Lecture 1: Income, capital and growth in the long run: how did rich countries become rich?

(check on line for updated versions)
Roadmap of lecture 1

• Introduction: three U-shaped curves
• Basic concepts: output, income, capital
• National accounts: the measurement of growth
• Facts and questions about long-run growth
• How did rich countries become rich?
• A roadmap of the comparative devt literature
• The standard growth model: output convergence, not income or wealth convergence
Introduction: three U-shaped curves

- (1) **Between-country income inequality 1700-2015**: divergence between Western and other countries during 19c & until mid 20c, convergence since 1980-1990 (reduction of inequality)
- (2) **Within-country income inequality**: in the US, income inequality rose since 1980 & is now back to the levels observed in early 20c: i.e. about 50% of national income for the top 10%
- (3) **Capital/income ratio**: in Europe & Japan, K/Y is almost back to the level observed in early 20c: i.e. about 500-600% for K/Y
- These three evolutions are partly related (world wars, decolonization, end of communism, globalization), but also involve country specific mechanisms: (1) largely due to internal evolutions of emerging countries; (2) mostly US trend; (3) mostly Europe and Japan (postwar recovery, demography); (2) & (3) could well happen together everywhere in the future - or not
- One of the key objectives of this course is to better understand these long-run evolutions: how did rich countries get rich, and how do inequality, state formation & development interact?
Figure 1.3. Global inequality 1700-2012: divergence then convergence?

Per capita GDP in Asia-Africa went from 37% of world average in 1950 to 61% in 2012.
Sources and series: see piketty.pse.ens.fr/capital21c.
The top decile share in U.S. national income dropped from 45-50% in the 1910s-1920s to less than 35% in the 1950s (this is the fall documented by Kuznets); it then rose from less than 35% in the 1970s to 45-50% in the 2000s-2010s.

Sources and series: see Figure I.1. Income inequality in the United States, 1910-2012.
Figure I.2. The capital/income ratio in Europe, 1870-2010

Aggregate private wealth was worth about 6-7 years of national income in Europe in 1910, between 2 and 3 years in 1950, and between 4 and 6 years in 2010. Sources and series: see piketty.pse.ens.fr/capital21c.
Basic concepts: output, income, capital

- National income $Y = \text{domestic output } Y_d \text{ (NDP)}$
  $+ \text{net foreign factor income}$

- Domestic output $Y_d \text{ (NDP = Net domestic product)}$
  $= \text{GDP (Gross domestic product)} – \text{capital depreciation}$

- Typically $Y$ and $Y_d = \text{about 85-90\% GDP in rich countries today}$

- i.e. capital depreciation $= \text{about 10-15\% GDP}$
  (but can be $<5\%$ in agrarian societies: low land depreciation rates
  as compared to buildings, equipment, computers, etc.)

- Net foreign factor income can be $>0$ (typically in countries with net foreign asset position $>0$), or $<0$ (typically in countries with net foreign asset position $<0$)
• Net foreign asset position (NFA) = gross foreign assets (gross assets owned by the residents of a country in the rest of world) – gross foreign liabilities (debt) (gross assets owned by rest of the world in the country)

• Net foreign capital income = close to 0% of $Y_d$ in most rich countries (between +1-2% & -1-2% $Y_d$) : right now, rich countries own approximately as much foreign assets in rest of the world as rest of the world owns in home assets, so that national income $\approx$ domestic output

• But this has not always been like this (colonial times); and it could change again: Germany and Japan – and China and oil producing countries – are currently accumulating large NFA, while NFA of Africa (or Greece) is v. negative >> see lecture 2

• At the world level, net foreign income flows cancel out, so that national income $Y = \text{domestic output} \ Y_d$
• National income \( Y = Y_d + r \text{ NFA} \)
• Private capital (or private wealth) \( W = \) non-financial assets (real estate, family firms,..) + financial assets (equity, bonds, life insurance, deposits, cash, pension funds,..) – financial liabilities (debt) held by private individuals (households) (+non-profit inst.)
• Public capital (or public wealth) \( W_g = \) non-fin + fin assets – liabilities held by the government (all levels)
• National capital (or national wealth) \( W_n = W + W_g \)
• National wealth \( W_n = \) domestic capital \( K \) + net foreign assets \( \text{NFA} \)
• Domestic capital \( K = \) agricultural land + housing + other domestic capital (=structures, equipment, patents,.. used by firms & govt)
• Note that firms are valued at market prices through equity
• Private wealth/national income ratio \( \beta = \frac{W}{Y} \)
• National wealth/national income ratio \( \beta_n = \frac{W_n}{Y} \)
• Domestic capital/output ratio \( \beta_k = \frac{K}{Y_d} \)
• At the world level, national wealth/national income ratio =
  domestic capital/output ratio; but at the country level, it can differ
• Basic orders of magnitude in rich countries today
  • National wealth $W_n \approx$ private wealth $W$
    (i.e. public wealth $W_g \approx 0$) (or <0..)
  • National wealth $W_n \approx$ domestic capital $K$
    (i.e. net foreign asset $NFA \approx 0$) (but large gross foreign positions)
  • National wealth $W_n \approx 500-600\%$ of national income $Y$
    $\approx$ residential housing + other domestic capital ($\approx 50-50$)
• Typically, in France, UK, Germany, Italy, US, Japan:
  Per capita average income $Y \approx 30\,000\,€$ (= national income/population)
  Per capita aver. wealth $W \approx 150\,000-180\,000\,€$ (=private wealth/pop)
  • I.e. $\beta = W/Y \approx 500-600\%$
  • $Y_K =$ capital income = rent, dividend, interest, profits,..
  • $\alpha = Y_K/Y =$ capital share in national income $\approx 25-30\%$
  • I.e. average rate of return $r = \alpha/\beta = 4-5\%$
• Basic accounting law: $\alpha = r \times \beta \rightarrow$ Lecture 2 on dynamics of $\beta$ and $\alpha$
National accounts: the measurement of growth

- **Maddison 2008 database** = the most extensive compilation of historical national accounts (*The World Economy...* 2001, appendix)
- See this [excel file](https://example.com/excel) for a combination of Maddison series and official UN population series and WB GDP series for recent decades; see also [Capital...](https://example.com/book), chap.1-2, & on-line appendix tables for [chapter 1](https://example.com/chapter)

- On the history of national accounts, see R. Stone, “The accounts of society”, [Nobel lecture 1984](https://example.com/lecture), and Vanoli 2002

- Since the 1930s-40s and until recently (≈ btw 1929 and 2008), national accounts were mostly about flows of output, income and consumption/invt, and not about stock of capital, assets & liabilities
- Maddison: no data on capital stock (only GDP and population)
- See [lecture 2](https://example.com/lecture) on the history of measurement of capital and wealth; recent return to stock measurement (back to 18c-19c and to an earlier tradition of national accounts)
Facts & questions about long-run growth

• **Fact 1: Convergence**
  Convergence between poor and rich countries now seems well under way; but not over yet (?)

• **Fact 2: Global growth slowdown in 21c**
  Productivity growth is always slow for countries at the world technological frontier; once global catch-up process is over, growth might be low everywhere (?)

• Population growth seems to be $\to 0$ (or $<0$) (?)
Fact 1. Convergence

- Between 1900 and 1980, Europe + America ≈ 70-80% world GDP
- In 2013: down to about 50% (as in 1860)
- At some point during 21c: down to 20-30%, i.e. to the share of Europe + America in world population = convergence in per capita output and income
- But will convergence be over in 2030, 2060 or 2090? Nobody knows. Probably closer to 2040 in East Asia, and closer to 2090 in South Asia and Africa.
- Convergence occurred mostly through domestic investment (not so much through foreign investment: emerging countries are not owned by rich countries... except Africa)
- Economic openness had a critical impact on development via free trade (specialization effect) and via diffusion of technology and know-how; but maybe not so much via free capital flows
Figure 1.2. The distribution of world population 1700-2012

Europe's population made 26% of world population in 1913, down to 10% in 2012.
Sources and series: see piketty.pse.ens.fr/capital21c.
Figure 1.3. Global inequality 1700-2012: divergence then convergence?

Per capita GDP in Asia-Africa went from 37% of world average in 1950 to 61% in 2012. Sources and series: see piketty.pse.ens.fr/capital21c.
Figure S1.3. Global inequality 0-2012: divergence then convergence?

Per capita GDP in Asia-Africa went from 37% of world average in 1950 to 61% in 2012.
Sources and series: see piketty.pse.ens.fr/capital21c.
Europe's population made 26% of world population in 1913, down to 10% in 2012.

Sources and series: see piketty.pse.ens.fr/capital21c.
Figure S1.1. The distribution of world output, 0-2012

Europe's GDP made 47% of world GDP in 1913, down to 25% in 2012.

Sources and series: see piketty.pse.ens.fr/capital21c.
Basic orders of magnitude to remember:

- World GDP 2012 = about 70 trillions €
  (i.e. 70,000 billions €)
- World population = about 7 billions
- Per capital GDP = about 10,000€
- Per capital income = about 800€/month
- Rich countries = about 2000-3000€/month
- Poor countries = about 200-300€/month
- More inequality in income than in output, and in market exchange rates than in PPP
### Table 1.1: Distribution of world GDP, 2012

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>World</strong></td>
<td>7 050</td>
<td>71 200</td>
<td>10 100</td>
<td>760 €</td>
</tr>
<tr>
<td><strong>Europe</strong></td>
<td>740 (10%)</td>
<td>17 800</td>
<td>24 000</td>
<td>1 800 €</td>
</tr>
<tr>
<td>incl. European Union</td>
<td>540 (8%)</td>
<td>14 700</td>
<td>27 300</td>
<td>2 040 €</td>
</tr>
<tr>
<td>incl. Russia/Ukraine</td>
<td>200 (3%)</td>
<td>3 100</td>
<td>15 400</td>
<td>1 150 €</td>
</tr>
<tr>
<td><strong>America</strong></td>
<td>950 (13%)</td>
<td>20 600</td>
<td>21 500</td>
<td>1 620 €</td>
</tr>
<tr>
<td>incl. United States/Canada</td>
<td>350 (5%)</td>
<td>14 300</td>
<td>40 700</td>
<td>3 050 €</td>
</tr>
<tr>
<td>incl. Latin America</td>
<td>600 (9%)</td>
<td>6 300</td>
<td>10 400</td>
<td>780 €</td>
</tr>
<tr>
<td><strong>Africa</strong></td>
<td>1 070 (15%)</td>
<td>2 800</td>
<td>2 600</td>
<td>200 €</td>
</tr>
<tr>
<td>incl. North Africa</td>
<td>170 (2%)</td>
<td>1 000</td>
<td>5 700</td>
<td>430 €</td>
</tr>
<tr>
<td>incl. Subsaharan Africa</td>
<td>900 (13%)</td>
<td>1 800</td>
<td>2 000</td>
<td>150 €</td>
</tr>
<tr>
<td><strong>Asia</strong></td>
<td>4 290 (61%)</td>
<td>30 000</td>
<td>7 000</td>
<td>520 €</td>
</tr>
<tr>
<td>incl. China</td>
<td>1 350 (19%)</td>
<td>10 400</td>
<td>7 700</td>
<td>580 €</td>
</tr>
<tr>
<td>incl. India</td>
<td>1 260 (18%)</td>
<td>4 000</td>
<td>3 200</td>
<td>240 €</td>
</tr>
<tr>
<td>incl. Japan</td>
<td>130 (2%)</td>
<td>3 800</td>
<td>30 000</td>
<td>2 250 €</td>
</tr>
<tr>
<td>incl. Other</td>
<td>1 550 (22%)</td>
<td>11 800</td>
<td>7 600</td>
<td>570 €</td>
</tr>
</tbody>
</table>

World GDP, estimated in purchasing power parity, was about 71 200 billions euros in 2012. World population was about 7,050 billions inhabitants, hence a per capital GDP of 10 100€ (equivalent to a monthly income of about 760€ per month). All numbers were rounded to the closed dozen or hundred.

Sources: see piketty.pse.ens.fr/capital21c.
In 2012, 1 euro was worth 1.30 dollars according to current exchange rate, but 1.20 dollars in purchasing power parity. Sources and series: see piketty.pse.ens.fr/capital21c.
In 2012, 1 euro was worth 8 yuans according to current exchange rate, but 5 yuans in purchasing power parity. Sources and series: see piketty.pse.ens.fr/capital21c.
Fact 2. Growth slowdown

- Productivity growth is always slow for countries at the world technological frontier; once global catch-up process is over, growth might be low everywhere.
- Population growth seems to be $\rightarrow 0$ (or $<0$).
- Average world growth 1700-2012: $g=1.6\%$, including $n=0.8\%$ for population and $h=0.8\%$ for per capita output.
- But $0.8\%$ per year was enough to multiply world population (and average income) by a factor of 10.
- $g = n + h$ with $n =$ population growth and $h =$ productivity growth.
- In the very long run, maybe $n \approx 0\%$ and $h \approx 1-1.5\%$, so that $g=n+h\approx 1-1.5\%$.
- Some economists are even less optimistic: long-run $g<1\%$ according to Gordon 2012 and secular stagnation debate.
### Table 2.1: World growth since the industrial revolution

<table>
<thead>
<tr>
<th>Average annual growth rate</th>
<th>World output</th>
<th>World population</th>
<th>Per capita output</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-1700</td>
<td>0.1%</td>
<td>0.1%</td>
<td>0.0%</td>
</tr>
<tr>
<td>1700-2012</td>
<td>1.6%</td>
<td>0.8%</td>
<td>0.8%</td>
</tr>
<tr>
<td>incl.: 1700-1820</td>
<td>0.5%</td>
<td>0.4%</td>
<td>0.1%</td>
</tr>
<tr>
<td>1820-1913</td>
<td>1.5%</td>
<td>0.6%</td>
<td>0.9%</td>
</tr>
<tr>
<td>1913-2012</td>
<td>3.0%</td>
<td>1.4%</td>
<td>1.6%</td>
</tr>
</tbody>
</table>

Between 1913 and 2012, the growth rate of world GDP was 3.0% per year on average. This growth rate can be broken down between 1.4% for world population and 1.6% for per capita GDP.

Sources: see piketty.pse.ens.fr/capital21c.
<table>
<thead>
<tr>
<th>An annual growth rate equal to...</th>
<th>...is equivalent to a generational growth rate (30 years) of...</th>
<th>...i.e. a multiplication by a coefficient equal to...</th>
<th>...and a multiplication after 100 years by a coefficient equal to...</th>
<th>...and a multiplication after 1000 years by a coefficient equal to...</th>
</tr>
</thead>
<tbody>
<tr>
<td>0,1%</td>
<td>3%</td>
<td>1,03</td>
<td>1,11</td>
<td>2,72</td>
</tr>
<tr>
<td>0,2%</td>
<td>6%</td>
<td>1,06</td>
<td>1,22</td>
<td>7,37</td>
</tr>
<tr>
<td>0,5%</td>
<td>16%</td>
<td>1,16</td>
<td>1,65</td>
<td>147</td>
</tr>
<tr>
<td>1,0%</td>
<td>35%</td>
<td>1,35</td>
<td>2,70</td>
<td>20 959</td>
</tr>
<tr>
<td>1,5%</td>
<td>56%</td>
<td>1,56</td>
<td>4,43</td>
<td>2 924 437</td>
</tr>
<tr>
<td>2,0%</td>
<td>81%</td>
<td>1,81</td>
<td>7,24</td>
<td>398 264 652</td>
</tr>
<tr>
<td>2,5%</td>
<td>110%</td>
<td>2,10</td>
<td>11,8</td>
<td>52 949 930 179</td>
</tr>
<tr>
<td>3,5%</td>
<td>181%</td>
<td>2,81</td>
<td>31,2</td>
<td>...</td>
</tr>
<tr>
<td>5,0%</td>
<td>332%</td>
<td>4,32</td>
<td>131,5</td>
<td>...</td>
</tr>
</tbody>
</table>

An annual growth rate of 1% is equivalent to an annual growth rate of 35% per generation (30 years), a multiplication by 2.7 every 100 years, and by over 20 000 every 1000 years.
Figure 2.1. The growth of world population 1700-2012

World population rose from 600 millions inhabitants in 1700 to 7 billions in 2012.
Sources ans series: see piketty.pse.ens.fr/capital21c.
Figure 2.2. The growth rate of world population from Antiquity to 2100

The growth rate of world population was above 1% per year from 1950 to 2012 and should return toward 0% by the end of the 21st century. Sources and series: see pikety.pse.ens.fr/capital21c.
Table 2.3: Demographic growth since the industrial revolution

<table>
<thead>
<tr>
<th>Average annual growth rate</th>
<th>World population</th>
<th>Europe</th>
<th>America</th>
<th>Africa</th>
<th>Asia</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-1700</td>
<td>0.1%</td>
<td>0.1%</td>
<td>0.0%</td>
<td>0.1%</td>
<td>0.1%</td>
</tr>
<tr>
<td>1700-2012</td>
<td>0.8%</td>
<td>0.6%</td>
<td>1.4%</td>
<td>0.9%</td>
<td>0.8%</td>
</tr>
<tr>
<td>incl: 1700-1820</td>
<td>0.4%</td>
<td>0.5%</td>
<td>0.7%</td>
<td>0.2%</td>
<td>0.5%</td>
</tr>
<tr>
<td>1820-1913</td>
<td>0.6%</td>
<td>0.8%</td>
<td>1.9%</td>
<td>0.6%</td>
<td>0.4%</td>
</tr>
<tr>
<td>1913-2012</td>
<td>1.4%</td>
<td>0.4%</td>
<td>1.7%</td>
<td>2.2%</td>
<td>1.5%</td>
</tr>
<tr>
<td>Projections 2012-2050</td>
<td>0.7%</td>
<td>-0.1%</td>
<td>0.6%</td>
<td>1.9%</td>
<td>0.5%</td>
</tr>
<tr>
<td>Projections 2050-2100</td>
<td>0.2%</td>
<td>-0.1%</td>
<td>0.0%</td>
<td>1.0%</td>
<td>-0.2%</td>
</tr>
</tbody>
</table>

Between 1913 and 2012, the growth rate of world population was 1.4% per year, including 0.4% for Europe, 1.7% for America, etc.

Sources: see piketty.pse.ens.fr/capital21c. Projections for 2012-2100 correspond to the UN central scenario.
• Per capita (per inhabitant) growth was exceptionally high in Europe and Japan in the 1950-1980 period (h=4-5% per year) because of a catch-up process with the US; but since 1980, per capital growth rates have been low in all rich countries

• In the very long, h=1% is already quite fast and requires permanent reallocation of labor (about one third of the economy is being renewed at each generation)
### Table 2.5: Per capita output growth since the industrial revolution

<table>
<thead>
<tr>
<th>Average annual growth rate</th>
<th>Per capita world output</th>
<th>Europe</th>
<th>America</th>
<th>Africa</th>
<th>Asia</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-1700</td>
<td>0,0%</td>
<td>0,0%</td>
<td>0,0%</td>
<td>0,0%</td>
<td>0,0%</td>
</tr>
<tr>
<td>1700-2012</td>
<td>0,8%</td>
<td>1,0%</td>
<td>1,1%</td>
<td>0,5%</td>
<td>0,7%</td>
</tr>
<tr>
<td>incl.: 1700-1820</td>
<td>0,1%</td>
<td>0,1%</td>
<td>0,4%</td>
<td>0,0%</td>
<td>0,0%</td>
</tr>
<tr>
<td>1820-1913</td>
<td>0,9%</td>
<td>1,0%</td>
<td>1,5%</td>
<td>0,4%</td>
<td>0,2%</td>
</tr>
<tr>
<td>1913-2012</td>
<td>1,6%</td>
<td>1,9%</td>
<td>1,5%</td>
<td>1,1%</td>
<td>2,0%</td>
</tr>
<tr>
<td>1913-1950</td>
<td>0,9%</td>
<td>0,9%</td>
<td>1,4%</td>
<td>0,9%</td>
<td>0,2%</td>
</tr>
<tr>
<td>1950-1970</td>
<td>2,8%</td>
<td>3,8%</td>
<td>1,9%</td>
<td>2,1%</td>
<td>3,5%</td>
</tr>
<tr>
<td>1970-1990</td>
<td>1,3%</td>
<td>1,9%</td>
<td>1,6%</td>
<td>0,3%</td>
<td>2,1%</td>
</tr>
<tr>
<td>1990-2012</td>
<td>2,1%</td>
<td>1,9%</td>
<td>1,5%</td>
<td>1,4%</td>
<td>3,8%</td>
</tr>
<tr>
<td>1950-1980</td>
<td>2,5%</td>
<td>3,4%</td>
<td>2,0%</td>
<td>1,8%</td>
<td>3,2%</td>
</tr>
<tr>
<td>1980-2012</td>
<td>1,7%</td>
<td>1,8%</td>
<td>1,3%</td>
<td>0,8%</td>
<td>3,1%</td>
</tr>
</tbody>
</table>

Between 1910 and 2012, the growth rate of per capita output was 1.7% per year on average at the world level, including 1.9% in Europe, 1.6% in America, etc.

Sources: voir piketty.pse.ens.fr/capital21c
Figure 2.3. The growth rate of per capita output since the industrial revolution

The growth rate of per capita output surpassed 4% per year in Europe between 1950 and 1970, before returning to American levels. Sources and series: see piketty.pse.ens.fr/capital21c
Figure 2.4. The growth rate of world per capita output since Antiquity until 2100

The growth rate of per capita output surpassed 2% from 1950 to 2012. If the convergence process goes on, it will surpass 2.5% from 2012 to 2050, and then will drop below 1.5%.

Sources and series: see piketty.pse.ens.fr/capital21c.
Figure 2.5. The growth rate of world output from Antiquity until 2100

The growth rate of world output surpassed 4% from 1950 to 1990. If the convergence process goes on it will drop below 2% by 2050. Sources and series: see piketty.pse.ens.fr/capital21c.
### Table 2.4: Employment by sector in France and the United States, 1800-2012

<table>
<thead>
<tr>
<th>Year</th>
<th>France</th>
<th></th>
<th>United States</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Agriculture</td>
<td>Manufacturing</td>
<td>Services</td>
<td>Agriculture</td>
</tr>
<tr>
<td>1800</td>
<td>64%</td>
<td>22%</td>
<td>14%</td>
<td>68%</td>
</tr>
<tr>
<td>1900</td>
<td>43%</td>
<td>29%</td>
<td>28%</td>
<td>41%</td>
</tr>
<tr>
<td>1950</td>
<td>32%</td>
<td>33%</td>
<td>35%</td>
<td>14%</td>
</tr>
<tr>
<td>2012</td>
<td>3%</td>
<td>21%</td>
<td>76%</td>
<td>2%</td>
</tr>
</tbody>
</table>

In 2012, agriculture made 3% of total employment in France, vs. 21% in manufacturing and 76% in the services. Construction - 7% of employment in France and the U.S. in 2012 - was included in manufacturing.

Sources: see piketty.pse.ens.fr/capital21c.
How did rich countries become rich, and how did convergence happen?

- (0) One possible view: with free markets and private property, everybody should become rich. The West first adopted these « institutions » (rule of law, well-protected property rights, ..., freedom, democracy, ...) and became rich. If the rest of the world follows this strategy, then everybody will become rich & happy.

- A bit simplistic & western-centric:

- (1) Rise of the West over 1500-1900 period came with a lot of violence: key role of armed trade, slavery, colonization, military domination. Not really peaceful institutions and the rule of law.

- (2) Rising living standards in 20c came with the rise of government (tax revenues: 10% Y before WW1; 30-50% Y in all developed countries today). In order to understand development, one needs a broader view of institutions: public infrastructures, education, social welfare, economic and political democracy. Not just property rights.
• (3) Free markets and private property sacralization during 19c and early 20c led to extreme inequality and social tensions >>> nationalism, wars, communism >> the elites finally accepted public regulation, welfare state, progressive taxation >>> reduction of inequality = the « Great Transformation » of the 1914-1945 period
• But complex legacy of 20c shocks: different memories of post-WW2 exceptional period:
  - high-growth egalitarian ideal in western Europe (Trente glorieuses)
  - mixed memory in US/UK (relative decline; Reagan-Thatcher reaction)
  - negative memory for ex-communist countries (Russia/China/East.Eur.)
>> pro-market reaction, back to private property sacralization
  - Third world: decolonization period, mixed experience with state intervention; European colonial power replaced by US power system... until today and the rise of China (pluto-communism?)
⇒ interaction between domestic inequality, international power relations, national identities and development narratives plays a key role
(4) Rise of emerging countries certainly benefited from market openness, but did not come simply from market forces; in particular, foreign investment played a relatively minor role: convergence came from domestic saving and investment, public infrastructures and education, the diffusion of knowledge and state formation; e.g. bigger govt and public spend. in China than India, & higher growth; there are different ways to organize economic & political institutions.

• The standard growth model predicts output convergence, not income and convergence; if we simply rely on market forces (rather than investment in productivity, knowledge and education), we can end up with permanent wealth inequality, foreign-owned countries, political instability and redistribution cycles (Africa, South America).

• International property relations are particularly complicated to regulate peacefully.

• Learning to live with inequality, collective learning about the ideal compromise & institutions: the dimensions of political conflict.
A quick roadmap of the global history/comparative development literature

• Hundreds of authors have written about comparative development (why some countries develop and not others) since 18c: Montesquieu 1748 (climate), Smith 1776 (markets), Marx 1867 (primitive accumulation, colonial extraction), Weber 1904 (protestant ethic), etc.

• Impossible to summarize everything; here I give a very quick overview and introduction; I will return to several themes later

• Braudel 1979 *Civilisation and capitalism* (3 vol.): the first global, multidimensional history of capitalism 1500-1800; much broader than Weber; enormous influence on subsequent research and the rise of « world history »

• Pomeranz 2000 *The Great Divergence: China and Europe in the Making of the Modern World Economy* (see also AHR 2002) = possibly the most important book in global history since Braudel
• **K. Pomeranz 2000**: btw 1500 and 1750-1800, (the most advanced regions of) China/Japan and Europe followed more or less the same devt path: slow but positive population growth, agriculture/textile domestic proto-industrialisation

• If anything, China/Japan had more « Smithian » market institutions than Europe until 1800: more unified land and grain markets (less church property, more political unity, fewer wars), more labor mobility (less serfdom & labor control)

• The Great Divergence only begins with armed trade & military domination of the West around 1750-1850; in effect, this allowed the West to escape the proto-industrialization « ecological constraint » (massive deforestation in 18c): coal, slaves, New World

• National accounts of colonial extraction are highly uncertain (Williams 1944 vs O’Brien 1982); Pomeranz innovation is to use land accounts: btw 1500 & 1800, share of forested land goes from 30-40% to 5-10% in Europe; by 1830, British imports of cotton/timber/sugar ≈ 1.5-2 additional Britain in arable land
• S. Beckert 2014, *Empire of Cotton – A Global History*: until 1500-1600, cotton and textiles had always been produced locally; things started to change with the Great Discoveries and the military expansion of Europe: the West appropriated land in America, sent slaves from Africa in order to produce raw cotton, and finally banned Indian textiles → by 1750-1850, Europe controlled global textile manufacturing (= complementary to Pomeranz 2000)

• Key role of slavery: half of all slaves transported over 1492-1887 period were transported after 1780; huge acceleration 1780-1860; it is only after US Civil War that Indian cotton rises again

• « 18c-19c were the age of barbarity and catastrophe; one has to be v. eurocentric to view 20c as the age of catastrophe: it is the age of independance and end of slavery; global capitalism today is still shaped by the struggles for independance, and for a fair empire of cotton »
• **Rosenthal-Wong 2011, Before and Beyond Divergence: The Politics of Economic Change in China and Europe:** stress on size of political communities (polities); Europe = smaller polities → more competition between small nation-states, more military innovation (and war-&-public-debt-incuded financial innovation) → rise of the West; but also self-destruction of Europe during 20c, and major coordination problems today within EU...; China = larger polity, less military innovation during 17c-19c, but probably better in the long run

• During 17c-18c, China not only had more Smithian market institutions than Europe, but also more Smithian government: no war, low taxes, development-friendly spending, no public debt... until Western indemnities and war tributes imposed by the West during 19c (key role of public debt in colonial coertion: China, Turkey, Morroco,...)
• See also P. Hoffman, « Prices, the military revolution, and western Europe’s comparative advantage in violence », *EHR 2011*; “Why Was It Europeans Who Conquered the World?”, *JEH 2012*

• J. Goody 2006, *The Theft of History* : analysis of Western-centric bias in some of the main writings in modern social sciences

• R. Allen 2007, *The British Industrial Revolution in Global Perspective*
World systems, power and ideology

- **K. Polanyi, The Great Transformation, 1944**: 19th-century capitalist system was inherently unstable, which led to its own destruction in 1914-1945

- Sacralization of private property + generalized competition between individuals and nations = very unequal & unstable system, both within and between countries → wars, monetary chaos, revolutions, fascism

- Key pb = myth of self-regulated markets for labor, land and money

- Over-optimistic view of pre-industrial restrictions on labor mobility?

- See also I. Wallerstein, The Modern World System, 1974-1989


- On core-periphery growth models: see Krugman-Venables QJE 1995: a decline in transport costs can make big parts of the world worst off

- Arrighi: power = military dominance + moral/ideological leadership; “power = the grey zone between coercion and consent”
State formation and the rise of government

• P. Lindert, *Growing Public- Social Spending and Economic Growth since the 18th Century*, Oxford UP 2004

• Very interesting and detailed history of the rise of modern government and social spendings (tax revenues: 10% Y during 18c-19c and pretty much until WW1; 30-50% Y in all developed countries today)

• Rising living standards during 20c came with the rise of government

• Rise of fiscal and social state was not bad for growth and development because public spendings were for the most part growth-enhancing: public infrastructures, education, health, etc.

• Up to a point, there is no equity/efficiency trade-off
Long run impact of inequality on development

• **Sokoloff- Engerman**, “Institutions, Factor Endowments, and Paths of Development in the New World”, 1997; *JEP* 2000: more initial inequality in South America than in North America (colonial extraction vs settlers colonies) → more instability, less development

• J.S. You, “Land reform, inequality and corruption: a comparative historical study of Korea, Taiwan and the Philippines”, 2014: less inequality in Korea/Taiwan than in the Philipinnes (particularly due to more ambitious land reform in 1950 and more egalitarian social and education services) → more growth in Korea/Taiwan in 1950-2000 than in the Philipinnes, although the starting points were not very different in terms of per capita GDP (see also China vs India)

→ extreme inequality is not good for growth & development, both because of inequality-induced political instability, and because high inequality tends to come with low mobility (high mobility and inclusive investment in social and educational services are good for growth)
• **Capital in the 21st century**: an attempt to put the study of inequality, beliefs systems and institutions at the center of economics/economic history/political economy; key role of 1914-1945 shocks in historical reduction of inequality; risk of returning to extreme inequality (r vs g); but many other evolutions are possible

• Basic idea = how each country deals with inequality & property relations is central for the construction of a legitimate government, state formation, and the development process; pb = each country tends to be self-centered + power of self-serving ideology

• This book is a very incomplete attempt to move in this direction, particularly regarding the study of beliefs systems and politics

The property-rights/western-centric viewpoint

- **North-Weingast**, « Constitutions and commitment », *EHR 1989*:
  British 1688 parliamentary miracle → financial & industrial development

- **Acemoglu-Robinson**, *Why nations fail*, 2012; *AER 2001*; etc.:
  « if property rights are well protected (small risk of expropriation, nationalization, etc) & small government, then development occurs »

- Very interesting, but (in my view):
  - Somewhat narrow approach to « institutions »: too much centered on the protection of private property rights
  - Somewhat too vague and ahistorical: AR also refer to « inclusive vs extractive institutions », but they are often not very precise; very little on specific institutions/policies such as education systems, welfare state, fiscal systems, etc. ; almost nothing on 20c state formation
  - Somewhat too Western-centered (or US-centered): « if western settlers impose the right institutions, then development occurs »

- Read them & make your own mind !
Figure 2. OLS Relationship Between Expropriation Risk and Income

From: AJR, “The Colonial Origins of Comparative Development”
Figure 3. First-Stage Relationship Between Settler Mortality and Expropriation Risk

From: AJR, “The Colonial Origins of Comparative Development”
The standard growth model: output convergence, not income & wealth cv

• The standard (neoclassical) growth model has many limitations: one-good model (no relative asset price), perfectly competitive markets with full information, little attention to inequality, etc.
• But it is a useful starting point to think about growth mechanics
• Output $Y = F(K,L) = \text{production function}$
  with $K = \text{capital input} (= \text{non-human capital: land, buildings, equipment, robots, patents, etc.})$
  and $L = \text{labor input} (= \text{human capital: efficient labor units = active population x labor productivity})$
• Exemple: Cobb-Douglas production function: $F(K,L)=K^\alpha L^{1-\alpha}$
  → one needs capital $K$ and labor $L$ to grow at the same rate in order to have balanced long-run growth of $Y$
  (also true with more general production functions: see lecture 2)
• Basic logic of the convergence model: if capital can freely flow from rich to poor countries, and if labor productivity is the same everywhere, then per capita output will be the same everywhere = « convergence »

• This result requires strong assumptions: perfect competition, one-good model, no specialization effect (core/periphery models), no colonial extraction, etc.

• But even if these strong assumptions are all satisfied, the point is that the standard growth model predicts output cv, not income or wealth cv: one can end up with permanent wealth inequality, foreign-owned countries, political instability and redistribution cycles (Africa, South America)

• Asian miracles were induced by domestic saving, diffusion of knowledge and education, pro-development policies and public investment, not by capital flowing from rich to poor countries
Two countries A and B with same population & labor productivity $L_A=L_B$

**Exemple 1: A and B have same per capita wealth $W_A=W_B=200\ 000\€$**

No need for capital flows between countries A and B: each country has the same per capita domestic capital $K_A=K_B= 200\ 000\€$

Assume $Y=F(K,L)$ is such that per capita output $Y_A=Y_B= 25\ 000\€$, i.e. capital-output ratio $\beta = K/Y = \text{wealth-output ratio } W/Y = 800\%$

No net foreign wealth: per capita income = per capital output = $25\ 000\€$

Assume growth rate $g = 1\%$ (population + productivity growth) and rate of return to capital $r = 5\%$ (marginal product of capital + preferences)

Capital share $\alpha = Y_K/Y = rK/Y = r \times \beta = 40\%$: in both count., labor income $Y_{LA}=Y_{LB}=15\ 000\€$, capital income $Y_{KA}=Y_{KB}=10\ 000\€$ ($=5\% \times 200\ 000\€$)

Balanced (steady-state) growth: $K$ must rise at same speed as $Y$ and $L$

If $g=1\%$, $r=5\%$, one needs to reinvest a fraction $g/r=20\%$ of $Y_K (2\ 000\€)$, and one can consume a fraction $1-g/r=80\%$ (8 000\€)

$\rightarrow Y = 25\ 000\€ = S + C = 2\ 000\€ \ (8\%) + 23\ 000\€ \ (92\%)$

With $g=2\%$, $r=5\%$, one needs to reinvest a fraction $g/r=40\%$ of $Y_K$, etc.
• With full equality (within & between countries), the fact that \( r > g \) is not a pb at all: it simply means that everybody needs to save and reinvest a fraction \( \frac{g}{r} \) of \( Y_K \) so that \( K \) rises at the same speed as \( Y \) and \( L \) (steady-state growth), & can consume a fraction \( 1 - \frac{g}{r} \) of capital income = this is the purpose of \( K \) accumulation and ownership: one can consume more than without \( K \) accumulation
• \( r < g \) would be a pb: one would need to reinvest more than \( Y_K \) in order to keep \( K \) rising at the same speed as \( Y \) and \( L \), which makes no sense: « dynamic inefficiency », i.e. over-accumulation of \( K \) (\( r < g \) impossible in infinite-horizon models; possible in OLG models)
• But with inequality between individuals (shocks to rates of return, labor incomes, demographics, etc.), a higher gap between \( r \) & \( g \) tends to amplify shocks and wealth concentration (see lecture 3)
• What about impact of \( r – g \) on inequality between countries?
• **Exemple 2 (unequal countries):** \( W_A = 400\,000\text{€}, W_B = 0\text{€} \)

• With free capital flows, half of country A’s wealth is invested in country B, so that each country still has the same per capita domestic capital \( K_A = K_B = 200\,000\text{€} \) and the same per capita output \( Y_A = Y_B = 25\,000\text{€} \)

• The difference is that now country B’s capital is owned by country A: income \( Y_B^* \) in country B = labor income \( Y_{LB} = 15\,000\text{€} \), while income \( Y_A^* \) in country A = \( Y_{LA} + Y_{KA} + Y_{KB} = 35\,000\text{€} \)

• Balanced growth: country B doesn’t save (& consumes 15 000€), while country A saves a fraction \( g/r \) of \( Y_{KA} + Y_{KB} \) (& consumes the rest)

• If \( g=1\% \), \( r=5\% \), \( Y_A^* = 35\,000\text{€} = S + C = 4\,000\text{€} \) (8%) + 31 000€ (92%)

→ **Market forces can lead to output convergence (under certain conditions), but not to convergence of wealth, income & welfare:** in standard models, any initial level of wealth inequality is self-sustaining

• Higher gap between \( g \) & \( r \) implies higher steady-state inequality of consumption and welfare (if \( g \approx r \), then all \( Y_K \) needs to be reinvested)

• **Only solution: country B needs to save more** (not easy since country B is poorer than country A → more natural to accumulate debt)

...or to expropriate country A! (→ large foreign assets often come with political and military domination, so as to avoid expropriation: colonies)
• **Exemple 3** (v. unequal countries): \( W_A=600\ 000\€, \ W_B=-200\ 000\€ \) (debt)

• With free capital flows, half of country A’s wealth is again invested in country B, so that each country still has same domestic capital \( K_A=K_B=200\ 000\€ \) and the same per capita output \( Y_A=Y_B=25\ 000\€ \)

• The difference is that now country B’s capital is owned by country A, and that in addition count.B needs to repay interest payments of its foreign debt \( (r \times D_B = 10\ 000\€ \) if \( r=5\% \) and \( D_B=200\ 000\€ \))

**income** \( Y_B^* \) in country B = labor income \( Y_{LB} - rD_B = 5\ 000\€ \), while **income** \( Y_A^* \) in country A = \( Y_{LA} + Y_{KA} + Y_{KB} + rD_B = 45\ 000\€ \)

• Balanced growth: count. B doesn’t save (& consumes a frac. \( g/r \) of \( rD_B \)), while count. A saves fraction \( g/r \) of \( Y_{KA}+Y_{KB}+rD_B \) (& consumes the rest)

• If \( g=1\%, r=5\%, \ Y_B^* = 5\ 000\€ = S + C = -2\ 000\€ + 7\ 000\€ \), while \( Y_A^* = 45\ 000\€ = S + C = 6\ 000\€ + 39\ 000\€ \)

⇒ There’s nothing in standard economic models that prevents extreme inequality to persist forever, especially if \( g << r \): possibility of permanent inequality between countries (or dynasties), with some countries (or dynasties) working for ever for others >> difficult to justify and regulate
• More on standard growth models: see Solow *QJE* 1956, Barro-Sala-i-Martin *2004 Chap.1-2*, Jones-Romer *AEJ 2010*

• Most important steady-state formula to remember: modified Golden rule formula \( r = \theta + \gamma g \)

(\( \theta \) = rate of time preference, \( \gamma \) = curvature of utility function)

• See also the following *course notes on wealth models* (particularly on the relation between equilibrium wealth inequality and \( r - g \)) (more in lectures 2-3)