Inequality in the World Economy
An Empirical Investigation

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For the
The Directorate for Employment, Labour and Social Affairs
ELSA Seminars Series
OECD, Paris
June 18, 2010

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http://utip.gov.utexas.edu
“Kepler undertook to draw a curve through the places of Mars, and his greatest service to science was in impressing on men's minds that this was the thing to be done if they wished to improve astronomy; that they were not to content themselves with inquiring whether one system of epicycles was better than another, but that they were to sit down to the figures and find out what the curve, in truth was.”

-- Charles Sanders Peirce (1877)

Deininger and Squire: Data Set of Choice?

Number of Observations Per Country, 1950-1997

Version of D&S used by Dollar and Kraay, “Growth is good for the poor.”
Deininger & Squire: Inequality Measures for the OECD

Countries ranked by average value, first and last dates shown

Trends of Inequality in the Deininger-Squire Data Set

Non-OECD vs OECD
The Texas Inequality Project

- *Measures* Global Pay Inequality
- Uses Simple Techniques that Permit Up-to-Date Measurement at Low Cost
- Uses International Data Sets for Global Comparisons
- Has Many Regional and National Data Sets as well, including for Europe, Russia, China, India, Latin America and the U.S.
- *Estimates* Global Income Inequality – Via Statistical Correspondence with other data sets.

A brief review of the Theil Statistic:

The “Between-Groups Component”

\[
T = \sum_{j=1}^{m} p_j R_j \log R_j + \sum_{j=1}^{m} p_j R_j T_j
\]

Weighted Sum of Within-Groups Components

\[
T_j = \frac{1}{n_j} \sum_{i \in g_j} r_i \log r_i
\]

Within-Group Inequality

\[
p_j = \frac{n_j}{n} \quad R_j = \frac{\mu_j}{\mu}
\]

n ~ employment; \(\mu\) ~ average income; j ~ subscript denoting group
Sources of Global Data

• Rich geographic and sectoral data sources in the US, including Local Area Personal Income, SIC, NAICS
• Goskomstat, China State Statistical Yearbook, and other national data sources
• Eurostat for regional data in Europe
• UNIDO Industrial Statistics (source of maps following) and other global data sources: ~3200 country-year observations

Rank of Mean and SD of Theil
Share of Manufacturing and UTIP-UNIDO

Inequality and Agriculture
Inequality as Global Macroeconomics

- At the national level, inequality is a curvilinear function of income level – a matter of macroeconomics, not microeconomics.
- Changes in inequality are driven in part by changing inter-sectoral terms of trade.
- The dominant movements in global pay inequality reflect changing financial regimes.
- Global factors dominate the picture.
- In the US, the stock market has driven income inequality.

A Stylized “Augmented Kuznets Curve”
Brazil on the Kuznets Curve

Global Movement of Inequality

- **Brown**: Very large decreases in inequality; more than 8 percent per year.
- **Red**: Moderate decreases in inequality.
- **Pink**: Slight Decreases.
- **Light Blue**: No Change or Slight increases
- **Medium Blue**: Large Increases -- Greater than 3 percent per year.
- **Dark Blue**: Very Large Increases -- Greater than 20 percent per year.
1963 to 1969

1970 to 1976

The oil boom: inequality declines in the producing states, but rises in the industrial oil-consuming countries, led by the United States.
1977 to 1983

… the Age of Debt

Note the exceptions to rising inequality are mainly India and China, neither affected by the debt crisis…

1981 to 1987

Start of the “Super-Bubble”
The age of globalization…

Now the largest increases in inequality in are the post-communist states; an exception is in booming Southeast Asia, before 1997…
This broad picture of the world economy from the standpoint of inequality measure suggests that the “super-bubble” was also, for most of the world’s population, a “super-crisis.”


The period since then was marked in the United States by efforts to keep the bubble going, in part through aggressive efforts to relax standards, which may be described as the growth of a “predator state.”

This led to the corruption of the financial markets whose collapse produced the great crisis.
What would have happened without the Global Element?

Note: Bands indicate two standard deviations of country observations within each year shown. OECD and non-OECD countries shown separately. Vertical scale is log(T) units.

United States
The US: Income Inequality and the NASDAQ, 1969-2006

If you remove a handful of counties, related to information technology and finance, most of the rise in income inequality in the late 1990s would not have occurred.
U.S. Income Inequality Between Counties 1969 – 2005 Plotted Against the NASDAQ Composite, with Three Counterfactual Scenarios of Inequality Growth from 1994 – 2000

Per Capita Income Inequality Across US Counties Over Time

1969 – 2004
Contribution to Inequality between Counties

(Components of the Theil T Statistic)

-0.005 - -0.000058
-0.000058 - -0.000037
-0.000037 - -0.000026
-0.000026 - -0.000019
-0.000019 - -0.000014
-0.000014 - -0.00001
-0.00001 - -0.000006
-0.000006 - -0.000003
-0.000003 - 0
0 - 0.05

Relatively Impoverished

Neutral

Prosperous

(income above national mean)

1969
1972

1973

Nixon's Soviet Wheat Deal
The Big Recession

1980

[Map of the United States with color-coded regions for 1980]

1981

The Big Recession

[Map of the United States with color-coded regions for 1981]
The Tech Bubble

1998

1999
2002

2003

Cheney Does Wyoming?
Inequality in Iran and Iraq

Inequality in the Southern Cone

Inequality in Scandinavia

Data for China drawn partly from State Statistical Yearbook; Other data from OECD STAN
Argentina

Contributions to Inequality in Argentina by Sector, 1994-2005

- Agriculture, Livestock, Hunting and Forestry
- Textiles and leather
- Supply of electricity, gas and water
- Wholesale & Retail trade and workshops
- Transport, Storage and Communications
- Real estate, business services and rentals
- Social services, private education and health
- Mining and quarrying
- Petroleum derivatives and chemicals
- Construction
- Hotels & Restaurants
- Financial Intermediation
- Civil service, defense, organizations and entities abroad
- Other service activities
Contribution to Inequality by Province in Argentina, 1994-2005

Inequality Across Provinces in Argentina, Monthly Data
Brazil
China
Contribution of Chinese Provinces to Total Inequality in China, 1987-2006

Graph showing the contribution of different Chinese provinces to total inequality over the years 1987 to 2006. The provinces highlighted are Beijing, Shanghai, and Guangdong.
These stacked line graphs show the contribution to inequality in China of each sector in each region. Two facts emerge clearly: the rise of monopolized activities such as transport, utilities and banking, especially in the richer areas, and the general relative decline of manufacturing and construction.

Russia
This figure shows the evolution of inequality in Russia measured across regions and across sectors. Note that the increases across regions are larger.

Source data are from Goskomstat; Calculations by L. Krytynskaia.

A stacked bar chart of Theil elements can show the changing contribution of each sector to inequality over time; values above zero indicate above-average incomes, and conversely...
Maps provide a useful way to visualize the increasing regional polarization of income. High values (yellow to red) indicate concentrations of relative wealth, low values (light to dark blue) show concentrations of relative poverty.
Important Note: These measures do not take account of relative changes in the regional cost of living.

These stacked line graphs show the contribution to inequality in Russia of each sector in each region. Two facts emerge clearly: the general decline of agriculture, education and health in all regions, and the rise of industrial production (energy), construction, transport and finance in a very few specific regions.

Note that in 2000 the bottom of the income structure is marked by agriculture; finance meanwhile has moved up past management and science.
Conclusions

• Inequality rose in both Russia and China
• Regional inequalities rose most sharply
• Liberalization favored monopolies and the export regions and sectors
• Agriculture lost ground
• In China, the capacity to provide key public services withstood the pressures of liberalization much better than in Russia
Inequality in India According to the World Bank's Data Set
(Deininger and Squire)

Overall Pay Inequality in Indian Manufacturing, 1973-98

- Rise in payrolls of Aluminum, Copper, Electricity generation, minting of coins and currency. Others include agr machinery, cement, chemicals, non-ferrous metals and man-made fibers.
- Drop in Theil value for cotton mills, plastics, fertilizers, industrial machinery, spinning and processing of man-made fibers. Labor conflict in cotton mills.
Overall Pay Inequality in Indian Manufacturing, 1979-98

Contribution of Each State to Overall Inequality in India

UP and Gujarat emerge as positive contributors after mid 1990s due to high Theil contribution of the electricity sector and also chemicals and repair of capital goods in Gujarat.
Contribution of Each Sector to Overall Pay Inequality in India

Time effects across States In Indian Inequality
F(18, 455)=3.0798, p=.00002
(Computed for covariates at their means)
Vertical bars denote 0.95 confidence intervals
Controlling for State Fixed Effects and Per Capita Income

Covariate means:
PcIncome: .2184046
For more information:

The University of Texas Inequality Project

http://utip.gov.utexas.edu

Type “Inequality” into Google to find us on the Web