

Wage progression of low-educated workers

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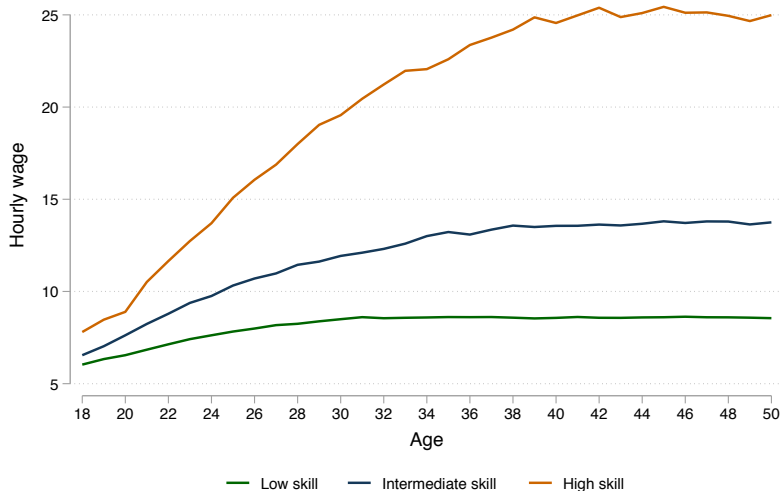
McMaster, September 2020

Motivation

Earnings of low-wage and low-educated workers have performed poorly in recent decades

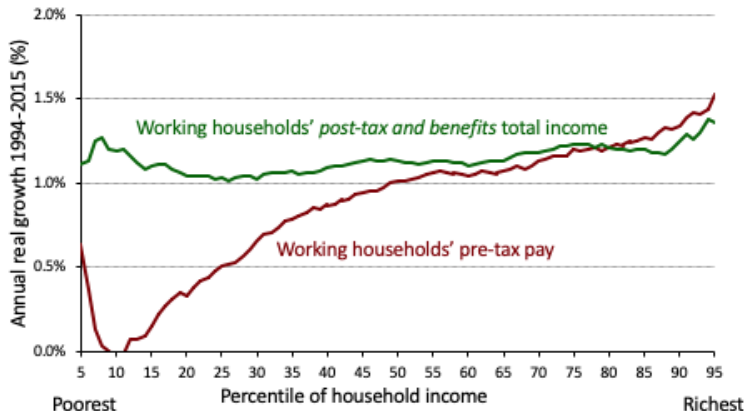
- ▶ earnings inequality is increasingly persistent: the poor stay poor
- ▶ there is little pay progression for low-educated workers
- ▶ employment is increasingly not enough to move households out of poverty or for longer run self-sufficiency

Wage progression in the UK



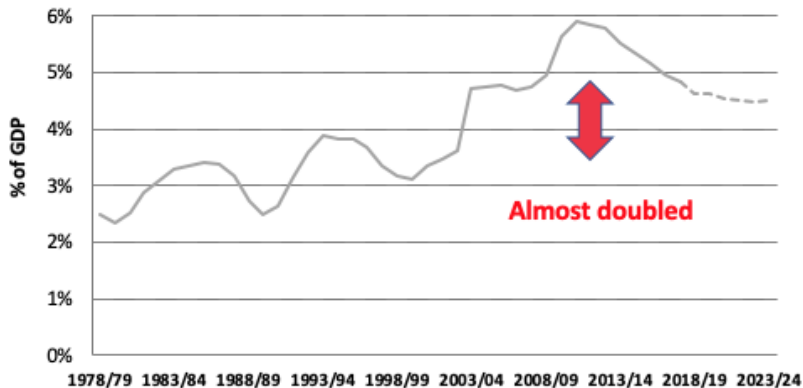
Source: ASHE, 2004-2016

Taxes and benefits have – until recently – boosted incomes at the bottom



Source: Blundell, Joyce, Norris Keiller and Ziliak, IFS, 2018

But relying on only taxes and benefits looks unsustainable

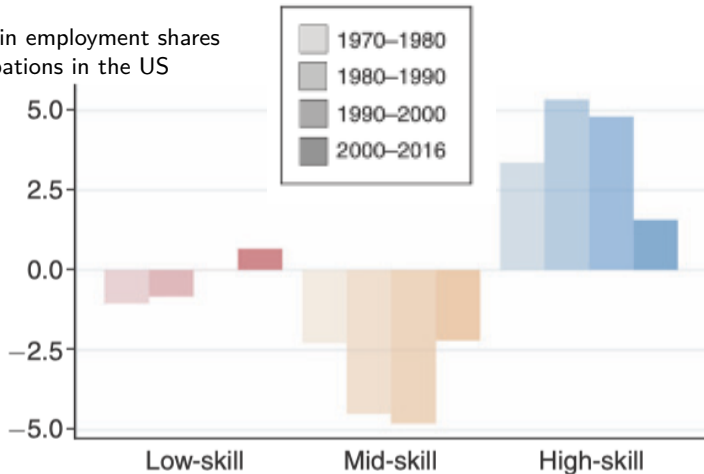


Source: IFS calculations from DWP (UK) benefit expenditure tables

Changes in the nature of work

Reduced demand for routine-task based jobs that can be automated or offshored; increased demand at the top where skills are complementary with technology/globalisation

Change in employment shares
in occupations in the US

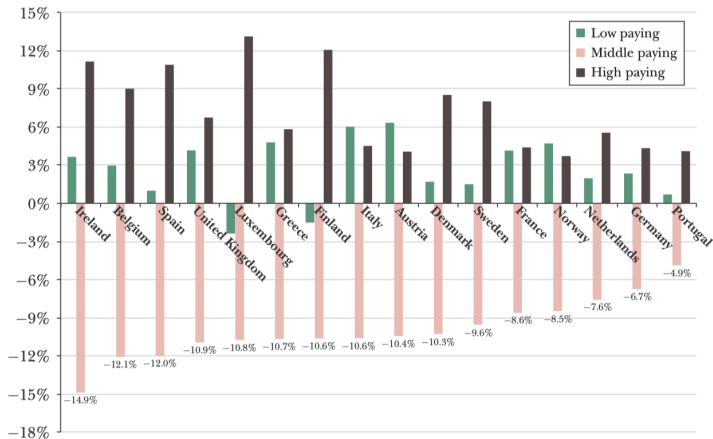


Source: Autor, Ely lecture in AER P&P, 2019

Similar patterns across European countries

Figure 3

Change in Occupational Employment Shares in Low, Middle, and High-Wage Occupations in 16 EU Countries, 1993–2010



Source: Autor, JEP, 2015

Motivation

- ▶ Evidence suggests a strong complementarity in returns to work experience for workers with higher education
 - ▶ the nature of work for higher educated workers leads to higher pay with more experience
 - ▶ but pay progresses only slowly with experience for the average low-educated worker
- ▶ Are there skills that are complementary with experience for low educated workers?
 - ▶ are there jobs that give low-educated workers opportunities to progress?
 - ▶ are there skills that lead not only to a one-off increase in pay, but that increase pay progression (enable workers to increase their productivity over their career)
 - ▶ what is the nature of these jobs and skills? can policy do more to enable/encourage development of these skills or these jobs?

Our contribution

- ▶ High quality **micro panel data** allows us to understand patterns of wage progression, and potentially learn about what drives them
- ▶ One fact that we see in many countries is large disparities in pay and pay growth, even when we compare observationally similar workers

What drives these differences?

- ▶ we drill down to see what are the characteristics of the **occupations** and **firms** in which workers in low-educated jobs do well
- ▶ what are the **tasks** and **skills** that firms value in workers in low-educated occupations?
- ▶ how important are **soft skills**?
- ▶ Ultimately we want to ask: what are the **potential policy levers** to improve pay growth for low-wage/low-educated workers?

Motivation

A large literature emphasises that

- ▶ firm heterogeneity plays an important role in explaining wage differences across workers However, there is little consensus in explaining
 - ▶ which features of the firm account for this variation
 - ▶ and how it affects wage dynamics of individuals
 - ▶ particularly for workers in low-educated occupations
- ▶ there are high returns to soft skills (non-routine intrinsically “human” tasks)

We highlight one channel

- ▶ in some low-educated occupations there might be an important complementarity between the (soft) skills of workers and the firm’s other assets, for example, the interplay with the firm’s innovativeness

Data

Matched worker-firm data for the UK 2004 - 2018

- ▶ **Workers**

- ▶ Annual Survey of Hours and Earning (ASHE)
- ▶ Labour Force Survey (LFS)

- ▶ **Firms**

- ▶ Annual Respondents Database (ARD)
- ▶ Business Enterprise Research and Development (BERD)

- ▶ **Nature of occupations**

- ▶ O*NET
- ▶ Regulatory Qualifications Framework (RQF)

Data on workers

Annual Survey of Hours and Earning (ASHE)

- ▶ 1% random sample of UK based workers, @180,000 employee jobs
- ▶ panel data, collected from firms based on tax records
- ▶ wages, hours and earnings, including bonuses and incentive pay
- ▶ firm identifier allowing match with firm data
- ▶ no data on individual's education or skills

Labour Force Survey (LFS)

- ▶ household survey, @ 35,000 households per quarter
- ▶ detailed information on individual's education, skills
- ▶ some information on training
- ▶ cross-section, no firm identifier

Data on firms

Annual Respondents Database (ARD)

- ▶ census of data on firm structure, location and employment
- ▶ census of production activities for firms with 250+ employees
- ▶ random stratified sample for smaller firms
- ▶ we use information on jobs in incorporated firms (excluding the public sector and private firms)

Business Enterprise Research and Development (BERD)

- ▶ Research and Development (R&D) expenditure
- ▶ census of firms with 400+ employees (70% of R&D)
- ▶ random stratified sample for smaller firms

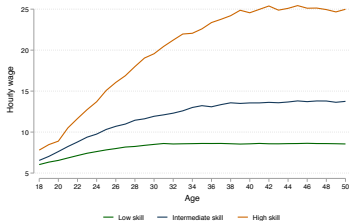
Data on education level by occupation

ASHE does not include data on individual's education; we use the **Regulatory Qualification Framework (RQF)**

- ▶ regulated by Ofqual (regulator of qualifications and exams)
- ▶ we use Appendix J which defines the education level required for each 4-digit occupation for immigration purposes
 - ▶ **Low-educated**, no formal qualifications necessary
process plant operative, basic clerical, cleaning, security drivers, specialist plant operative or technician, sales
 - ▶ **Medium-educated**, typically requires A-level or some basic professional qualification
trades, specialist clerical, associate professionals, medical or IT technicians, some managerial occupations
 - ▶ **High-educated**, typically required higher education or an advanced professional qualification
most managerial and executive occupations, engineers, scientists, R&D manager, bankers, other professions

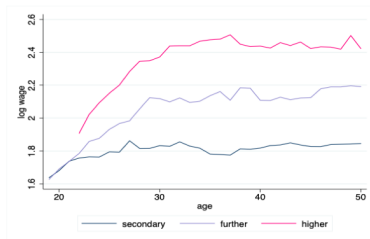
Comparing wage progression by occupation and individual

Measured by occupation



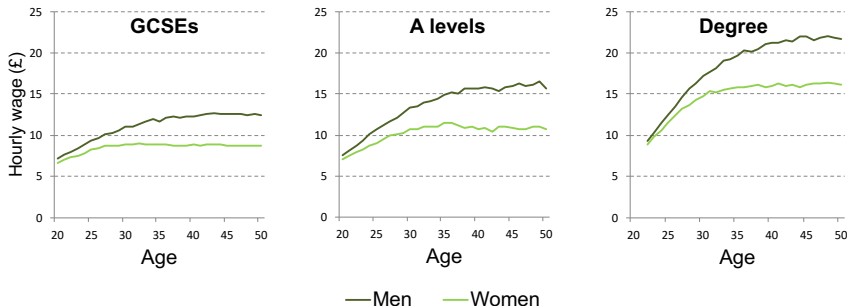
Source: ASHE

Measured by individual



Source: BHPS

Wage progression measured by individual education



Source: LFS, 1993-2017, Costa Dias, Joyce and Parodi, 2018

Wages and earnings by education level of occupation

Our main measure is hourly wages including overtime, bonuses and incentive pay

Occupation	Wage (hourly) £	% incentive pay	% overtime	Annual earnings £
Low-educated	10.12	2.4%	5.5%	17,791
Medium-educated	15.21	5.2%	2.9%	29,378
High-educated	24.01	7.0%	1.3%	48,972

Source: Authors' calculations using ASHE, 2004-2018

Data on task and skill content of occupations

We use O*NET to identify the task and skill content of occupations

- ▶ O*NET is an open access online database funded by the US Department of Labor that describes the mix of knowledge, skills and abilities required in an occupation and the activities and tasks performed
- ▶ collected through surveys of workers and occupational experts

The aims of O*NET are to provide

- ▶ individuals with information about the nature of different occupations to help them make job, education and training decisions
- ▶ firms and policymakers with standardised information about the skill and knowledge requirements of occupations, and of the workers in those occupations, to help them make decisions about training
- ▶ researchers to undertake research on the nature of work

We use these to proxy soft skills and abilities in O*NET

How important is ... to the performance of your current job?

- ▶ **Coordination**: Adjusting actions in relation to others' actions.
- ▶ **Active Listening**: Giving full attention to what other people are saying, taking time to understand the points being made, asking questions as appropriate, and not interrupting at inappropriate times.
- ▶ **Social Perceptiveness**: Being aware of others' reactions and understanding why they react as they do.
- ▶ **Problem Sensitivity**: The ability to tell when something is wrong or is likely to go wrong. It does not involve solving the problem, only recognizing that there is a problem.

And this information on work content

- ▶ **Coordinate or lead others**

- ▶ In your current job, how important are interactions that require you to coordinate or lead others in accomplishing work activities (not as a supervisor or team leader)?

- ▶ **Work with work group or team**

- ▶ How important is it to work with others in a group or team in this job?

- ▶ **Responsibility for outcomes and results**

- ▶ How responsible is the worker for work outcomes and results of other workers?

- ▶ **Consequence of error**

- ▶ How serious would the result usually be if the worker made a mistake that was not readily correctable?

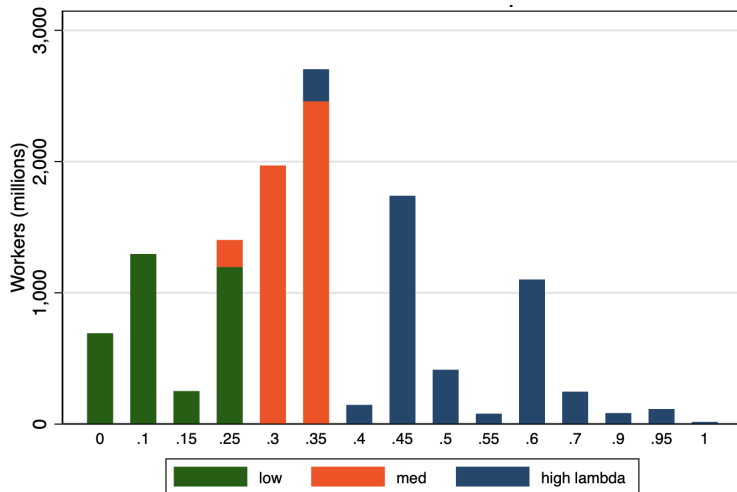
- ▶ **Importance of being exact or accurate**

- ▶ How important is being very exact or highly accurate in performing this job?

We create a single index of the importance of soft skills

- ▶ The O*NET data is available at the US occupation level
- ▶ We match to UK occupations, at one point in time (so no within occupation variation)
- ▶ We use principle components analysis to combine into a single index
 - ▶ normalise to $[0,1]$
 - ▶ we refer to this as "lambda" (λ), a measure of "soft skills"
- ▶ We descretise this into terciles, dividing the UK workforce in low-educated occupations into three equal bins
 - ▶ this defines occupations as low, medium or high λ

Distribution of soft skills across low-educated occupations



Source: Authors' calculations using O*NET and ONS employment data

Examples of low-educated occupations by lambda

Low lambda (low importance of soft skills)

- ▶ domestic cleaners, street cleaners, bar staff, caretaker, packer, process operator

Medium lambda (medium importance of soft skills)

- ▶ finance officer, book-keeper, plasterer, clerk, sales assistant

High lambda (high importance of soft skills)

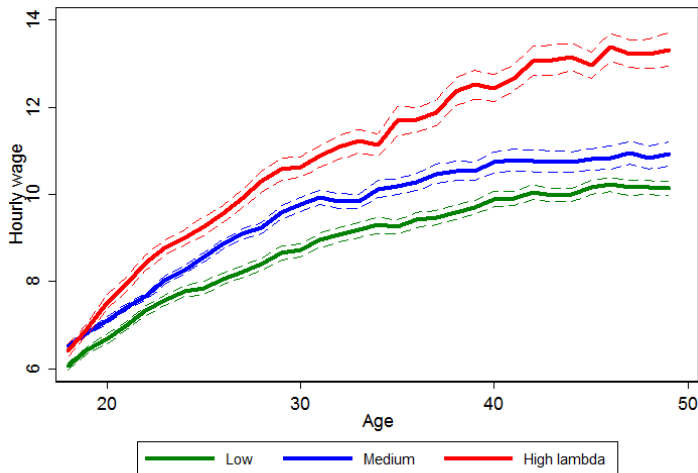
- ▶ receptionist, medical or school secretary, housekeeping manager, assembler, air transport operative, office supervisor

Difference in importance of skills and abilities by lambda

Skill/ability	low lambda	high lambda	difference	% difference
Social perceptiveness	2.48 (0.04)	3.01 (0.06)	0.526*** (0.06)	21%
Coordination	2.67 (0.03)	3.16 (0.03)	0.487*** (0.03)	18%
Active listening	2.83 (0.05)	3.29 (0.05)	0.486*** (0.07)	16%
Problem sensitivity	2.88 (0.02)	3.28 (0.03)	0.400*** (0.04)	14%
Responsibility for outcomes	3.02 (0.04)	3.38 (0.07)	0.362*** (0.08)	12%
Consequence of error	2.63 (0.05)	2.93 (0.06)	0.306*** (0.08)	12%
Coordinate others	3.26 (0.02)	3.56 (0.04)	0.307*** (0.04)	9%
Work with group	4.07 (0.03)	4.22 (0.03)	0.152*** (0.04)	4%

Source: Authors' calculations using O*NET

Workers in low-educated occupations where soft skills are important experience more wage progression



Sample is male workers aged 18-49 in low-skilled occupations in private firms with 400+ employees.

Source: Authors' calculations using ASHE, 2004-2018

Check: are there differences in education by lambda?

One potential concern is that the workers in **high soft-skill** occupations are more educated than those in **low soft-skill**; this doesn't seem to be the case

	Workers in low-educated occupations		
	low lambda	high lambda	diff
Age left education	17.39 (0.02)	17.42 (0.02)	0.026 (0.03)
Has higher education degree	83.2 (0.19)	81.6 (0.19)	-1.6*** (0.27)
N	37,725	42,230	79,955

Source: Authors' calculations using LFS, 2004-2018

A model

We propose a model that is consistent with this empirical finding

Why do we want to write down a model?

- ▶ to better understand what is driving these results
- ▶ to consider potential policy reforms
- ▶ to derive other empirical predictions that we can verify to support the idea that this model is relevant
- ▶ (we are in midst of revising theory, so I'm presenting a slightly cannibalised hybrid)

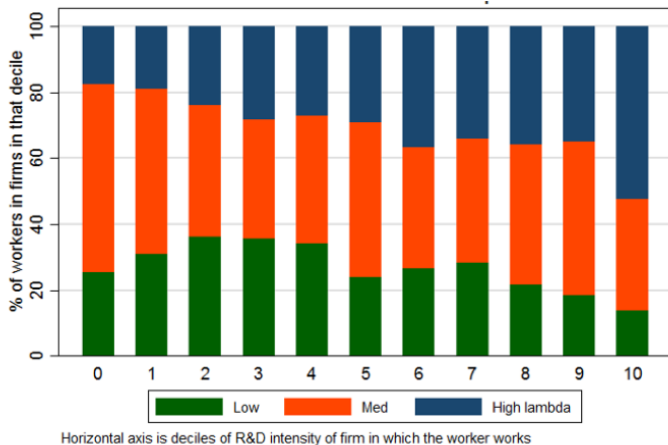
A model to better understand these results

In some low-educated occupations **workers are complementary to the firms other assets**

- ▶ i.e. they increase the productivity of these other assets
- ▶ the other assets are here modelled as workers in high-educated occupations (e.g. researchers in R&D firms)
- ▶ workers' productivity depends upon both hard skills and **soft skills**
 - ▶ hard skills are observable whereas **soft skills are hard to detect ex-ante**
 - ▶ for workers **in low-educated occupations, soft skills form a larger proportion of their abilities** and are important in determining wages
 - ▶ for workers in high-educated occupations, easily verifiable hard skills are more important in determining their wages

There are more of the high soft skill type of low-educated occupation in more innovative firms

Share of workers in low-educated occupations by lambda and R&D intensity

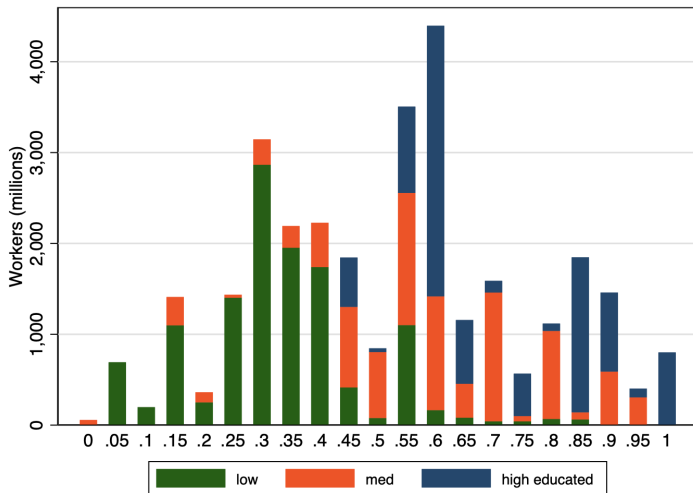


Source: Authors' calculations using ASHE-BERD, 2004-2018

The return to soft skills

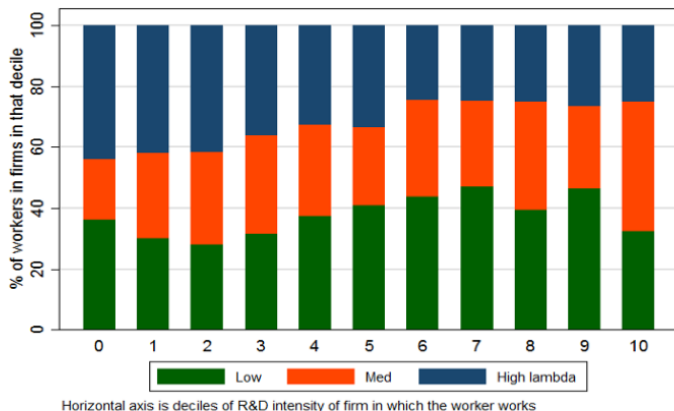
- ▶ The model relies on the **distinction between hard skills and soft skills**
 - ▶ **hard skills are observable and verifiable**, e.g. formal qualifications
 - ▶ **soft skills are difficult to observe**, both for employer and us
 - ▶ in model what drives the returns to experience in some low-educated occupations is the soft skills that are valuable to the firm because they are complementary with other assets
- ▶ We are not claiming that the *absolute* importance of soft skills is greater for workers in low than high-educated occupations
 - ▶ soft skills are **relatively** more important for workers in low-educated occupations
 - ▶ eg a researcher and an administrative assistant
 - ▶ researcher might have higher soft skills than the admin assistant
 - ▶ but her income will be mostly determined by her track record of publications and inventions, which are verifiable
 - ▶ the admin assistant might have lower soft skills than the researcher, but these will represent a higher share of her value to the researcher, and so play a more important role in determining the assistant's wage

Distribution of soft skills by education group



Source: Authors' calculations using O*NET and ONS employment data

Share of workers in high-educated occupations by lambda and R&D intensity



Source: Authors' calculations using ASHE-BERD, 2004-2018

The model implies that:

Workers in low-educated occupations with high soft skills command higher bargaining power

- ▶ a worker whose value comes from difficult to observe soft skills is difficult to replace
 - ▶ because these soft skills are unknown at point of hiring, or require training/investment by the firm, it is not a simple matching set up; tenure/training increases wage premium of these workers

Workers in high-educated occupations typically have observable qualifications, wage is primarily determined by education, reputation, etc, which are easily observable and verifiable

- ▶ a firm can replace a worker with observable hard skills by another similar worker with limited downside risk

Model: production

Representative firm with a two-layer hierarchy

- ▶ a high-educated worker monitors continuum of tasks each performed by a low-educated worker
- ▶ tasks are ranked by degree of complementarity between the qualities of the high-educated and low-educated workers on that task
 - ▶ $\lambda \in [0, 1]$: degree of complementarity
 - ▶ Q : quality of high-educated worker
 - ▶ $q = q(\lambda)$: quality of low-educated worker on task λ
- ▶ Production on task (partial O'Ring, Kremer 1993, Kremer and Maskin 1996):

$$f(\lambda, q, Q) = \lambda qQ + (1 - \lambda)(q + Q)$$

Technology and production

Assumption: more innovative firms display higher average complementarity between low-skilled occupation workers and high-skilled employee

- ▶ (Garicano, 2000; Garicano and Rossi-Hansberg, 2006; Caroli and Van Reenen, 2001; and Bloom et al., 2014)
- ▶ more formally:

$$\mathbb{E}_{\phi}(\lambda, z) = \int_0^1 \lambda \phi(\lambda, z) d\lambda$$

increases with innovativeness z .

Firm output aggregates tasks according to:

$$F(\vec{q}, Q, z) = \int_0^1 f(\lambda, q(\lambda), Q) \phi(\lambda, z) d\lambda$$

$$\text{where } \int_0^1 \phi(\lambda) d\lambda = 1$$

Model: wage negotiation

- ▶ The firm engages in separate wage negotiation with each worker
 - ▶ yields equilibrium wages: w_q and w_Q for each task
- ▶ If negotiations fail the firm hires a substitute at reservation quality and wages:
 - ▶ quality q_L at wage w_L , or Q_L at w_H
- ▶ It is easier for firm to find a substitute for high-educated employee than low-educated employee
 - ▶ $Q - Q_L < q(\lambda) - q_L$, because difficult to observe soft skills are an important part of low-educated worker's quality
- ▶ Wages are then determined with outside option for the low and high educated workers \bar{w}^L and \bar{w}^H , respectively

Model: equilibrium wages

- ▶ Surplus is split between the firm and the workers according to some bargaining
- ▶ We can derive expression for equilibrium wages of workers in low and high educated occupations that are functions of λ and the qualities of both types of workers

$$w_q(\lambda_z, q, Q)$$

$$w_Q(\lambda_z, q, Q)$$

Model: equilibrium training

We assume that prior to the wage negotiation, the firm can learn about or train the low-educated occupation worker on each task λ , so that the expected quality of the worker moves up from q_L to some higher quality level $q^*(\lambda)$ at a quadratic cost

- ▶ this gives us that the optimal level of training with respect to q - i.e. for workers in low-educated occupations - is increasing with λ_z and so with z , the innovativeness of the firm

Model solution

- ▶ Equilibrium wages of worker in low-educated occupation:
 - ▶ is increasing in λ_z , the importance of soft skills
 - ▶ is increasing in Q^* , working with higher productivity workers increases the importance of the soft skills of the low-educated worker

Outsourcing

- ▶ For sufficiently low λ - i.e. tasks with no complementarities - it is optimal to have low quality workers $q(\lambda) = q_L$
- ▶ If the firm is subject to an overall time constraint for training or screening
 - ▶ if the time constraint is binding, for sufficiently low λ the firm will want to outsource to free up time for training/screening the high λ tasks
 - ▶ the cutoff value of λ below which the firm decides to outsource increases with innovativeness z
- ▶ Implies that more frontier (innovative) firms will outsource a higher fraction of tasks

Tenure

- ▶ There is a wage premium to working in a more innovative firm for workers in low-educated occupation, which is driven by the complementarity between their quality and the firm's other assets
- ▶ Workers in low-educated occupations should have longer tenure in more innovative firms than in less innovative firms (as more time and money is invested in getting them from q_L to q^*)
- ▶ A more innovative firm will invest more in training its workers in low-educated occupations than a non innovative firm (this is captured by the fact that $q - q_L$ is an increasing function of z in the model)

Return to soft skills in low-educated occupations

$$\ln(w_{ijkft}) = g(A_i, T_{ift}, FT_{ift}, S_{ift}) + \phi_j(T_{ift}, \psi_i) + \gamma_i + \eta_t + e_{ijkft}$$

$$\phi_j(T_{ift}, \psi_i) = \alpha_1 \lambda_j \cdot T_{ift} + \alpha_2 \lambda_j + \alpha_3 T_{ift} + \psi_i$$

i : individual j : occupation k : labour market f : firm t : year

ψ_i : worker's (unobserved) soft skills

λ_j : importance of soft skills in occupation w : wages

T_i : tenure

► captures increased productivity and learning about soft skills of worker

A : age, FT : full/part-time, S : firm size

Unobserved heterogeneity

Unobserved worker heterogeneity: γ_i and ψ_i

- ▶ ψ_i : worker's (difficult to observed) soft skills
- ▶ γ_i : other (difficult to observed) potentially confounding factors
- ▶ but γ_i also identifies average ψ_i that is revealed while the worker is in an innovative firm during the sample period, **would lead us to underestimate the impact of soft skills**
 - ▶ we would like to condition on the level of skills of the worker at entry into the workforce, rather than on an average worker effect
 - ▶ **we use the initial wage that the individual receives when they enter the labour market** (ASHE has longer history than BERD)
 - ▶ pre-sample measurement reflects worker's initial skill level, is not influenced by evolution of soft skills in sample (Blundell, Griffith and Van Reenen, 1999 and Blundell, Griffith and Windmeijer, 2002)

Dependent variable: $\ln(w_{ijkft})$

High lambda	0.0790*** (0.0049)	0.0179*** (0.0048)	0.0495*** (0.0039)
× tenure	0.0070*** (0.0005)	0.0008* (0.0005)	0.0026*** (0.0003)
× tenure 0-5 years	0.0048*** (0.0014)	0.0051*** (0.001)	0.0086*** (0.0011)
× RD firm			
× tenure 0-5 years × RDfirm			

RD firms

tenure × RD firm

initial wage			0.0519*** (0.0011)
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Controls for age, tenure, tenure-squared, gender, full/part-time, firm size, initial wage

Geo-Year	✓	✓	✓
Worker effects		✓	
R^2	0.288	0.284	0.509
Observations	173,339	173,339	173,339

Source: Authors' calculations using ASHE-BERD, 2004-2018

Adding in R&D intensity of the firm

$$\ln(w_{ijkft}) = \beta_1 R_{ft} + g(A_i, T_{ift}, FT_{ift}, S_{ift}) + \gamma_i + \eta_t + \phi_j(R_{ft}, T_{ift}, \psi_i) + e_{ijkft}$$

$$\phi_j(R_{ft}, T_{ift}, \psi_i) = \alpha_1 \lambda_j \cdot R_{ft} \cdot T_{ift} + \alpha_2 \lambda_j \cdot R_{ft} + \alpha_3 R_{ft} \cdot T_{ift} + \alpha_4 \lambda_j + \psi_i$$

\tilde{R} : R&D intensity

i : individual j : occupation k : labour market f : firm t : year

ψ_i : worker's (unobserved) soft skills

λ_j : importance of soft skills in occupation w : wages

T_i : tenure

► captures increased productivity and learning about soft skills of worker

A : age, FT : full/part-time, S : firm size

Dependent variable: $\ln(w_{ijkft})$

High lambda	0.0790*** (0.0049)	0.0179*** (0.0048)	0.0495*** (0.0039)	0.0130** (0.0052)	0.0421*** (0.0041)
× tenure	0.0070*** (0.0005)	0.0008* (0.0005)	0.0026*** (0.0003)	0.0007 (0.0005)	0.0022*** (0.0003)
× tenure 0-5 years	0.0048*** (0.0014)	0.0051*** (0.001)	0.0086*** (0.0011)	0.0027** (0.0012)	0.0059*** (0.0014)
× RD firm				0.0112* (0.0062)	0.0148*** (0.0050)
× tenure 0-5 years × RDfirm				0.0050*** (0.0018)	0.0054*** (0.0021)
RD firms				0.0339*** (0.0038)	0.0415*** (0.0033)
tenure × RD firm				-0.0016*** (0.0004)	-0.0006** (0.0003)
initial wage			0.0519*** (0.0011)		0.0515*** (0.0011)

Controls for age, tenure, tenure-squared, gender, full/part-time, firm size, initial wage

Geo-Year	✓	✓	✓	✓	✓
Worker effects		✓		✓	
R^2	0.288	0.284	0.509	0.286	0.512
Observations	173,339	173,339	173,339	173,339	173,339

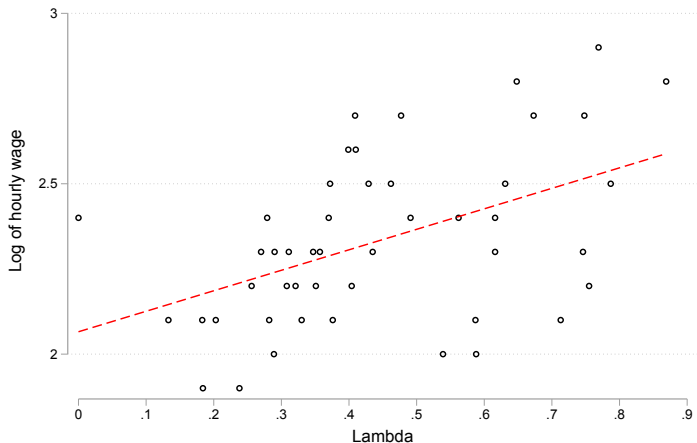
Source: Authors' calculations using ASHE-BERD, 2004-2018

Robustness and other predictions from the model

- ▶ non-discrete λ
- ▶ training
- ▶ tenure
- ▶ outsourcing
- ▶ comparison with high-educated occupations

Mean wage by λ , low-educated occupations in R&D firms

Wages are higher in higher λ occupations (where soft skills are more important) for workers in *low-educated* occupations in R&D firms



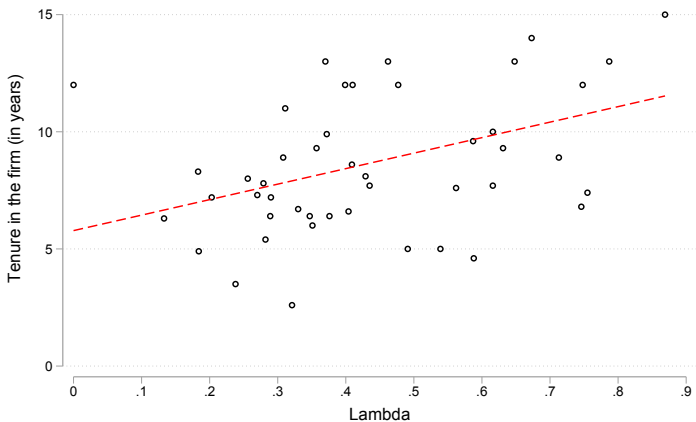
Source: Authors' calculations using ASHE-BERD, 2004-2018

Workers in low educated occupations where λ is higher - soft skills are more important - get more training

	low lambda	high lambda	diff
In education or training (of any kind)	13.4 (0.18)	18.6 (0.19)	5.3*** (0.26)
N	37,725	42,230	79,955
Training during work	4.6 (0.15)	6.8 (0.17)	2.2*** (0.23)
N	19,060	22,319	41,379
Employer paying for training	1.6 (0.04)	2.5 (0.05)	0.9*** (0.06)
N	94,030	106,804	200,834

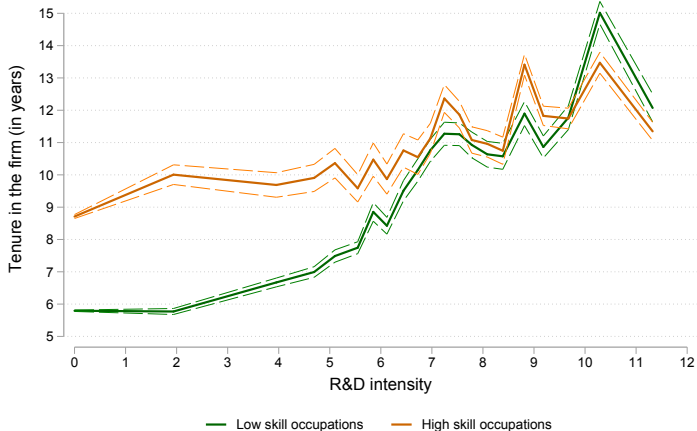
Source: Authors' calculations using LFS, 2004-2018

Workers in low educated occupations where λ is higher - soft skills are more important - have longer tenure



Source: Authors' calculations using ASHE-BERD, 2004-2018

Workers in low educated occupations where λ is higher - soft skills are more important - have longer tenure in more R&D intensive firms

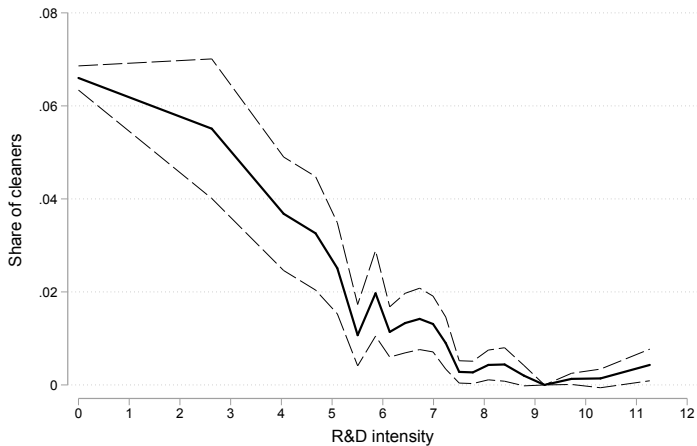


Source: Authors' calculations using ASHE-BERD, 2004-2018

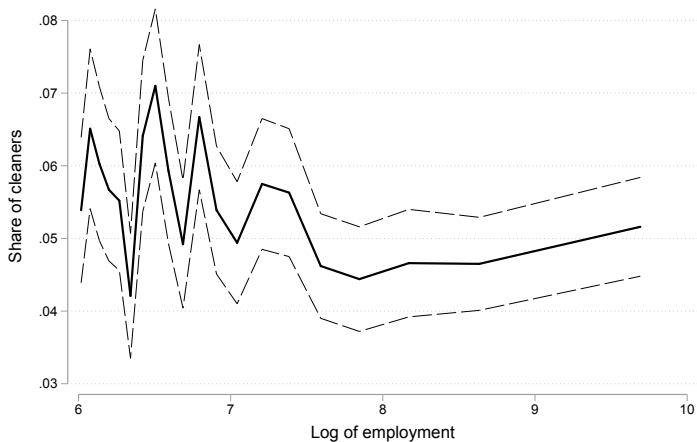
How to measure outsourcing?

- ▶ Our model predicts that innovative firms will outsource the tasks that have little complementarity between high and low skill occupation workers
- ▶ the time dimension of our data does not allow us to look at this directly
- ▶ Indicative evidence for one specific occupation
 - ▶ the technology of cleaning does not vary much across firms
 - ▶ the share of low-skilled workers in a firm that are cleaners should be reasonably constant (recall these are all firms with 400+ employees)
 - ▶ cleaning a low λ task (not complementary with high-skilled workers)
 - ▶ the only reason this share would be lower than average in some firms is because those firms outsource cleaning

Share of cleaners decrease with R&D



Share of cleaners decrease with R&D, not with firm size



The payoff to soft skills is higher in low-educated occupations than in high-educated occupations

Dependent variable: $\ln(w_{ijkft})$		
	low educated	high educated
High lambda	0.1511*** (0.0022)	0.0750*** (0.0036)
Medium lambda	0.0968*** (0.0023)	0.0578*** (0.0037)
Firm size	0.0026*** (0.0003)	0.0287 (0.0004)
Male	0.0971*** (0.0020)	0.1690*** (0.0024)
Full-time	0.1351*** (0.0029)	0.0266*** (0.0038)
Age	0.0295*** (0.0002)	0.0688*** (0.0007)
Age-squared	-0.0004*** (0.0001)	0.0007*** (0.0001)
Tenure	(0.0172*** (0.0002)	0.0085*** (0.0003)
Tenure-squared	-0.0002*** (0.0001)	-0.0002*** (0.0001)
Geo-Year	✓	✓
R^2	0.231	0.153
Observations	974,451	497,909

Conclusion

- ▶ We use new employee-employer matched data that includes information on R&D to show:
 - ▶ workers in low-educated occupations experience wage progression in occupations where soft skills are higher
 - ▶ these returns are higher in innovative firms
 - ▶ the premium for working in a high λ occupation is higher for workers in low-educated than high-educated occupations
- ▶ We propose a model that is consistent with this finding
 - ▶ soft skiller in some low-educated occupations are complementary to the firms other assets – e.g. workers in high-educated occupations – this increases their worth to the firm and allows them to capture a higher share of the surplus
- ▶ We show empirical support for this model
 - ▶ though of course we can't rule out potential alternative explanations

Preliminary thoughts on policy implications

- ▶ The nature of vocation training
- ▶ Certifiable social skills
- ▶ Early years training, including developing important social skills
 - ▶ IFS work on the important effects that the UK Sure Start program
 - ▶ Orla Doyle work on the impacts of the Preparing for Life intervention in Dublin
 - ▶ Perry Preschool and the Abecedarian interventions in the US