Ομιλία του κ. Philippe Aghion

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Growth, Innovation,and the Smart State

Introduction

- During the post-war period, growth in European countries was mainly driven by imitation
- To this corresponded the old “welfare state”

Introduction

- Example: French State during the Trente Glorieuses
  - Industrial policy based on national champions plus state-owned firms
  - Keynesian macroeconomic policy to deal with the business cycle
  - Welfare state to deal with social issues
- However innovation has become the driving force of growth, which in turn calls for a new role of the State

Introduction

- However this model no longer works for an innovation-based economy
  - Constant firm turnover questions old industrial policy
  - Macroeconomic policy over the cycle must be more supply-sided
  - New role of the state to deal with job turnover

Schumpeterian growth theory

- Long-run growth driven by innovations
- Innovations result from entrepreneurial activities motivated by prospect of innovation rents
- Creative destruction: new innovations displace old technologies

Frontier innovation vs catch up growth

$\longrightarrow$ Schumpeterian paradigm is flexible in modeling contribution of past innovations:

$$A_{t+1} - A_t = \mu_n (\gamma - 1) A_t + \mu_m (\overline{A}_t - A_t)$$

$$\Longrightarrow$$

$$g_t = \frac{A_{t+1} - A_t}{A_t} = \mu_n (\gamma - 1) + \mu_m \left(a_t^{-1} - 1 \right)$$

$\longrightarrow$ *policies aimed at influencing* μ_n *and* μ_m *will affect a country's growth performance differently depending upon its proximity to frontier as measured by a* (Acemoglu-Aghion-Zilibotti (2003))

Appropriate growth policies

- During the post-war period, growth in European countries was driven by imitation
- Over time, and particularly with globalization, innovation has become the driving force of growth
- Innovation requires flexibility and turnover, and different policies and institutions

Enhancing productivity growth in advanced countries

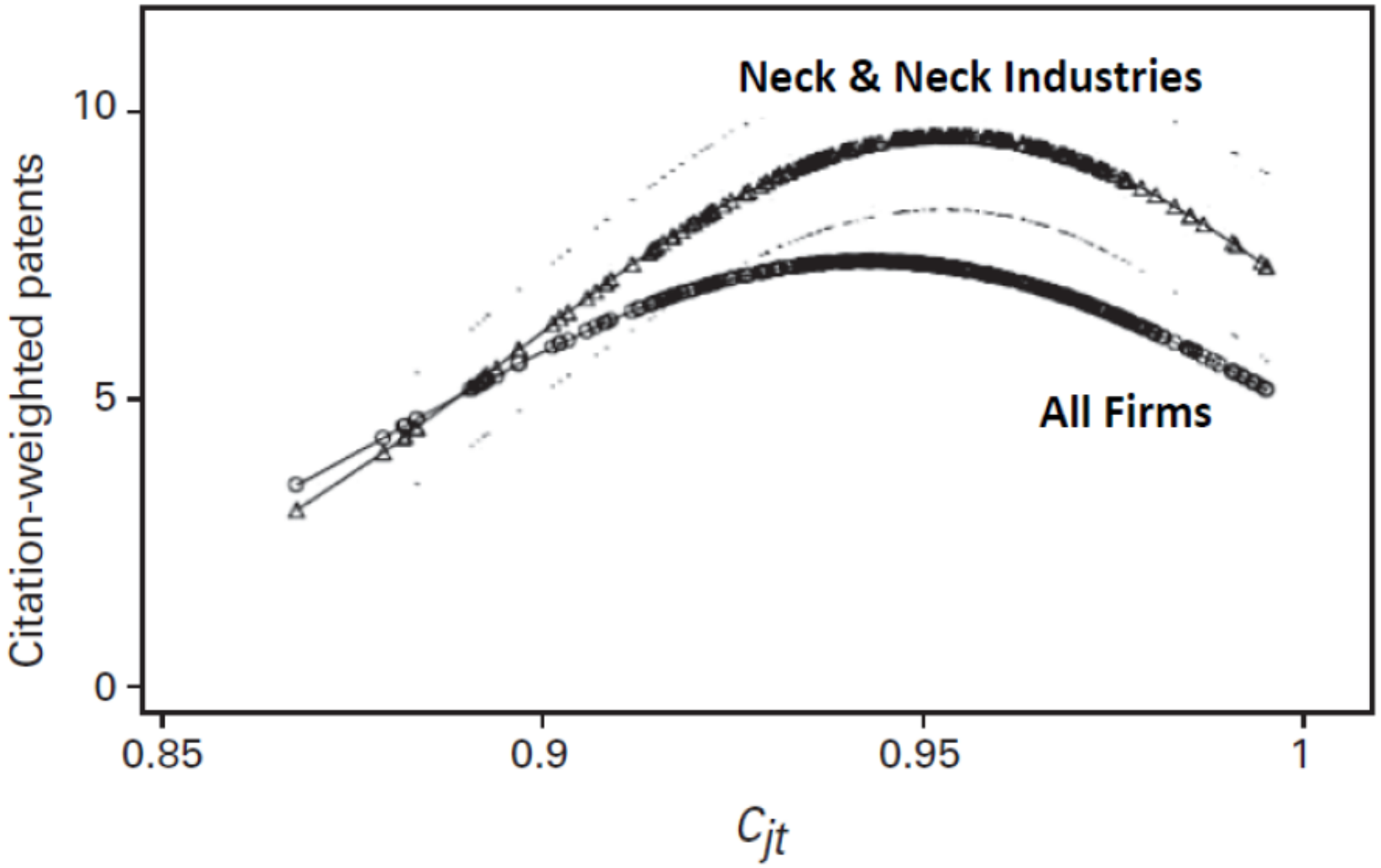
Enhancing productivity growth in advanced countries

- Investment in higher education
- Liberalization of product market
- Liberalization of labor market
- Equity financing
- Countercyclical macroeconomic policy

First pillar: Competition

- Competition/entry is more growth-enhancing for countries or sectors that are closer to technological frontier
- Competition/entry is more growth enhancing in countries or states with less regulated labor markets

Competition vs Innovation



Neck-and-neck split with year and industry effects

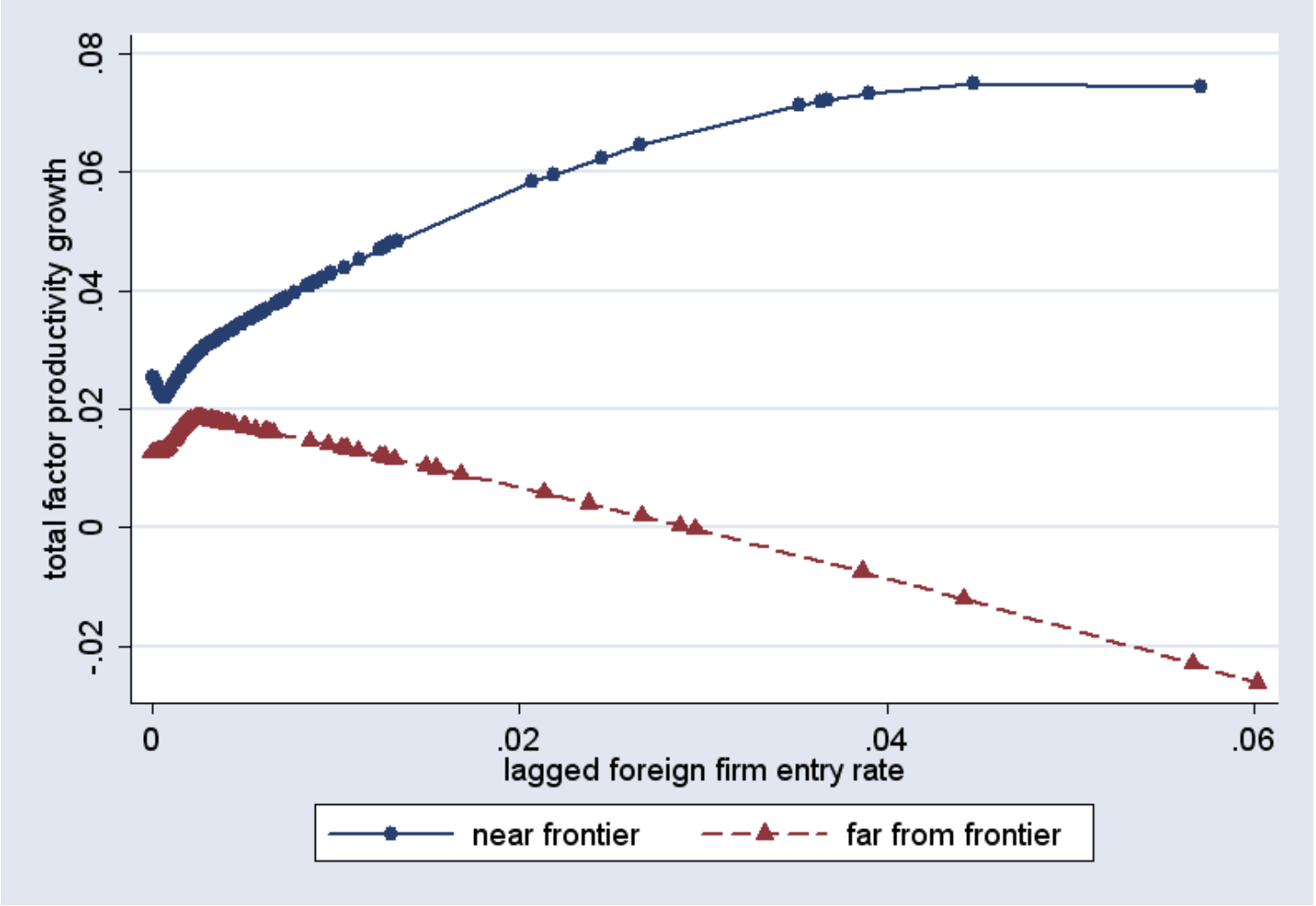

total factor productivity growth
-.02
0
.02
.04
.06
.08
0
.02
.04
.06
lagged foreign firm entry rate
near frontier
far from frontier

Fig 11.2a: HIGH BARRIERS

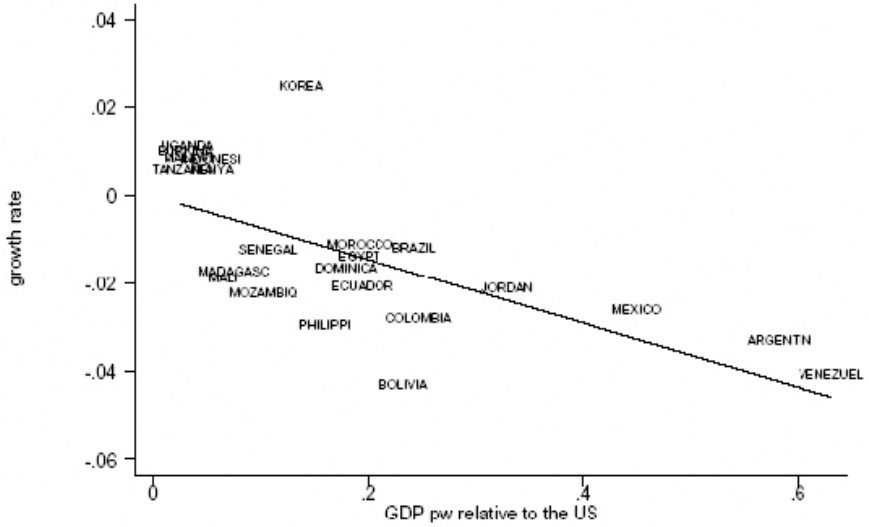


Fig 11.2b: LOW BARRIERS

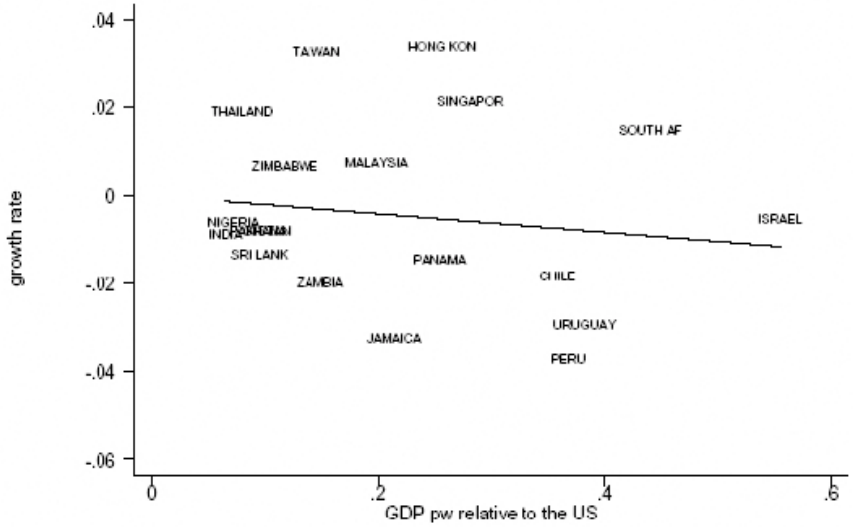


Fig 11.2c: HIGH BARRIERS (FE)

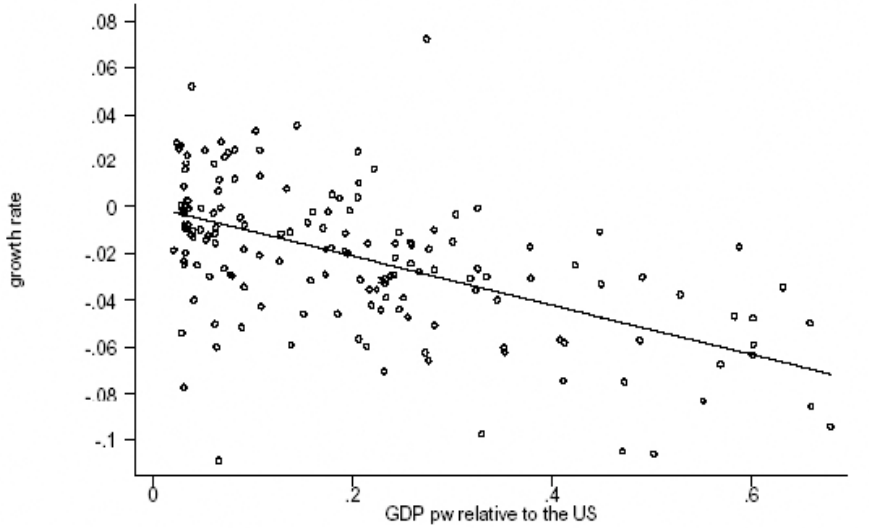
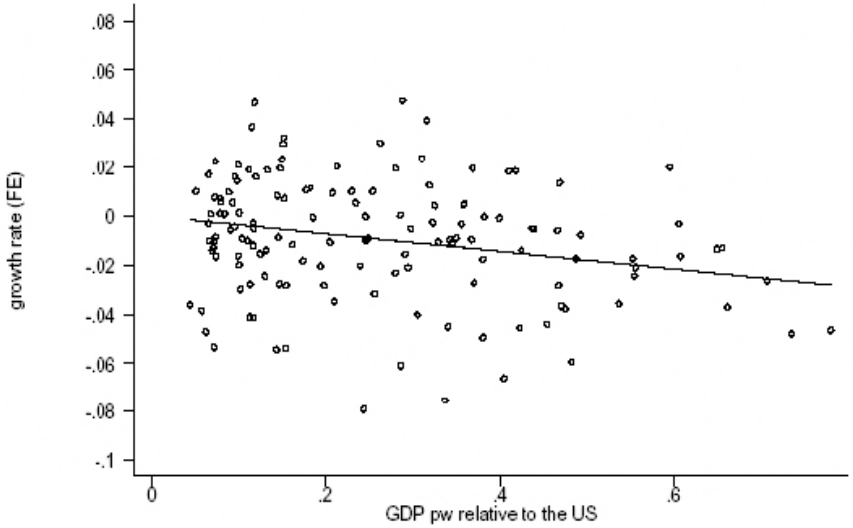


Fig 11.2d: LOW BARRIERS (FE)

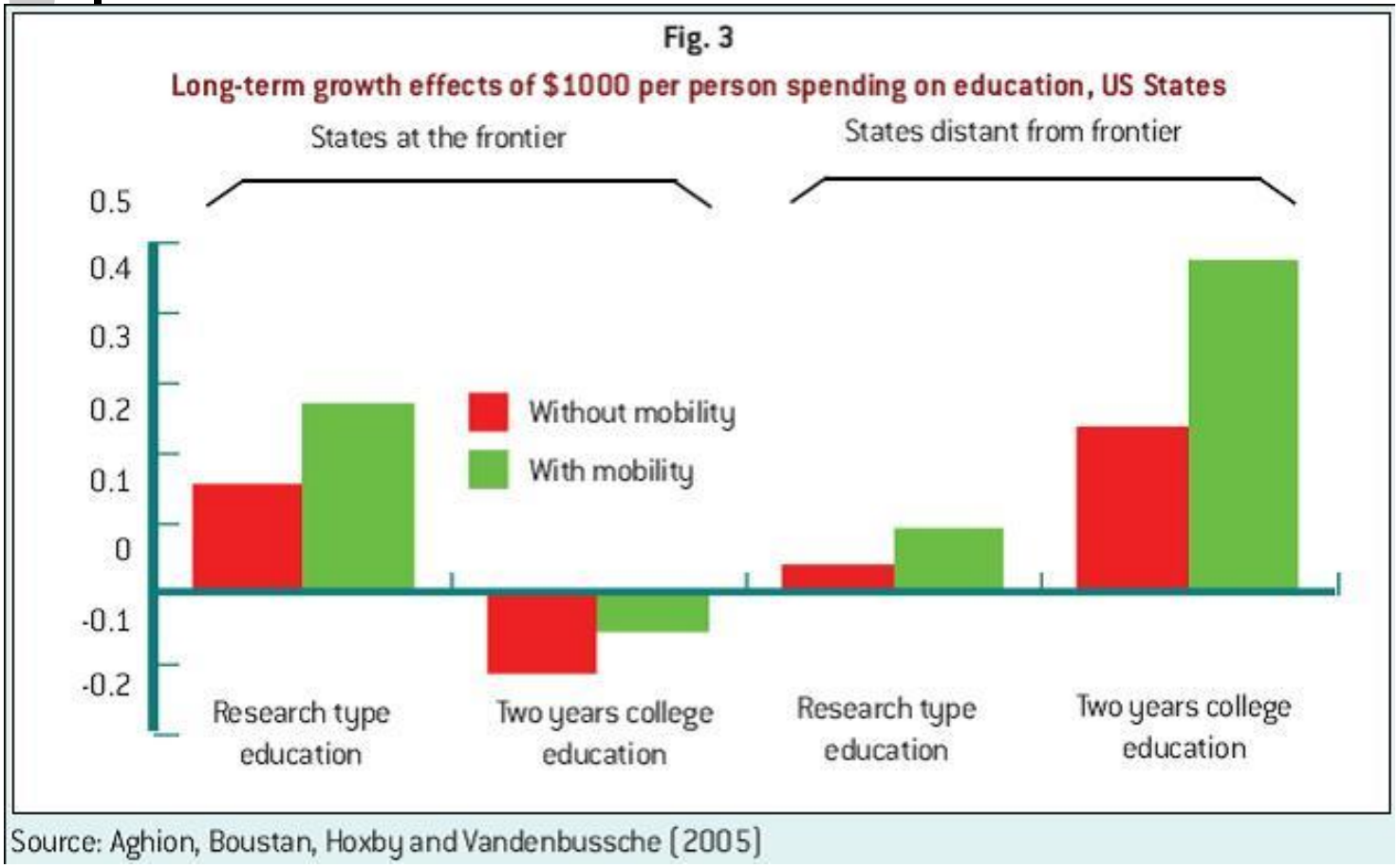


Three fallacies about competition policy

- Competition policy would counteract effects of patent policy: in fact the two policies are complementary
- Competition policy goes against any form of industrial policy: in fact the two are complementary
- Competition policy works independently of institutions: in fact corruption limits competition

Second pillar: education and universities

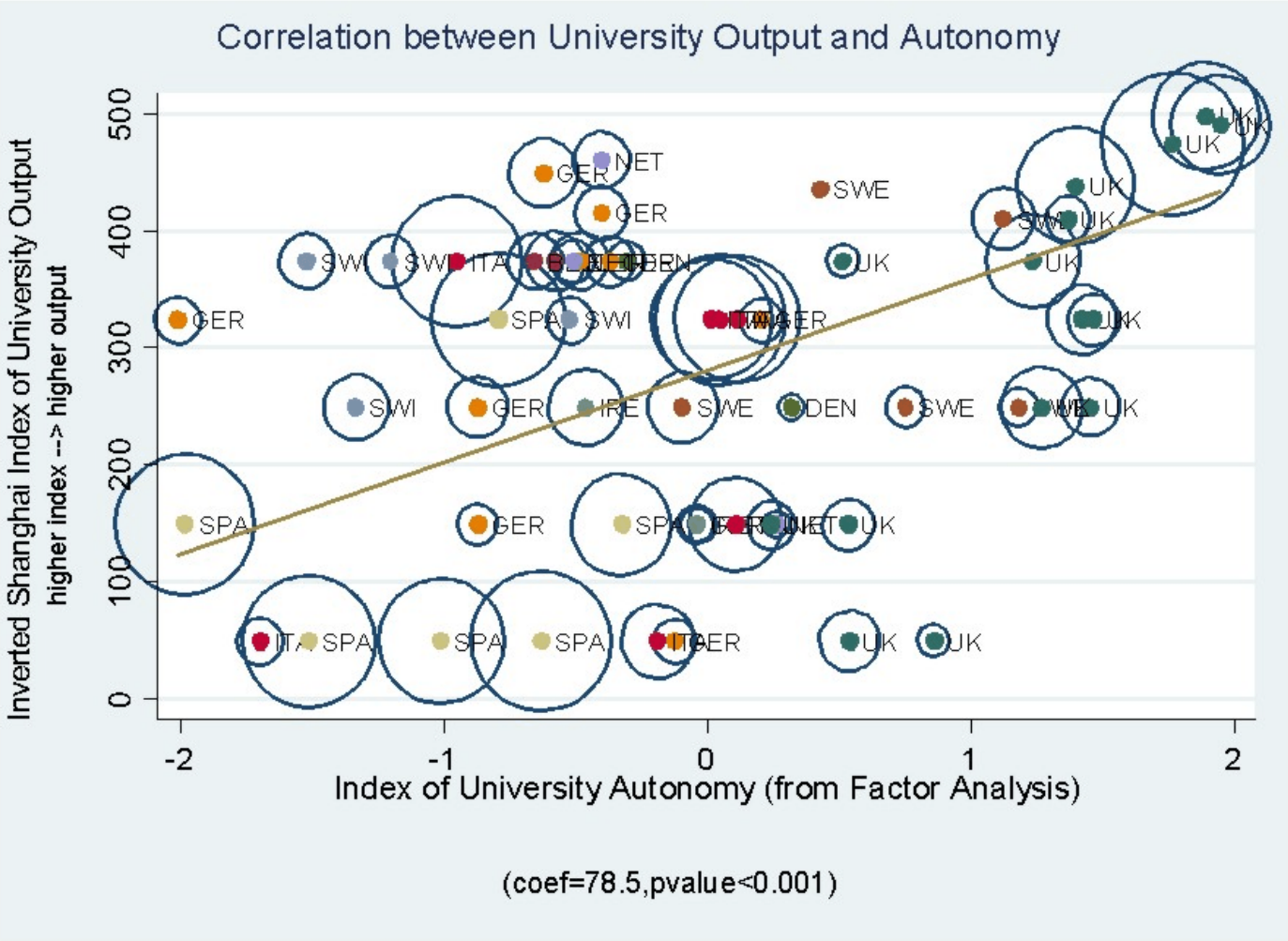
- Need good primary/secondary education...importance of good PISA performance
- Haning well-ranked universities is more growth-enhancing closer to technological frontier....importance of good Shanghai rankings



Source: Aghion, Boustan, Hoxby and Vandenbussche (2005)

Autonomy of universities

Autonomie



Source : The Governance and Performance of ResearchUniversities: Evidence from Europe and the U.S. – P. Aghion et alii – NBER avril 2009

Third pillar: Labor market flexibility: “flexsecurity”

- Labor market flexibility is more growth enhancing the closer a country is to the technological frontier
- Need to combine labor market flexibility with reasonable unemployment benefits conditional upon training for new jobs: flexsecurity!

EPL

Variable	eq1	eq2	eq3	eq4	eq5
Leader MFP growth	0.02949	0.02996	0.02830	0.02813	
Gap to Leader	-0.00858***	-0.00836***			
EPL	-0.00000				
EPL, for highest tercile		0.00002	-0.00009**	-0.00011**	-0.00015***
EPL, for middle tercile		0.00004*	0.00002	0.00001	0.00001
EPL, for lowest tercile		0.00004	-0.00005	0.00002	0.00003
MFP Gap, for highest tercile			-0.01261***	-0.00816	-0.00547
Gap, for middle tercile			-0.00276	-0.00174	-0.00210
Gap, for lowest tercile			-0.00901***	-0.01095***	-0.01173***
EPL*Gap, for highest tercile				-0.00017	-0.00029*
EPL*Gap, for middle tercile				-0.00004	-0.00003
EPL*Gap, for lowest tercile				0.00012*	0.00014**
Leader growth, for highest tercile					0.13600***
Leader growth, for middle tercile					0.00817
Leader growth, for lowest tercile					-0.02597

legend: * p<.1; ** p<.05; *** p<.01

Fourth pillar: Finance

- As country moves closer to frontier, needs to rely more on equity finance and stock markets
- Reason is that innovative investments are more risky and therefore investors require both, to get a share of upside returns and to get control rights (Aghion-Bolton, 1992; Kaplan-Stromberg 2002).

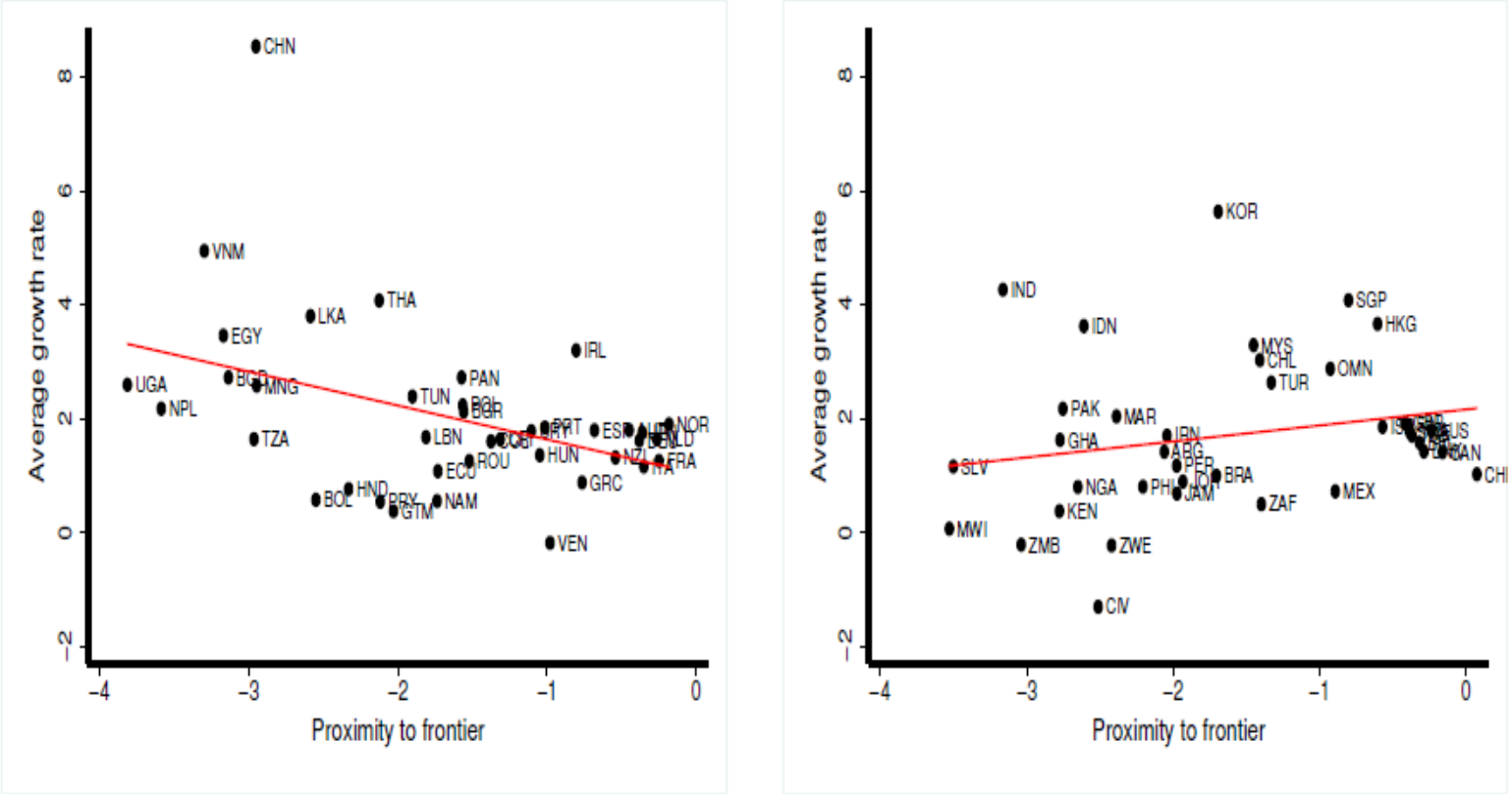


Figure 1: Average growth rate and Proximity to the frontier for the Bank-Based (left) and Market-Based (right) countries (per capita GDP growth rate)

Panel : Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Ireland, Iceland, Italy, Japan, Korea, the Netherlands, Norway, Portugal, Spain, Sweden, the United Kingdom and the United States.

Times period : 1995-2007

Dependant variable : Hourly labour productivity growth (instrumental variables method)

	(1)	(2)	(3)	(4)	(5)
Changes in capacity utilization rate	0.00200***	0.00190***	0.00161***	0.000908	0.000634
	(0.000622)	(0.000499)	(0.000475)	(0.000648)	(0.000702)
Growth in working time	-0.583***	-0.787***	-0.797***	-0.784***	-0.698***
	(0.170)	(0.138)	(0.138)	(0.157)	(0.172)
Changes in the employment rate	-0.529***	-0.641***	-0.653***	-0.878***	-0.809***
	(0.177)	(0.165)	(0.160)	(0.203)	(0.217)
Share of ICT production in total VA	0.930***	0.344*	0.372**	0.0614	0.170
	(0.261)	(0.195)	(0.179)	(0.164)	(0.178)
Share of pop. (>15) w/ some higher educ.		0.0808**			
		(0.0348)			
EPL			-0.00726**		
			(0.00307)		
PMR(t-2)				-0.0103**	
				(0.00486)	
EMPL* PMR(t-2)					-0.00368***
					(0.00130)
Constant	-0.0376**	-0.0199	0.0107	0.0296**	0.0197*
	(0.0160)	(0.0153)	(0.0118)	(0.0137)	(0.0113)
Observations	163	149	142	95	95
P-value of the Durbin-Wu-Hausman endogeneity test	0.00066	0.02912	0.03388	0.02966	0.01112
P-value of Basmann test of overidentifying restrictions	0.6354	0.2581	0.4140	0.2075	0.7716

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Rethinking the Role of the State

Why still need state intervention?

- Knowledge externalities (e.g in education and health)
- Credit constraints

Basic idea

- Quality, not just quantity, of investment matters
- Hence the complementarity between investment and governance
- Three illustrations
  - Schools and Universities
  - Industrial policy
  - Macroeconomic policy

PISA and growth

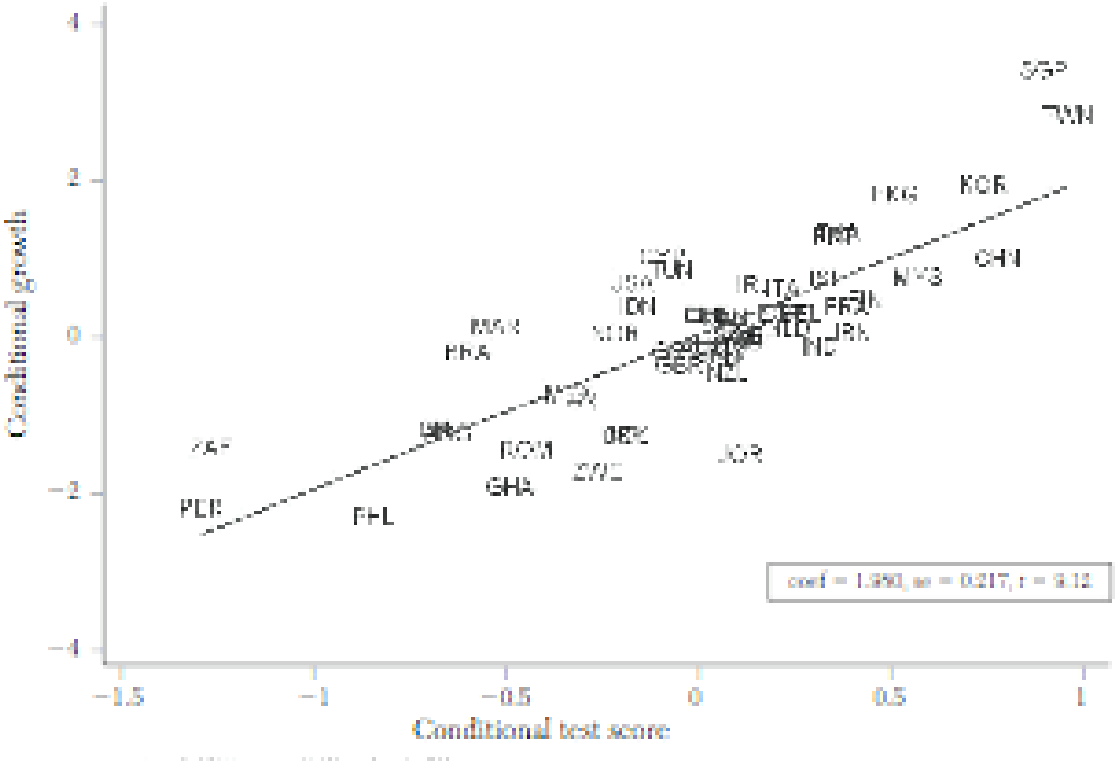


Figure 7. Added-Variable Plot of Growth and Test Scores

Notes: Added-variable plot of a regression of the average annual rate of growth (in percent) of real GDP per capita in 1960–2000 on the initial level of real GDP per capita in 1960, average test scores on international student achievement tests, and average years of schooling in 1960. Author calculations; see table 2, column 2.

Years of schooling and growth

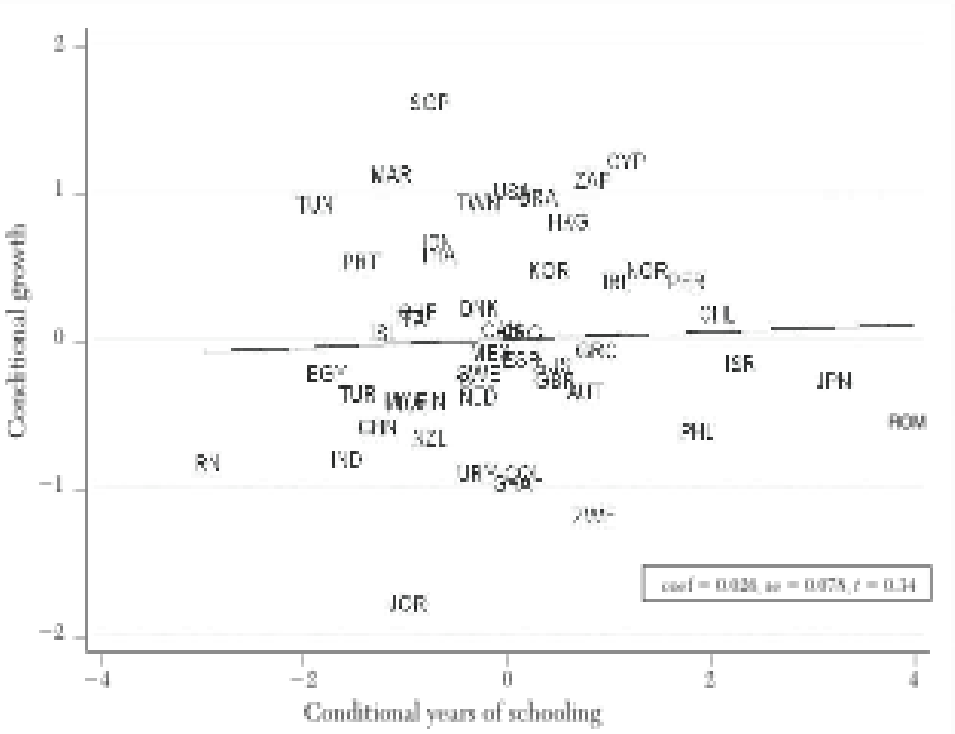
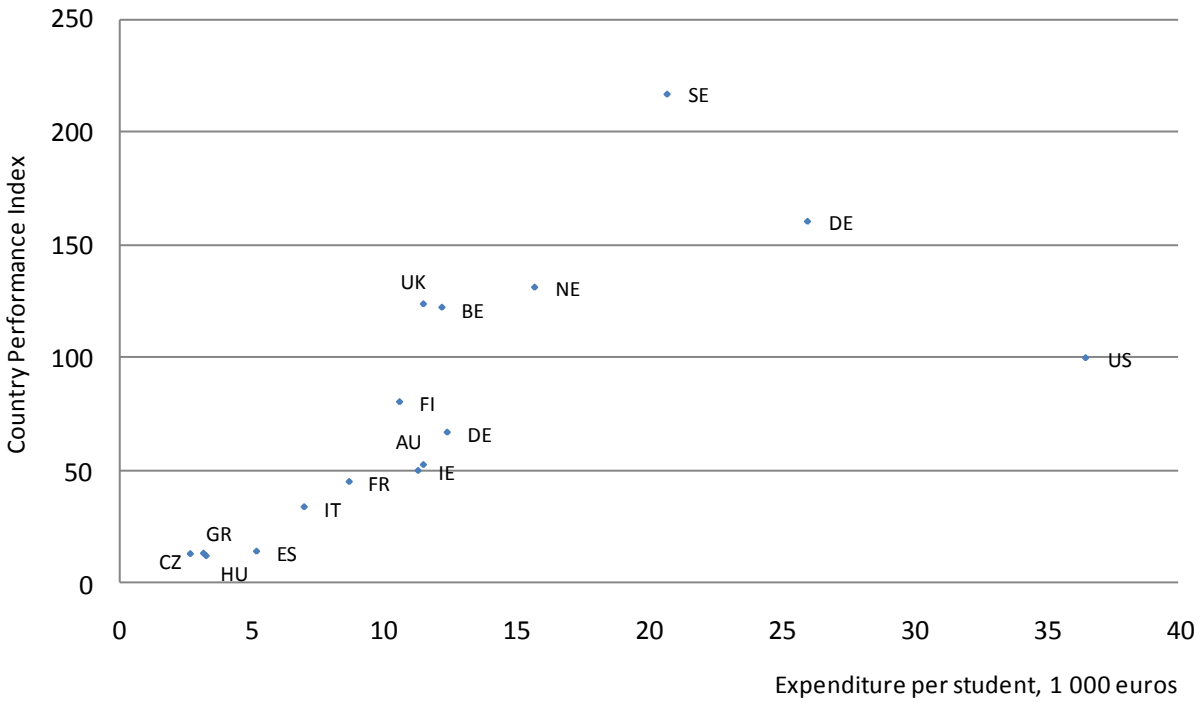


Figure 8. Added-Variable Plot of Growth and Years of Schooling with Test Score Controls

Notes: Added-variable plot of a regression of the average annual rate of growth (in percent) of real GDP per capita in 1960–2000 on the initial level of real GDP per capita in 1960, average test scores on international student achievement tests, and average years of schooling in 1960. Author calculations; see table 2, column 2.

Figure 2: Relationship between expenditure per student and country performance

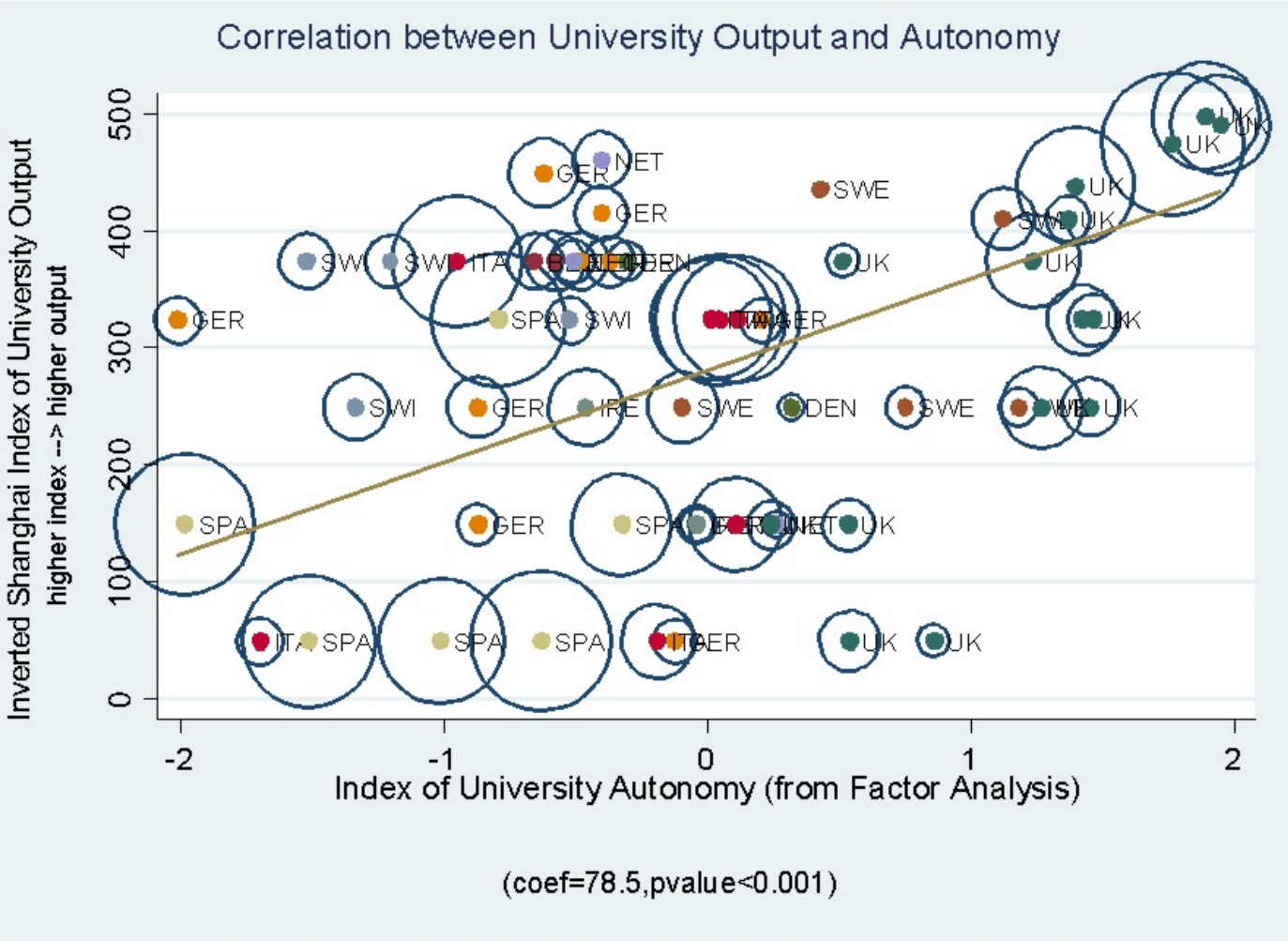


- Autant les meilleures universités de recherche américaines apparaissent comme des modèles , autant le système américain présente-t-il une performance globale très médiocre au regard des moyens mis en oeuvre

Source : The governance and performance of research universities: evidence form Europe and the U.S. – P. Aghion et alii – NBER avril 2009

Autonomy of universities

Autonomie



Source : The Governance and Performance of ResearchUniversities: Evidence from Europe and the U.S. – P. Aghion et alii – NBER avril 2009

Industrial Policy

- Over time, and particularly since the 1980s, economists have come to dislike sectoral ("industrial") policy on two grounds:
  - (i) it focuses on big incumbents ('national champions);
  - (ii) governments are not great in 'picking winners'.
- Current dominant view is that sectoral policy should be avoided especially when it undermines competition

Sectoral Policy

- **Two arguments for not ruling out vertical targeting**
  - Redirect technical change (for example towards clean innovation)
  - Industrial policy works better if properly governed

Sectoral Policy

- **Need good governance of vertical targeting**
  - Introduce objective selection criteria
  - Reconcile sectoral policy and competition
  - Introduce reliable exit mechanisms

Macroeconomic policy

- Keynesian view (non-discriminatory increase in public spending)
- Conservative view (tax and spending cuts)

Laissez-Faire Policy May Be Harmful

- Macroeconomic volatility is detrimental to innovation, particularly in firms that are more credit constrained
- The underlying intuition is that growth-enhancing investments (in skills, R&D, structural capital,..) need to maintained over the long run.

Primitive Keynesianism is obsolete

- Debate on the multiplier
- Globalization and Innovation

A Third Way

- There is a third way between keynesian and conservative approaches
  - namely, countercyclical fiscal and monetary policy to partly circumvent credit market imperfections and thereby help firms maintain their growth-enhancing investments over the cycle.

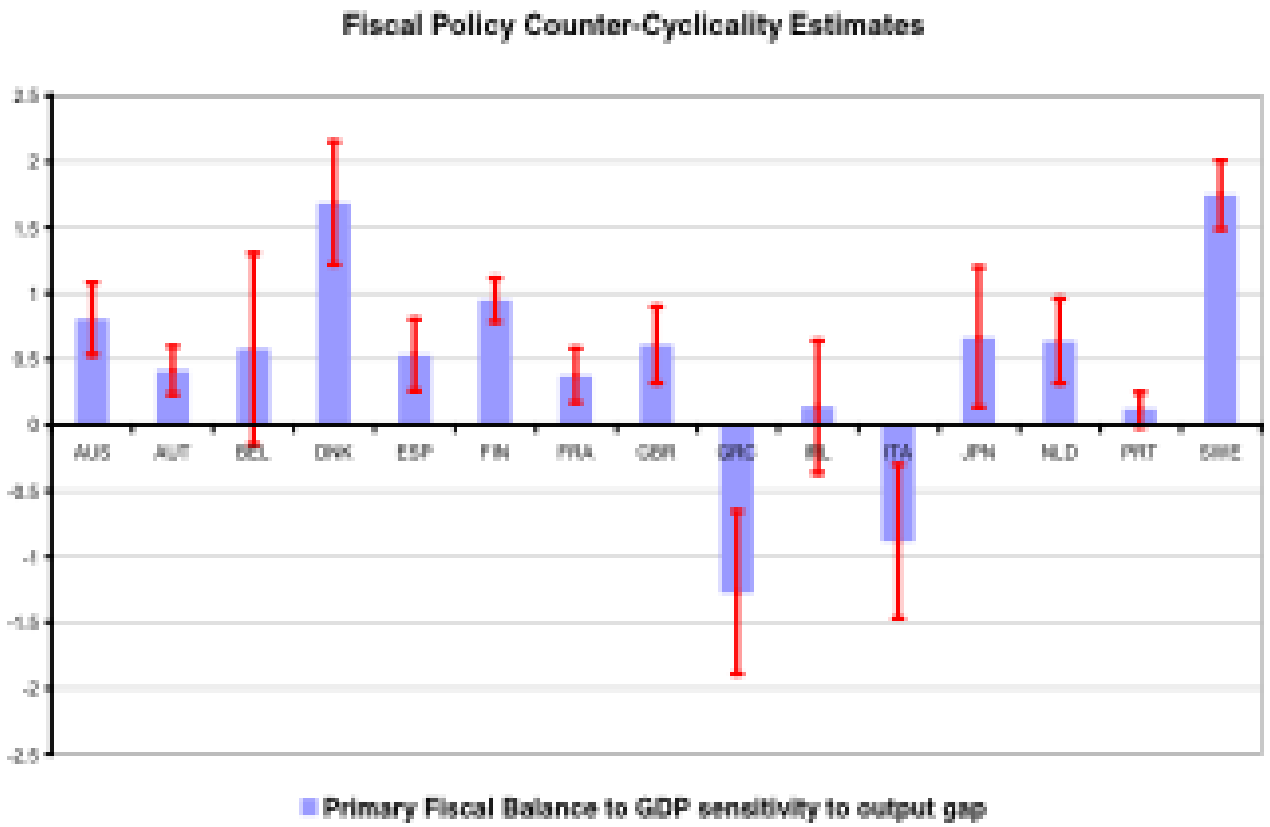
A Third Way

- Idea: more countercyclical fiscal policies, i.e policies that increase public deficits in recessions and reduce them in booms, are more growth-enhancing in countries or sectors that are more credit constrained.

Fiscal Policy Over the Cycle

- 17 OECD countries, 45 manufacturing industries
- Period 1980-2005
- **Finding: Countercyclical fiscal policy enhances growth more in sectors that are more dependent on external finance or in sectors with lower asset tangibility**

Fiscal countercyclicality across OECD countries



- We run the following estimation

$$Growth = F\left(fiscal\ countercyclicality \times credit\ constraints\right)$$

- We measure growth at the industry level over 1980-2005.
- Fiscal countercyclicality is the extent to which the government has run surpluses in good times and deficits in bad times
- Credit constraints are measured by level of asset tangibility for corresponding sector in the US.

Fiscal cyclicality and growth

Dependent variable: Labor Productivity Growth				
	(i)	(ii)	(iii)	(iv)
Log of Initial Relative Labor Productivity	-2.512***	-2.510***	-2.505***	-2.502***
	(0.503)	*(0.503)*	*(0.533)*	*(0.533)*
Interaction (Asset Tangibility and Total Fiscal Balance to GDP Counter-Cyclicality)	-13.03***			
	(4.011)			
Interaction (Asset Tangibility and Total Fiscal Balance to pot. GDP Counter-Cyclicality)		-12.81***		
		(3.971)		
Interaction (Asset Tangibility and Primary Fiscal Balance to GDP Counter-Cyclicality)			-8.118***	
			(2.656)	
Interaction (Asset Tangibility and Primary Fiscal Balance to pot. GDP Counter-Cyclicality)				-8.220***
				(2.642)
Observations	523	523	523	523
R-squared	0.538	0.538	0.535	0.535

Conclusion (1)

- Transition from imitation-based to innovation-based growth
  - Promote competition and turnover
  - Promote labor market flexibility and training
  - Invest more and better in higher education
  - More “supply-sided” macroeconomic policies over the cycle

Conclusion (2)

- Challenge is for State to help reconcile growth, and reduction in public debt
  - Reform the state
  - Target investments
  - Improve governance

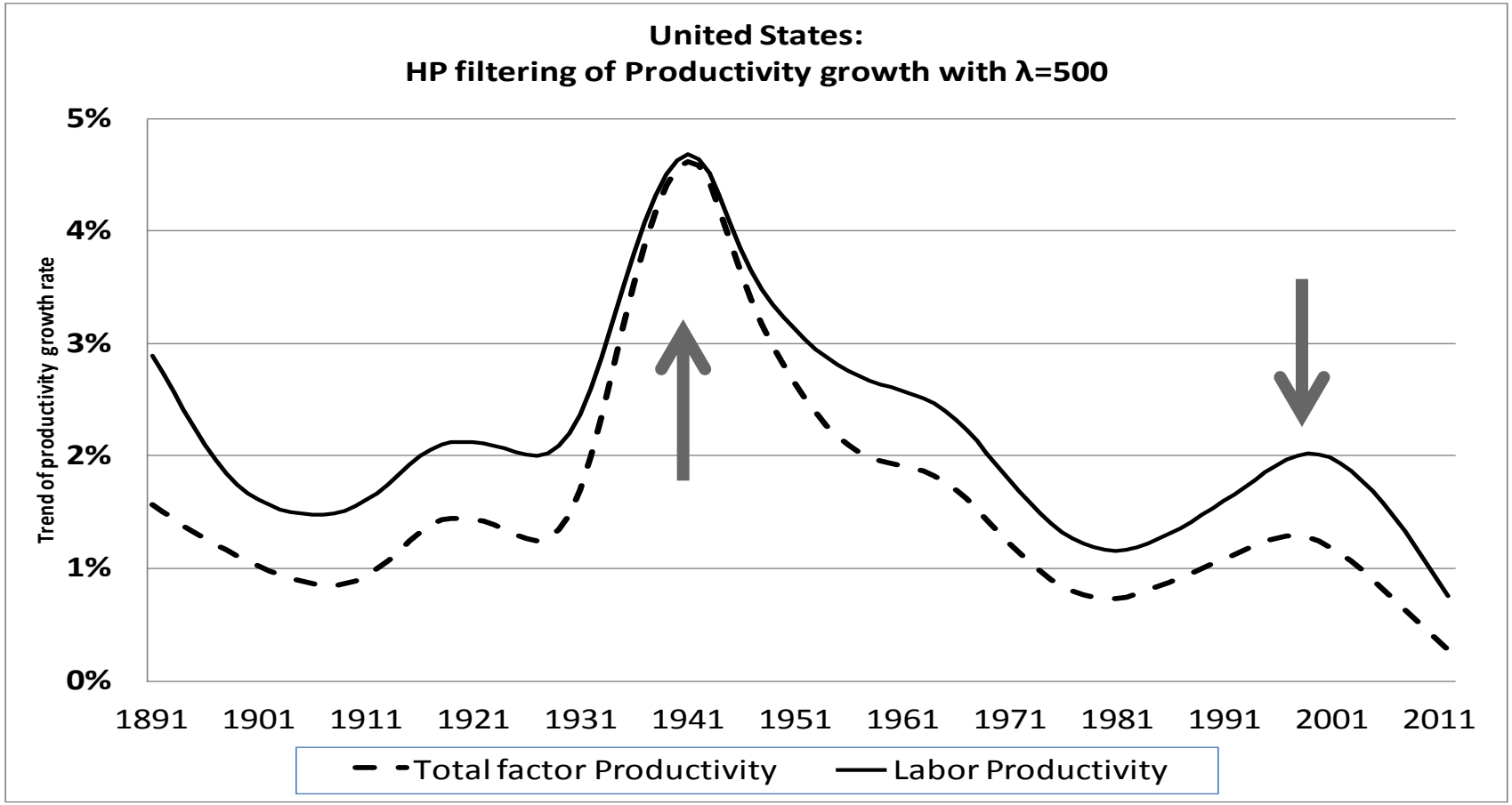
Schumpeterian waves

Schumpeterian waves

- Drawn from Gilbert Cette et al (2014)
- Productivity over the period 1890-2012
  - Using annual and quarterly data
  - From the end of the Long Depression to the Great Crisis
- 13 advanced countries
  - G7: US, UK, Japan, France, Germany, Italy, Canada
  - + Spain, The Netherlands, Finland, Australia, Sweden, Norway
  - + reconstituted Euro area
- Labor Productivity and TFP

1. Two productivity growth waves in US

Two productivity growth waves



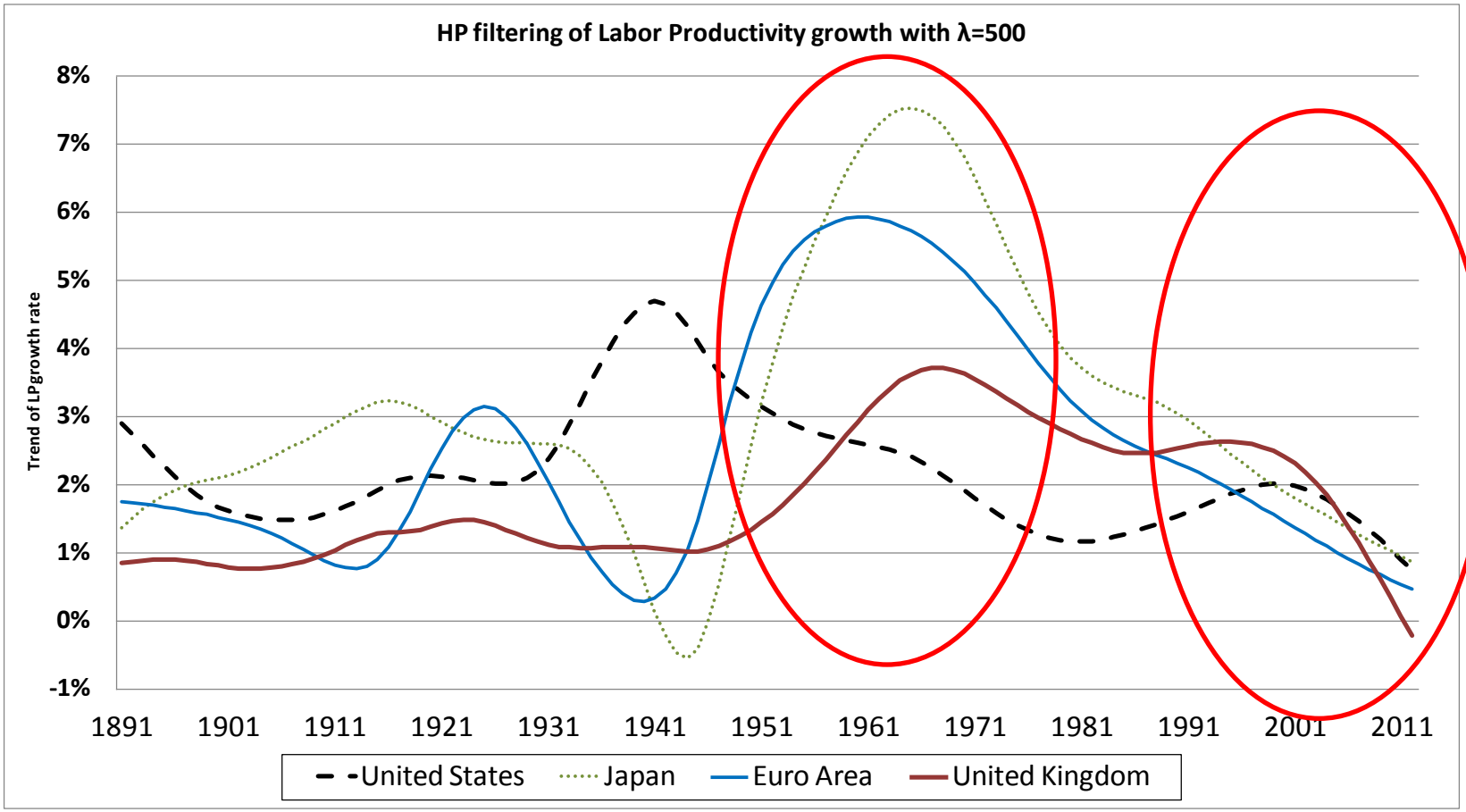
Two productivity growth waves

- 1st productivity growth wave:
  - 2nd industrial revolution: electricity, internal combustion engine, chemistry, communication (Gordon, 2000)
  - But also organizational change and financial development (Ferguson and Washer, 2004)
  - Long lag in diffusion: cf. electricity (David, 1990)

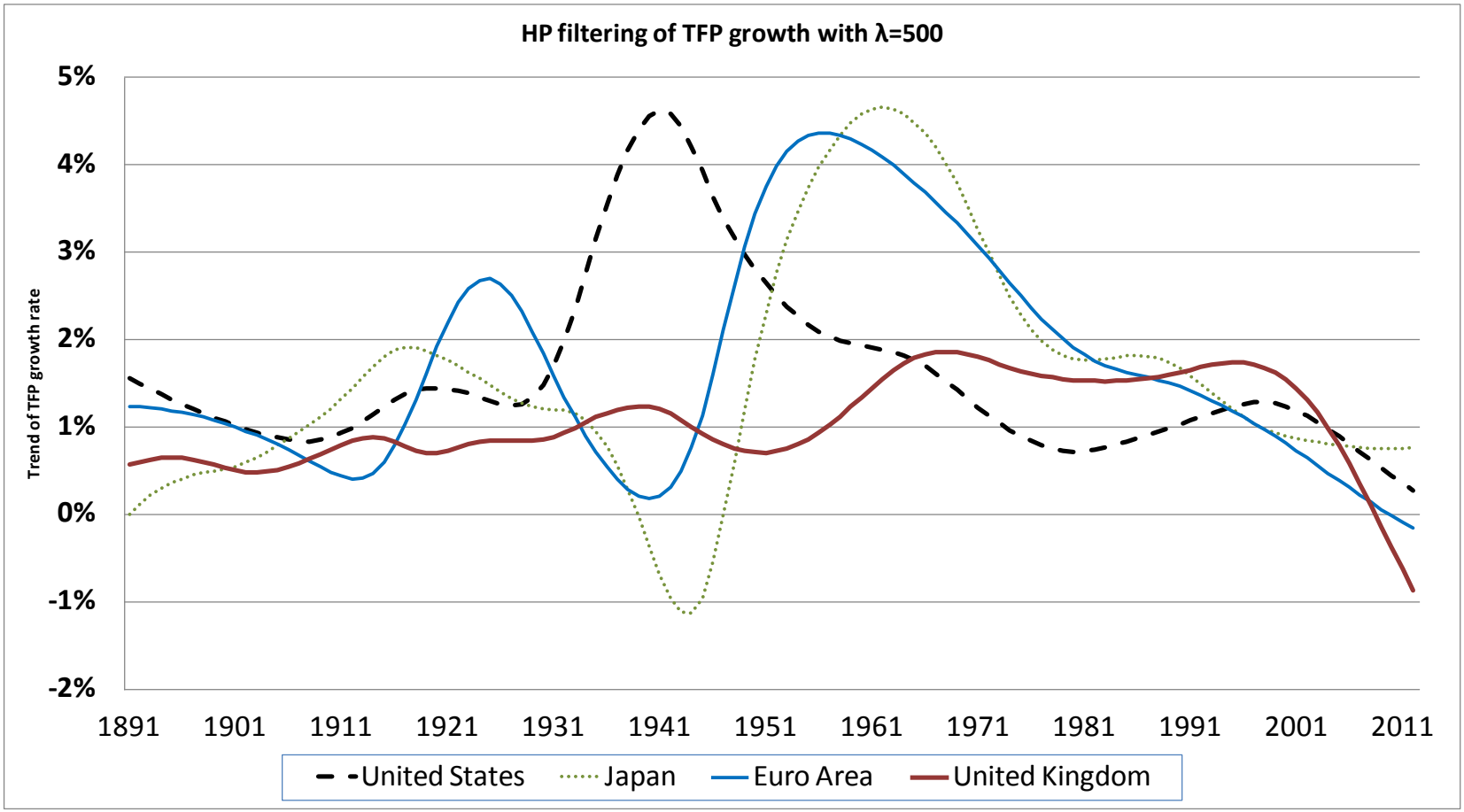
- 2nd productivity growth wave: ICT
  - Smaller wave
  - Ended?

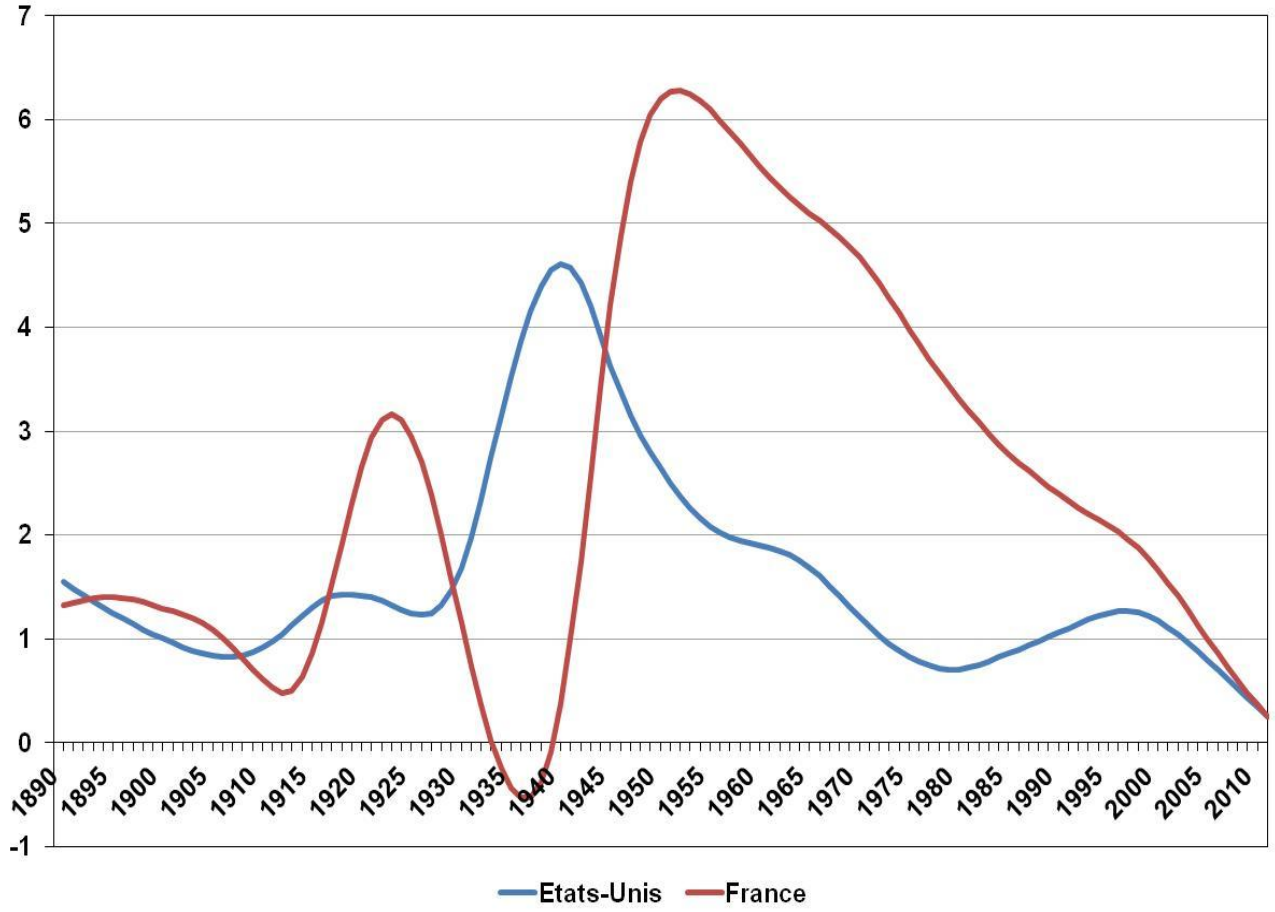
2. In other countries, delayed productivity growth waves (if any)

Delayed productivity growth waves in other countries



Delayed productivity growth waves in other countries




7
6
5
4
3
2
1
0
-1
1890
1895
1900
1905
1910
1915
1920
1925
1930
1935
1940
1945
1950
1955
1960
1965
1970
1975
1980
1985
1990
1995
2000
2005
2010
Etats-Unis
France

Delayed productivity growth waves in other countries

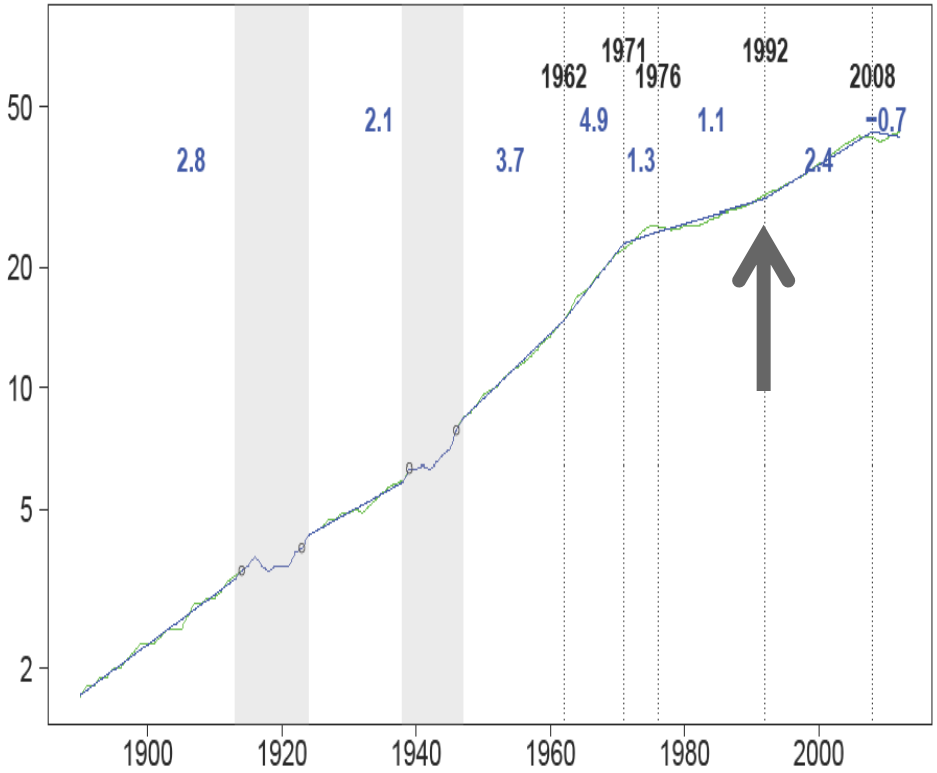
- 1st productivity growth wave:
  - Hitting the euro area, Japan and UK after WWII
- 2nd productivity growth wave:
  - Absent so far in the euro area and Japan
  - Slow ICT diffusion: Role of market rigidities / education?

3. Country-specific productivity breaks due to idiosyncratic shocks

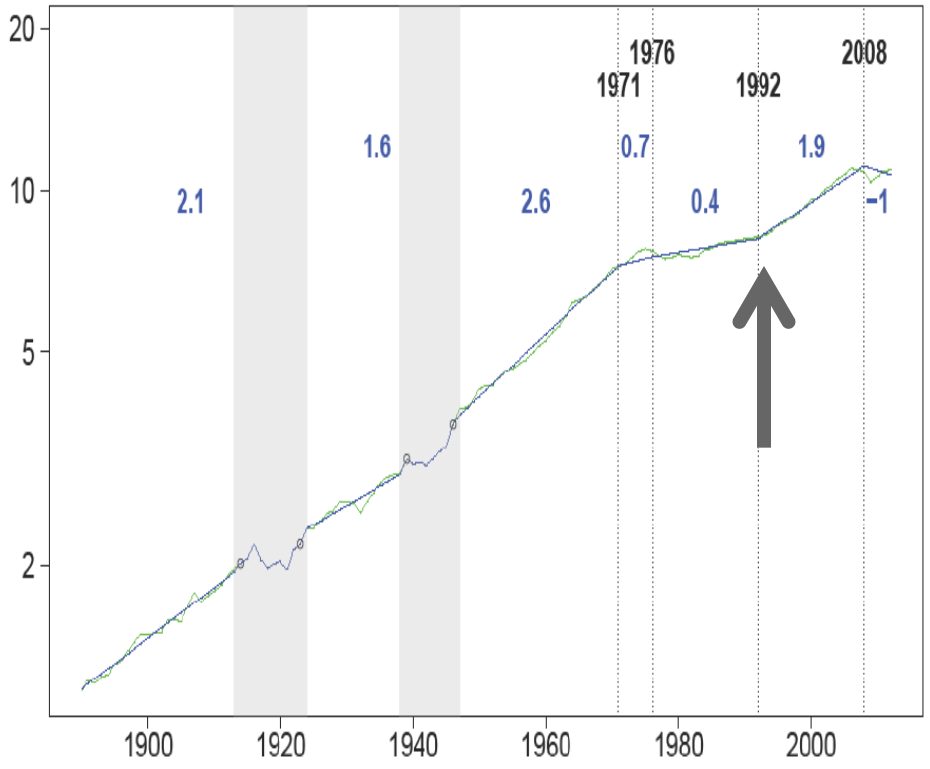
Productivity breaks: country-specific shocks

Sweden

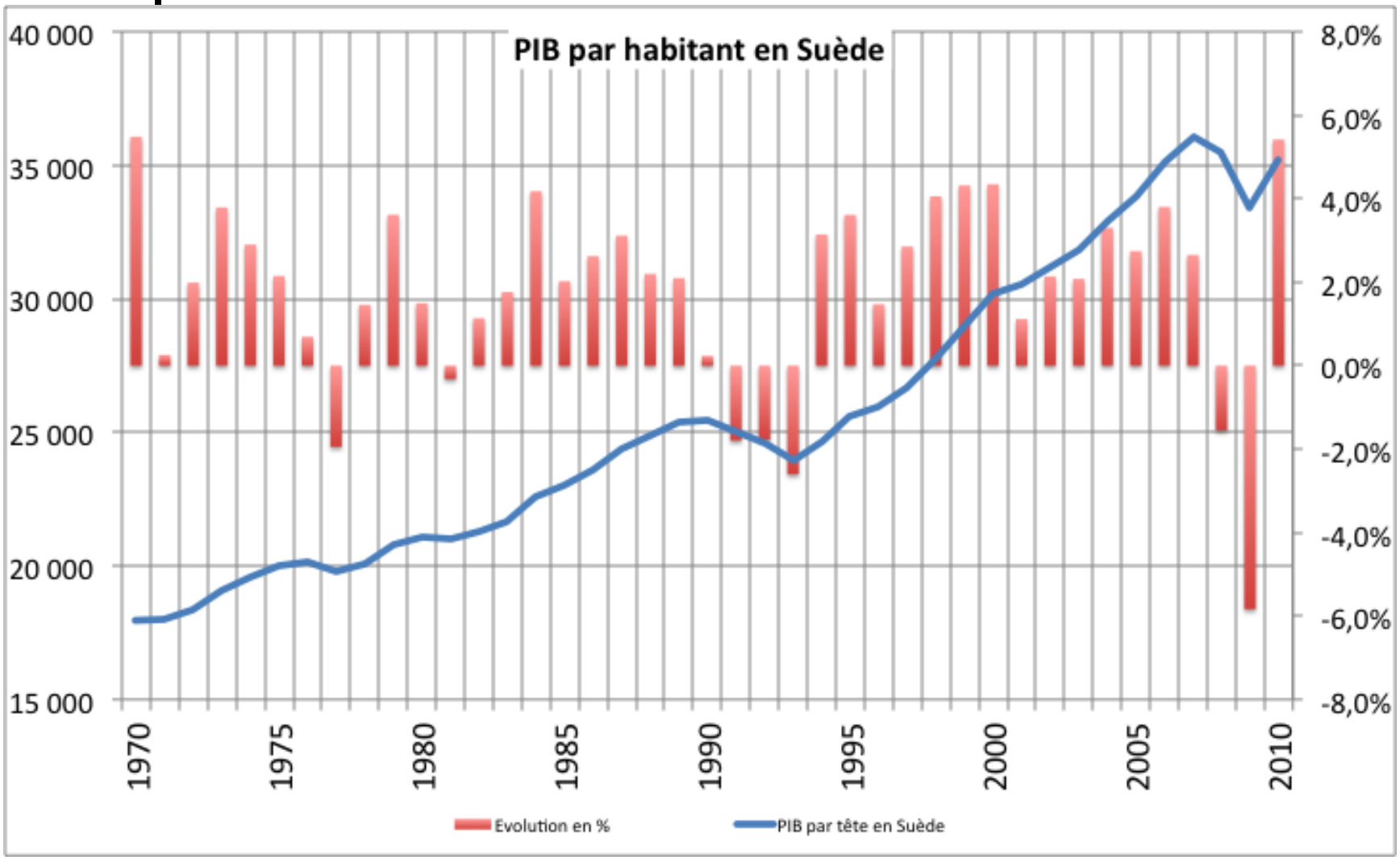
Labor productivity



Total Factor Productivity



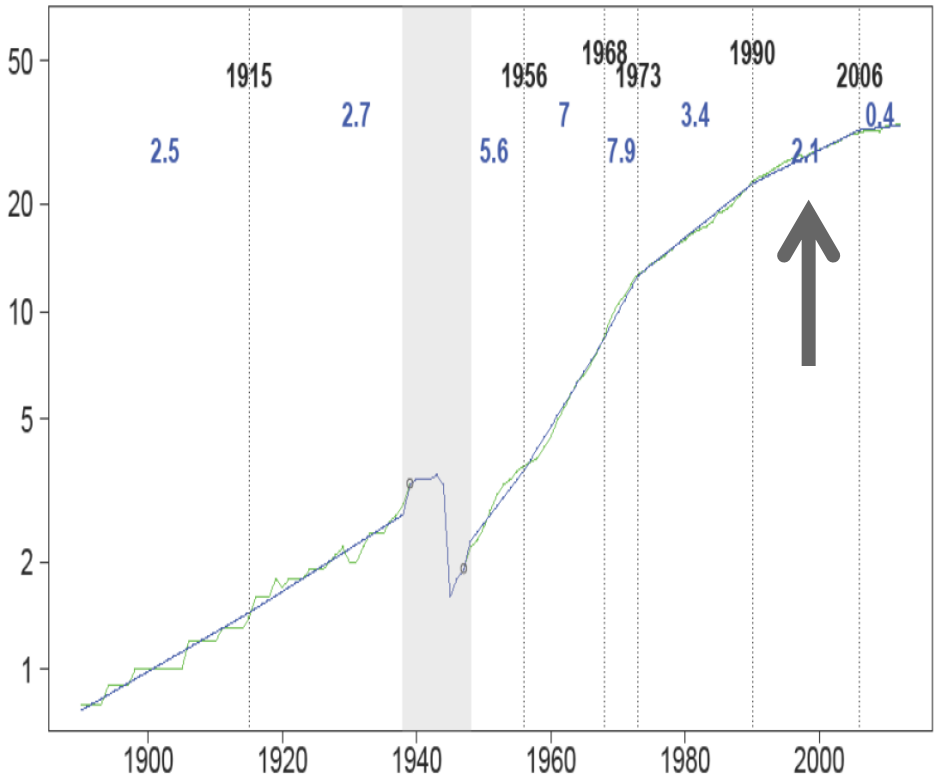
US$ PPP of 2005 (log scale)
Areas in grey: war periods


PIB par habitant en Suède
40 000
35 000
30 000
25 000
20 000
15 000
8,0%
6,0%
4,0%
2,0%
0,0%
-2,0%
-4,0%
-6,0%
-8,0%
1970
1975
1980
1985
1990
1995
2000
2005
2010
Evolution en %
PIB par tête en Suède

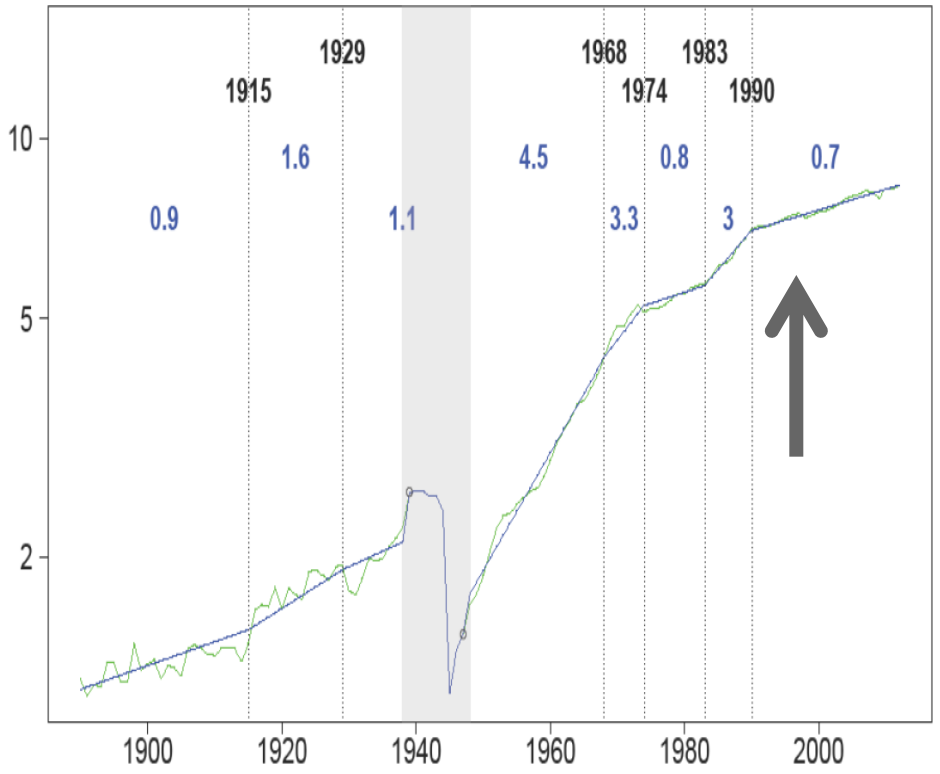
Productivity breaks: country-specific shock

Japan

Labor productivity



Total Factor Productivity



US$ PPP of 2005 (log scale)
Areas in grey: war periods

Country-specific productivity breaks

- **Reformers**
  - **Netherlands:** Wassenaard agreement, 1982
    - TFP growth : 1977-1983 0,5 %, 1983-2002 1,5 %
  - **Canada**, reforms initiated in early 1990s
    - TFP growth: 1974-1990 0,3 %, 1990-2000 1,1 %
  - **Australia**, reforms initiated in early 1990s
    - TFP growth: 1971-1990 0,4 %, 1990-2002 1,4 %
  - **Sweden**, reforms initiated in early 1990s
    - TFP growth: 1976-1992 0,4 %, 1992-2008 1,9 %

Conclusion (3)

- Waves
  - Leader and followers
  - Structural reforms help wave diffusion

Conclusion (4)

- A new Growth Pact for Europe:
  - Structural reforms in exchange for more macroeconomic flexibility
  - Use structural funds to encourage structural reforms
  - New European industrial policy

Ομιλία του κ. Κώστα Αζαριάδη

Καθηγητή Οικονομικών στο Washington University, St. Louis

THE GOVERNMENT IN A KNOWLEDGE-BASED SOCIETY

Costas Azariadis,

Professor of Economics,

Washington University in St. Louis

Megaron - the Athens Concert Hall, Nikos Skalkotas Hall

June 24th, 2014

1. From the Past

1761: John Harrison paid £ 20,000 by the UK gov't. Invents

marine chronometer

1970's & 1980's: National Science Foundation helps APRANET grow into

the internet

2. From the Present

Spending on biomedical research:

	($ bn)	% gov't
Annual USA	160	~ 40
Annual World	280	~ 40

3. Knowledge as an Engine of Growth

physics: steam engine $\rightarrow$ micro chip

$\rightarrow$ i-phone

biology: penicillin $\rightarrow$ DNA maps

math: Pythagoras theorem

4. Knowledge as a Public Good

P-Theorem "consumed" simultaneously by many users

Gov't has a stake in producing public goods

Gov't is inefficient & wasteful

Examples:
- foreign aid in Africa
- structural aid to South Italy
- North -to- South transfers in the EU

5. Learning from our Successes

- National Science Foundation
- National Institutes of Health Disburse ~ $40 bn per year
- Peer-review system

  Research proposals judged by large panels of best researchers

  Decentralization

  No politics

- Successes: patents, publications

6. Conclusions

How do we subsidize innovation without much waste?

- **role of institutions (too vague)**
- **holding politicians accountable**
  - sunset laws
  - referendums
  - direct democracy
- **decentralized decisions**
  - gov't fixes innovation budget
  - experts distribute funds