Tracking graduate skills demand

CGHE Seminar 337

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Motivation

- The British workforce has never been better educated.
- 35% HE graduate attainment in 2020, up from 13 % in 1995.
- Fast growing body of research on increasingly granular supply-side determinants of graduate outcomes.
- Less is known about how the mass expansion reshaped skills use in the British economy nor how well the demand for graduate skills has held up.
- On the one hand, a stable graduate wage premium (e.g., Blundell et al. 2022), on the other hand, graduate underemployment and rising pay differentiation (O'Leary & Sloane, 2016, Green & Zhu, 2010)

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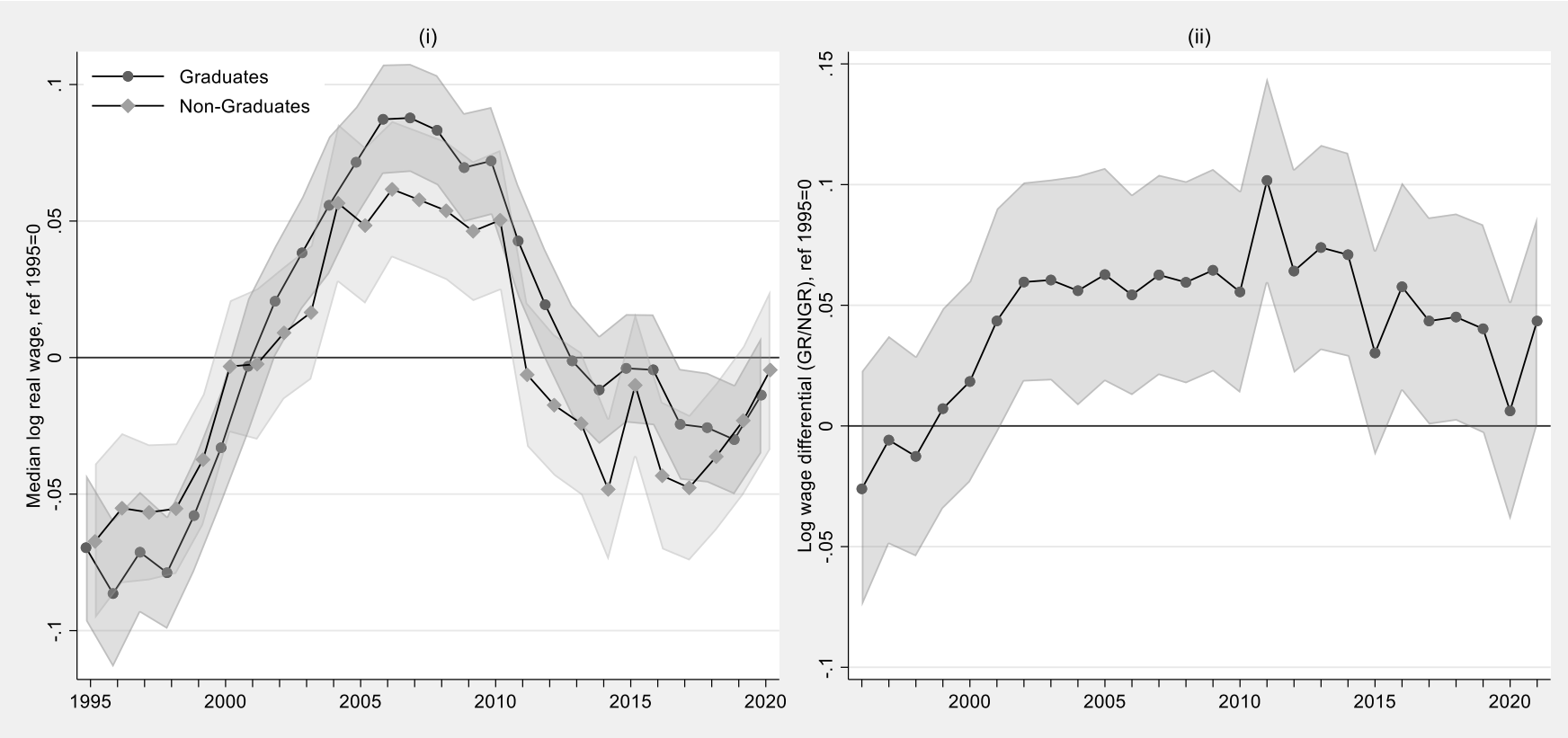
Wages and the graduate pay-premium in the British labour market



Source: UK LFS 1995Q1-2021Q4

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Aims and objectives:

Using worker-reported job task data from the British Skills and Employment Surveys 1997, 2001, 2006, 2012, 2017, this talk will

1. Measure and track graduate skills use in the British economy since 1997.
2. Assess the impact of the HE expansion on graduate skill use in the British labour market.
3. Estimate the 'price' British employers are willing to pay for graduate skills.

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Geoff Mason: Graduate Utilisation in British Industry

- In two papers (1996, 2002), Geoff examined graduate recruitment and deployment in detailed studies of British industries.
- The studies cover the initial years after the onset of HE mass expansion in Britain.
- Among other things, they ask and answer:
  - To what extent is [the substitution of non-graduates by graduates] associated with potentially productivity-enhancing developments such as job enrichment and a higher quality of work performance?

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Mason (1996). Graduate Utilisation in British Industry

- Mason (1996) criticised the often static "conceptualisation of the nature of 'graduate-level' work" which ignored job-enrichment and contradicts the implicit assumption that growing graduate numbers will enhance industrial performance through job enrichment.
- Case studies in steel and financial services showed:
  - Intensified product market competition and technological change increased graduate demand.
  - Graduate were valued for their problem-solving, adaptability, specialist knowledge, and interpersonal skills.
  - To utilise graduate skills, employers reorganised old high-level jobs and created new high-level, 'non-routine' jobs. However, there was increasing differentiation of entry routes, some graduates were recruited into otherwise unchanged 'routine' jobs.
  - Employers paid graduate wages for enriched jobs.

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Mason (2002). High Skills Utilisation Under Mass Higher Education

- Growing graduate supply was partially met by increasing demand for graduate-level skills and specialist knowledge.
- However, growing numbers also entered less-demanding jobs.
- Drivers of higher skills demand were technical change, organisational change towards project-type working, intensified competition and more complex legislative requirements.
- Job-enrichment occurred through 1) permanent upgrading of previously clerical or administrative jobs and 2) temporary moulding of jobs towards individual skill sets.
- Limits to job enrichment without external drivers for high-skills demand

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The ‘Task approach’: Outline of a theoretical framework

- Jobs are conceived as bundles of tasks.
- A *task* is “a unit of work activity that produces output (goods and services)”.
- A *skill* is “a worker’s endowment of capabilities for performing various tasks”.
- Individual skills determine how many tasks a worker can carry out. Employers pay for task delivery.
- Digital technologies take over job tasks that can be made sufficiently routine for automation.
- Digit technologies complement high-skilled, usually university-educated workers in carrying out: “problem-solving and complex communication activities”.

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The ‘Task approach’: Predictions

1. Digitalisation shifted task profiles towards cognitive and interpersonal activities thus driving up skill requirements.

2. Digitalisation enabled graduates to become more productive across a wider range of jobs including in previously non-graduate jobs.

3. The demand and thus pay for university-educated rose in relative and absolute terms.

4. In the absence of task-biased technological change, graduates extend their range of tasks (i.e. move into non-graduate jobs) but with downward pressure on graduates’ pay and the pay of others.

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Selection of previous publications:

- Green, F., & Henseke, G. (2021). Task-warranted graduate jobs and mismatch. *The Singapore Economic Review*, 1-23. https://discovery.ucl.ac.uk/id/eprint/10133544/
- Green, F., & Henseke, G. (2021). Europe's evolving graduate labour markets: supply, demand, underemployment and pay. *Journal for Labour Market Research*, *55*(1), 1-13. https://doi.org/10.1186/s12651-021-00288-y
- Green, F., & Henseke, G. (2016). Should governments of OECD countries worry about graduate underemployment?. *Oxford Review of Economic Policy*, *32*(4), 514-537. https://doi.org/10.1093/oxrep/grw024
- Green, F., Henseke, G. (2016). The changing graduate labour market: analysis using a new indicator of graduate jobs. *IZA J Labor Policy* 5, 14. https://doi.org/10.1186/s40173-016-0070-0
- Henseke, G., & Green, F. (2017). Cross-National Deployment of "Graduate Jobs": Analysis Using a New Indicator Based on High Skills Use. In *Skill mismatch in labor markets* (Vol. 45, pp. 41-79). Emerald Publishing Limited. https://doi.org/10.1108/S0147-912120170000045002

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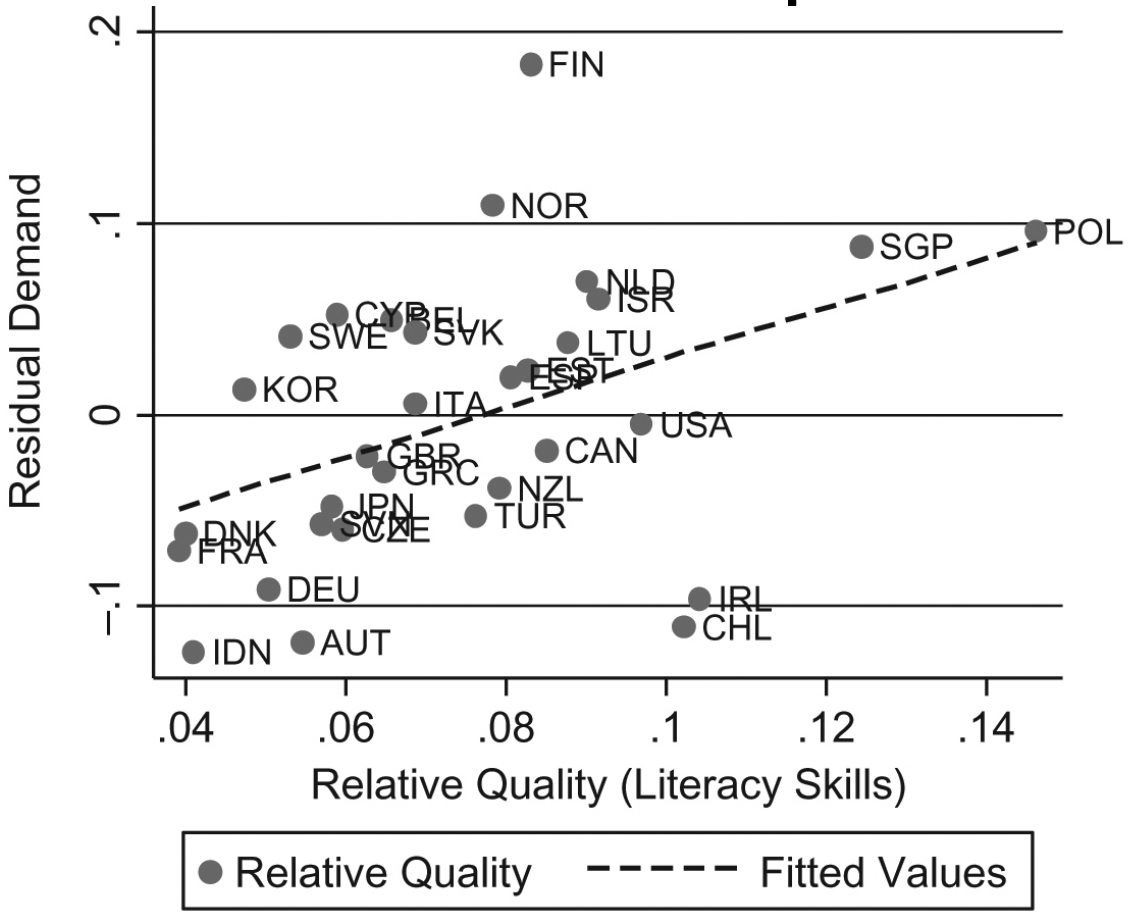
Selected Findings: Graduate skills demand varied with attributes of post-18 education systems.



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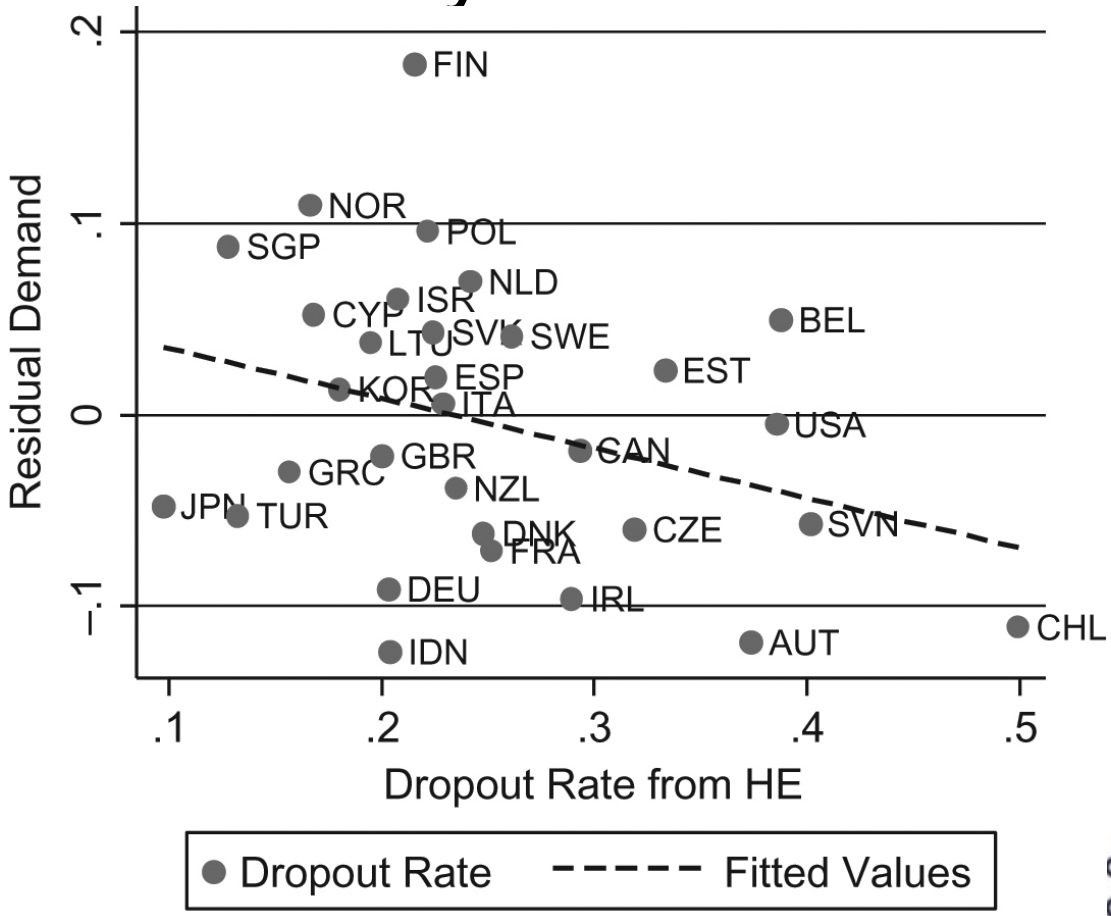

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Dataset

- British Skills and Employment Survey Series (SES). The series started in 1986.
- Since 1997, SES has measured the importance of more than 30 job tasks alongside information on educational requirements, work organisation and tools using the job requirements approach.
- All surveys in the series are independent random probability surveys.
- Sample restricted to 20-60-year-olds.

Central Variables

Degree requirements: “If they were applying today, what qualifications, if any, would someone need to get the type of job you have now?” (1= “Masters or PhD Degree” or “University or CNAA Degree”)

Job skills: Importance of 30 job tasks covering Literacy, Numeracy, Problem-solving, Specialist knowledge, Learning, Communication, Self-planning, Task discretion, Task variety, Computer use.

Hourly Pay: Usual pre-tax labour earnings and income from self-employment. Combined with typical hours of work including overtime to derive hourly pay rate. Inflation-adjusted.

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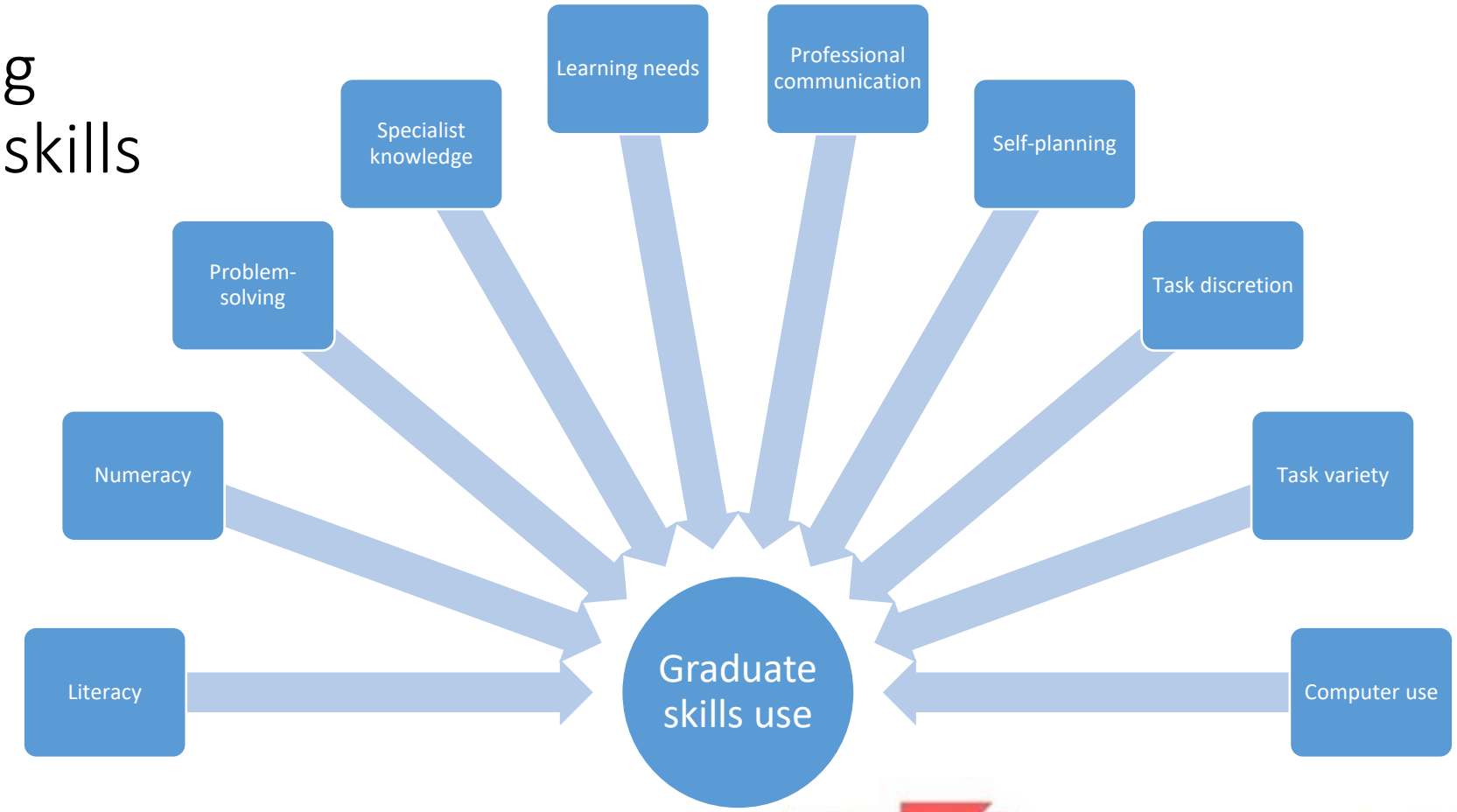
Measuring graduate skills use



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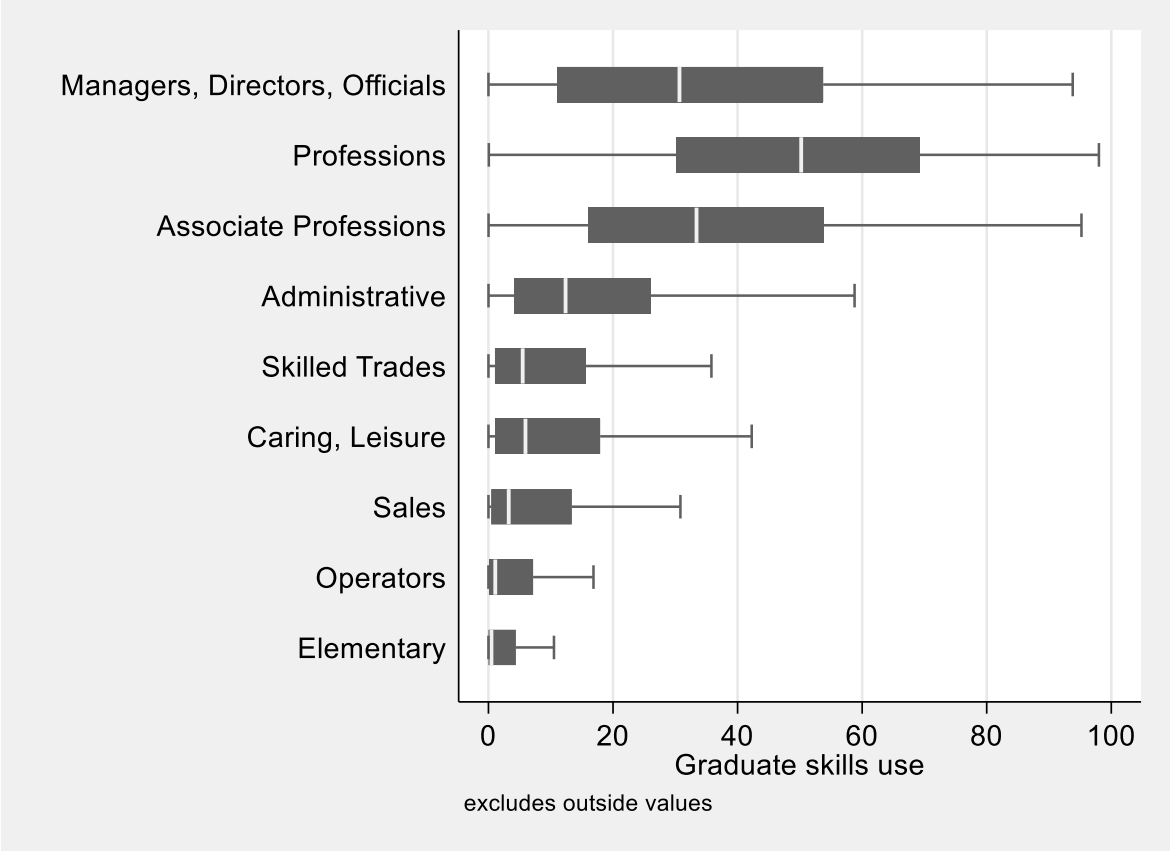
Graduate skill use within and across major occupation groups



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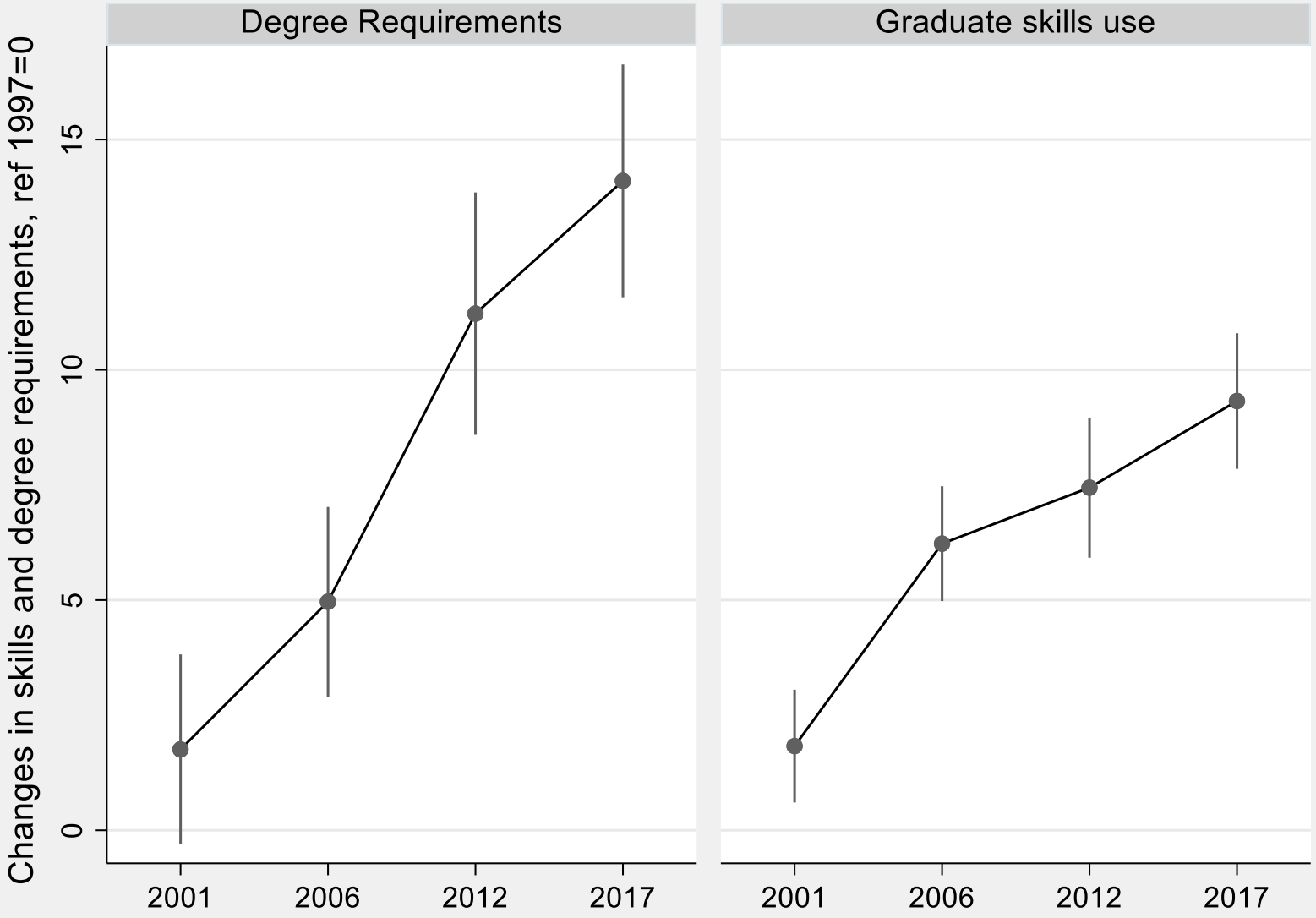
1.1. Trends in degree requirements and graduate skills use



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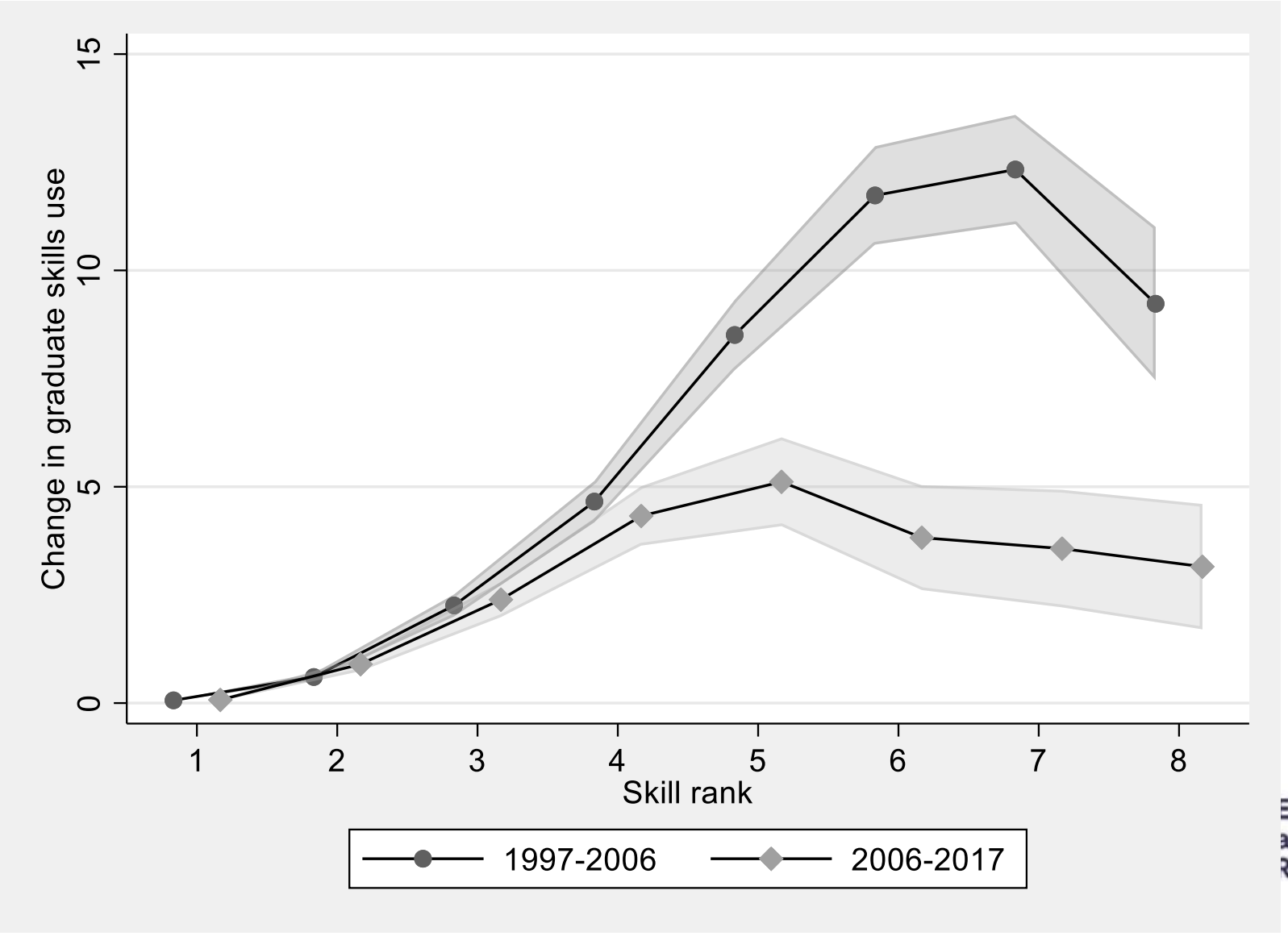

1.2. Changing graduate skills use across the skill distribution

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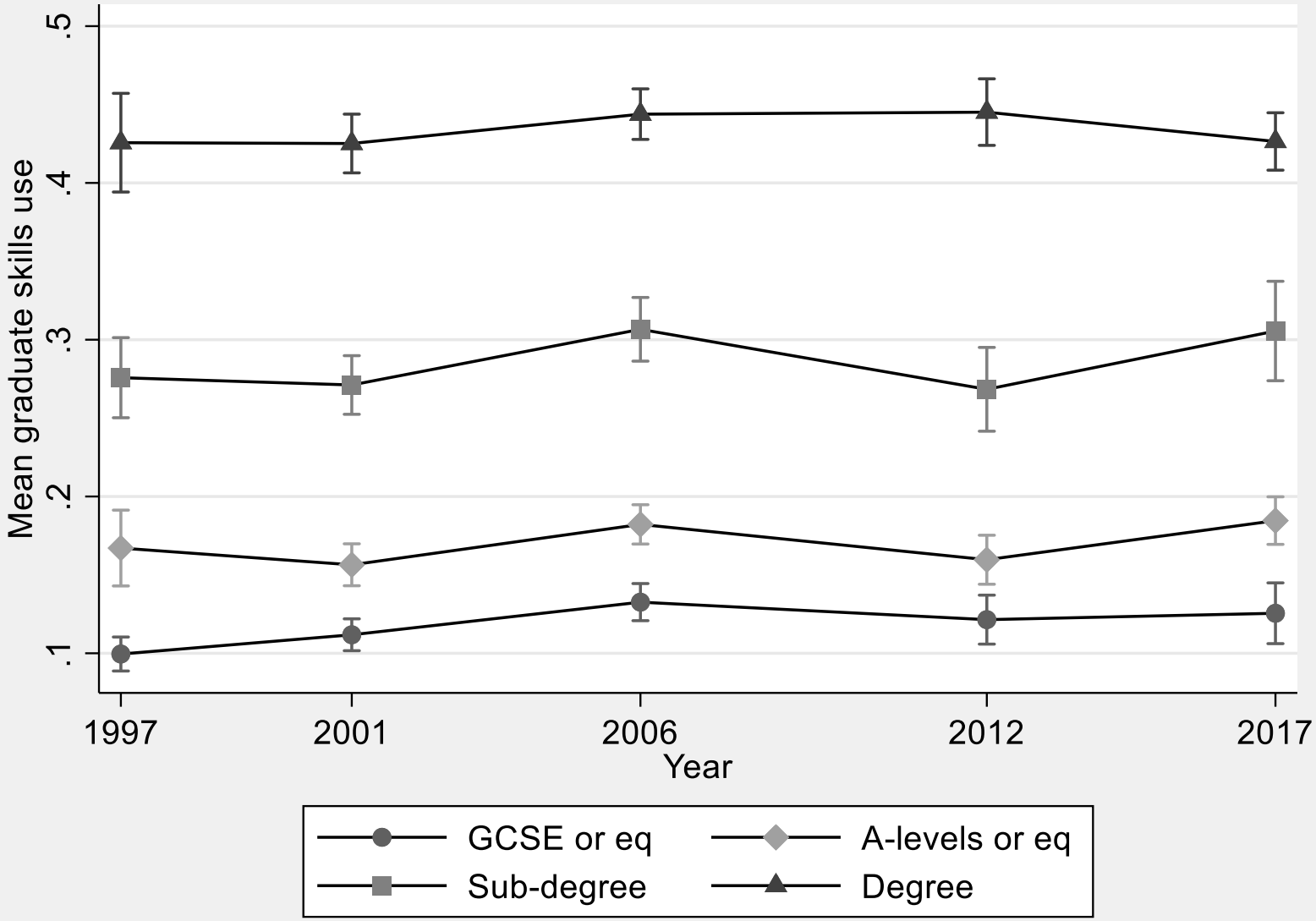

2.1. Relationship of educational attainment with graduate skills use

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2.2. The impact of HE massification on job upskilling

- There was a close relationship between the projected change in high-level work due to the expansion of HE and the observed increase in graduate skills use.
- In all, the expansion of HE attainment in the UK workforce explained nearly 50 % of the observed increase in graduate skills use between 1997-2017.
- However, the impact of the continued HE expansion on the growth of graduate skills use dropped to near zero after 2006.
- Meanwhile, degree requirements continued to ratcheted up due to HE expansion with an unbroken trend over 1997-2017

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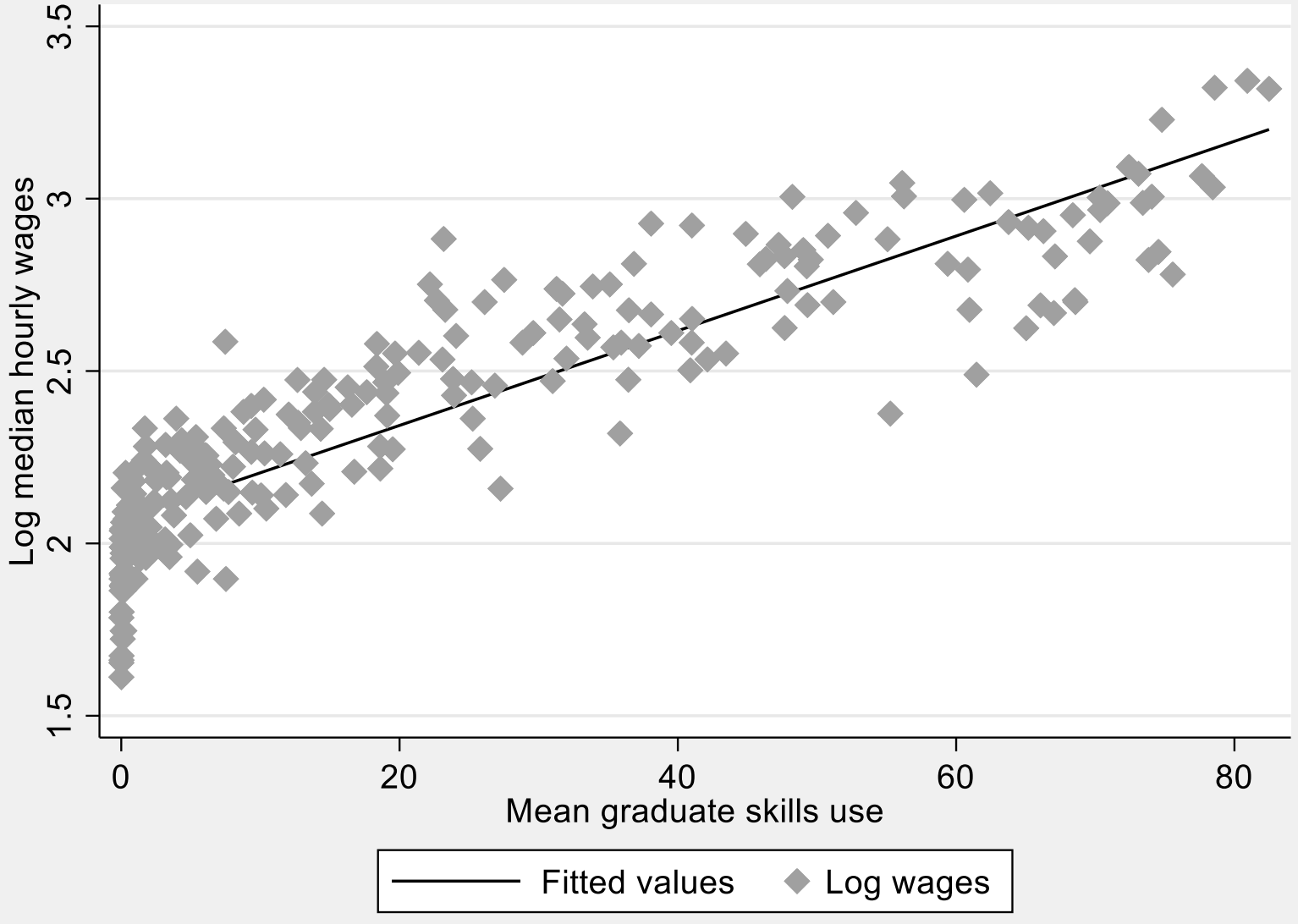
3.1. Correlation of graduate skill use with real hourly wages



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3.2. The price of graduate skills use: Main findings

- A five-point increase in graduate skills use was predicted to raise hourly wages by 7.2 %.
- Given the difference in graduate skills uses between school-leavers and graduates, the estimated task price explained 80% of the UK graduate wage premium.
- Degree requirements did not affect pay over and above skills use.
- Graduate skills use retained its high wage premium throughout the period.
- The wage premium was similar across the job skill distribution.

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Summary

- Graduate skills use rose since 1997, but slowing down after 2006.
- Degree requirements continued to increase.
- Graduate skills use rose with the inflow of graduates.
- However, around the Great Recession, there was a decoupling of graduate supply from job skills coinciding with the weakening relationship between graduate skills use and degree requirements.
- 80% of the graduate wage premium are down to job skills. Wage returns were stable. Paper requirements did not affect wages.

Discussion

- Hitherto, limited and varied purpose of degree requirements in British labour market (Brown & Souto-Otero, 2018).
- Skills supply (used to) mattered. While employers continue to value graduate skills use, the pipeline from graduate supply to job skills broke at around the time of the Great Recession. What is the root cause?
- British workers were still working harder (Green et al., 2022), but not necessarily smarter.
- Education-related wage differentials largely reflected differences in skills use.

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- Call for Papers -

CGHE Workshop "Unequal Graduate Outcomes: International perspectives over the Long-Term"

Pre-Call Announcement: Abstract submission opening at start of March 2023 for an in-person event on 11 & 12 Sep

Thank you!!!

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The ‘Task approach’: Empirical Challenges

- Disentangling job tasks from skills in observational data is hard.
- Workers who are more proficient or feel more skilled in a particular task tend to select jobs where that specific task is of greater importance.
- High and low-skill workers might select different jobs due to hard-to-observe considerations on both the employers’ and employees’ sides.
- Skills development in response to job task profiles will further reinforce the match of skills proficiency to job tasks.

➔ OLS wage returns to tasks are potentially biased.

Analytical Approach

1. Deriving an index of graduate skills use

$$P(D_{it} = 1|t) = \Phi\left(\sum_k \alpha_k \cdot t_{ikt}\right)$$

1. Sorting: Correlation of graduate skill requirements with worker characteristics

$$\hat{S}_{it} = \alpha + \delta_{1t} H_{it} + \delta_2 X_{it} + \varepsilon_{it}$$

2. Wage effects: Pseudo-panel of wages on changes in tasks

$$\ln(\bar{w}_{ct}) = \mu_C + \beta \cdot \bar{\kappa}_{ct} + \tau_t + \varepsilon_{ct}$$

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