

WORLDS APART: INTER-NATIONAL AND WORLD INEQUALITY 1950-2000

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1. Definition of three concepts of world (or inter-national) inequality
2. Unweighted inter-national inequality, 1950-99: why did it increase and how silly it is to talk about convergence
3. Weighted inter-national inequality, 1950-99: why did it decrease?
4. “True” world inequality, 1988, 1993, 1998 (very preliminary)
5. Historical overview: Concept 1 inequality during the previous globalization episode, 1870-1913
6. Some evidence on the relationship between openness and distribution

What world inequality are we talking about?

Comparison between the three concepts of inequality

	Concept 1: unweighted inter- national inequality	Concept 2: weighted inter- national inequality	Concept 3: “true” world inequality
Main source of data	National accounts	National accounts	Household surveys
Unit of observation	Country	Country (weighted by its population)	Individual
Welfare concept	GDP or GNP per capita	GDP or GNP per capita	Mean per capita disposable income or expenditures
National currency conversion	Market exchange rate or PPP exchange rate		
Within-country distribution (inequality)	Ignored	Ignored	Included

Other problems/issues:

1. What currency to use: dollars or PPP dollars?
2. And if PPPs, what PPPs (Geary-Khamis, Afriat, EKS)?
3. Survey-based mean income or GDP per capita?

Do we believe HS for distributions but not for the means?

The case of India

4. Income or expenditure?

Countries tend to use either one or the other

Definitions of Y, X differ

5. Per capita or equivalent units?

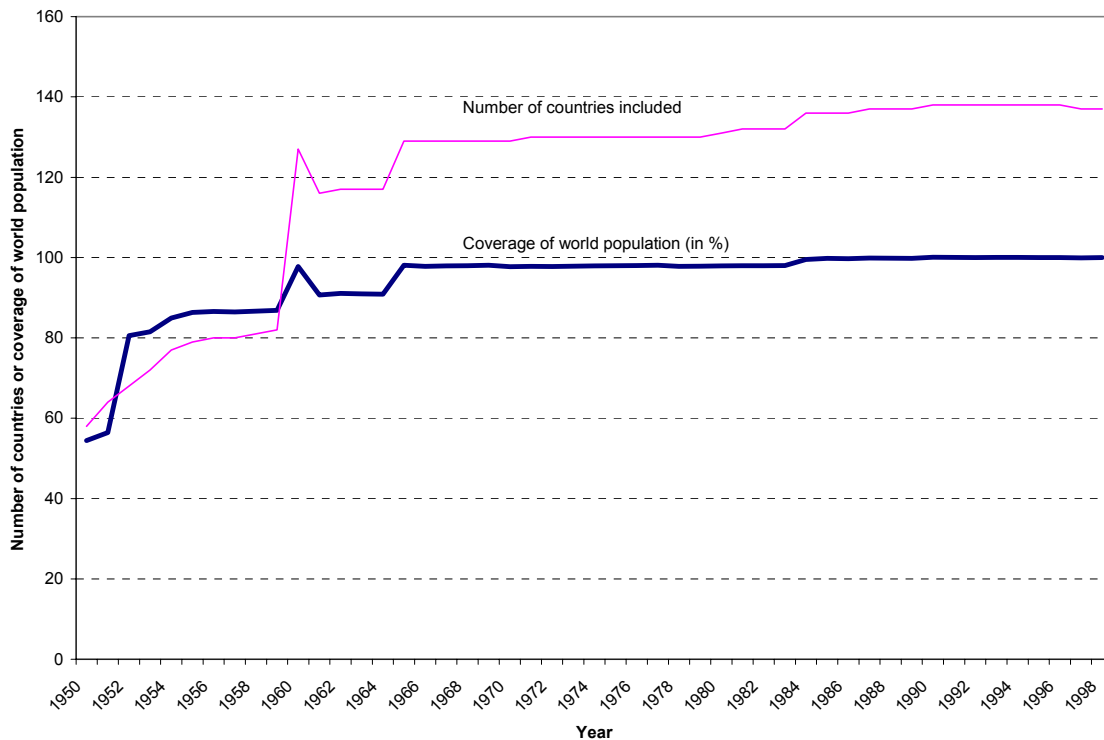
What people agree and what people disagree?

	Up or down?	Why?
Concept 1 inequality	Up during the last 20 years (everyone agrees)	<ul style="list-style-type: none"> • Because globalization helps some and hurts others • Because of debt crisis, high interest rates, failed SAPs • Because some countries excluded themselves from globalization
Concept 2 inequality	Down during the last 20 years (everyone agrees)	China alone explains it. No trend otherwise.
Concept 3 inequality	<p>Up (Milanovic, Dikhanov and Ward, Dowrick and Akmal)</p> <p>Down (Sala-i-Martin, Dollar and Kraay)</p> <p>No change (Bourgignon and Morrison)</p> <p>Very high, Gini between 62-66 (everyone agrees)</p>	

How did Concepts 1 and 2 change over the last half-century?

First, who is included...

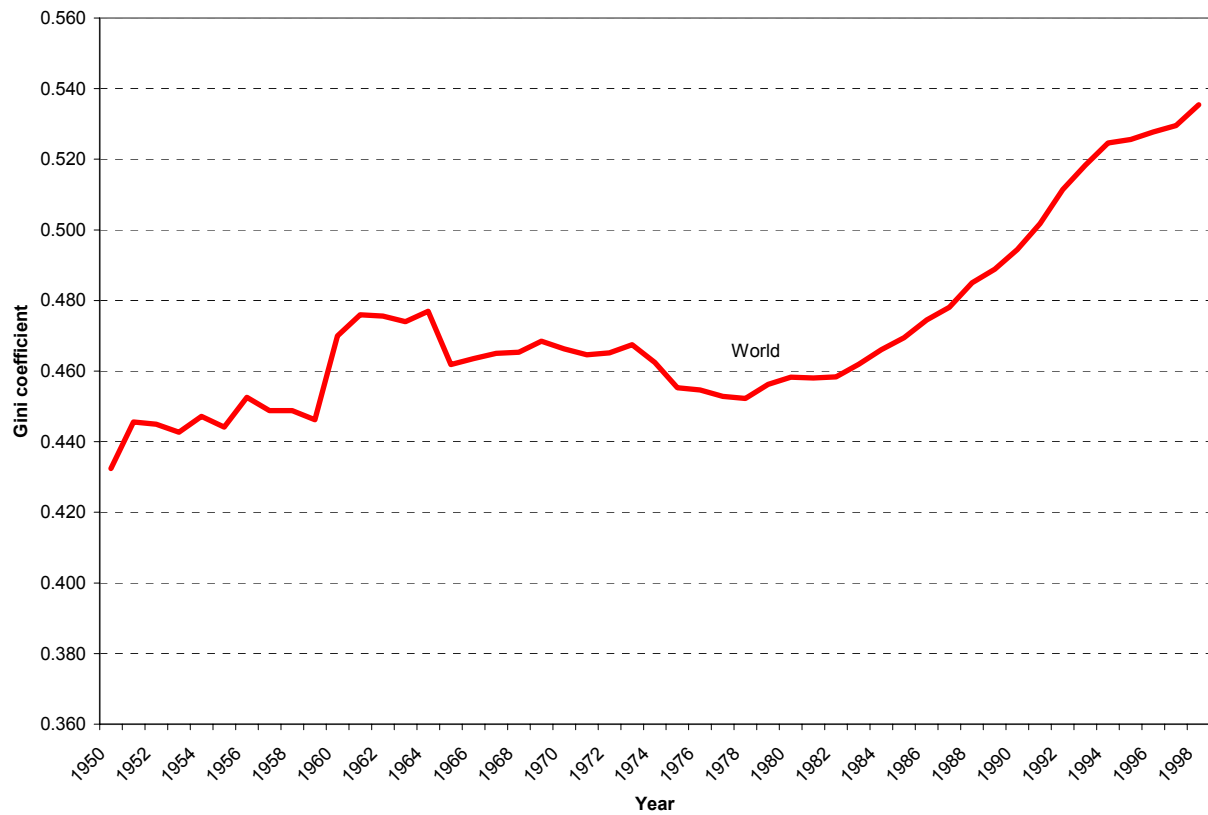
Coverage: number of countries and share of world population



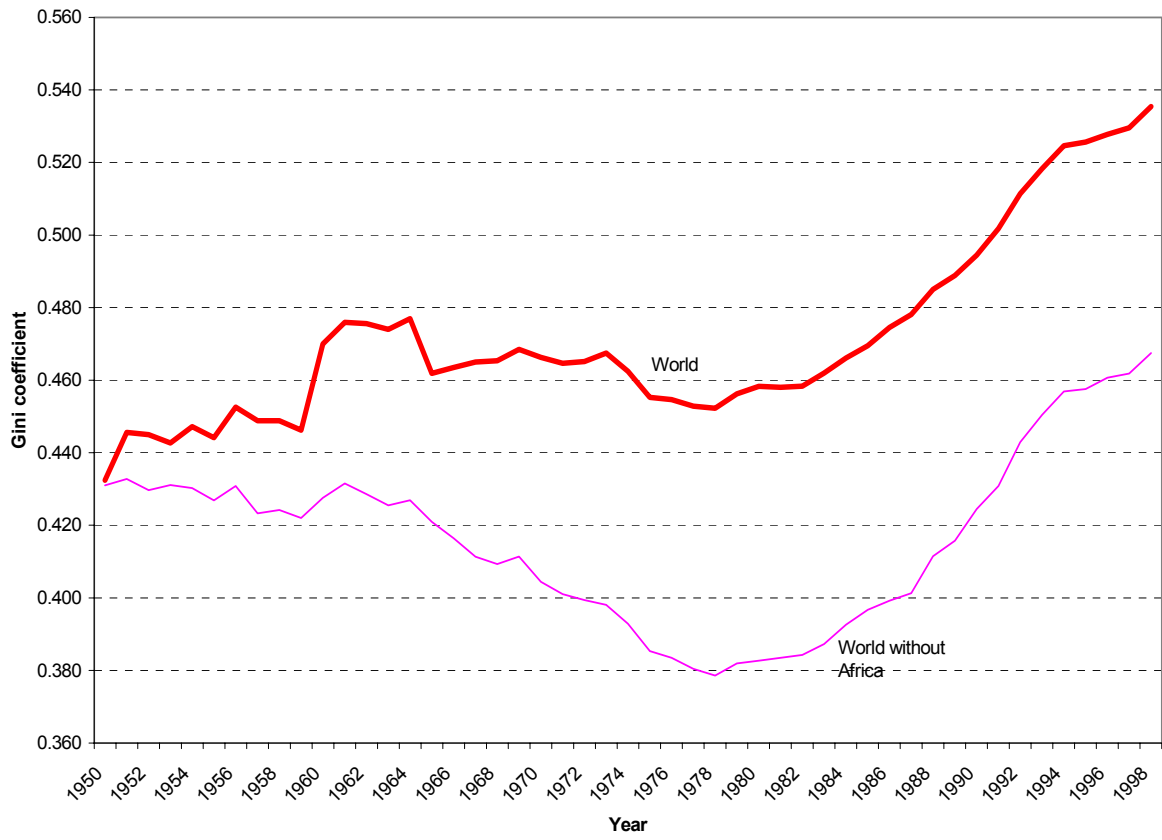
- About 140 countries included
- almost 100 percent of world population and world GDP (in current dollars)
- current countries projected backward
- SIMA World Bank data used to get benchmark 1995 \$PPP GDP per capita; then these GDP per capita projected backward and forward using countries' real growth rates (mostly from national SYs; some from Maddison, and PennWorld Tables, UN sources)

According to Concept 1, countries' performances have diverged over the last two decades

Unweighted inter-national inequality, 1950 to 1998



And it is not only because Africa is falling behind



**Regional mean incomes are diverging—
or more exactly WENAO is pulling ahead**

The average unweighted mean standardized distance

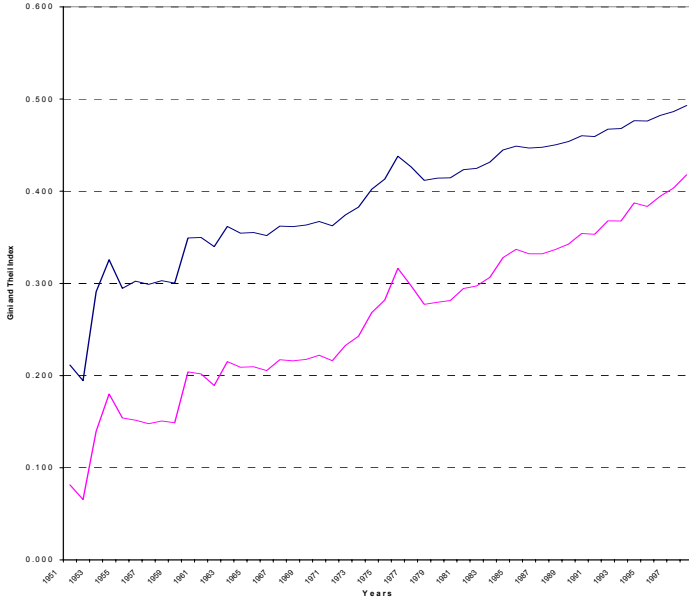
	1960	1978	1998
WENAO-Africa	2.1	2.0	2.5
WENAO-Asia	1.9	1.4	1.9
WENAO-LAC	1.5	1.5	2.0
WENAO-Europe	1.9	1.5	2.2

Therefore, the importance of between-regional inequality (in total Gini) increases

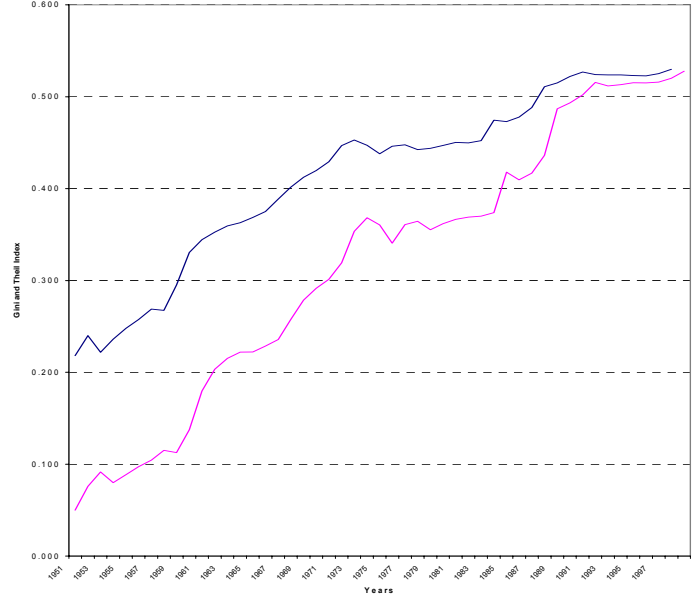
Gini points	1960	1978	1998
Within-region	5.7	5.4	5.9
Between-region	35.5	34.2	40.2
Overlap	5.2	7.9	7.7
World	46.3	47.6	53.8

Regional convergence and divergence (Gini and Theil index)

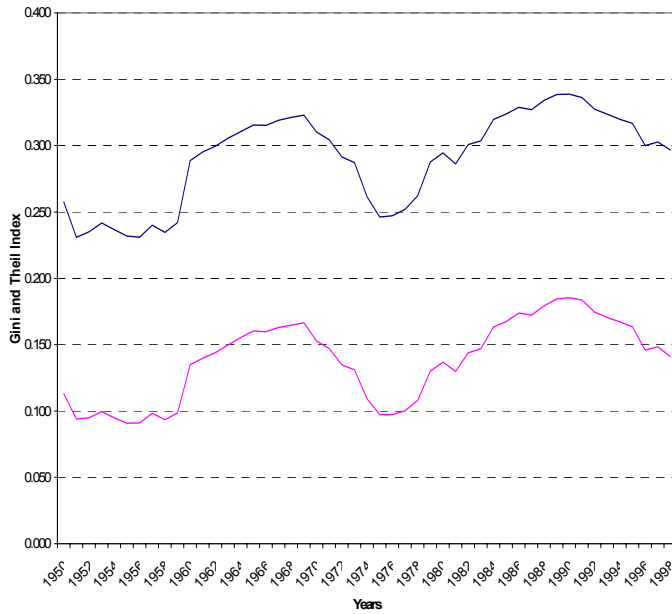
Africa



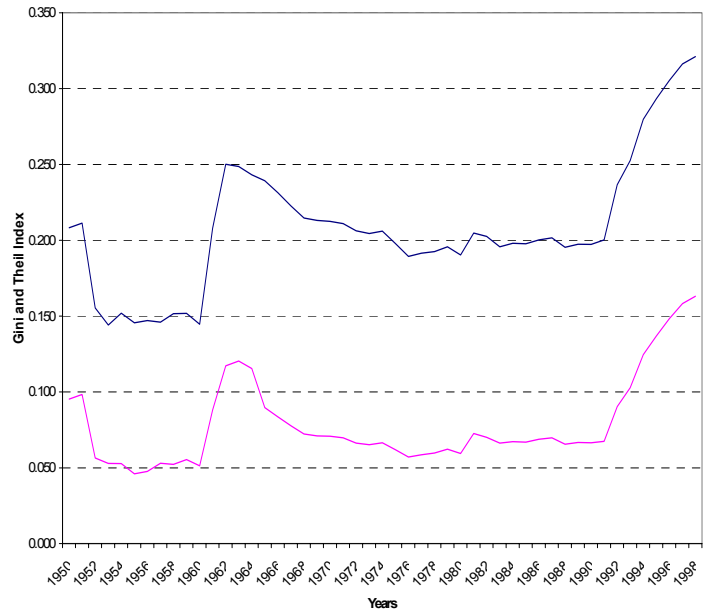
Asia



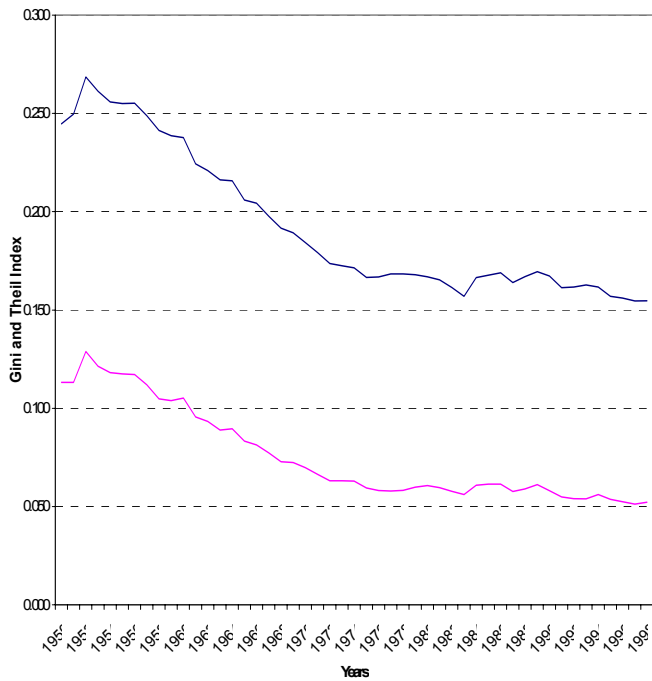
Latin America, Caribbean



Eastern Europe, C. Asia



And WENAO

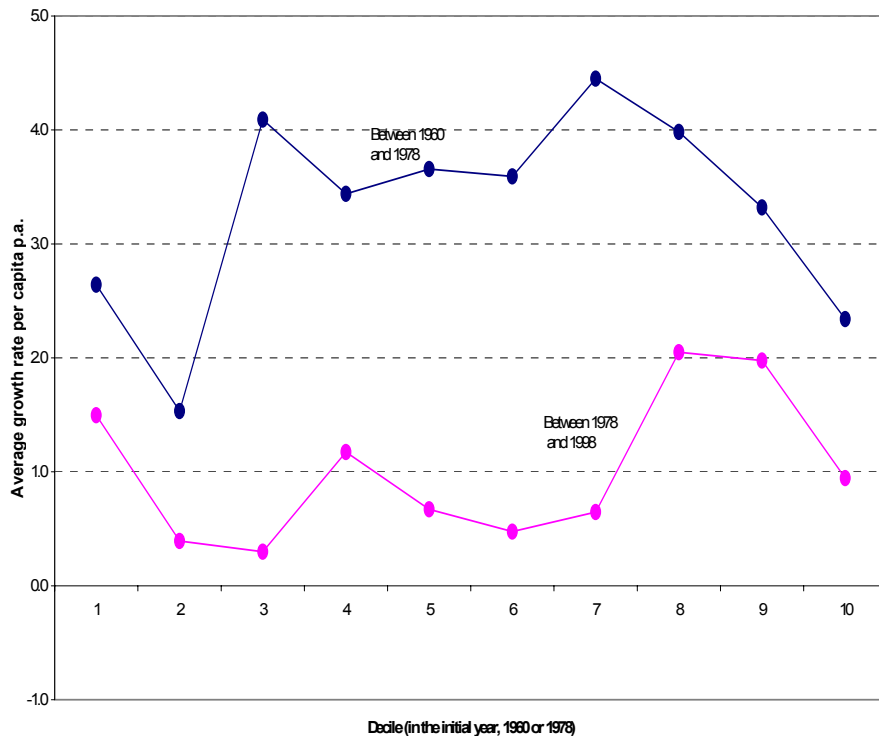


Conclusions:

- **Continued divergence in Africa and Asia (note that Asia is, by far, the most heterogeneous continent).**
- **Divergence in Europe and Central Asia since transition started.**
- **Stability in Latin America and the Caribbean.**
- **Continued convergence of WENAO.**

Compare Period 1 (1960-78) to Period 2 (1978-98)

**Average p.a. and per capita growth rate by decile
(deciles formed acc. to GDP per capita of the initial year,
1960 and 1978)**



Conclusions.

- Every decile grew faster in Period 1 than in Period 2.
- Countries between 3rd and 7th decile grew the fastest in Period 1; countries of the 8th and 9th decile grew the fastest in Period 2.

Downwardly mobile counties (DUMCEES):

The Four Worlds defined

- The Rich: All countries with the GDP per capita equal/greater than the poorest WENAO
- The Contenders: With GDP per capita at least $\frac{2}{3}$ of the poorest WENAO
- The Third World: With GDP per capita between $\frac{1}{3}$ and $\frac{2}{3}$ of the poorest WENAO
- The Fourth World: With GDP per capita less than $\frac{1}{3}$ of the poorest WENAO

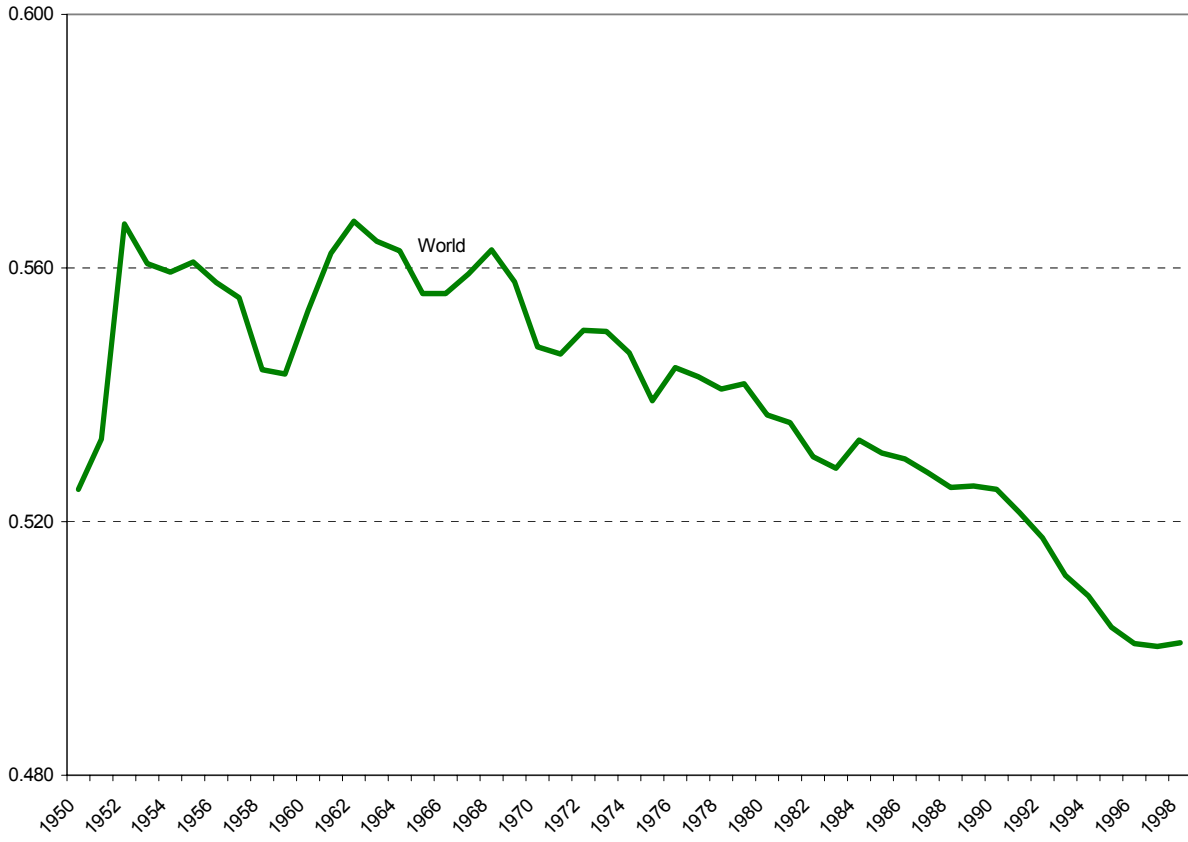
**The composition of the Four Worlds in 1960 and 1998:
(number of countries)**

	Rich	Contenders	Third World	Fourth World
1960	41	22	39	25
1998	29	11	19	78

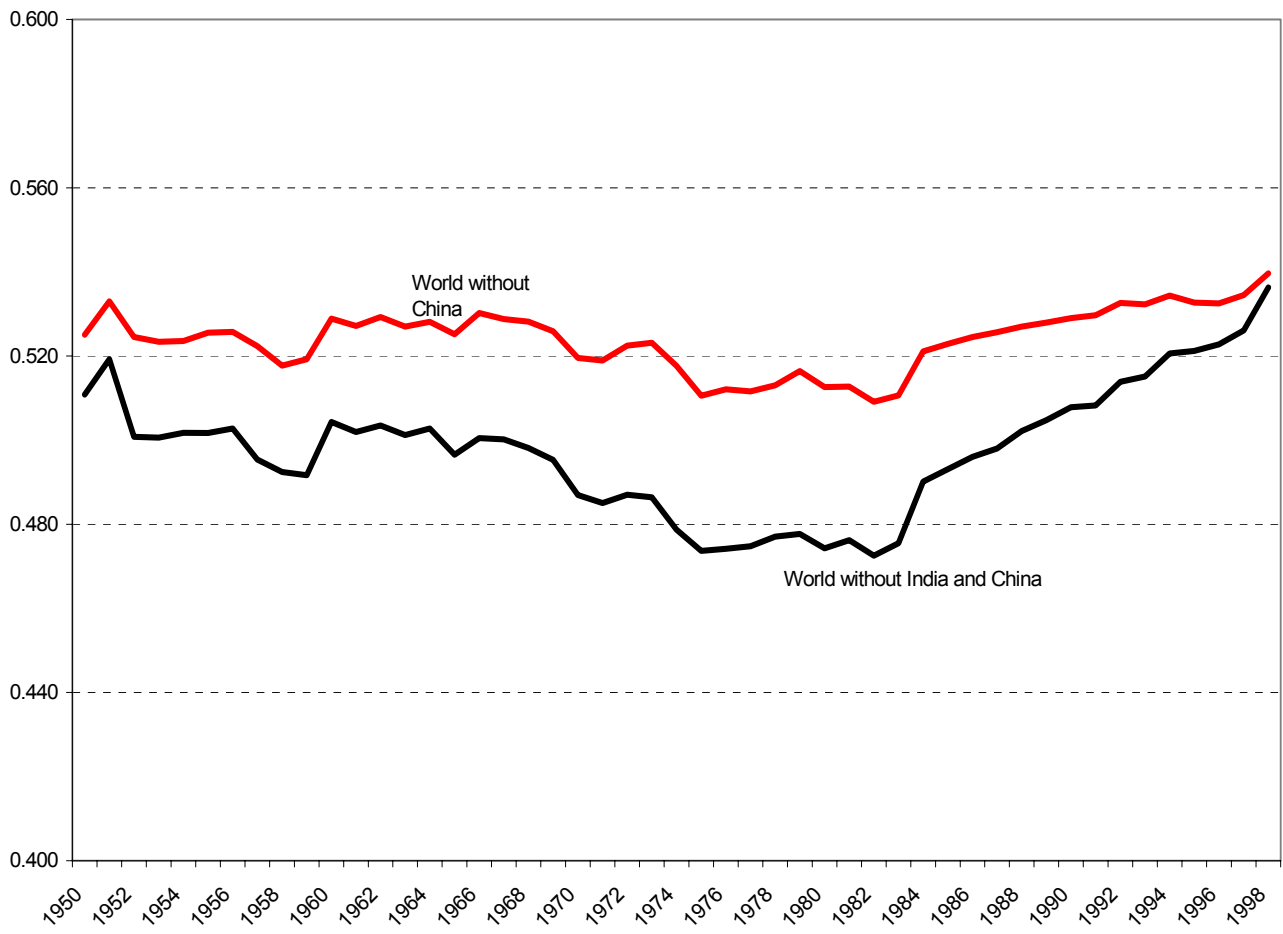
Percent of countries in the region belonging to the Fourth World

	Africa	Asia	LAC	EE/FSU
1960	48	30	0	0
1998	84	58	48	73

But according to Concept 2, there is a convergence of incomes across countries...



...or maybe there is not



What explains the change in population-weighted international inequality?

Interactions within the triangle of China, India, and the US? Yes, for the period 1965 to 1980. Surprisingly, *not* for the more recent period.

		1980 to 1965	1998 to 1965
(1) Overall Gini change		-1.9	-5.5
(2) Total change in "triangle" contribution		-2.0	-0.6
(3) Due to income		-1.2	-0.2
Due to population		-0.8	-0.4
Percentage breakdown			
Due to triangle (2):(1)		104	11
Due to income in triangle (3):(1)		60	3
Gini points contributions	1965	1980	1998
China-India	0.21	0.02	1.29
India-US	4.06	3.41	3.89
China-US	6.04	4.87	4.56
Total triangle	10.3	8.3	9.7

In Gini terms, China did **not** catch up very much with the United States during the last two decades. The world-mean normalized difference was 4.15 in 1980, and 4.0 in 1998. [US mean-normalized GDP per capita increased from 4.32 to 4.56; China's. from 0.17 to 0.56.]

The difference between India and the US increased, as well as between India and China.

$$\frac{y_i - y_j}{\mu} p_i p_j$$

So, what explains decline in Concept 2 inequality between 1980 and 1998? It is **China vs. the rest of the world.**

Gini points (ICTs): China and the rest of the world, 1980 and 1998

	1980	1998	Change
China-United States	4.9	4.6	-0.3
China-Japan	1.7	1.5	-0.2
China-Germany	1.3	0.9	-0.4
China-other large OECD countries	2.5	2.0	-0.5
China-large 3 rd world countries	1.1	0.7	-0.4
China-all other countries	7.3	3.7	-3.6
Total	18.8	13.4	-5.4
World Gini	53.7	50.1	-3.6

Note: Other large OECD countries = France, Italy and UK.

Large 3rd world countries = Brazil, Mexico, Pakistan, Bangladesh, Indonesia, Nigeria.

What does Concept 3 say?

World international dollar inequality in 1988 and 1993
(distribution of persons by \$PPP and \$ income per capita)

	Full sample		Common sample	
<u>International dollars</u>				
	1988	1993	1988	1993
Gini index	62.5 (3.1)	65.9 (2.6)	62.8 (3.1)	66.0 (2.7)
Theil index	75.8	86.4	76.5	87.3
<u>Dollars</u>				
Gini index	77.8 (2.3)	80.7 (2.0)	78.2 (2.3)	80.5 (2.2)

Note: Gini standard errors given between brackets.

- Household survey means are unreliable. Use GDP per capita instead.

World income inequality in 1988 and 1993
(common-sample countries; distribution of persons from household surveys with survey mean per capita income/expenditure “forced” to equal GDP per capita)

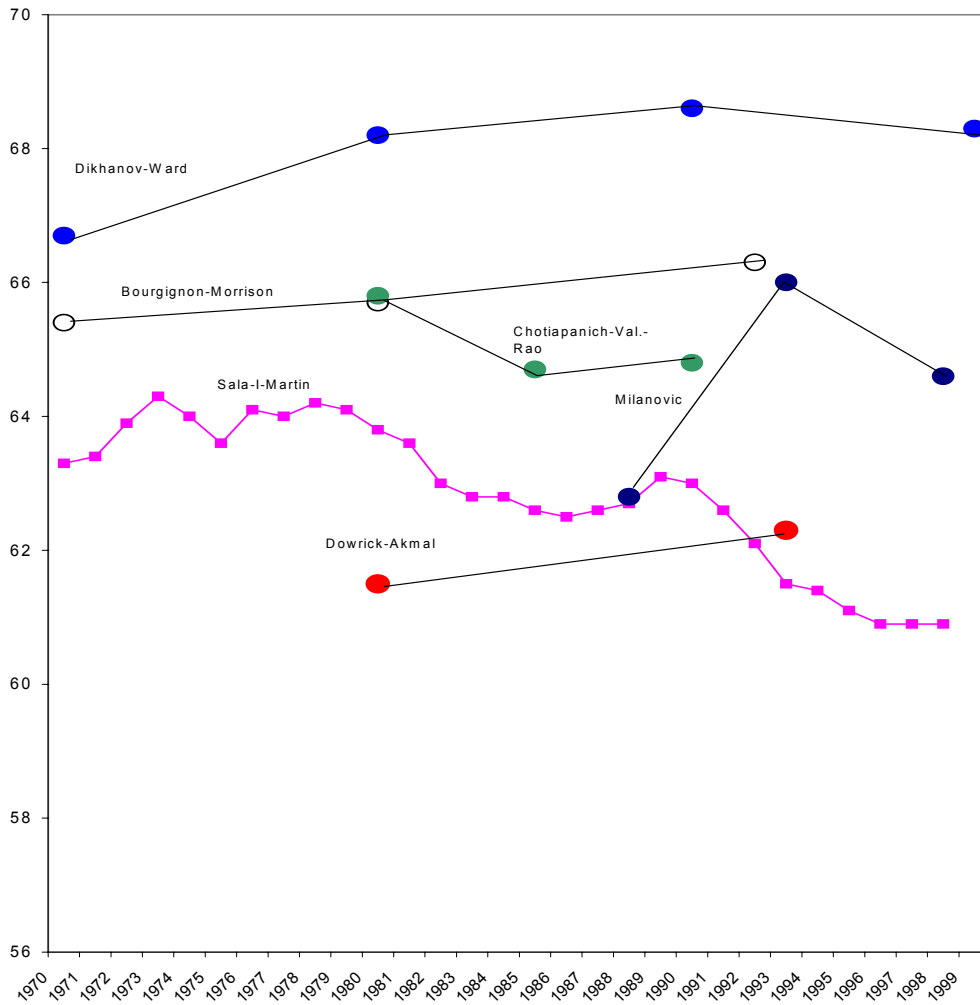
	Gini1988	Gini 1993	Theil 1988	Theil 1993
Within-country inequality	1.3	1.3	19.4	22.6
Between-country inequality	56.1	57.6	58.4	62.1
Overlap	5.0	5.0	---	---
Total world inequality	63.3	63.9	77.8	84.7
Number of countries	91	91	91	91

Notes: Percentage contribution to total inequality between brackets.

The level of inequality is still the same, but the increase between 1988 and 1993 is reduced: only 0.6 Gini points (instead of 3.2), or 6.9 Theil points (instead of 10.8).

What do different authors say?

Gini coefficients of Concept 3 inequality, 1970-99
(always in PPP terms)



Several studies of Concept 3 (global; inter-personal) inequality compared

	Period	Exact years	Results	Gini values	Source of distribution data	Mean income	PPPs Used	Number of countries	Main problems	Main advantages
Milanovic (2001)	1988-98	1988 1993 1998	Inequality increases then declines	63 ('88) 66 ('93) 65 ('98)	Household survey data	Household survey mean	EKS (World Bank)	88 (common sample) to 113 total	Mixes X and Y.	Use of survey data only (about ¾ using individual-level data)
Bourguig non-Morrison (1999)	1820-1990	1950 1960 1970 1980 1992	Inequality increases	64 ('50) 64 ('50) 65 ('70) 66 ('80) 66 ('90)	Various sources: Maddison, Morrison, HS etc.	National accounts (GDP per capita)	Geary-Khamis (Maddison)	33 country groups	Combines HS data and NA. Mixes X and Y. "Representative" countries used. Very few data points.	The long run.
Sala-i-Martin (2002)	1970-98	All	Inequality slightly increases then declines	63 ('70) 64 ('80) 63 ('90) 61 ('98)	Quintiles from HSs (Deininger-Squire)	National accounts (GDP per capita)	Geary-Khamis (PWT)	(A) 68 countries with more than 1 income share	Very few data points (quintiles). Extrapolates for the	Approximates distribution for each country/year

	Period	Exact years	Results	Gini values	Source of distribution data	Mean income	PPPs Used	Number of countries	Main problems	Main advantages
Dikhanov and Ward	1970-99	1970 1980	Inequality slightly	67 (1970) 68 (1999)	Quintiles and Ginis from	National accounts	EKS (World)	45 countries	Combines HS data	
								observation; (B) 29 countries with only 1 observation; (C) 28 countries with no data.	years for which data are unavailable (many such years). Group C countries, all population assigned the same income. Mixes HS data and NA. Mixes Y and X data (?). Unclear how HH and per capita data are treated.	separately.

	Period	Exact years	Results	Gini values	Source of distribution data	Mean income	PPPs Used	Number of countries	Main problems	Main advantages
(2001)		1990 1999	increased		WIDER	(personal consumption expenditures per capita)	Bank)		and NA.	
Dowrick and Akmal (2001)	1980-93	1980 1993	Inequality slightly increases	61 (1980) 62 (1993)	Quintiles and Gimis from Deininger-Squire	National accounts (GDP per capita)	Afriat (own calculations)	47 countries with quintile data; unclear how many more	Combines HS data and NA. Unclear how Y and X are treated (mixed?). Unclear how HH and per capita data are treated	Uses Afriat PPP to remove Geary-Khamis bias.
Chotikapanich, Valenzuela and Rao (1997)	1980-90	1980 1985 1990	Stable	66 ('80) 65 ('85) 65 ('90)	D-S	National accounts (GDP per capita)	PWT Geary-Khamis	36	Combines HS data and NA.	
Schultz (1998)	1960-89	1960 1970 1980 1989	Increases then declines	[variance of logs]	D-S	National accounts (GDP per capita)	PWT Geary-Khamis	56 from D-S. For other 64 countries inequality	Combines HS data and NA. Double	

Period	Exact years	Results	Gini values	Source of distribution data	Mean income	PPPs Used	Number of countries	Main problems	Main advantages
							measures estimated.	approximation: inequality measure approximates from D_S data, for countries without data, approximation based on regression	

Dowrick, Steve and Muhammed Akmal (2001), "Contradictory Trends in Global Income Inequality: A Tale of Two Biases", draft 29 March 2001, available from <http://ecocomm.anu.edu.au/economics/staff/dowrick/dowrick.html>.

Dikhanov, Yuri and Michael Ward (2001), "Evolution of the Global Distribution of Income, 1970-99", August 2001 draft.

Sala-i-Martin, Xavier (2002), "The Disturbing 'Rise' in Global Income Inequality", mimeo, draft March 2002. Downloadable from

Milanovic, Branko (1999), "True world income distribution, 1988 and 1993: First calculation based on household surveys alone", *The Economic Journal*, January 2002, pp.

Bourguignon, Francois and Christian Morrisson (1999), "The size distribution of income among world citizens, 1820-1990", mimeo, June.

Schultz, T. P. (1998). "Inequality in the distribution of personal income in the world: how it is changing and why." *Journal of Population Economics*, vol. 11, No. 3, pp. 307-344.

Chotikapanich, D., Valenzuela, R. and Rao, D.S.P. (1997). "Global and regional inequality in the distribution of income: estimation with limited and incomplete data." *Empirical Economics*, vol. 22, pp. 533-546.

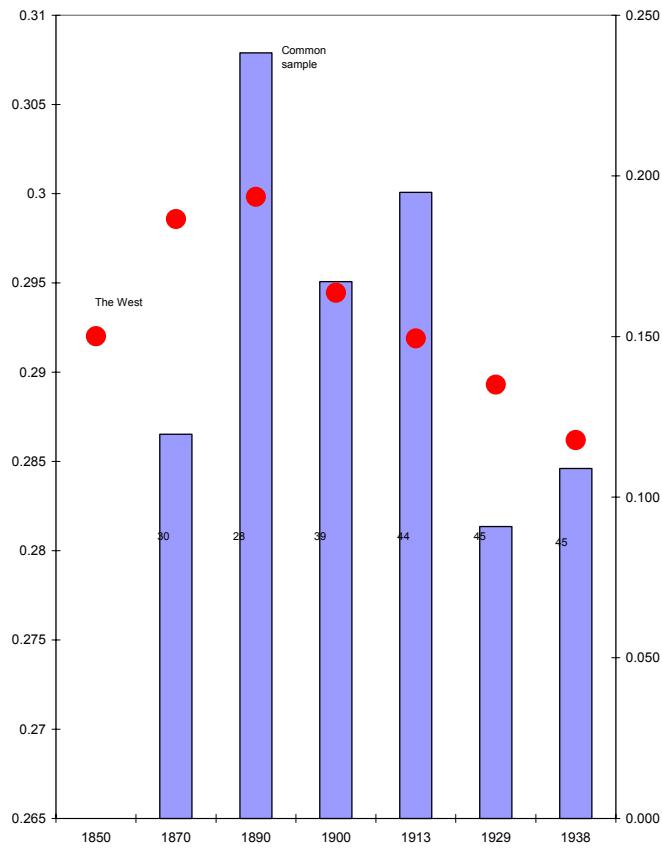
	Approximation of individual country distributions	How is approximation done	Approximation of missing country/years	If no distribution data at all	Combines HS and NA
Milanovic	No	No approximation; each point is observation	Take the closest year	(nothing done)	No
Bourguignon and Morrison	No	No approximation; each point is one observation	Take the closest year and country	Take the closest country	Yes (applies GDP per capita to distributions)
Sala-i-Martin	Yes, using D-S database	Kernel estimates (smoothing) for each country/year	Trend	Mean income used	Yes (applies GDP per capita to distributions)
Dowrick and Akmal	Yes, using D-S data base	No approximation of quintiles available if Gini only available Chotikapanich approximation of the Lorenz curve used	Take the closest year.	(nothing done)	Yes (applies GDP per capita to distributions)
Dikhanov and Ward	Yes, using WIDER data	Using "quasi-exact distribution rendering"	Take the closest years.	(nothing done)	Yes (applies personal consumption per capita to distributions)
Schultz	Yes, using D-S data base	Variance of log incomes estimated from D-S quintiles	Regression	Use regressions to estimate log variance.	
Chotikapanich et al.	Yes, using D-S data base	Lognormal distribution estimated based on mean income and Gini	Take the closest year.	(nothing done)	Yes (applies GDP per capita to distributions)

Summary of different approaches

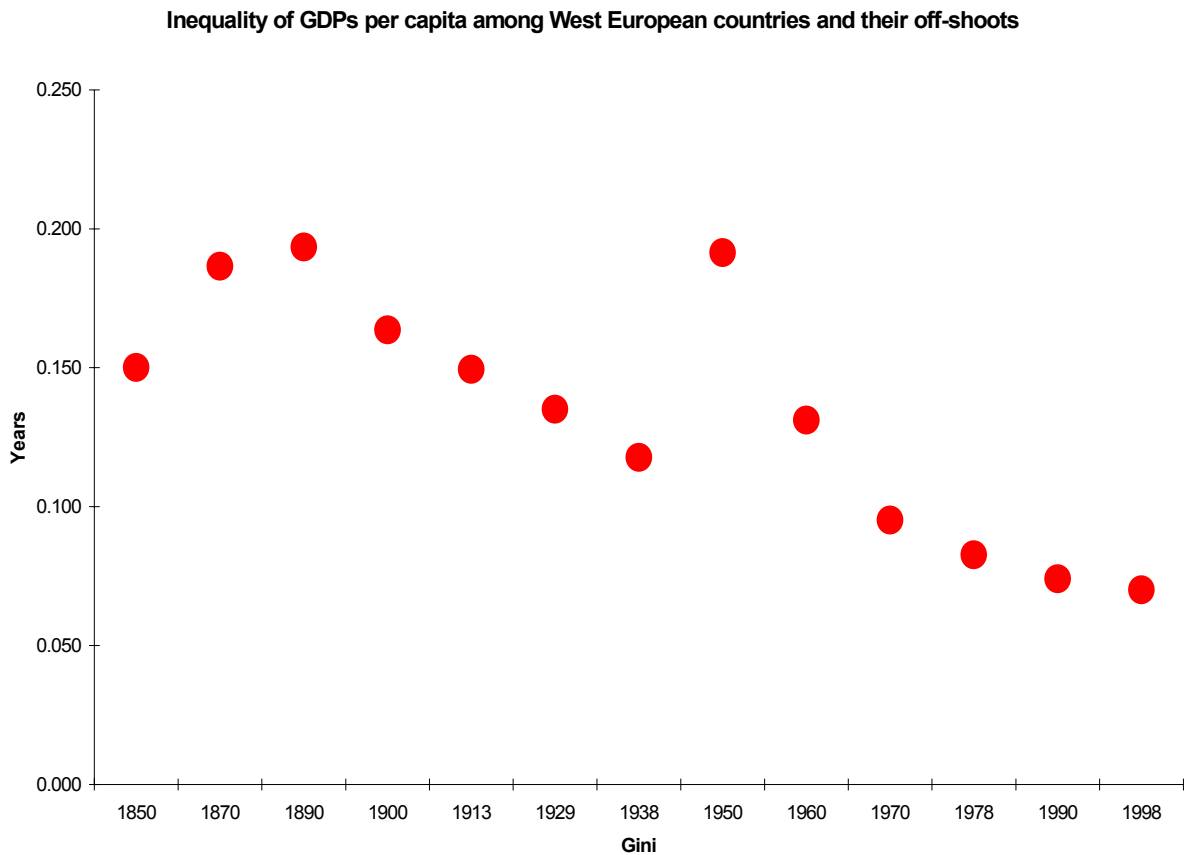
	Income distribution source	Approximation of income distributions	Approximation of missing country/year (observations)	Mean income from:	PPPs used
Milanovic	HS directly	No	No	HBS directly	EKS
Bourguignon and Morrison		No	Yes (big time)	GDP per capita	Geary-Khamis (Maddison)
Sala-i-Martin	D-S	Yes	Yes (trends)	GDP per capita	PWT
Dowrick and Akmal	D-S	No/Yes	No	GDP per capita	Afriat
Dikhanov and Ward	WIDER	Yes	No	Personal C per capita	EKS
Dollar and Kraay					
Chotikapanich et al.	D-S	Yes	No	GDP per capita	PWT
Schultz	D-S	Yes	Yes (big time)	GDP per capita	PWT

Globalization and convergence/divergence during the 1870-1938 period

1. No obvious trend among 30+ countries with GDP per capita data → no association between globalization and income convergence



2. Convergence among the Western countries and their offshoots. But the convergence continues during the Inter-war period (retrenchment of globalization) and accelerates after WW2 → again, convergence (where it exists) not related to openness



Openness and decile shares—some preliminary evidence

Equations (for 10deciles and 88 countries, 1988-1993)

$$\frac{y_i^j}{m_j} = \beta_0 + \beta_1 OPEN_j + \beta_2(OPEN * m_j) + \beta_3 DFI_j + \beta_4(DFI * m_j) + \beta_5 FD_j + \beta_6 DEM_j$$

$$\Delta\left(\frac{y_{ij}}{m_j}\right) = \beta_0 + \beta_1 \Delta OPEN_j + \beta_2(\Delta OPEN * m_j) + \beta_3 \Delta DFI_j + \beta_4(\Delta DFI * m_j) + \beta_5 \Delta FD_j + \beta_6 \Delta DEM_j$$

y_{ij} = income of i-th decile of j-th country in constant PPP dollars,

m_j = mean household survey income of j-th country

OPEN = (exports and imports)/GDP

DFI = (direct foreign investment)/GDP

FD = financial depth = (M2/GDP)

DEM = democracy.

(Preliminary) Conclusions:

- At very low level of GDP per capita, openness reduces the share of the bottom 7 deciles, increases the share of the top two.

- Turning point: at income level of triple-C (Colombia, Chile, Czech), there is a reversal: openness increases relative share of the bottom and middle deciles; the share of the top declines.

→ results consistent with Wood's idea of three types of labor, and with the Kuznets type of movement.

- But when regional dummy variables are introduced, GDP per capita loses significance. Openness is good for equality in transition and rich countries; bad in LAC and Africa.

- No effect of DFI on income shares.