Productivity Perspectives depend on your point of view

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Overview

- *Recent Evidence on Productivity*
- **Who Cares about Productivity? Why?**
- **Integrating the Evidence**
- **What do we really know? (What will we tell policy makers?)**
- **Research Agenda**

Recent Evidence

- **Growth Accounting**
  - **Contribution of ICT, other capital, MFP**
  - **Sectoral, cross-country, timeseries**
- **Econometric Estimates**
  - **Cross-country convergence (million regressions)**
  - **Sectoral and micro-level datasets**

Growth Accounting

1995-2000: contribution in pct-points to average annual growth

	US	EU	NL	AUS
Labor Productivity Growth	1.9	1.4	1.1	3.2
ICT	.7	.4	.6	1.2
Other Capital	.3	.5	.1	.4
TFP	.8	.5	.5	1.6

Source: van Ark & O'Mahony, Parham (AUS)

Growth Accounting

- Only factors that are explicitly purchased can contribute to output in the framework
  - no theory for role of spillovers or policy environment
- Representative firm makes optimizing decisions
  - perfect competition is assumed
- Contribution of quality of capital or labor can be computed
  - no account of *source* of higher quality
- But: most of output growth is accounted for

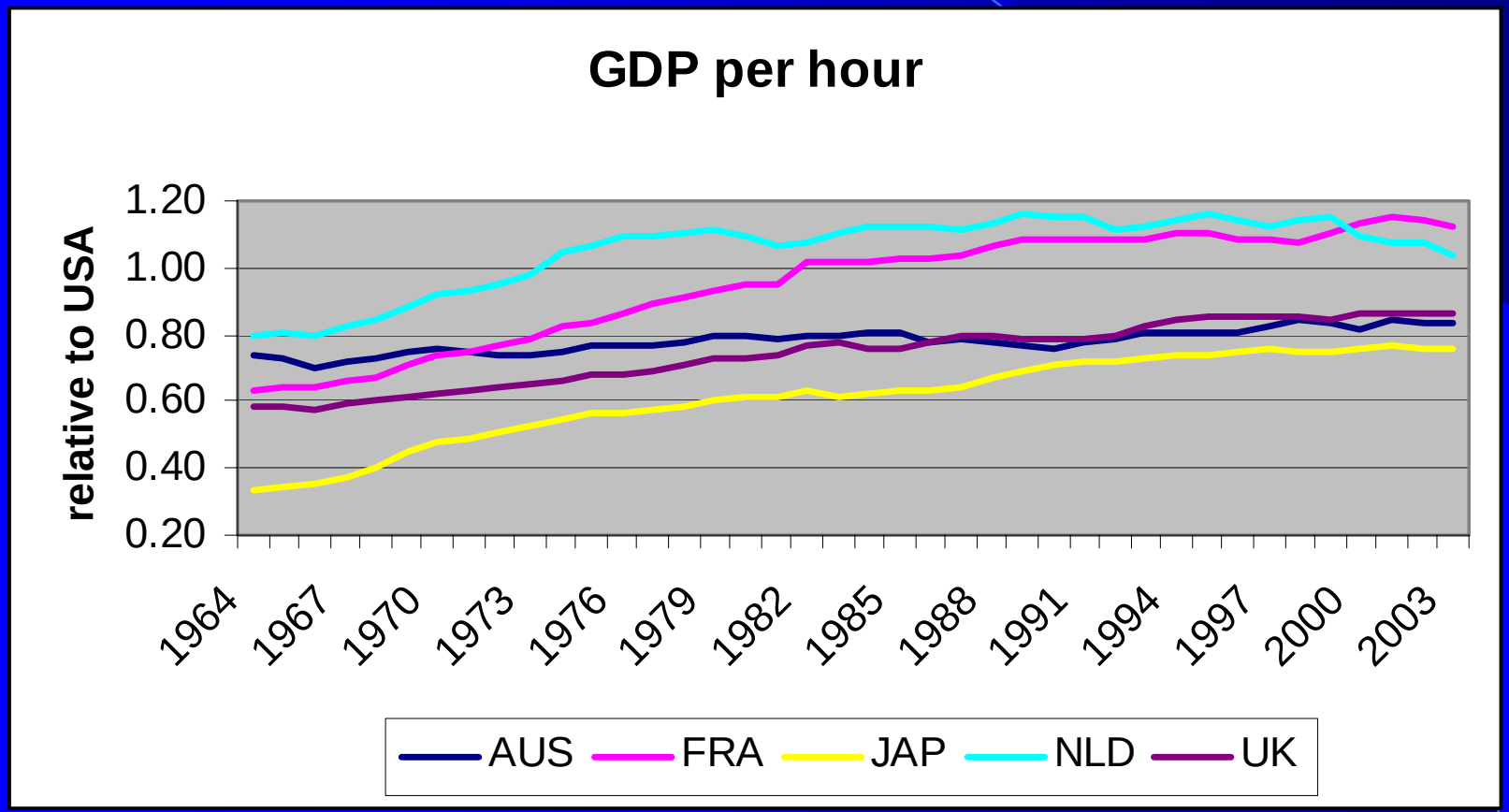
Sectoral Comparisons

1995-2002: contribution in pct-points to average annual growth

	US	EU	NL
Labor Productivity	2.2	.7	.8
ICT-Producing	.6	.5	.2
ICT-Using	1.3	.3	.3
Other	.3	.0	.3

Source: van Ark & O'Mahony

Convergence in Levels



Source: GGDC, Groningen

Convergence

- What drives convergence process?
  - Many factors are significant in cross-country growth regressions
- Do we really know if 10% above or below is significant
  - international price comparisons
  - definitions of output and input

Sectoral and micro data

- Econometric evidence in panel data setting
  - R&D
    - R&D output elasticities
    - Shifting of R&D based on tax-incentives
    - Spillover benefits of R&D done abroad
  - ICT
    - Firm-level evidence on return to ICT investment
  - Many other studies: trade-openess, competition, schooling

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Who cares about Productivity?

- **Central Banks**
  - **productivity levels**
    - **used for computing potential GDP**
  - **productivity growth rates**
    - **monitor cycle. Used in hours-to-output models**
- **Economic Policy Makers**
  - **Comparisons across countries: measures of wellbeing**
  - **Comparisons across countries/over time: targets for policy ambition (ie EU 'Lisbon')**
  - **Extremely useful for *Policy Evaluation***

Why?

- Innovation/R&D policy: how much to spend, where, and in what manner.
- Education: total budget and allocation across types of students/workers
- Trade: effects of imported materials; effects of international specialisation
- Competition policy: effects of concentration; deregulation
- Framework conditions: which regulations to tackle first; how do they affect productivity

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Integrating Evidence on Productivity

- Firms choose innovation strategy
  - Technology frontier populated by innovating firms
  - Adopters buy latest technology, and apply it well
  - Followers wait until capital can be used ‘off-the-shelf’
- Firms then choose output/inputs to meet demand

Innovate, Adopt or Follow

- Innovation is highly risky and requires knowledge and risk-funding. But, it also requires flexibility in resources to leverage successful ideas. Further, markets need to respond to innovative products
- Adopters need some skilled workers and functioning financial markets.

		Innovate vs Adopt	Adopt vs Follow
Cost of Innovative Activity			
R&D, Skills		X	X
Foreign	R&D, VC	X	
Reallocation			
Flexibility in labor and product markets		X	
Financial Markets		X	X

Choice of resources

- After choosing innovation strategy, firms attempt to meet resulting market demand
- At firm level, growth accounting is valid tool
  - innovators push out frontier, if successful
  - adopters have embodied technical change
  - followers ‘converge’ towards previous frontier
- Aggregate productivity is weighted average of firms’ productivities

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What to tell policymakers?

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- Productivity growth requires:
  - human capital
  - flexibility in resources
  - competition
- Productivity and innovation are harmed by:
  - targeted policies to firms/sectors/groups
  - emphasis on ‘hard sciences’
  - squeezing fundamental research

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Research Agenda

- Theory
  - models of heterogeneous firms in dynamic market (Acemoglu, Klette&Kortum, Melitz&Helpman, Aghion et al)
- Statistics
  - longitudinal business data
  - linked employer-employee data
  - linked ‘special surveys’/policy experiments
  - international distributed micro-data analysis

Distributed micro data research