Growth, Inequality, and Social Welfare

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Tatjana Kleineberg (Yale)
Aart Kraay (World Bank)

World Bank DECRG Policy Research Talk
June 24, 2014
Widespread concerns about rising inequality within countries

• US economy is a “winner-take-all economy where a few do better and better, while everybody else just treads water”
  – Barack Obama, July 24, 2013 speech
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- “We are the 99%”
  
  — Occupy Wall Street
“Broad majorities in 31 of the 39 countries surveyed say the income gap has increased over the past five years. Reports of a rise in income inequality are particularly high in the advanced economies, where a median of 80% say things have gotten worse, compared with medians of 70% in the developing economies and 59% in the emerging markets.”

— Pew Research Center (2013)
Evidence on Inequality Trends is Mixed

• Inequality has increased in some countries, particularly due to gap between top end and everyone else
  – US: Gini increases from 30 to 40 in past 40 years
  – China: Gini increases from 32 to 42 in past 20 years
  – Atkinson/Piketty/Saez data show big increases in top 1% income share in countries like United States, United Kingdom
Figure 8. Top 1 Percent Share: English Speaking Countries (U-shaped), 1910–2005

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• But inequality has remained stable in other countries, and fallen in still others
  – Brazil: Gini falls from 60 to 55 during 2000s
  – Atkinson/Piketty/Saez data show stable top 1% income share in countries like Japan, Switzerland, Germany
Figure 9. Top 1 Percent Share: Middle Europe and Japan (L-shaped), 1900–2005

How Much Do These Changes in Inequality (in Either Direction) Matter?
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• Matter for what?
  – Intrinsic notions of fairness?
  – Economic outcomes like growth, institutions, etc.?
  – Many other possibilities.....
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- Focus in this talk on one very modest question: how much do trends in inequality matter for social welfare?
  - Use several standard social welfare functions to value changes in inequality in terms of percentage points of growth in average incomes
    - Useful way of thinking about whether changes in inequality are “big” or “small” relative to growth
    - Useful to remember what inequality measures imply for social preferences across individuals
Illustration

- World Bank’s goal of “shared prosperity”, i.e. growth in average incomes in bottom 40%
  - Social welfare function is average incomes in bottom 40%
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• Example: In China between 1990 and 2007...
  Growth in Average Incomes 6.7%
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• Two key ingredients
  – Choose a social welfare function
  – Decompose into growth and (in)equality change
    • Both in units of income growth
Rest of Talk

• Review some common social welfare functions and what they imply for social preferences across individuals (nothing novel here)

• New empirical evidence on decomposition of social welfare growth into contributions of
  – Growth in average incomes
  – Growth in equality
  – Relate both to determinants of growth and inequality from cross-country literature
Some Useful Social Welfare Functions

• Specific Examples

• Welfare Weights and Shared Prosperity
Examples of Social Welfare Functions

- **Average income of bottom X%**
  - Mean income x (income share of bottom X%)
  - Simple average of incomes below some cutoff percentile
SWFs Imply Weights on Percentiles of Income Distribution

![Graph showing weights on percentiles of income distribution.](image-url)
Examples of Social Welfare Functions

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• **Sen (1976) “Real National Income”**
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  – Weighted average of individuals incomes with weights proportional to *ranks* in income distribution
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• **Atkinson SWF**
  – Mean income x (1-Atkinson Inequality Index)
  – Average of incomes raised to power 1-θ, higher θ means more inequality aversion
    • θ=0 gives back simple average incomes
SWFs Imply Weights on Percentiles of Income Distribution
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The diagram illustrates the weights on different percentiles of the income distribution for various social welfare functions. The x-axis represents the percentiles of income distribution, while the y-axis shows the weight on each percentile in the social welfare function. The graph includes lines for different social welfare functions:

- **Bottom40**: The line for the Bottom40 function shows the weight on the lower percentiles of the income distribution.
- **Sen**: The line for Sen's function indicates the weight on the middle percentiles.
- **Atkinson(0)**: This line represents the Atkinson function with a sensitivity parameter of 0.
- **Atkinson(1)**: The line for the Atkinson function with a sensitivity parameter of 1 shows the weight on the higher percentiles.

The graph visually represents how different social welfare functions assign weights to various percentiles of the income distribution, highlighting the differences in how each function treats different parts of the income distribution.
SWFs Imply Weights on Percentiles of Income Distribution

**Weight on Percentile j in Social Welfare Function**

- **Percentiles of Income Distribution**
  - Bottom40
  - Sen
  - Atkinson(0)
  - Atkinson(1)
  - Atkinson (2)
Welfare Weights Worth Taking Seriously

• Shared prosperity target implies welfare weights that:
  – Are zero above 40\textsuperscript{th} percentile
  – Increase with income for those below the 40\textsuperscript{th} percentile
Welfare Weights Worth Taking Seriously

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• What does shared prosperity target at country level imply for welfare weights in world?
  – Not everyone in bottom 40 percent of world is also in bottom 40 percent of their own country
  – Welfare weights still are proportional to incomes for those who are in bottom 40 percent of their own country
  – Implies hump-shaped welfare weights across percentiles of world distribution
Shared Prosperity: Global Welfare Weights

Weight in Social Welfare Function (Normalized to Sum to One)

Percentile of Developing World Income Distribution
Shared Prosperity: Global Welfare Weights

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Percentile of Developing World Income Distribution
Global Welfare Weights for Twin Goals

![Chart showing weight in social welfare function normalized to sum to one, with percentiles of developing world income distribution. The chart includes two lines: one for the bottom 40% and another for $1.25/Day.]
Growth, Inequality, and Social Welfare

• Decomposing Social Welfare Growth

• Applications to Three Datasets
  1. Global cross-country data (POVCALNET + LIS)
  2. Atkinson/Piketty/Saez top incomes data
  3. Bourguignon and Morrisson global inequality in long run of history
Decomposing Growth in Social Welfare

Growth in Social Welfare = Growth in Mean + Growth in Relevant Income Equality Measure

- First term is contribution of distribution-neutral growth to growth in social welfare
- Second term is “cost”/”benefit” of equality change in percentage points of welfare (and income) growth
Application 1: POVCALNET+LIS

• Large irregularly-spaced cross-country panel on average income/consumption and decile shares based on:
  – POVCALNET – for developing countries
  – LIS – for OECD countries

• High-quality sample based directly on primary data from household surveys

• Most results based on sample of “spells” at least 5 years long, ensuring both end-points of spell are same type
Growth and Social Welfare

SWF=Bottom 40%, aka “Shared Prosperity”
Growth and Social Welfare

SWF = Sen’s Real National Income
Growth and Social Welfare

SWF=Atkinson A(1)
Thought Experiment – Which Distribution Do You want to Draw Welfare Growth From?
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Thought Experiment – Which Distribution Do You want to Draw Welfare Growth From?

![Graph showing distribution of average annual growth rates for different income measures.](image-url)
Thought Experiment – Which Distribution Do You want to Draw Welfare Growth From?
Descriptive Regressions

• Estimate OLS regression of SWF growth on average income growth
  – Estimated slope tells us about correlation between growth and inequality change
    • Slope = (>) (<) 1 implies zero (positive) (negative) correlation between equality changes and growth
  – Transformation of R-squared tells us share of variance (across spells) in social welfare growth due to average income growth
## Basic Regressions

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Application 2: Piketty Top Incomes Data: United States 1950-2010

Top 1% Income Share in the United States, 1950-2010
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Income and Social Welfare in the United States, 1950-2010

[Graph showing trends in mean income and social welfare from 1950 to 2010.]
Application 2: Piketty Top Incomes Data: United States 1950-2010

Income and Social Welfare in the United States, 1950-2010


Mean Income

Social Welfare (Epsilon=0.25)

Social Welfare (Epsilon=0.5)

Application 3: Bourguignon and Morrisson (2002): Growth In Sen SWF For World

Average Annual Growth

-0.005 0 0.005 0.01 0.015 0.02 0.025 0.03

-0.005
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0.015
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Average Annual Growth

Inequality
Mean

Two Nerdy Digressions

• Why is the share of variance of social welfare growth due to growth in average incomes lower for more bottom-sensitive SWFs?
  – Partly due to sampling variation that introduces more variability in poorest income shares
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• What if you prefer another SWF?
  – Use concept of generalized Lorenz dominance to rank “final” distribution relative to “initial” distribution for each spell
  – *Any* increasing concave SWF would have moved in same direction as mean in 75% of spells
Correlates of Growth and Equality Change
Correlates of Growth and Equality Changes

• Regress growth and equality measures on:
  – Initial income
  – Initial equality
  – Usual suspects from cross-country literature
    • Financial development, trade openness, financial openness, inflation rate, government budget balance, life expectancy, population growth, civil liberties/political rights, revolutions, war dummy
    • Primary enrollment, educational inequality, share of agriculture in GDP
Correlates of Growth and Equality Changes

• Estimated “effects” on growth and equality sum to “effects” on social welfare

• To avoid cherrypicking favourite specifications, use Bayesian Model Averaging to combine results from all $2^{13}$ combinations of RHS variables

• Lowbrow estimation by OLS on irregularly-spaced panel of pooled spells
  – Least-bad alternative? (Hauk and Wacziarg)
Overview of BMA Results

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- Little evidence that initial equality is correlated with subsequent growth
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Faster social welfare growth in countries that are initially poor and initially unequal
Overview of BMA Results

• Magnitude and significance of effects of other variables on growth generally larger than effects on equality changes

• Some examples of tradeoffs, e.g. share of agriculture in GDP is fairly significantly correlated with:
  – Slower growth
  – Increases in equality
  – But magnitude of growth effect is much larger so unambiguously bad for social welfare growth
Summary

• Social welfare functions provide an off-the-shelf useful tool for valuing effects of inequality changes
  – Provides useful perspective on what we mean by “shared prosperity”

• Evidence from three datasets shows most of the variation in growth in social welfare is due to growth in average incomes
  – Changes in inequality are on average small and uncorrelated with growth in average incomes

• Most of correlation between “growth determinants” and growth in social welfare due to effects on growth in average incomes
  – Little systematic evidence on correlates of inequality change
Implications

• Growing emphasis on inequality in recent policy discussion raises question of how much it matters

• Inequality changes have on average contributed much less to social welfare growth than differences in average growth performance across countries

• Emphasis on inequality in development policy discussions should not come at expense of focus on growth