Economics 270c
Graduate Development Economics

Professor Ted Miguel
Department of Economics
University of California, Berkeley
Lecture 1: Introduction to Economics 27

• Lecturer: Prof. Ted Miguel
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Office hours: Mondays 9-11:30am, Evans 647
Lecture 1: Global patterns of economic growth and development (1/16)

The political economy of development
Lecture 2: Inequality and growth (1/23)
Lecture 3: Corruption (1/30) – Guest lecture by Ben Olken
Lecture 4: History and institutions (2/6)
Lecture 5: Democracy and development (2/13)
Lecture 6: Ethnic and social divisions (2/20)
Lecture 7: Economic Theories of Conflict (2/27)
Lecture 8: War and Economic Development (3/6)

Human resources
Lecture 9: Human capital and income growth (3/13)
Lecture 10: Increasing human capital (3/20)
Lecture 11: Health and nutrition (4/3)
Lecture 12: The Economics of HIV/AIDS (4/10)
Lecture 13: Labor markets and migration (4/17)

Lecture 14: Environment and development (4/24)
Lecture 15: Social Learning and Technology Adoption (5/1)
• Prerequisites: Graduate microeconomics, econometrics

• Grading:
  Three referee reports – 30%
  Two problem sets – 20%
  Research proposal – 15%
  Final exam – 30%
  Class participation – 5%

• Course structure:
  1) Cross-country growth empirics (lecture 1)
  2) The political economy of development (lectures 2-8)
  3) Human resources (lectures 9-13)
  4) Other topics (lectures 14-15)

• All readings are available online (see syllabus)
Lecture 1 outline

(1) This Course
(2) Development in Human terms
(3) Jones [1997]
(4) Cross-country growth empirics
  (Deaton [2005], Levine and Renelt [1992])
(2) Development in human terms

- Themes:
(3) Jones (1997, JEP)

- Characterizes economic growth patterns across countries in the post-war period, using national accounts data
- Has there been income convergence or not?
- The most recent (Jones 2005) empirical evidence points against the convergence hypothesis: “twin peaks”?
Figure 1
World Income Distribution, 1960 and 1988

[Graph showing distribution of GDP per worker relative to the U.S. over log scale.]
Figure 2
Relative Y/L, 1960 vs. 1988
(log scale)
Table 1
Frequency of Growth Miracles and Growth Disasters

<table>
<thead>
<tr>
<th>Interval</th>
<th>Number of Countries</th>
<th>Fast Growth</th>
<th>Intermediate Growth</th>
<th>Slow Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Countries</td>
<td>(121)</td>
<td>40</td>
<td>45</td>
<td>15</td>
</tr>
<tr>
<td>$y \leq .05$</td>
<td>(18)</td>
<td>22</td>
<td>61</td>
<td>17</td>
</tr>
<tr>
<td>$.05 &lt; y \leq .10$</td>
<td>(23)</td>
<td>22</td>
<td>35</td>
<td>43</td>
</tr>
<tr>
<td>$.10 &lt; y \leq .20$</td>
<td>(31)</td>
<td>65</td>
<td>32</td>
<td>3</td>
</tr>
<tr>
<td>$.20 &lt; y \leq .40$</td>
<td>(24)</td>
<td>42</td>
<td>50</td>
<td>8</td>
</tr>
<tr>
<td>$.40 &lt; y \leq .80$</td>
<td>(21)</td>
<td>43</td>
<td>52</td>
<td>5</td>
</tr>
<tr>
<td>$y &gt; .80$</td>
<td>(4)</td>
<td>0</td>
<td>75</td>
<td>25</td>
</tr>
</tbody>
</table>

Notes: Entries in the main part of the table reflect the percentage of countries in each interval exhibiting fast, intermediate and slow growth. Fast growth is defined to be one percentage point faster than U.S. growth (1.4 percent), and slow growth is defined to be one percentage point slower.
Figure 3
Density of GDP Per Worker Weighted by Population
FIGURE 2. Divergence in the Last Half Century

Ratio of GDP per person, 5th Richest to 5th Poorest (left scale)

Standard Deviation of Log GDP per person (right scale)

TABLE 2.
Ratios of Per Capita GDP at Various Percentiles

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Max/Min</td>
<td>39.3</td>
<td>62.1</td>
<td>50.4</td>
<td>54.5</td>
<td>87.4</td>
<td>2.23</td>
</tr>
<tr>
<td>95/5</td>
<td>20.3</td>
<td>24.4</td>
<td>27.3</td>
<td>31.8</td>
<td>32.1</td>
<td>1.58</td>
</tr>
<tr>
<td>90/10</td>
<td>11.8</td>
<td>14.8</td>
<td>16.7</td>
<td>22.2</td>
<td>27.1</td>
<td>2.29</td>
</tr>
<tr>
<td>80/20</td>
<td>5.2</td>
<td>7.9</td>
<td>9.2</td>
<td>10.7</td>
<td>12.5</td>
<td>2.39</td>
</tr>
<tr>
<td>95/50</td>
<td>4.6</td>
<td>5.2</td>
<td>5.2</td>
<td>6.1</td>
<td>5.9</td>
<td>1.29</td>
</tr>
<tr>
<td>90/50</td>
<td>3.5</td>
<td>4.2</td>
<td>4.7</td>
<td>5.6</td>
<td>5.5</td>
<td>1.56</td>
</tr>
<tr>
<td>80/50</td>
<td>2.2</td>
<td>3.1</td>
<td>3.3</td>
<td>3.8</td>
<td>3.8</td>
<td>1.72</td>
</tr>
<tr>
<td>95/80</td>
<td>2.1</td>
<td>1.7</td>
<td>1.6</td>
<td>1.6</td>
<td>1.6</td>
<td>0.75</td>
</tr>
<tr>
<td>50/5</td>
<td>4.4</td>
<td>4.7</td>
<td>5.3</td>
<td>5.2</td>
<td>5.4</td>
<td>1.23</td>
</tr>
<tr>
<td>50/10</td>
<td>3.3</td>
<td>3.5</td>
<td>3.5</td>
<td>3.9</td>
<td>4.9</td>
<td>1.47</td>
</tr>
<tr>
<td>50/20</td>
<td>2.4</td>
<td>2.6</td>
<td>2.8</td>
<td>2.8</td>
<td>3.3</td>
<td>1.39</td>
</tr>
</tbody>
</table>

Note: Using the 104 countries that have continuous data for 1960 to 1999, the table reports the ratio of per capita GDP from various percentiles. For example, the 3rd row reports the 90th percentile to the 10th percentile in each year. The last column of the table shows the ratio of the 1999 column to the 1960 column. Underlying data from Penn World Tables 6.1.
<table>
<thead>
<tr>
<th>HDI rank</th>
<th>Human development index (HDI) value</th>
<th>Life expectancy at birth (years)</th>
<th>Adult literacy rate (% ages 15 and above)</th>
<th>Combined gross enrolment ratio for primary, secondary and tertiary schools (%)</th>
<th>GDP per capita (PPP US$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Developing countries</td>
<td>0.694</td>
<td>65.0</td>
<td>76.6</td>
<td>63</td>
<td>4,359</td>
</tr>
<tr>
<td>Least developed countries</td>
<td>0.518</td>
<td>52.2</td>
<td>54.2</td>
<td>45</td>
<td>1,328</td>
</tr>
<tr>
<td>Arab States</td>
<td>0.679</td>
<td>67.0</td>
<td>64.1</td>
<td>62</td>
<td>5,685</td>
</tr>
<tr>
<td>East Asia and the Pacific</td>
<td>0.768</td>
<td>70.5</td>
<td>90.4</td>
<td>69</td>
<td>5,100</td>
</tr>
<tr>
<td>Latin America and the Caribbean</td>
<td>0.797</td>
<td>71.9</td>
<td>89.6</td>
<td>81</td>
<td>7,404</td>
</tr>
<tr>
<td>South Asia</td>
<td>0.628</td>
<td>63.4</td>
<td>58.9</td>
<td>56</td>
<td>2,897</td>
</tr>
<tr>
<td>Sub-Saharan Africa</td>
<td>0.515</td>
<td>46.1</td>
<td>61.3</td>
<td>50</td>
<td>1,856</td>
</tr>
<tr>
<td>Central and Eastern Europe and the CIS</td>
<td>0.802</td>
<td>68.1</td>
<td>99.2</td>
<td>83</td>
<td>7,939</td>
</tr>
<tr>
<td>OECD</td>
<td>0.892</td>
<td>77.7</td>
<td>..</td>
<td>89</td>
<td>25,915</td>
</tr>
<tr>
<td>High-income OECD</td>
<td>0.911</td>
<td>78.9</td>
<td>..</td>
<td>95</td>
<td>30,181</td>
</tr>
<tr>
<td>----------------------------------------</td>
<td>-----------------------</td>
<td>---------------------------</td>
<td>-------------------------</td>
<td>-----------------------------</td>
<td>----------------------------------</td>
</tr>
<tr>
<td>Developing countries</td>
<td>6,981.9 T</td>
<td>21,525.4 T</td>
<td>1,414</td>
<td>4,359</td>
<td>2.3</td>
</tr>
<tr>
<td>Least developed countries</td>
<td>221.4 T</td>
<td>895.1 T</td>
<td>329</td>
<td>1,328</td>
<td>0.7</td>
</tr>
<tr>
<td>Arab States</td>
<td>773.4 T</td>
<td>1,683.6 T</td>
<td>2,611</td>
<td>5,685</td>
<td>0.2</td>
</tr>
<tr>
<td>East Asia and the Pacific</td>
<td>2,893.6 T</td>
<td>9,762.2 T</td>
<td>1,512</td>
<td>5,100</td>
<td>6.0</td>
</tr>
<tr>
<td>Latin America and the Caribbean</td>
<td>1,745.9 T</td>
<td>3,947.0 T</td>
<td>3,275</td>
<td>7,404</td>
<td>0.6</td>
</tr>
<tr>
<td>South Asia</td>
<td>902.2 T</td>
<td>4,235.9 T</td>
<td>617</td>
<td>2,897</td>
<td>2.6</td>
</tr>
<tr>
<td><strong>Sub-Saharan Africa</strong></td>
<td><strong>418.5 T</strong></td>
<td><strong>1,227.4 T</strong></td>
<td><strong>633</strong></td>
<td><strong>1,856</strong></td>
<td><strong>–0.7</strong></td>
</tr>
<tr>
<td>Central and Eastern Europe and the CIS</td>
<td>1,189.9 T</td>
<td>3,203.5 T</td>
<td>2,949</td>
<td>7,939</td>
<td>..</td>
</tr>
<tr>
<td>OECD</td>
<td>29,650.5 T</td>
<td>29,840.6 T</td>
<td>25,750</td>
<td>25,915</td>
<td>2.0</td>
</tr>
<tr>
<td>High-income OECD</td>
<td>28,369.5 T</td>
<td>27,601.9 T</td>
<td>31,020</td>
<td>30,181</td>
<td>2.2</td>
</tr>
</tbody>
</table>
(4) Mankiw, Romer, Weil (1992, QJE)

- An early and influential exposition of economic growth empirics, using cross-country data
- They take the neo-classical growth model – with its assumption of constant technological progress $A$ (which can be interpreted broadly) – to the data, and assess the extent to which capital accumulation can explain recent economic growth patterns across countries. Technological progress is treated as a residual
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- They take the neo-classical growth model – with its assumption of constant technological progress $A$ (which can be interpreted broadly) – to the data, and assess the extent to which capital accumulation can explain recent economic growth patterns across countries. Technological progress is treated as a residual.

- How reasonable is it to assume that country $A$ is uncorrelated with physical, human capital investment?
- Endogeneity may be a problem: are human and physical capital investment exogenous in reality?
(4) Deaton (2005, *REStat*)

• National accounts system (NAS) data and household survey (HHS) data have yielded very different estimates regarding global income trends. Which is correct?

• This has major implications for our understanding of the impact of economic reforms in China and India.

• Studying these measures also sheds light on data quality across regions.
<table>
<thead>
<tr>
<th></th>
<th>No. of Surveys</th>
<th>Mean Ratio</th>
<th>Standard Error</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>277</td>
<td>0.860</td>
<td>(0.029)</td>
<td>0.306</td>
</tr>
<tr>
<td>EAP</td>
<td>42</td>
<td>0.819</td>
<td>(0.069)</td>
<td>0.224</td>
</tr>
<tr>
<td>EECA</td>
<td>59</td>
<td>0.847</td>
<td>(0.038)</td>
<td>0.230</td>
</tr>
<tr>
<td>LAC</td>
<td>26</td>
<td>0.767</td>
<td>(0.094)</td>
<td>0.329</td>
</tr>
<tr>
<td>MENA</td>
<td>20</td>
<td>0.955</td>
<td>(0.104)</td>
<td>0.300</td>
</tr>
<tr>
<td>OECD</td>
<td>33</td>
<td>0.781</td>
<td>(0.052)</td>
<td>0.097</td>
</tr>
<tr>
<td>SA</td>
<td>23</td>
<td>0.649</td>
<td>(0.063)</td>
<td>0.122</td>
</tr>
<tr>
<td>SSA</td>
<td>74</td>
<td>1.000</td>
<td>(0.061)</td>
<td>0.415</td>
</tr>
</tbody>
</table>
Figure 1: Ratio of Survey Estimates of Mean Income or Consumption per Capita to Comparable National Accounts Estimates

Consumption to consumption ratio

Income to consumption ratio

Income to GDP ratio

Log of real GDP PC 1995 PPP
Figure 3.—Logarithms of Population-Weighted Averages of Consumption or Income

- Consumption, PWT, matched to surveys
- Survey means, income where possible
- Survey means, consumption where possible

The graph shows the logarithms of population-weighted averages of consumption or income over the years from 1990 to 2000.
Figure 4.—Ratios of Survey Means to National Accounts Means of Consumption and/or Income per Head, India and China

India

Ratio of survey consumption to NAS consumption


0.4 0.5 0.6 0.7 0.8 0.9 1.0 1.1

China

Ratio of survey income to NAS consumption

old series

new series

Ratio of survey consumption to NAS consumption


0.4 0.5 0.6 0.7 0.8 0.9 1.0 1.1
Figure 5.—Ratios of Survey Means to National Accounts Means of Consumption and/or Income per Head: United States and United Kingdom

USA

- CPS income
- CEX consumption
- CEX income


UK

- FES consumption
- EFS consumption

Deaton (2005, *REStat*)

- Weaknesses of household survey (HHS) data:
  1) Survey non-response / non-compliance / coverage
  2) Surveys often (but not always) fail to include the rental value of owner-occupied housing
  3) Recall periods (i.e., 1 week vs. 1 month) have a major impact on reported consumption levels
  4) The disaggregation of survey items has an impact
  5) The identity of the survey respondent matters
  6) NGO / non-profit related consumption activities are typically missed in HH surveys but captured (at least in theory) in NSA measures
• Weaknesses of national accounts system (NAS) data:
  1) Illegal / regulated activities (e.g., smuggling) may be systematically missed in the national accounts data
  2) The construction of NAS data often uses outdated and poorly measured official statistics, input-output tables, and estimated crop yields
  3) Household / informal sector production is missed in national accounts

Deaton (2005, *REStat*)
(4) Levine and Renelt (1992, AER)

- Levine and Renelt examine a regression of the form:
  \[ Y = a + B_i I + B_M M + B_Z Z + u \]

  where \( Y \) is per capita income growth, \( I \) is the vector of standard variables (as in MRW 1992), \( M \) the variable being tested for robustness, and \( Z \) are other controls.

- How robust to the addition of other controls is \( B_M \)?
- The bottom line: nearly all variables (in terms of fiscal, monetary, and trade policy, and political variables) are fragile to the addition of other controls, except for the standard investment and initial income variables.