OECD EMPLOYMENT OUTLOOK 2017

CHAPTER 3

HOW TECHNOLOGY AND GLOBALISATION ARE TRANSFORMING THE LABOUR MARKET

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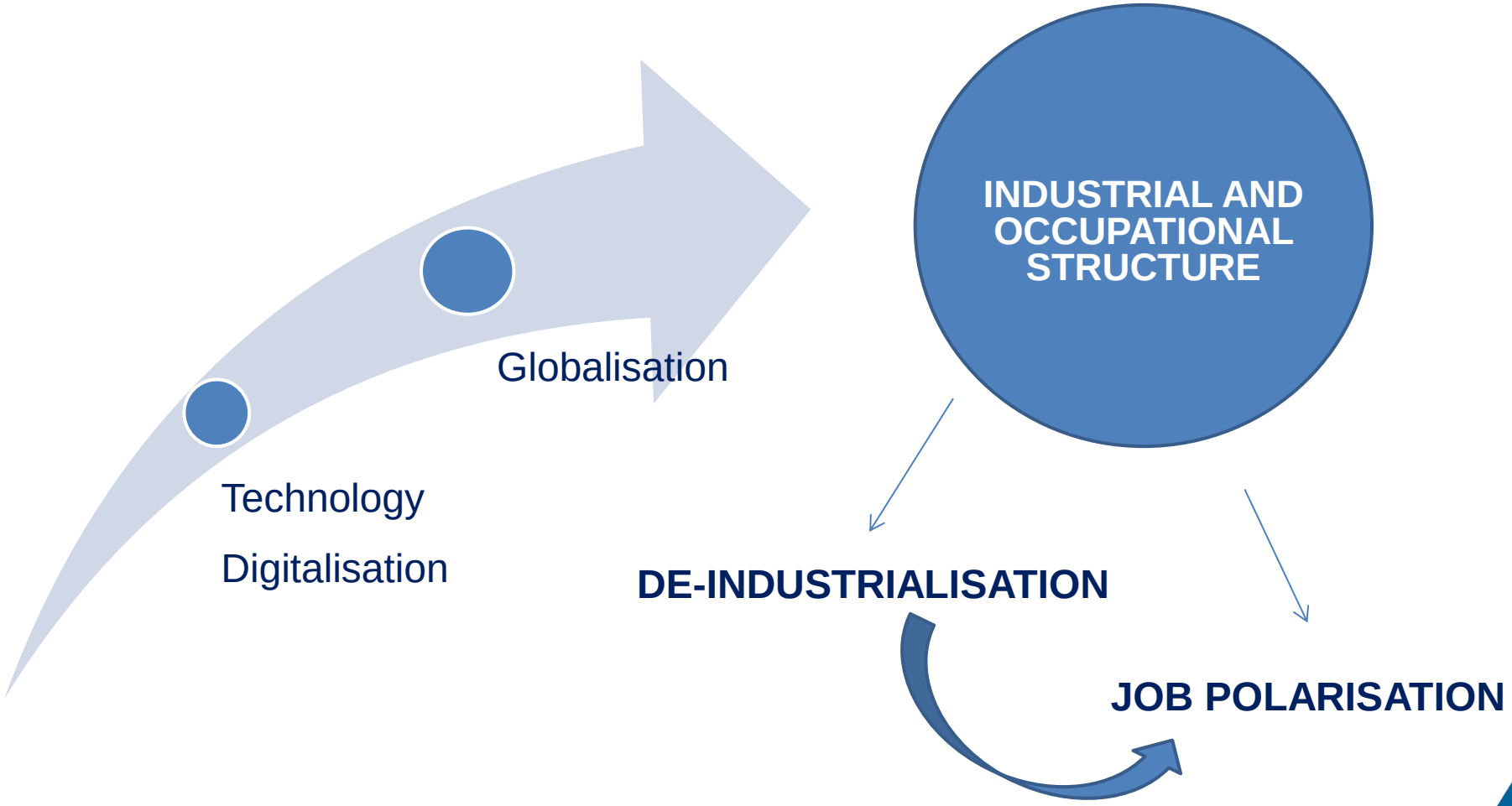
OECD
BETTER POLICIES FOR BETTER LIVES

Technology and globalisation are shaping the world of work



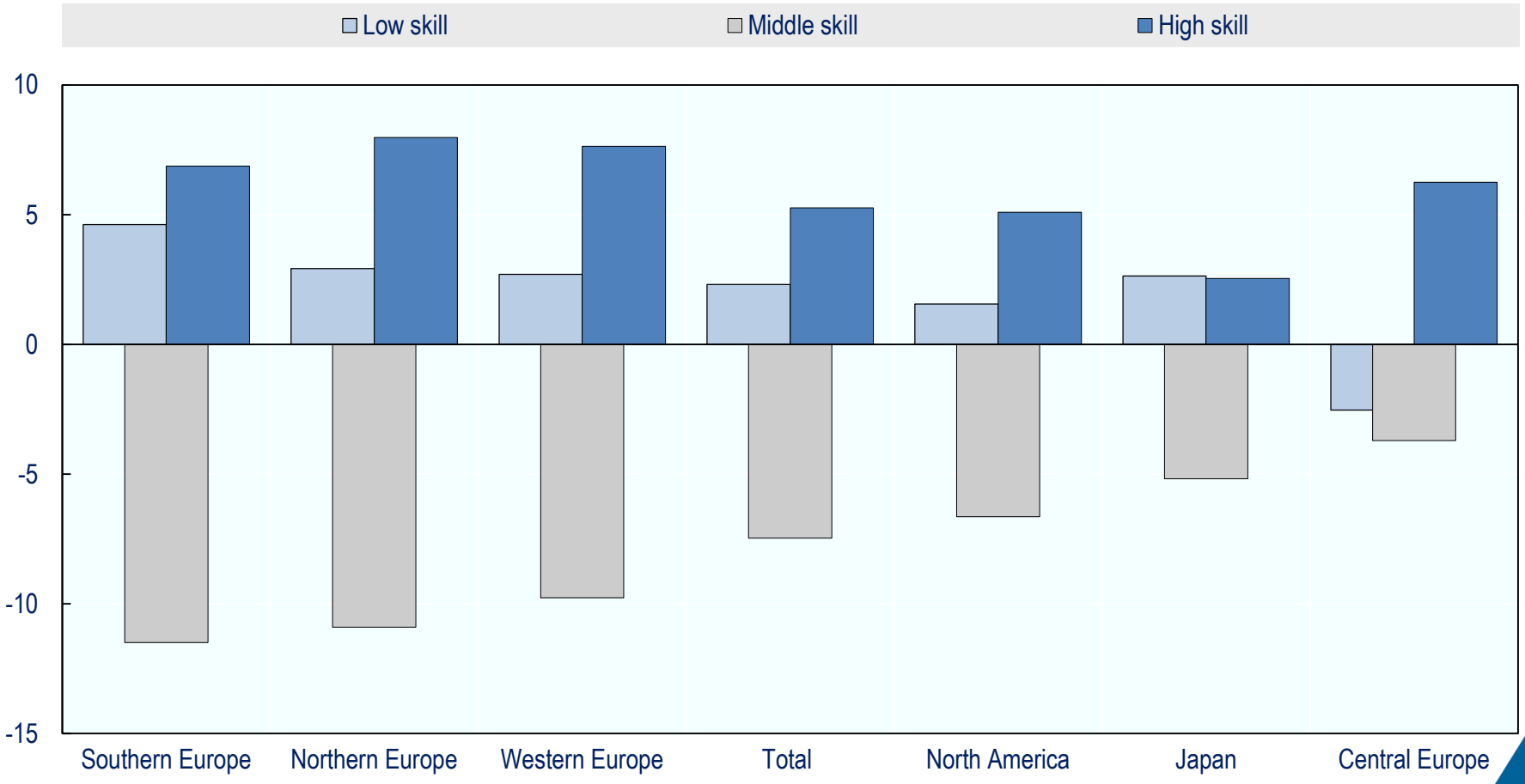
We build on a vast literature

- Our starting point is the pioneering work on polarisation by Autor, Katz and Kearney (2006), Autor and Dorn (2013), Goos and Manning (2007), and Goos, Manning and Salomons (2009, 2014).
- A more recent literature looks at the role of specific megatrends such as globalisation and the rise of China (e.g. Autor, Dorn and Hanson (2013, 2015, 2016), Keller and Utar (2016)).
- We add to recent OECD contributions (e.g. Marcolin, Miroudot and Squicciarini, 2016; OECD, 2016).
- In particular, we extend the analysis by Breemersch, Damijan and Konings (2017).

The labour market continues to polarise

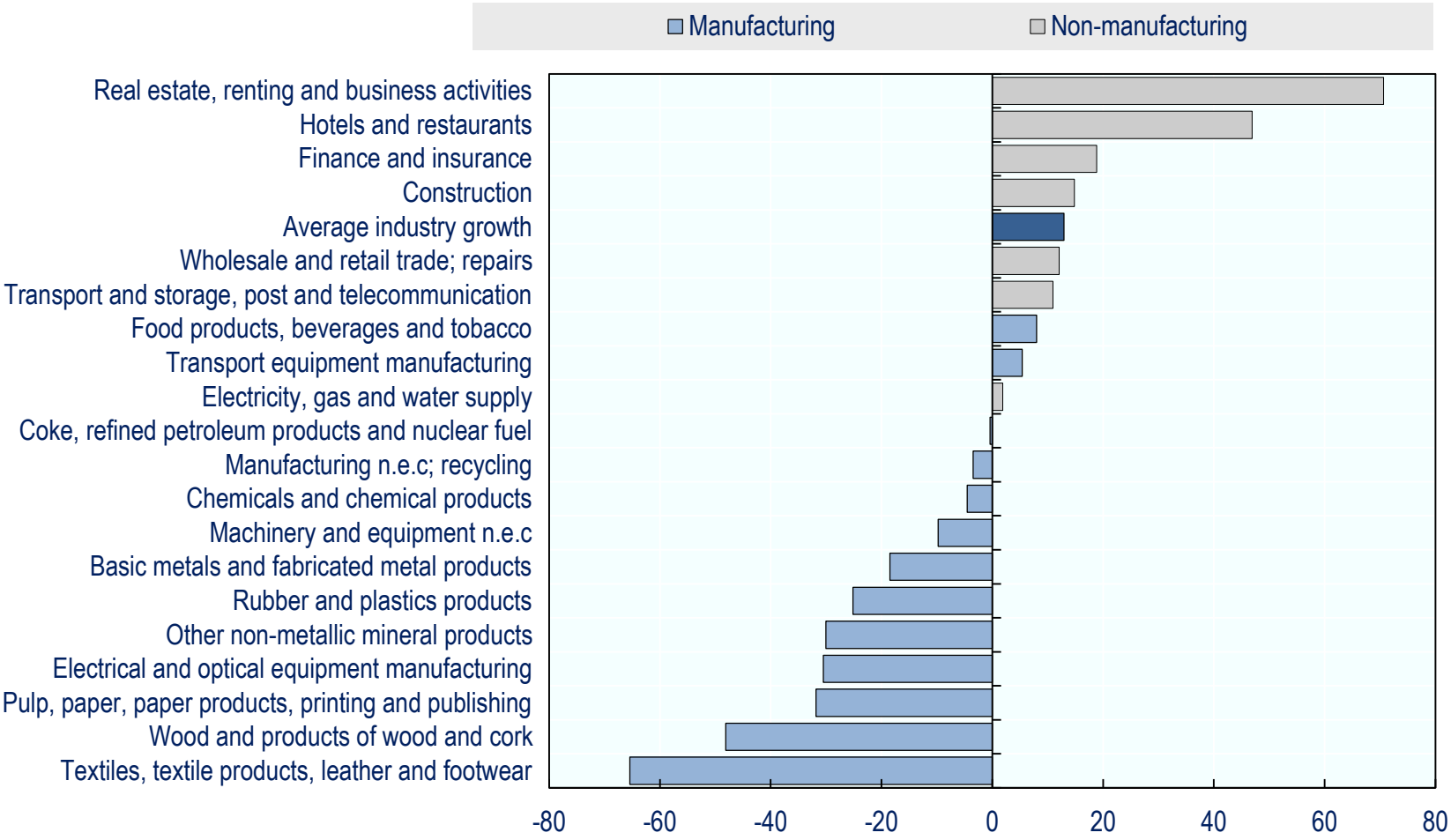
Labour market polarisation, selected OECD countries by region, 1995 to 2015

Percentage point change in share of total employment



The decline of manufacturing

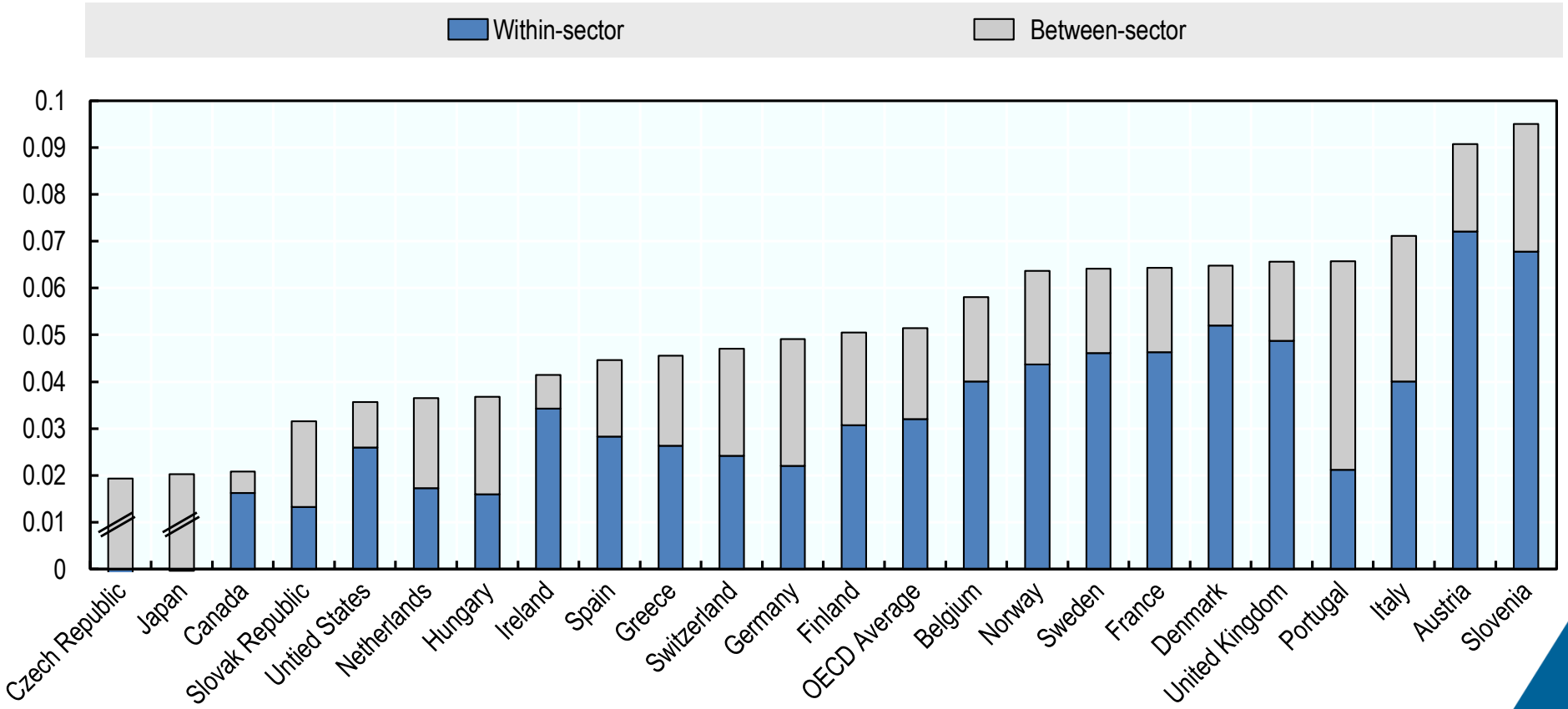
Percentage change in total employment within industry, 1995 to 2015



Note: The figure includes Austria, Belgium, Canada, the Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Netherlands, Norway, Portugal, the Slovak Republic, Slovenia, Spain, Sweden, the United Kingdom and the United States.

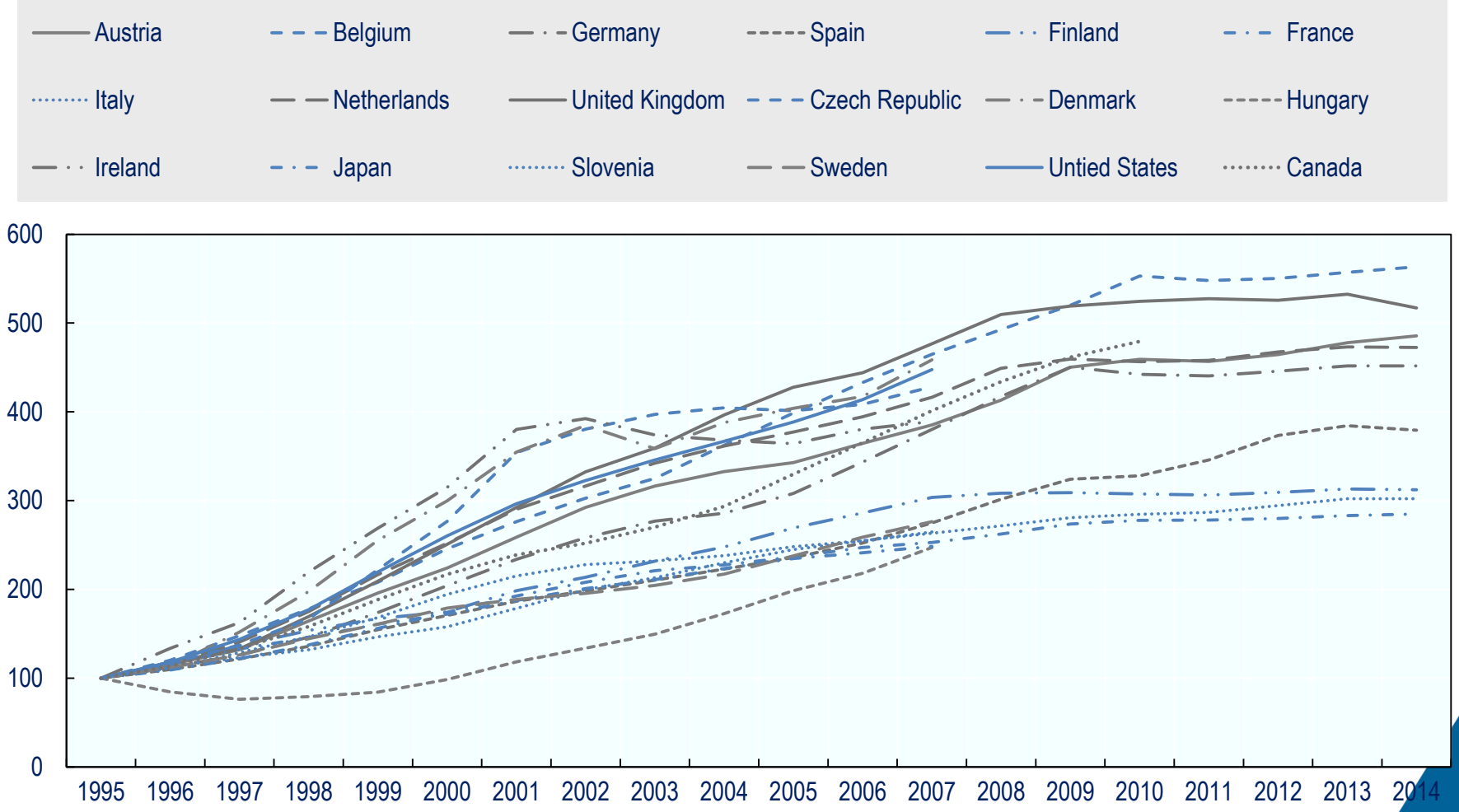
Most polarisation in the OECD comes from within-sector shifts rather than changing industrial structure

Percentage-point change in polarisation between 1997 and 2007



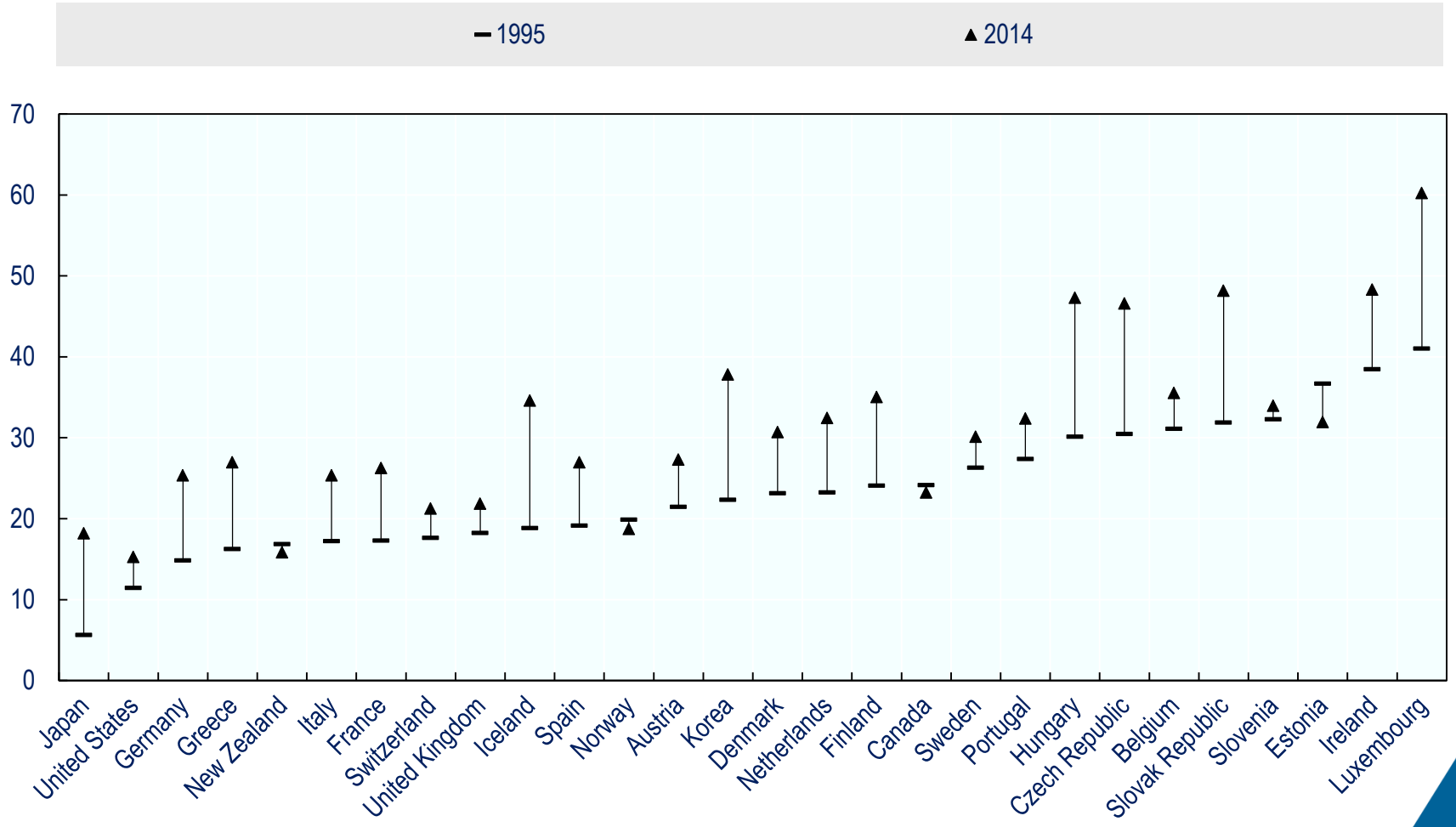
ICT technology has spread fast throughout the world

ICT capital services per hour worked, index (1995 = 100), 1995 to 2014



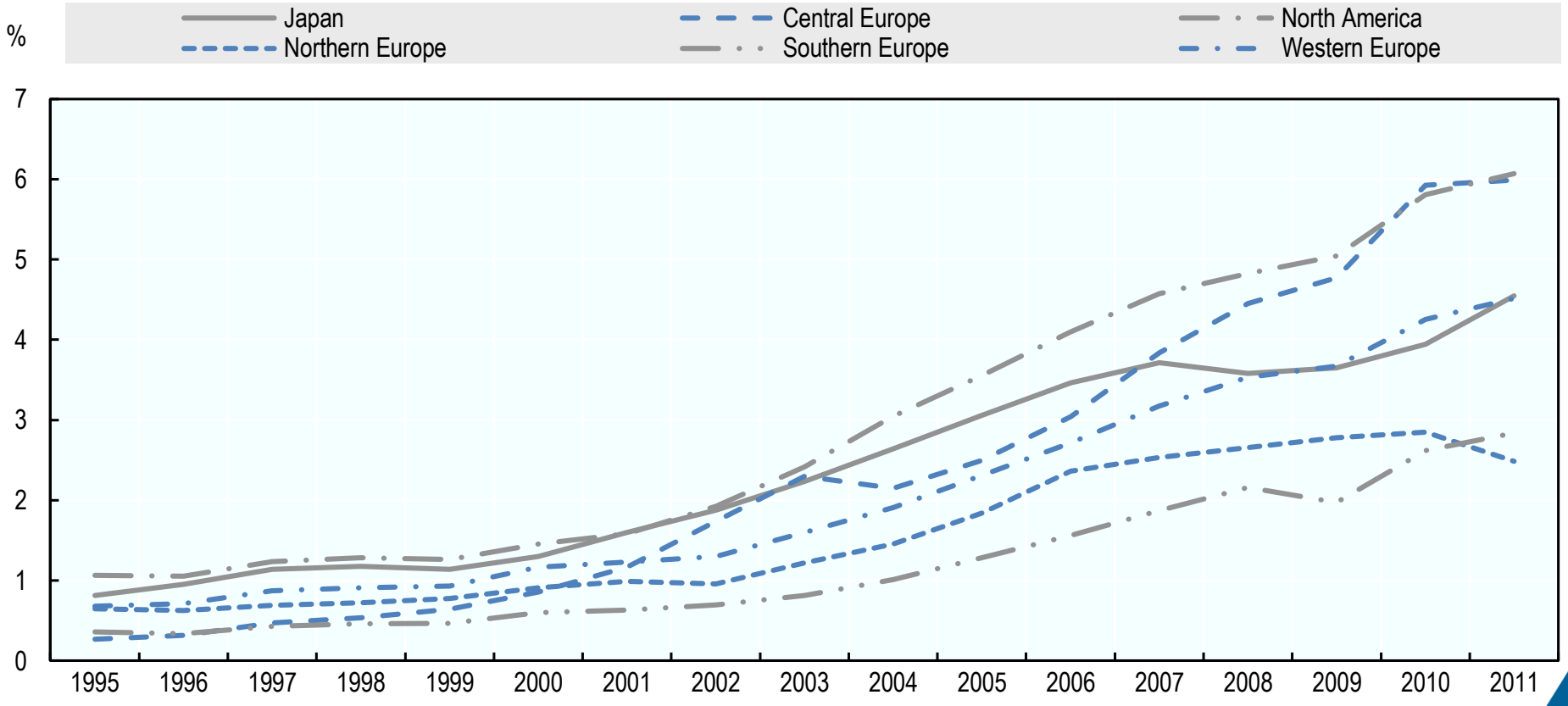
The rise of global value chains

Change in foreign value added share of gross exports, 1995 to 2014



China is an increasingly important global player

Chinese imports as a share of total domestic absorption, 1995 to 2011



Empirical strategy

Polarisation

$$ln\frac{N_h}{N_{m_{ict}}} = \alpha_1 + \alpha_2 lnICT_{ict} + \alpha_3 lnR\&D\ intensity_{ict} + \alpha_4 lnTiVA_{ict} + \alpha_5 lnImp.pen_{ict}^{CHN} + \theta_{ic} + \varphi_{ct} + \epsilon_{ict}$$

$$ln\frac{N_l}{N_{m_{ict}}} = \beta_1 + \beta_2 lnICT_{ict} + \beta_3 lnR\&D\ intensity_{ict} + \beta_4 lnTiVA_{ict} + \beta_5 lnImp.pen_{ict}^{CHN} + \theta_{ic} + \psi_{ct} + \eta_{ict}$$

De-Industrialisation

$$\Delta lnE_{ict} = \gamma_1 + \gamma_2 \Delta lnICT_{ict} + \gamma_3 \Delta lnR\&D\ intensity_{ict} + \gamma_4 \Delta lnTiVA_{ict} + \gamma_5 \Delta lnImp.pen_{ict}^{CHN} + \delta_{ct} + \omega_{ict}$$

Results

- Increased technology adoption displays the strongest association with labour market polarisation.
  - A 10% increase in ICT use is associated with a 1.5% increase in high-skill relative to middle-skill employment within manufacturing.

The determinants of polarisation

Polarisation in the manufacturing sector, 1995-2007

	(1) top	(2) bottom	(3) top	(4) bottom	(5) top	(6) bottom
ICT	0.16**	-0.03	0.15**	-0.03	0.15**	-0.03
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
R&D intensity			0.04	-0.03	0.04	-0.03
			(0.02)	(0.03)	(0.03)	(0.03)
TiVA					-0.10	-0.02
					(0.12)	(0.26)
Imp.pen^{CHN}					0.01	0.06
					(0.02)	(0.04)
N	2496	2488	2496	2488	2496	2488

Measuring the impacts of technology and globalisation on the labour market

- Increased technology adoption displays the strongest association with labour market polarisation.
  - A 10% increase in ICT use is associated with a 1.5% increase in high-skill relative to middle-skill employment within manufacturing.
- Technology adoption displays a clear association with the progressive shift of employment from manufacturing to services.
  - A 10% increase in ICT correlates with a fall of 0.5% in manufacturing employment.
  - Overall, ICT use does not display negative effects on employment across the economy.

The determinants of de-industrialisation

Employment growth in manufacturing and non-manufacturing, 1995-2007

	(1)	(2)	(3)	(4)
	Manufacturing		Non-manufacturing	
	Δ ln emp	Δ ln emp	Δ ln emp	Δ ln emp
ICT	-0.06*	-0.05*	-0.01	0.01
	(0.03)	(0.03)	(0.02)	(0.03)
$Imp.pen^{CHN}$		-0.02**		0.01
		(0.01)		(0.00)
N	2619	2477	1399	908

Measuring the impacts of technology and globalisation on the labour market

- No clear relationship between involvement in global value chains (or the penetration of Chinese imports), and changing occupational patterns…

  …but some evidence that growing import penetration from China has contributed to reducing employment in manufacturing.

- Labour market institutions may affect the way trade and globalisation impact the structure of the labour market.

  - Stricter EPL amplifies the effect of both ICT and GVC's on polarisation.
  - Stronger unions reduce the effect of ICT on bottom polarisation.

The role of institutions

Manufacturing sector polarisation, 1995 to 2007

	(1) Top	(2) Top	(3) Top	(4) Bottom	(5) Bottom	(6) Bottom
Institutions →	Union density.	Minimum wage	EPL	Union density	Minimum wage	EPL
ICT	0.15**	0.16**	0.11*	0.06	-0.03	-0.11
	(0.07)	(0.06)	(0.06)	(0.08)	(0.07)	(0.07)
ICT x Strong institution	0.01	-0.01	0.09*	-0.16***	0.01	0.17***
	(0.04)	(0.03)	(0.05)	(0.05)	(0.05)	(0.05)
R&D	0.04*	0.04	0.04**	-0.02	-0.03	-0.08*
	(0.02)	(0.03)	(0.02)	(0.03)	(0.03)	(0.04)
R&D x Strong institution	0.00	-0.01	-0.01	-0.01	-0.01	0.09*
	(0.02)	(0.02)	(0.03)	(0.03)	(0.03)	(0.05)
TiVA	-0.07	-0.10	-0.27**	-0.01	-0.04	-0.59
	(0.12)	(0.13)	(0.11)	(0.21)	(0.26)	(0.50)
TiVA x Strong institution	-0.04	0.04	0.28**	-0.02	0.12	0.94
	(0.08)	(0.09)	(0.11)	(0.16)	(0.14)	(0.63)
N	2496	2496	2496	2488	2488	2488

Conclusions

- Increased technology adoption displays the strongest association with labour market polarisation.
- Technology adoption displays a clear association with the progressive shift of employment from manufacturing to services.
- No clear relationship between involvement in global value chains (or the penetration of Chinese imports), and changing occupational patterns…
- … but some evidence that growing import penetration from China has contributed to reducing employment in manufacturing
- Labour market institutions may affect the way trade and globalisation impact the structure of the labour market

Thank you

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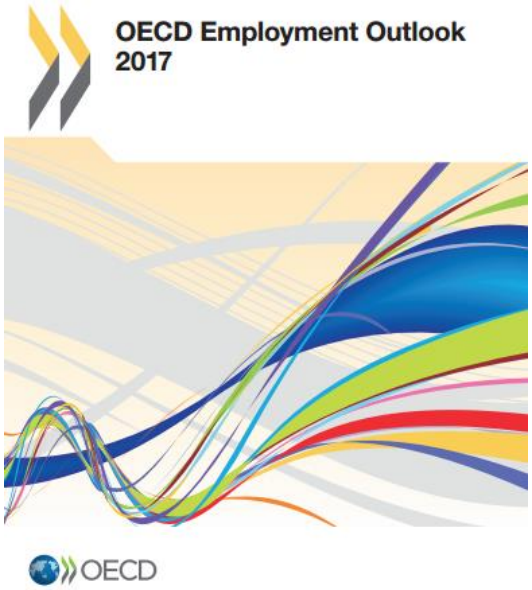

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