# *Decreasing Growth*

## *Why is growth lastingly decreasing in advanced economies?*

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1. The Issue

2. The 'usual suspects'

3. Larry Summers' 'Liquidity trap'

4. The 'public spending on R&D' explanation

5. Conclusion

# I. The Issue

*The optimistic view:*

*from the 'great divergence' to …*
*the 'great convergence'*

# GDP/cap. 1820-1994 Maddison (1995)

| Countries & Regions | GDP/capita 1820 | GDP/capita 1994 | Average growth (%) | Level/Africa 1820 | Level/Africa 1994 |
|---|---|---|---|---|---|
| Western Europe | 1292 | 17387 | 1,52 | 2.87 | 13.54 |
| New countries | 1205 | 20850 | 1,67 | 2.68 | 16.24 |
| Southern Europe | 804 | 8287 | 1,37 | 1.79 | 6.45 |
| Eastern Europe | 772 | 4665 | 1,05 | 1.72 | 3.63 |
| Latin America | 679 | 4820 | 1,15 | 1.51 | 3.75 |
| Asia & Oceania | 550 | 3252 | 1,04 | 1.22 | 2.53 |
| Africa | 450 | 1284 | 0,61 | 1.00 | 1.00 |
| World | 651 | 5145 | 1,209 | 1.45 | 4.01 |

## The Great divergence (Maddison, 2001)
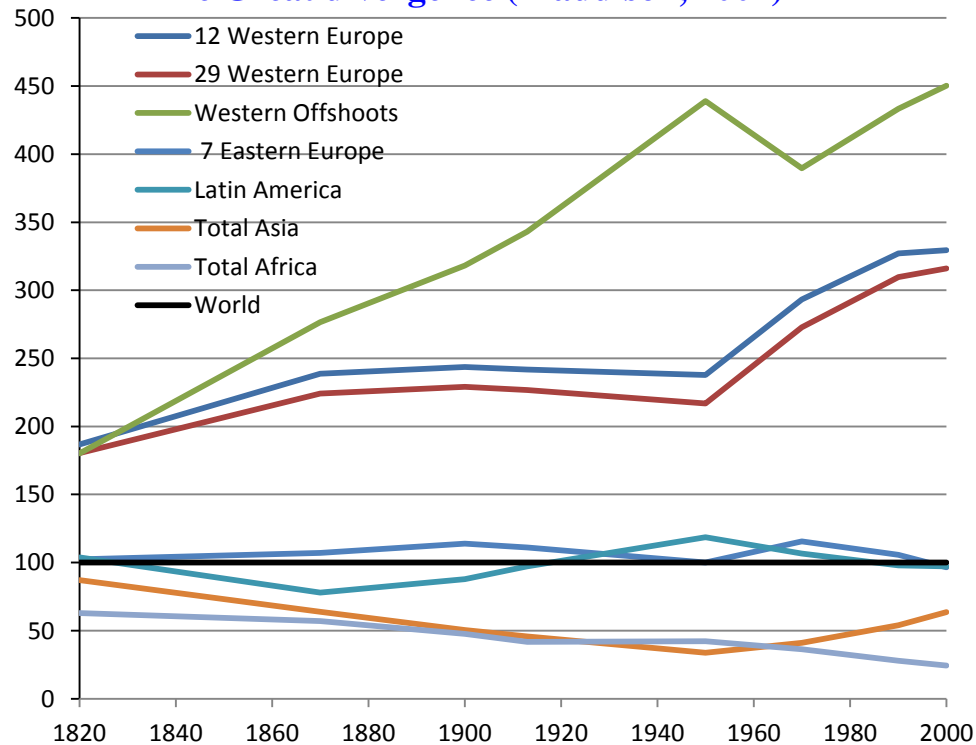
# The Great Convergence

## Convergence since 1980
### 100 = Advanced economies
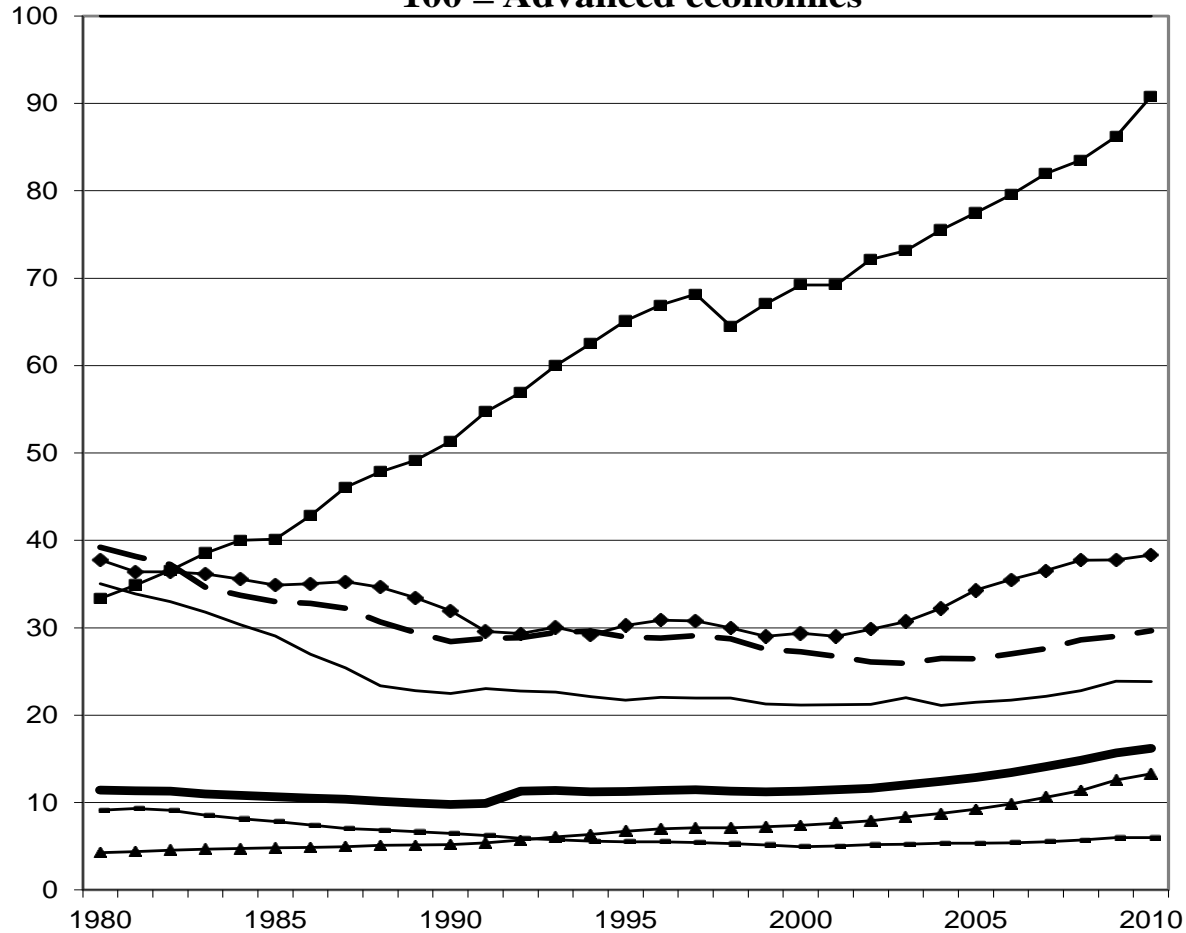


Legend:
- Advanced countries=100
- Asian NICs
- Emerging & developing countries
- Central & Eastern Europe
- Developing Asia
- Latin America and the Caribbean
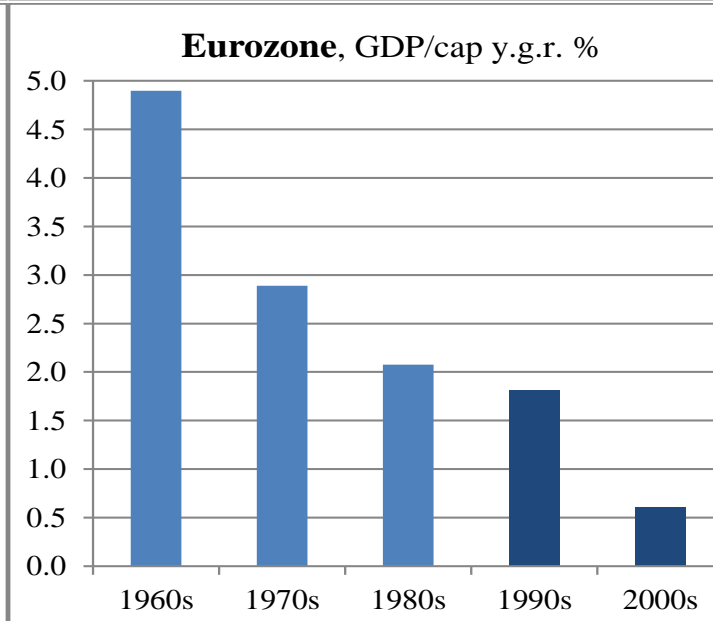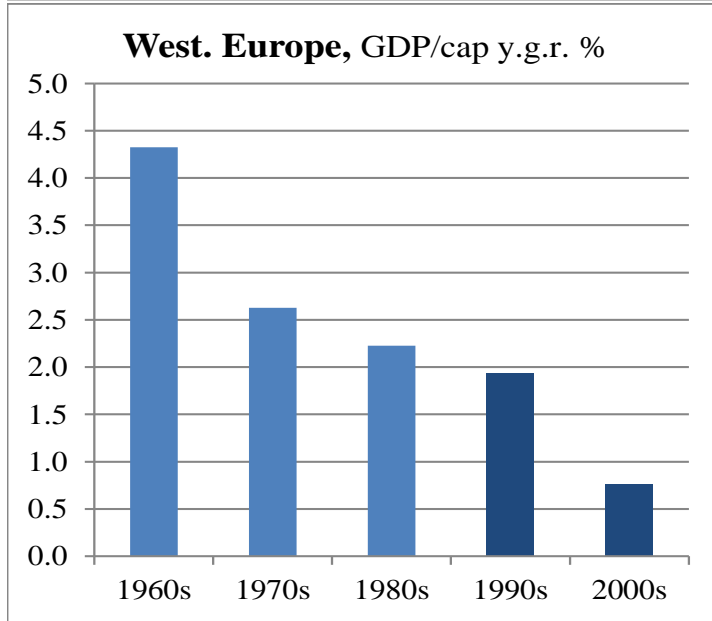- Middle East and North Africa
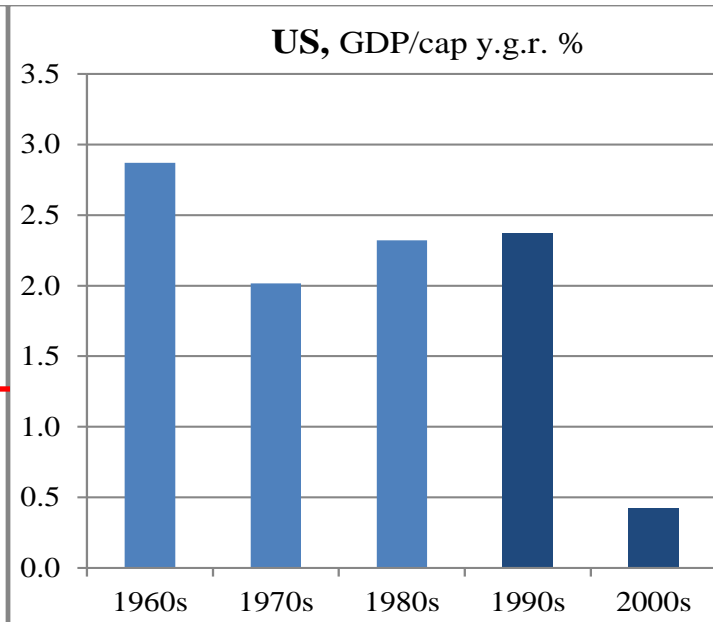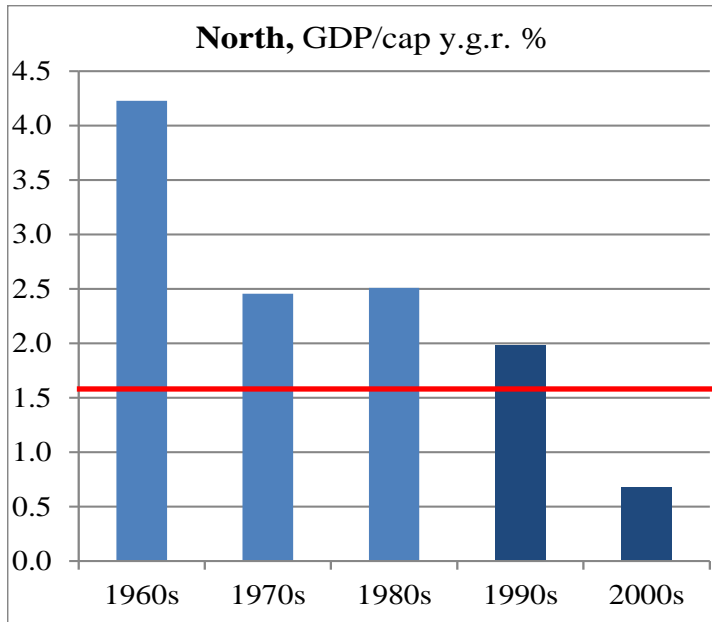- Sub-Saharan Africa

*But...*

*does it reflect higher growth of emerging countries*

*... or lower growth of advanced countries?*

# 1. The North

|  | 1960s | 1970s | 1980s | 1990s | 2000s |
|---|---|---|---|---|---|
| **North** | 4.23 | 2.45 | 2.51 | 1.98 | 0.67 |
| **W Europe** | 4.33 | 2.63 | 2.23 | 1.93 | 0.76 |
| **Eurozone** | 4.90 | 2.89 | 2.07 | 1.81 | 0.61 |
| **US** | 2.87 | 2.02 | 2.32 | 2.37 | 0.42 |
| **Japan** | 9.44 | 3.13 | 3.99 | 0.72 | 0.54 |

*The Issue*

**Japan**, GDP/cap. y.g.r. %
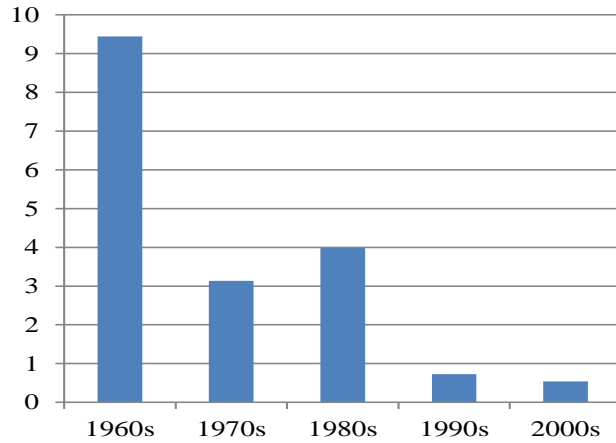


**North: Growth GDP per capita**
Average per year, last 10 years, 1965-2010



**Growth of GDP per capital**
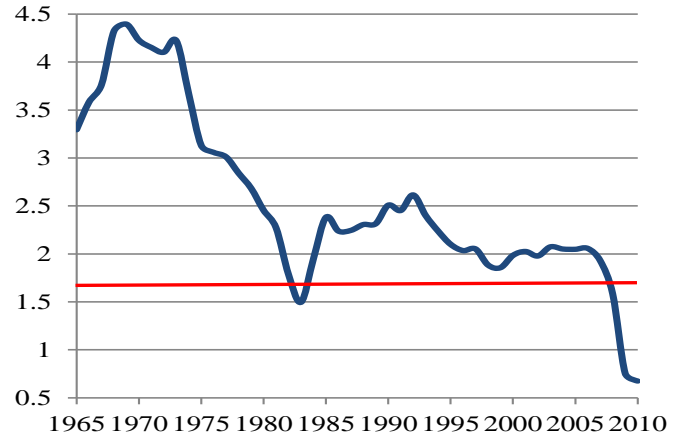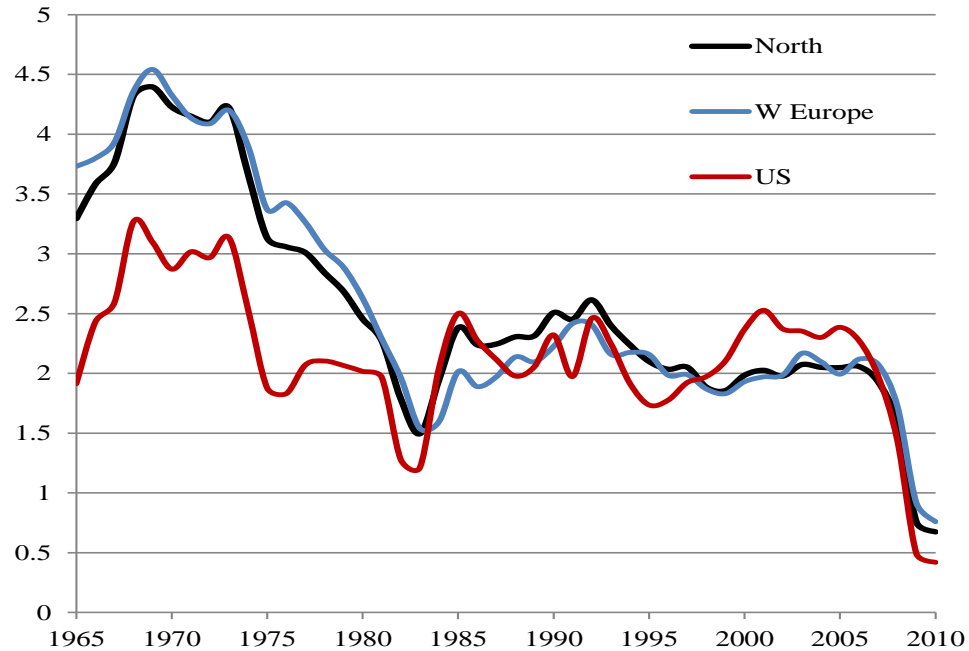Average per year last 10 years

# 2. The South

|  | 1960s | 1970s | 1980s | 1990s | 2000s |
|---|---|---|---|---|---|
| **Asian NICs *** | 4.16 | 5.94 | 4.94 | 3.48 | 3.07 |
| **Latin America** | 3.12 | 3.68 | -1.10 | 1.74 | 1.43 |
| **China** | 0.59 | 2.86 | 4.70 | 6.33 | 9.33 |
| **India** | 2.17 | 1.43 | 3.35 | 3.00 | 6.11 |
| **Sub Saharan Africa** | 1.61 | 1.44 | 1.47 | 1.46 | 1.61 |
| **North Africa+Mid East** | 2.51 | 2.44 | 2.04 | 2.00 | 2.43 |
| **CEEC** |  |  |  | 1.14 | 3.92 |

* Hong Kong, Indonesia, Korea, Malaysia, Philippines, Singapore, Taiwan, Thailand.

**China,** GDP/cap y.g.r. %

**India,** GDP/cap y.g.r. , %

**Asian NICs,** GDP/cap y.g.r. %

**Latin America,** GDP/cap y.g.r. %

**Sub-Saharan Africa**, GDP/cap y.g.r. %

| | 1960s | 1970s | 1980s | 1990s | 2000s |
|---|---|---|---|---|---|

**North Afr + Mid. East**, GDP/cap y.g.r. %

| | 1960s | 1970s | 1980s | 1990s | 2000s |
|---|---|---|---|---|---|
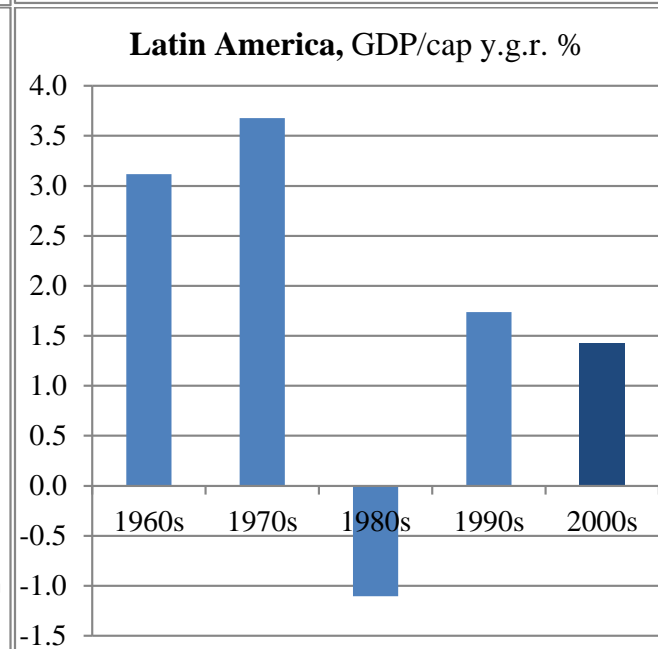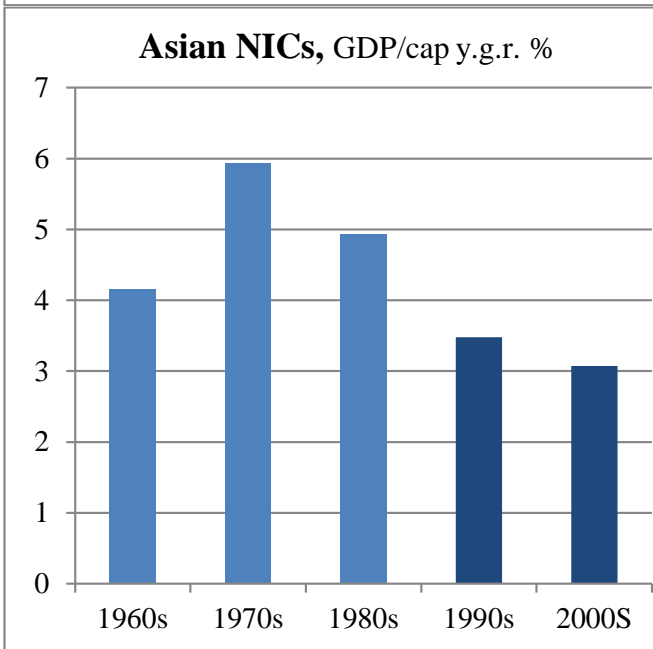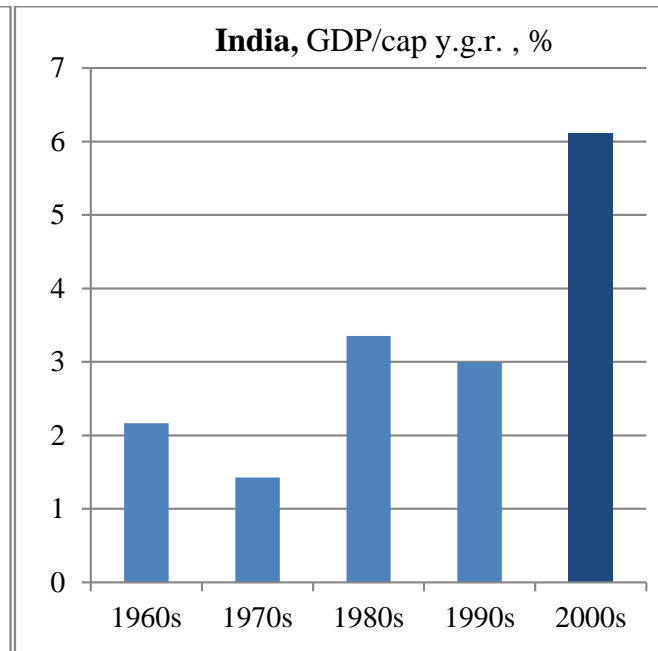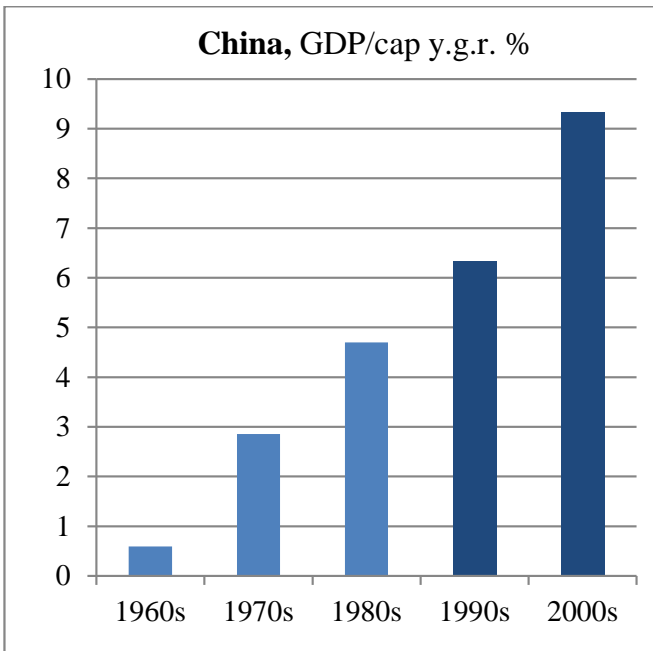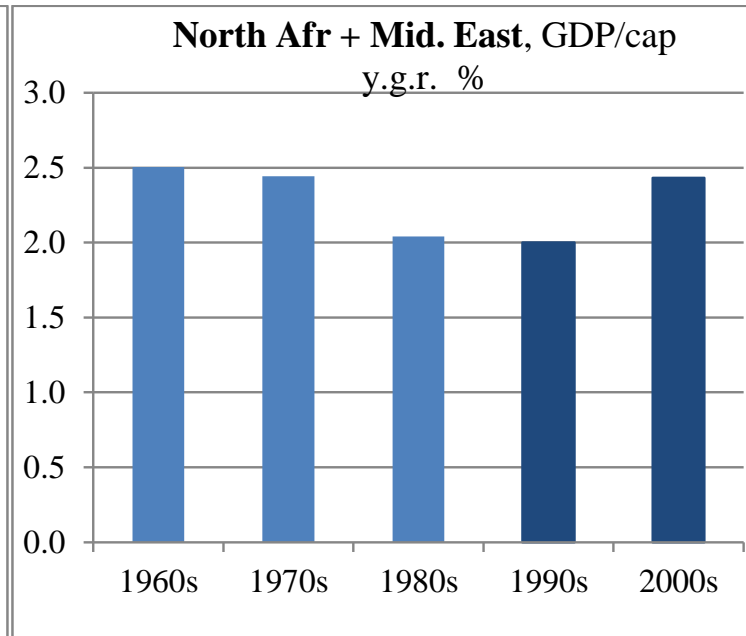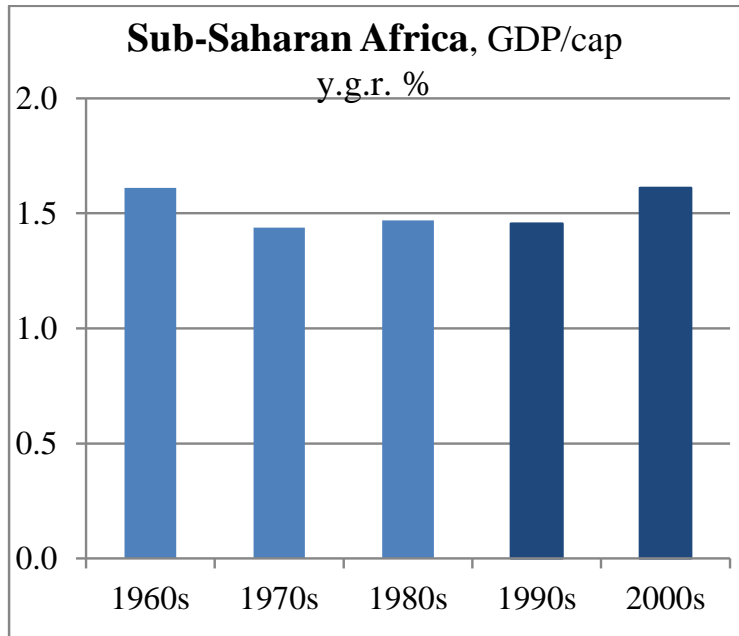
# Labour productivity per hour

Smoothed (through Hodrick-Prescott filtering*) of the average annual growth of labor productivity per hour (*LP*) in the United States, the Euro Area, Japan and the United Kingdom
1891 to 2012 – In%

# Total Factor Productivity

Smoothed (through Hodrick-Prescott filtering*) of the average annual growth of total factor productivity (*TFP*) in the United States, the Euro Area, Japan and the United Kingdom
1891 to 2012 – In%



United States — — Euro Area — Japan - - - United Kingdom
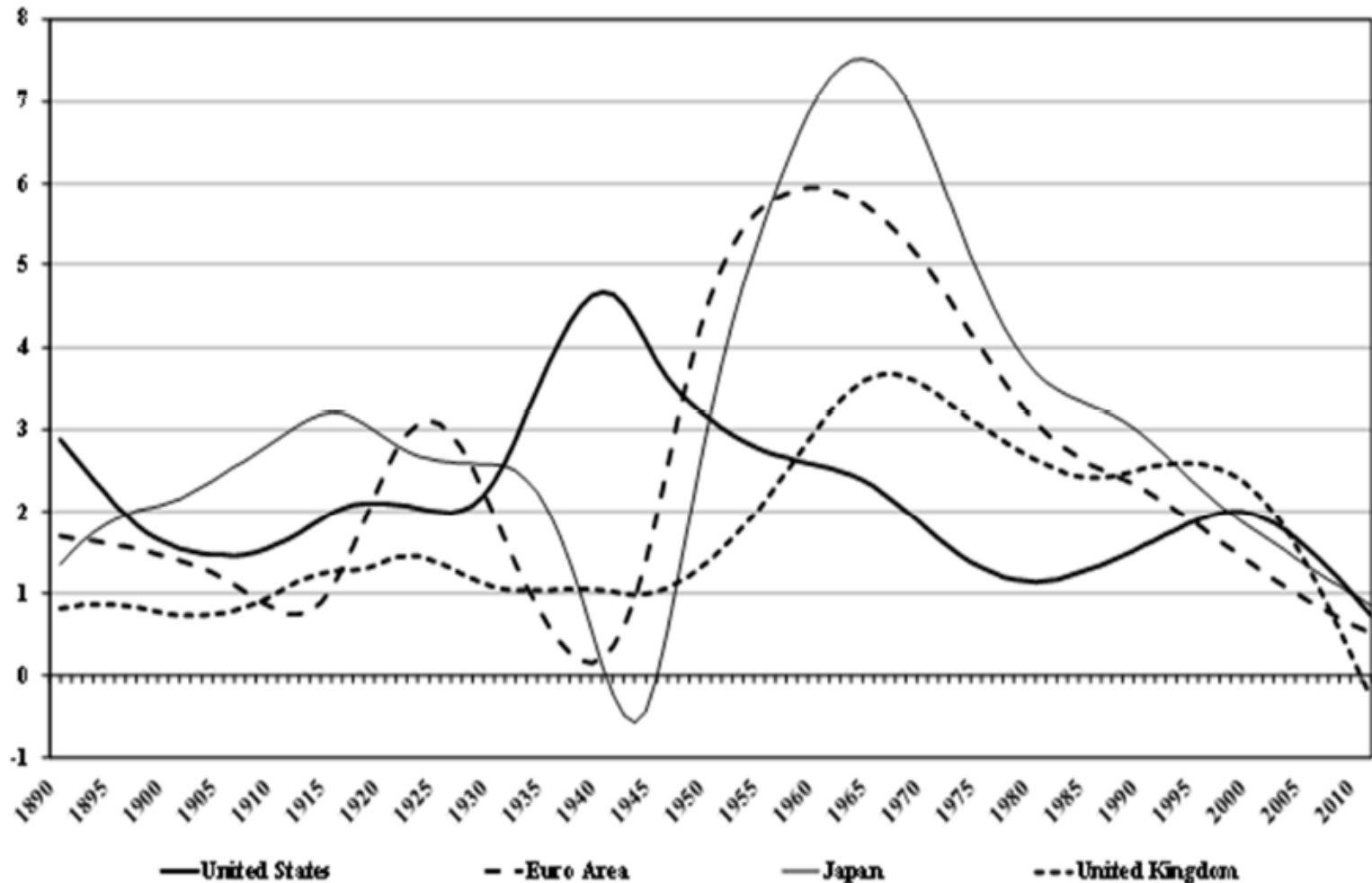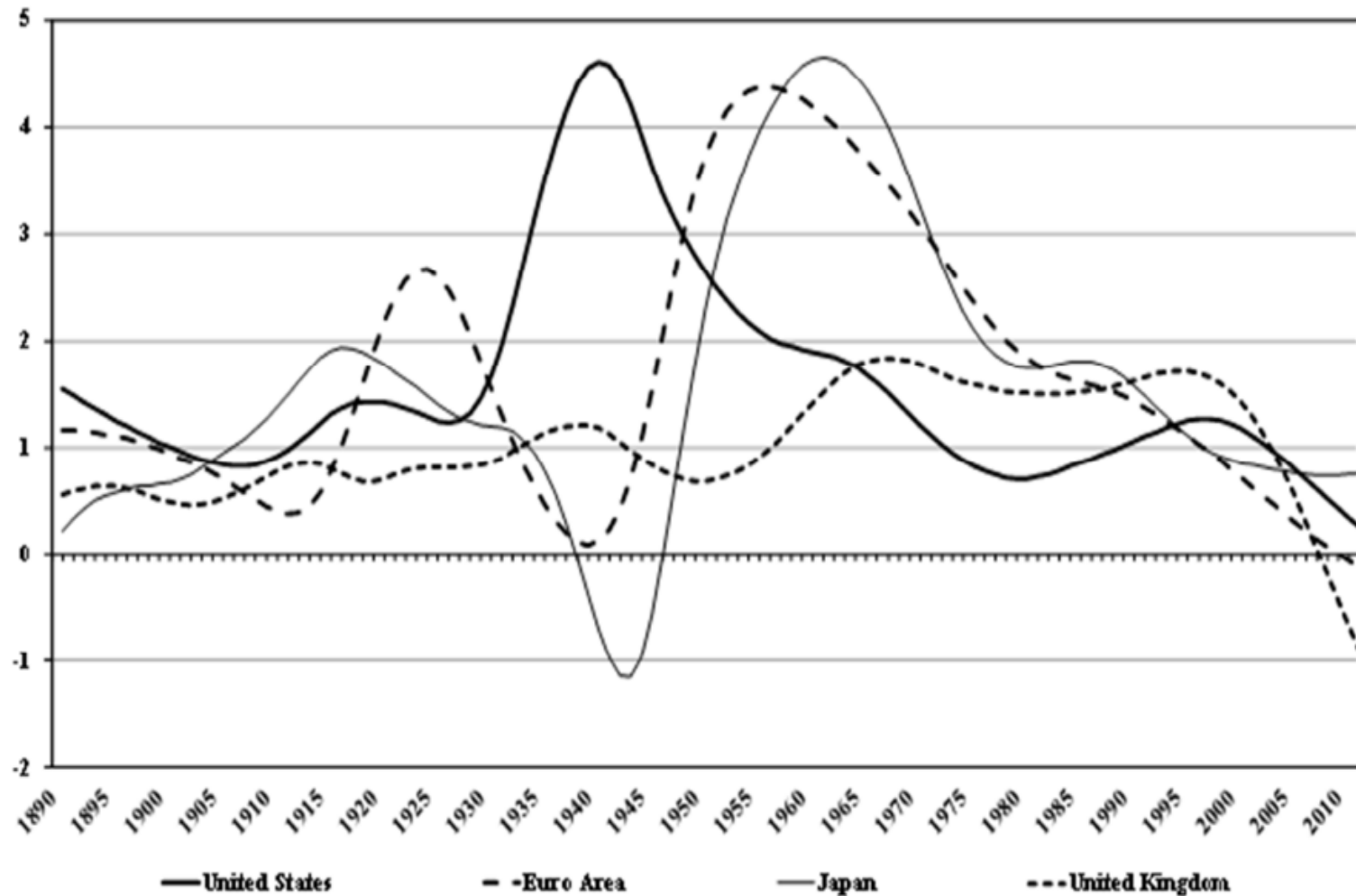
# II. The Usual Suspects

1. **Technology**

2. **Globalization**

3. **Institutions**

4. **Demography**

# 1. Technology

From Solow's paradox (1987) to Gordon's low growth ...

## *1) Transitory decrease in productivity*

Introduction of a General Purpose Technology

→ Employment of skilled workers and resources to adjust the production processes (Eicher, 1996 ; Aghion *et al,* 1999)

→ transitory stage of decrease in productivity Example: computerization of tasks in firms and factories.

2) ***Gordon (2012)***:

The new 'General purpose technology' (ICT) is 'weaker' than the one before.

2nd Industrial revolution: electricity + domestic appliances; internal combustion engine; running water + central heating; chemical industries; telephone, radio, TV.

3rd industrial revolution: Computers + Internet.

But:    ***Why is the new GPT so weak?***

# 2. Globalization

1) Competition from emerging countries

$\rightarrow$ decrease in the wage of unskilled workers

   + reservation wage

$\rightarrow$  unemployment $\rightarrow$ lower production and lower growth.


   but: only transitory. Once the unemployment is stabilised, the economy goes back to its`normal` growth path.


2)  Replacement of jobs in non-tradable services for jobs in manufacturing + low increase in productivity in the former $\rightarrow$ lower growth.

# 3. Institutions

1) The 'Free-market' point of view:

The weight of the state has increased (too many levies and high public debt).

$\rightarrow$ there are to many rectrictions to the free market adjustments (minimum wages, hiring and lay-off restrictions, unemployment subsidies, welfare state etc.).

But: the weight of the state has rather decreased in a lot of countries over the last 30 years (even if the public debt has increased) and the countries with the largest public expenditures (Sandinavia) are not the ones with the lowest growth.

2) The Keynesian point of view:

Lower welfare state and higher inequality $\rightarrow$ reduction in demand $\rightarrow$ reduction in investment $\rightarrow$ reduction in growth.

# • **4. Demography**

Decrease in the growth rate of the population.

In several 'endogenous growth' models (with externalities, Ex. Barro, 1990) as well as in the semi-endogenous model (Jones, 1995), the growth of efficient labour is a condition for growth.

In all advanced economies, and even in the US over the last 25 years, the population growth rate has significantly decreased.

## Figure 8. Population Growth Rate

Annual Growth Rate of US Population
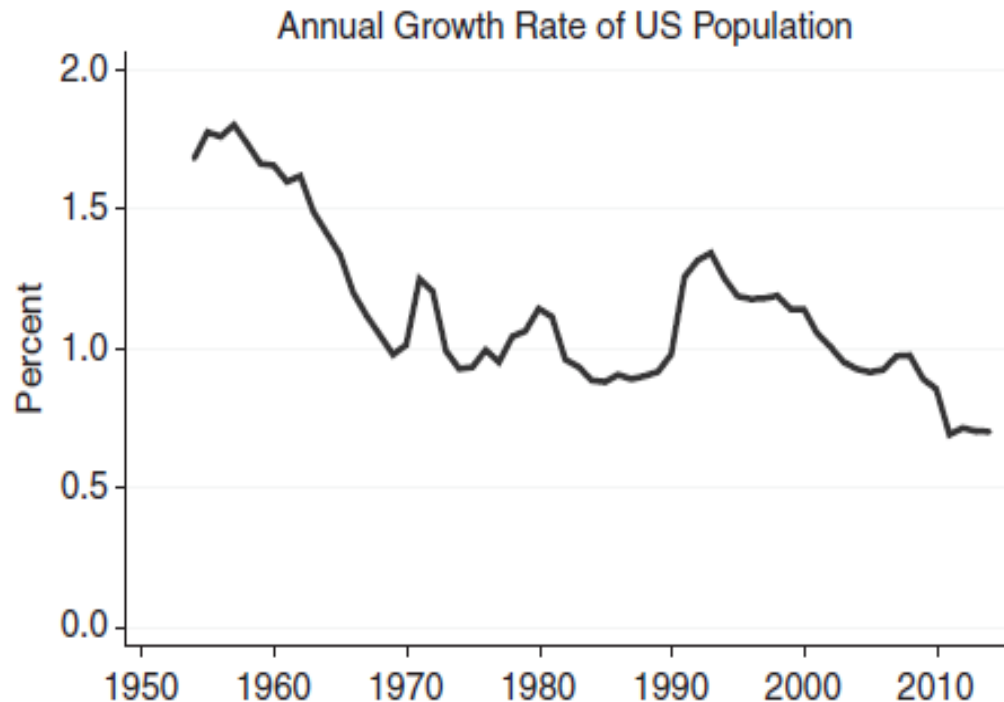
But:

Efficient labour combines the population and the skill level of the population, and the latter has significantly increased in most advanced countries.

# III. Larry Summer's 'Liquidy trap'

- The nominal interest rate cannot be lower than 0.

  It must even be positive to account for the preference for liquidity and the credit risks.

- Several factors have made savings increase and investment (the demand for credit) decrease:

  Higher savings: more inequality (the rich save more); the population get older and live longer;

  Lower investment: less demand (high inequality, high private debt).

→The natural real interest rate is negative and,

because of the very low inflation, the natural nominal interest rate is also negative (or almost nil).

→ The monetary policy becomes ineffective.

→ In addition, low nominal interest rates incited banks to finance more risky projects → the bubble in dwellings that hid the decrease in growth for a while but significantly increased the households' debt.

Because of the negative natural nominal interest rate, the GDP remains under its potential level and growth is decreasing.

→ Diagnosis: the monetary policy is no longer efficient

→ Public expenditure.

From simple simulations of the standard Federal Reserve macro-econometric model, he shows that this would decrease the Public debt / GDP ratio.

# IV. The 'public spending on R&D' explanation

From a research paper in progress on 'decreasing growth'

Shares of Government and Industry in total R&D in the US
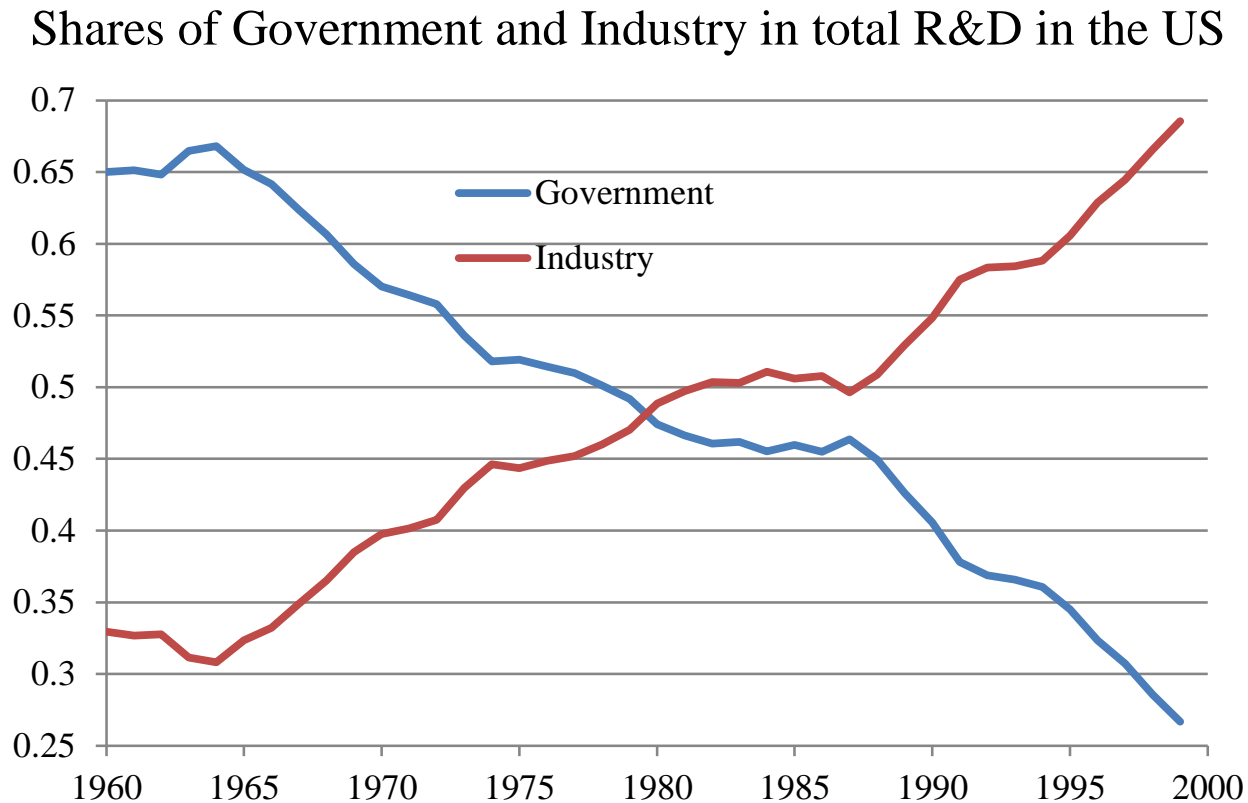
Public spending on R&D
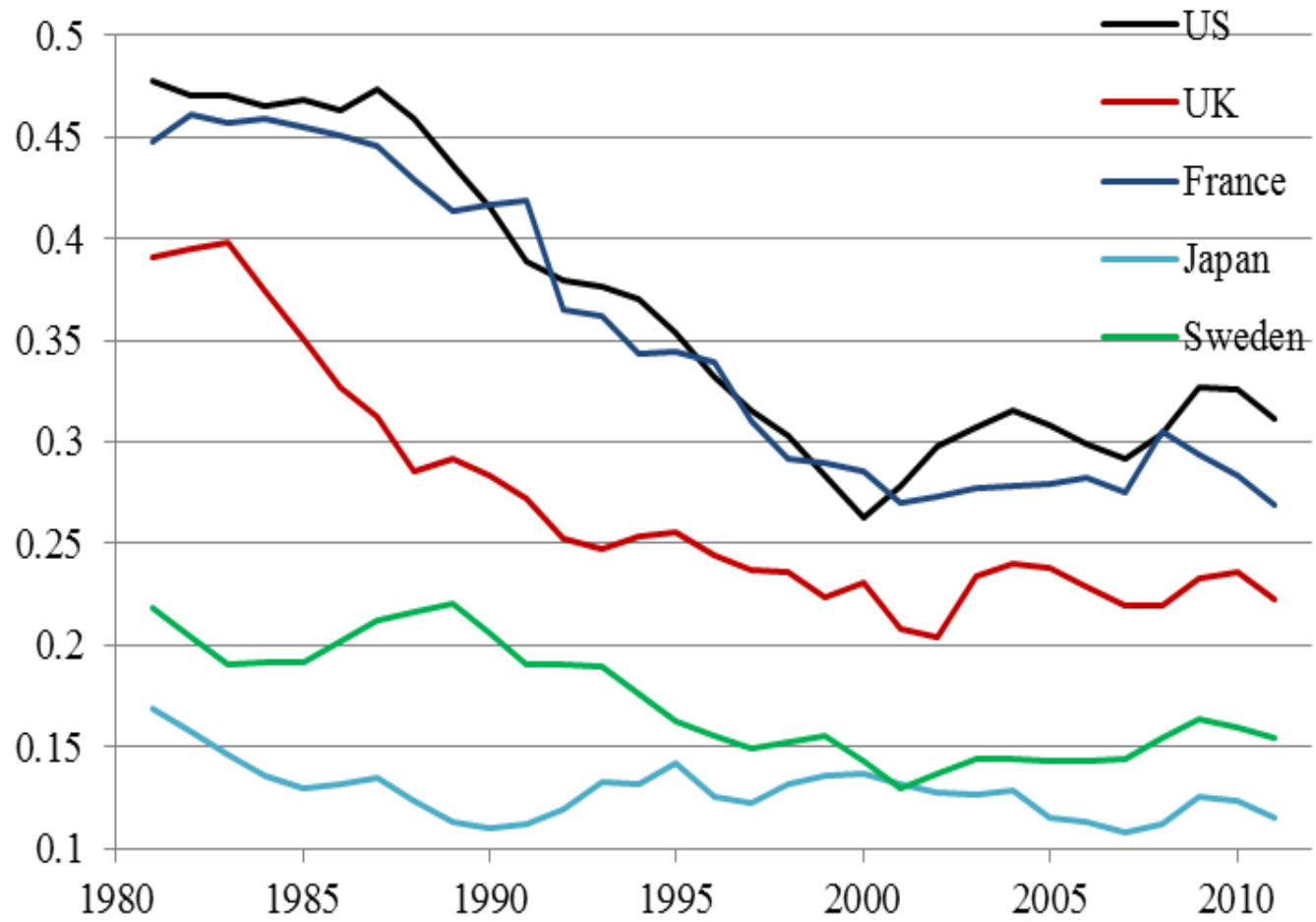
In addition:

1. A growing part of public expenditure on R&D is devoted to tax credits and subsidies to firms.

2. Most of the public funding on R&D is given for projects (invitation to tender) for which the results of the research must be precisely exposed before its financing $\rightarrow$ reduces the novelty of the funded research programmes.

- But:

Public R&D has two pro-long term growth characteristics:

1. It is typically more 'general', which makes that it can be used by a large number of sectors.

2. it is (or was) freely available for private agents.

- In contrast, R&D implemented by firms are:

1. More 'specific' to the firm or the sector in which the firm produces.

2. Poorly available for other firms (patents or secret).

This is normal: firms needs return on investment and they do not wand the outcome of their R&D efforts to be captured by other firms.

$\rightarrow$ *Spillovers are higher when R&D is public and general than when it is financed and/or implemented by firms.*

The basic framework of the paper :

Firms: (i) produce and (ii) invest in R&D to improve their total factor productivity (TFP)

*Increase in TFP = Increase in knowledge generated by the firm.*

Firm's R&D $\rightarrow$ Increase in the firm's TFP

Public Research $\rightarrow$ Increase in the amount of publicly available knowledge.

$$\text{Firm's } \Delta\text{knowledge} = \text{Function} \begin{pmatrix} \text{firm's spending on R \& D} \\ \text{Stock of already accumulated private knowledge} \\ \text{Stock of public knowledge} \end{pmatrix}$$

$$\Delta\text{Public knowledge} = \text{Function} \begin{pmatrix} \text{Government's spending on R \& D} \\ \text{Stock of already accumulated private knowledge} \\ \text{Stock of public knowledge} \end{pmatrix}$$

What is shown:

1) In terms of long term growth, there is an optimal R&D spending and an optimal ratio $\dfrac{Stock\ of\ public\ knowledge}{Stock\ of\ private\ knowledge}$ ,i.e., an optimal distribution of R&D spending between private (firms) and public R&D.

2) More important: *there is a trade-off between short term and longer term growth*.

*If the government wants to increase growth in the short term, then it must lessen the public share of R&D or/and subsidise private R&D ... but this jeopardises growth in the longer term.*

But: *Why should governments have a short or middle term prospects and why now more than before?*

1. *Elections and limited time horizon. But why more now?*

2. *Lower defence effort (spillovers from the defence R&D are far bigger than from other sectors)*

3. *Pro-private beliefs: Governments think that firm-set R&D is more pro-growth.*

4. *Pro-growth R&D as growth decreases*
   *→ vicious circle.*

# Conclusion

The decrease in public R&D is just one possible explanation (not 'THE' explanation).

So: one possible solution could be to increase the share of public & general research in R&D.

But: the impact will only appear in the middle and longer term…

Another key point: ***Gordon + Rifkin***

'New economy' = Internet $\rightarrow$ ***non-rival*** services.
Google, Facebook, Tweeter etc.

Non-rival services $\rightarrow$ low growth.
+ 'predator' sectors
+ tends towards monopoly.