Appendix 1.

Compatibility between polarisation and upgrading trends

According to the polarisation hypothesis, total employment is, in a given period of time t, divided into three classes of workers, low-skill (L), middle-skill (M) and high-skill H, as shown in formula (1)

$$E_t = L_t + M_t + H_t \quad (1)$$

The shares of these classes are represented in equation (2)

$$1 = \frac{L_t}{E_t} + \frac{M_t}{E_t} + \frac{H_t}{E_t} = s_{Lt} + s_{Mt} + s_{ht} \quad (2)$$

And share changes over a period of time, from t to t+1 can be represented as follows:

$$\Delta s_L + \Delta s_M + \Delta s_H = 0 \quad (3)$$

Polarisation can be formalised as $\Delta s_M < 0$, which implies that $\Delta s_L + \Delta s_H > 0$.

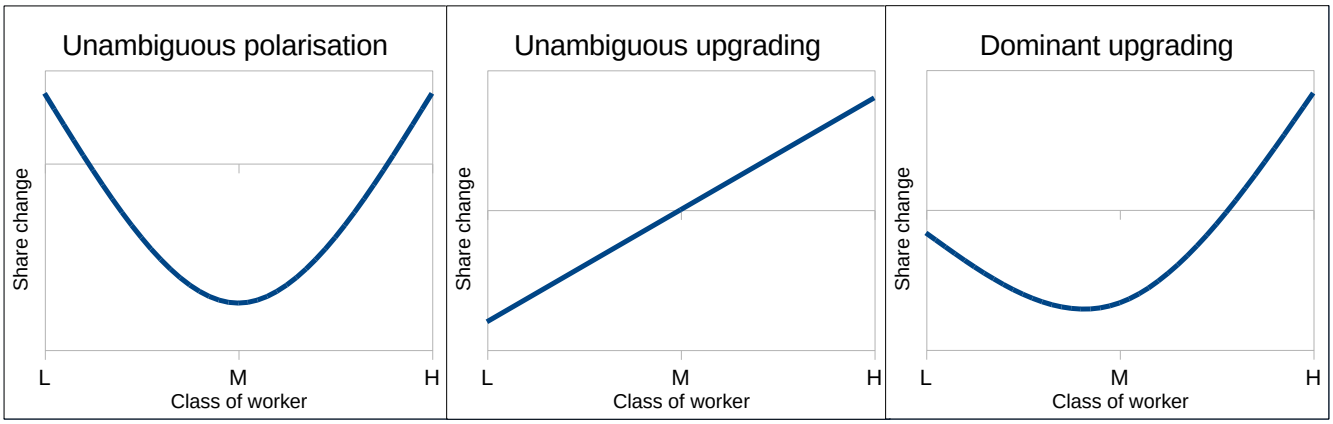
Condition $\Delta s_L + \Delta s_H > 0$ holds when:

1) $\Delta s_L > 0 \wedge \Delta s_H > 0$, which corresponds to unambiguous polarisation, e.g. Goos et al. (2009), Autor (2015)
2) $\Delta s_H \gg 0 \wedge \Delta s_L < 0$, which corresponds to upgrading
3) $\Delta s_H < 0 \wedge \Delta s_L \gg 0$, which corresponds to downgrading (not discussed in this paper)

The second case identifies an upgrading situation if, for a sufficiently large $\Delta s_H \gg 0$, either the following conditions hold:

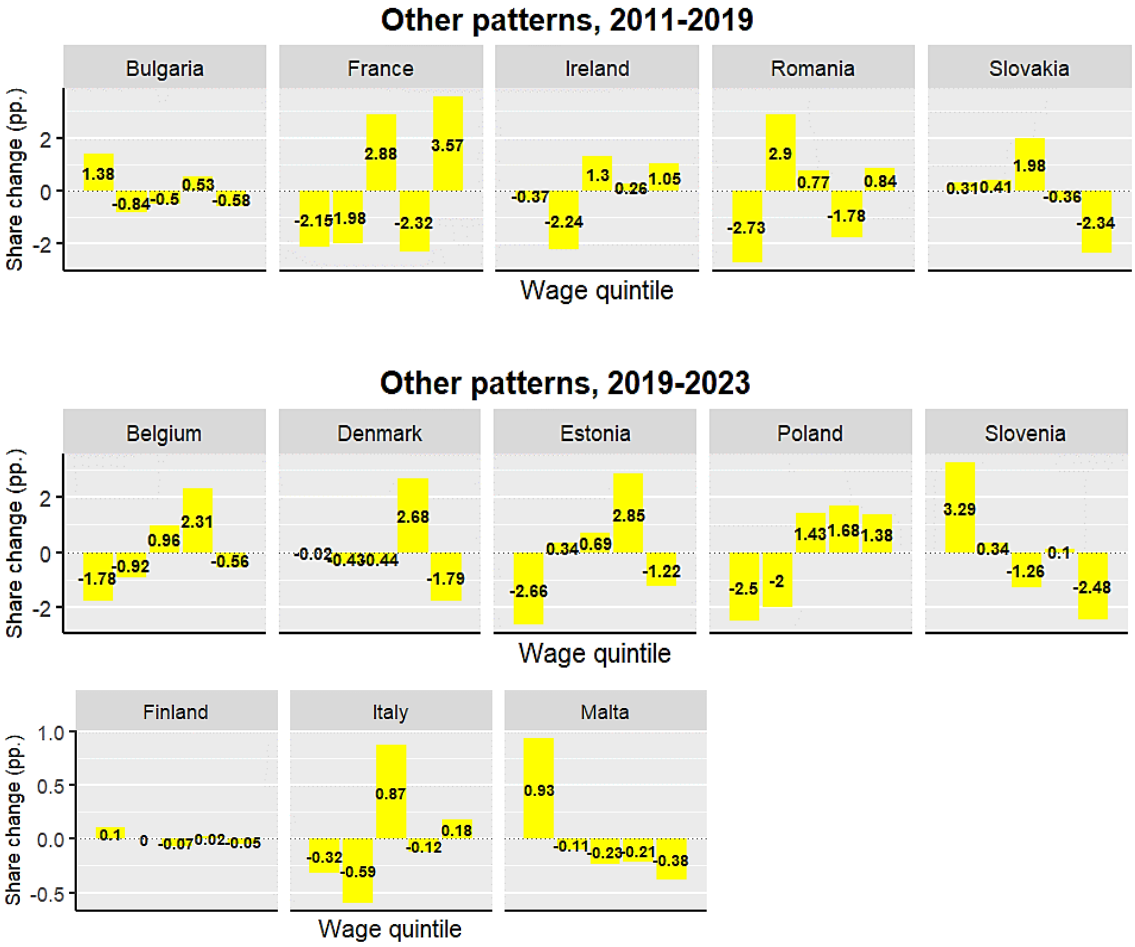
1) $\Delta s_L < \Delta s_M < \Delta s_H$, corresponding to unambiguous upgrading, or
2) $\Delta s_M < \Delta s_L < \Delta s_H$, corresponding to dominant upgrading.

Figure A1. Patterns of polarisation and upgrading



Source: authors' work
Remark. Empirically, the "dominant upgrading" case, is similar to the 1989-1999 curve depicting changes in employment shares by occupations in Hunt and Nunn (2022) figure 8.
Appendix 2.

Figure A2. Relative change in employment shares by wage quintile



Source: authors' work

Table A1. Multi-country studies of employment change and some key characteristics

	Unambiguous polarisation	Dominant polarisation	Dominant upgrading	Unambiguous upgrading
Author(s)	a) Goos et al., 2009 b) Goos et al., 2014 c) Michaels et al., 2014 d) OECD, 2015	a) Naticchioni, Ragusa, & Massari, 2014 b) Antonczyk et al., 2018 c) Cirillo, 2018 d) Mahutga et al., 2018 e) Jerbashian, 2019	a) Oesch & Rodriguez Menes, 2011 b) Fernandez-Macías, 2012 c) Eurofound, 2014 d) Eurofound, 2017 e) Fernandez-Macías & Hurley, 2017 f) E. C. Murphy & Oesch, 2018	a) Berman et al., 1998 b) Oesch & Piccitto, 2019
Period	a) 1993–2006 b) 1993–2006 c) 1980-2004 d) 1995-2010	a) 1995-2007 b) 1979–2004 c) 1999-2011 d) 1979-2012 e) various periods 1993-2007 to 1997-2007	a) 1990–2008 b) 1995–2007 c) 1995-2007 d) 1998–2007, 2008–2010, 2011–2013, 2013–2016 e) 1995–2007, 2008-2010, 2011-2013 f) 1970–2010	a) 1970-1990 b) 1992–2015 (7-8 years periods)
Countries	a) 16 European countries b) 16 European countries c)Austria, Denmark, Finland, France,Germany, Italy, Japan, Netherlands, Spain, UK, USA d) 19 OECD countries	a) 12 European Countries b) US and Germany c) Germany, Spain, France, Italy and United Kingdom d) 21 countries (North&South) e) 10 Western European countries	a) Germany,Spain, Switzerland, UK b) 15 European countries c) 12 European countries d) EU-28 e) 15 European countries f) Ireland, Switzerland	a) 10 developed countries b) Germany, Spain, Sweden, UK,

Source: author’s compilations based on Haslberger (2022).

Notes: European countries mostly refer to Western industrialised economies. The period row details sub-periods whenever analyses and results were employed.