

# Job upgrading, job competition and the expansion of higher education

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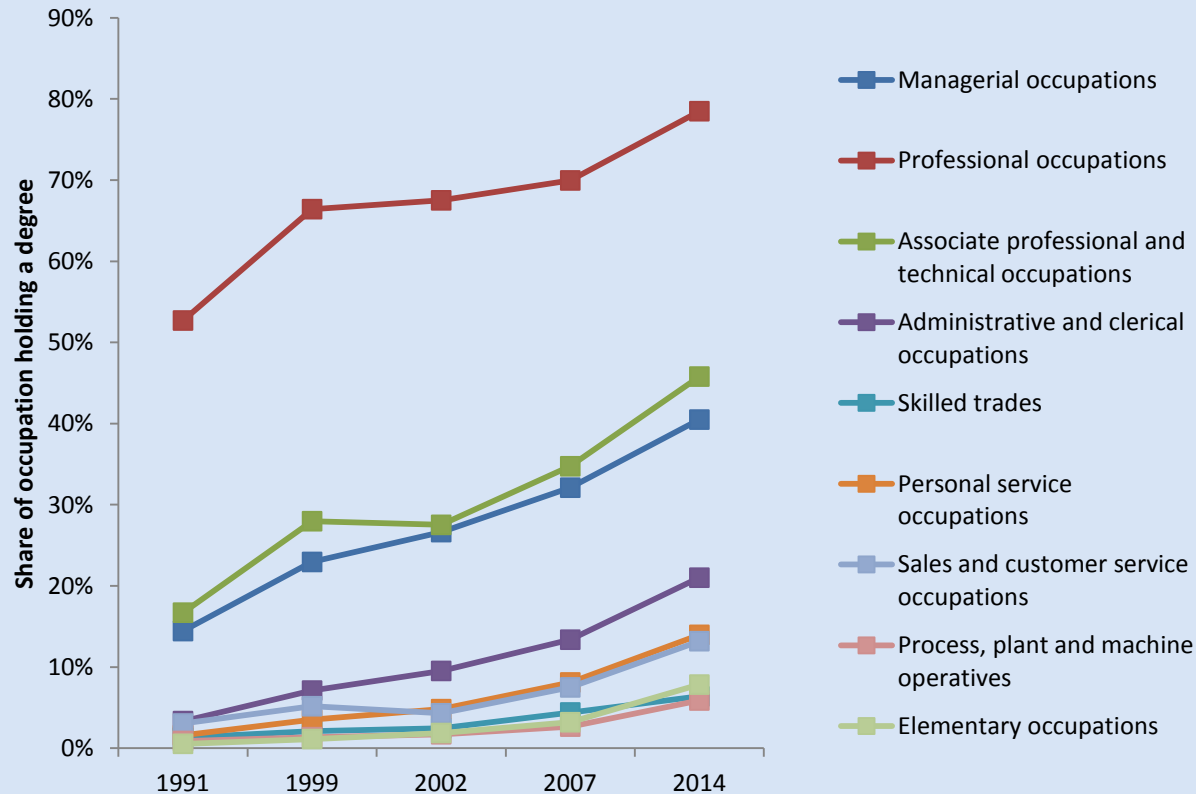
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# Outline

- The expansion of higher education has led to increasing shares of graduate workers across most occupations
- Where graduates substitute for non-graduates, the expectation is that the nature of the job changes to employ those extra skills
- The evidence on this sort of job upgrading has a variety of weaknesses
- This paper aims to offer a new way of assessing upgrading using data from the Workplace Employment Relations Survey

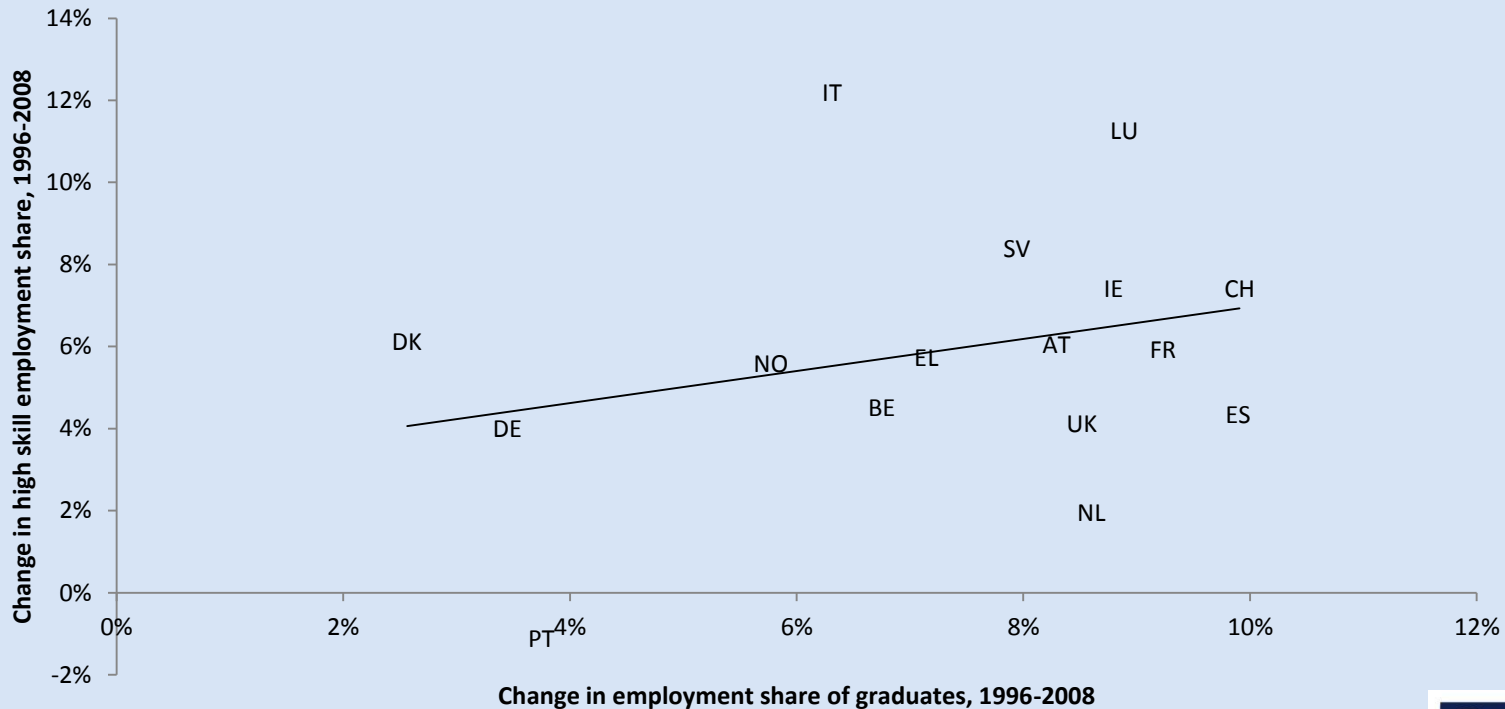
# Background

- Graduate shares of all occupations have risen since 1991:



# Background

- The UK is not unusual in seeing graduates replace non-graduates



# Background

- To what extent is this a problem? Depends on the relationship between graduate labour supply and productivity.
- Human capital (policy) view:
  - Skill supply → productivity
  - Technical change increases the demand for skill
  - Increased skill supply creates its own demand
- Last two elements capture job upgrading – changes in the nature of work in a given occupation to require greater skill

# Background

- Evidence on economic growth and higher education is mixed
- Holmes (2013): no cross-country relationship between the level or the growth of tertiary educational attainment and GDP per capita growth
- However:
  - BIS (2013) find a relationship between graduates and productivity growth
  - Other studies (Aghion et al, 2009) ; Vandenbussche et al, 2006) find more specific channels related to innovation, R&D and technology adoption

# Background

- The link between technological progress and skill demand might be weakening, even for those in 'skilled jobs'
  - Digital Taylorism (Lauder, Brown and Ashton, 2011)
  - The rise of the robots? (Frey and Osborne, 2013; Brynjolfsson and McAfee, 2014)

# Background

- Global Agenda Council on Employment, 2014:
  - *“In most countries of the OECD, a higher education degree is the qualification most frequently required in jobs today. The composition of jobs in advanced countries has also consistently shifted over the past decade towards the employment of more highly qualified people at the expense of those low-qualified. While part of this trend is due to rising job-skill requirements, it has been made possible by the greater supply of people with higher qualifications coming into the labour market.”*
  - *“Comparing job requirements to the qualifications of the workforce, it is apparent that important imbalances exist in dynamic labour markets. In several countries, the share of the labour force with tertiary qualifications exceeds the share of jobs requiring tertiary degrees, which can lead to higher levels of graduate unemployment or overqualification.”*



# Background

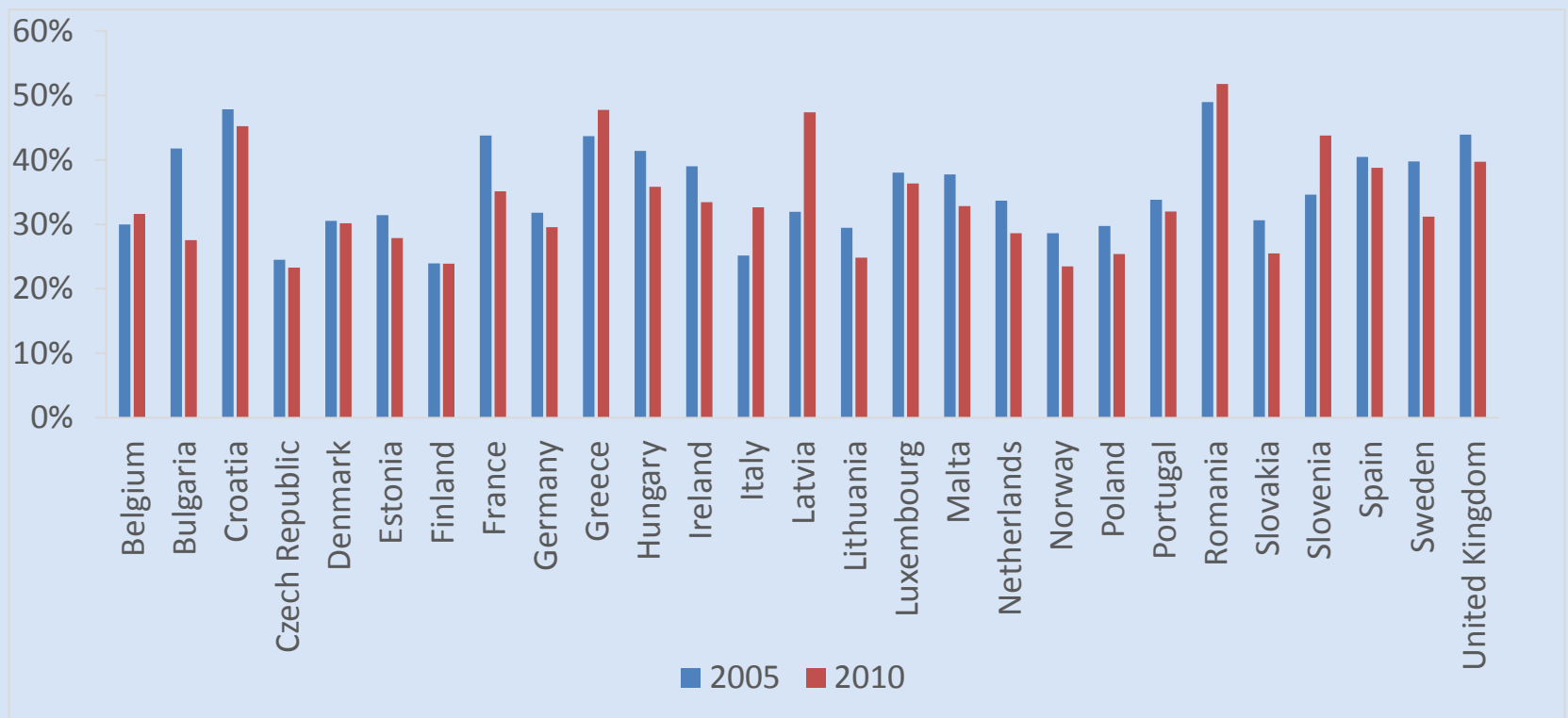
- It becomes necessary to distinguish between two questions:
  - Does an individual need a degree to get a particular job?
  - Does an individual need a degree to be able to do a particular job?
- It is the second part which is crucial for job upgrading.
- Job competition (Thurow, 1975):
  - With a fixed distribution of jobs (and productivity and wages), degrees act as positional goods.
  - Increasing supply of degrees pushes graduates into lower skill-requirement jobs → over-skilling rather than rising productivity

# Existing evidence on upgrading

- Over-education measures
  - Job evaluations
  - Within occupation comparisons to mean/modal levels of education
  - Self-assessment
- Job evaluations are time-consuming, costly and infrequent
- Statistical method has numerous possible critiques
- Self assessment, particularly on the use of graduate skills, expects a lot of respondents abilities to create counterfactuals

# Existing evidence on upgrading

- “Do you have skills to cope with more demanding duties?”



Source: EWCS

# Existing evidence on upgrading

- UK Skill Survey data suggest graduate over-skilling is low and has risen very little:

% of graduates	Male		Female	
	1992	2006	1992	2006
Qualified	78.3	66.8	76.4	68.0
of which Overskilled	7.9	5.5	5.0	4.3
Overqualified	21.7	33.2	23.8	32.1
of which Overskilled	7.5	9.9	7.2	8.4

*Source: Green and Zhou (2010), own calculations*

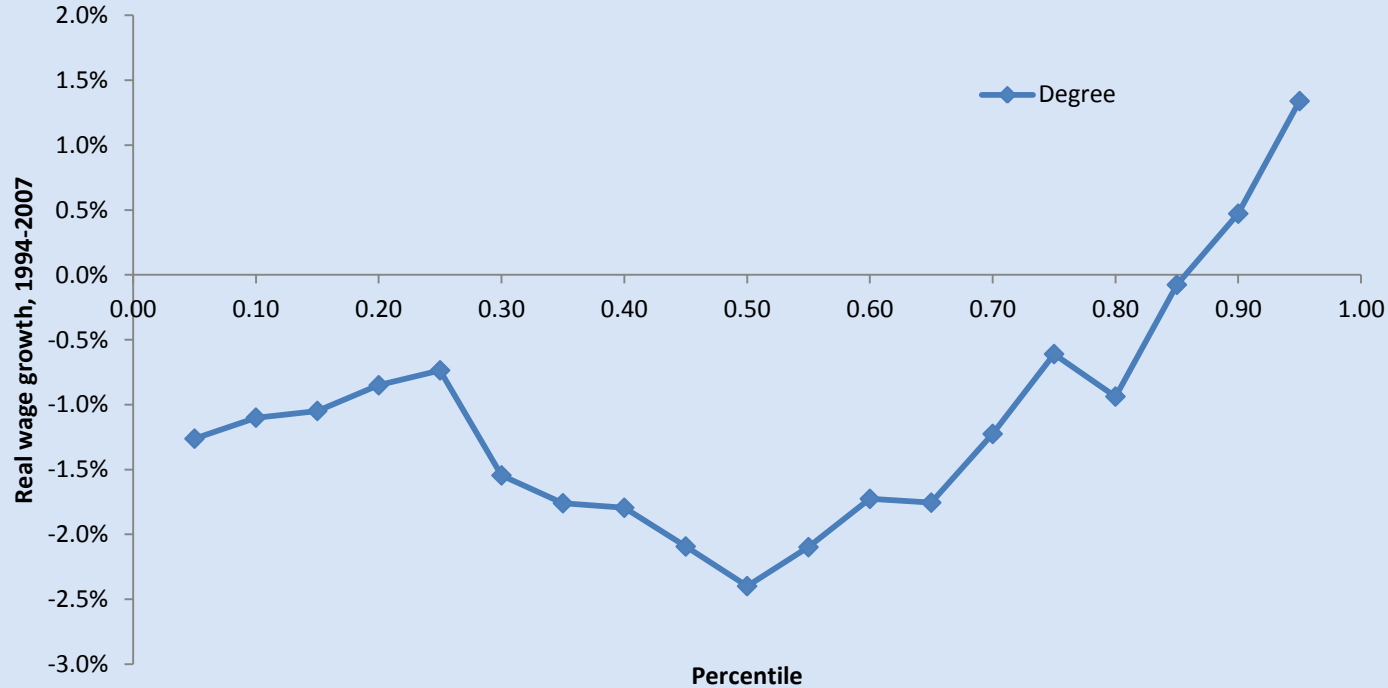
- This is consistent with significant upgrading, but also with:
  - Lower quality degree courses / lower ability students
  - Vocational degrees replacing other routes
  - Degree courses targeted at employer needs (Chillas, 2010)

# Existing evidence on upgrading

- Some point to relatively constant graduate earnings premia as an indicator that demand for graduate skills has risen with their supply
- However, this is also consistent with job competition – less qualified are pushed into lower paying jobs, so relative wage gaps are maintained
- In addition, estimated premia are averages – the distribution also matters.

# Existing evidence on upgrading

- Effect of changes in return to degree across UK wage distribution, 1994-2007



Source: UK LFS

# Existing evidence on upgrading

- More direct evidence on job upgrading has typically been found in case study evidence:
  - Mason (1996) – financial services and steel manufacturing.
  - Mason (2002) – telecoms, rail transport, retail and computer services
  - James et al (2012) – real estate agents
  - Tholen (2014) – software engineers, press officers, laboratory technicians and financial analysts
- These studies have not found a systematic pattern on upgrading, but there are specific examples. In some cases, the upgrading is driven by the employee rather than the employer.

# New evidence on upgrading

- This study attempts to look at changes in jobs that reflect upgrading and demand for skill quantitatively via survey data.
- We use the Workplace Employment Relations Survey (WERS) from 1998, 2004 and 2011
  - To our knowledge, presently unused for looking at the graduate labour market
  - Larger than other datasets with skill and job content data
  - Matched employer survey could help understand way management choices affect employee outcomes



# New evidence on upgrading

- Model:
  - $i = 1, \dots, n$  occupations
  - Two educational levels  $e$ : graduate ( $e=1$ ) and non-graduate ( $e=0$ )
  - Average skill requirement of each type of worker in each occupation denoted  $R_{ie}$
  - ‘Upgraded’ graduate jobs in occupation  $i$  where  $R_{i1} > R_{i0}$
  - As proportion of graduates increases, effective job upgrading requires  $\Delta(R_{i1} - R_{i0}) \geq 0$  and  $\Delta R_{i1} \geq 0$ .
  - Controls for occupation-wide changes in skill requirements.

# Data

- We use WERS data on influence and discretion as a proxy for the skill requirement of a job
  - High skilled work is typically associated with elements of employee autonomy and decision making
  - Deskilling accompanies tighter managerial control and a greater reliance on routine tasks (Gallie et al, 2004; Braverman, 1974).
- We aim to group occupations as narrowly as possible. Given the data, we adopt two approaches:
  - 1998 – 2011: occupation major (1 digit) group x industry = 108 groups
  - 2004 – 2011: occupation minor (3 digit) group = 70 groups

# Data

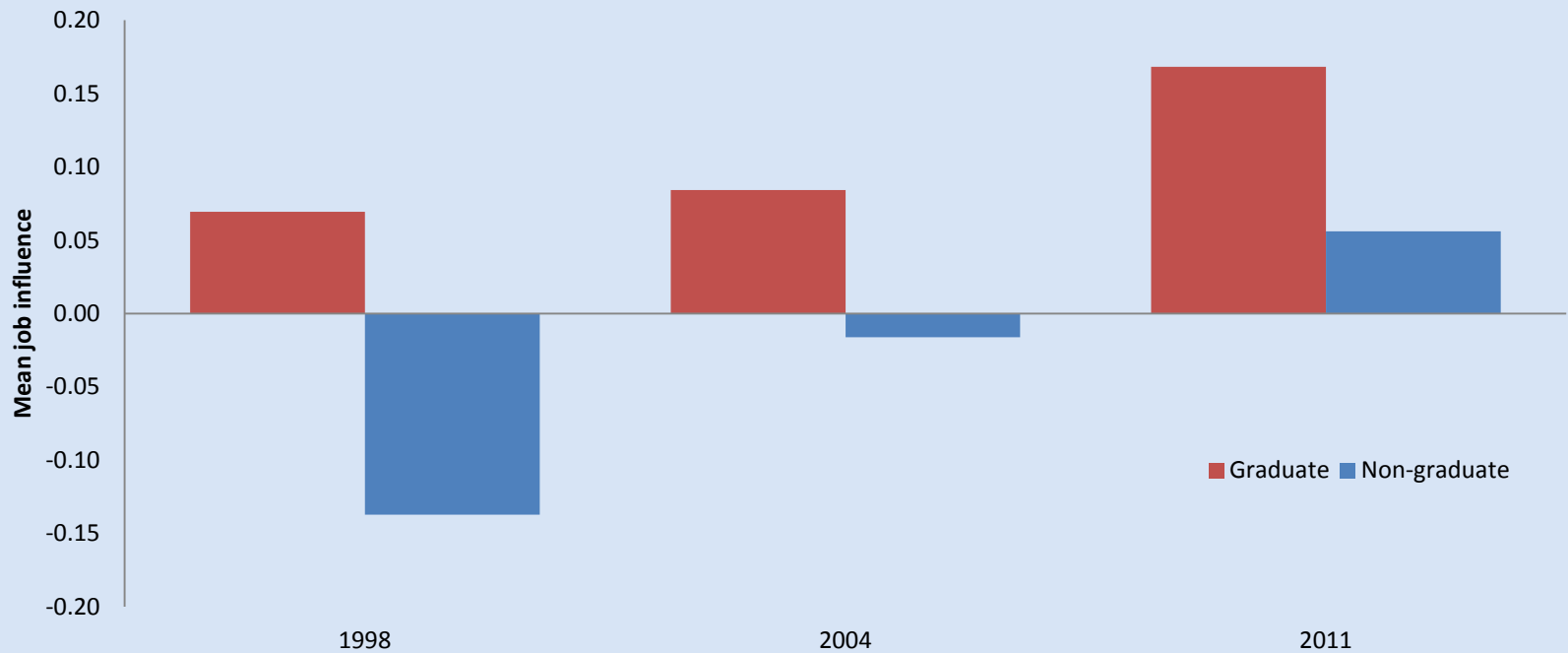
- Factor analysis – factor 1 labelled “influence”

<b>1998-2011</b>	<b>Factor 1</b>	<b>Factor 2</b>	<b>Uniqueness</b>
The tasks you do in your job	0.6998		0.4848
The pace at which you work	0.7205		0.4843
How you do your work	0.7447		0.4518
How well managers respond to employee suggestions		0.7581	0.4234
Relations between managers and employees		0.7551	0.4229
Cronbach alpha	0.7970	0.8130	

<b>2004-2011</b>	<b>Factor 1</b>	<b>Factor 2</b>	<b>Uniqueness</b>
The tasks you do in your job	0.7227		0.4489
The pace at which you work	0.7153		0.4810
How you do your work	0.8051		0.3580
The order in which you carry out tasks	0.7656		0.4261
The time you start or finish your working day	0.4545		0.7811
How well managers respond to employee suggestions		0.8350	0.3288
Relations between managers and employees		0.7865	0.3907
Satisfaction with involvement in decision-making		0.7222	0.3993
Cronbach alpha	0.8157	0.8545	

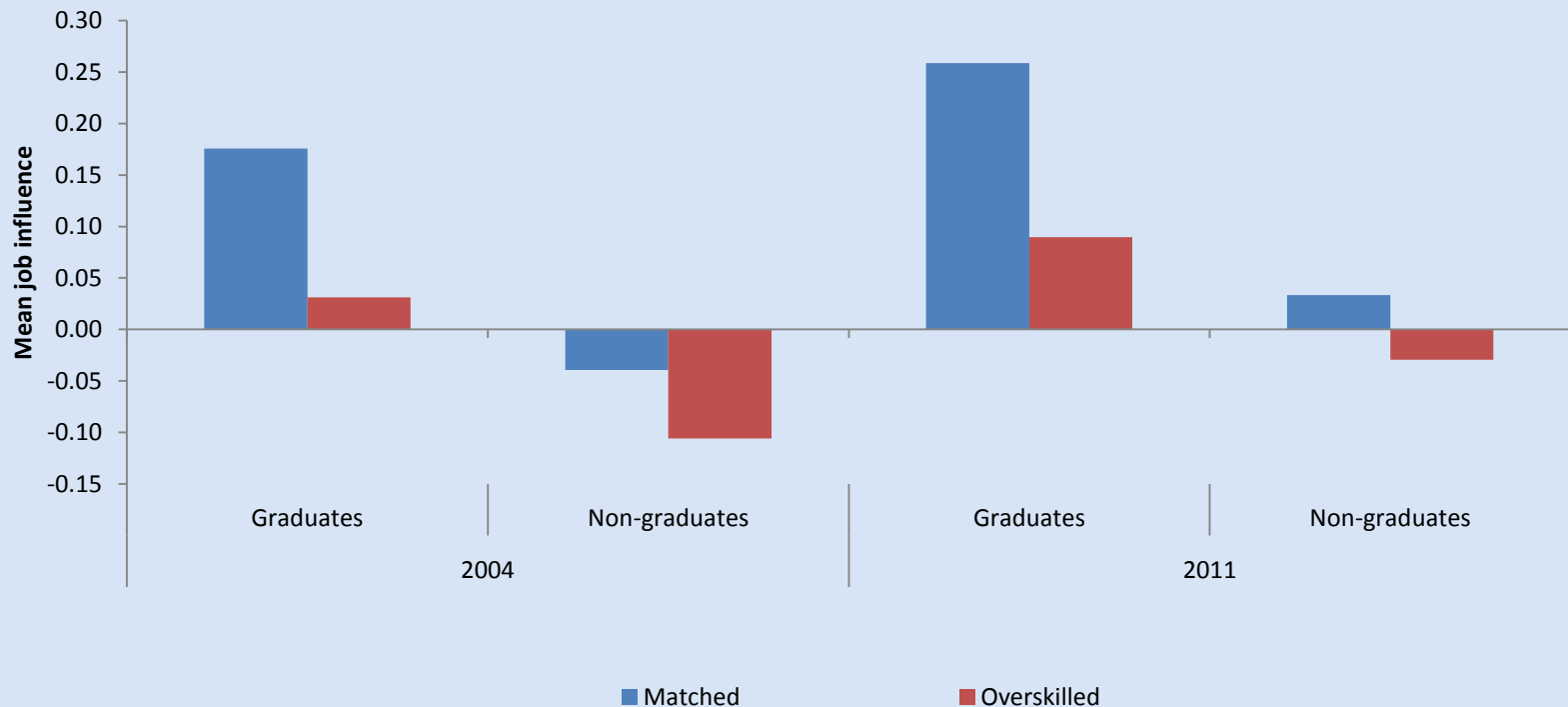
# Data

- Graduate vs. non-graduate influence



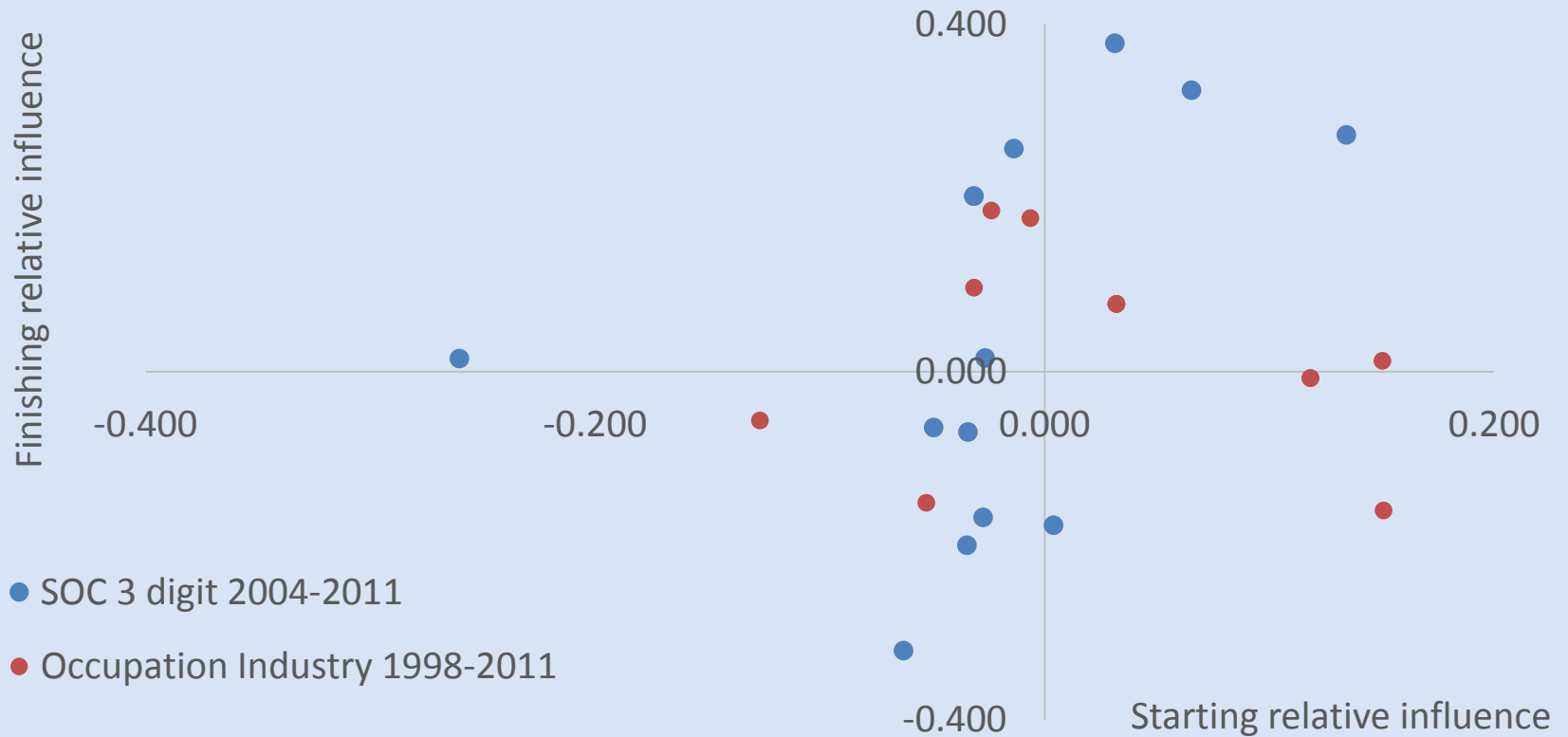
# Data

- Well matched vs. overskilled influence



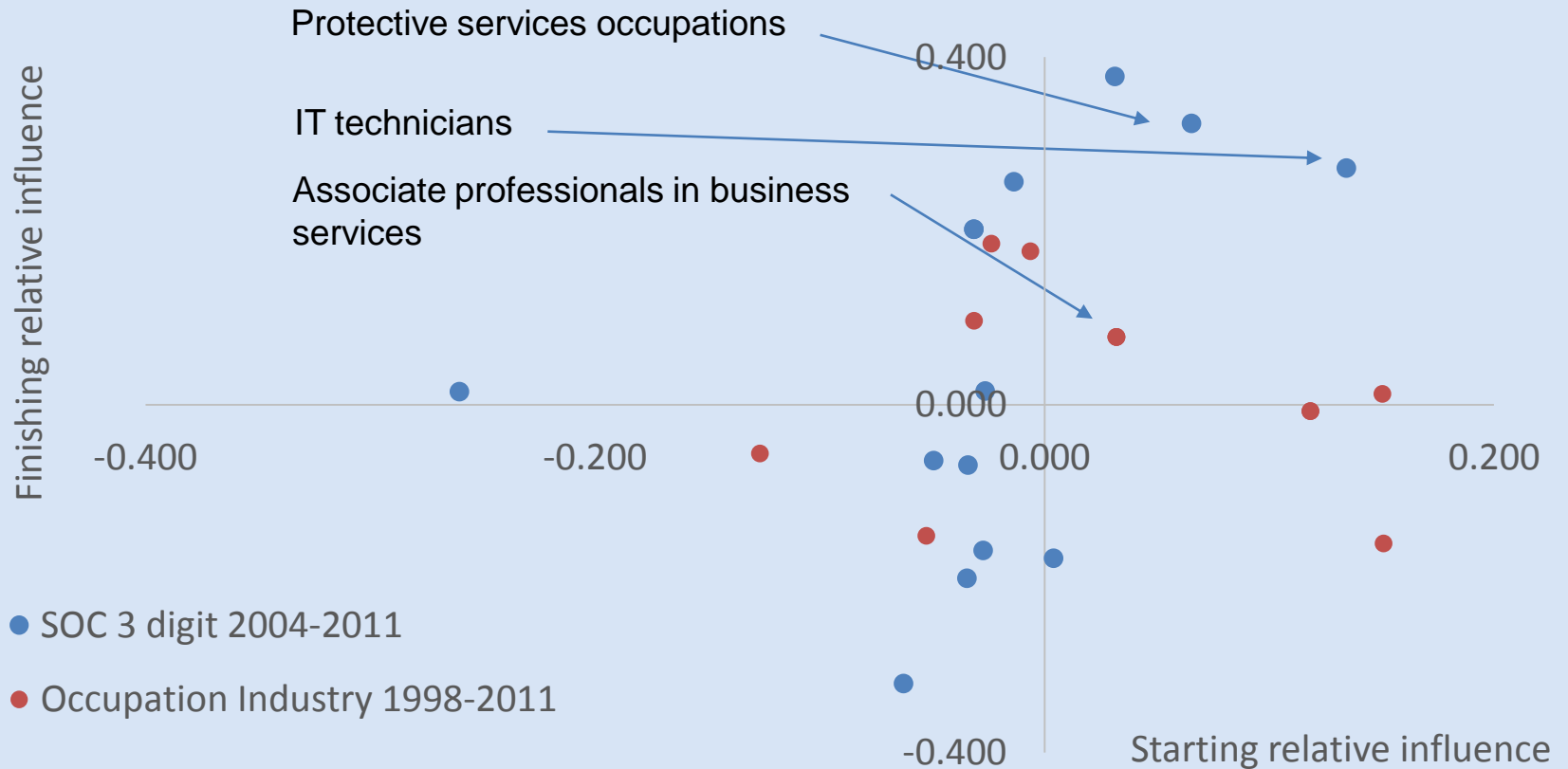
# Results

- Selected occupations



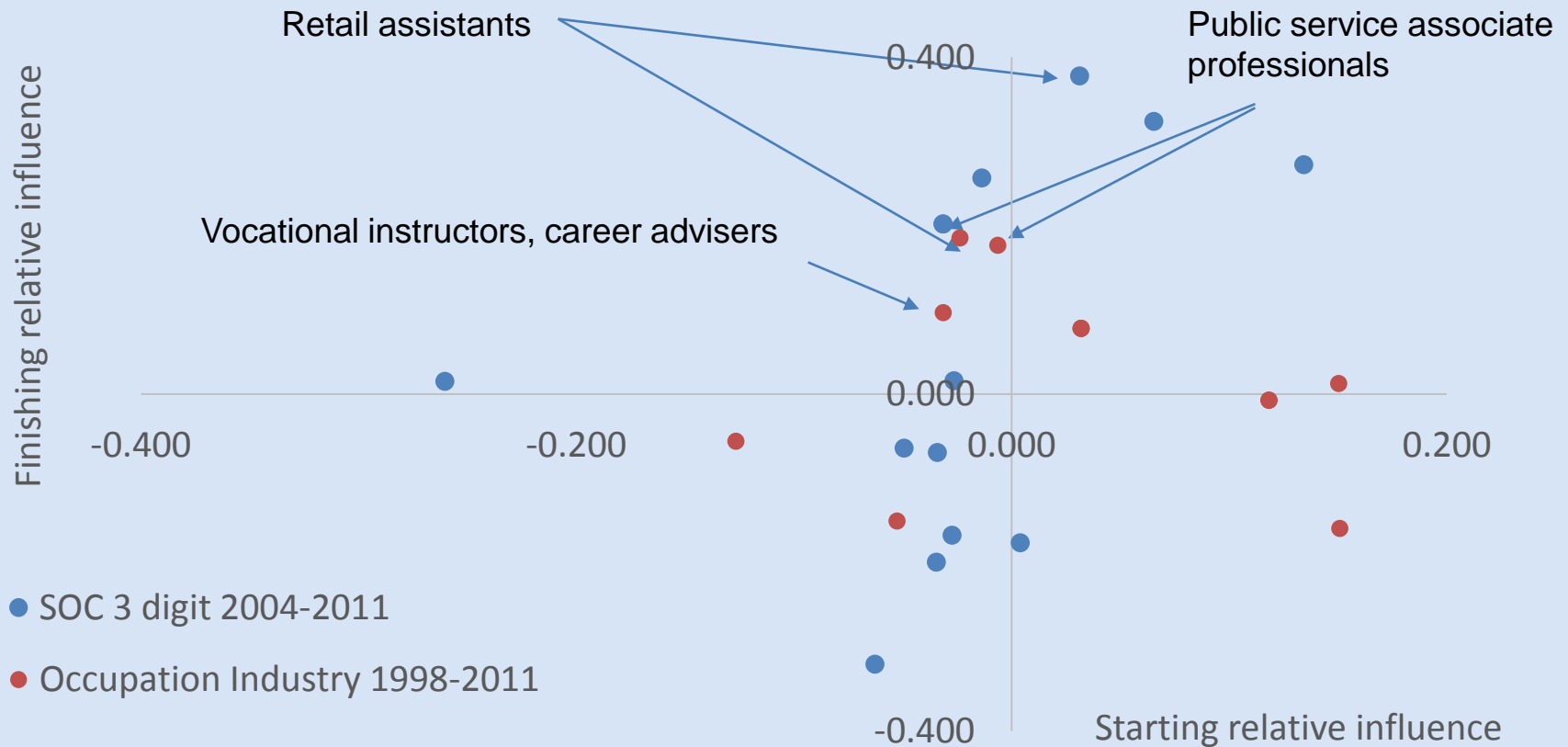
# Results

- Upgrading occupations – existing graduate jobs



# Results

- Upgrading occupations – recently graduate jobs





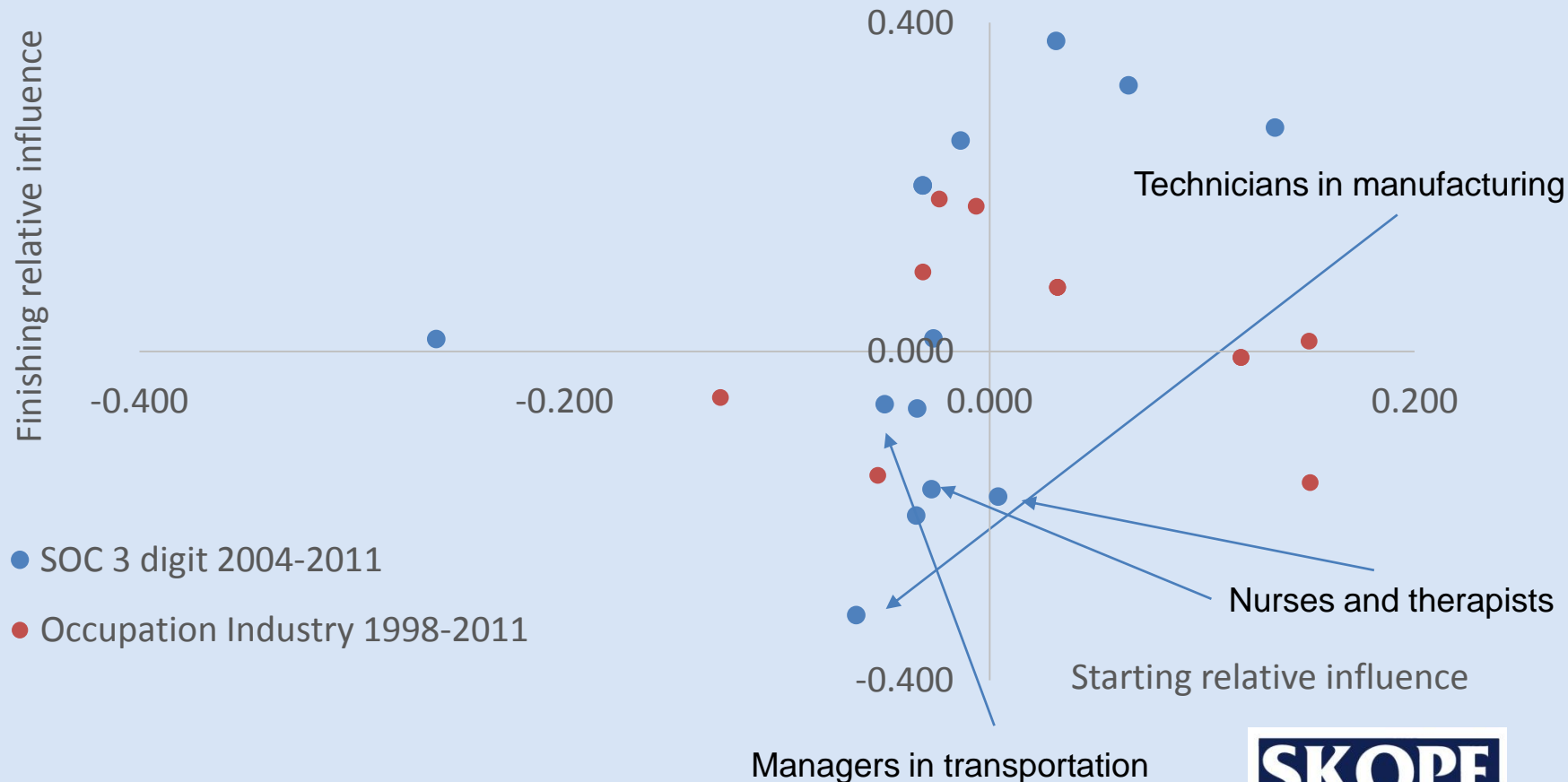
# Results

- Job competition



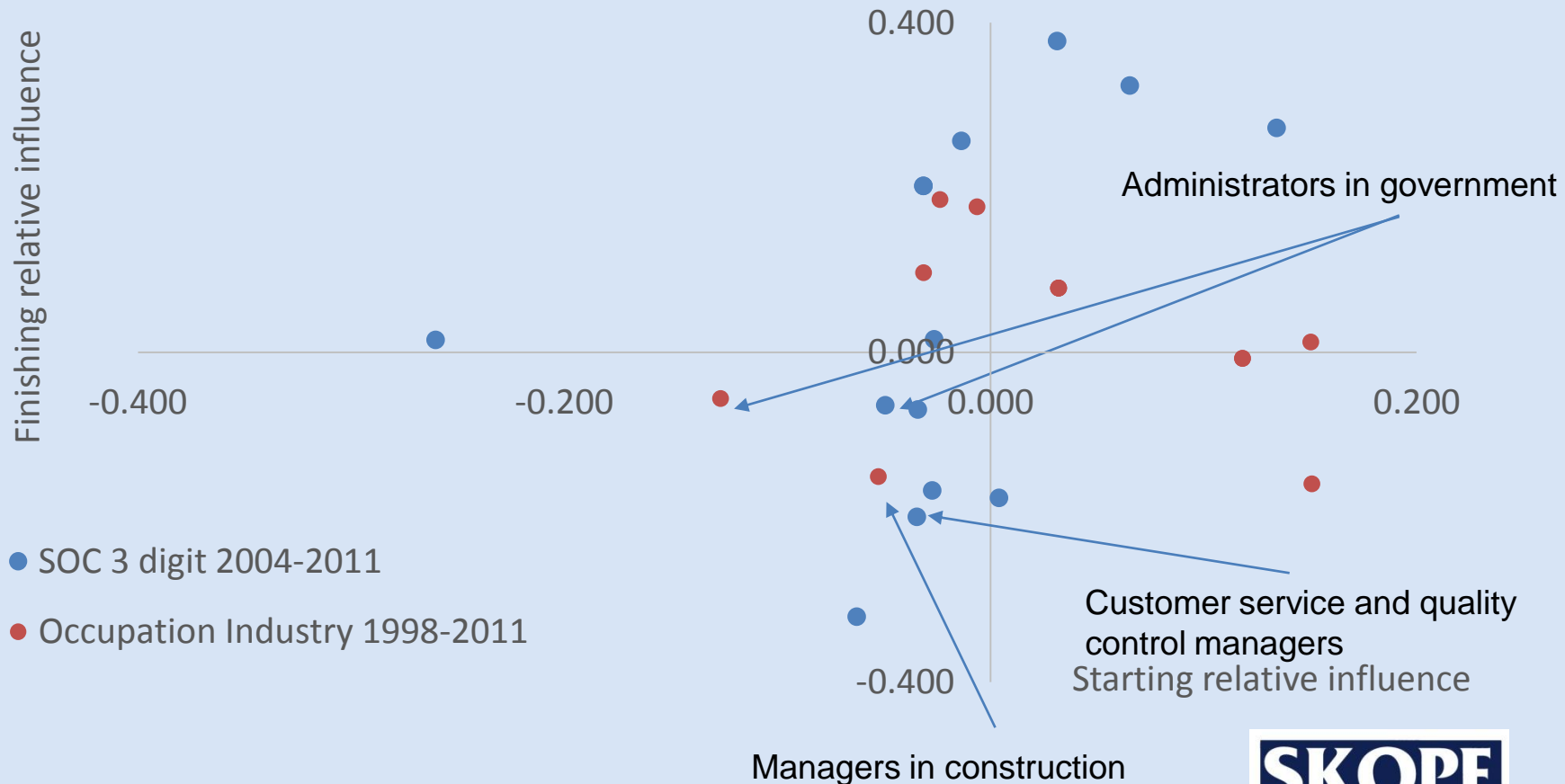
# Results

- Job competition...or graduate mismatch?



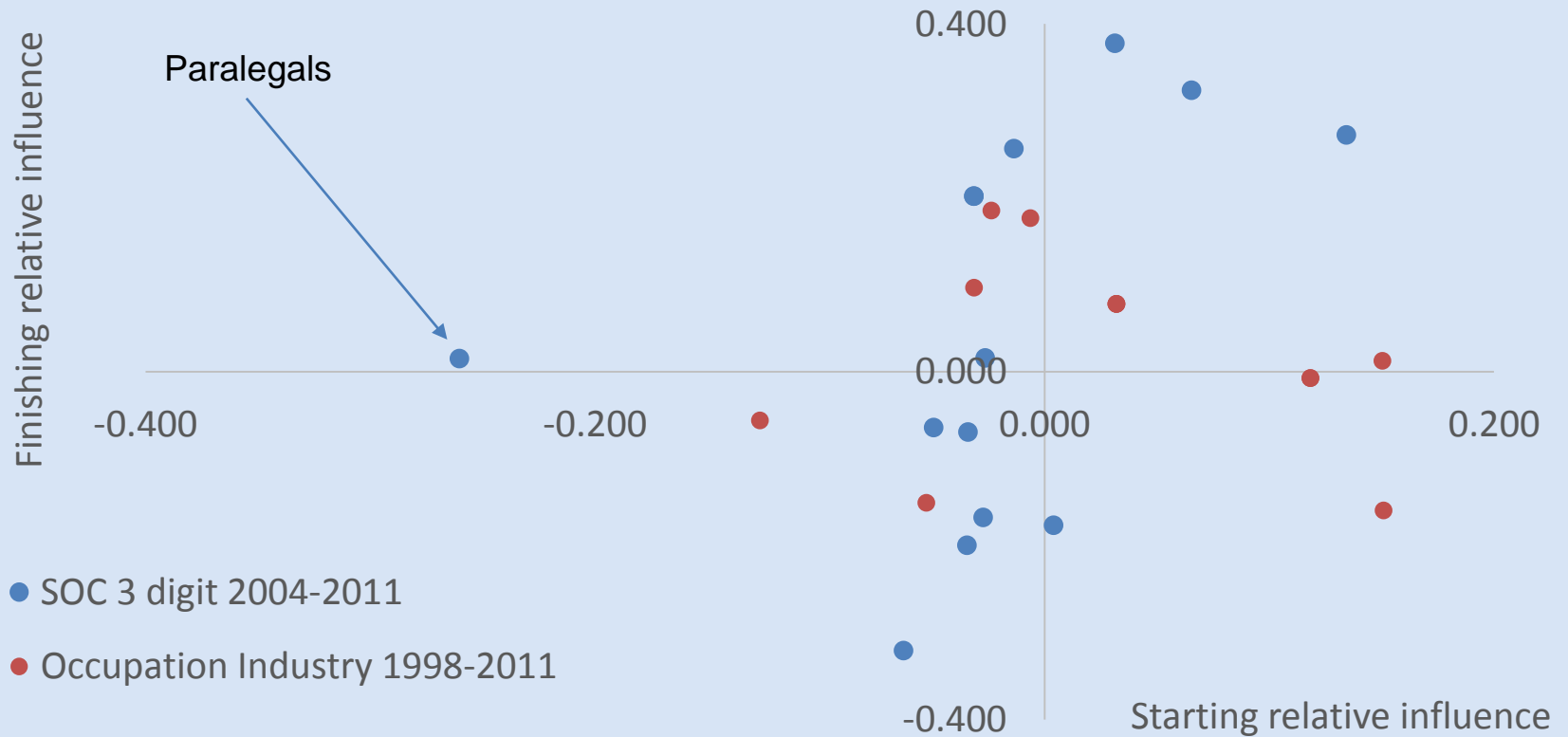
# Results

- Graduate mismatch:



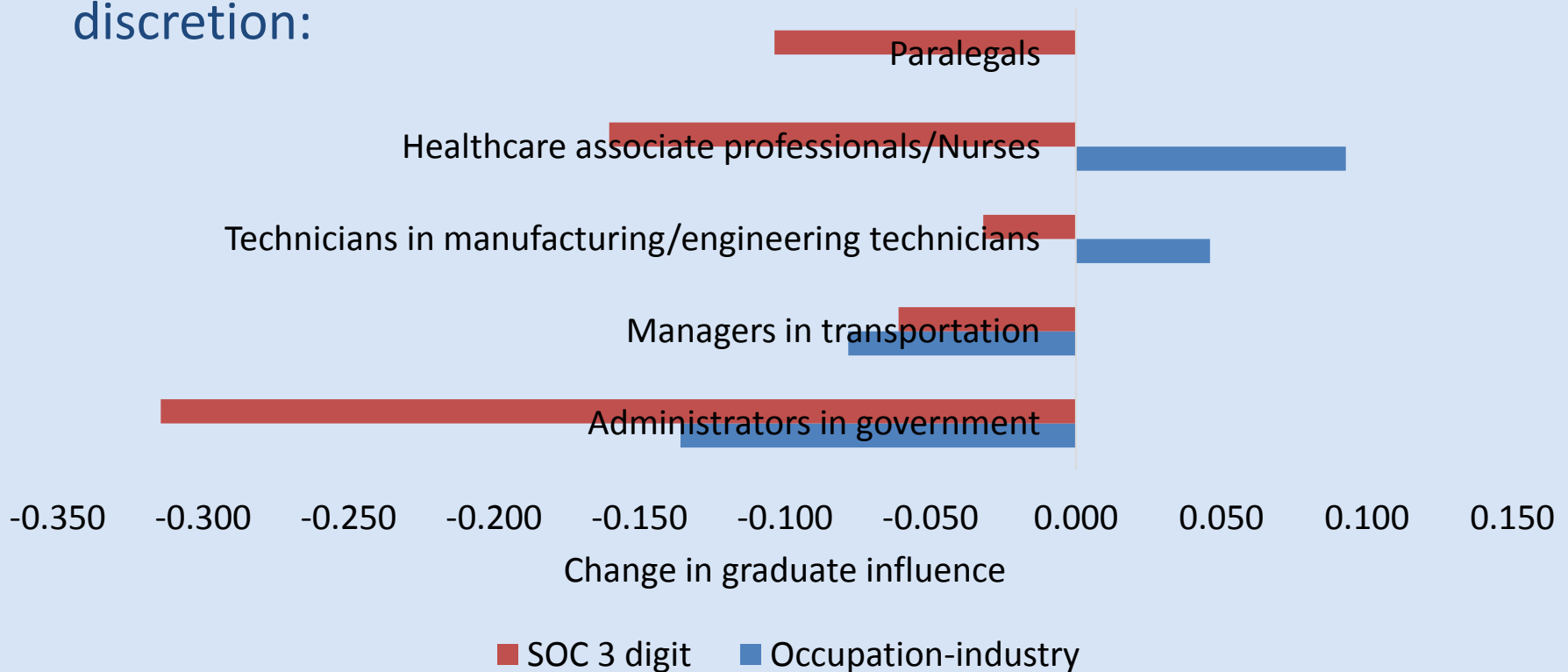
# Results

- Graduate mismatch:



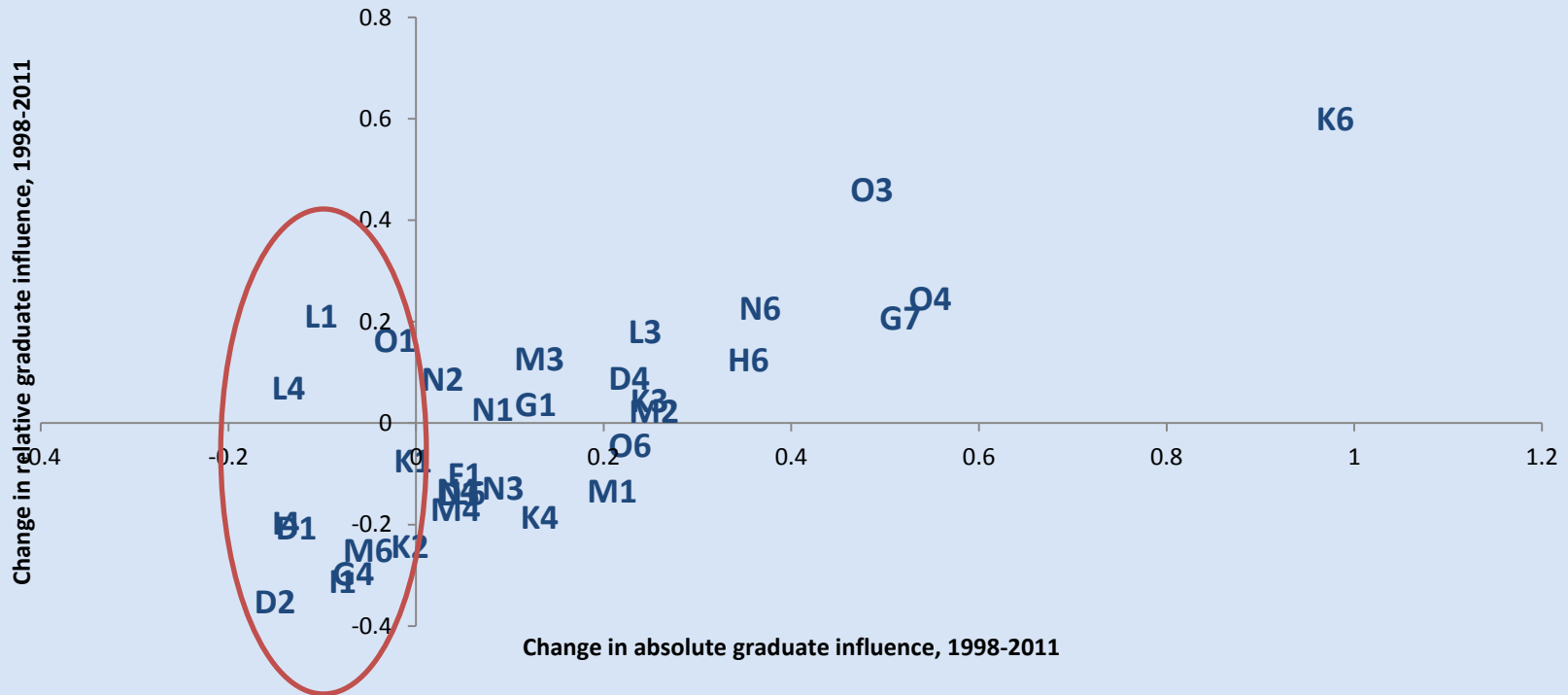
# Results

- A number of occupations have falling absolute levels of discretion:



# Results

- A number of occupations have falling absolute levels of discretion:



# Future work

- How does upgrading relate to changing pathways (e.g. degrees replacing vocational education?)

Occupation industry code	Description	Change in		Relative influence
		Apprentice share, 1994	apprentice share, 1994-2007	
F1	Managers in construction	39%	-12%	-0.098
O6	Personal service workers in community sector	33%	-15%	-0.041
D3	e.g. Technicians in manufacturing	30%	-15%	-0.138
D1	Managers in manufacturing	26%	-10%	-0.204
D2	e.g. Engineers in manufacturing	24%	-3%	-0.349
L3	Associate professionals in public administration	21%	-12%	0.183
M3	e.g. vocational instructors, career advisors	19%	-12%	0.128
I1	Managers in transportation	19%	-5%	-0.310
O1	Managers in community sector	17%	-10%	0.166
K3	e.g. IT technicians, tax consultants	16%	-11%	0.046
G1	Managers in retail	16%	-7%	0.040
L6	Personal service workers in public administration	14%	-11%	-0.135
L1	Managers and senior officials in public administration	11%	-5%	0.213
M1	Managers in education	11%	-5%	-0.131
N3	e.g. nurses, therapists	11%	-8%	-0.126
M6	e.g. nursery nurses	10%	-4%	-0.249

# Future work

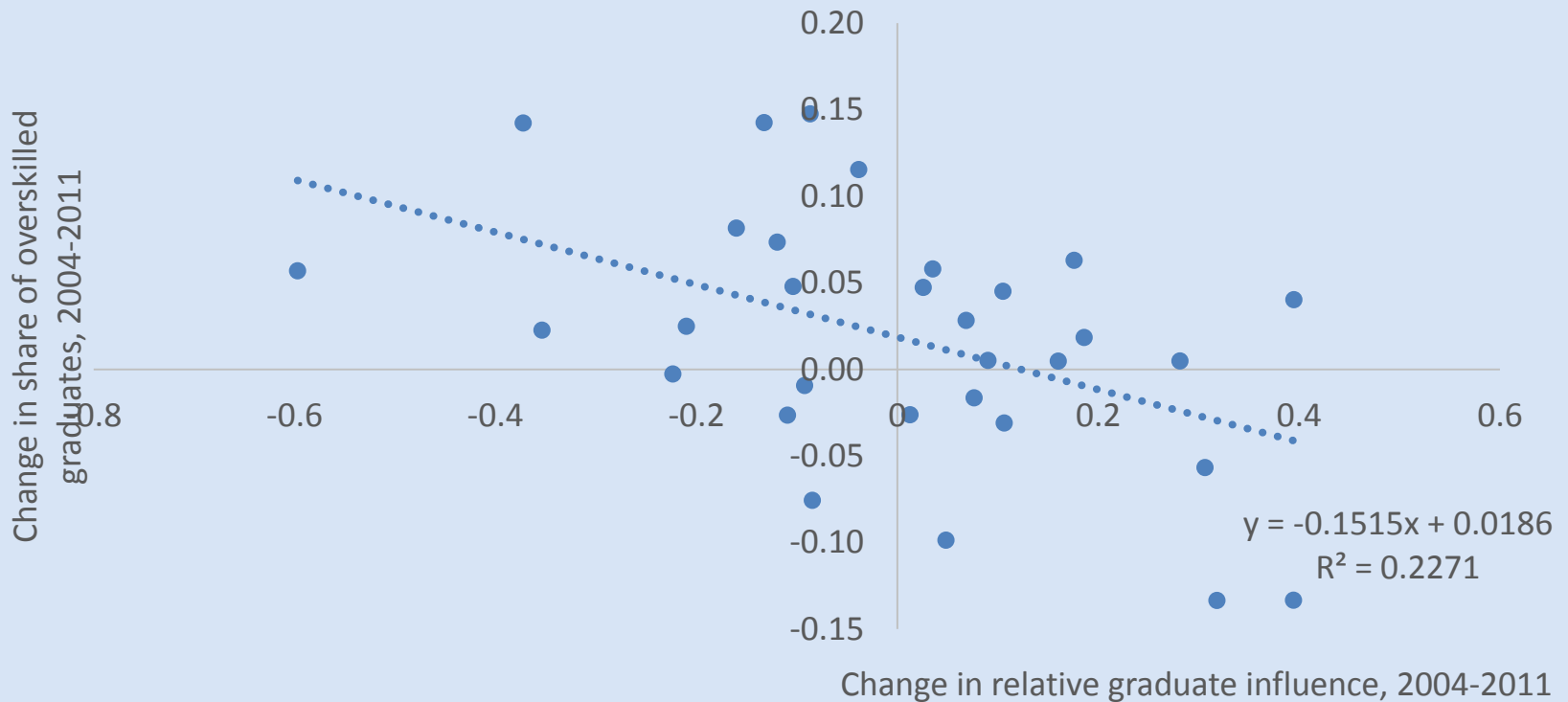
- What managerial changes lead to job upgrading?

<i>% of workplaces where management introduced...</i>	Relative influence	Relative influence	Graduate influence	Non-graduate influence
Technical change	-0.786	-0.920	-0.442	0.553
Changes to work techniques	1.833**	1.561**	0.268	-1.263**
New product	-0.341			
Schemes to raise employee involvement	-0.888			
Changes to organisation of work	0.252			
Changes in working time arrangements	-1.167*	-1.243**	-1.089**	0.317
R <sup>2</sup>	0.163	0.124	0.087	0.125
N	55	55	55	55



# Future work

- How does our measure of job upgrading relate to other overskilling measures?



# Conclusion

- As graduate shares of occupations increases, it is important for a variety of policy objectives that jobs upgrade to take advantage of available skills
- Many existing measures of graduate over-qualification or over-skilling have problems as indicators for job upgrading
- This paper has demonstrated a way of testing for the extent of upgrading using data on influence and discretion as a proxy for skill requirements
- We find positive examples, but enough negative examples to indicate this process should not be taken for granted
- We also raise the possibility that for some occupations, degrees are a less effective way of producing required skills

# Contact Details

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