Can pro-growth policies lift all boats? An analysis based on household disposable incomes

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Motivation

- Factors distribution and the channels from GDP to households
  How GDP trickles down to household income
- Equity
  Equity, a multi-faceted concept, is deemed to be an essential ingredient of any successful growth strategy
- Data
  Recent changes in the statistical landscape have made such work more attainable than 20 years ago
- Demands
  Governments and other organizations
Challenges

- Integrating two strands of analyses (growth and inequality) and developing an empirical proposal for measuring the effects of pro-growth policies on these two outcomes

- Desiderata
  - It must be **understandable** and easy to describe
  - It must conform to a **common sense notion of growth**
  - It must encompass **common sense notions of inequality and poverty**
  - It must rely to a large extent on **tools and knowledge already available** while enhancing their scopes
  - It must fit the **purpose** for which it is being developed
  - It must be **technically solid**
  - It must be **operationally viable**
  - It must be easily **replicable**
The proposal

A. Measuring inequality using income standards

B. Framework for the growth/inequality nexus

C. Some examples of the effects of pro-growth policies on household incomes across the distribution

D. The way forward
A. Measuring inequality using income standards (1)

• The existing empirical literature makes use of two main approaches for tracking inequality and poverty:
  ✓ Inequality indexes, which summarize traditionally income distribution through a single value
  ✓ Poverty measures, which use a poverty line to identify the poor and a poverty index to summarize the extent of poverty

• But each approaches relies on different metrics and different set of assumptions, which lead to different set of conclusions:
  ✓ Inequality indexes use various aggregation assumptions that make them differently sensitive to various parts of the income distribution: the Gini is overly sensitive to the middle, the Theil index to the top, deciles ratio are insensitive to the middle
  ✓ Poverty measures are hampered by the lack of coherent framework for setting poverty lines
A. Measuring inequality using income standards (2)

- Different metrics raise difficulties in assessing poverty and inequality simultaneously, while inequality could be deemed to be a matter of income dispersion and income deprivation at the same time.
- The different assumptions embodied in inequality measures or poverty lines could be considered to be reasonable and useful within one country, but not within others.
- More generally, inequality measurement should avoid fundamental arbitrariness while at the same time being able to cope with various degrees of social preferences among countries.
- As such, income inequality needs to be measured using an encompassing framework which emphasizes progressively different part of the income distribution:
  - from top to upper middle class income
  - from upper middle class to mean income
  - from mean to median income
  - from median to lower middle class income
  - from lower middle class to income of the poor
A. Measuring inequality using income standards (3)

- Inequality can be tracked using **income standards** built upon the **generalized mean** concept (cf. Foster & Szekely, IER, 2008)

- What is a generalized mean?
  
  ✓ Income distribution: \( x = (x_1, ..., x_n) \)

  ✓ Class of generalized means:

\[
\mu_\alpha (x) = \left[ \left( x_1^\alpha + ... + x_n^\alpha \right) / n \right]^{1/\alpha} \quad \text{for all } \alpha \neq 0
\]

\[
\mu_0 (x) = \left( x_1 ... x_n \right)^{1/n} \quad \text{for } \alpha = 0
\]
A. Measuring inequality using income standards (4)

• How to read it?
  ✓ The generalized mean reduces to the standard mean when \( \alpha = 1 \) thus providing a natural dividing line
  ✓ When \( \alpha \to -\infty \) the generalized mean is equal to the minimum income in the society
  ✓ When \( \alpha \to +\infty \) the generalized mean is equal to the top income in the society

• The generalized mean is an income standard which summarizes the affluence of a society, placing progressively more or less weight on incomes further up or down the distribution

• Income standards robustly consider inequality and poverty using the same metric while not using arbitrary cut-offs

• They are based on a powerful axiomatic justification
A. Measuring inequality using income standards (5)

- A typology of income standards for measuring inequality:
  - $\alpha > 1$: top-sensitive income standards
  - $\alpha < 1$: bottom-sensitive income standards
  - $\alpha = 1$: mean income; $\alpha = 0$: median income

- Based on this typology, one can build **generalized means curves** to assess changes in inequality and poverty for given patterns of growth in mean household income

- Generalized means curves go beyond any standard inequality and poverty measures by providing a **synthetic but comprehensive picture** of changing income distribution:
  - How inequalities are generated and structured?
  - How poverty evolves?
  - Who gain/lose in absolute terms?
  - Did a society become more polarized (i.e. has its middle class shrunk)?
A. Measuring inequality using income standards (6)

- Generalized means curves for **Sweden** and **Turkey** between the mid-1990s and late 2000s

![Graph showing percentage growth of income standard for Sweden and Turkey over bottom to top-sensitive income standards.](image)
A. Measuring inequality using income standards (7)

- Generalized means curves for **Italy** and **Germany** between the mid-1990s and late 2000s
A. Measuring inequality using income standards (8)

- Generalized means curve for USA between the mid-1990s and late 2000s: inequality on the rise, combined with losses for the poor in absolute terms

Percentage growth of income standard

- United States

Bottom to top-sensitive income standards
A. Measuring inequality using income standards (9)

- Generalized means curve for **Spain** between the mid-1990s and late 2000s: relative advantage for the middle class, combined with losses for the poor in absolute terms

![Percentage growth of income standard graph](image-url)
A. Measuring inequality using income standards (10)

- Differences between pre (red) and post-tax and transfers (blue) income:

<table>
<thead>
<tr>
<th>Year</th>
<th>Average Annual Growth Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004</td>
<td>6.0</td>
</tr>
<tr>
<td>2005</td>
<td>5.5</td>
</tr>
<tr>
<td>2006</td>
<td>5.0</td>
</tr>
<tr>
<td>2007</td>
<td>4.5</td>
</tr>
<tr>
<td>2008</td>
<td>4.0</td>
</tr>
<tr>
<td>2009</td>
<td>3.5</td>
</tr>
<tr>
<td>2010</td>
<td>3.0</td>
</tr>
<tr>
<td>2011</td>
<td>2.5</td>
</tr>
</tbody>
</table>

Turkey (2004-11)
B. Framework (1)

- The empirical literature on growth and inequality is made of two major strands:
  - The Kuznets’ approach which identifies a **mechanical** relationship between the levels of growth and inequality
  - A causal approach which aims to identify the factors influencing growth and inequality **independently**
- Both approaches don’t try to identify factors and policies which could influence growth and inequality **simultaneously** (one attempt: Lundberg & Squire, TEJ, 2003)...
- ... but the evolution of growth and inequality is undoubtedly the outcome of similar process and influenced by the same policies
- Growth and inequality are also likely to influence each other
- An overriding need of the policy maker is the **simultaneous balance** of policy impact on growth and inequality to understand how to advance both outcomes simultaneously
B. Framework (2)

- Proposed approach: looking at GDP and income standards simultaneously, taking GDP per capita as a starting point and then adding inequality through the use of income standards at several points of the income distribution.

- The approach literally looks beyond GDP.

- **Growth equation**: human capital augmented neoclassical growth model (Mankiw, Romer and Weil, 1992).

- **Income standards equation**: (Foster & Szekely, IER, 2008) where GDP per capita acts as a “production factor” for long term levels of household income at different points of the distribution.

- The system is ran for a continuum of income standards.
B. Framework (3)

\[ \Delta \ln(\text{GDP}_t) = \beta_0 - \beta_1 \ln(\text{GDP}_{t-1}) + \beta_2 \ln(s_t) + \beta_3 \ln(h_t) - \beta_4 n_t + \beta_5 t + \delta_1 \Delta \ln(s_t) + \delta_2 \Delta \ln(h_t) + \delta_3 \Delta \ln(n_t) + \varepsilon \]

\[ \Delta \ln(\mu_\alpha(x_t)) = \eta_{0,\alpha} + \eta_{1,\alpha} \ln(TT_t) + \eta_{2,\alpha} \Delta \ln(\text{GDP}_t) + \eta_{3,\alpha} \ln(\text{GDP}_t) - \eta_{4,\alpha} \mu_\alpha(x_{t-1}) + \nu \]

• with \( \text{cov}(\varepsilon, \nu) \neq 0 \) and where:
• \( \Delta \ln(\text{GDP}_t) \) is the variation in GDP per capita between year \( t \) and year \( t-1 \)
• \( \Delta \mu_\alpha(x_t) \) is the variation in income standards between year \( t \) and year \( t-1 \) for a given value of \( \alpha \), estimated for a continuous range of \( \alpha \)s.
• \( s \) is the investment rate
• \( h \) is the stock of human capital, measured as mean years of schooling
• \( n \) is the growth rate of the working age population
• \( TT \) measures terms of trade effects (i.e. changes in export relative to import prices).
• \( \varepsilon \) et \( \nu \) are error terms, assumed to be correlated across the two equations.
B. Framework (4)

- **Baseline elasticities**: From GDP to household income across the distribution
- **Treatment of time is absolutely crucial**
B. Framework (4)

- Alternative framework (forthcoming): single household income equation to capture the effect of policies in addition to growth

\[
\Delta \ln \mu_\alpha(x_{it}) = \beta_0,\alpha - \beta_1,\alpha \ln \mu_\alpha(x_{it-1}) + \beta_2,\alpha \Delta \ln GDP_{it} + \beta_3,\alpha \ln GDP_{it-1} + \beta_4,\alpha \ln TT_{it} + \gamma_t + \eta_i + \varepsilon_{it}
\]

Or

\[
\Delta \ln \mu_\alpha(x_{it}) = \\
\theta_0,\alpha - \theta_1,\alpha \ln \mu_\alpha(x_{it-1}) + \theta_2,\alpha \Delta \ln LP_{it} + \theta_3,\alpha \ln LP_{it-1} + \theta_4,\alpha \Delta \ln LRU_{it} + \theta_5,\alpha \ln LRU_{it-1} + \theta_6,\alpha \ln TT_{it} + \gamma_t + \eta_i + \varepsilon_{it}
\]
B. Framework (5)

Household incomes elasticity to GDP

A. Market income

B. Disposable income
B. Framework (6)

Household incomes elasticity to productivity

A. Market income

B. Disposable income
B. Framework (7)

Household incomes elasticity to labour utilisation

A. Market income

B. Disposable income
C. The effects of pro-growth policies on household income (1)

• Based on the first empirical set-up, one can explore the impact of structural policies on household income across the distribution, by incorporating additively policy variables into the two equations.

• Income standards present a double advantage for policy analysis:
  ✓ A direct measure of policies’ effects on household income levels at various points of the distribution.
  ✓ An unambiguous assessment on inequality: if a policy reform has a positive effect which is stronger (weaker) for bottom-sensitive income standards compared with mean incomes, then this implies that this policy reform reduces (increases) income inequality.

• In what follows three bottom-sensitive cases are considered: median incomes (α=0), income of the lower middle class (α=-3) and income of the poor (α=-8).
C. The effects of pro-growth policies on household income

• Change in policy parameters to deliver a 1% long-term increase in GDP per capita:

<table>
<thead>
<tr>
<th>Example of specific structural policy reform</th>
<th>Effects on long-term GDP per capita (%)</th>
<th>Effects on long-term average household income (%)</th>
<th>Effects on long-term household incomes across the distribution (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>The median</td>
<td>The lower-middle class</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relax hiring and firing procedures / Reduce labour market duality</td>
<td>1.0</td>
<td>1.4</td>
<td>1.9</td>
</tr>
<tr>
<td>Reduce the level or duration of unemployment benefits</td>
<td>1.0</td>
<td>1.3</td>
<td>1.5</td>
</tr>
<tr>
<td>Reduce the level of unemployment benefits for the long-term unemployed</td>
<td>1.0</td>
<td>0.8</td>
<td>0.8</td>
</tr>
<tr>
<td>Reform the tax structure by reducing the share of direct (corporate and income) taxes and increasing the share of property or indirect taxes</td>
<td>1.0</td>
<td>0.5</td>
<td>0.5</td>
</tr>
<tr>
<td>Reduce marginal tax rates on labour</td>
<td>1.0</td>
<td>1.3</td>
<td>1.3</td>
</tr>
<tr>
<td>Encourage educational upskilling and equity in access to education</td>
<td>1.0</td>
<td>0.9</td>
<td>0.9</td>
</tr>
<tr>
<td>Reduce barriers to entry for foreign firms -- FDI inflows</td>
<td>1.0</td>
<td>1.0</td>
<td>1.3</td>
</tr>
<tr>
<td>Reduce barriers to exports / Encourage exports among domestic firms</td>
<td>1.0</td>
<td>1.1</td>
<td>1.1</td>
</tr>
<tr>
<td>Encourage innovation and raise the effectiveness of R&amp;D support</td>
<td>1.0</td>
<td>0.7</td>
<td>0.7</td>
</tr>
</tbody>
</table>
### C. The effects of pro-growth policies on household income

(3)

<table>
<thead>
<tr>
<th>Example of specific structural policy reform</th>
<th>Effects on long-term GDP per capita</th>
<th>Effects on long-term average household income</th>
<th>Effects on long-term household incomes across:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>The median</td>
<td>The lower-middle class</td>
</tr>
<tr>
<td>Step-up job-search support and activation programs for the unemployed</td>
<td></td>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>Increase the minimum cost of labour</td>
<td></td>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>Relax product market regulation (by easing entry restrictions in non-manufacturing sectors, reducing barriers to firm entry)</td>
<td></td>
<td>1.0</td>
<td>1.4</td>
</tr>
</tbody>
</table>
C. The effects of pro-growth policies on household income

• Many structural reforms have a stronger traction on household incomes -- especially those at the low-end of the distribution-- than on GDP per capita.

• This reflects the fact that reform effects channelled via GDP per capita are often compounded by additional effects beyond and above those via GDP.

• Evidence of long-term policy synergies between growth and equity objectives: reforming job protection to tackle labour market duality; reducing regulatory barriers to domestic competition as well as to trade and FDI; and stepping-up job-search support and activation programs.

• Clear cases of long-term policy trade-offs between the growth and equity objectives are not easy to identify. But there are exceptions: tightening of unemployment benefits for the long-term unemployed, reduction of minimum relative to median wages.
D. The way forward

- Considering the full distribution, including the top 1%:

United States

Percentage growth of income standard

Bottom to top-sensitive income standard

Average income

-0.15
-0.1
-0.05
0
0.05
0.1
0.15
0.2
0.25
0.3

-10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17

adj non adj.
Growing inequalities can be harmful to long-term level of GDP per capita:

GDP elasticity to inequality across the distribution

Bottom to top-sensitive Atkinson measures
THANK YOU

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