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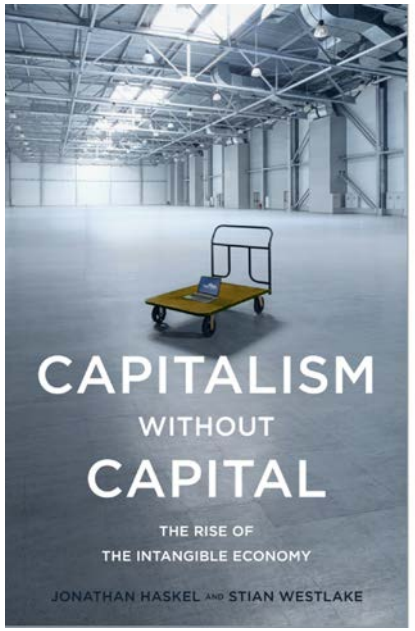

The Intangible Economy

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@haskelecon

RES/ONS/RSS meeting, "Challenges for Economic Statistics in the Digital Age",
Wednesday 05 July 2017, 3:00pm - 6:00pm

Joint work with Carol Corrado (The Conference Board, New York), Cecilia Jona-Lasinio (Istat and LUISS Rome), Massimiliano Iommi (Istat and LUISS Rome)

Book project with Stian Westlake "Capitalism without Capital", November 2017.
Contents and first chapter.

We need to understand economies

Which used to produce this…

…and now produce this.

What do companies look like?

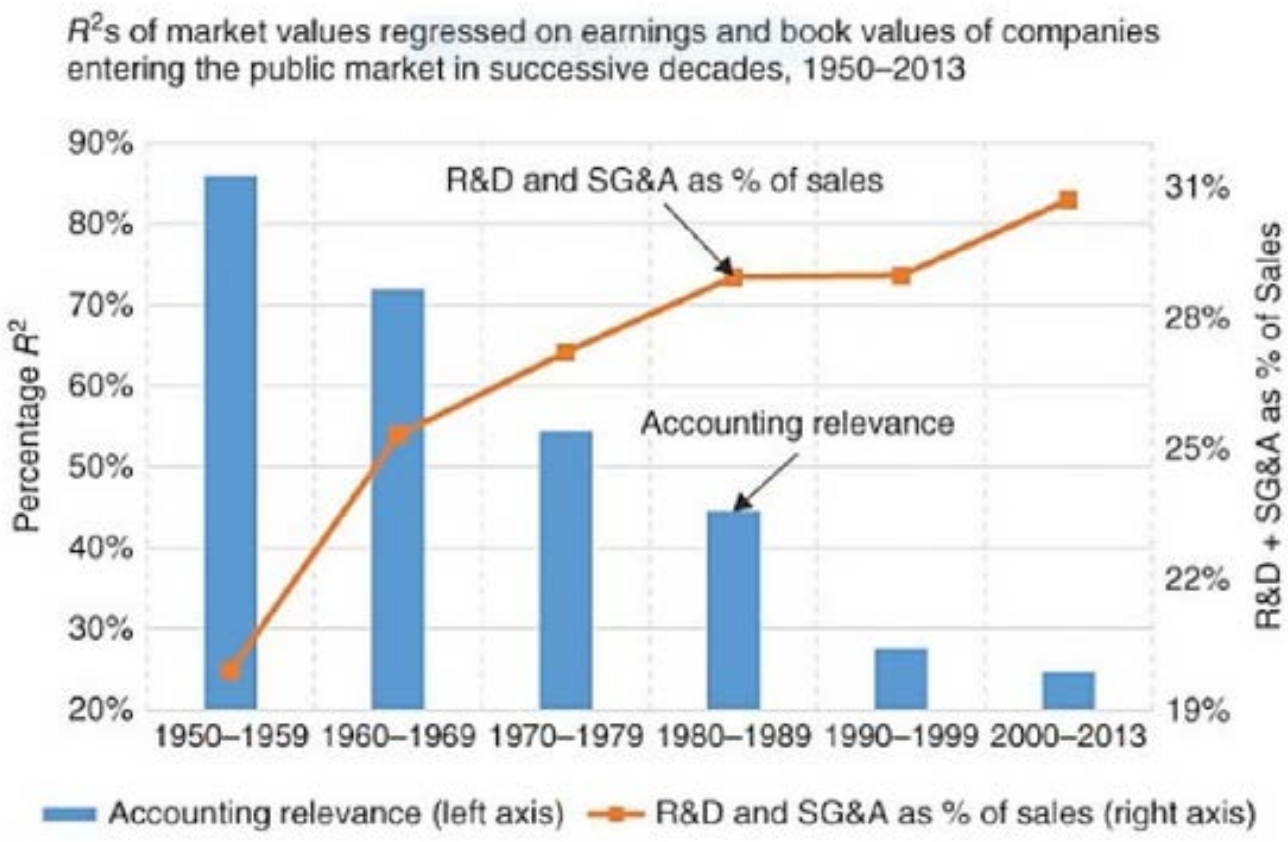
	Sainsbury's	**Microsoft**
Sales	24bn	85bn
Assets:		
Property, equipment		

What do companies look like?

	Sainsbury's	**Microsoft**
Sales	24bn	85bn
Assets: Property, equipment	10bn	5bn

Capitalism without Capital

Lev on declining informativeness of company accounts.



- Source: (Lev and Gu 2016)Figure 82, p.88

Investment in modern economies

Tangible investment	**Intangible investment**
Buildings and structures	***Computerised information***
IT equipment (computer hardware, communications equipment)	Software
Non-computer machinery, equipment and weapons systems	Databases
Vehicles	***Innovative property***
	R&D and mineral exploration
	Creating entertainment, literary or artistic originals
	Design
	Economic competencies
	Training
	Market research and branding
	Business process re-engineering

New investments mean…

- New GDP

$$\mathrm{P^Q Q} = \mathrm{P^Y Y} + \mathrm{P^N N} = \mathrm{P^C C} + \mathrm{P^I I} + \mathrm{P^N N}$$

- New sources-of-growth

$$d\ln \mathrm{Q} = s_Q^L dlnL + s_Q^K dlnK + s_Q^R dlnR + dlnTFP$$

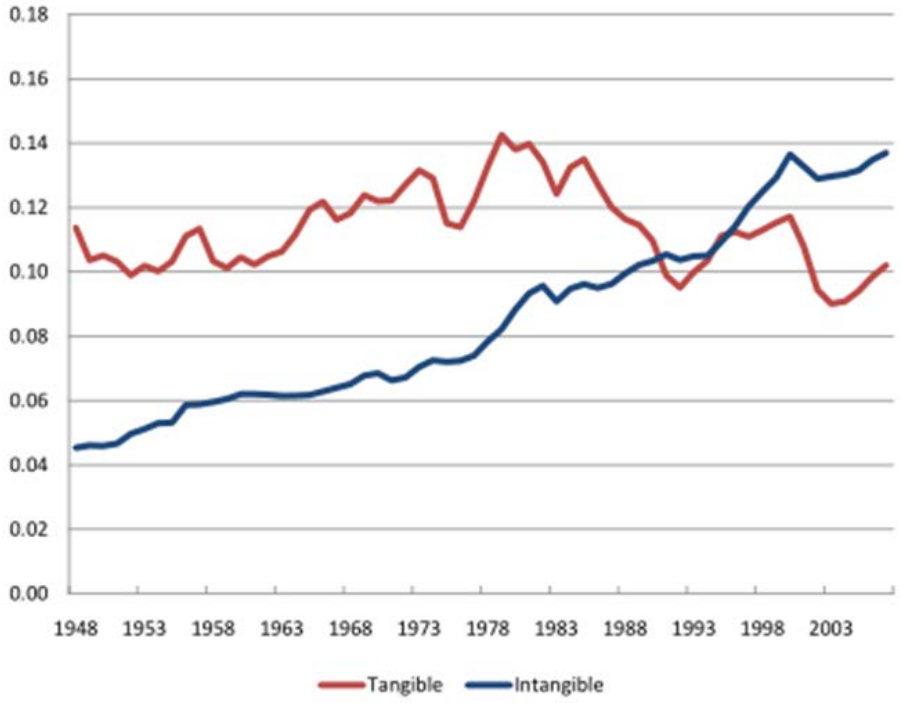
- This approach helps make sense of
  - Innovation as an investment and spillover, not all just a Solow-type spillover
  - The knowledge economy
  - The creative economy
  - Big data
  - Productivity, TFP and spillovers
- Statistical agencies are starting to collect these data, but only slowly

Data

- Thanks to EU support, series of projects have built on EU-KLEMS
  - COINVEST
  - SPINTAN
  - EIB project
  - www.INTAN-invest.net (unfunded)
- Data set
  - Country-industry-institutional sector-year tangible/intangible investment
  - Years: 1995-2013
  - Industries: A to M, P,Q,R and S
  - Countries:
    - EU15xLU (Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Netherlands, Portugal, Spain, Sweden, UK
    - NMS: Czech Republic, Hungary, Slovakia and Slovenia
    - USA
- Productivity accounting for subset of countries (www.Spintan.net)
  - GDP/GVA by industry (new investment)
  - Capital prices (new capital assets)
  - TFP

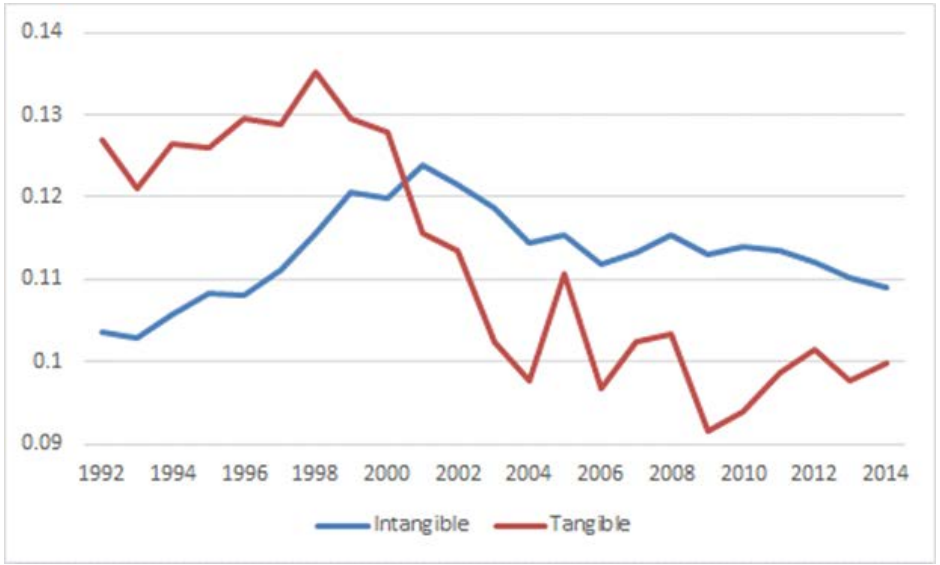
So what's been happening to tangible and intangible investment? The long term…

Intangible and tangible investment over time, US



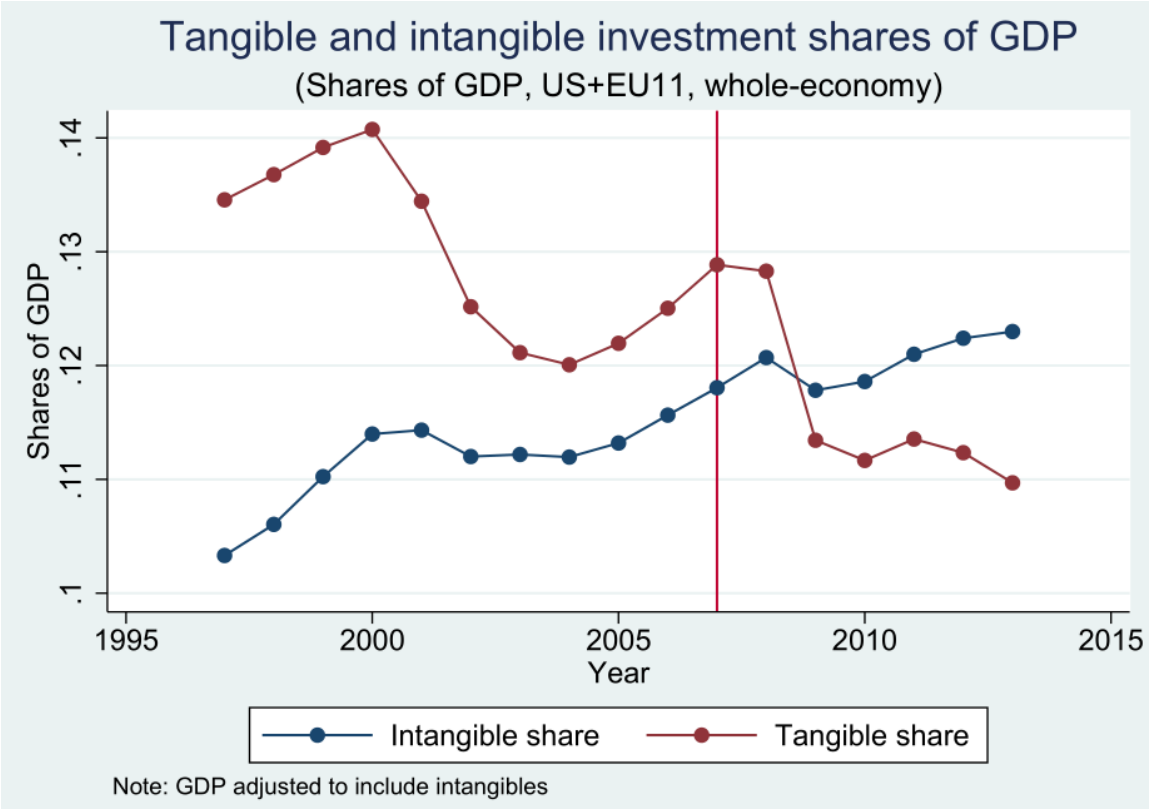
Source: Carol Corrado

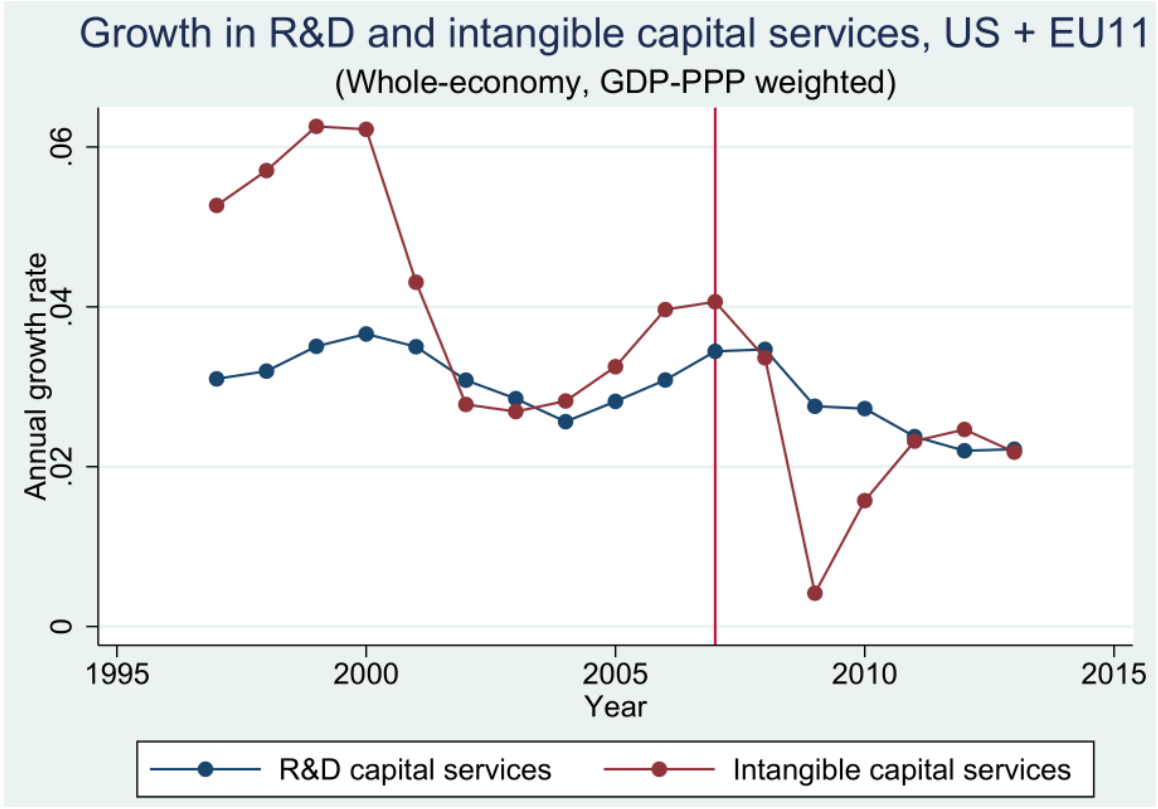
Intangible and tangible investment over time, UK



Source: Peter Goodridge

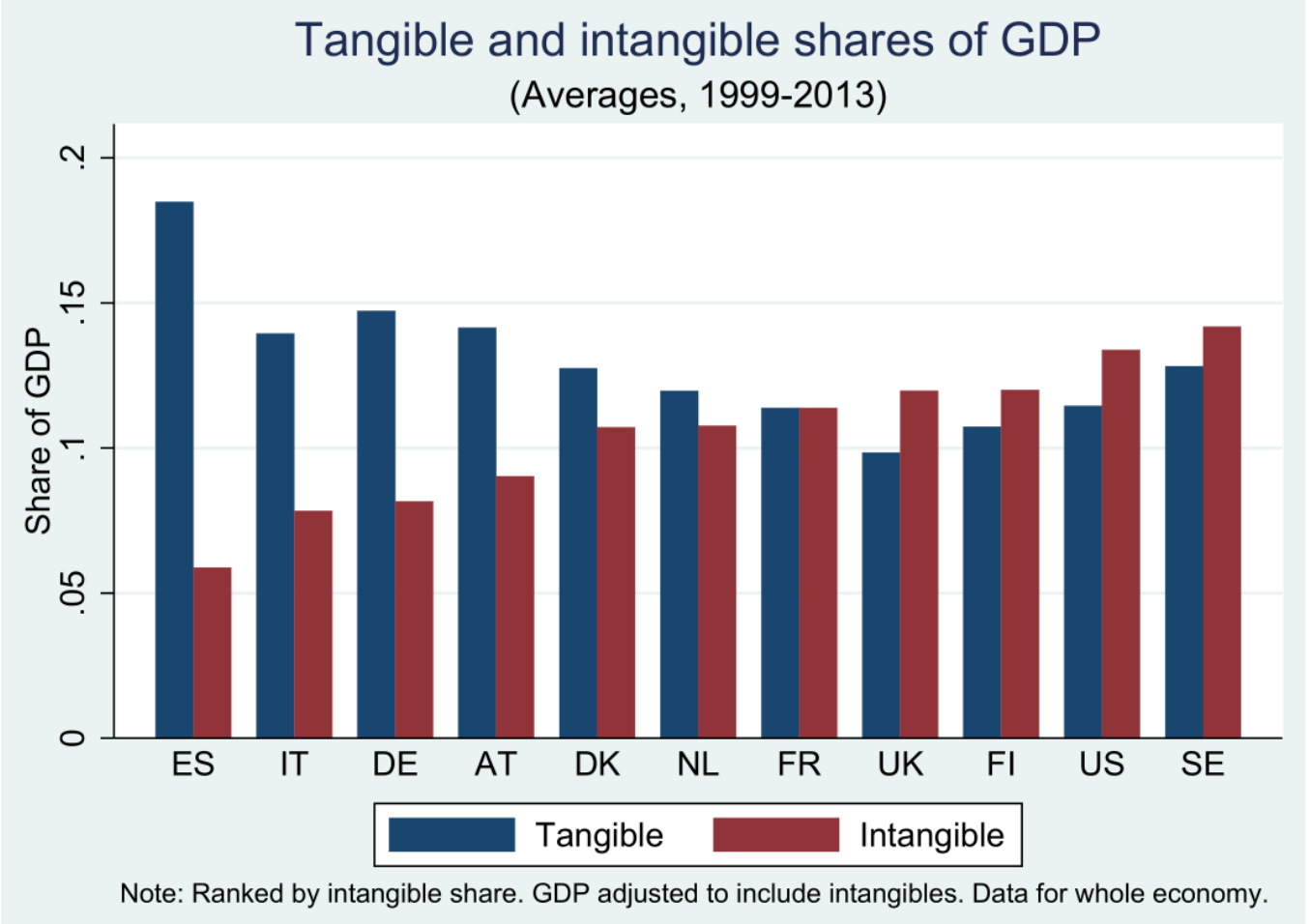
…shorter term: slowdown in capital services growth since 2008…





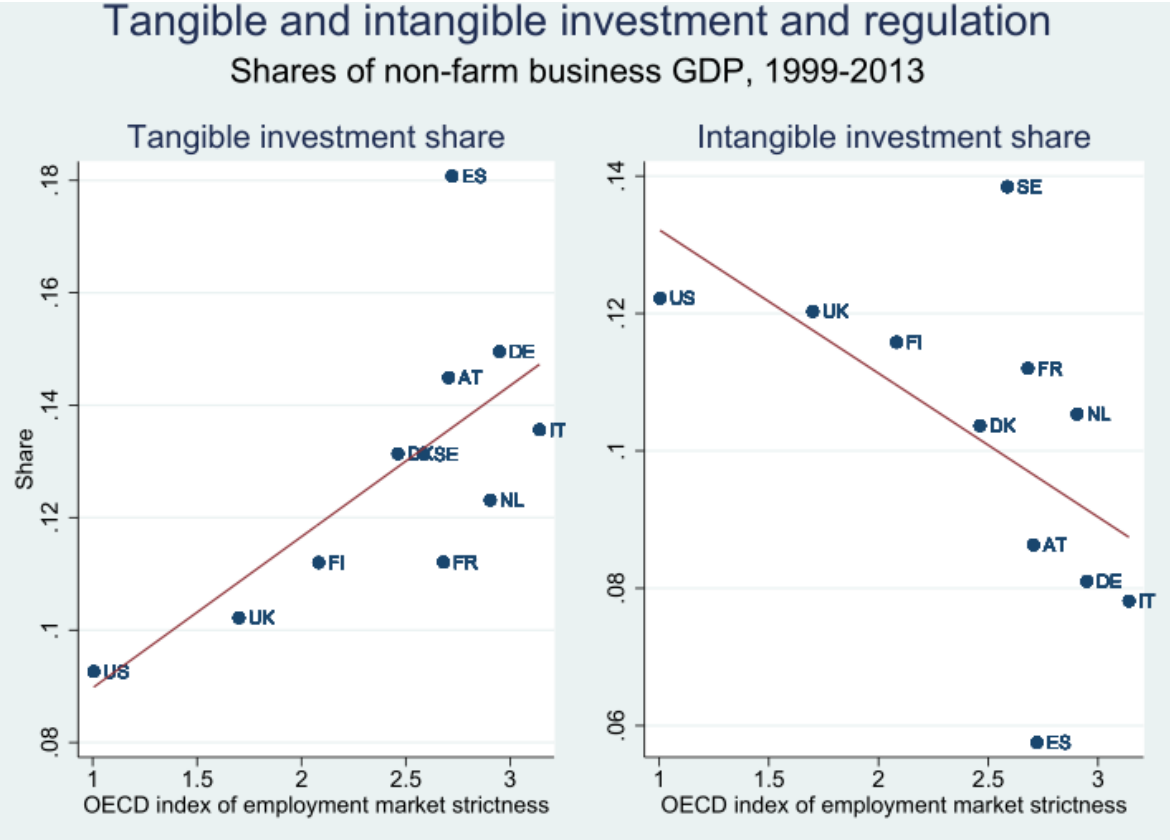
Source: calculations from SPINTAN database

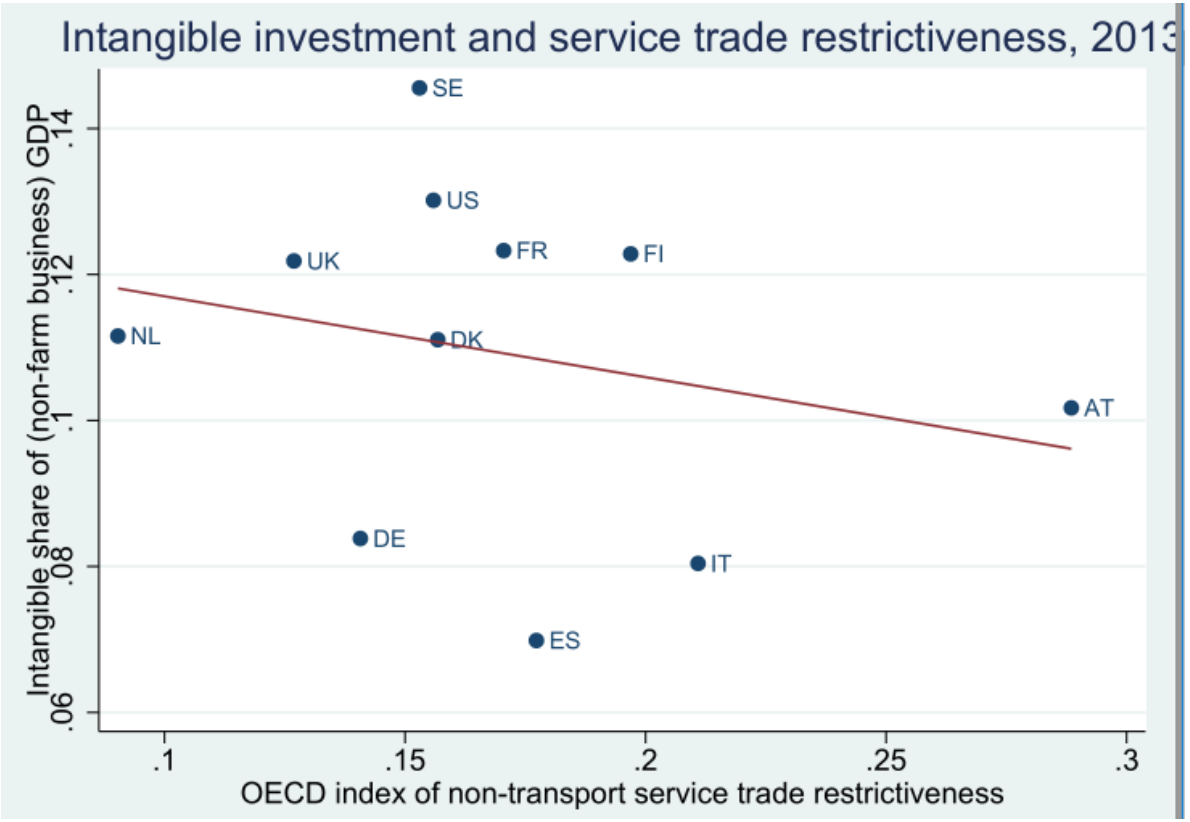
Variation over countries…



Source: calculations from SPINTAN database

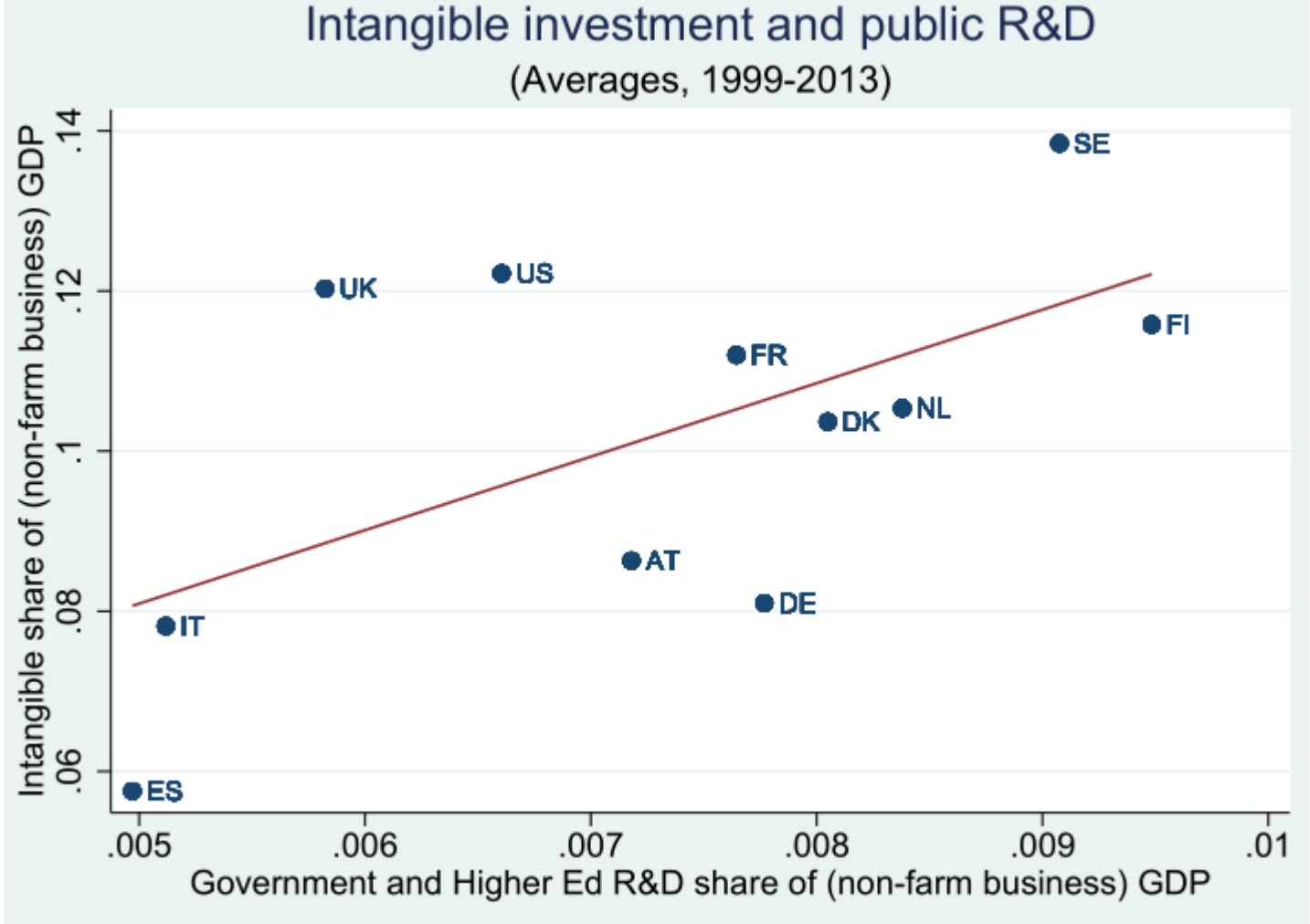
…correlated with policy-relevant variables…





Source: calculations from SPINTAN database

…including public R&D



Source: calculations from SPINTAN database

Properties of intangibles 1: Accounting conventions

- In company and national accounts, many are unmeasured
- Typical treatment in company accounts
  - If own-account, expensed, not capitalised
  - If bought-in, valued and depreciated
  - If company is sold “goodwill” is valued
  - (some software and R&D can be capitalised under restrictive circumstances e.g. late in development stage)
- Should national accounts stick to company accounts conventions?
  - Treatment asymmetric
  - Varies by industries (e.g. airport landing rights are allowed)

- Implications
  - It not counted at all, it looks like we have some fabulously profitable companies (in return on capital terms i.e. huge sales, no capital.

Properties of intangibles 2: economic properties

- Properties of intangibles- the four “S”s (Haskel/Westlake)
  - Sunk - investment cannot be recovered
  - Scalable – fixed investment e.g. in Uber software, can be scaled
  - Spillovers – knowledge investment can be used by others
  - Synergies – investment synergies with other intangible capital and human capital

- Implications:
  - *Sunk: financing difficulties*
  - *Spillovers: demand for living in cities rises*
  - *Scalable: intangible-intensive companies get relatively larger => frontier gap gets bigger*
  - *Synergies: potentially large wage gains for intangible capital owners*

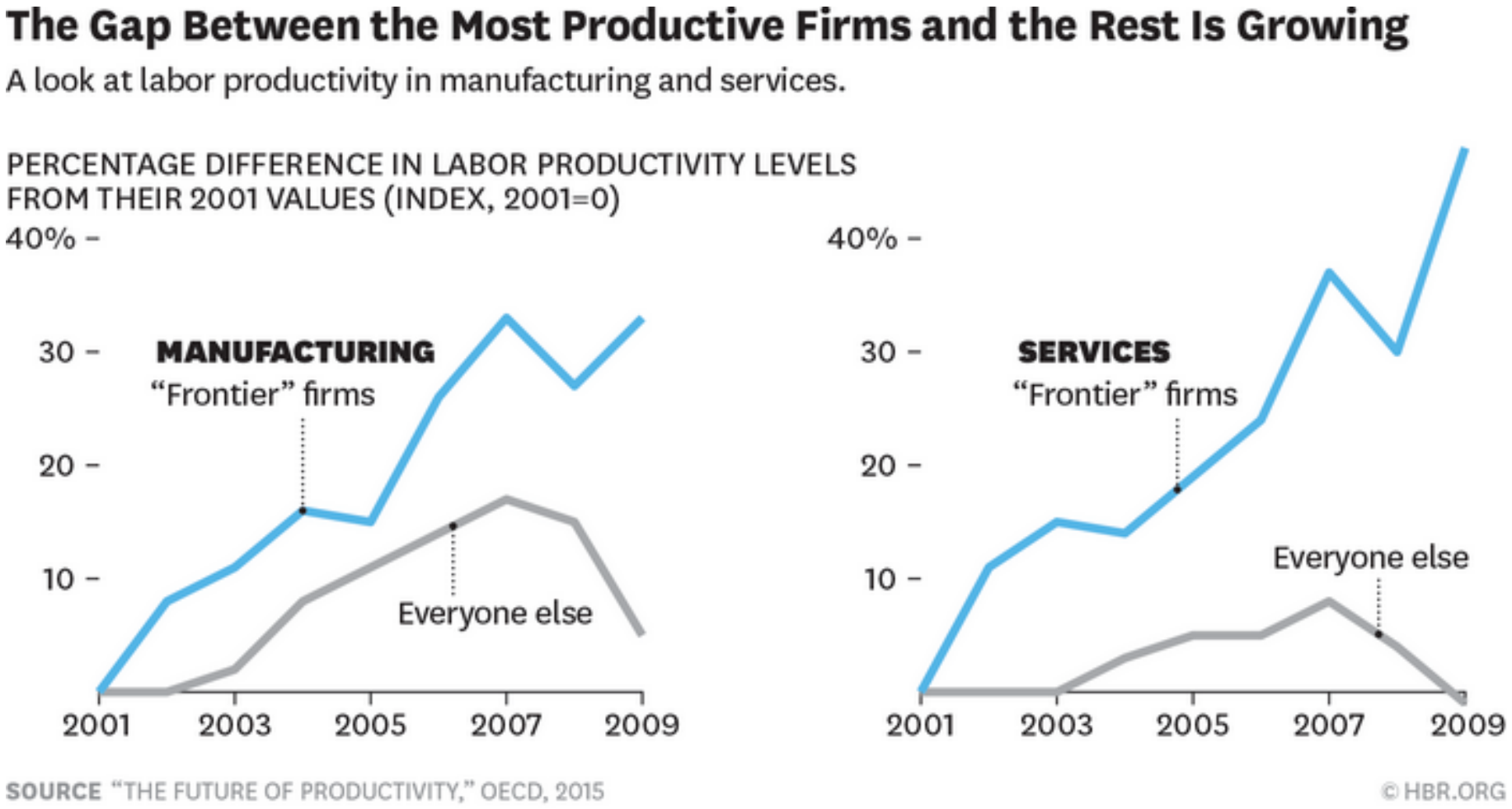
Example of implications of intangibles: scalable

- Are intangibles worsening the productivity gap between leading firms and laggards? **(Haskel and Westlake)**

- Tangible-intensive industries
  - constant returns,
  - successful companies expand, but are no more productive. Frontier gap stays the same
- Intangible-intensive industries, scalable,
  - Increasing returns
  - successful companies expand *and* get more productive. Frontier gap widens

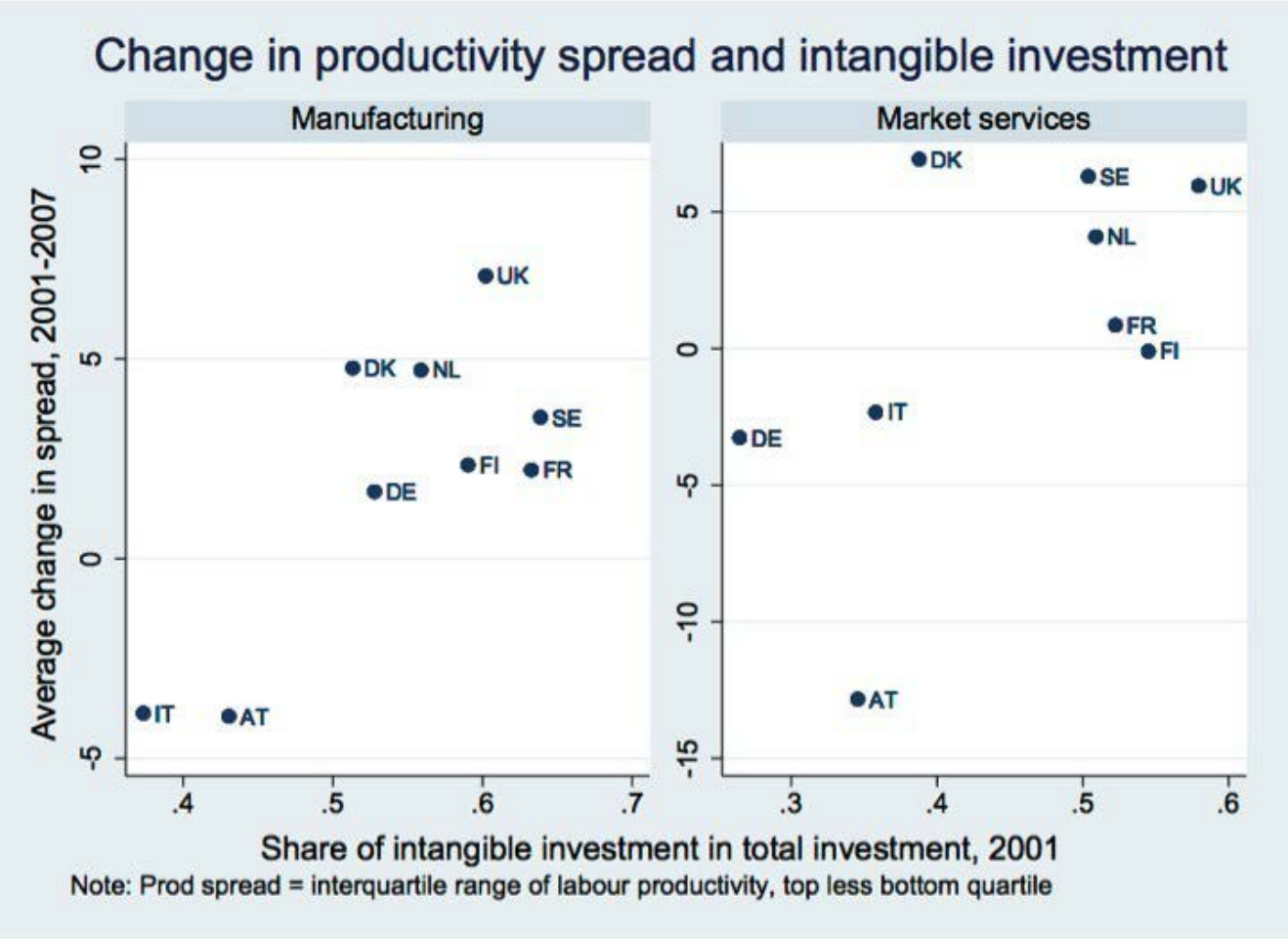
- Test: *Productivity gap widens (the most in intangible-intensive industries)*

The widening productivity gap



Source: Andrews, D. C. Criscuolo and P. Gal (2015),

The productivity spread has risen the most in intangible-intensive industries



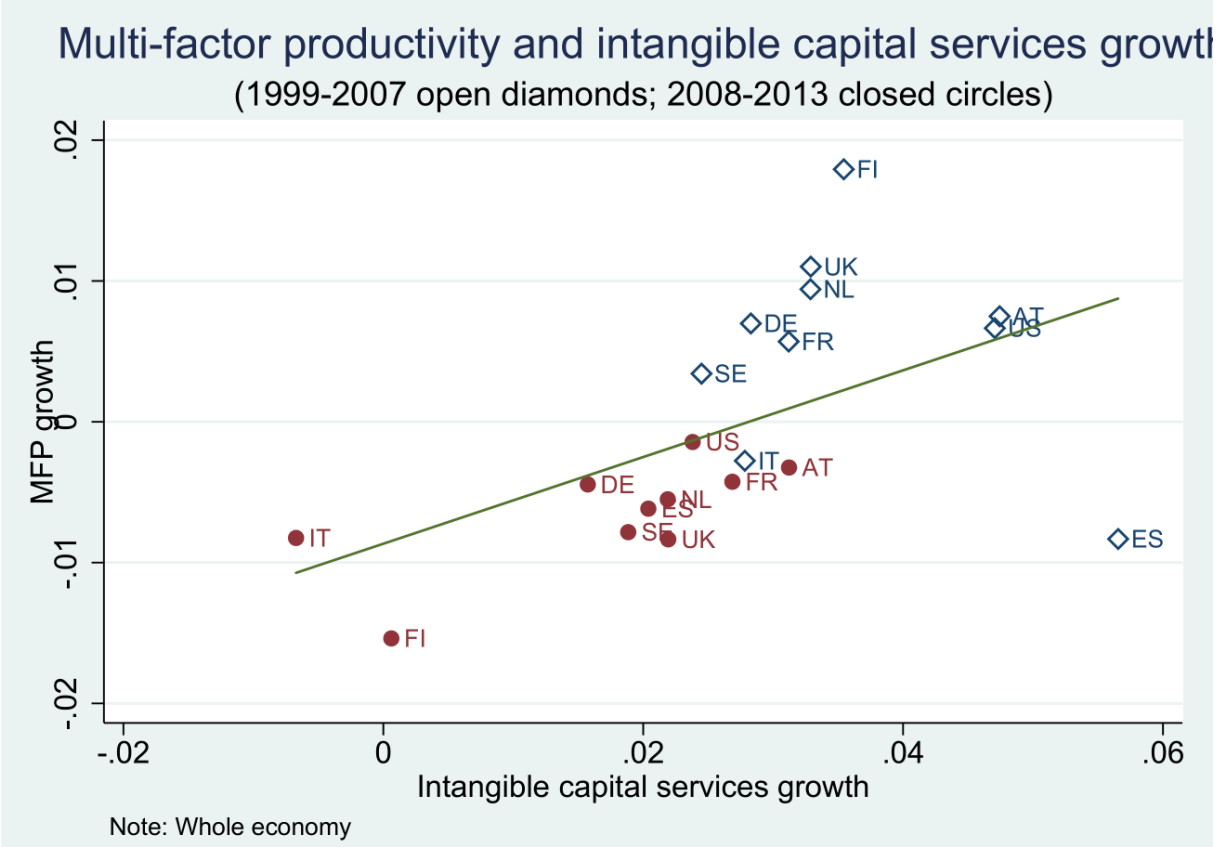
And if these firms pay higher wages to all workers, wage inequality rises too.

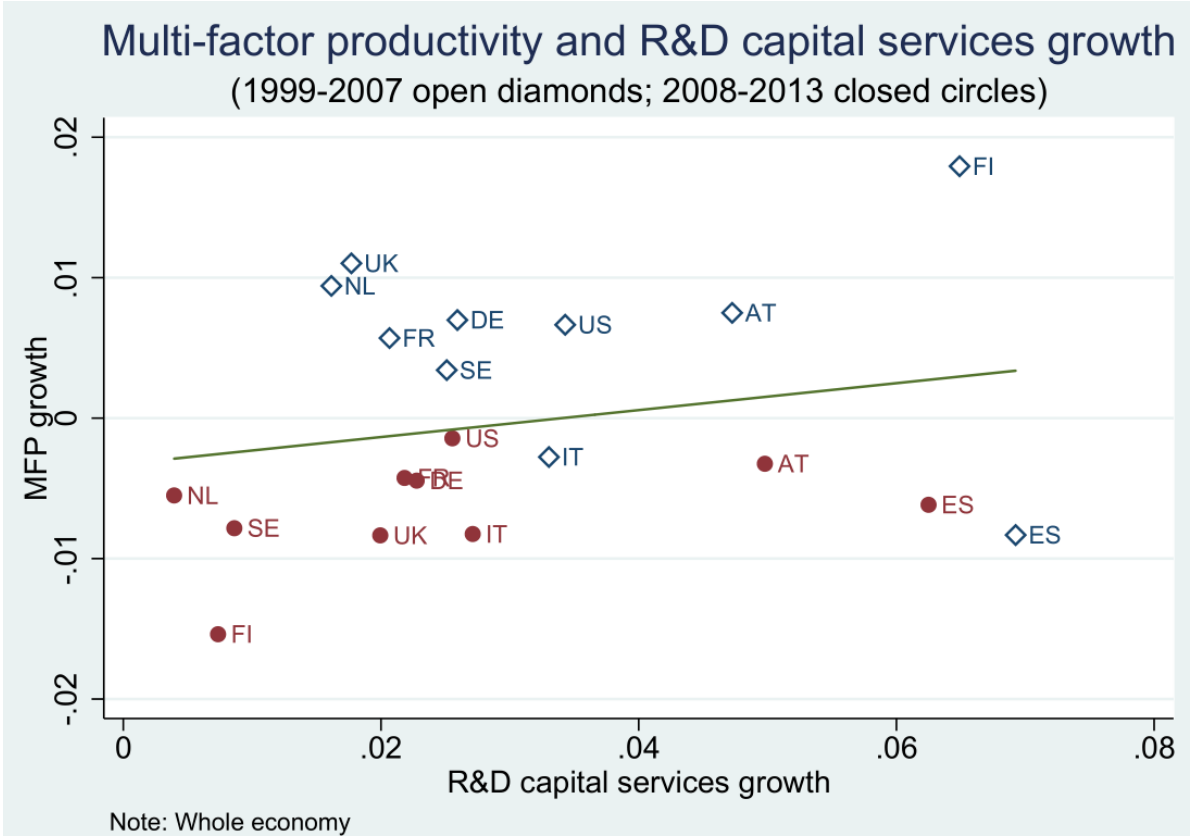
Source: Haskel and Westlake, 2016, using data from SPINTAN and Distributed Microdata project

Example of implications of intangibles: spillovers

- Tangible assets: unlikely to be spillovers
- Intangible assets:
  - If there are spillovers,
  - fall in intangible capital building => fall in TFP growth

Spillovers?





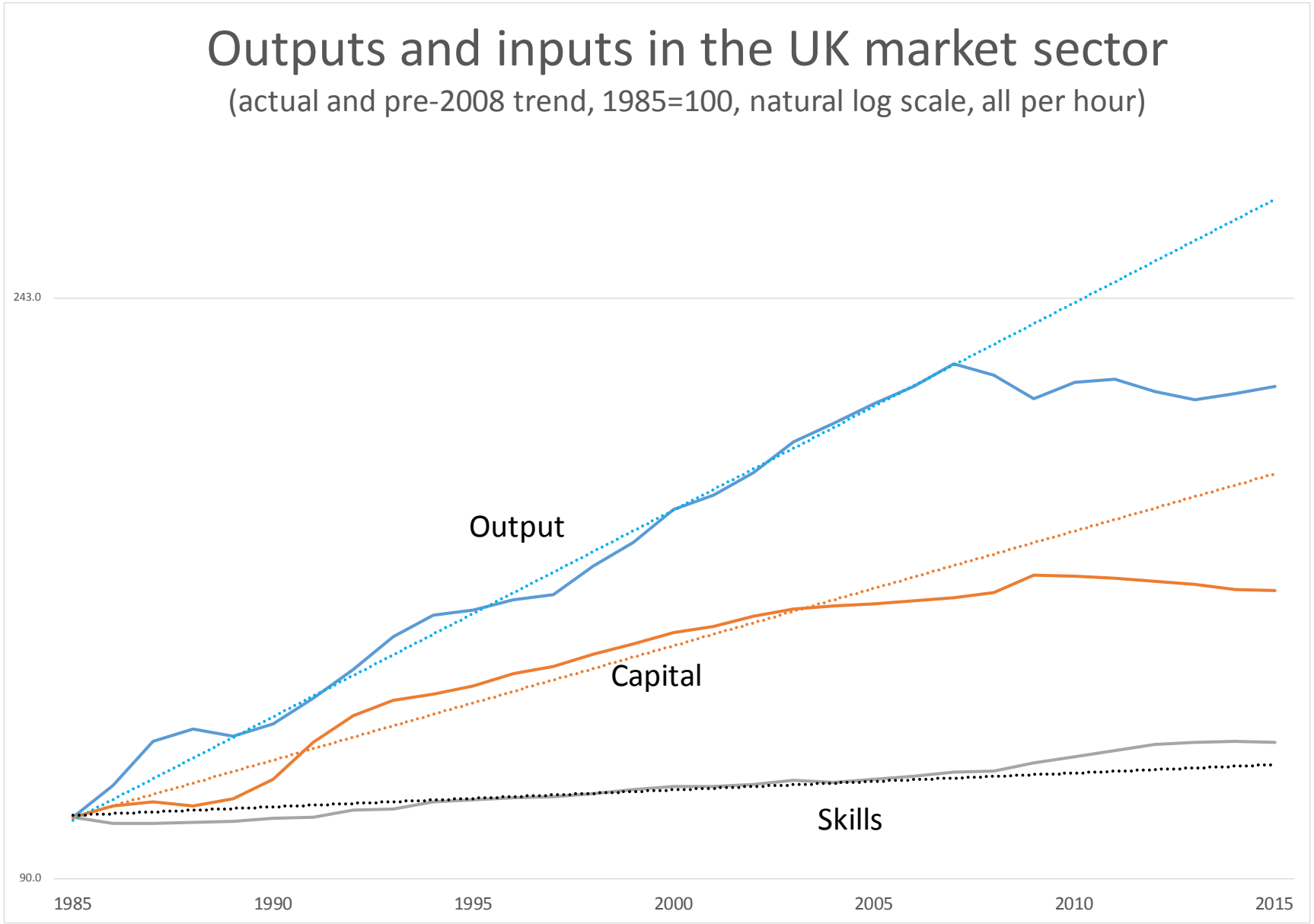
Source: calculations from SPINTAN database

Summary

- Investment is becoming more intangible
- That's not well measured
- If you incorporate it: better understanding of
  - Innovation, creative economy, manufacturing v services, TFP etc.
- What do we find?
  - Big differences: between countries: Greece v Finland
  - Over time: intangible investment did not fall as fast over the recession, but is growing slower
  - Intangible investment correlated with policy instruments e.g. strictness of employment legislation
- So what?
  - Increasing productivity inequality in intangible-intensive sectors => productivity and wage inequality
  - Seems evidence of spillovers: more intangible capital growth, more TFP. So slowdown of intangible capital growth => TFP slowdown

Spares

The UK productivity puzzle



Source: ONS

Accounting for the gap (in 2011)

		Before (00-07)	After (07-11)	Implied gap	*% of gap explained*
1	**DlnV/H***	2.54%	-0.47%	12.6	
	Components				
2	Labour	0.22%	0.63%	-1.7	
3	Capital	1.13%	0.99%	0.6	
4	TFP	1.19%	-2.09%	12.9	*0%*
5	Labour re-allocation	-0.26%	0.23%	-1.9	
	R&D				
6	TFP: without R&D capitalised	1.21%	-2.10%	13.0	*-1%*
	Capital: premature scrapping				
7	TFP: raise dep rates by 1.25 after 2009	1.19%	-1.53%	10.8	*16%*
8	TFP: raise dep rates by 1.5 after 2009	1.19%	-0.95%	8.6	*33%*
	Structural				
9	TFP without Ag/Min/Utils & Financial Services**	1.11%	-1.05%	8.7	*33%*
	Cyclical				
10	Utilisation (Basu, Fernald, Kimball)	1.28%	-1.50%	11.0	*14%*
11	Utilisation (Buildings, this paper)	1.24%	-2.00%	12.8	*1%*

Source: Goodridge, Haskel, Wallis (Economica, 2016)