Economic Policy and Business Activity
1st cycle, 3rd year, 2nd semester
"Licenciaturas" in Economics and in Management, optional for Finance and Applied Mathematics (ISEG)
2016-2017

Chapter 4

GROWTH POLICIES
AND STRUCTURAL REFORMS

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Index

1. ISSUES AND CONCEPTS

2. THEORIES

3. POLICIES

READINGS

Theoretical classes

Week	Chapter of the program	Chapters of the textbook	Textbook (pages)	Boxes*
7 and 8	4	6	436-528	6.1 and 6.4

* Boxes in the textbook's pages but not included in the column do not make part of the readings

PRACTICAL CLASSES
Readings 4ᵗʰ Chapter

Text 7

EU (2014). Catching-up processes in the Euro area. *Quarterly Report on the Euro Area*, Vol. 12, nº 1, pp. 7-18.

Text 7A

BIS (2013): Molander, P. & Holmquist, J. (2013). *Reforming Sweden's budgetary institutions – Background, design and experiences*, Report to the Swedish Fiscal Policy Council, pp. 6-25 and 32-44.

(Text 7 is included in SEBENTA)

Fourth Preliminary Test: May 5, Texts 7 and 7A

ISSUES AND CONCEPTS

FIVE STYLIZED FACTS ON GROWTH AND CONVERGENCE

Five stylized facts emerge from historical observation:

1. By historical standards, **fast growth** in income per person **is a recent phenomenon.**

2. Along a growth path, income per person and productivity exhibit significant medium-term **turnings points** that are not necessarily synchronous across countries at similar development levels.

3. **Convergence at the top is neither general nor unattainable.** In the last decades, the income per person in some formerly underdeveloped countries, such as East Asian countries, has caught up with that of the most advanced ones, but other countries, including most sub-Saharan African countries, have further diverged.

4. Largely as a consequence of growth developments, **income inequalities among world citizens strongly increased during the nineteenth and the first half of the twentieth centuries.** They have stabilized since the 1990s, essentially through the rapid increase in wealth of part of the Chinese and Indian populations.

5. **Growth patterns differ over time** and they can at times increase inequality within countries.

GDP and GDP per capita: Measuring the international comparisons

- **GDP per capita** at **current prices and exchange rates** – Nominal GDP/N

- **GDP per capita** at **constant prices**, do not account for prices' effects. It is used for comparisons over time, namely the measure of economic growth – Nominal GDP/GDP deflator, gives the **Real GDP**, which can also be divided by the current population.

- **GDP per capita** in **purchasing power parity** – this method uses a similar basket of goods and services in the different countries, a good measure of welfare.

GDP per person ≠ well-being

GDP per person		Standard of living	
Luxembourg	218	Luxembourg	182
Irlande	127	Norvège	130
Etats-Unis	126	Irlande	130
Norvège	121	Japon	114
Suisse	106	Autriche	113
Islande	105	Suisse	110
Autriche	102	Etats-Unis	109
Pays Bas	102	France	107
Danemark	101	Islande	104
Canada	99	Pays Bas	102
Belgique	98	Italie	99
Royaume-Uni	98	Danemark	97
Australie	95	Royaume-Uni	95
Finlande	95	Canada	93
Japon	94	Belgique	93
Suède	94	Espagne	92
France	92	Suède	91
Italie	89	Allemagne	89
Allemagne	89	Australie	87
Espagne	80	Finlande	85
Nlle Zélande	73	Grèce	74
Grèce	70	Corée	71
Corée	65	Nlle Zélande	70
Portugal	62	Portugal	63

Note: % of country average in 2004.
Source : Gaulier et Fleurbaey (2006).

Corrected for:

• Working time

• Life expectancy

• Precariousness

• Household composition

• Inequality

• Sustainability

Aggregation method = willingness to pay (equivalent income).

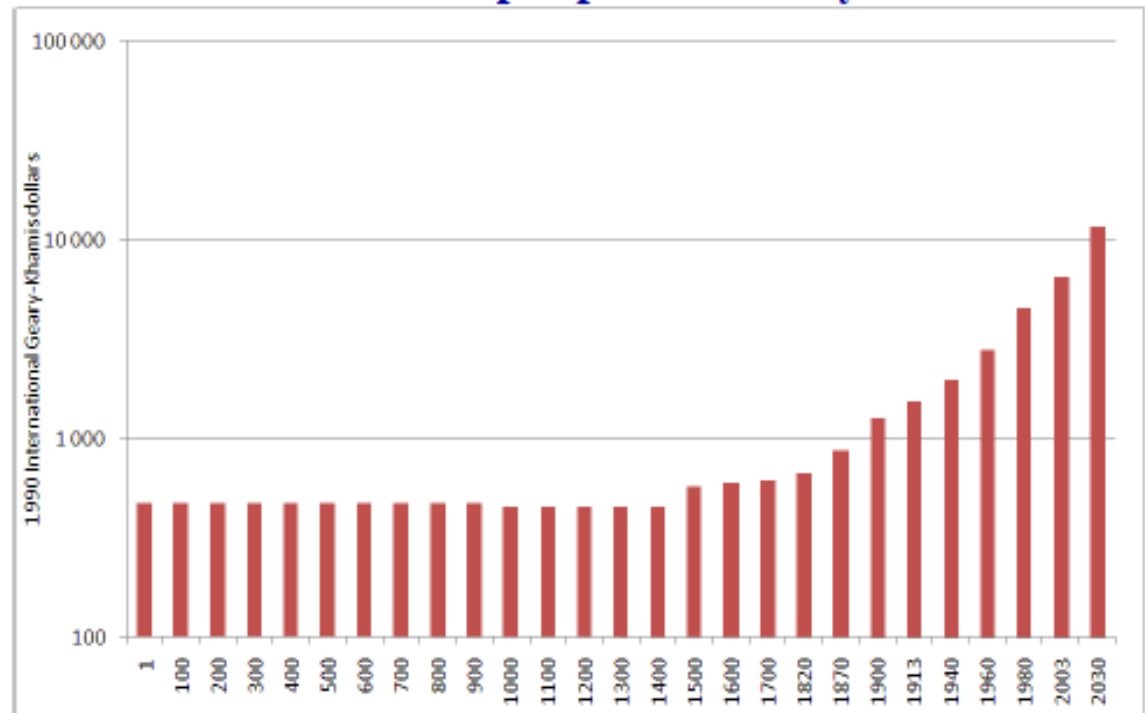# World growth is recent

Angus Maddison (1926-2010)

- **Four steps**
  - GDP ~100$/person until late Middle-Ages (0.2% annual growth)
  - 1800: 200 $/person
  - 1914: 1000 $/person
  - 2000: 6500 $/person
- **20th century:**
  - Sequences of strong growth interrupted by wars

World GDP per person since year 1

Source: Maddison (2007).

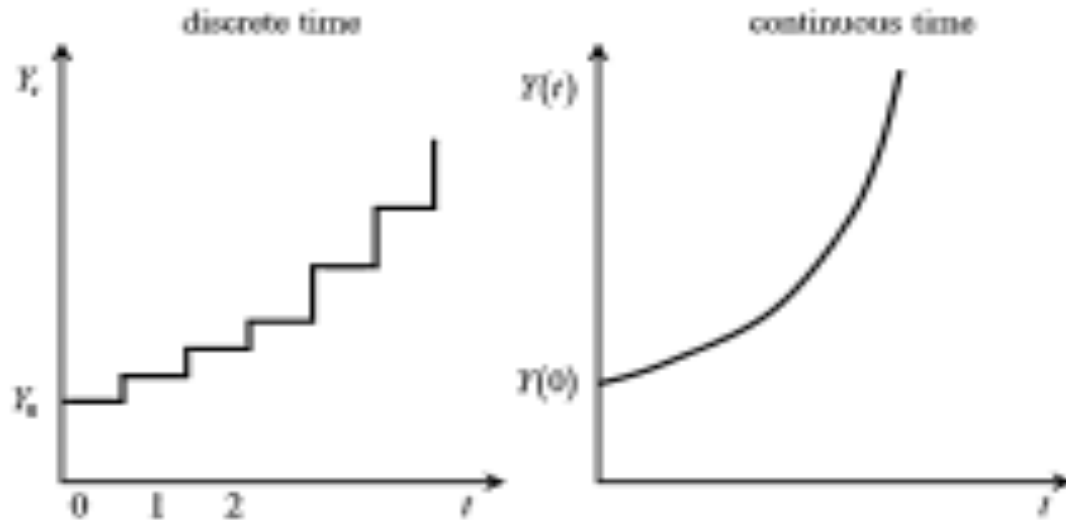# ECONOMIC DEVELOPMENT IN THE VERY LONG-RUN (SECULAR TRENDS)

Fig. 1.1 Exponential growth of gross world product in discrete and continuous time

Table 1.1 Gross domestic product per capita in various cultures, in U.S. $, real 1990 prices

Year	1500	1820	1950	2011
Western Europe/Euro area	771	1,202	4,578	19,624
China	600	600	448	4,869

Source: 1500–1950: Maddison (2007, 382); 2010: IMF (2012): World Economic Outlook Database, April 2012
Note: 2010: GDP based on PPP per capita

Comparative Growth Experience, 1960-2004

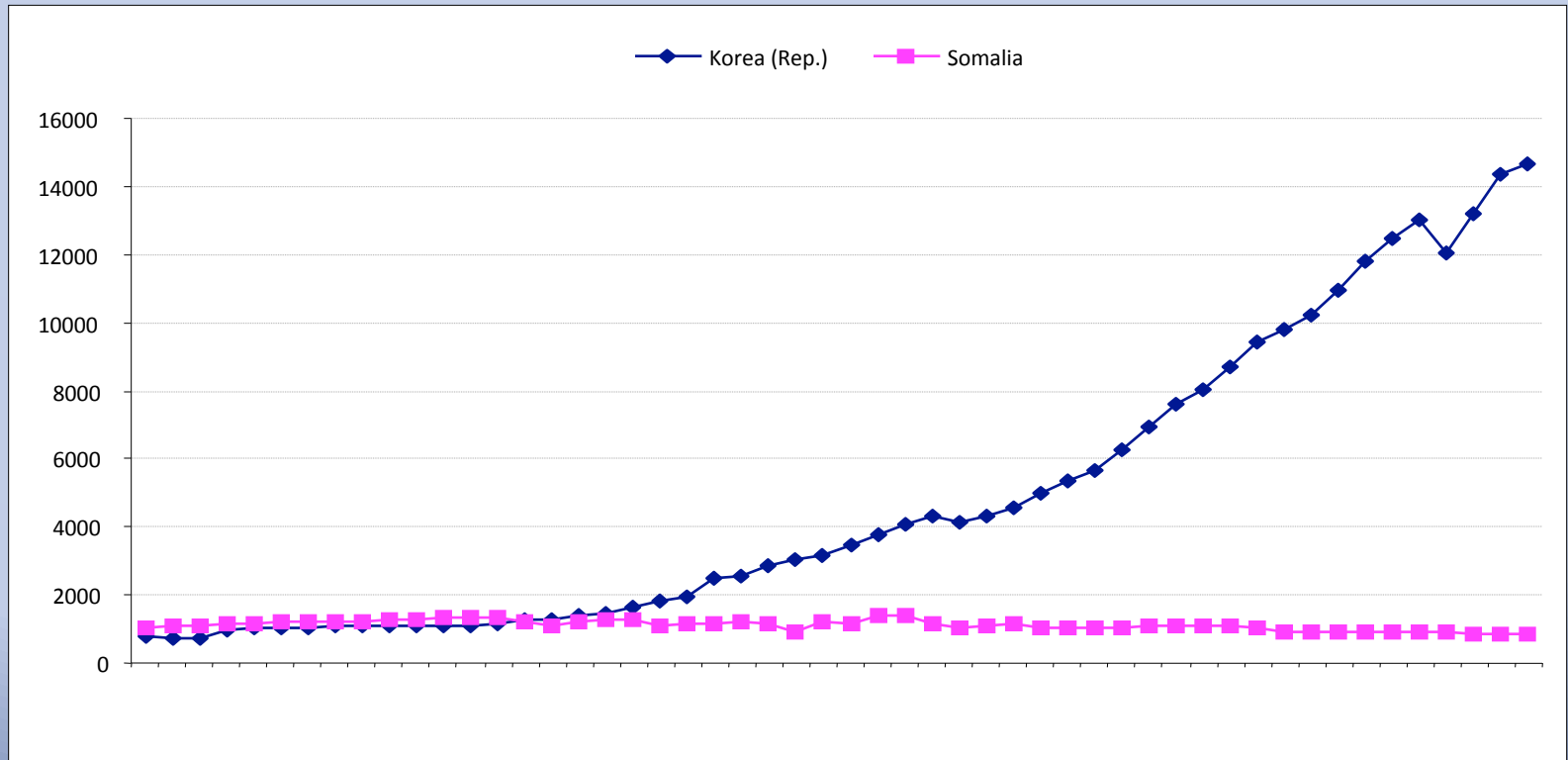| Country	Per Capita GDP in 1960 (2000 Dollars)	Per Capita GDP in 2004 (2000 Dollars)	Average Annual Growth Rate (%)
Ghana	412	1,440	2.84
Mozambique	838	1,452	1.25
Senegal	1,776	1,407	-0.53
Korea	1,458	18,424	5.76
Malaysia	1,801	12,133	4.34
Philippines	2,039	3,939	1.50
Sri Lanka	866	4,272	3.63
Taiwan	1,444	20,868	6.07
Thailand	1,059	7,274	4.38
Argentina	7,838	10,939	0.76
Brazil	2,644	7,205	2.28
Mexico	3,719	8,165	1.79
U.S.A.	12,892	36,098	2.34

Note: Brazil, Malaysia, Mozambique, Senegal and Thailand's latter per capita GDP figure is for 2003.
Source: Penn World Table 6.2 (Variable: Real GDP Per Capita (Chain))

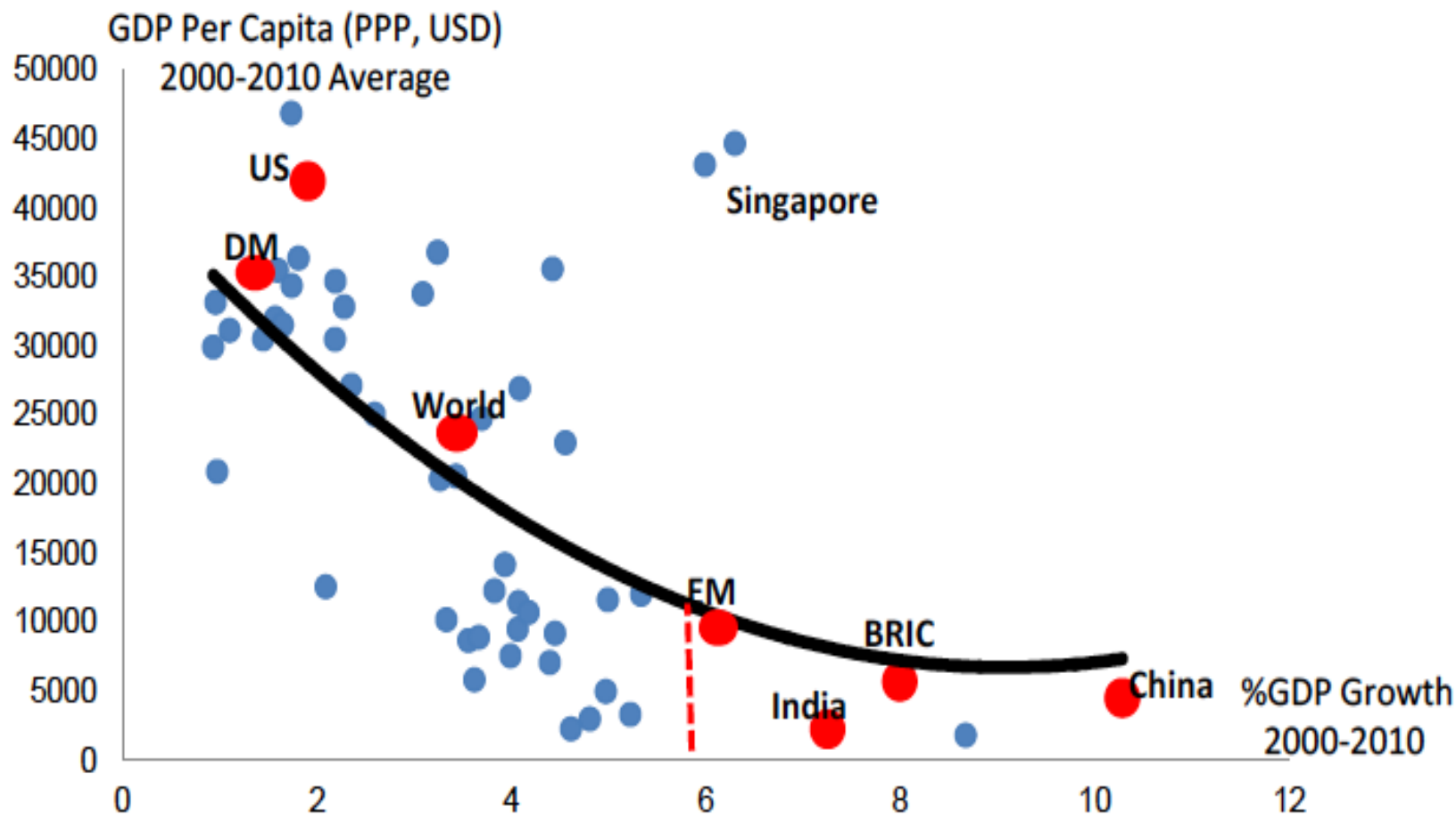**A MAJOR ISSUE FOR ECONOMIC POLICY: WHY GROWTH RATES DIFFER?**

Why are there so few middle income nations?

Korea (Rep.)-Somalia, GDP per Capita 1950-2001

Countries with lower GDP per capita grow (or may grow) faster

GDP Per Capita (PPP, USD) 2000-2010 Average vs %GDP Growth 2000-2010. Red points labeled US, DM, World, EM, BRIC, India, China, and Singapore.

Source: IMF World Economic Outlook and SLJ Macro Partners

S I N G A P O R E

Renta per cápita (dólares PPP de 2005)

Singapur — Malasia — España — Suecia — EEUU
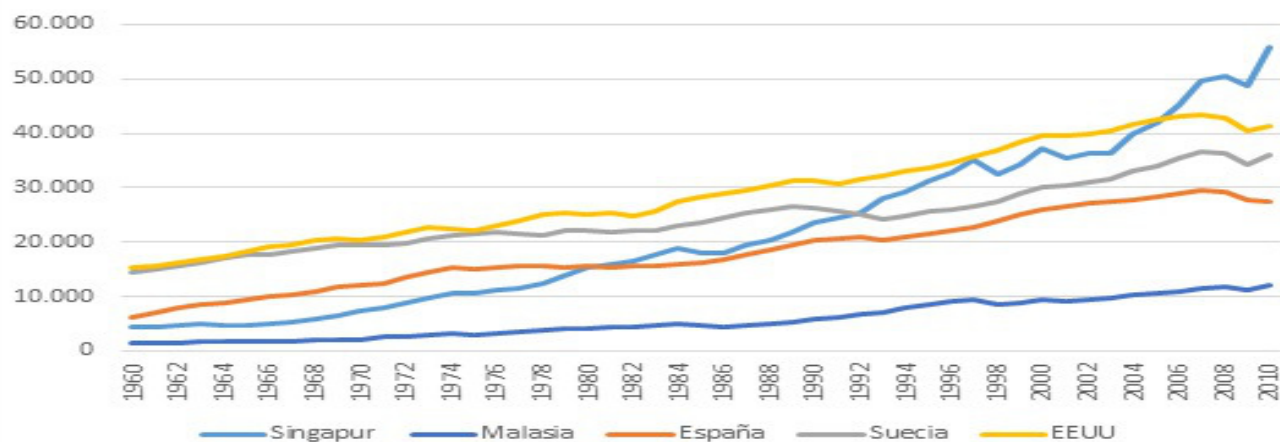
Catching up

- Japan and Europe have *converged* towards the US in the second half of the 20th century but they have hit a 'glass ceiling' at 80% of US income per capita

- Some emerging market economies *take off one after another*: Dragons, Tigers, China, Vietnam …

- Others *stagnate or even regress* in relative terms (Sub-Saharan Africa)

- The early 21st century league table is different from the early 20th century one. GDP/capita was then 70% higher in Argentina than in Spain, and it is now 50% lower

A 1 pp growth differential results in a 64% GDP level after 50 years ($1.01^{50} = 1.64$)
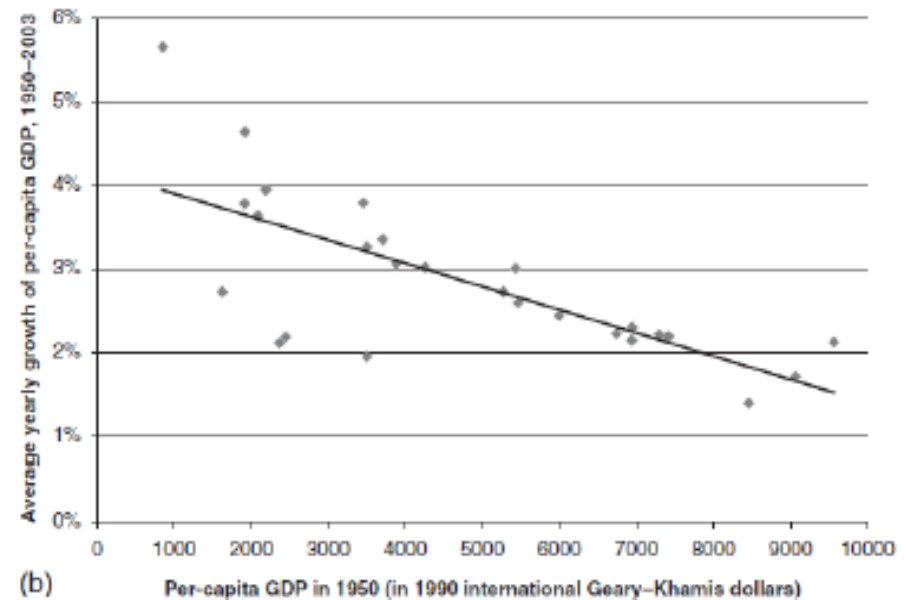
Join the club!
Absolute convergence only within the OECD

All countries

OECD countries

(a) Per-capita GDP in 1950 (in 1990 international Geary–Khamis dollars)
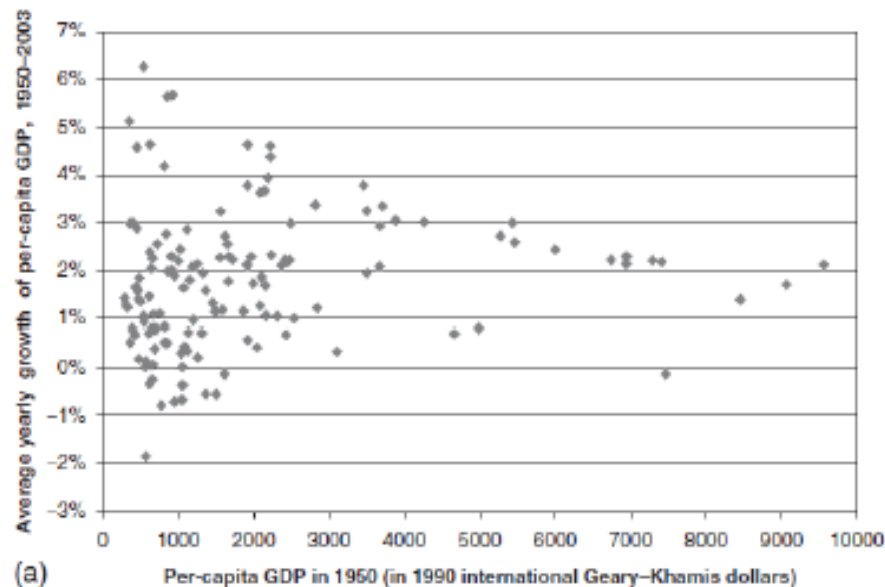
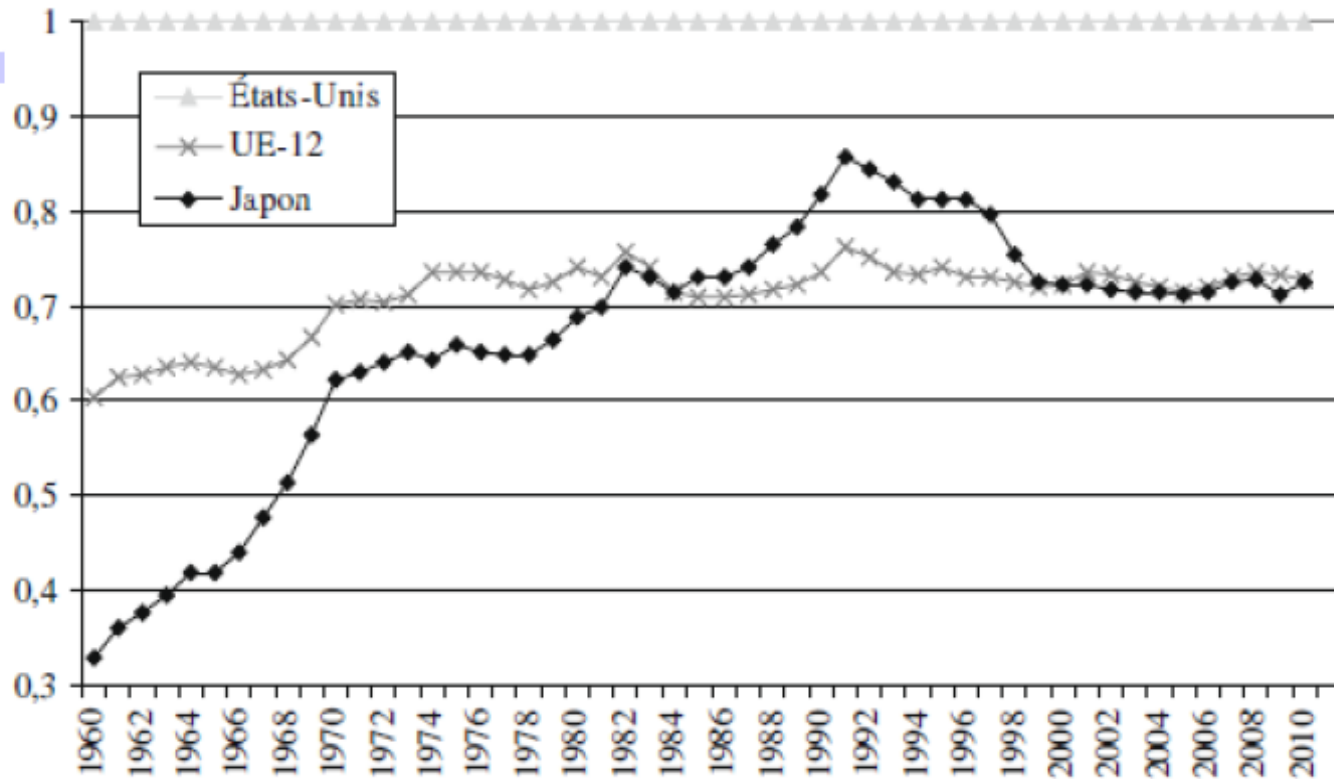(b) Per-capita GDP in 1950 (in 1990 international Geary–Khamis dollars)

Source: data from Maddison (2007), www.ggdc.net/maddison.

When the catch-up process stops

GDP per capita (in PPP) relative to US level

ACCORDING TO SOME AUTHORS, **THE DECISIVE STEP IN THE CATCHING-UP PROCESS IS TO BECOME AN ADVANCED ECONOMY** (WITH SOPHISTICATED FINANCIAL MARKETS; GOOD, CREDIBLE AND FUNCTIONAL INSTITUTIONS; PARTICIPATING IN THE R&D DEVELOPMENTS; RESPONSIVE AND PREDICTING MAJOR ECONOMIC CHANGES; ETC.). ONLY VERY FEW COUNTRIES HAVE ACHIEVED SUCH A SUCCESS.

Types of convergence

- **Convergence sigma (σ) –** *σ convergence –* Reduction of the dispersion of GDP per capita.

- **Convergence beta (β) -** *β convergence –* Negative correlation between initial GDP per capita the growth rate of GDP per capita – less developed countries grow fast.

- **Convergence clubs** – Groups of countries where there is convergence *β*

A closer look at the catching-up process

- Two concepts of convergence:
  - *β-convergence*: all things equal, poorer countries grow faster
  - *σ-convergence* : income differences narrow down over time
- Empirical implementation:

$$\frac{1}{T-1}\ln\frac{Y_{iT}}{Y_{i1}} = \alpha - \beta\ln Y_{i1} + \gamma Z_{iT} + \varepsilon_{iT}$$

- Z vector of exogenous variables, such as:
  - Saving rate
  - Demography
  - Education
  - Functioning of markets
  - Macroeconomic stability
  - Political stability
- Convergence is *conditional* on having these factors right
- *β = convergence speed* ~2,5% per year ~ 30-year half life

From GDP per person to labor productivity

$$\frac{Y}{H} = \frac{1}{d}\frac{1}{(1-u)}\frac{1}{x}\frac{1}{y}\frac{Y}{P}$$

$$\frac{Y}{H} = \Lambda \frac{Y}{P}$$

$\Lambda_{EZ} > \Lambda_{US}$

Λ = labor-market factors.
Less hours worked per person in the total population in the Eurozone, compared to the USA.

Table B6.1.1
Number of hours worked in 2008 in the Euro area and in the US

	Variable	US	Euro area	Euro area versus US
Total population in millions	P	304	322	+6%
Ratio 15–64-year-old/total population	y	67%	67%	—
Participation rate of the 15–64-year-olds	x	75%	73%	−3%
Employment rate	$1 - u$	94%	92%	−2%
Average number of hours worked	d	1792	1574[a]	−12%
Total number of hours worked (billion)	H	259.8	226.7	−13%

Notes: Civilian employment only. [a]Weighted average of the four largest countries.

Source: OECD, *Labor Force Statistics* 2009.

From labor productivity to total factor productivity

Growth accounting in the US and in the EU
Average annual growth rates, in %

	United States			European Union (15)			Gap (US – EU)		
	1990-1995	1995-2000	2000-2004	1990-1995	1995-2000	2000-2004	1990-1995	1995-2000	2000-2004
GDP (1)	2.5	4.2	2.4	1.6	2.7	1.5	0.9	1.5	0.9
Total hours worked: (2)= (3)+(4)	1.3	1.9	-0.4	-0.9	0.9	0.4	2.2	1.0	-0.8
Employment (3)	1.1	1.7	0.4	-0.5	1.4	0.7	1.6	0.3	-0.3
Working hours (4)	0.2	0.2	-0.8	-0.4	-0.5	-0.3	0.6	0.7	-0.5
Labor productivity (5)= (1)-(2)	1.2	2.3	2.8	2.5	1.8	1.1	-1.3	0.5	1.7
Contrib. of capital/labor ratio (6)	0.7	1.2	1.1	1.3	0.9	0.7	-0.6	0.3	0.4
TFP: (7) = (5) - (6)	0.5	1.1	1.7	1.2	0.9	0.4	-0.7	0.2	1.3

Correlation between GDP per capita and the growth of labor productivity

Graph I.3: **GDP per capita in level and labour productivity growth, EU countries**

$y = -0.2112x + 6.2722$
$R^2 = 0.5896$
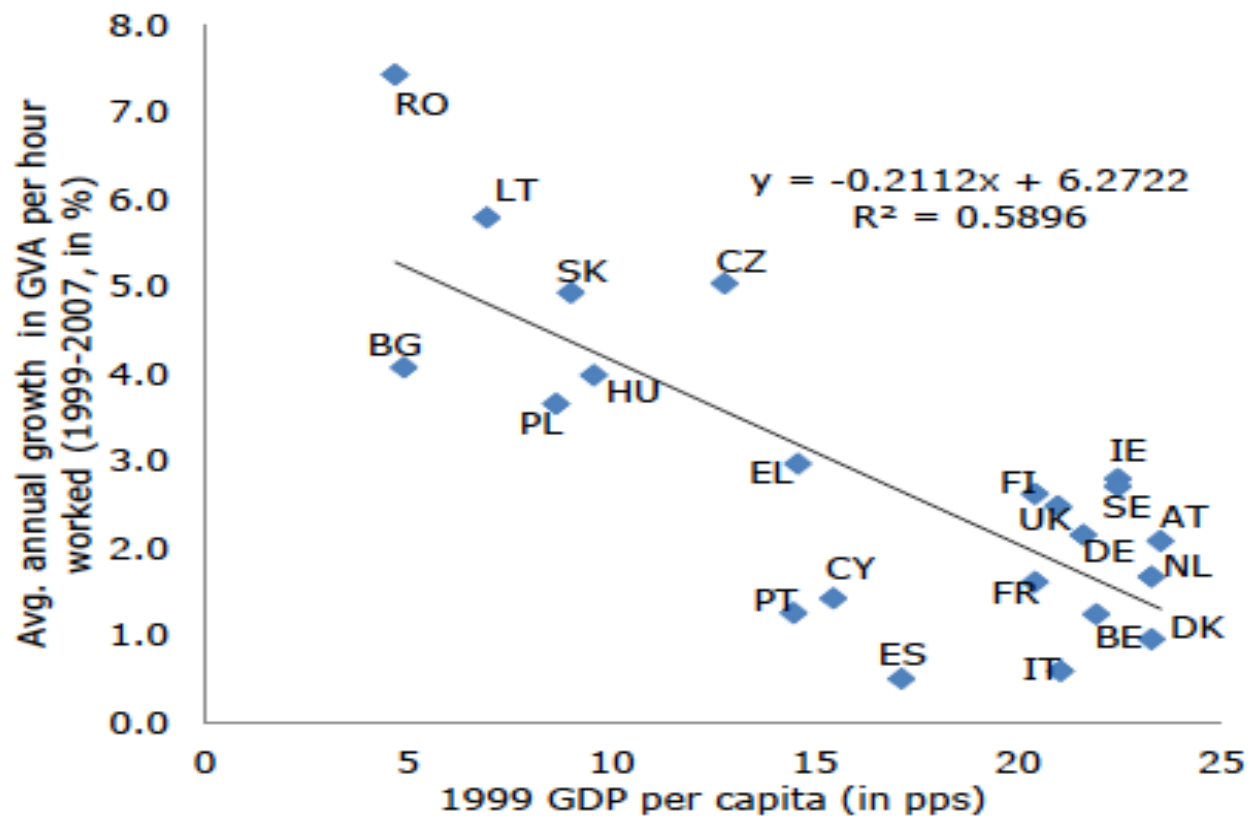
Source: AMECO.

Global inequality

- Inequality has first risen *within* countries, then *between* countries
- Has inequality been reduced in the 2000s?
  - Ongoing empirical debate: see Chen and Ravallion (2001), Sala-i-Martin (2002)
  - *Lower inequality between individuals* due to rise of Indian and Chinese middle classes
- '*Bottom billion*' (Collier, 2007) entrenched in deep poverty

Global Lorenz curve of income

Legend: 1820, 1890, 1950, 1992, 2002
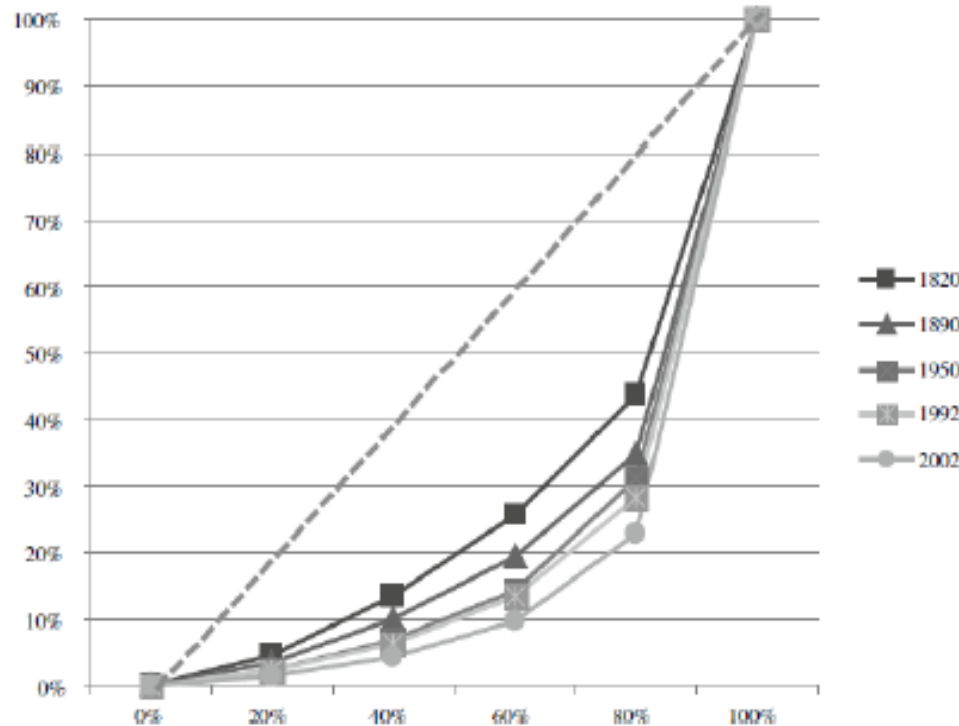
Global Gini coefficient
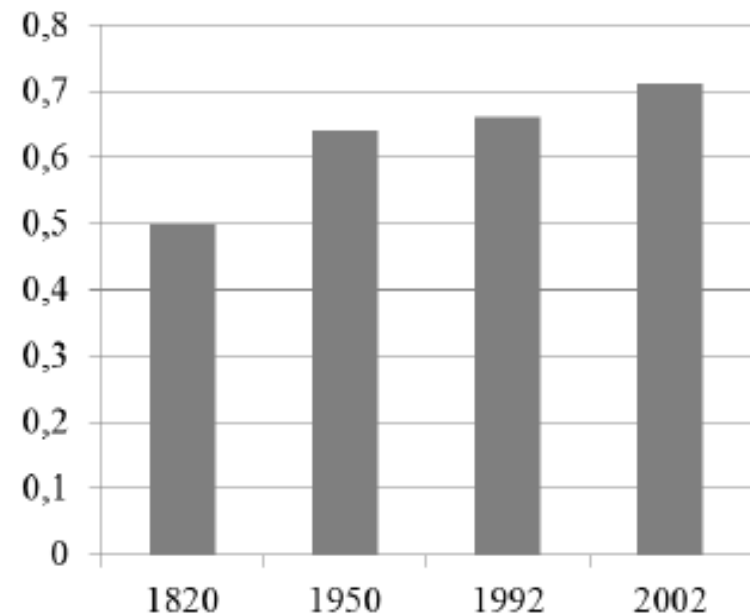
Sources: Bourguignon and Morrison (2002), Milanovic (2009).

THEORIES

Main theoretical contributions

- **Neoclassical models of capital accumulation**
  - Solow (exogenous savings)
  - Ramsey (optimal savings)
- **Endogenous growth**
  - Externalities
  - Innovation
  - Trade and geography
- **Other avenues**
  - Inequalities
  - Institutions

SOLOW MODEL (I)

- $Y = A\,K^{\alpha}\,L^{1-\alpha}$

- $0 < \alpha < 1$ A = TFP;
- α = part of K returns in income
- A=TFP

Determination of GDP Growth

- $\Delta Y = \Delta K + \Delta L + \Delta$ Residual
- Residual = total factor productivity (TFP) = Solow residual
- <u>Explanations for TFP</u>: generic factor, technology, labor organization, functioning of the markets, institutions

SOLOW MODEL (II): HYPOTHESES

- **Technical progress and savings rate are exogenous**

- **Constant returns to scale**

- **Decreasing returns of K and L**

- **K and L are perfect substitutes**

SOLOW MODEL (III): DISCUSSION
Inside the black box

- Solow's message: no growth policy once the economy has reached the steady state

- Problem with Solow: TFP assumed exogenous

  - TFP may be exogenous at the level of the firm but endogenous *at the aggregate level*

    - Productive efficiency depends on interaction among firms (through *e.g.* quality of inputs, specialized suppliers, skills, etc.)

  - TFP may be *endogenous at the firms level*

    - Technical progress does not come from heaven. Firms invest in research and innovation, thereby generating new products and new processes

SOLOW MODEL (IV): Other features

- The ratio K/L depends on the savings rate and the depreciation of K

- The stock of capital (K) and GDP grow at a constant rate equals to the sum of population growth rate (n) plus the growth rate of TPF (g)

- *(GDP growth rate only depends on demography and technical progress)*

- GDP per capita and capital per capita grow at g rate (growth of TFP)

- Savings rate and investment do not influence GDP growth rate but only the level GDP per capita

- Elasticity of GDP per capita in relation to savings: an increase in 1% in the savings rate leads to an increase of $[\alpha / (1- \alpha)]\%$ in the GDP per capita.

- The savings rate that maximizes consumption per capita (optimal savings) is equals to the part of capital returns in the GDP (α).

- In the point where savings is optimized, the marginal return of capital [real interest rate (r)] equals the GDP growth rate $= (n + g)$

- $r = n + g$ ("Golden Rule of Capital Accumulation")
- $r > n + g$ If r > capital growth rate (n+g), capital will be insufficient
- $r < n + g$ If r < capital growth rate (n+g), capital will be excessive

Optimal capital accumulation

Optimal saving rate: *Ramsey*   Ste

$(n+g+\delta)k$

consumption

k^{α}

σk^{α}

αk^{α}

savings

$\hat{k}$ k^*

Frank Ramsey
1903-1930
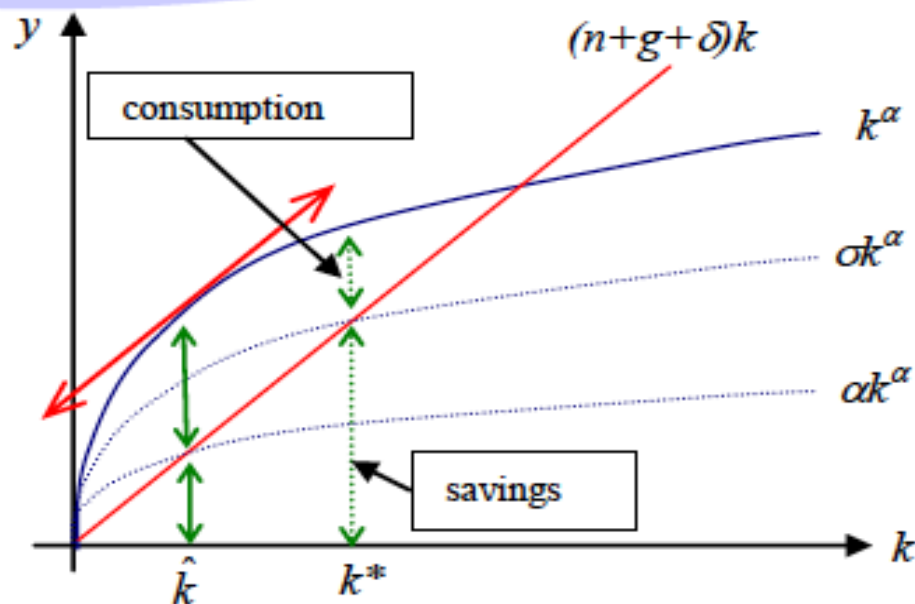
- Social planner picks σ to maximize long-term per-capita consumption

➢ Optimal level of capital per head and marginal productivity of capital so that:

$$r = n + g \text{ ('golden rule')}$$

From where come productivity gains: the case of ICT (Information and Communication Technologies)

- **UNFOLDING TFP**
  - Human capital
  - Innovation
  - Technology
  - ... ICT

- **HOW ICT INFLUENCE**
  - Substitution of L by K, increase in the ratio k/L
  - Substitution of undifferentiated L by more qualified L
  - Better management of stocks
  - Improvement in the use of inputs

Contributions to the growth of GDP 2000-2004 (%)

	USA	EU15
Productivity of labor (1)	**2,8**	**1,2**
Ratio K/L (2)	**1,1**	**0,8**
ICT	0,6	0,3
Non ICT	0,5	0,5
TFP (3) = (1) – (2)	**1,7**	**0,4**
ICT	0,3	0,2
Non ICT	1,4	0,2

Endogenous growth

Externalities

- Romer (1986): non-decreasing marginal return on physical and human capital, channeled through:
  - know-how
  - pecuniary externalities
  - public infrastructures
- Consequences
  - a higher saving rate permanently increases growth
  - path-dependency
- Ex. AK model

$$y = k \Rightarrow \frac{\partial y}{\partial k} = 1 = cst$$

No limit to capital accumulation.

Innovation

- Market structures determine incentives to innovate, hence the rate of growth:
  - 'Schumpeterian' innovation through creative destruction (vertical differentiation: Aghion and Howitt 1992)
  - 'Chamberlinian' innovation through product diversity (horizontal differentiation: Grossman et Helpman, 1989)

'Dixit-Stiglitz' utility function

$$U(C) = \left[\int_{i=0}^{1} \alpha_i C_i^{(\sigma-1)/\sigma} di \right]^{\sigma/(\sigma-1)} \text{ with } \int_{i=0}^{1} \alpha_i di = 1$$

USA: Learning Curve of Best-Practice Productivity in Medium Grade Men's Shoes
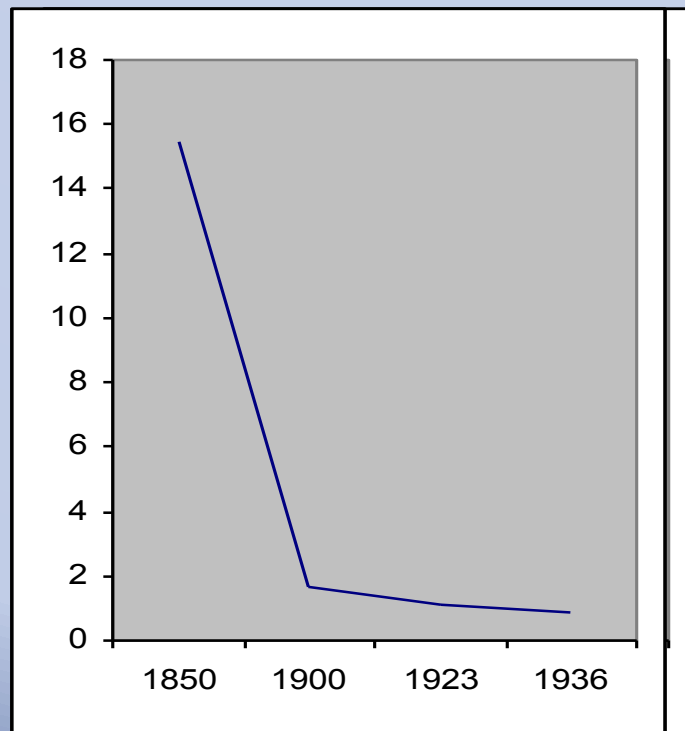
Man-Hours Required by Best-Practice Methods of Producing A Pair of Medium-grade Men's Shoes at Selected Dates in the U.S.

Year	Man-Hours Per Pair
1850	15.5
1900	1.7
1923	1.1
1936	0.9

Beyond the production function

- **International trade**
- **Economic geography**
- **History**
  - **Path-dependency with multiple equilibriums**
- **Income distribution**
- **Institutions**

THE CORE/PERIPHERY MODEL
(Krugman, 1991; Baldwin et al., 2003)

Agglomeration forces

- **Demand-shifting externalities** (*'backward linkages'*)

New workers coming in → higher local demand → entry of new firms

- **Production-shifting externalities** (*'forward linkages'*)

More product diversity → lower prices → more purchasing power → new workers coming in

Dispersion forces

- **Pro-competitive effect**
  - New workers coming in → lower wages
  - Entry of new firms → lower prices

- **Congestion costs:** pollution, traffic jams, bottlenecks, scarcer land resources

- **Comparative advantage**

Trade costs increase both agglomeration and dispersion forces, but more the latter than the former

Growth and institutions

- **Institutions:** *"The humanly devised constraints that structure human interaction. They are made up of formal constraints (rules, laws, constitutions), informal constraints (norms of behavior, conventions, and self-imposed codes of conduct), and their enforcement characteristics."* D. North and R. Fogel (1990)

Graph 4: Canonical relationship between "good governance" and income level
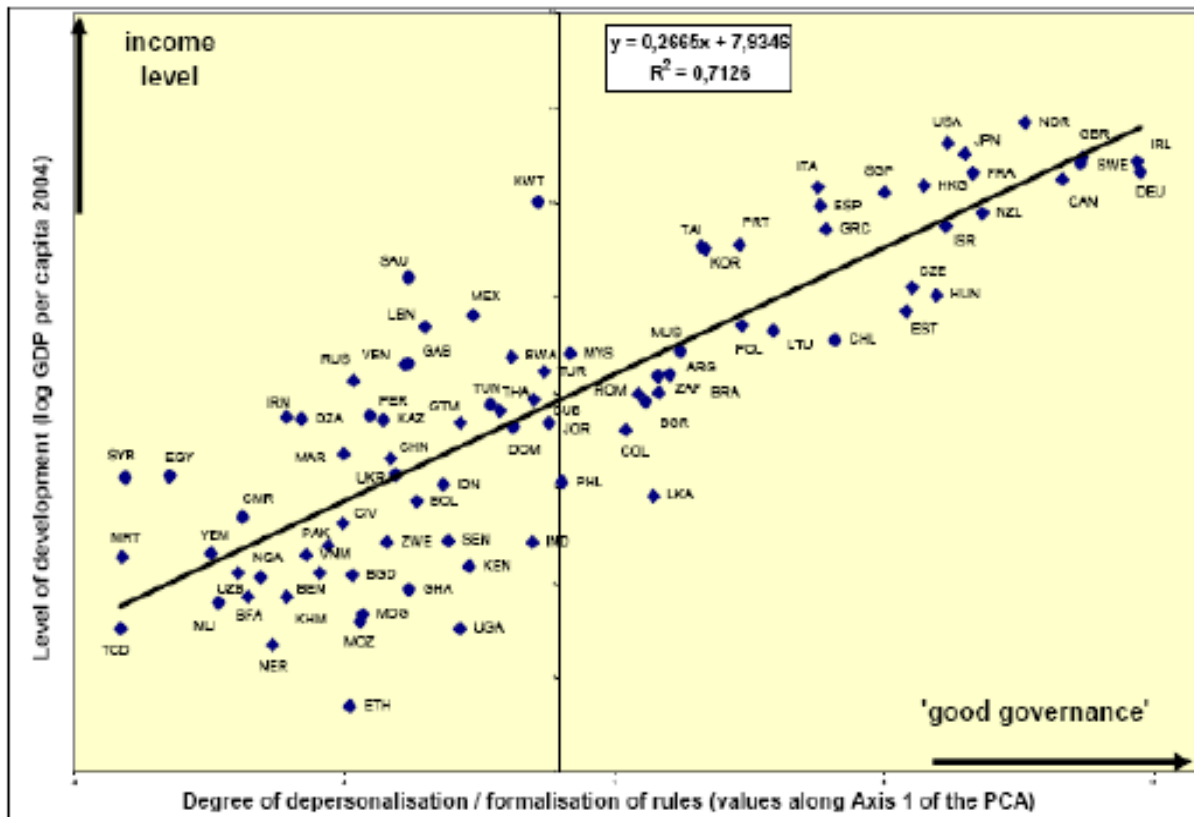
Douglass Robert North Fogel 1920 - 1926 -

Source:
Ould Aoudia & Meisel (2007)
Institutional Profile Database,
www.cepii.fr/francgraph/bdd/institutions.htm

Sources: Institutional Profiles database, World Development Indicators (World Bank).

Growth and institutions (II)

- *Causality problem*: good institutions are costly (ex. anti-corruption)
  - Econometric answer: instrument institutions using settlers mortality (deemed to explain colonization strategies), cf. Acemoglu, Johnson & Robinson (2001)
  - Theoretical answer: 'legal origins' (common law vs civil law), cf. Glaeser & Shleifer (2002)
- *North, Wallis and Weingast (2009)*: development consists in moving from one social order to another one:
  - Primitive social order: before the apparition of organized societies
  - Limited access social order: rent sharing
  - Open social order: rents can be challenged.

  Key: protect elites so that they do not oppose the move to an open social order

# Growth and income distribution: a two-way relationship

Growth → inequality

- Kuznets (1955): *U*-shaped relationship between development level and income inequality

- Unequal access to finance, education

Inequality → growth

- Risk of political instability/deadlock

- Demand for redistributive taxation (Alesina and Rodrik, 1994)

GDP per capita versus Gini coefficient

PPP GDP per capita, US dollars, logarithmic scale
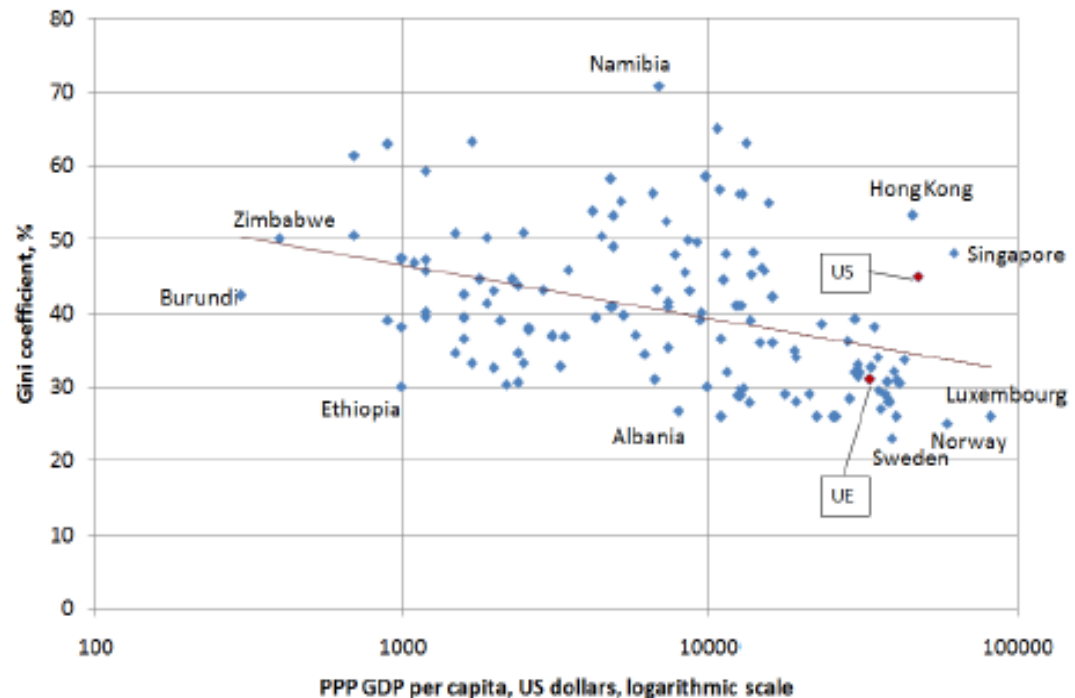
Source: CIA Factbook.

POLICIES

Making the best out of theory

Education, innovation, structural reform, market structure…

$$Y = A \cdot F(K,L)$$

Investment and capital markets

Labor supply and labor markets

- In the *short run* (a few months to a few years), potential output is exogenous; growth is dominated by cyclical fluctuations and by stabilization policies
- In the *medium run* (a few years), governments can influence potential output through investment and labor supply
- In the *long run* (many years), GDP and the labor/capital mix are determined by demography, technology, institutions and market structures

Making markets work better

Labour productivity growth acceleration 1996–2003 versus 1985–95

correlation coefficient = −0.17
t-statistic = −0.73
without Greece:
correlation coefficient = −0.58
t-statistic = −3.1

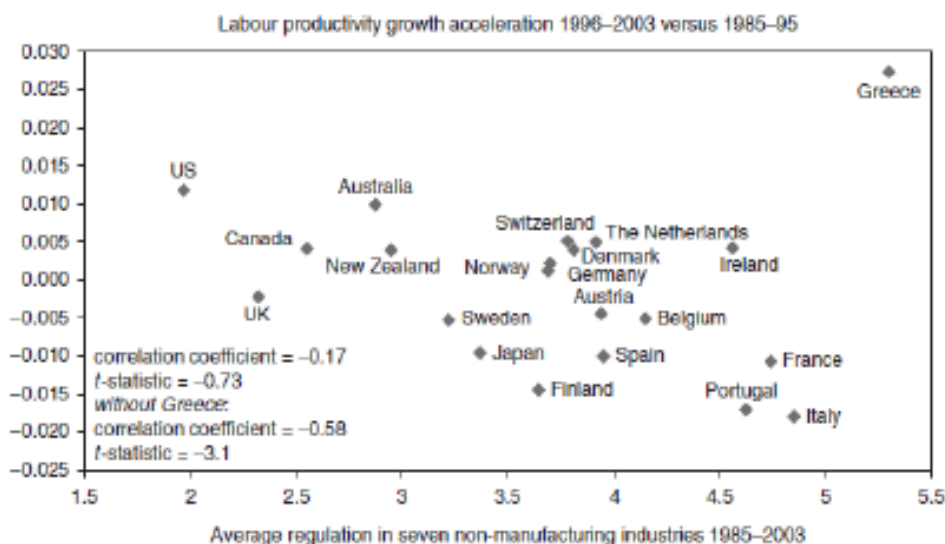Average regulation in seven non-manufacturing industries 1985–2003

Figure 6.12 Product market regulation and labor productivity acceleration in OECD countries;
Source: Conway et al. (2006).

Reading: From 0 (least restrictive) to 6 (most restrictive).

- *Labor supply*
  - Family-oriented policies
  - Immigration
  - Welfare-to-work
  - Higher working time
- *Savings and investment*
  - Lower cost of capital (taxes, competition)
  - Channeling savings towards capex
 - Public infrastructures (ex: trans-European network)

Net social return must be positive *after accounting for opportunity costs* such as distortive tax financing

Developing financial markets

- Often neglected in growth strategies (ex: Lisbon)
- Channels
  - Cost of capital
  - Savings
  - Allocation of capital
- Major issue post crisis: is there a trade-off between financial stability and growth? Ill allocation of skills?

Share of low-cash firms in total investment, 1955-2005
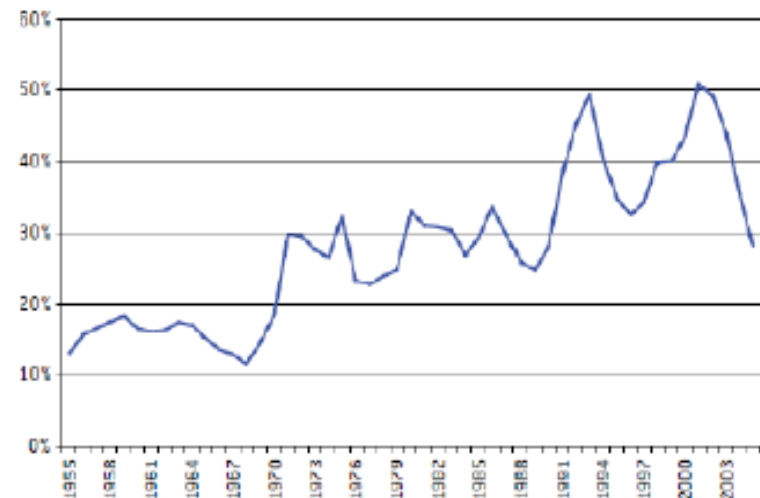
Source: Philippon and Véron (2008).

Growth after the financial crisis

Capital ageing, creative destruction, reduced R&D

Sector reallocations, hysteresis

$$Y = A \cdot F(K,L)$$

Financial constraints, higher cost of capital

Impact of past banking crises on potential GDP growth

	Année de la crise	Un an après	Deux ans après	Cinq ans après	Sept ans après	Dix ans après
Méthode Cerra et Saxena (2008)						
• crises RR	$-0,2$	$-0,5$	$-0,8$	$-0,3^{(*)}$	$-0,1^{(*)}$	$0,0^{(*)}$
• crises LV	$-0,3^{(*)}$	$-0,5^{(*)}$	$-0,6$	$-0,1^{(*)}$	$0,1^{(*)}$	$0,1^{(*)}$
• crises sévères RR	$-0,7$	$-1,3$	$-1,9$	$-0,7$	$-0,2^{(*)}$	$0,0^{(*)}$
• crises sévères LV	$-0,4^{(*)}$	$-0,8^{(*)}$	$-0,9^{(*)}$	$-0,1^{(*)}$	$0,1^{(*)}$	$0,1^{(*)}$
Méthode FMI (2009)						
• crises RR	$-0,2$	$-0,5$	$-0,8$	$-0,2$	$0,2$	$0,2$
• crises LV	$-0,9$	$-1,0$	$-1,0$	$-0,2$	$0,3$	$0,1$
• crises sévères RR	$-0,7$	$-1,3$	$-1,9$	$-0,7$	$-0,1$	$0,2$
• crises sévères LV	$-1,1$	$-1,3$	$-1,3$	$-0,2$	$0,3$	$0,0$

Lecture : Les crises bancaires (RR) causeraient un déficit de croissance potentielle de l'ordre de 0,2 point l'année de la crise, 0,5 point l'année suivante, etc.

Note : (*) Non significatif à 5 %.

Source: Cabannes et al. (2011).

The "Washington Consensus" at its evolution

End-1980s

(i) fiscal discipline
(ii) reorientation of public spending
(iii) tax reform
(iv) financial liberalization
(v) unified and competitive exchange rates
(vi) trade liberalization
(vii) openness to foreign direct inv't
(viii) privatization
(ix) deregulation
(x) secure property rights

2000s

(xi) corporate governance
(xii) anti-corruption
(xiii) flexible labor markets
(xiv) WTO agreements
(xv) financial codes and standards
(xvi) 'prudent' capital-account opening
(xvii) non-intermediate FX regimes
(xviii) independent central bank / inflation targeting
(xix) social safety nets
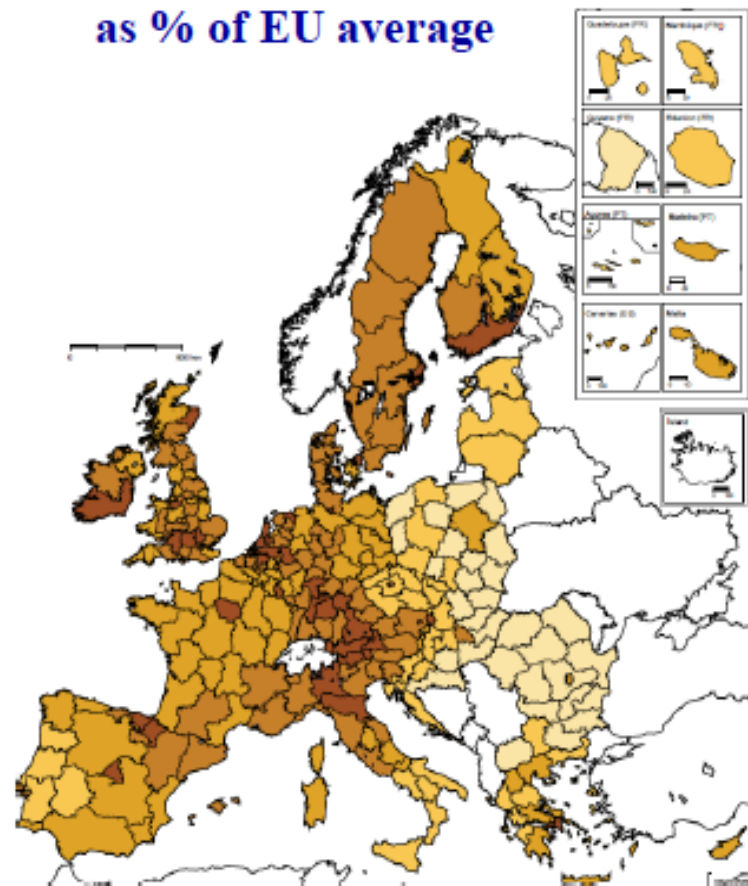(xx) targeted poverty reduction

Source: Rodrik (2005).

The role of competition and intellectual property

- A difficult balance to strike:
  - "Schumpeterian" model: innovation financed by rent. Excessive competition / weak intellectual protection are bad
  - But firms in place should be challenged and patents can be used as deterrent to competition
- Recent examples:
  - EC vs Microsoft
  - European Parliament discussion on software patentability
  - WTO 'TRIPs' agreement* for antiretroviral drug production in low-income countries
  * 'Trade-Related aspects of Intellectual Property Rights'

Countering distance and history

Regional GDP per person as % of EU average

- Trade-off between *geographical equity* (cf. EU structural funds) and *economic efficiency* (cf. French 'competitiveness clusters')

- Transport infrastructures may encourage agglomeration rather than dispersion

- First best = agglomeration + lump-sum transfers to low-income regions

- Usually not feasible + multiple equilibrium argument makes 'big push' possible

- IT can help solve contradiction and support efficiency-cum-equity by 'making the world flatter'

  - Ex: 3G access in countryside or Africa

Source: Eurostat.

Types of structural reforms

- **Competition and regulation**

    Negative mark-ups of shocks in services

    Reduced entry barriers for manufacturing start-ups

- **Fiscal reform**

- **Reform of unemployment benefits**

- **Other reforms in the labor market**

- **Investment in human capital**

- **Investment in R&D**