Income distribution and redistribution

HMRC-HMT Economics of Taxation
http://darp.lse.ac.uk/HMRC-HMT

Frank Cowell, 7 December 2015
Overview...

Income distribution and redistribution

- Income distribution
  - Inequality trends
  - Inequality internationally
- Redistribution

Use US data as a working template
## Quantile Incomes by Households

<table>
<thead>
<tr>
<th></th>
<th>1967</th>
<th>2014</th>
<th>Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>10%</td>
<td>$10,102</td>
<td>$12,276</td>
<td>21.5%</td>
</tr>
<tr>
<td>20%</td>
<td>$18,593</td>
<td>$21,432</td>
<td>15.3%</td>
</tr>
<tr>
<td>50%</td>
<td>$44,271</td>
<td>$53,657</td>
<td>21.2%</td>
</tr>
<tr>
<td>80%</td>
<td>$73,382</td>
<td>$112,262</td>
<td>53.0%</td>
</tr>
<tr>
<td>90%</td>
<td>$93,215</td>
<td>$157,479</td>
<td>68.9%</td>
</tr>
<tr>
<td>95%</td>
<td>$117,759</td>
<td>$206,568</td>
<td>75.4%</td>
</tr>
</tbody>
</table>

- DeNavas-Walt et al (2015) Table A-3
The Parade: quantiles vs population

- Income vs proportion of population
- Legend: 2014 (dashed), 1957 (solid)
- Income levels: $0, $50,000, $100,000, $150,000, $200,000, $250,000
- Proportion of population range: 0 to 1

The chart illustrates the quantile ratios from 1967 to 2014. Each line represents a different quantile ratio, with the y-axis showing the ratio values ranging from 0.0 to 4.5. The x-axis represents the years from 1965 to 2015. The ratios q.95/q.50, q.90/q.50, q.80/q.50, q.20/q.50, and q.10/q.50 are plotted, each line showing an increasing trend over the years.
Overview...

Developments in the USA and UK

- Income distribution
- Inequality trends
- Inequality internationally
- Redistribution
### Mean incomes by groups of households

<table>
<thead>
<tr>
<th>Quintile</th>
<th>1967</th>
<th>2014</th>
<th>Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st quintile</td>
<td>$9,915</td>
<td>$11,676</td>
<td>17.8%</td>
</tr>
<tr>
<td>2nd quintile</td>
<td>$27,473</td>
<td>$31,087</td>
<td>13.2%</td>
</tr>
<tr>
<td>3rd quintile</td>
<td>$43,865</td>
<td>$54,041</td>
<td>23.3%</td>
</tr>
<tr>
<td>4th quintile</td>
<td>$61,372</td>
<td>$87,834</td>
<td>43.1%</td>
</tr>
<tr>
<td>5th quintile</td>
<td>$110,447</td>
<td>$194,053</td>
<td>75.7%</td>
</tr>
<tr>
<td><strong>Overall</strong></td>
<td><strong>$50,614</strong></td>
<td><strong>$75,738</strong></td>
<td><strong>49.6%</strong></td>
</tr>
</tbody>
</table>
Differential growth of mean incomes

Mean Incomes US

- Lowest quintile
- Second quintile
- Third quintile
- Fourth quintile
- Highest quintile

Graph showing the mean incomes across different quintiles from 1965 to 2015.
1: The Generalised Lorenz Curve

Income shares, US

[Graph showing income shares from 1967 to 2015 for different categories, with a legend indicating different colors for each category.]
2: Top income shares in US

![Graph showing top income shares in US from 1913 to 1997, with different lines representing P90–100, P99–100 ex cl, and P99–100 In cl.](image)
Top income shares in the UK
3: Lorenz curve

- Natural interpretation in terms of shares
- Gives a natural definition of the Gini coefficient
Example 1: Inequality, US experience
Overview...

Comparisons across countries? Convergence?
## Income or consumption?

<table>
<thead>
<tr>
<th>Country</th>
<th>Year</th>
<th>Consumption</th>
<th>Income</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albania</td>
<td>1996</td>
<td>0.252</td>
<td>0.392</td>
</tr>
<tr>
<td>Bulgaria</td>
<td>1995</td>
<td>0.274</td>
<td>0.392</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>2000</td>
<td>0.334</td>
<td>0.392</td>
</tr>
<tr>
<td>Vietnam</td>
<td>1998</td>
<td>0.362</td>
<td>0.489</td>
</tr>
<tr>
<td>Nepal</td>
<td>1996</td>
<td>0.366</td>
<td>0.513</td>
</tr>
<tr>
<td>Morocco</td>
<td>1998</td>
<td>0.390</td>
<td>0.586</td>
</tr>
<tr>
<td>Nicaragua</td>
<td>1998</td>
<td>0.417</td>
<td>0.534</td>
</tr>
<tr>
<td>Thailand</td>
<td>2000</td>
<td>0.428</td>
<td>0.523</td>
</tr>
<tr>
<td>Peru</td>
<td>1994</td>
<td>0.446</td>
<td>0.523</td>
</tr>
<tr>
<td>Panama</td>
<td>1997</td>
<td>0.468</td>
<td>0.621</td>
</tr>
<tr>
<td>Russia</td>
<td>1997</td>
<td>0.474</td>
<td>0.478</td>
</tr>
<tr>
<td>Brazil</td>
<td>1996</td>
<td>0.497</td>
<td>0.596</td>
</tr>
</tbody>
</table>

See [World Bank (2005)](http://example.com), page 38
Example 2: International trends

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Mexico</td>
<td>0.45</td>
<td>0.48</td>
<td>Turkey</td>
<td>0.43</td>
<td>0.41</td>
</tr>
<tr>
<td>United States</td>
<td>0.34</td>
<td>0.38</td>
<td>Greece</td>
<td>0.34</td>
<td>0.31</td>
</tr>
<tr>
<td>Israel</td>
<td>0.33</td>
<td>0.37</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>United Kingdom</td>
<td>0.32</td>
<td>0.34</td>
<td>France</td>
<td>0.30</td>
<td>0.29</td>
</tr>
<tr>
<td>Italy</td>
<td>0.31</td>
<td>0.34</td>
<td>Hungary</td>
<td>0.27</td>
<td>0.27</td>
</tr>
<tr>
<td>Australia</td>
<td>0.309</td>
<td>0.34</td>
<td>Belgium</td>
<td>0.256</td>
<td>0.259</td>
</tr>
<tr>
<td>New Zealand</td>
<td>0.27</td>
<td>0.33</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Japan</td>
<td>0.30</td>
<td>0.33</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Canada</td>
<td>0.29</td>
<td>0.32</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Germany</td>
<td>0.25</td>
<td>0.30</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Netherlands</td>
<td>0.27</td>
<td>0.29</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Luxembourg</td>
<td>0.25</td>
<td>0.288</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Finland</td>
<td>0.209</td>
<td>0.259</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sweden</td>
<td>0.20</td>
<td>0.26</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Czech Republic</td>
<td>0.23</td>
<td>0.26</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Norway</td>
<td>0.22</td>
<td>0.25</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Denmark</td>
<td>0.22</td>
<td>0.25</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: OECD (2011)
Example 2: International trends (2)

• Break down overall inequality to analyse trends:
  • \( I = \sum_j w_j I_j + I_{\text{between}} \)
  • do this with any inequality measure \( I \)?
  • what weights should we use?

• Traditional approach takes each country as separate unit
  • shows divergence – increase in inequality
  • but, in effect, weights countries equally
  • debatable that China gets the same weight as very small countries

• New conventional view (Sala-i-Martin 2006)
  • within-country disparities have increased
  • not enough to offset reduction in cross-country disparities.

• Components of change in distribution are important
  • “correctly” compute world income distribution
  • decomposition within/between countries is then crucial
  • what drives cross-country reductions in inequality?
  • large growth rate of the incomes of the Chinese
Inequality: World experience

Source: Sala-i-Martin (2006)
Inequality: World experience: (2)

Source: Sala-i-Martin (2006)
Overview...

Impact of taxes and benefits

- Income distribution
- Inequality trends
- Inequality internationally
- Redistribution
Another application of ranking

• Tax and benefit system maps one distribution into another
  • \( c = y - T(y) \)
  • \( y \): pre-tax income \( c \): post-tax income
• Use ranking tools to assess the impact of this in welfare terms
• Typically this uses one or other concept of Lorenz dominance
• Linked to effective tax progression
  • \( T \) is progressive if \( c \) Lorenz-dominates \( y \)
  • see Jakobsson (1976)
• What Lorenz ranking would we expect to apply to these 5 concepts?

original income  + cash benefits
gross income     - direct taxes
disposable income - indirect taxes
post-tax income   + non-cash benefits
final income
Impact of Taxes and Benefits. UK 2006/7.
Lorenz Curve

- + cash benefits
- – direct taxes
- – indirect taxes
- + noncash benefits

- Big effect from benefits side
- Modest impact of taxes
- Direct and indirect taxes work in opposite directions
Impact of Taxes and Benefits. UK 2006/7.

GLC

- Final income does not second-order dominate original income.
Implied tax rates in *Economic andLabour Market Review*

*Formerly *Economic Trends*. Taxes as proportion of gross income – see Jones, *(2008)*
Impact of taxes and benefits: Brazil

Comportamento do índice de Gini e das rendas monetárias original, inicial, disponível, final – Brasil (2002-2003 e 2008-2009)

Source: Carlos Ribeiro et al. (2011)
Summary

• 2nd-order (GL)-dominance: ranking by cumulations
  • From lecture 1
• Lorenz dominance equivalent to ranking by shares
  • Special case of GL-dominance normalised by means
  • use to characterise redistributional impact
• If Lorenz-curves intersect unambiguous inequality orderings not possible
  • Makes inequality measures especially interesting
• Use I-measures to capture effective tax progression
References


• *OECD (2011) Divided We Stand: Why Inequality Keeps Rising* OECD iLibrary.


