1, 0.1)
Relatively Progressive	> 0.1&<Gini
Neutral	> 0.1&=Gini
Regressive	>Gini

Chart values:
- Free basic services (as transfers): -0.39
- Care dependency: -0.37
- Child support grant: -0.34
- Foster Care grant: -0.32
- Disability grant: -0.25
- Primary education: -0.19
- Pre and Primary education: -0.19
- Old age pension: -0.17
- Grant-in-aid: -0.15
- Secondary School Education: -0.12
- Pre-school education: -0.11
- Health Spending: 0.00
- Other grants: 0.01
- Free basic services (as indirect subsidies): 0.16
- Tertiary Education Spending: 0.50
- Market income Gini: 0.77

Source: Own estimates using IES, 2010/11.

Mexico. Concentration Coefficients of Public Benefits: 2010

Legend
- **Education Spending**
- **Health Spending**
- **Targeted Transfer**
- Other Social Assistance
- **Non-Contributory Pension**
- **Contributory Pension**
- **Subsidy**
- **Gini**

Category	Value
Oportunidades	-0.54
IMSS-Oportunidades	-0.54
Piso Firme (PAZAP)	-0.48
Programa de Empleo Temporal (PET)	-0.44
Seguro Popular	-0.39
Adultos Mayores (Federal)	-0.38
SSA Centros	-0.34
Primary Education Spending	-0.24
Pre-school Education Spending	-0.21
Lower Secondary Education Spending	-0.15
DIF Feeding Programs	-0.14
Vivienda (Tu Casa)	-0.12
Otros Dirigidos	-0.11
Procampo	-0.10
Liconsa (Milk)	-0.06
Total CEQ Social Spending	-0.05
Hábitat	-0.01
Upper Secondary Education Spending	0.02
Opciones Productivas	0.10
Total Redistributive Spending	0.12
Electricity Subsidy	0.14
VAT Exemptions	0.25
Employment Subsidy	0.26
Gas Subsidy (LP)	0.28
IMSS Health	0.28
Tertiary Education Spending	0.31
Other Scholarships	0.43
Final Income Gini	0.43
Final Income* Gini	0.44
Gasoline Subsidy (IEPS)	0.46
Adultos Mayores (DF)	0.46
PEMEX, FA Health	0.46
Post-Fiscal Income Gini	0.49
ISSSTE Health	0.49
Disposable Income Gini	0.49
Net Market Income Gini	0.50
Market Income Gini	0.51
IMSS Pensions	0.62
ISSSTE Pensions	0.74

Concentration Coefficient (or Gini when specified)

Source: Scott (2013).

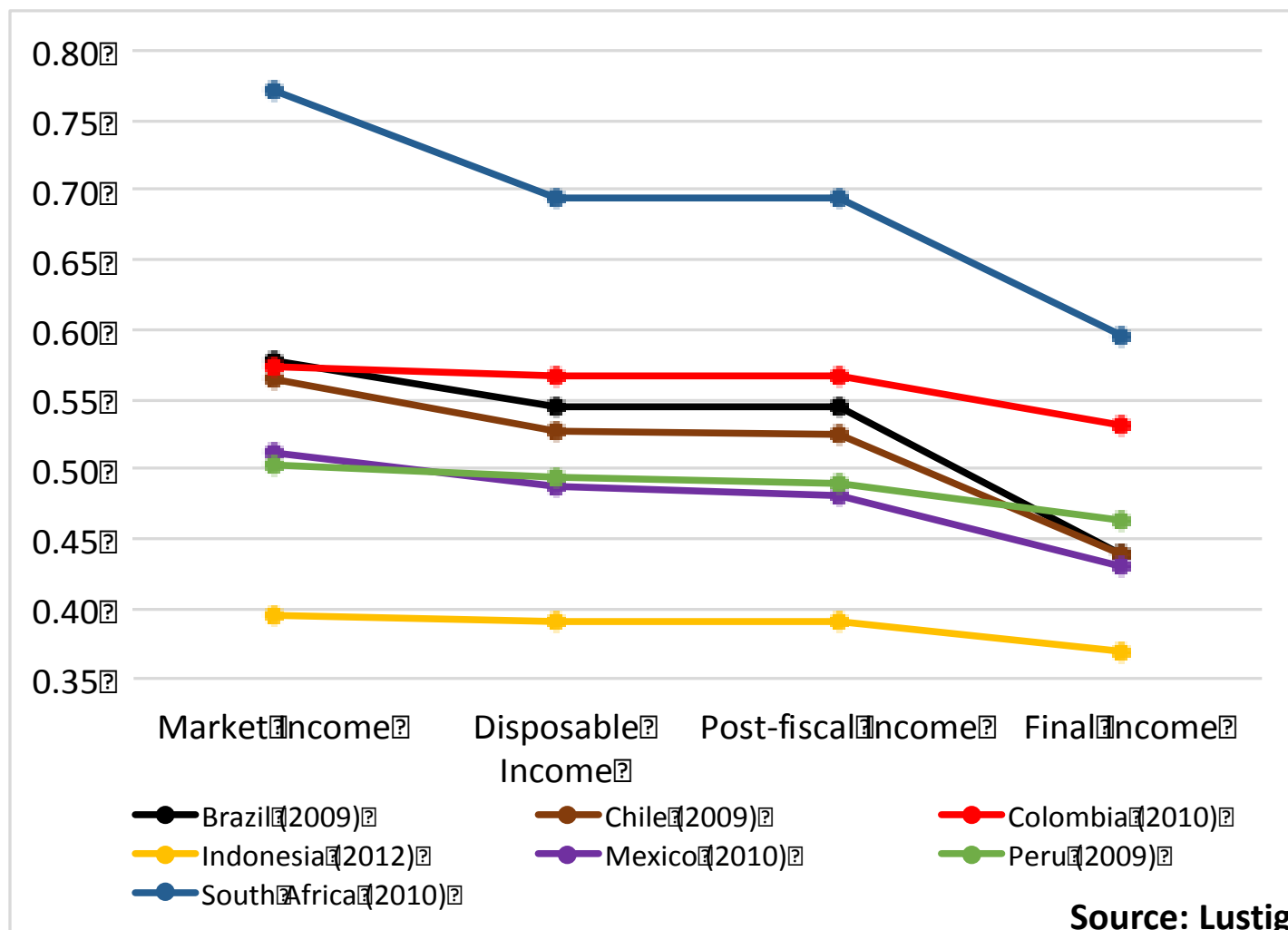# Ethiopia: overall incidence of spending
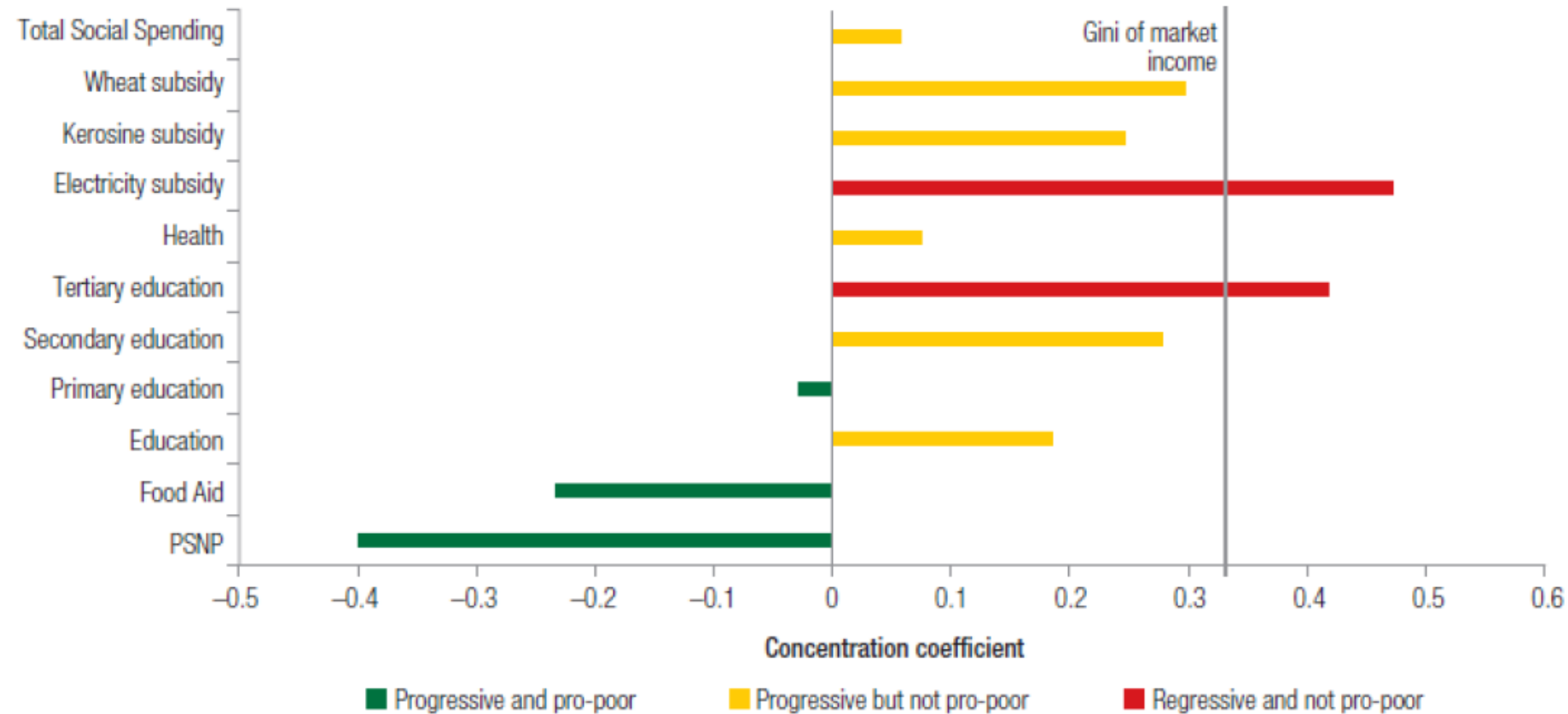
Source: Ethiopia Poverty Assessment (2015).

What is the net impact of taxes and government transfers on poverty and inequality?

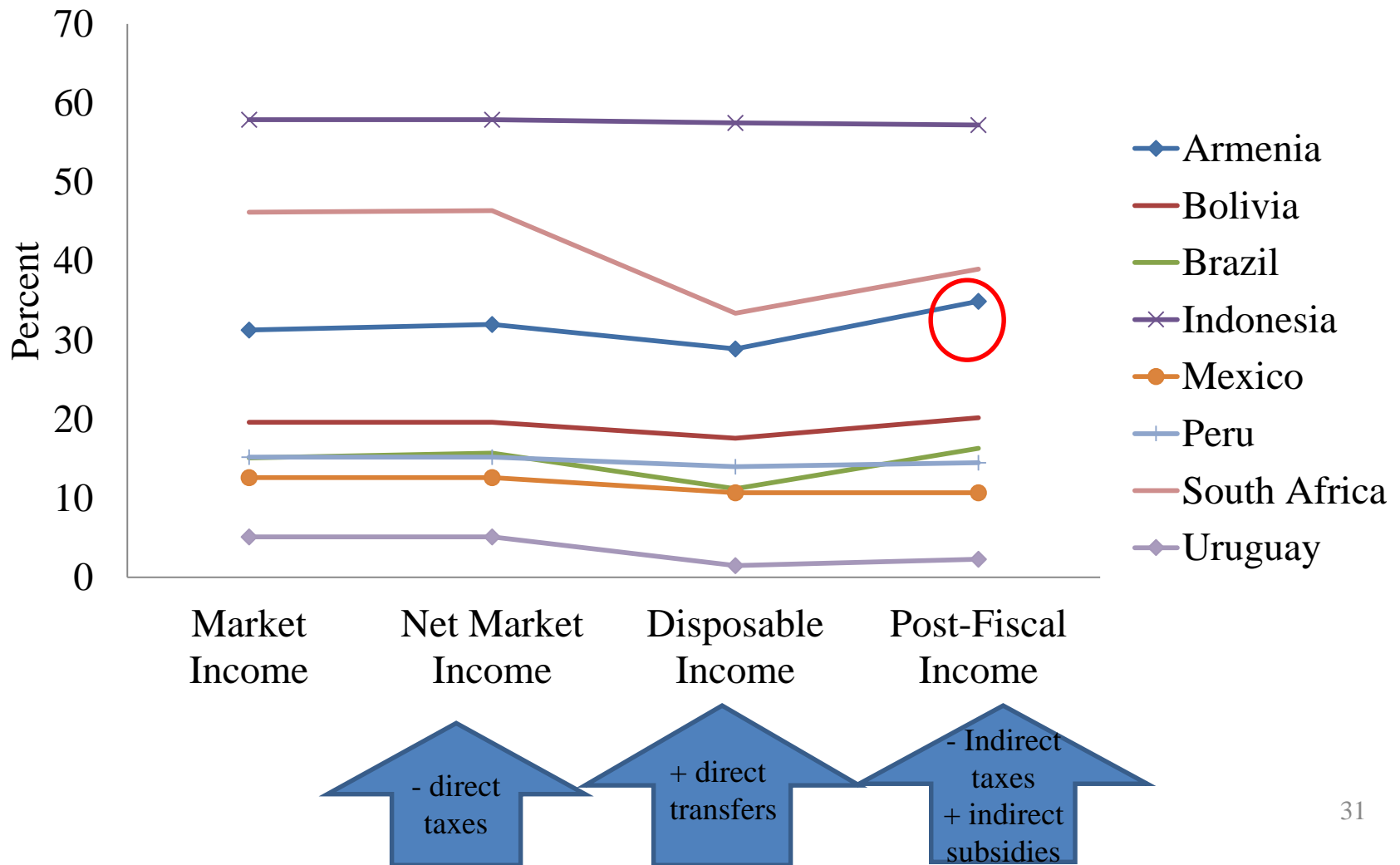# Fiscal Redistribution: Brazil, Chile, Colombia, Indonesia, Mexico and South Africa

Gini Coefficient, circa 2010

Source: Lustig (2015a)

With the effect on poverty larger than other middle income countries.
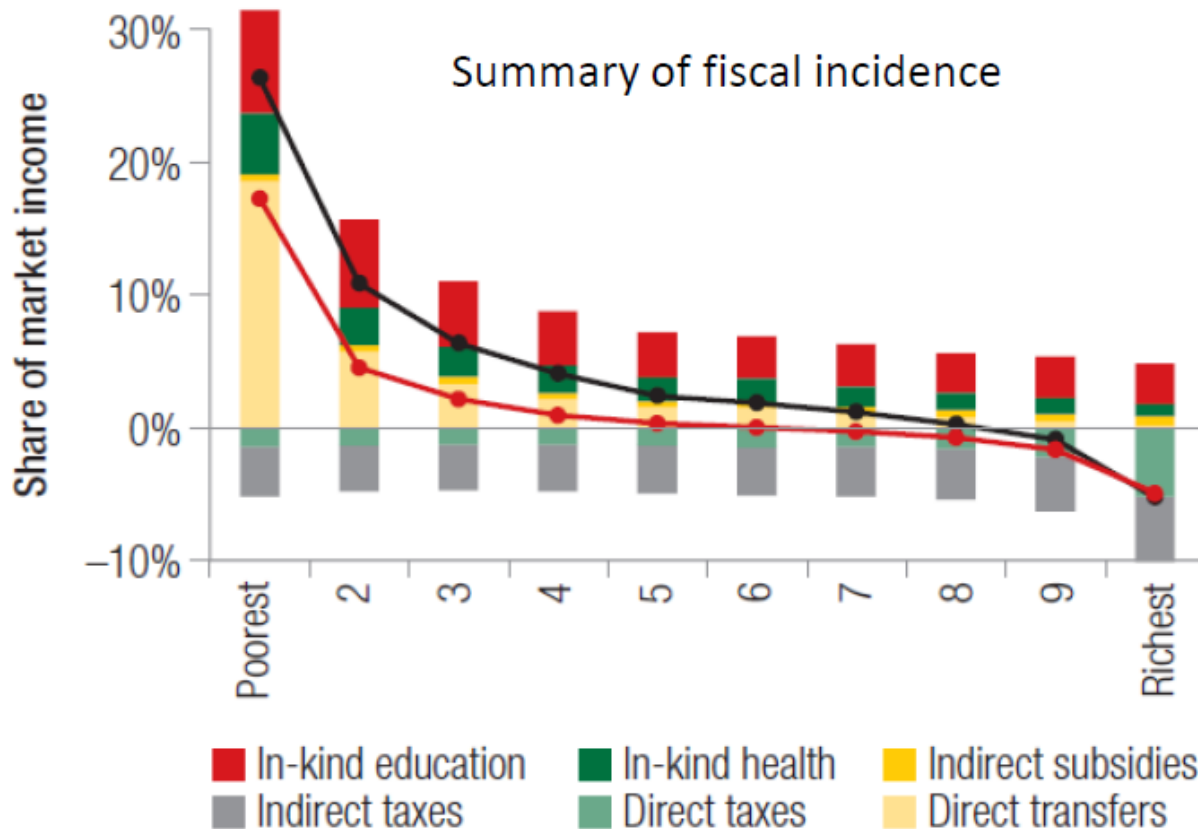
Poverty Headcount at $2.50 per day (PPP)

Legend: Armenia, Bolivia, Brazil, Indonesia, Mexico, Peru, South Africa, Uruguay

X-axis: Market Income, Net Market Income, Disposable Income, Post-Fiscal Income

Arrows: - direct taxes | + direct transfers | - Indirect taxes + indirect subsidies

Does the combination of existing taxes and transfers makes some poor poorer?

Example: Fiscal Mobility Matrix for Brazil

	After taxes and transfers groups						% of Pop.	Mean Income
Before taxes and transfers groups	< 1.25	1.25– 2.50	2.50– 4.00	4.00– 10.00	10.00– 50.00	> 50.00		
< 1.25	69%	21%	6%	3%			5.7%	$0.74
1.25– 2.50	4%	81%	10%	4%			9.6%	$1.89
2.50– 4.00		15%	75%	9%	1%		11.3%	$3.24
4.00– 10.00			11%	86%	3%		33.6%	$6.67
10.00– 50.00				15%	85%		35.3%	$19.90
> 50.00					32%	68%	4.5%	$94.59
% of Pop.	4.3%	10.7%	13.5%	35.8%	32.5%	3.2%	100%	$14.15
Mean Income	$0.86	$1.91	$3.25	$6.61	$19.34	$88.70	$12.17	

Source: Lustig and Higgins (2012).

In Ethiopia, fiscal policy reduces poverty and inequality but at a cost to some who are poor

Summary of fiscal incidence

Legend:
- In-kind education
- In-kind health
- Indirect subsidies
- Indirect taxes
- Direct taxes
- Direct transfers

- The poorest 80% benefit from fiscal policy when all benefits are taken into account (solid black line)

- However, some of the poorest do not benefit: 9% of households are impoverished—made poor or were poor and made poorer—by fiscal policy

Source: Ethiopia Poverty Assessment (2015).

Data and Information Requirements

Data

- Household level, income and expenditure data.

- Total government spending on each of the different types of health and education services in the household survey.

- National Accounts data on spending per student for each level of education; as well as data on the number of beneficiaries for targeted transfers.

- Economic and functional classification of Government revenue and expenditure over the last decade.

Background information:

- Poverty and Inequality Trends over the past decade

- Macroeconomic Performance over the past decade.

- Detailed description of Tax Policy, including tax rates, tax base, exemptions, and zero ratings for all taxes and fees (including tax expenditures)

- Detailed description of Contributory Pension System, Flagship Cash Transfer Programs (including non-contributory pensions), Price Subsidies (Consumer and Producer), Public Education System, Public Health System, Public Housing Subsidies

Lessons & The Way Forward

- Timing
  - Typically takes several months to complete
  - We aim to time these analyses appropriately so that they can feed our policy dialogue

- Team composition
  - In most countries we have strong client government and local involvement in the form of academics and/or think tanks who directly contribute to the analysis.
  - Inside the Bank, our macro and poverty economists work together to ensure that the fiscal system is accurately represented from both the macro and micro point of view. The team also benefits from inputs from sectoral colleagues to ensure we have the best information and most in-depth understanding of each of the different sectors being analyzed.

What Next?

- Enhance our capacity to undertake policy simulations.
  - This involves ensuring that we can complement the diagnostic picture with more sophisticated models that allow for behavioral responses give alternative reform scenarios.

- Fill existing knowledge gaps
  - In order to capture the top earners we have some good experiences merging tax administration data with Household Survey to better capture the full income distribution.
  - We hope to extend our diagnostic capacity to estimate the incidence of corporate taxes and infrastructure spending
  - We also hope to be able to better handle quality of spending concerns

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