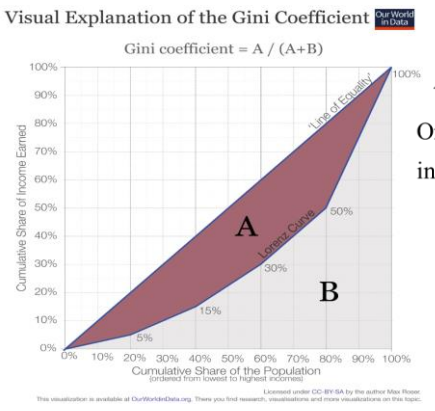
*7.2 How about Pure Inequality?: Ginis and Lorenz - World and Brazil

Marcelo Neri
FGV Social

Gini Index and Lorenz Curve

Graph from the Lorenz Curve L(P)



Analytical Interpretation

Once there are $\frac{N\,(N-1)}{2}$ distinct pairs of people in the sample, Gini's formula is:

$$\gamma = \frac{1}{\mu N(N-1)} \sum_{i>j}^{N} \sum_{j}^{N} |x_i - x_j|$$

Alternative Formula

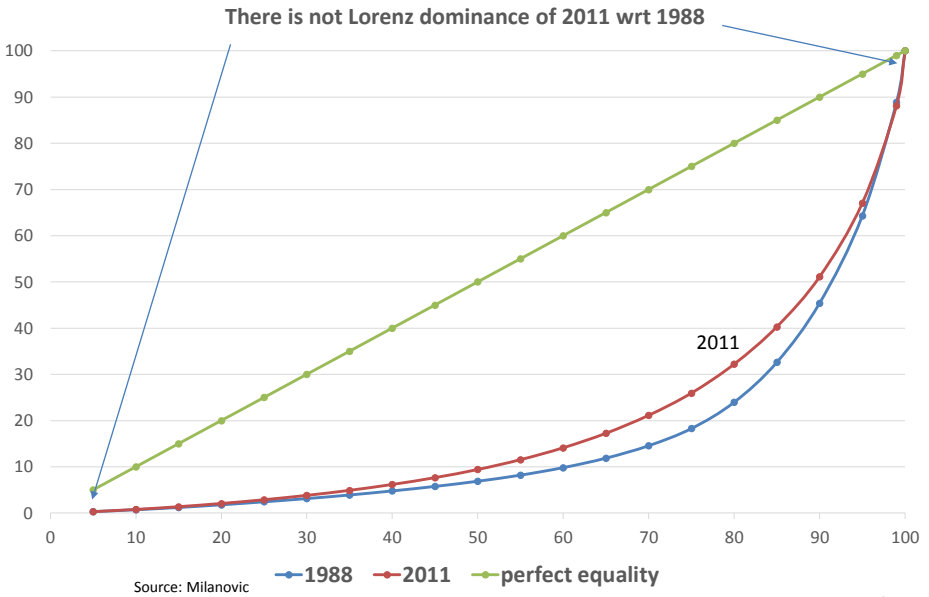
$$\gamma = \frac{N+1}{N-1} - \frac{2}{N\,(N-1)\mu} \sum_{i=1}^{N} \rho_i\, x_i$$

Aggregated Level Analysis of Welfare Function (BES) based on the Gini (δ)

Sen (1976): $\mu\,(1 - \delta)$

Graff (1981): $\mu\,(1 - \delta)^{\rho}$, where $\rho \in [0, 1]$.

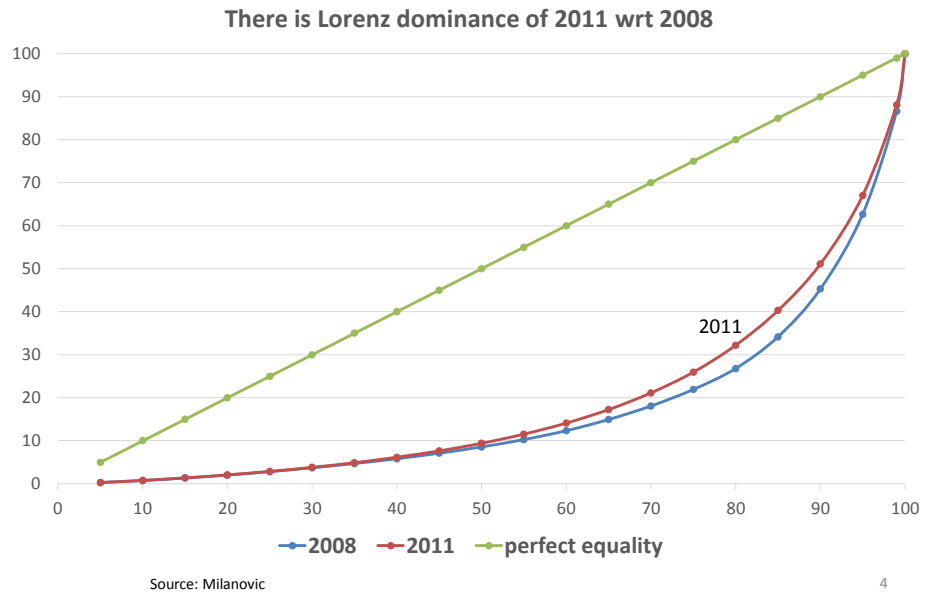
Lorenz curves 1988 and 2011 - Global



Source: Milanovic

3

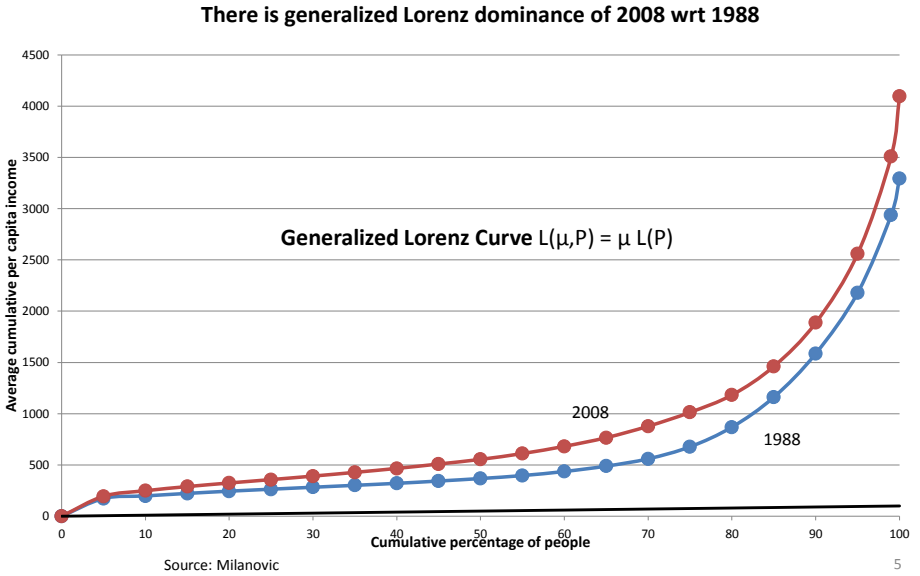
Lorenz curves 2008 and 2011 - Global



Source: Milanovic

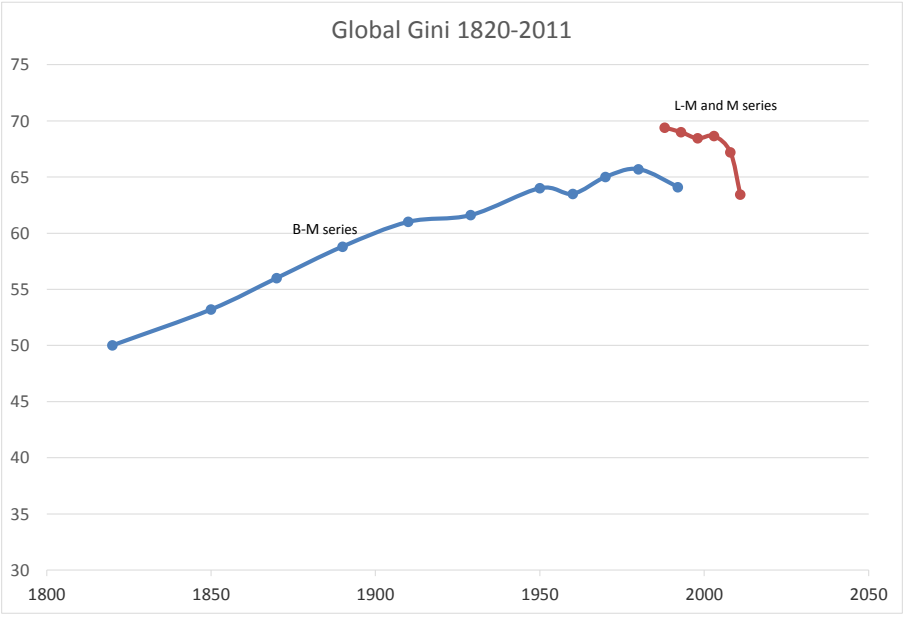
4

Generalized Lorenz curves 1988 and 2008 - Global



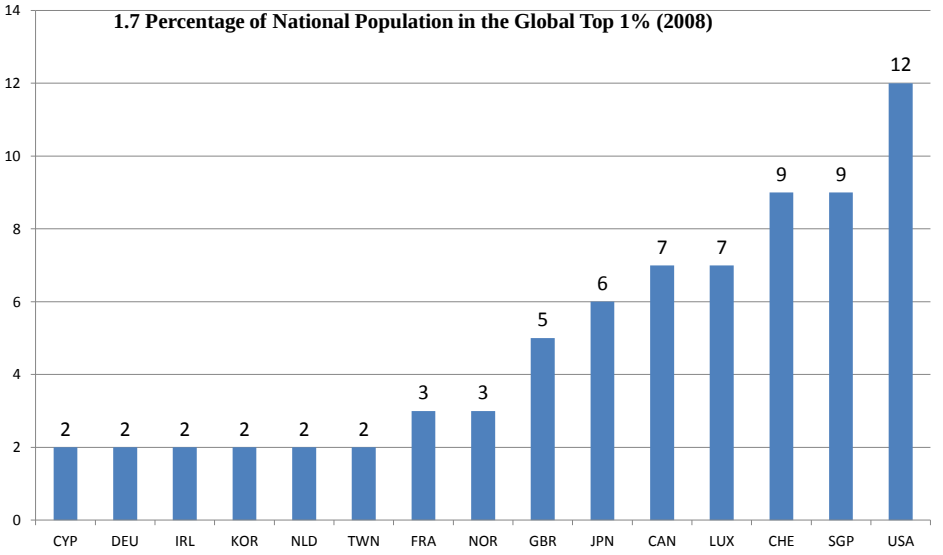
Source: Milanovic

5

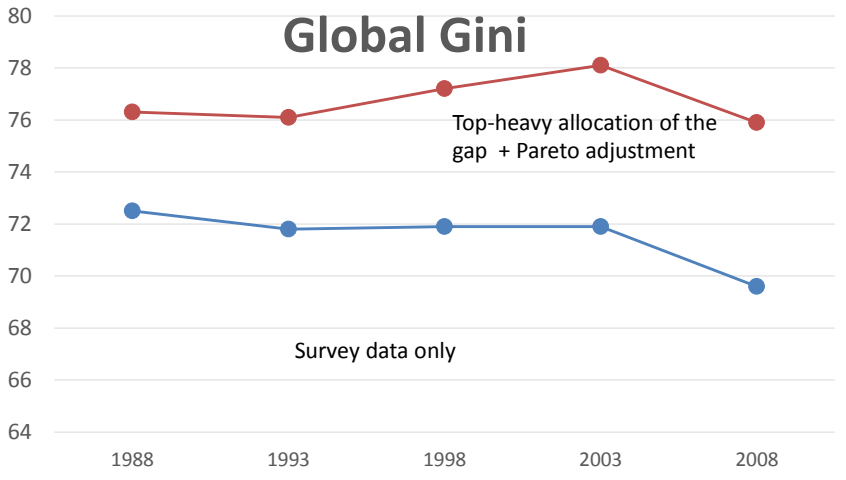


Branko Milanovic

Countries with more than 1% of their population in top global percentile (above $PPP 72,000 per capita in 2008 prices)



Source: Milanovic (2016), Chapter 1

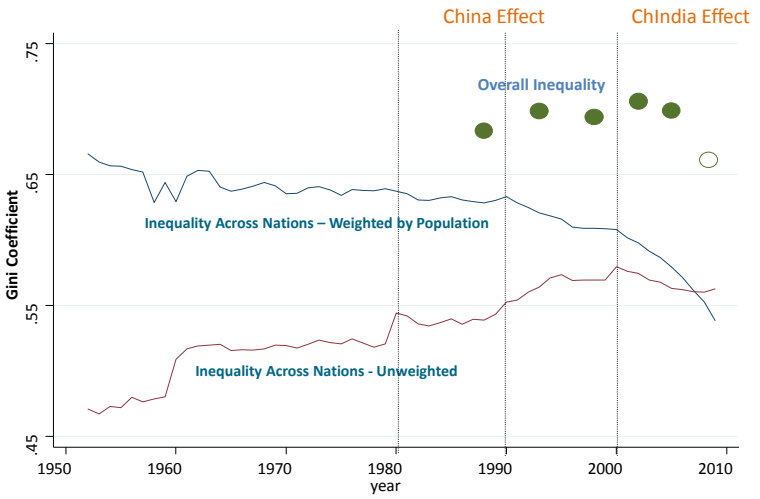


With full adjustment (allocation to the top 10% + Pareto) Gini decline **almost vanishes**

Branko Milanovic

Summary_data.xls

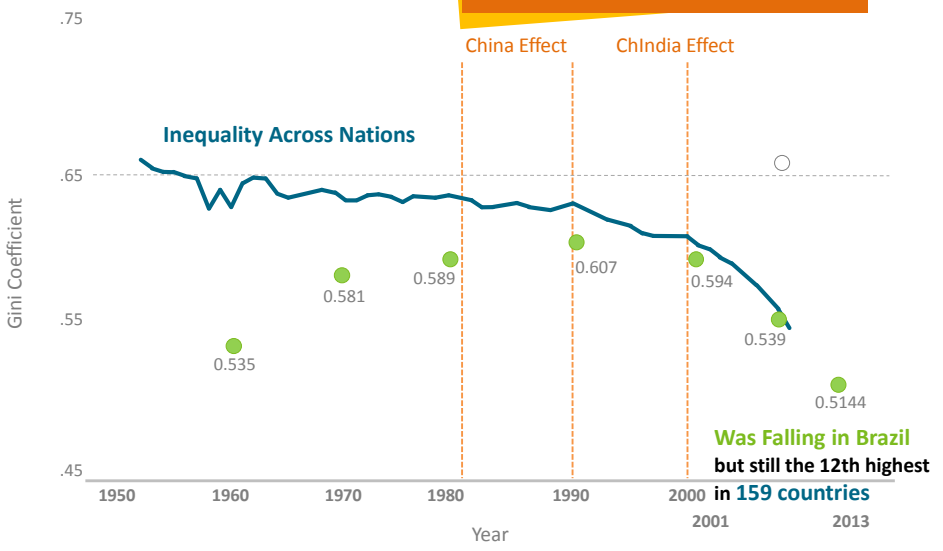
Evolution of World Income Inequality Different Concepts



Source: Milanovic (2011)

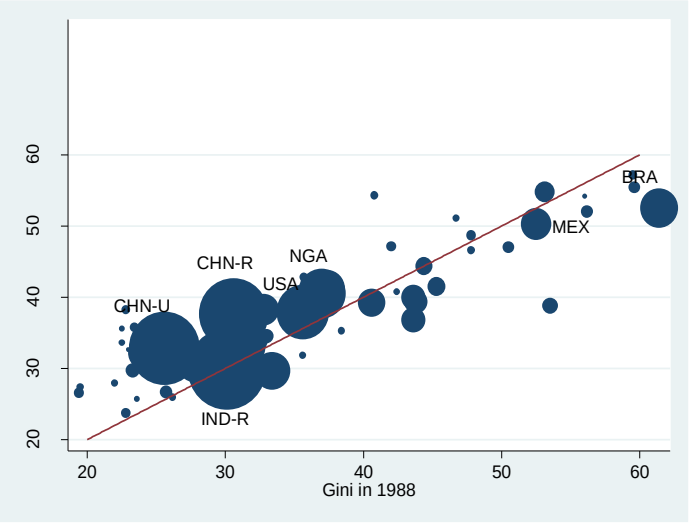
Brazil is a small World

Brazilian Per capita GDP PPP has grown 3.5% agains 3.6% of the world between 2002 e 2012



Source: Milanovic (2011) and Neri (2011)

Ginis in 1988 and 2011 (population-weighted countries)



twoway (scatter gini gini_88 if bin_year==2011 & keep==1 & mysample==1 & group==1 [w=totpop], text(50 55 "MEX") text(57 60 "BRA") text(42 34 "USA") text(23 30 "IND-R") text(46 36 "NGA") text(39 24 "CHN-U") text(45 30 "CHN-R") ylabel(20(10)60)) (function y=x, range(20 60) legend(off) ytitle(Gini in 2011) xtitle(Gini in 1988))
Using final11\combine88_11.dta

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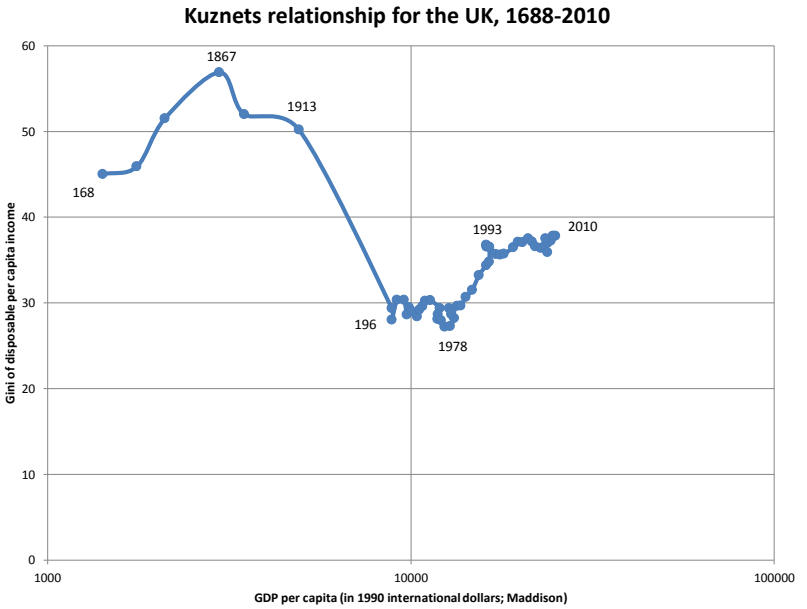
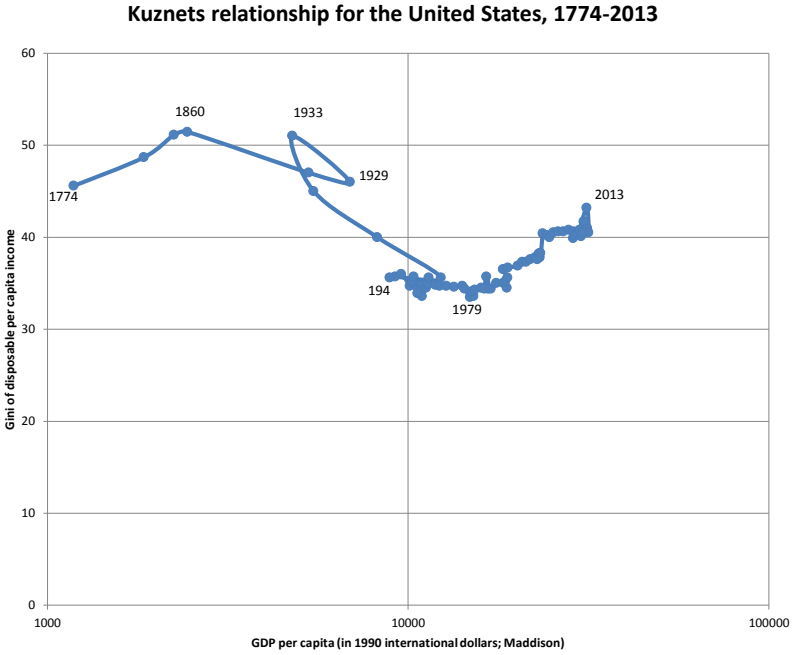
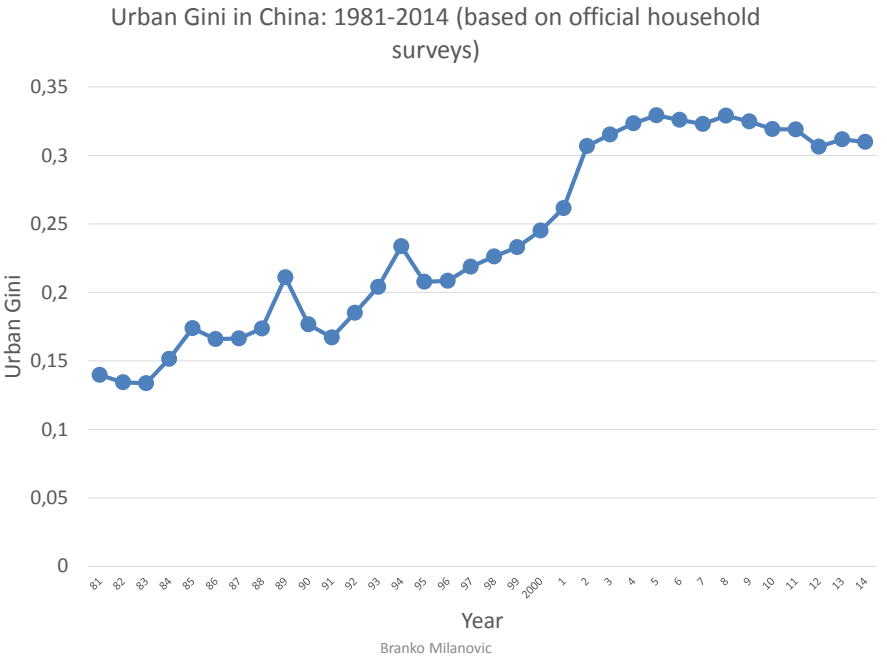
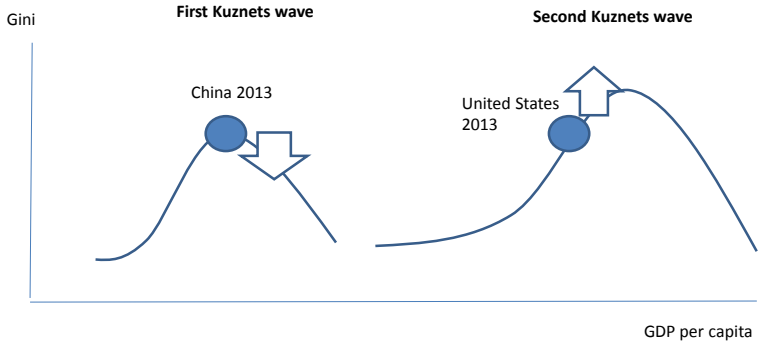



Kuznets relationship for the United States, 1774-2013
Gini of disposable per capita income
GDP per capita (in 1990 international dollars; Maddison)
1774
1860
1933
1929
194
1979
2013
60
50
40
30
20
10
0
1000
10000
100000

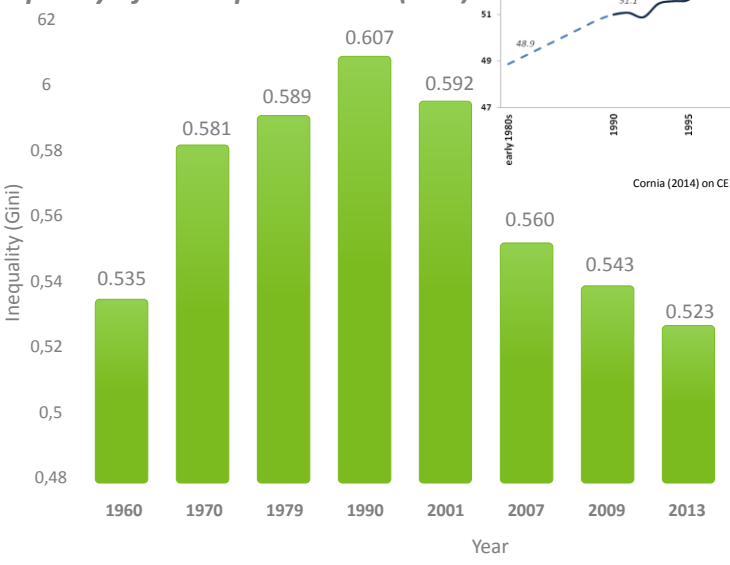

Urban Gini in China: 1981-2014 (based on official household surveys)
Urban Gini
Year
Branko Milanovic
0,35
0,3
0,25
0,2
0,15
0,1
0,05
0
81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 2000 1 2 3 4 5 6 7 8 9 10 11 12 13 14

Where are now China and the US?



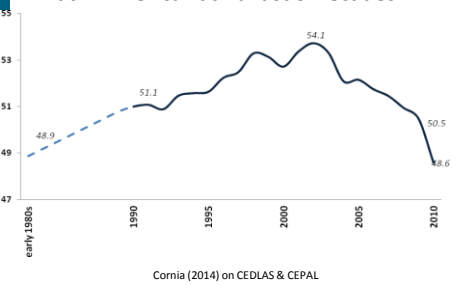
Long Run & Regional Perspective

Inequality of Per Capita Income (Gini)



Source: CPS;FGV from PNAD, PME and Census / IBGE microdata and Langoni (1973)

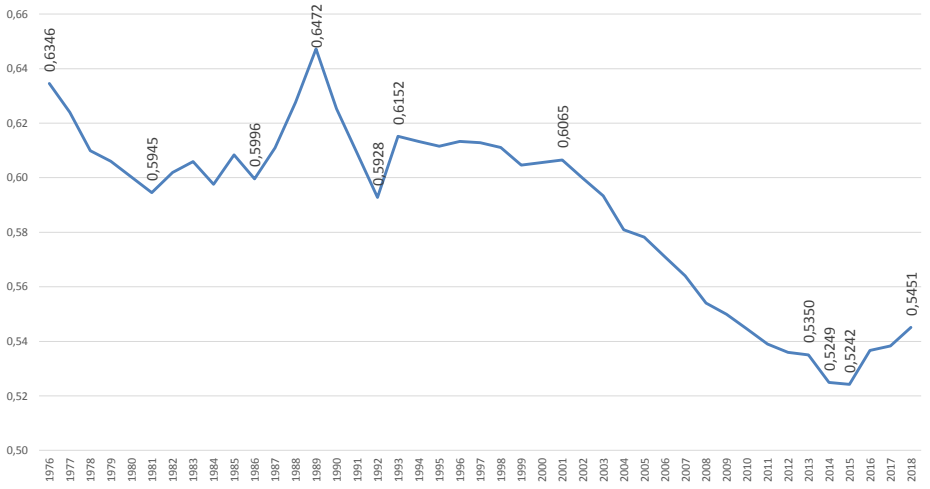
Latin America Latina last 3 Decades



Cornia (2014) on CEDLAS & CEPAL

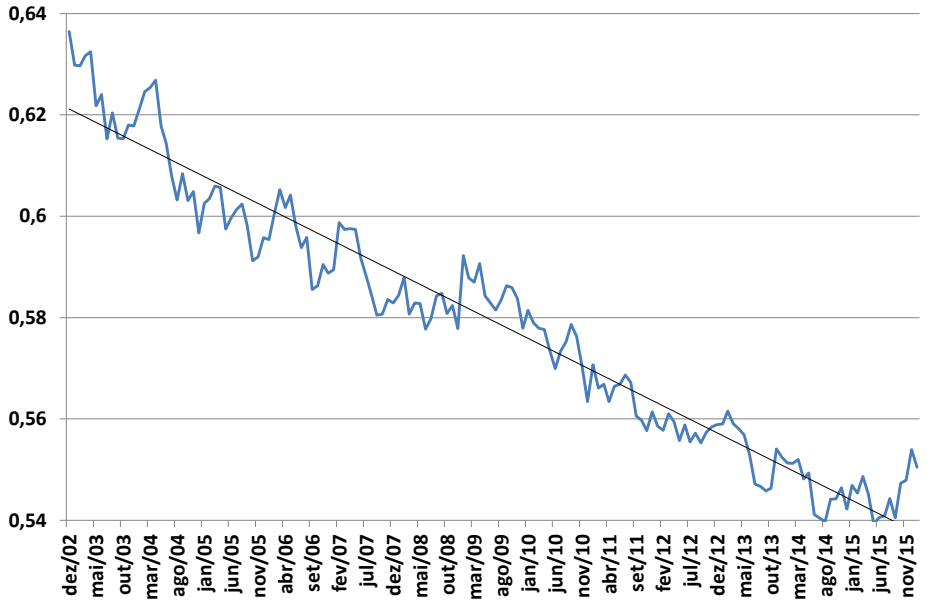
Kuznets curves or Kuznets Waves? Milanovic (2016)

BRAZIL GINI HOUSEHOLD PER CAPITA INCOME – ALL SOURCES



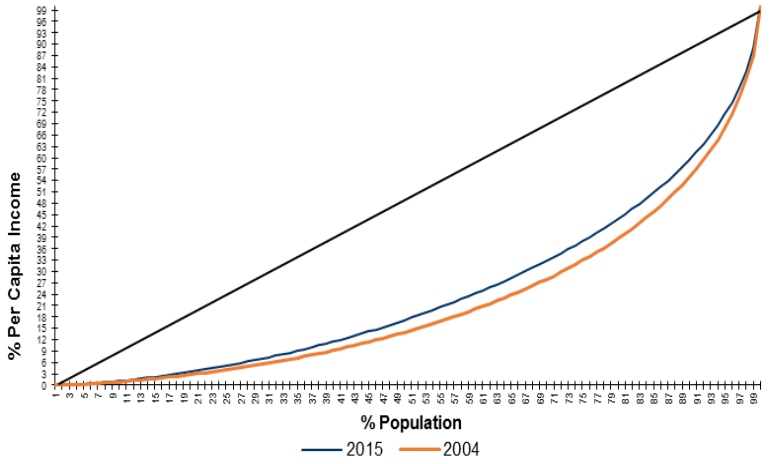
Source FGV Social from PNAD and PNADC/IBGE microdata – Harmonized PNAD 2004-2015 guided

GINI – PER CAPITA EARNINGS INEQUALITY

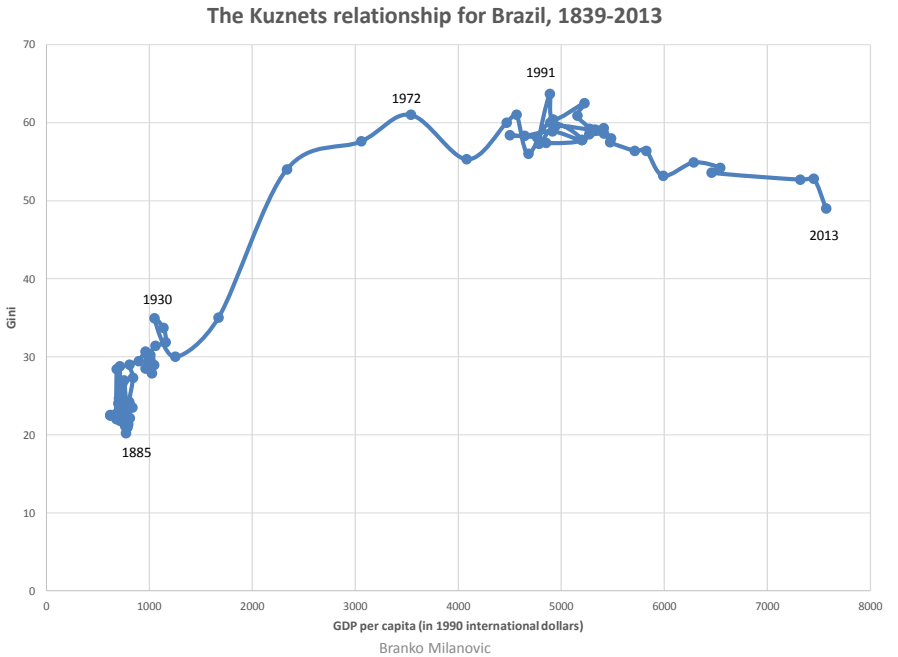


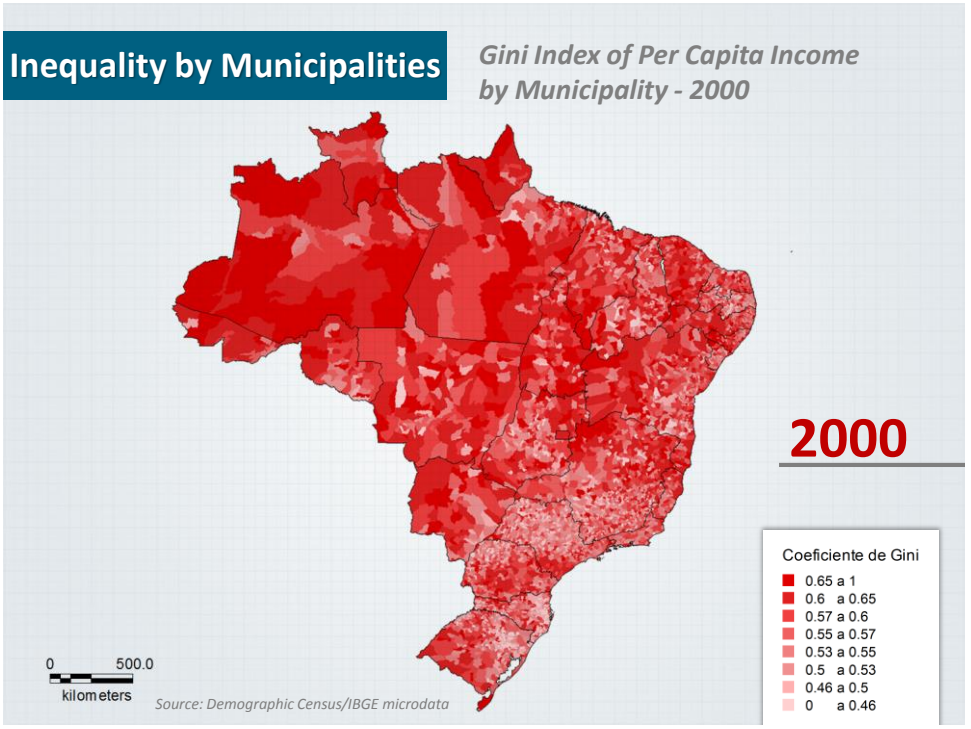
Source FGV Social from PME/IBGE microdata per capita labour 15 to 60 years

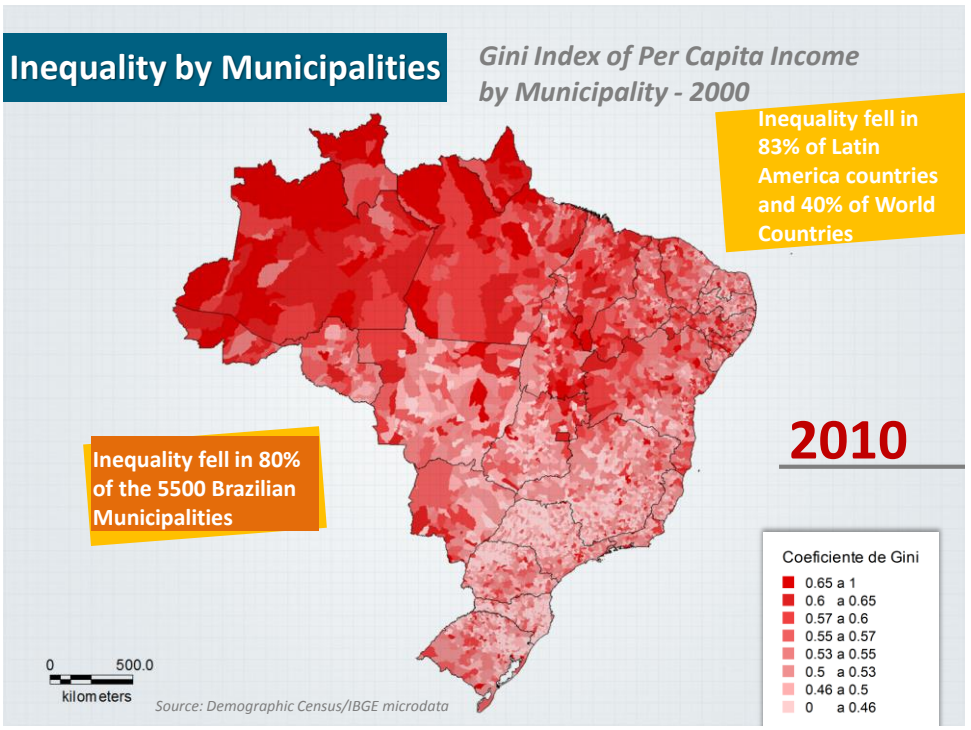
Lorenz Dominance



Source FGV Social from PNAD/IBGE microdata

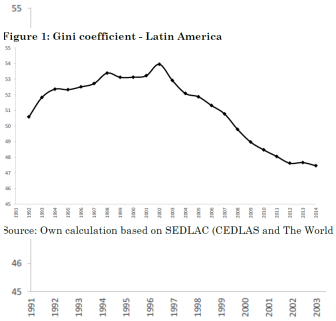



Inequality by Municipalities
Gini Index of Per Capita Income by Municipality - 2000
2000
Coeficiente de Gini
0.65 a 1
0.6 a 0.65
0.57 a 0.6
0.55 a 0.57
0.53 a 0.55
0.5 a 0.53
0.46 a 0.5
0 a 0.46
0
500.0
kilometers
Source: Demographic Census/IBGE microdata


Inequality by Municipalities
Gini Index of Per Capita Income by Municipality - 2000
Inequality fell in 83% of Latin America countries and 40% of World Countries
Inequality fell in 80% of the 5500 Brazilian Municipalities
2010
Coeficiente de Gini
0.65 a 1
0.6 a 0.65
0.57 a 0.6
0.55 a 0.57
0.53 a 0.55
0.5 a 0.53
0.46 a 0.5
0 a 0.46
0
500.0
kilometers
Source: Demographic Census/IBGE microdata

Inequality in Latin America

Figure 1: Gini coefficient - Latin



Source: Own calculation based on SE

Table 1: Annual changes in Gini coefficient

	1992-2002	2002-2010	2010-2014
Argentina	0.8	-1.1	-0.5
Bolivia	0.6	-1.5	0.1
Brazil	0.1	-0.7	-0.4
Chile	0.0	-0.4	-0.2
Colombia	0.6	-0.3	-0.5
Costa Rica	0.5	0.0	0.1
Ecuador	0.0	-0.8	-0.9
El Salvador	-0.1	-0.9	-0.7
Honduras	0.6	-0.5	0.4
Mexico	-0.3	-0.5	0.4
Panama	0.1	-0.6	-0.1
Paraguay	0.5	-0.7	0.0
Peru	0.4	-1.0	-0.5
Uruguay	0.6	-0.1	-0.9
Venezuela	0.6	-1.1	0.0
Southern South America	0.4	-0.6	-0.4
Andean region	0.4	-1.0	-0.4
Central America	0.2	-0.5	0.0
Latin America	0.3	-0.7	-0.3

Source: Own calculation based on SEDLAC (CEDLA