MAKING SENSE OF THE PRODUCTIVITY SLOWDOWN: *NEXT STEPS*

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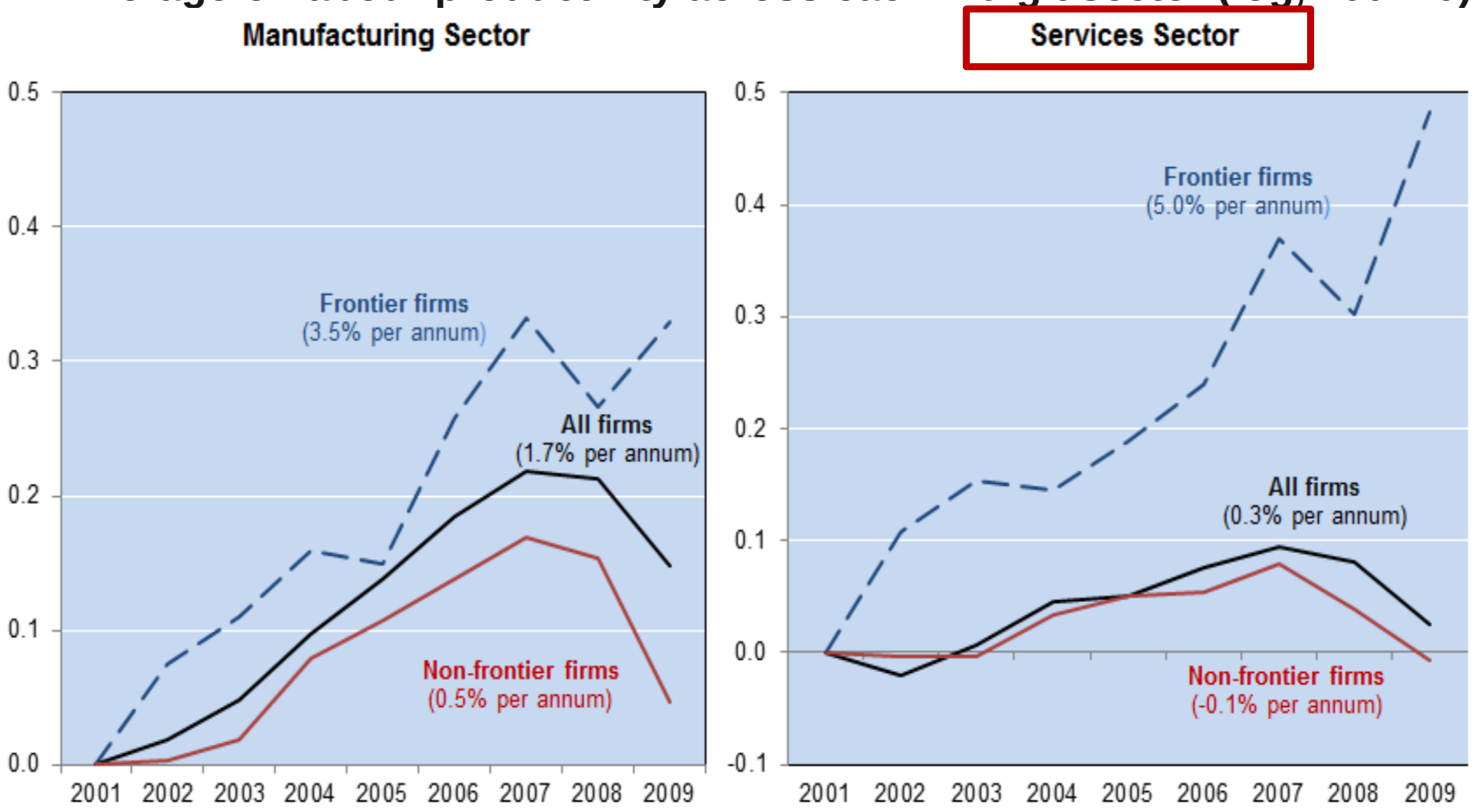
Why did productivity growth slow, even before the crisis?

- Taking a granular approach, is it because:
  1. Slowing growth at the global productivity frontier?
  2. Stalling diffusion: slowing productivity convergence to the global frontier?
  3. Rising resource misallocation?
- Debate has generally centred on #1 but we know little about global frontier firms.
  - More likely to be: larger, profitable, MNE, patent (slide A1) + they come from various countries (slide A2).
- OECD research also shows:
  - More scope for policy to influence #2 and #3, than #1
  - Misallocation (#3) hinders diffusion (#2)

Rising productivity gap between firms at global frontier and others

Average of labour productivity across each 2-digit sector (log, 2001=0)



Industry-level data from 1985 show bigger divergence from the early 2000s (slide A3)

Source: Andrews, D. C. Criscuolo and P. Gal (2015), "Frontier firms, technology diffusion and public policy: micro evidence from OECD countries", OECD Productivity Working Papers No. 2.

Possible explanations for this divergence

- Three possible technological explanations:
  - Technological diffusion slowed down
  - “Winner takes all” dynamics
  - Replication and diffusion of the magic bundle has become more difficult
- Robustness – not driven by:
  - Productivity measure: LP, TFP (slide A4)
  - Frontier definition: Top 50, 100, 5% (slide A5)
  - One particular industry (slide A6) or survival bias (slide A7)

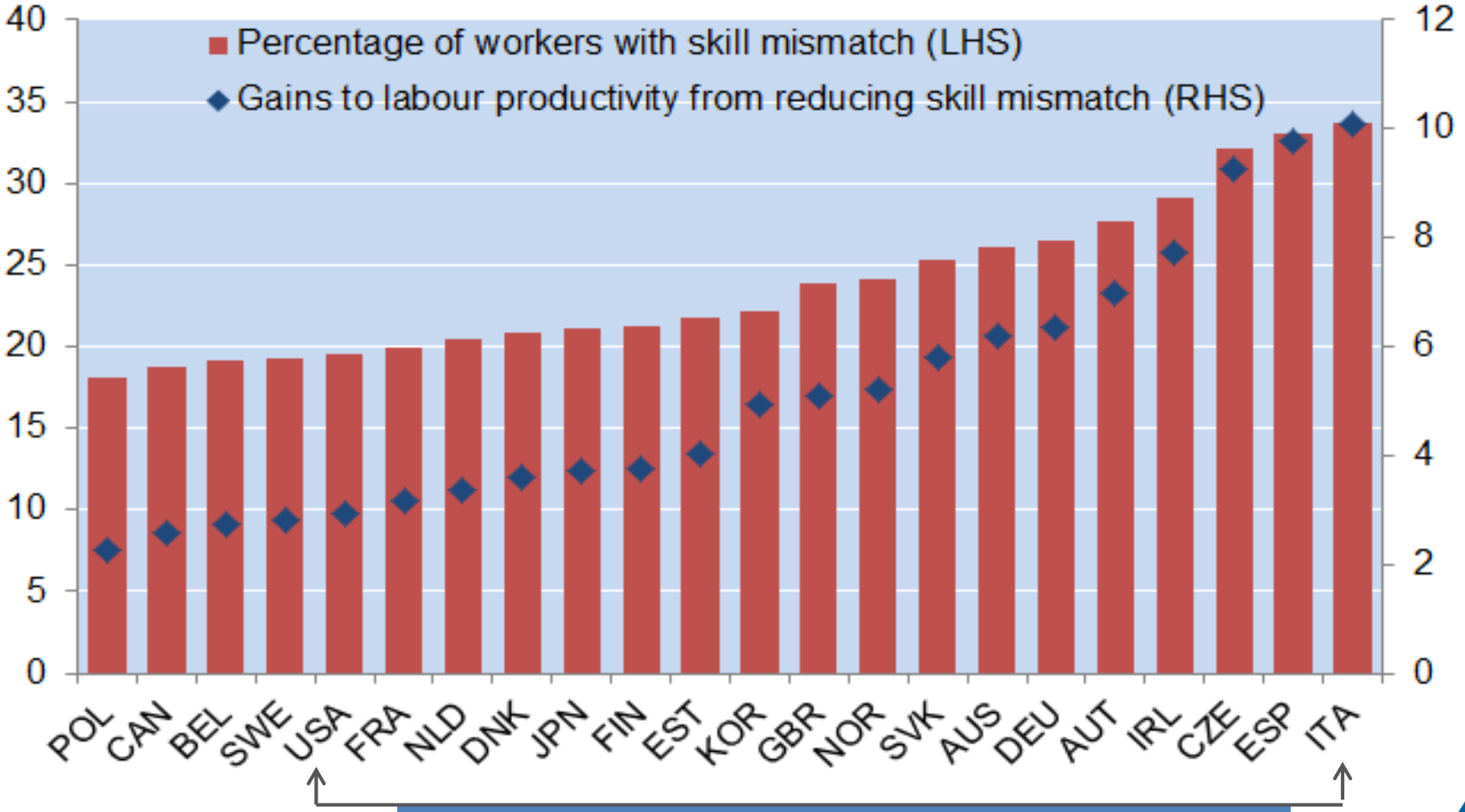
Diffusion: some conjectures and future work

- Update and extent the analysis, including more analysis of the role of policy.
- If diffusion stalled, what explains the timing?
  - Technology-related factors
  - Policy weakness thwarting scope for diffusion
    - IPR regimes need updating?
    - Barriers to entry and limits to market size (EU services)?
    - Vested interests and lobbying blocking wider penetration of ICT and new business models in services
- Links between rising wage inequality and productivity dispersion.

Misallocation: some conjectures and future work

- Time series work on misallocation is significant since most research is cross-sectional.
- We are thinking about:
  - Misallocation in market services (slide A8)
  - Zombie" firms, K-misallocation, ↓ business dynamism
  - Policy-induced exit costs (high in southern Europe)
- Misallocation across cities: links with housing policies
- Misallocation of skills
  - Skill mismatch affects ¼ workers and is correlated with policies, esp. housing market distortions (slide A9)
  - Human talent trapped in inefficient firms constrains growth of innovative firms and diffusion (slide A10)

Productivity gains from reducing skill mismatch to the best practice level



Differences in skill mismatch can account for one-fifth of the labour productivity gap between Italy and the US.

Source: Adalet McGowan, M and D. Andrews (2015), "Labour market mismatch and labour productivity: evidence from PIAAC data" *OECD Economics Department Working Paper,* No. 1209.

The OECD new book: out now!

Available at:

http://www.oecd.org/economy/the-future-of-productivity.htm

Book + 5 page policy note + technical papers + videos and ppt

Authors:

Müge Adalet McGowan

Dan Andrews

Chiara Criscuolo

Giuseppe Nicoletti

The following reports and papers detail the results:

- Adalet McGowan, M., D. Andrews, C. Criscuolo and G. Nicoletti (2015), *The Future of Productivity*
- Adalet McGowan, M. and D. Andrews (2015a), "Labour Market Mismatch and Labour Productivity: Evidence from PIAAC Data"
- Adalet McGowan, M. and D. Andrews (2015b), "Skill Mismatch and Public Policy in OECD Countries"
- Andrews, D. and F. Cingano (2012), "Public policy and resource allocation: Evidence from firms in OECD countries"
- Andrews, D., C. Criscuolo and P. Gal (2015), "Frontier Firms, Technology Diffusion and Public Policy: Micro Evidence from OECD Countries"
- Andrews, D., C. Criscuolo and C. Menon (2014), "Do resources flow to patenting firms? Cross-country evidence from firm level data"
- Calvino, F., C. Criscuolo and C. Menon (2015), "Cross-country Evidence of Start-Up Dynamics"
- Criscuolo, C., P. Gal and C. Menon (2014), "The Dynamics of Employment Growth: New Evidence from 18 Countries",
- Saia, A., D. Andrews and S. Albrizio (2015), "Public Policy and Spillovers From the Global Productivity Frontier: Industry Level Evidence",

Spares

A1-A3. Characteristics of the global frontier

A4-A7. Frontier robustness

A8-A12. More on misallocation, including skills

A1. The globally most productive firms: Who are they?

Comparing outcomes between frontier and non-frontier firms (2005)

Frontier: 100 globally most productive firms within each 2-digit sector

	Global Frontier Firms	Non-Frontier Firms	Difference in means
	Mean	Mean	
Productivity	4.06	2.51	1.5 ***
Employment	309	229	81
Capital stock (€m)	31	19	12 **
Turnover (€m)	250	59	191 ***
Profit rate	0.57	0.13	0.45 ***
Age	21.5	23.2	-1.7 ***
MNE status*			
Probability	0.47	0.28	0.19 ***
Patenting status			
Depreciated patent stock	3.71	0.90	2.8 ***

Note: definition based on Solow-residual type MFP, using industry-specific but country- and time-invariant factor shares. N = 297,688

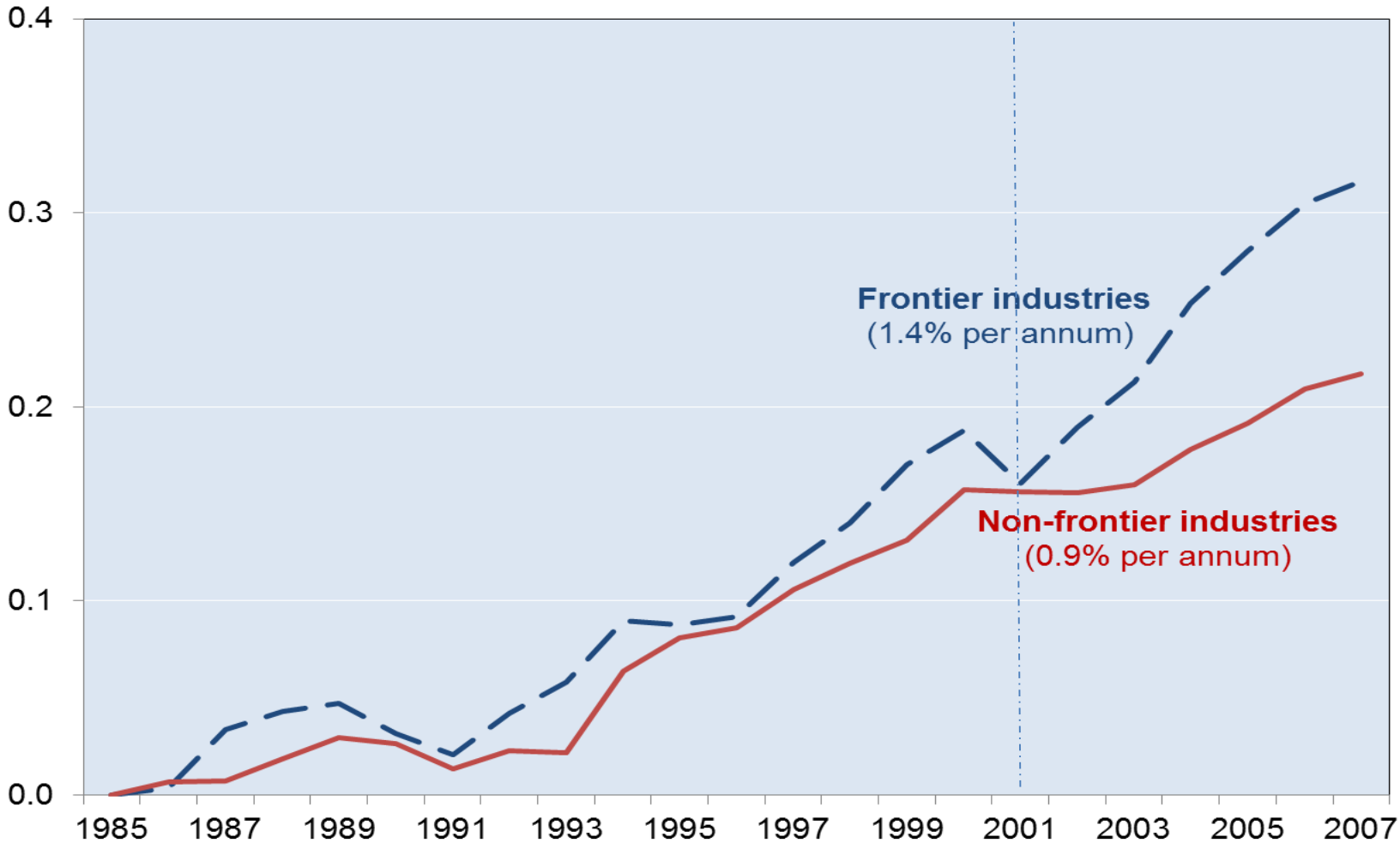
A2. The globally most productive firms: Coming from various countries

	Manufacturing			Business services	Total market sector
	Total	ICT producing	ICT using		
Austria		x	x	x	
Belgium	x	x	x	x	x
Czech Republic					
Germany	x	x	x	x	x
Denmark	x	x	x		
Estonia					
Spain	x	x	x	x	x
Finland		x	x		
France	x	x	x	x	x
Great Britain	x	x	x	x	x
Greece				x	
Hungary					
Italy	x	x	x	x	x
Japan	x	x	x	x	x
Korea	x	x	x	x	x
Netherlands	x	x	x	x	x
Norway					
Poland				x	
Portugal					
Sweden	x	x	x	x	x
Slovenia					
Slovakia					
United States	x	x	x	x	x
Number of countries (Total: 23)	12	14	14	14	11

Source: Andrews, D. C. Criscuolo and P. Gal (2015), **"**Frontier firms, technology diffusion and public policy: micro evidence from OECD countries**",** OECD Productivity Working Paper No. 2.

A3. Industry-level data show bigger divergence from early 2000s

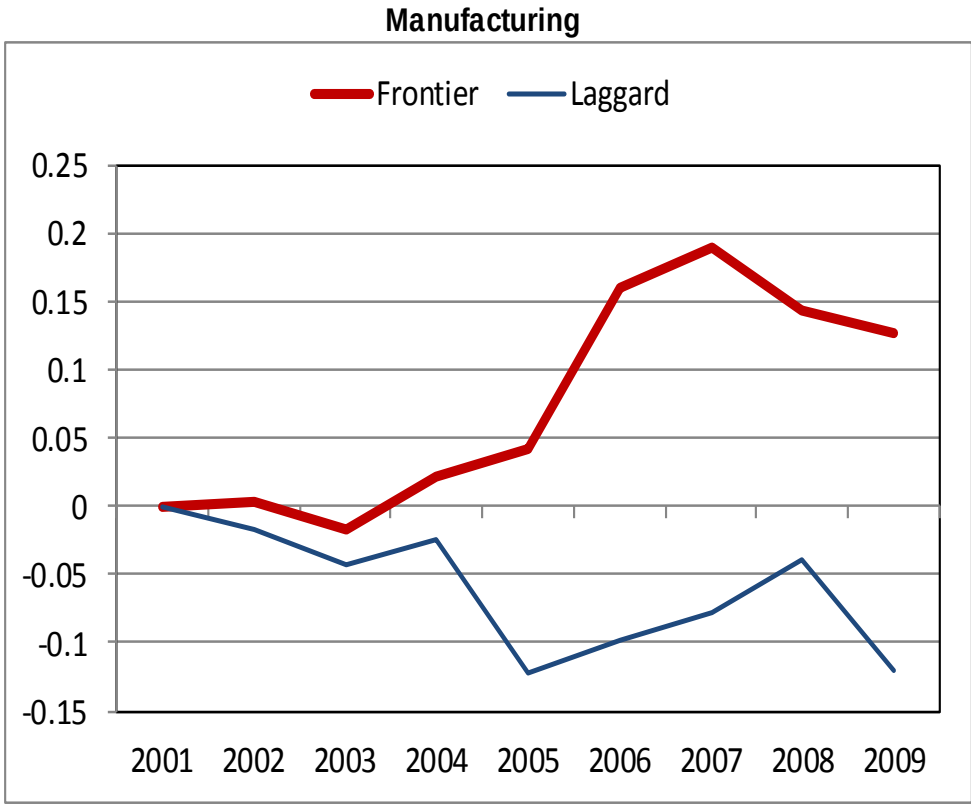
Unweighted average of TFP in the non-farm business sector; index 1985=0

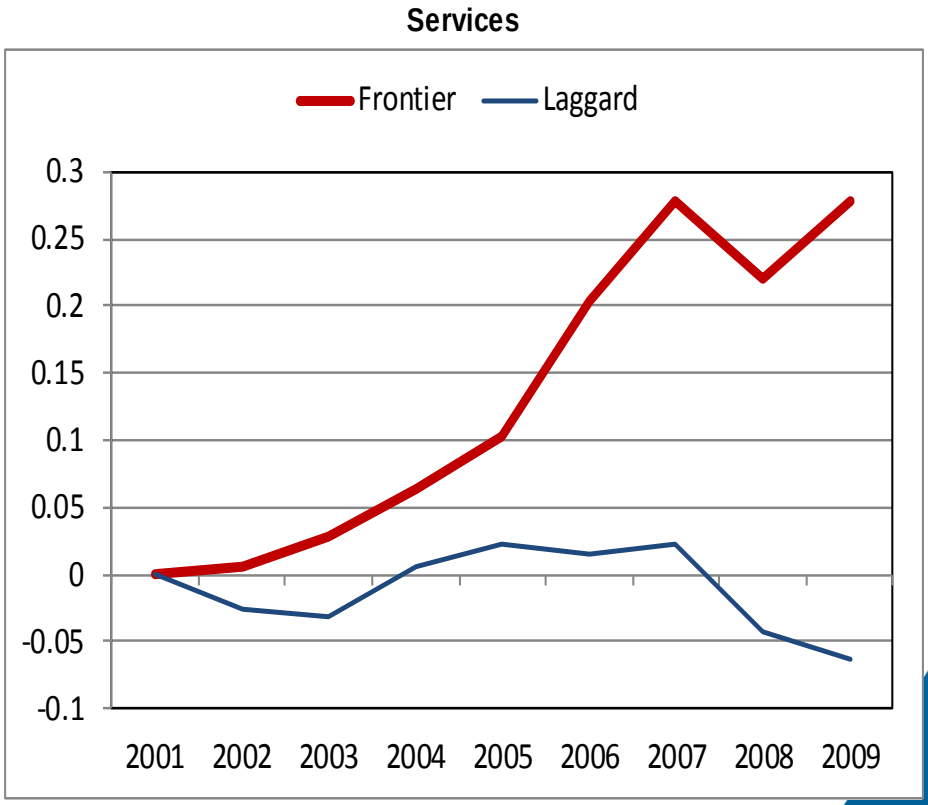


Source: OECD calculations based on Bourles et al (2013) dataset.

A4. Robustness: Productivity measure

Log of Solow-residual based MFP, top 100; index 2001=0

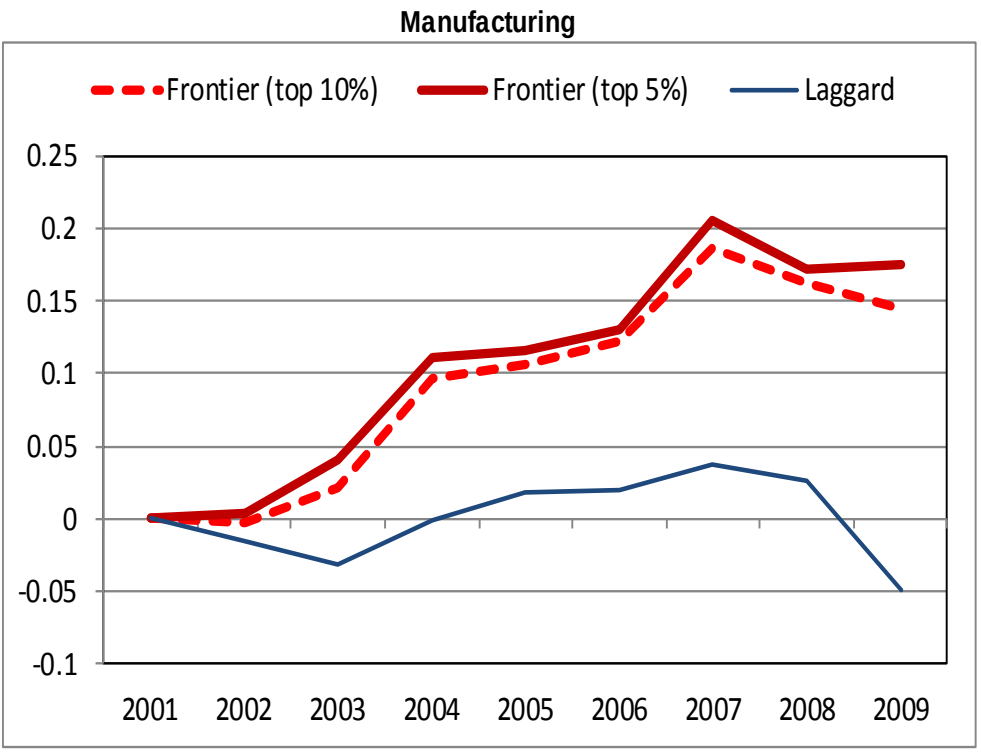


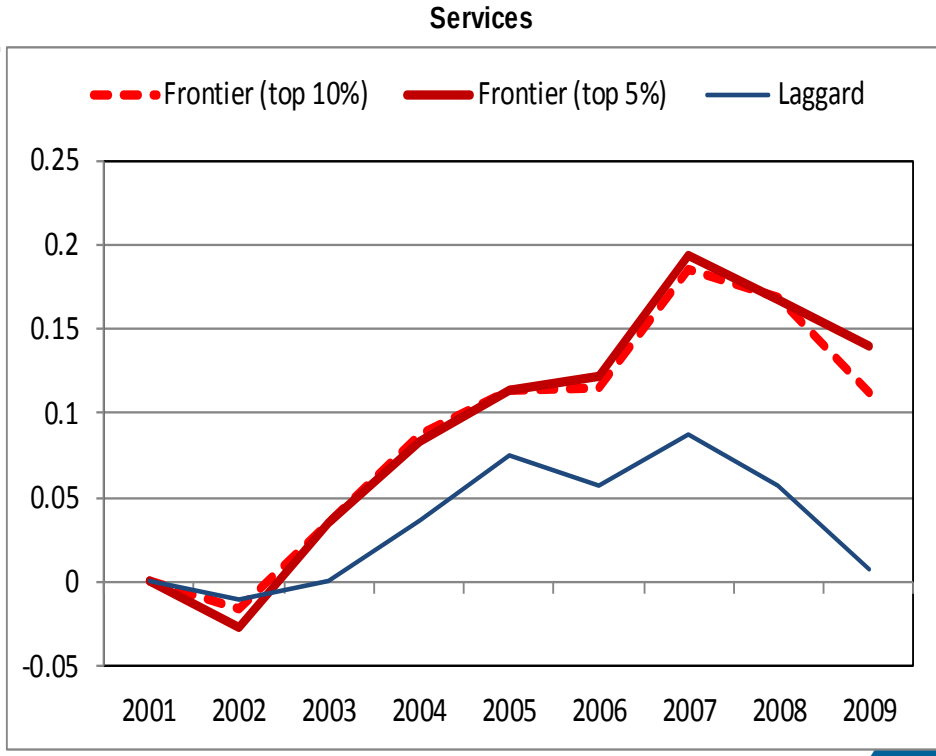


Source: Andrews, D. C. Criscuolo and P. Gal (2015), **"**Frontier firms, technology diffusion and public policy: micro evidence from OECD countries**",** OECD Productivity Working Paper No. 2.

A5. Robustness: Frontier measure

Log of labor productivity, top 5%, top 10%; index 2001=0

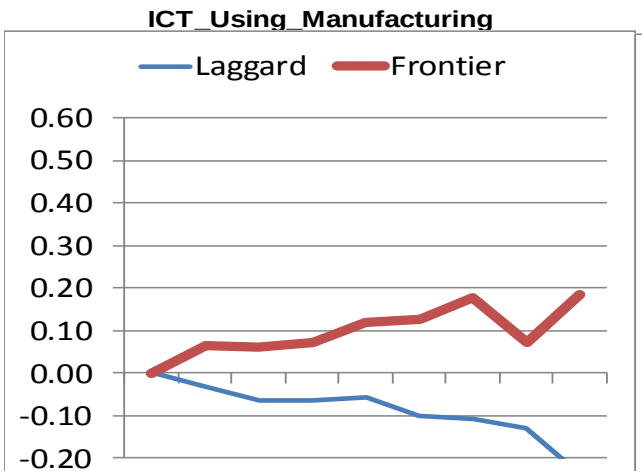


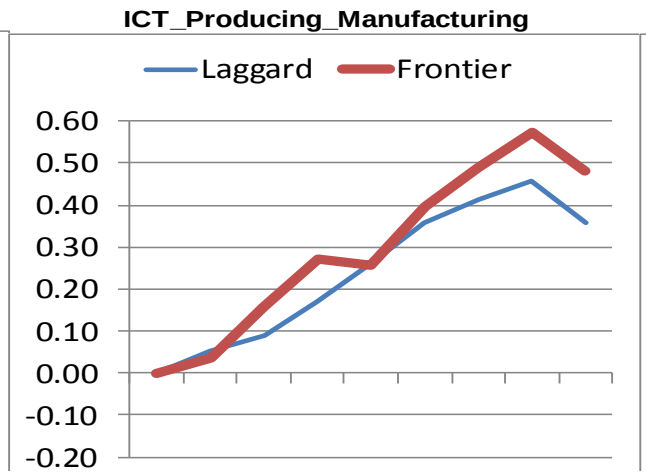


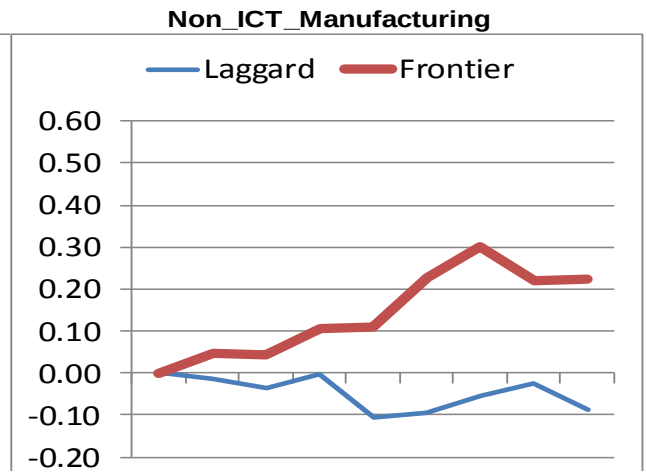
Source: Andrews, D. C. Criscuolo and P. Gal (2015), "Frontier firms, technology diffusion and public policy: micro evidence from OECD countries", OECD Productivity Working Paper No. 2.

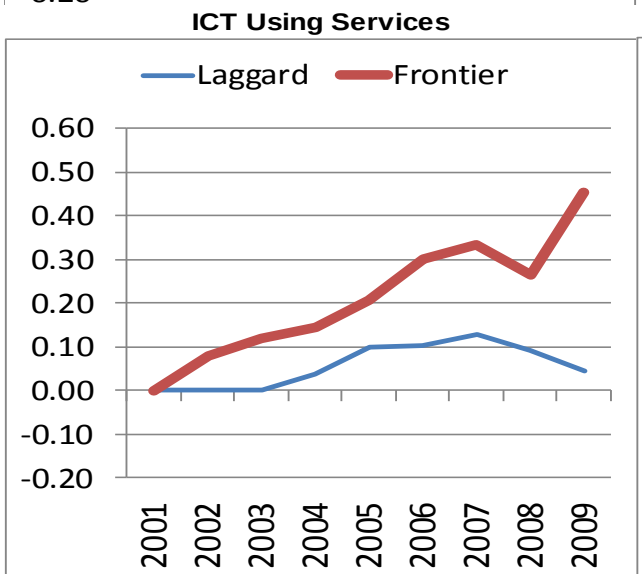
A6. Robustness: By Industry and ICT intensity

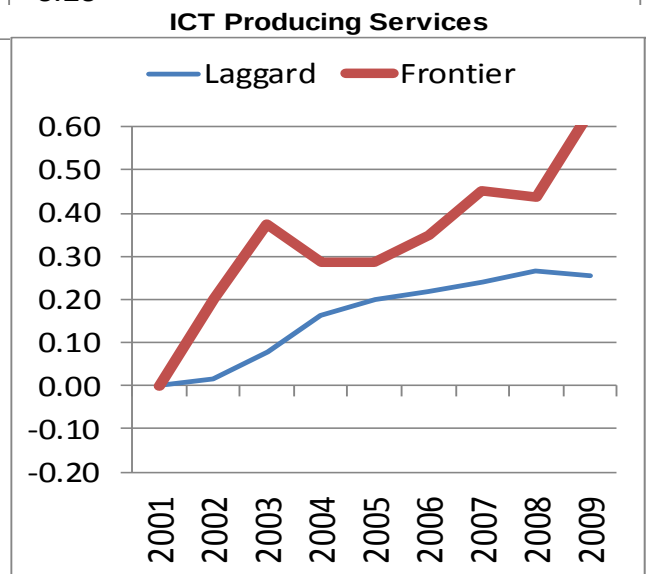
Log of labor productivity; index 2001=0

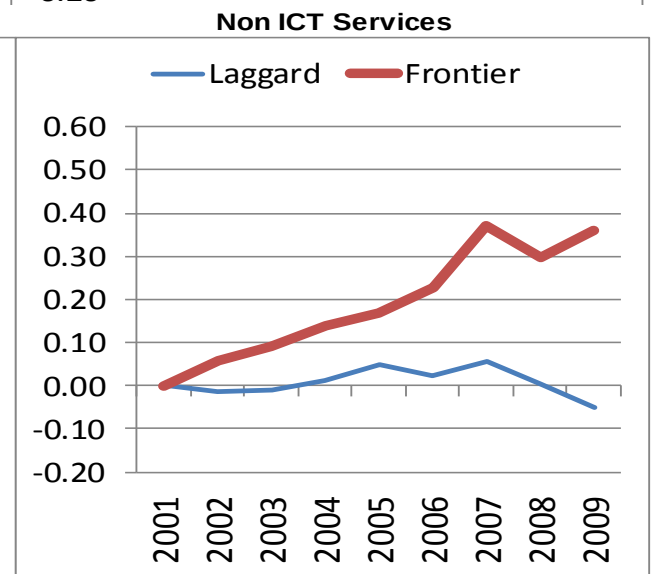






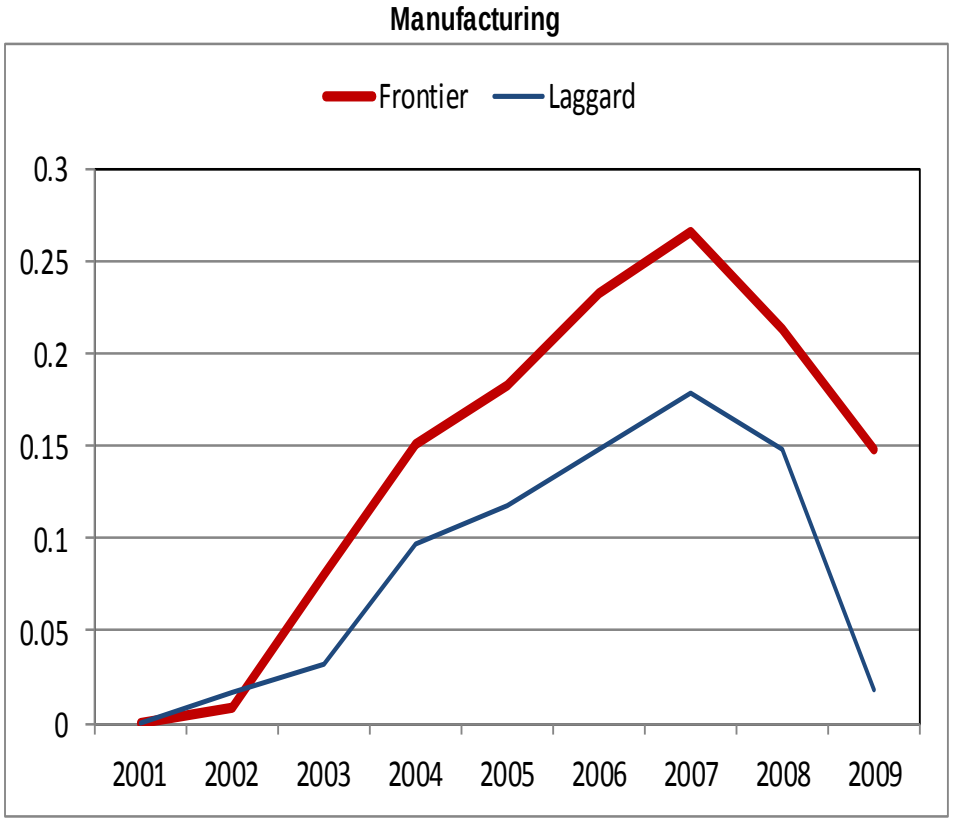


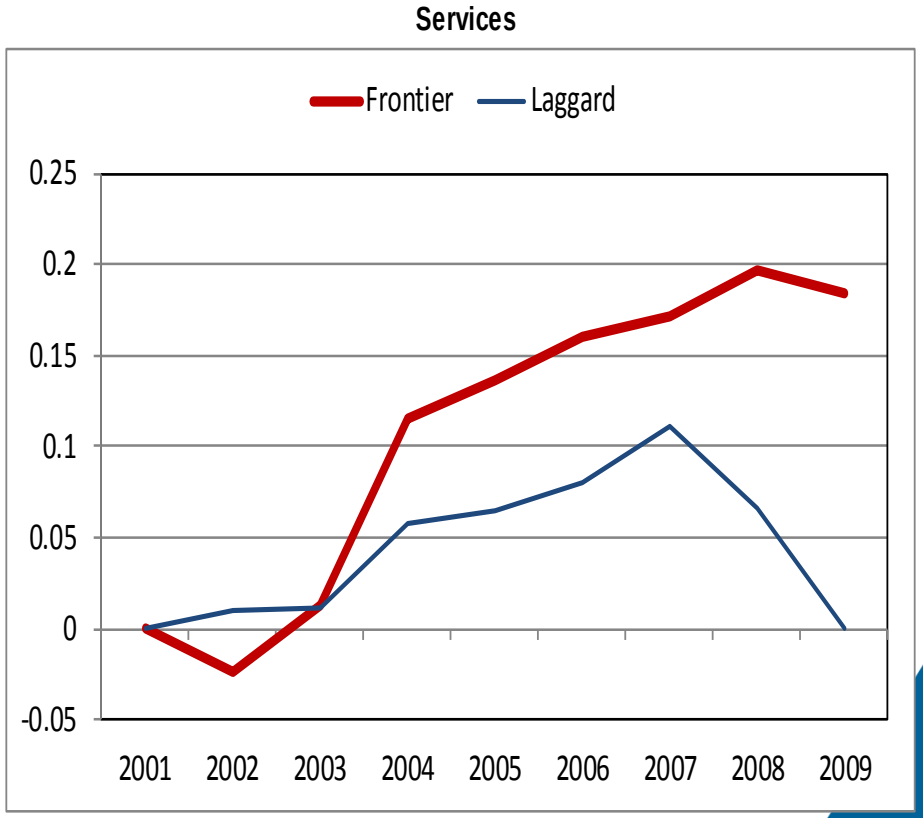




A7. Robustness: Surviving firms only

Log of labor productivity, top 100; index 2001=0
Balanced sample, both on and off the frontier

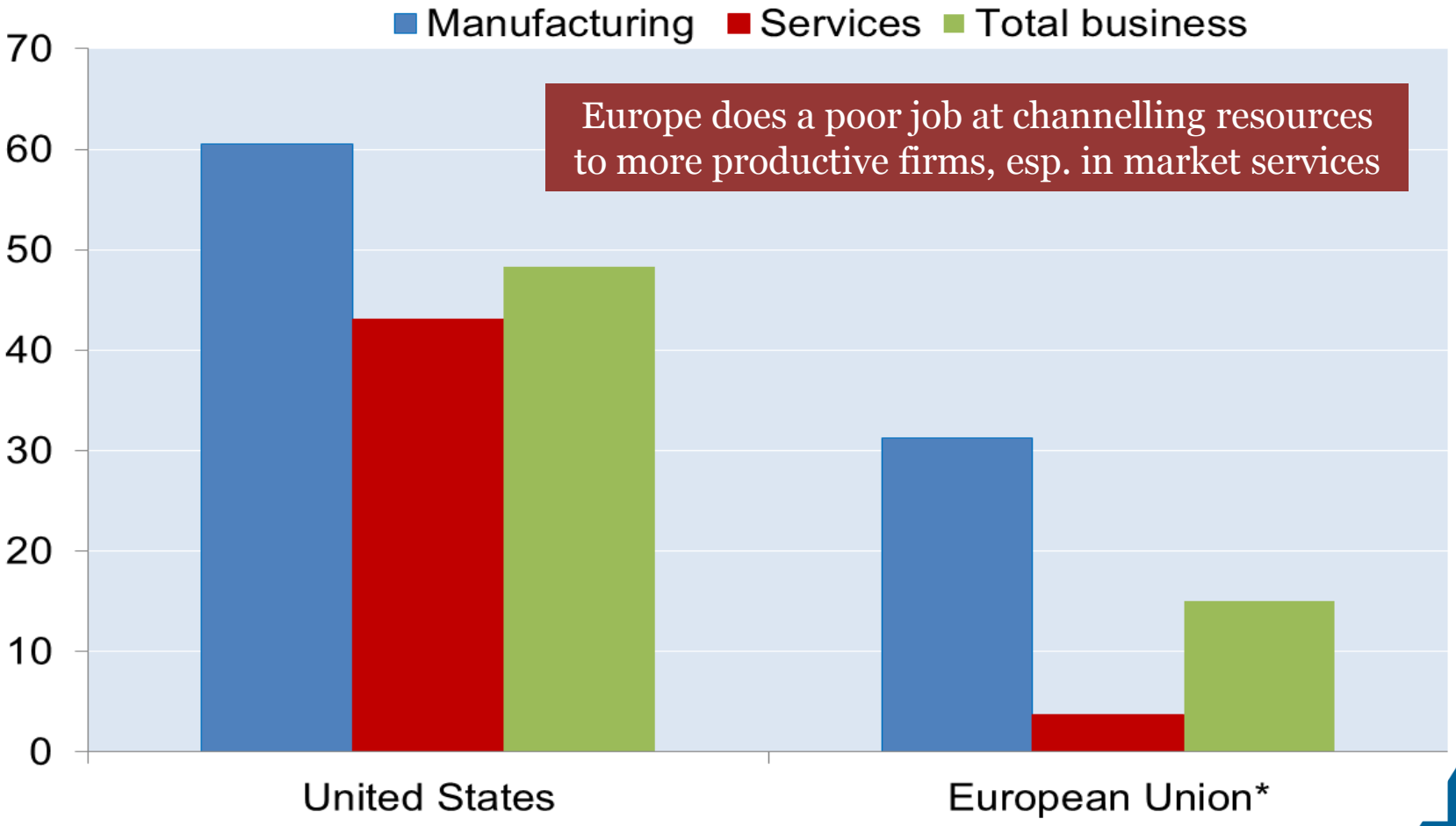




Source: Andrews, D. C. Criscuolo and P. Gal (2015), **"**Frontier firms, technology diffusion and public policy: micro evidence from OECD countries**",** OECD Productivity Working Paper No. 2.

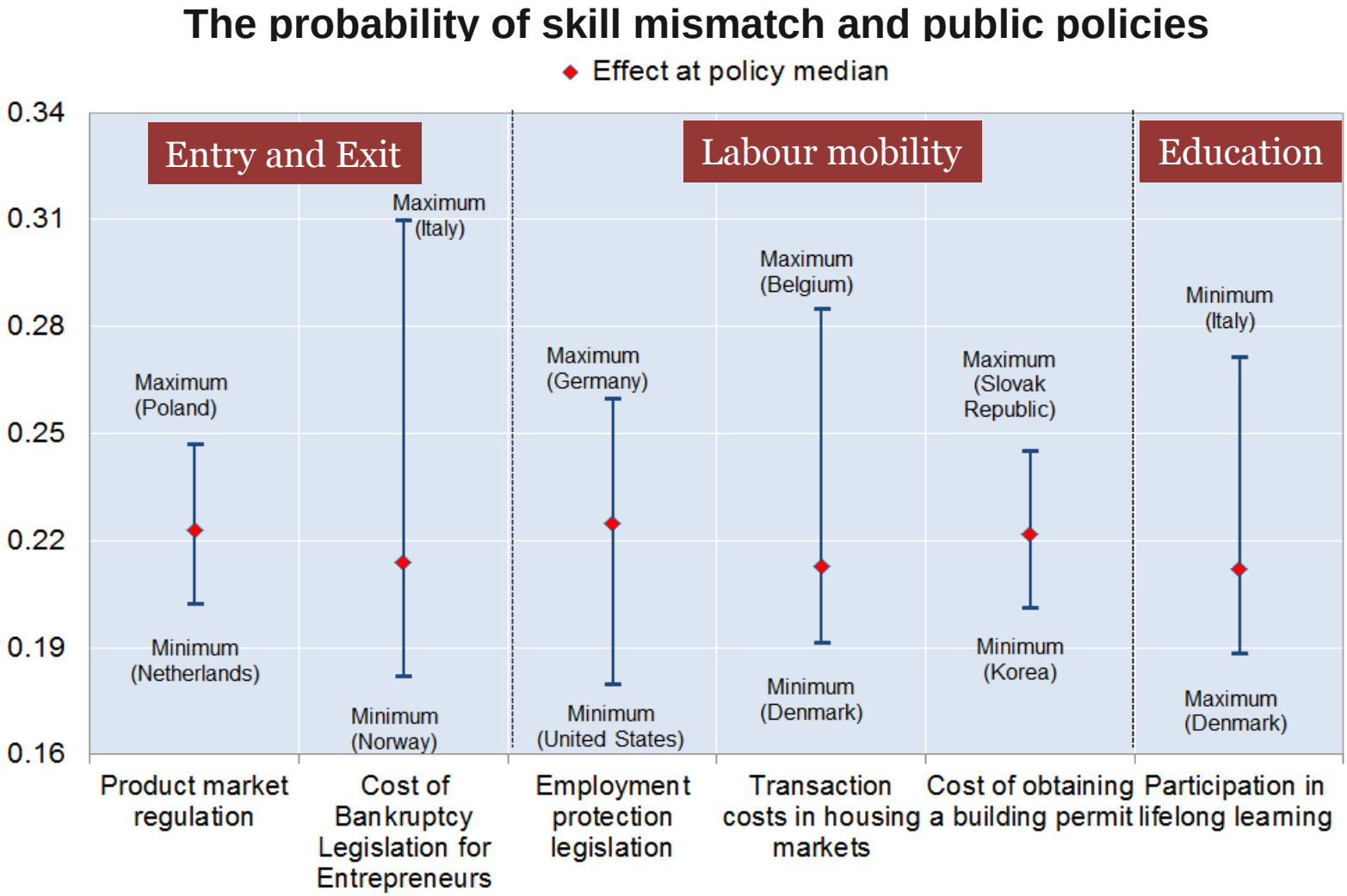
A8. Misallocation, big time!

Contribution of the allocation of employment across firms to the level of labour productivity; per cent



Andrews, D. and F. Cingano (2014), "Public Policy and Resource Allocation: Evidence from Firms in OECD Countries", *Economic Policy*, No. 29(78), pp. 253-296.

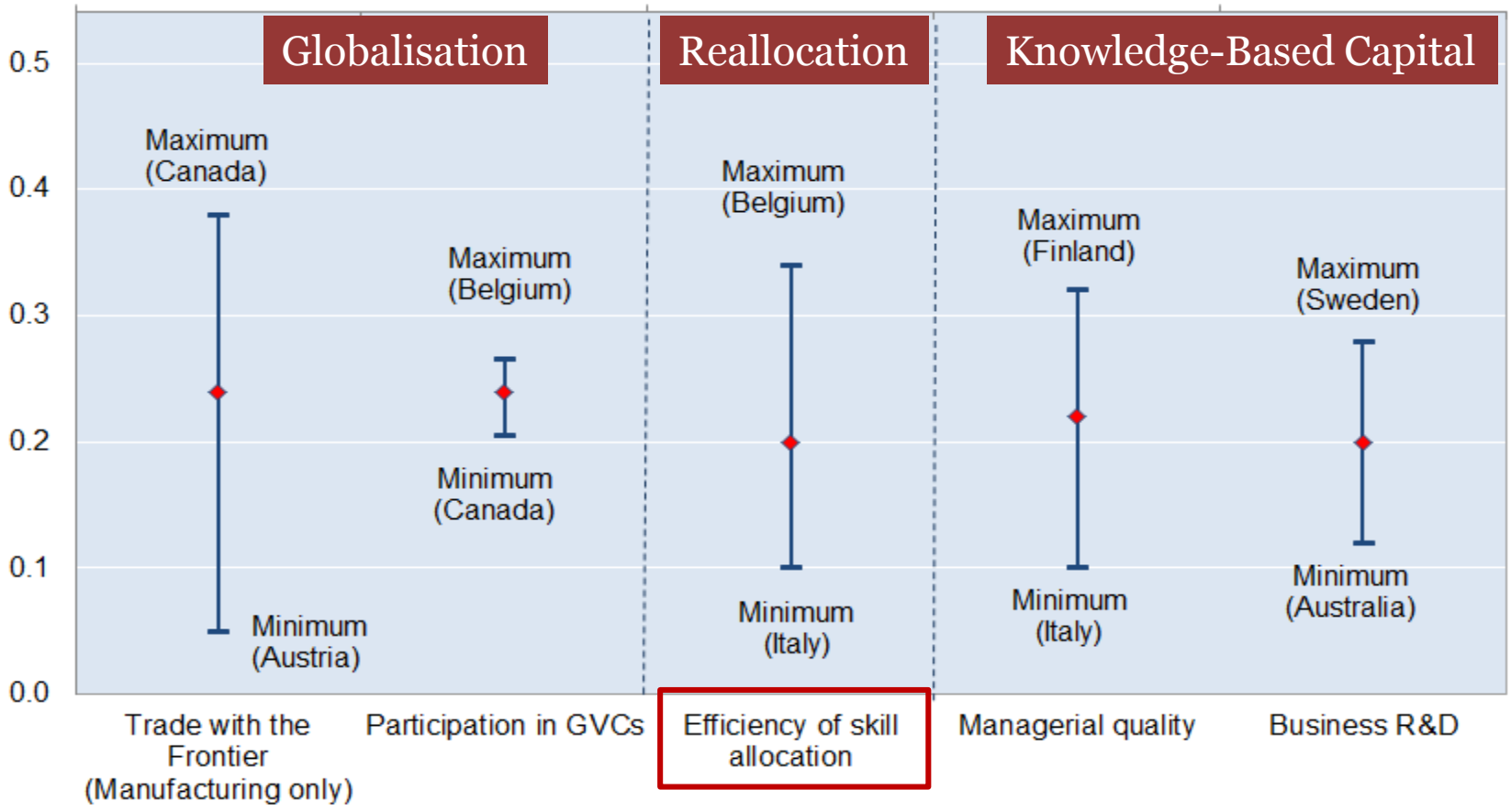
A9. Skill misallocation is policy-induced



Source: Adalet McGowan, M and D. Andrews (2015), "Skill mismatch and public policy in OECD countries" *OECD Economics Department Working Paper,* No. 1210.

A10. Diffusion comes easier to some economies than others

Estimated frontier spillover (% pa) associated with a 2% point increase in MFP growth at the global productivity frontier



Source: Saia, A., D. Andrews and S. Albrizio (2015), "Public Policy and Spillovers From the Global Productivity Frontier: Industry Level Evidence", OECD Economics Department Working Papers, No. 1238.

A11. Skill mismatch: combining self-assessment with skill proficiency

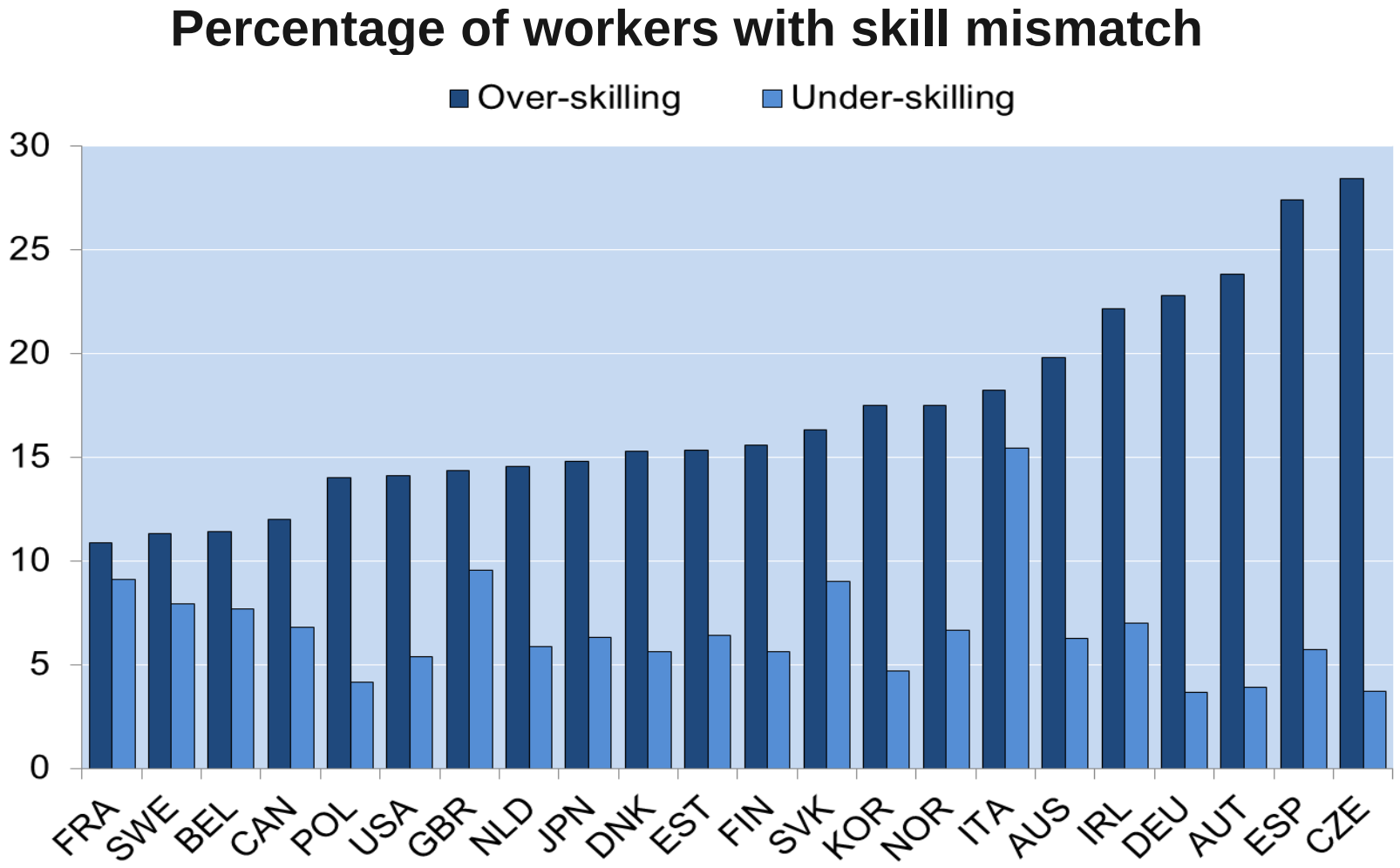
Use micro-data from OECD Survey of Adult Skills (PIAAC) to:

1. Create a quantitative scale of the skills required to perform the job for each occupation using the literacy scores of well-matched workers – *those who neither feel they have the skills to perform a more demanding job nor require further training to perform their current job satisfactorily*.

2. Use this scale to identify *min* and *max* threshold values (*e.g.,* based on the 10^{th} and 90^{th} percentile), which bounds what it is to be a well-matched worker.

3. Workers with scores lower (higher) than this *min* (*max*) threshold in their occupation are under (over) skilled.

A12. Over-skilling is more prevalent than under-skilling



On average, over-skilling is ~2½ times more likely than under-skilling