Economic History

(Master APE & PPD, Paris School of Economics)

Thomas Piketty

Academic year 2015-2016

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

(check on line for updated versions)

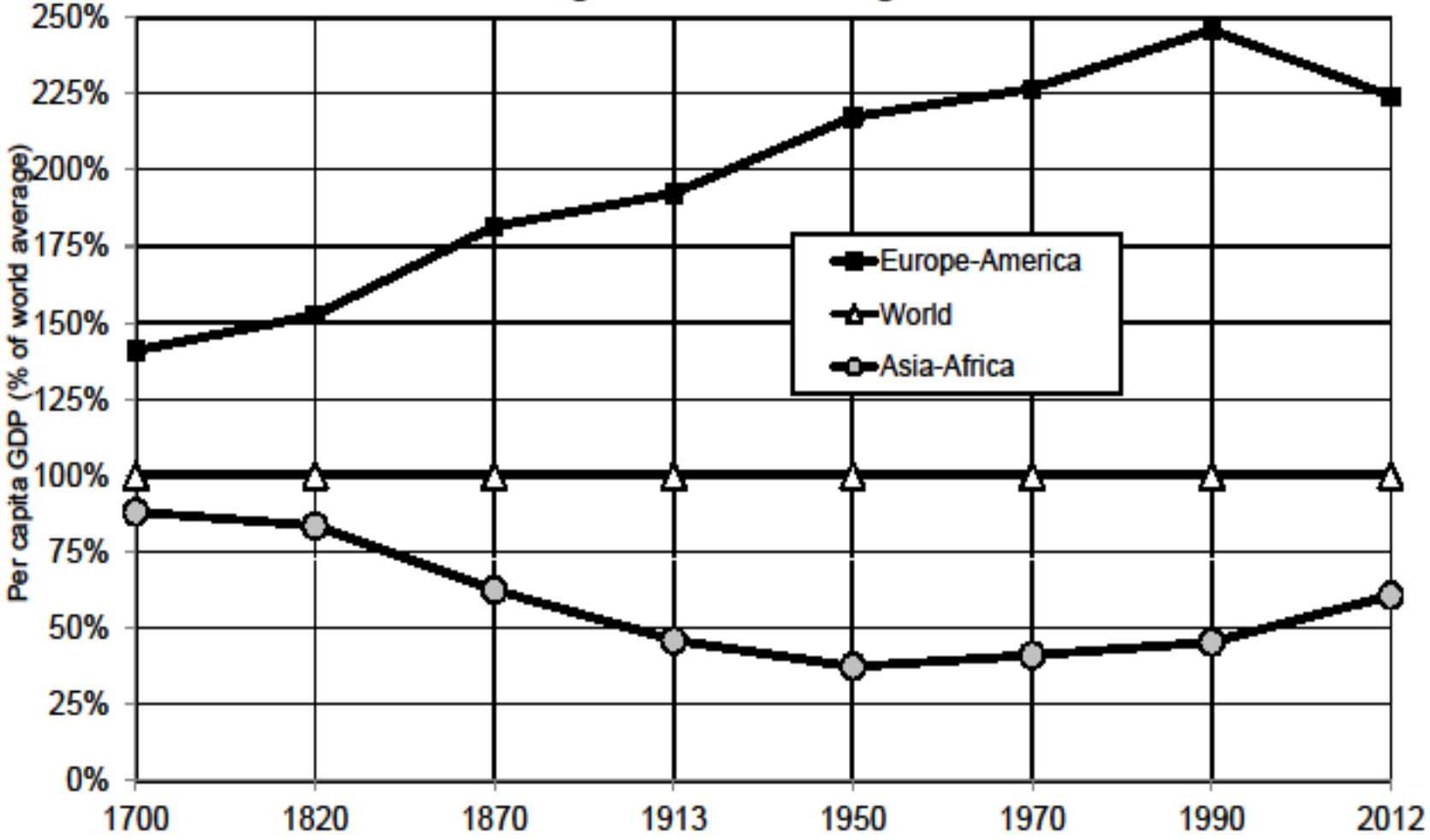
Roadmap of lecture 1

- 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

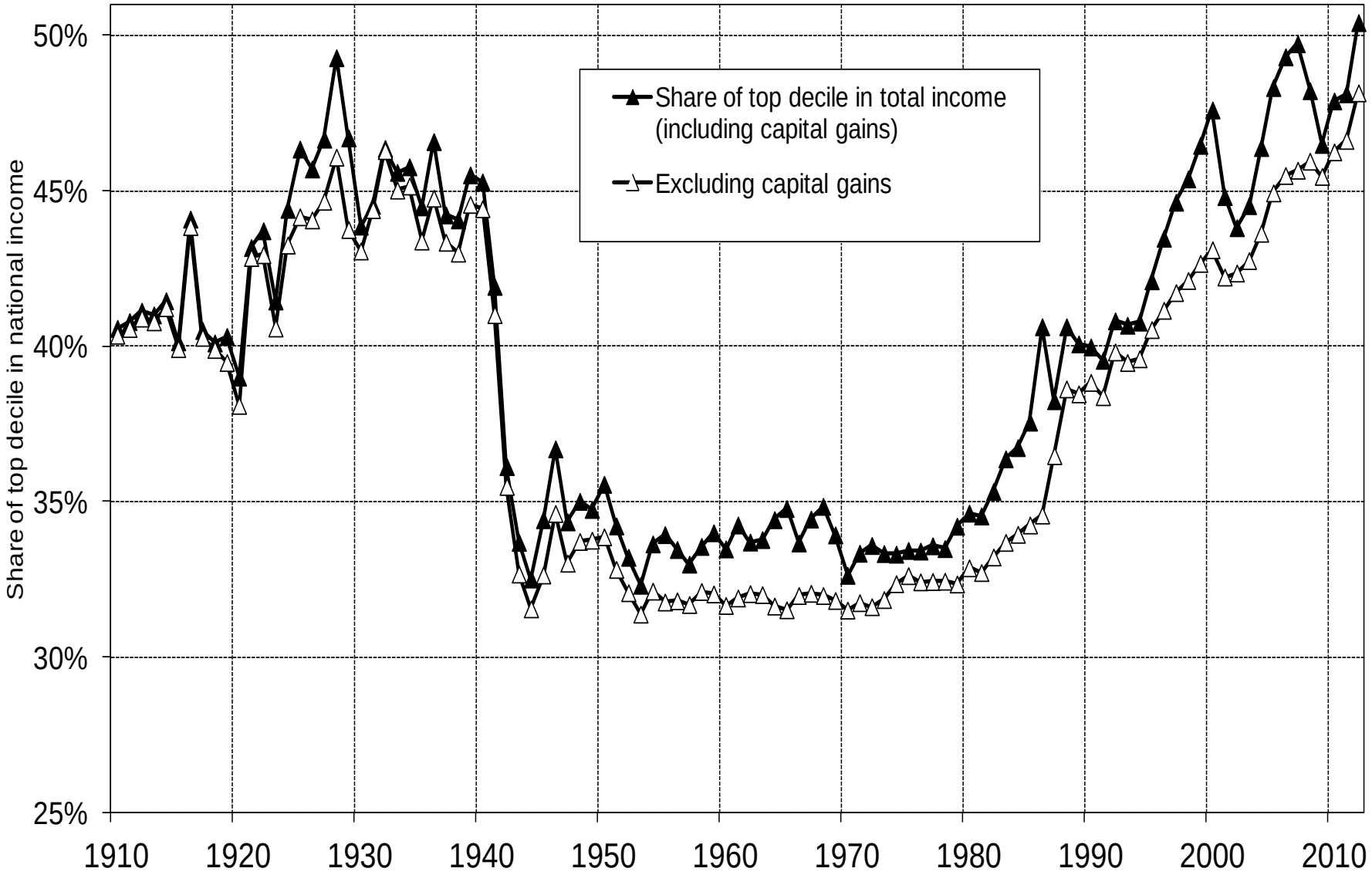
- **(1) Between-country income inequality 1700-2015**: divergence between Western and other countries during 19c & until mid 20c, convergence since 1980-1990 (reduction of inequality)
- **(2) Within-country income inequality**: in the US, income inequality rose since 1980 & is now back to the levels observed in early 20^{c} : 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 20^{c} : i.e. about 500-600% for K/Y
- These three evolutions are partly related (world wars, decolonization, end of communism, globalization), but also invole 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.

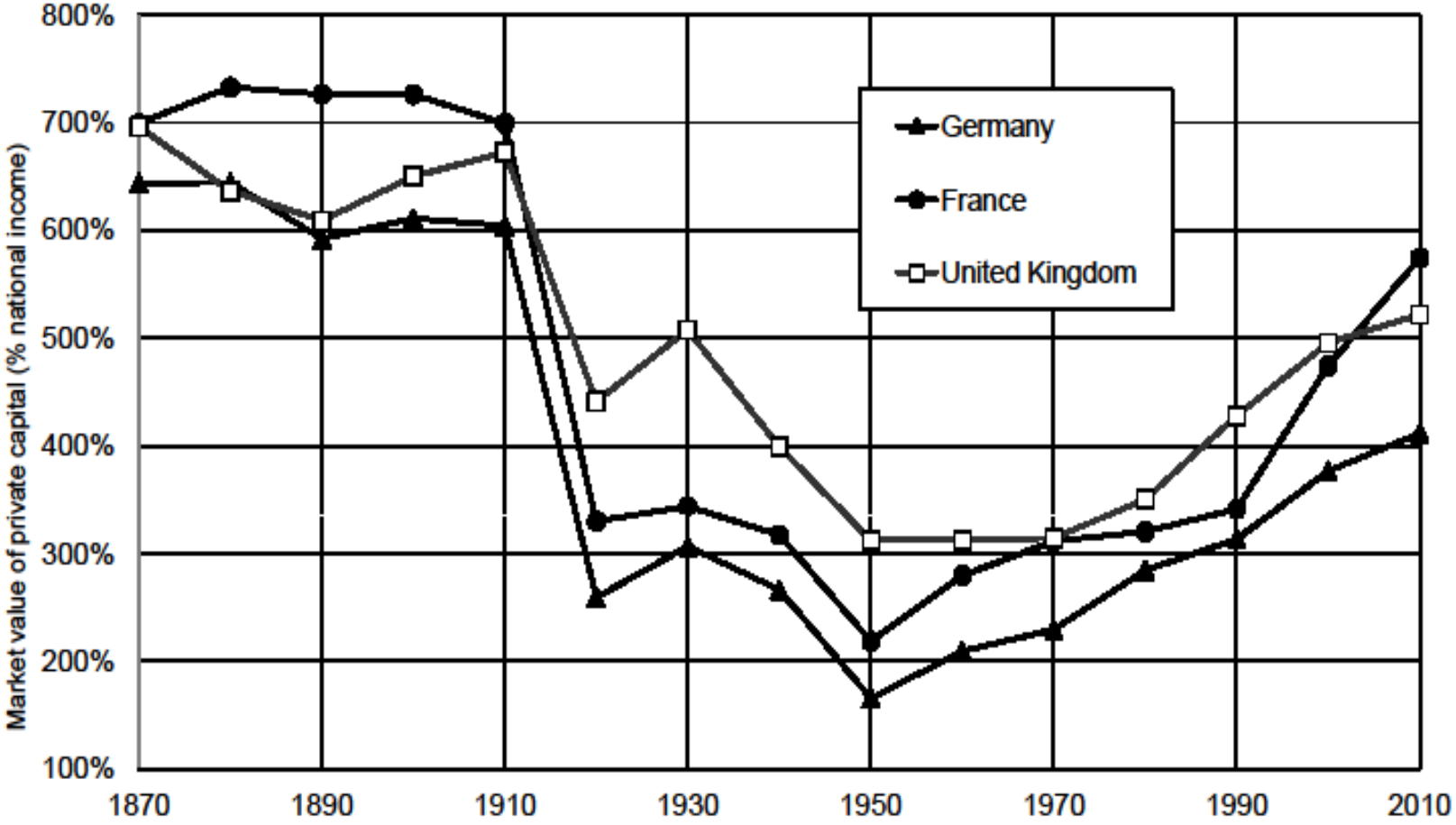
Figure I.1. Income inequality in the United States, 1910-2012



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.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 = domestic output Y_d (NDP)
  + net foreign factor income

- Domestic output Y_d (NDP = Net domestic product)
  = GDP (Gross domestic product) – capital depreciation
- Typically Y and Y_d = about 85-90% GDP in rich countries today
- I.e. capital depreciation = 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 ≈ 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 = domestic output Y_d**

- National income $Y = Y_d + r\ NFA$
- 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 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 $\beta = W/Y$
- National wealth/national income ratio $\beta_n = W_n/Y$
- Domestic capital/output ratio $\beta_k = K/Y_d$
- **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 ≈ private wealth W
  (i.e. public wealth W_g ≈ 0) (or <0..)
- National wealth W_n ≈ domestic capital K
  (i.e. net foreign asset NFA ≈ 0) (but large gross foreign positions)
- National wealth W_n ≈ 500-600% of national income Y

  ≈ residential housing + other domestic capital (≈ 50-50)
- Typically, in France, UK, Germany, Italy, US, Japan:

Per capita average income Y ≈ 30 000€ (= national income/population)

Per capita aver. wealth W ≈ 150 000-180 000€ (=private wealth/pop)

- I.e. $\beta = W/Y \approx 500\text{-}600\%$
- Y_K = capital income = rent, dividend, interest, profits,..
- $\alpha = Y_K/Y$ = capital share in national income ≈ 25-30%
- I.e. average rate of return $r = \alpha/\beta = 4\text{-}5\%$
- **Basic accounting law: $\alpha = r \times \beta$** → Lecture 2 on dynamics of β and α

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** for a combination of Maddison series and official UN population series and WB GDP series for recent decades; see also Capital…,chap.1-2, & on-line appendix tables for chapter 1)

- On the history of national accounts, see R. Stone, "The accounts of society", Nobel lecture 1984, 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 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

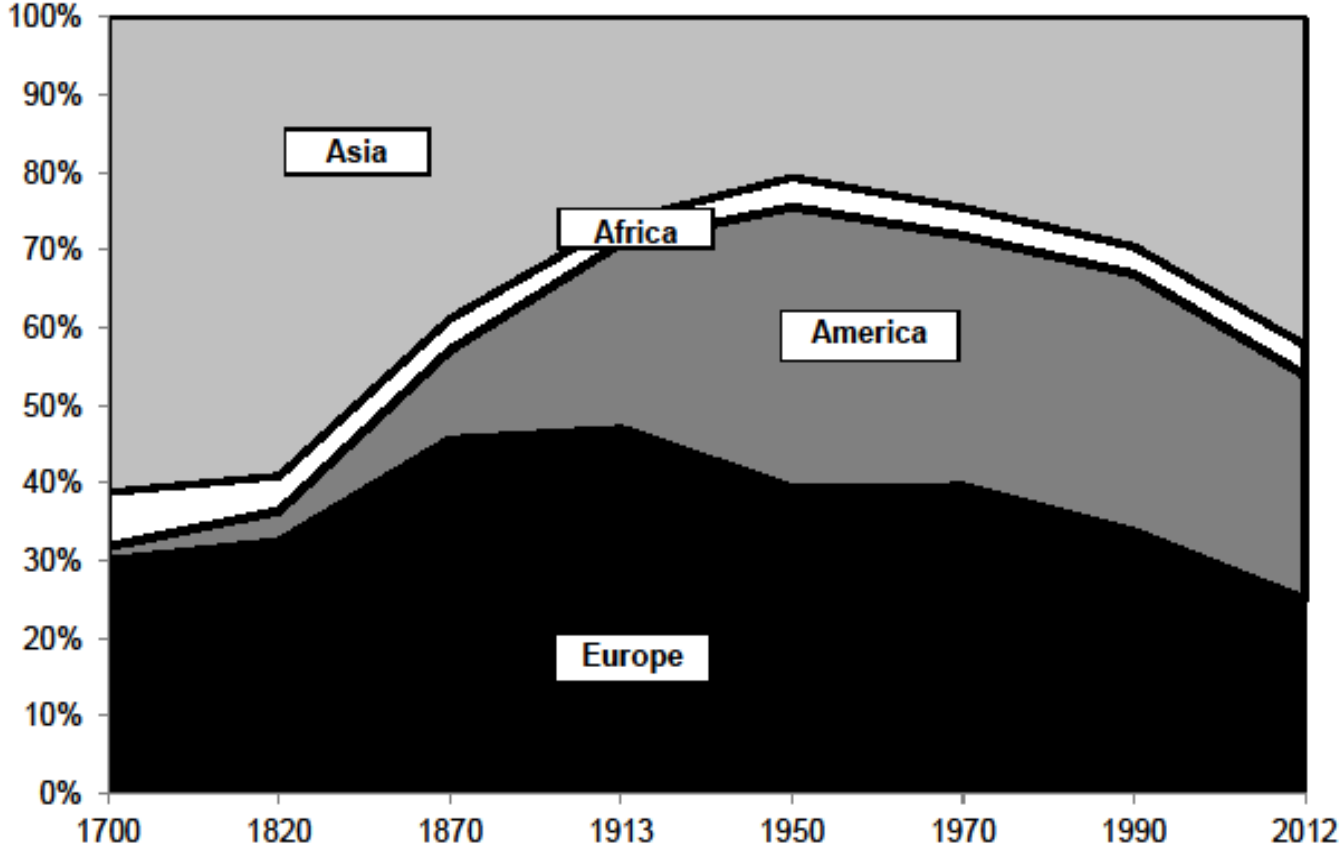
- **Fact 1: Convergence**
- Convergence between poor and rich countries now seems well under way; but not over yet (?)

- **Fact 2: Global growth slowdown in 21^{c}**
- 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) (?)

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 21^{c}: 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 occured 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

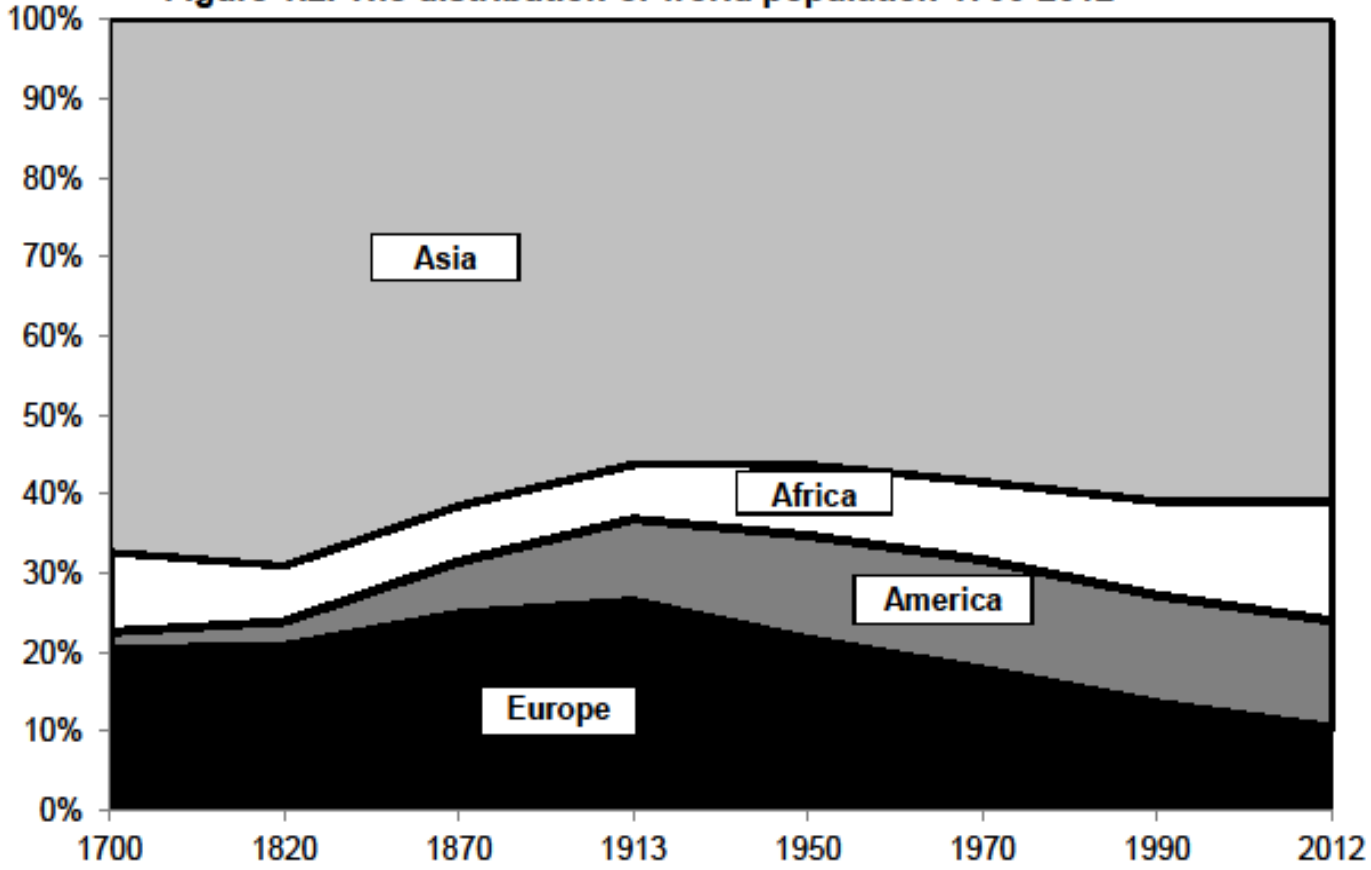
Figure 1.1. The distribution of world output 1700-2012



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

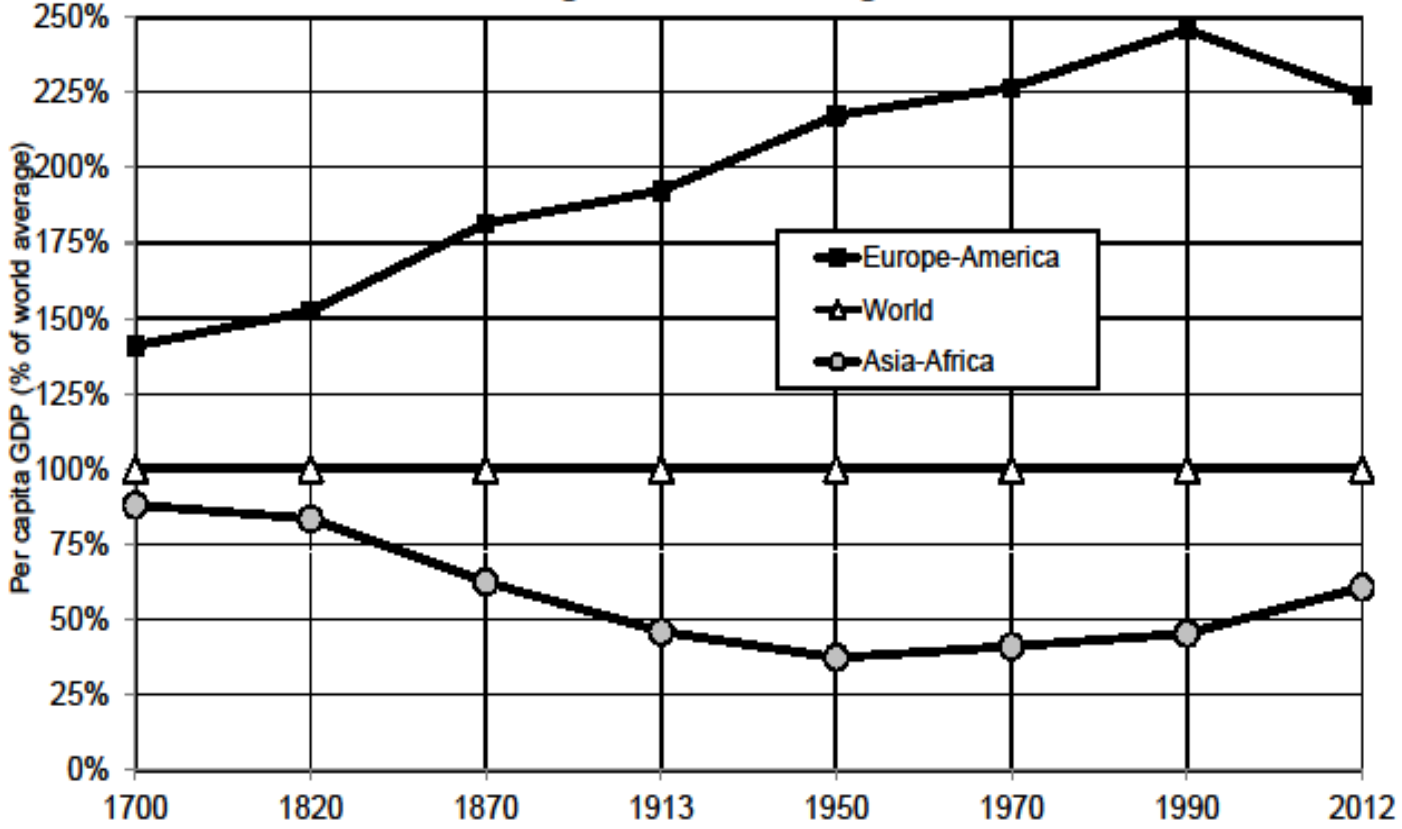
Sources and series: see piketty.pse.ens.fr/capital21c.

Figure 1.2. The distribution of world population 1700-2012



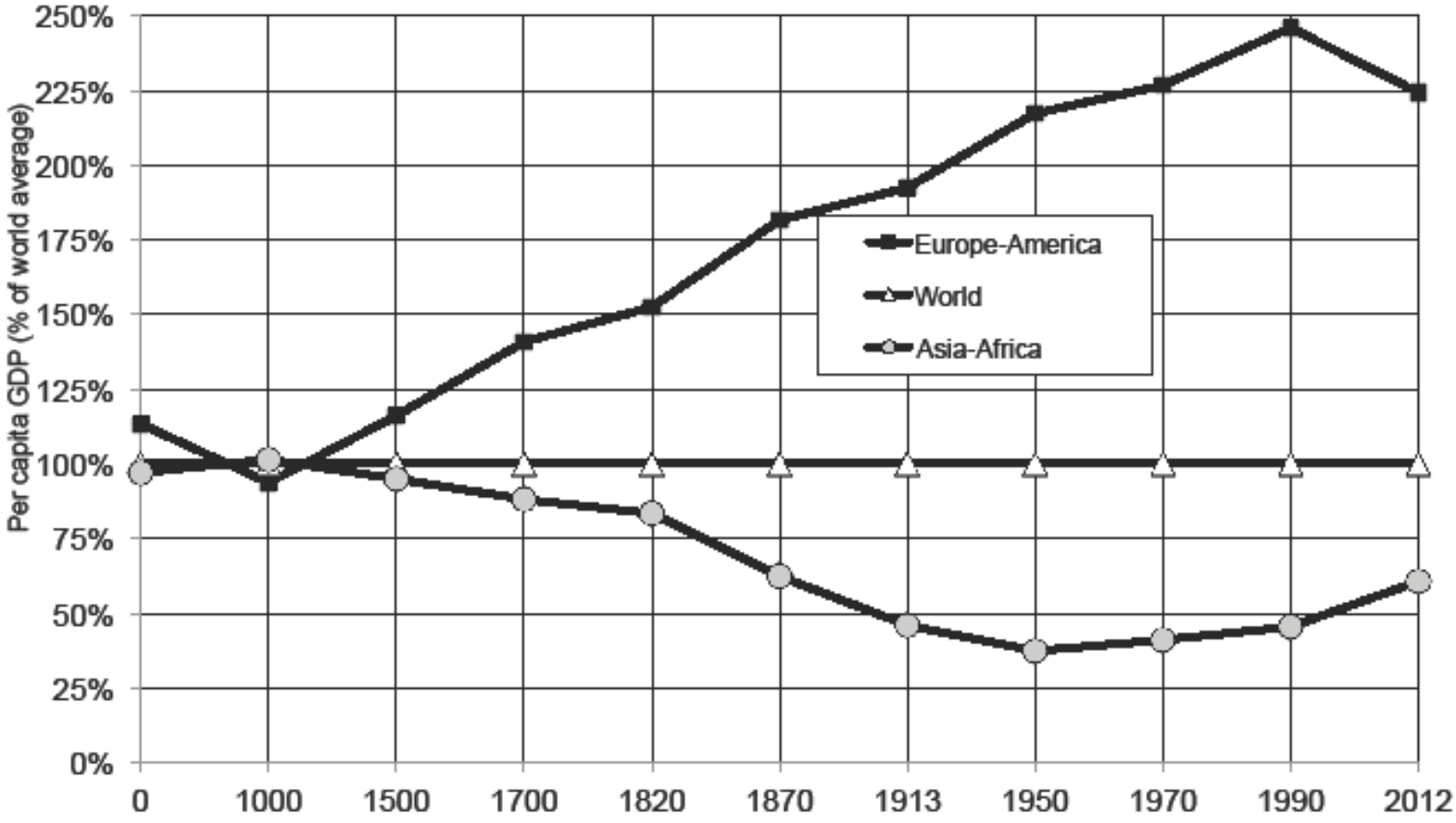
Europe's population made 26% of world population in 1913, down to 10% in 2012.
Sources and series: see piketty.pse.ens.fr/capital21c.

Figure 1.3. Global inequality 1700-2012: divergence then convergence?



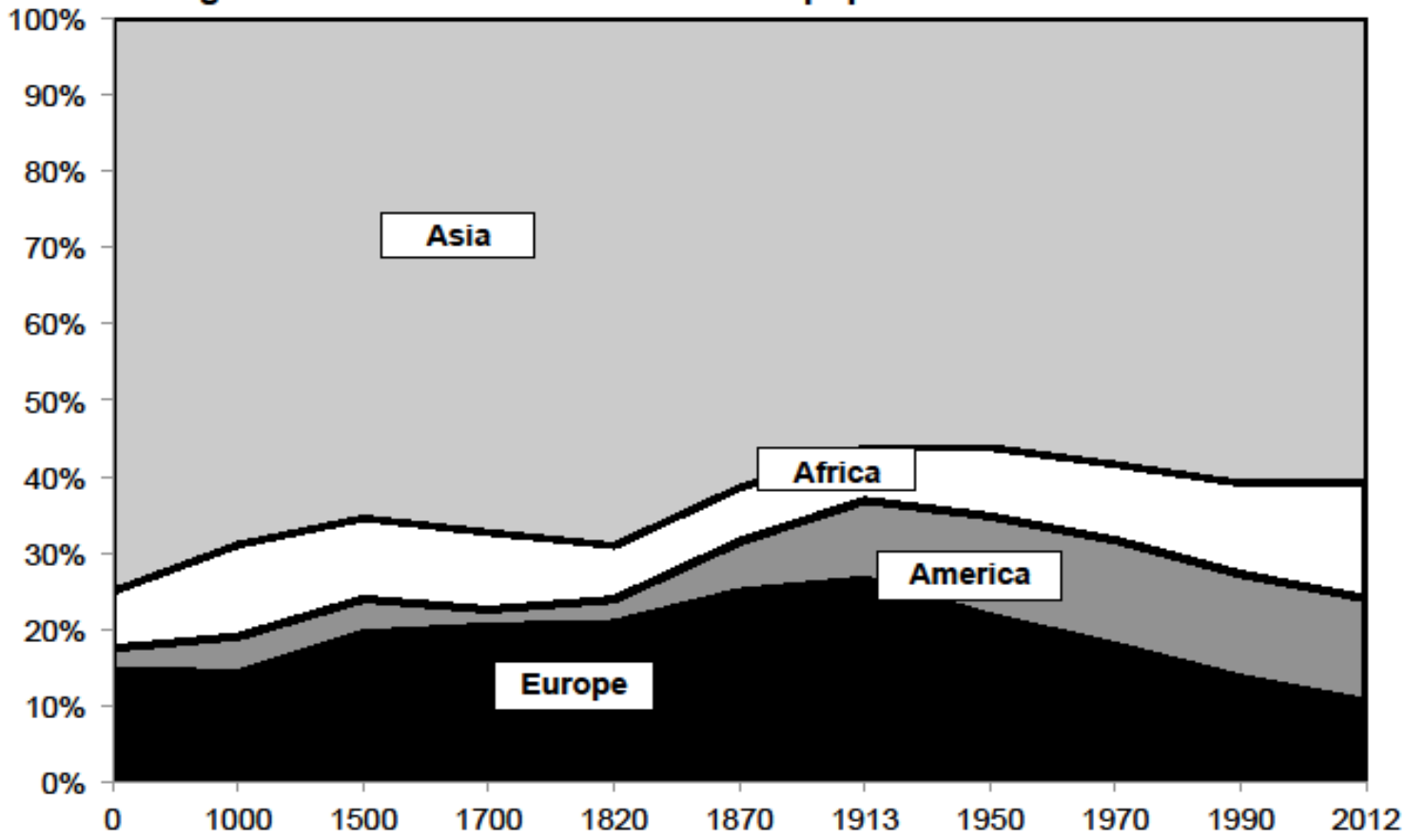
Per capita GDP in Asia-Africa went from 37% of world average in 1950 to 61% in 2012.
Sources and series: see piketty.pse.ens.fr/capital21c.

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.

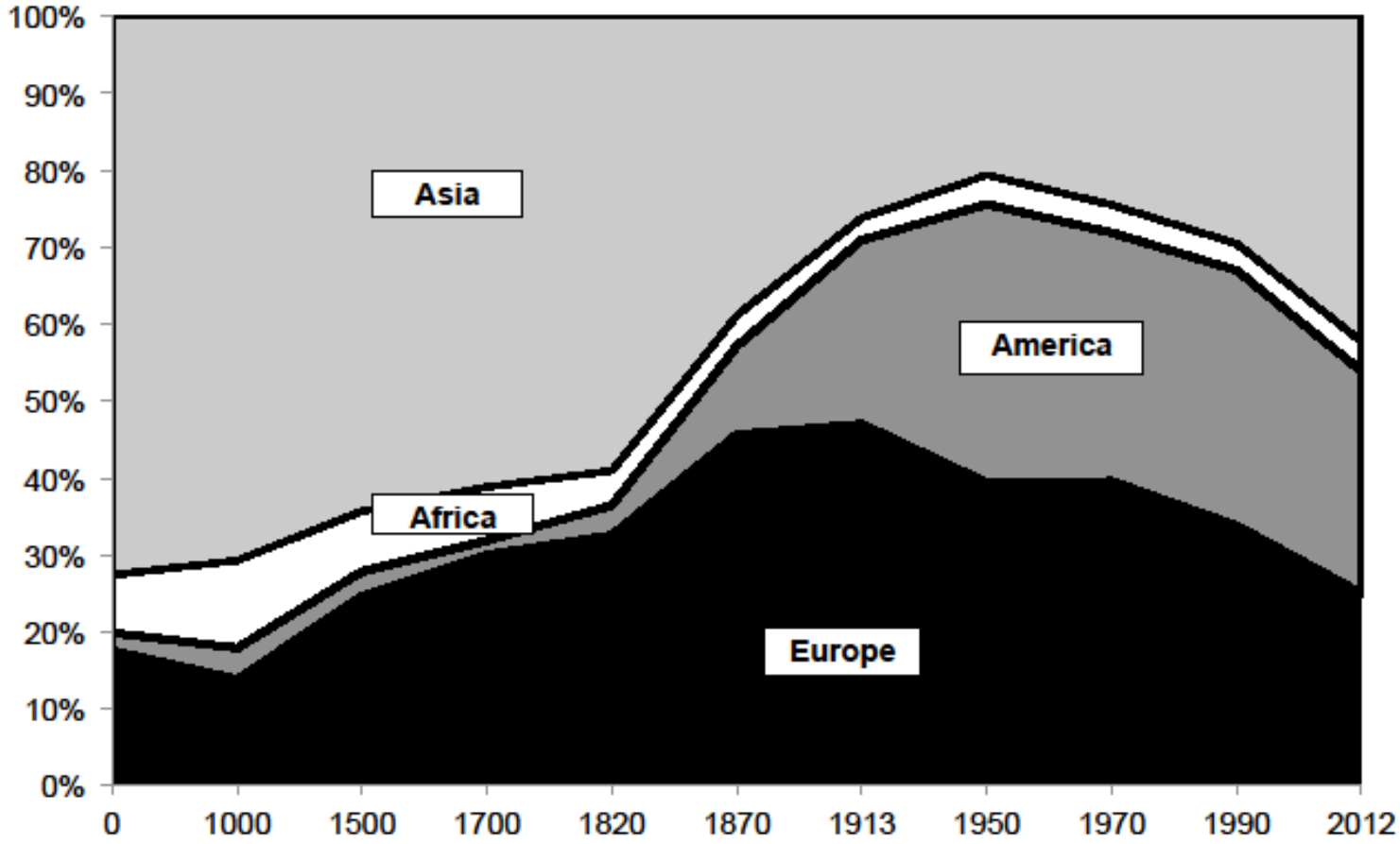
Figure S1.2. The distribution of world population 0-2012



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 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

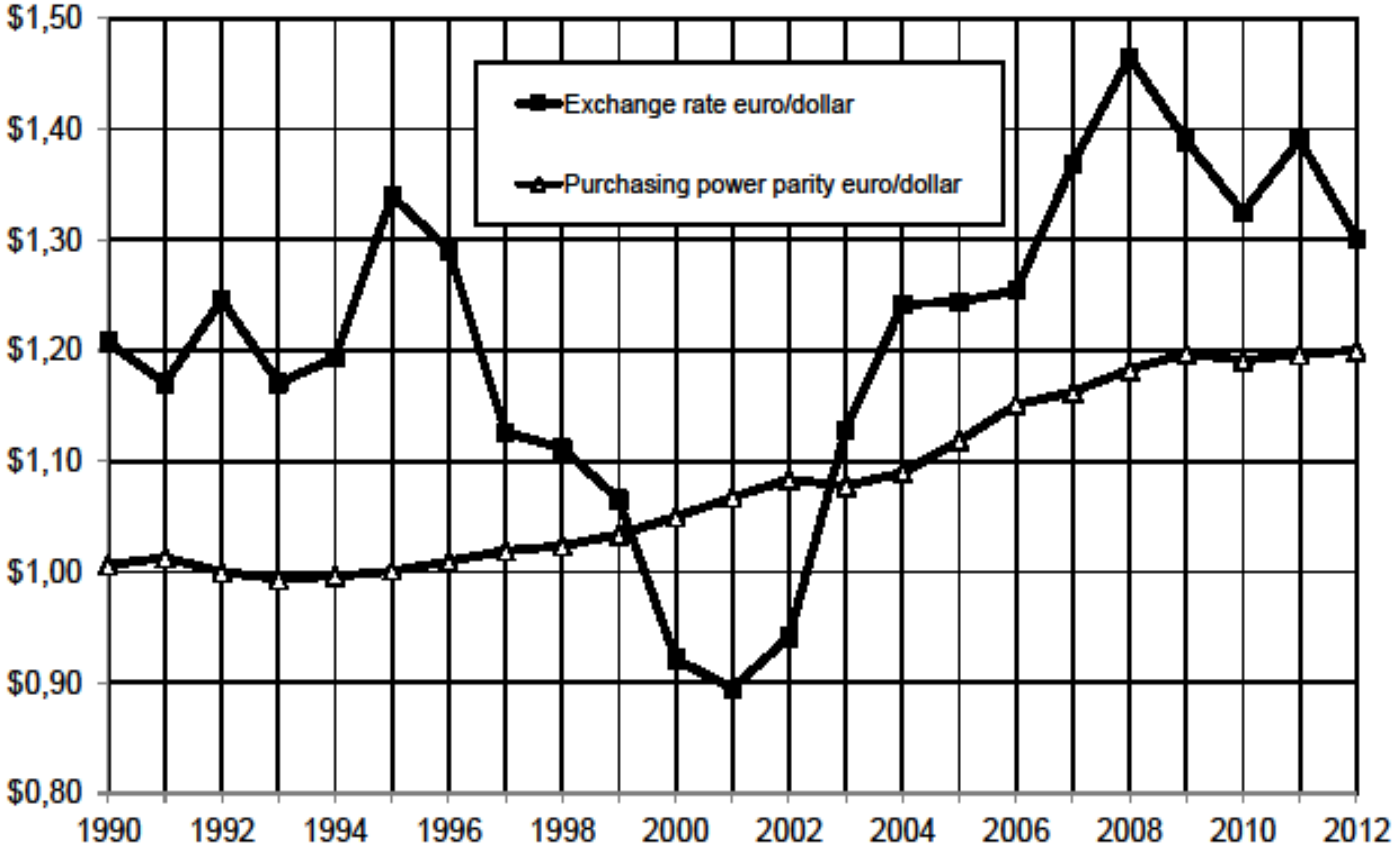
Table 1.1: Distribution of world GDP, 2012

	Population (millions inhabitants)		GDP (billions euros 2012)		Per capita GDP (euros 2012)	Equivalent per capita monthly income (euros 2012)
World	**7 050**	***100%***	**71 200**	***100%***	**10 100 €**	**760 €**
Europe	**740**	***10%***	**17 800**	***25%***	**24 000 €**	**1 800 €**
incl. European Union	540	*8%*	14 700	*21%*	27 300 €	2 040 €
incl. Russia/Ukraine	200	*3%*	3 100	*4%*	15 400 €	1 150 €
America	**950**	***13%***	**20 600**	***29%***	**21 500 €**	**1 620 €**
incl. United States/Canada	350	*5%*	14 300	*20%*	40 700 €	3 050 €
incl. Latin America	600	*9%*	6 300	*9%*	10 400 €	780 €
Africa	**1 070**	***15%***	**2 800**	***4%***	**2 600 €**	**200 €**
incl. North Africa	170	*2%*	1 000	*1%*	5 700 €	430 €
incl. Subsaharan Africa	900	*13%*	1 800	*3%*	2 000 €	150 €
Asia	**4 290**	***61%***	**30 000**	***42%***	**7 000 €**	**520 €**
incl. China	1 350	*19%*	10 400	*15%*	7 700 €	580 €
incl. India	1 260	*18%*	4 000	*6%*	3 200 €	240 €
incl. Japan	130	*2%*	3 800	*5%*	30 000 €	2 250 €
incl. Other	1 550	*22%*	11 800	*17%*	7 600 €	570 €

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

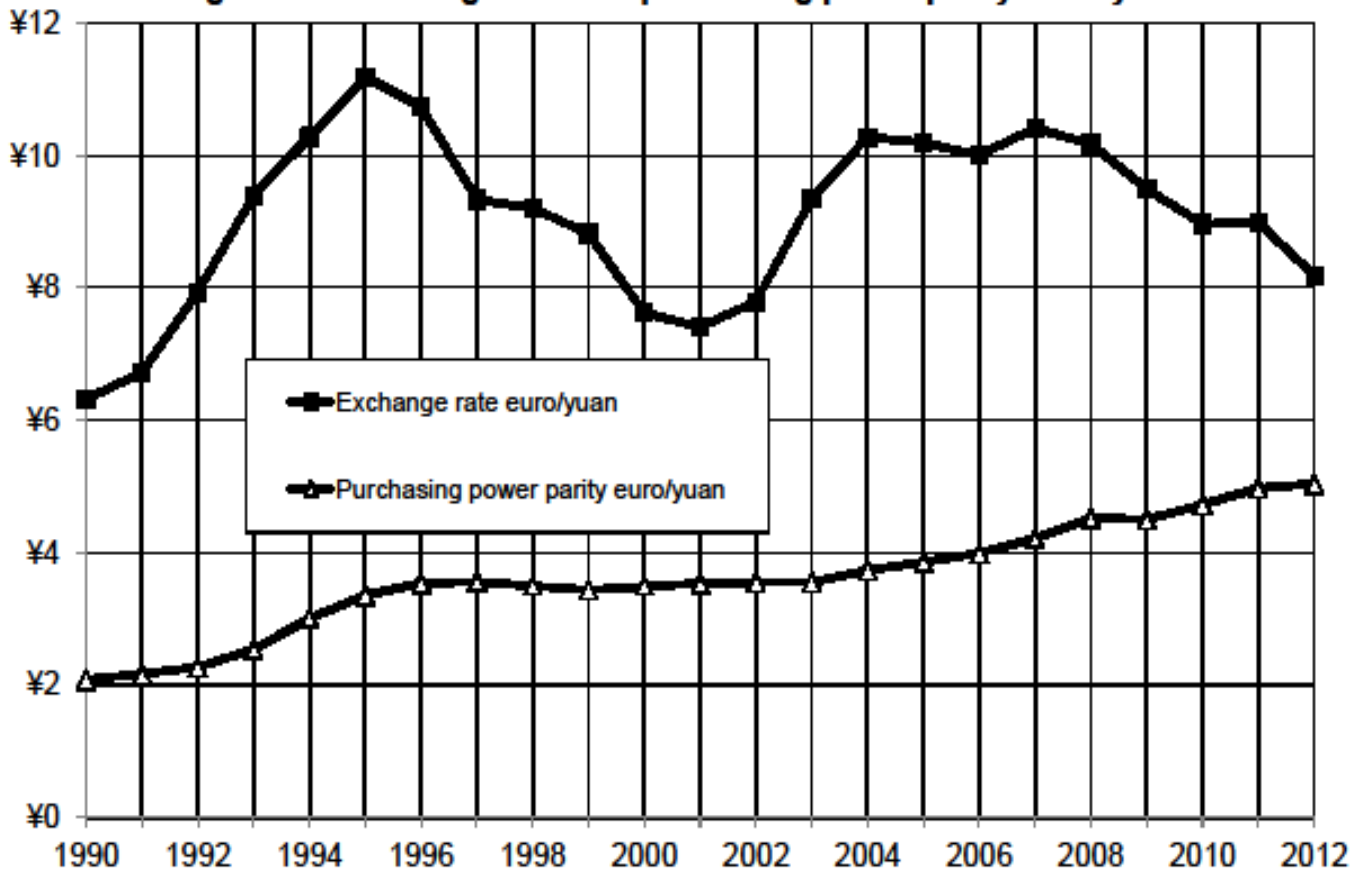
Sources: see piketty.pse.ens.fr/capital21c.

Figure 1.4. Exchange rate and purchasing power parity: euro/dollar



In 2012, 1 euro was worth 1,30 dollars according to current exchange rate, but 1,20 dollars in purchasing power partity. Sources and series: see piketty.pse.ens.fr/capital21c.

Figure 1.5. Exchange rate and purchasing power parity: euro/yuan



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 →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 ≈ 0% and h ≈ 1-1,5%, so that g=n+h≈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

Average annual growth rate	**World output**	World population	Per capita output
0-1700	**0,1%**	0,1%	0,0%
1700-2012	**1,6%**	0,8%	0,8%
incl.: 1700-1820	***0,5%***	*0,4%*	*0,1%*
1820-1913	***1,5%***	*0,6%*	*0,9%*
1913-2012	***3,0%***	*1,4%*	*1,6%*

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.

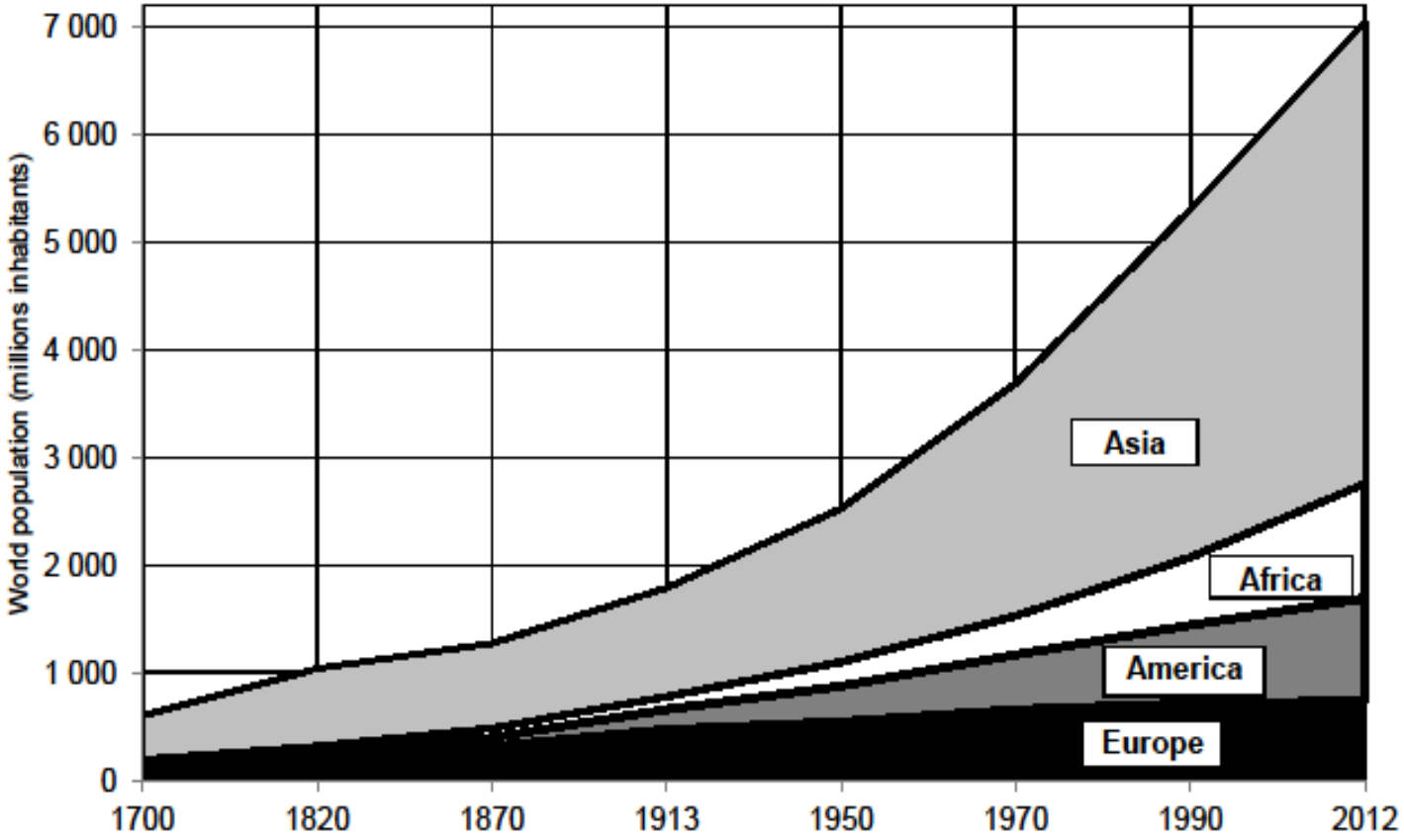
Sources: see piketty.pse.ens.fr/capital21c.

Table 2.2. The law of cumulated growth

An annual growth rate equal to…	.. is equivalent to a generational growth rate (30 years) of...	…i.e. a multiplication by a coefficient equal to…	…and a multiplication after 100 years by a coefficient equal to…	…and a multiplication after 1000 years by a coefficient equal to…
0,1%	3%	1,03	1,11	2,72
0,2%	6%	1,06	1,22	7,37
0,5%	16%	1,16	1,65	147
1,0%	35%	1,35	2,70	20 959
1,5%	56%	1,56	4,43	2 924 437
2,0%	81%	1,81	7,24	398 264 652
2,5%	110%	2,10	11,8	52 949 930 179
3,5%	181%	2,81	31,2	…
5,0%	332%	4,32	131,5	…

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.

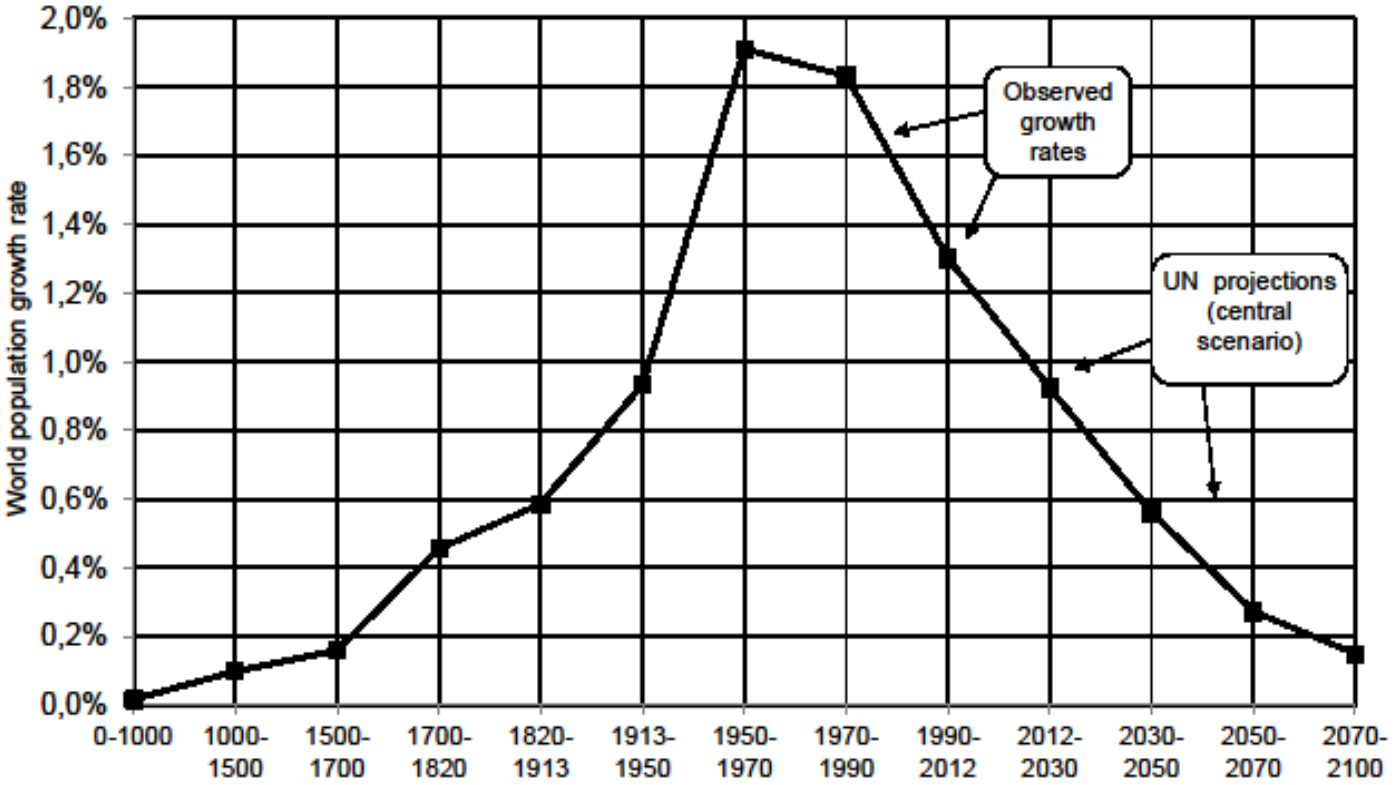
Figure 2.1. The growth of world population 1700-2012



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 piketty.pse.ens.fr/capital21c.

Table 2.3: Demographic growth since the industrial revolution

Average annual growth rate	**World population**	Europe	America	Africa	Asia
0-1700	**0,1%**	0,1%	0,0%	0,1%	0,1%
1700-2012	**0,8%**	0,6%	1,4%	0,9%	0,8%
incl: 1700-1820	**0,4%**	0,5%	0,7%	0,2%	0,5%
1820-1913	**0,6%**	0,8%	1,9%	0,6%	0,4%
1913-2012	**1,4%**	0,4%	1,7%	2,2%	1,5%
Projections 2012-2050	***0,7%***	*-0,1%*	*0,6%*	*1,9%*	*0,5%*
Projections 2050-2100	***0,2%***	*-0,1%*	*0,0%*	*1,0%*	*-0,2%*

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)

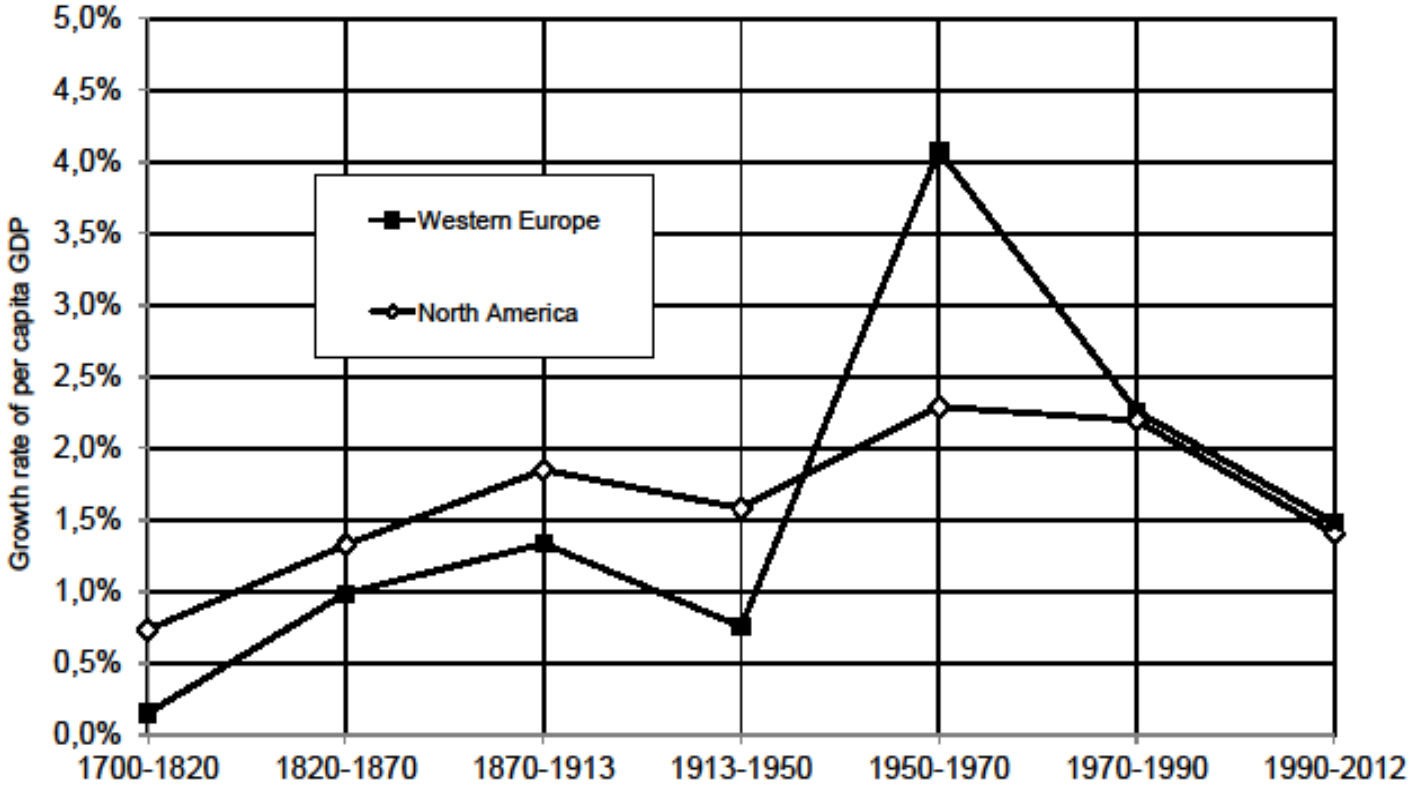
Table 2.5: Per capita output growth since the industrial revolution

Average annual growth rate	Per capita world output	Europe	America	Africa	Asia
0-1700	**0,0%**	0,0%	0,0%	0,0%	0,0%
1700-2012	**0,8%**	1,0%	1,1%	0,5%	0,7%
incl.: 1700-1820	**0,1%**	0,1%	0,4%	0,0%	0,0%
1820-1913	**0,9%**	1,0%	1,5%	0,4%	0,2%
1913-2012	**1,6%**	1,9%	1,5%	1,1%	2,0%
1913-1950	**0,9%**	0,9%	1,4%	0,9%	0,2%
1950-1970	**2,8%**	3,8%	1,9%	2,1%	3,5%
1970-1990	**1,3%**	1,9%	1,6%	0,3%	2,1%
1990-2012	**2,1%**	1,9%	1,5%	1,4%	3,8%
1950-1980	**2,5%**	3,4%	2,0%	1,8%	3,2%
1980-2012	**1,7%**	1,8%	1,3%	0,8%	3,1%

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.

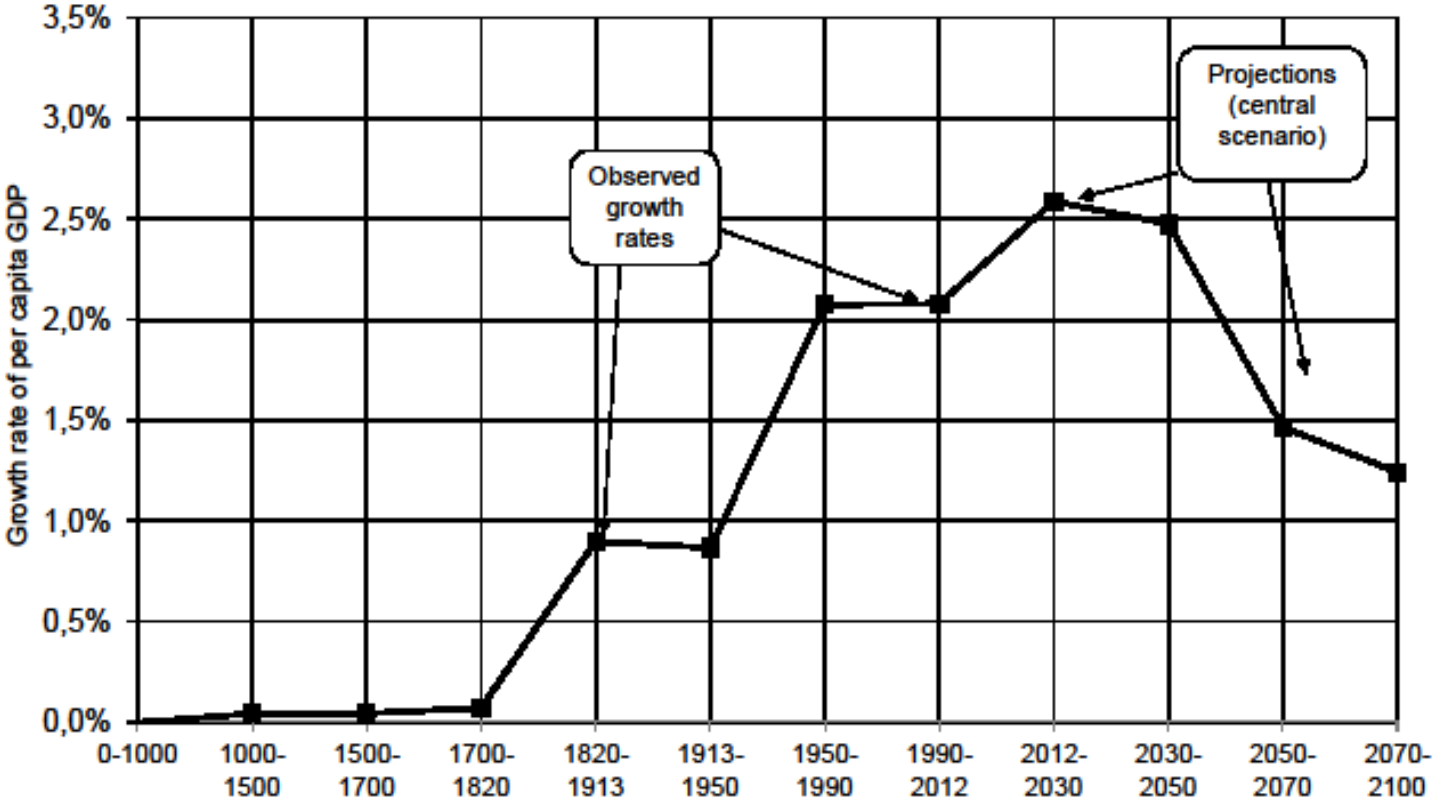
Sources: voir piketty.pse.ens.fr/capital21c

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

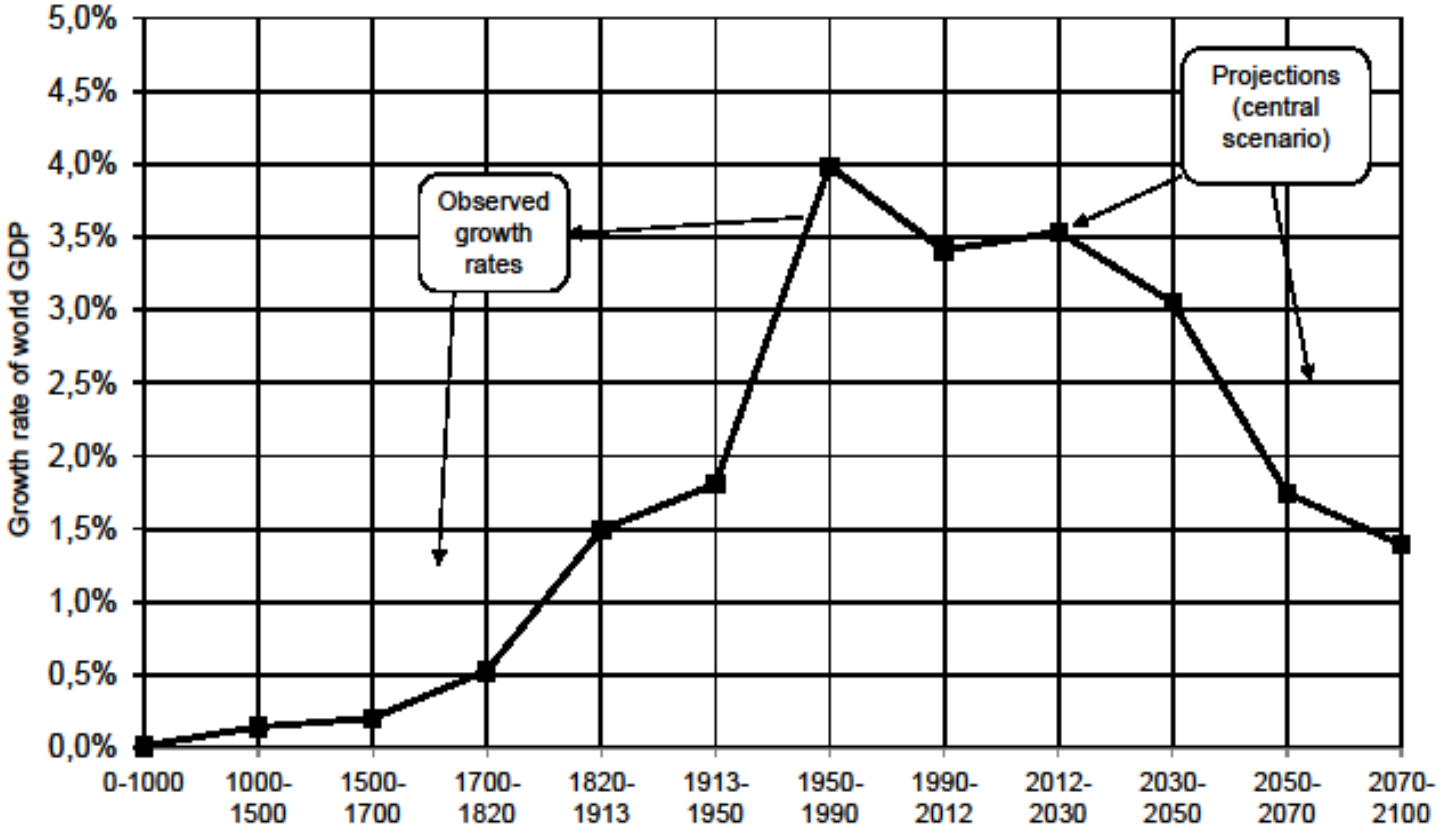
Figure 2.4. The growth rate of world per capita output since Antiquity until 2100



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

(% of total employment)	France			United States		
	Agriculture	Manufacturing	Services	Agriculture	Manufacturing	Services
1800	64%	22%	14%	68%	18%	13%
1900	43%	29%	28%	41%	28%	31%
1950	32%	33%	35%	14%	33%	50%
2012	3%	21%	76%	2%	18%	80%

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 devlopment narratives plays a key role

- (4) Rise of emerging countries certainly benefited from market openess, 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 18^{c} : 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 governement: 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**: 19^{c} capitalist system was inherently unstable, which led to its own destruction in 1914-1945
- Sacralization of private property + generalized competition between individuals and nations = v. 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
- **G. Arrighi, *The Long Twentieth Century*, 1994**; global history = succession of world systems, or core-periphery systems: Genoa 1400-1600, Holland 1600-1750, UK 1750-1920, US 1910-?, China: ?-?
- 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/idelogical 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 etailed 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 governement
- 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
- See «Putting Distribution Back at the Center of Economics», JEP 2015; « Vers une économie politique et historique », Annales – Histoire, sciences sociales 2015, « About Capital in the 21st century », AER 2015, and other debates and symposia

The property-rights/western-centric viewpoint

- **North-Weingast**, « Constitutions and commitment », EHR 1989 : British 1688 parliamentary miracle → financial & industrial devlopt
- **Acemoglu-Robinson**, *Why nations fail*, 2012; AER 2001; etc. : « if property rights are well protected (small risk of expropriation, nationalization, etc) & small government, then developmt 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; v. 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 devlopment occurs »
- Read them & make your own mind !

OLS

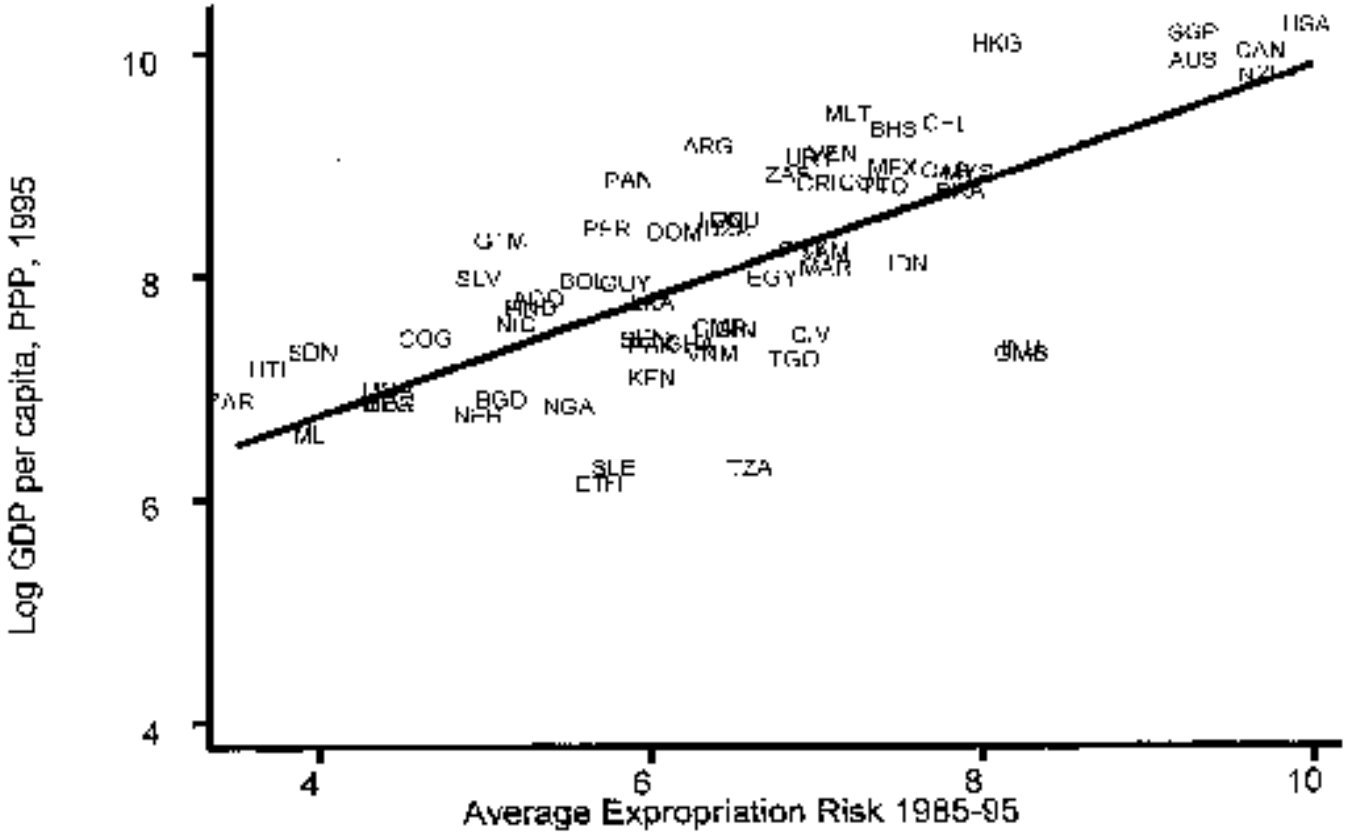


FIGURE 2. OLS RELATIONSHIP BETWEEN EXPROPRIATION RISK AND INCOME

From: AJR, "The Colonial Origins of Comparative Development"

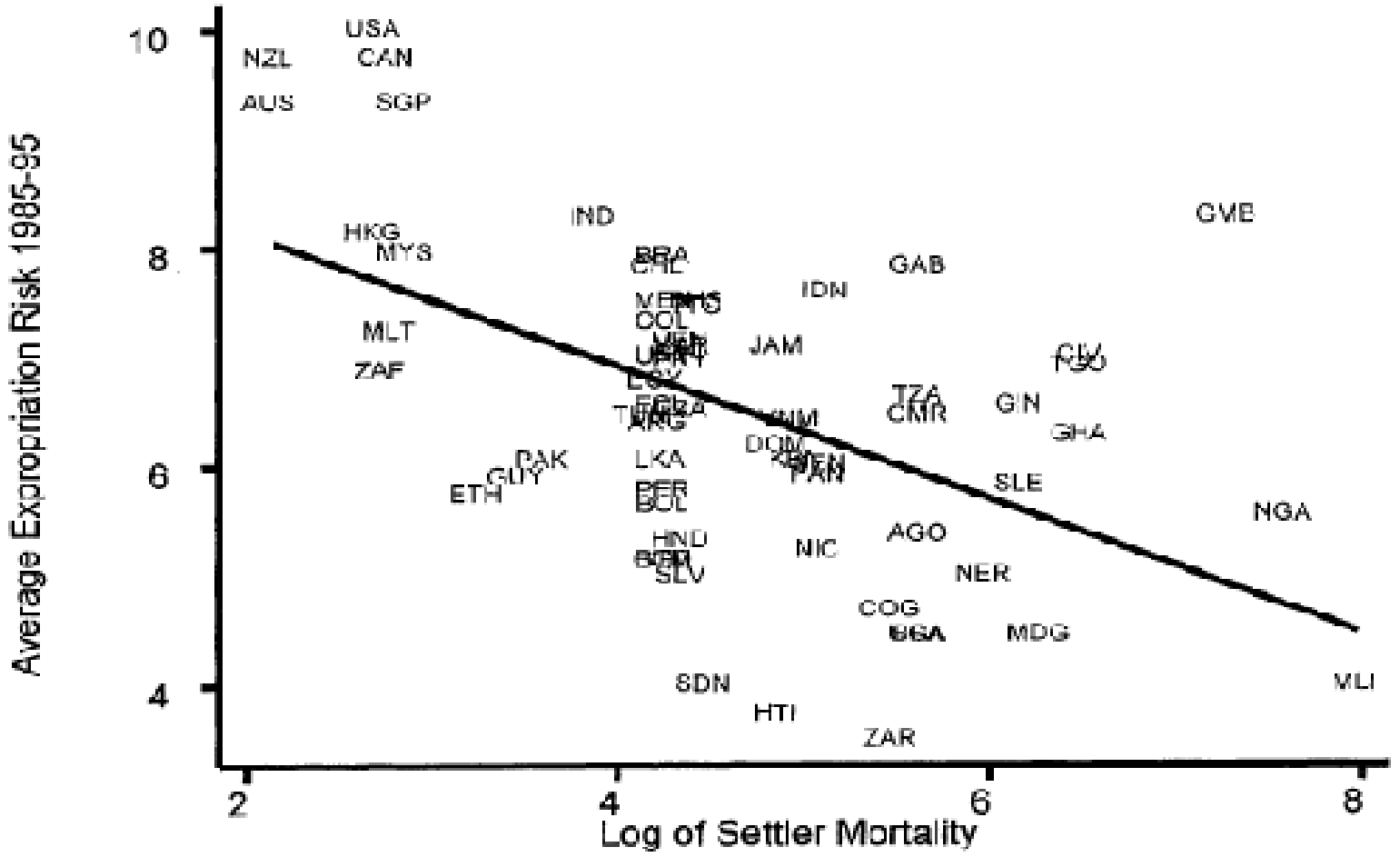


FIGURE 3. FIRST-STAGE RELATIONSHIP BETWEEN SETTLER MORTALITY AND EXPROPRIATION RISK

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) = production function

with K = capital input (= non-human capital: land, buildings, equipment, robots, patents, etc.)

and L = labor input (= 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 that the standard growth model predicts output cv, not income or wealth cv: one can end up with permanent wealth inquality, 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 $\beta = K/Y$ = 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% x 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€)
  → 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 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-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 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€, W_B=0€**
- 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€ 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: **income Y_B^* in country B = labor income Y_{LB} = 15 000€**, while **income Y_A^* in country A = Y_{LA} + Y_{KA} + Y_{KB} = 35 000€**
- 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€ = S + C = 4 000€ (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≈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 $\mathbf{r = \theta + \gamma\, g}$

(θ = rate of time preference, γ = 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)