Job Matching in the UK:

Determinants and Implications of Underskilling and Overskilling

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Abstract

One of the most oft cited reasons for the UK's lack of competitiveness is skills shortages. Yet the issue is normally discussed in the framework of a pool of inadequately skilled, unemployed labour who cannot hope to fill the job requirements of firms. In this paper we consider job-skills mismatches of those individuals fortunate enough to have jobs and question whether firms are failing to utilise the skills of their existing labour force. Further, we also consider whether firms are hiring workers not capable of fulfilling their job requirements without adequate training provision.

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1 Introduction

The widely held belief that skills shortages are a significant feature of European labour markets has prompted governments across the continent to increase public expenditure on workforce training programmes. This has occurred for a variety of reasons. In the first instance, it is perceived that the structure of industry has changed at a faster rate than the distribution of skills within the labour force. Thus we observe structurally unemployed manufacturing workers on the one hand and unfilled service sector job vacancies on the other (Dur,1999). A second, and related, rationale for government intervention in the labour market is to reduce wage pressure created by high demand for certain types of scarce labour. Thus we can see economies with high levels of unemployment existing at the same time as we observe high wage growth in the employed sector. A particular point of focus for policy-makers at the present time is on the small firm sector who are often perceived to be good at creating jobs but a little deficient on the quality aspect (Cowling and Storey,1998).

In this paper we seek to identify the nature and characteristics of workers and their jobs as a means of explaining why there is a perceived skills shortage in the UK (Haskel and Martin,1993). Specifically we focus on those currently in work. Our underlying motivation is to question whether what we are observing and identifying as a skills shortage is a consequence of imperfect job matching. For example it might be the case that firms personnel functions are failing to match workers to jobs which reflect their skills base. This is compounded in the case of underskilled workers in situations where workforce based training is inadequate. It might also be the case that workers are too skilled for their jobs, perhaps as a result of overtraining.

The advantage of our data is that we are able to identify underskilling *and* overskilling of workers. To this end we hope to build upon the start made by Green, Machin and Wilkinson (1998), who questioned employers about their experiences of deficiencies in the quality of their existing labour force. The added value of this paper is that we use individual workers level data relating to job-skills mismatches. Thus we approach the same problem, but from the perspective of the worker rather than the firm. Our work can then be viewed as being complementary to previous research.

We begin by disentangling the causal link between skills gaps and shortages. On the latter the Training Agency (1990) Report identifies a 'skills gap' as corresponding to deficiencies in a firms existing workforce to operate effectively in the context of their job. A 'skills shortage' is then identified as a situation arising when the labour market cannot supply enough people with the appropriate skills to fulfil demand. Thus, in a dynamic sense, firms facing skills gaps can adjust the composition of their workforces appropriately over time. Only in situations where this is not achievable does a skills gap translate into a shortage.

In terms of how previous work has tackled these issues, it is evident that the majority has explicitly focused on skills shortages in the context of the derived attributes, behavioural and technical, that employers desire from their employees. To this end, many studies have used vacancy durations as a proxy for skills shortages (Haskel and Martin,1993, Jones and Goss, 1991, Lindeboom and Van Ours,1993, Russo et al,1996). Yet as Green et al. (1998)

point out, this type of approach has singularly failed to address the extent to which firms existing employees are deficient in the skills necessary to operate at optimal efficiency. Implicit in the former approach is that firms have chosen the optimal recruitment strategy and are still encountering labour shortages.

On recruitment behaviour, for example, the work of Russo et al. (1996) shows that regional labour market conditions affect firms choice recruitment strategy with significantly different outcomes in terms of vacancy duration. In a related paper, Lindeboom and Van Ours (1993) find differences in terms of the job offer / job acceptance decisions of employers and workers. Thus, far from being a binding labour supply constraint, empirical work of the vacancy duration school has tended to focus on frictions in the labour market which prevent vacancies from being filled instantaneously (Haskel and Martin,1993, Pissarides,1990).

Earlier literature, notably that of Becker (1962), Mincer (1962) and Oi (1962), which relates to job turnover, also has relevance to the issue of job matching. Here, the point of focus is on human capital investment as a means of reducing labour turnover. This occurs as workers develop more job specific skills over time that results in better matches between skills and current employment. It follows that younger workers are more likely to get their job-skills matches wrong through inexperience (Miller,1984). Yet others have pointed out that mismatches may not always lead to job separations (Harris and Holmstrom, 1982, Harris and Weiss,1984). This occurs if wage profiles are downwardly rigid ie that wages do not always follow productivity.

Our point of focus is very specifically on workers currently in employment. To this end we follow in the footsteps of Green et al. (1998). Our findings also have some potentially important public policy implications in the sense that if matching is higher in certain sectors or size classes of firms then targeted policy measures might enhance productivity and competition in the economy (Wagner,1996).

The rest of the paper is set out as follows; in Section II we briefly discuss the source of our data. In Section III we present the sample statistics, and in Section IV we discuss the methodology used to generate the results. We conclude in Section V.

2 The Data

The second European survey on working conditions took place in January 1996 and collated the views of 15,800 workers from all over Europe. 1,000 workers in each Member State of the European Union (15 Member States in 1996) were questioned simultaneously about their working conditions. The sample is representative of the working population (employees and the self-employed). It is a questionnaire based survey, involving face-to-face interviews conducted outside the workplace. The questionnaire covers all aspects of working conditions: physical environment, workplace design, working hours, work organisation and social relationships at the workplace.

3 Sample Statistics

In this section we discuss the sample statistics by distinguishing between workers who are well matched with their jobs, those who are over-skilled and those who are underskilled. The discussion is presented by various sub-sections in order that the reader is not swamped by the volume of data considered in the empirical estimation.

Table 1: Sample statistics (%)

	Underskilled	Matched	Overskilled
Personal Characteristics			
Male	9.8	77.4	12.8
Female	8.6	80.8	10.6
Age (years)	39.9	38.9	35.1
Single	10.0	73.5	16.5
Married	8.0	81.2	10.8
Cohabiting	16.1	73.2	10.7
Divorced	0.0	83.3	16.7
Split	12.5	87.5	0.0
Kids	8.4	80.2	11.4
No kids	10.1	77.3	12.6
Degree	6.5	78.5	15.1
A level	8.8	79.3	11.9
O level	11.9	77.3	10.8
Sector			
Agriculture	20.0	53.3	26.7
Manufacturing	11.9	77.0	11.1
Construction	5.3	89.5	5.3
Retail	3.6	74.3	22.1
Catering	9.4	81.3	9.4
Transport	12.3	78.5	9.2
Utilities	25.0	66.7	8.3
Estate	8.7	82.6	8.7
Pubadmin	0.0	90.9	9.1
Other services	7.5	83.9	8.7
Contract			
Fixed	11.1	70.4	18.5
Permanent	10.4	77.5	12.2
Temporary	5.9	76.5	17.7
Occupation			
Manager	3.1	87.7	9.2
Professional	9.9	76.1	14.1
Technician	8.9	86.7	4.4
Clerical	13.9	78.5	7.7

	Underskilled	Matched	Overskilled
Sales	6.7	80.0	13.3
Farmer	20.0	53.3	26.7
Craft	8.2	82.2	9.6
Plant operative	17.2	63.8	19.0
Unskilled	7.6	78.6	13.8
Tenure (years)	9.8	9.6	5.9
Training (% yes)	61.4	45.3	39.8
Industrial Relations (% yes)			
Short	42.3	25.1	33.6
Home	6.1	9.7	3.9
Security	67.0	80.0	75.8
Norms	43.0	30.5	31.7
Direct	52.2	38.0	41.4
Order	59.6	72.4	65.6
Method	69.9	71.7	63.0
Quality	90.4	84.7	77.2
Solve	88.6	87.6	83.2
Decision	57.5	55.8	43.8
Learn	81.6	81.7	63.6
Consult	61.1	58.3	60.0
Firm Size			
Size0	5.1	84.8	10.2
Size5	3.9	90.2	5.9
Size30	11.2	75.9	12.9
Size75	7.0	83.7	9.3
Size300	6.1	80.3	13.6
Size500	13.0	73.2	13.8
N obs	*114*	*817*	*128*

(i) Job Mismatches in Aggregate

In the UK as a whole 77.2% of workers skills match the demands of their jobs. Of the 22.8% of workers whose jobs-skills matches were not aligned, 12.1% were too skilled for the demands of their jobs and 10.7% were underskilled. This suggests that overskilling is the largest cause of job-skill mismatches in the UK.

(ii) Personal Demographics

Here we find that female workers are marginally more likely to be matched in terms of skills to work function than males, but less likely to be too skilled for their jobs. On age there appears to be some variation with the youngest workers tending to be overskilled. Marital status was also an important area of differentiation with single or cohabiting workers the least likely to find close job-skills matches. The evidence broadly suggests that children are not a barrier to finding suitable employment. However, education does appear to be important. Here, for example, the data strongly suggests that firms are failing to fully utilise the skills of their most highly educated workers. At the opposite end, a higher proportion of workers with low educational levels were underskilled.

(iii) Sector

There was tremendous variation in job matches across industry sectors. For example, 90.9% of workers in public administration were well matched compared to only 53.3% in agriculture. Sectors where overskilling was highest were agriculture and retailing. Underskilling was more common in utilities and once again agriculture. Overall, the data suggests that the agricultural sector has the biggest problem in matching jobs to workers.

(iv) Employment Contracts

On the nature of employment contracts, we observe that permanent and temporary contract workers had higher proportions of job-skills matches than fixed contract workers. The latter finding suggests that 'temping' agencies are playing a useful role in filling short-term vacancies. However, the data also shows that both fixed and temporary contract workers had much higher rates of overskilling. The latter group also had very low levels of underskilling.

(v) Occupation

Regarding occupational classification, we note that farm workers and plant & machine operators had the lowest job-skills matching with only 53.3% of the former and 63.8% of the latter finding a suitable match. By contrast, managerial staff and technicians had very high levels of matching. Farmers and plant & machine operatives were also more likely to overskilled or underskilled, although in both cases overskilling dominated. By contrast, technicians and clerical workers had very low rates of overskilling. In addition, managerial and sales staff had low rates of underskilling.

(vi) Job Tenure and Training

On job tenure we note that overskilled workers, rather counter-intuitively, have shorter job tenures than matched or underskilled workers. The latter finding is rather worrying as it suggests that even after ten years with a firm, a significant minority of workers are still not skilled enough to meet the demands of their jobs. At the opposite end, the data suggests that firms still find it difficult to fully utilise the skills of their existing workers, even after six years in post.

The data on training is more reassuring. Here we observe that the incidence of training declines as we progress from underskilled, to matched, to overskilled workers. Yet we are still left with several interesting questions; firstly, why aren't the other 38.6% of underskilled workers receiving training?; secondly, do 45.3% of matched workers really need training?, and; thirdly, why are firms committing training resources to workers who are already too skilled for their jobs?

(vii) Industrial Relations and Job Characteristics

Here we find a substantial number of differences in job matching. For example, substantially more underskilled workers were in jobs involving short, repetitive tasks. In contrast a perception of job security was more associated with good job matching. Underskilled workers were also associated with jobs that were heavily regulated by production norms and under direct employer supervision. They were also less likely to be able to choose their order of tasks.

(viii) Firm Size

The single self-employed, perhaps not surprisingly, are highly likely to have good job skills matches. As we move up the scale to micro firms (1-9 employees) we observe even higher proportions of good matches. This contrasts with large firms where there appears to be significant numbers of overskilled and underskilled workers. This is somewhat surprising when we consider the relatively professional practices adopted by larger firms when recruiting staff (for example, national advertising, use of employment agencies, psychological testing and multiple interviewing) and the existence of an identifiable personnel function (Wynarczyk et al, 1993). Micro firms, by contrast, tend to use informal recruitment techniques (Atkinson and Meager, 1994) and draw their labour from the immediate locality. In terms of the causes of job-skills mismatches, overskilling appears most acute amongst the self-employed, in micro and medium sized businesses (100-499 employees).

4 Methodology and Results

In order to investigate the effects of individual characteristics on job matching of the individual, a multinomial logit model is estimated. The model (reported in Table 2) estimates the determinants of the probability of being underskilled and overskilled relative to the reference state of matched.

The multinomial logit model can be written in the following form:

$$\Pr(y_i = j) = P_{ij} = \frac{\exp(x'_i \beta_j)}{1 + \sum_{k=1}^{J} \exp(x'_i \beta_k)} \quad \text{for j=1,2,3}$$

$$\Pr(y_i = 0) = P_{i0} = \frac{1}{1 + \sum_{k=1}^{J} \exp(x'_i \beta_k)} \quad \text{for j=0}$$

where 0 is matched, 1 is underskilled and 2 is overskilled. For interpretational ease, the exp(β) are reported rather than the βs themselves. These relative risk ratios (RRRs) take a value of less than 1 if the variable reduces the probability of being in state j relative to the reference state, and a value of greater than 1 if the variable increases the probability. As an example, the RRR value of 1.69 on the male variable in the job matching equation in Table 2 implies that the relative chances of being overskilled rather than underskilled is some 69% higher for men relative to women, all things equal.

Table 2: The Determinants of Underskilling, Job Matching and Overskilling in the UK.

	Underskilling		Overskilling	
	RRR	**Z**	**RRR**	**Z**
Personal Characteristics				
male	0.68	-1.29	1.69	1.71
age	0.99	-0.57	0.99	-0.62
married	0.99	-0.02	0.97	-0.07
cohabiting	1.60	0.92	0.78	-0.44
divorced	0.36	-1.16	1.83	0.89
split	0.00	0.00	0.00	0.00
kids	0.95	-0.16	0.95	-0.15
degree	0.66	-0.86	1.76	1.22
a level	0.80	-0.66	1.03	0.09
Sector				
agriculture	1.02	0.01	1.58	0.39
manufacturing	0.86	-0.24	0.79	-0.32
construction	0.58	-0.61	1.04	0.04
retail	0.53	-0.88	1.75	0.83
catering	0.99	-0.00	0.38	-0.77
transport	0.77	-0.40	1.10	0.13
utilities	2.81	1.14	3.71	1.22

	Underskilling		Overskilling	
	RRR	**Z**	**RRR**	**Z**
estate	1.93	0.84	1.71	0.61
pubadmin	0.67	-0.66	1.49	0.58
other services	1.23	0.38	1.17	0.25
Contract				
fixed	1.19	0.23	1.04	0.05
permanent	0.48	-1.28	0.83	-0.34
temporary	0.20	-1.14	1.20	0.20
Occupation				
professional	2.72	1.35	1.48	0.61
technician	7.08	2.58	1.10	0.13
clerical	4.63	1.96	2.36	1.27
sales	3.54	1.57	1.59	0.69
farmer	4.74	1.20	3.87	1.20
craft	2.40	1.14	2.16	1.18
plant operative	2.91	1.31	2.82	1.47
unskilled	3.62	1.75	1.33	0.46
tenure	1.02	1.22	0.92	-3.16
training	1.37	1.07	0.76	-0.89
Industrial Relations				
short	2.78	3.62	1.17	0.52
home	0.80	-0.40	0.45	-1.30
security	0.34	-3.38	0.87	-0.38
norms	2.07	2.42	0.96	-0.15
direct	2.11	2.77	1.11	0.37
order	0.55	-1.78	1.06	0.16
method	2.62	2.66	0.75	-0.84
quality	1.84	1.34	0.73	0.89
solve	1.00	0.01	1.83	1.34
decision	1.05	0.17	0.53	-2.10
learn	0.84	-0.42	0.50	-2.08
consult	0.74	-1.07	1.54	1.43
Firm Size				
Size0	0.11	-2.39	0.58	-0.78
Size5	0.10	-3.07	0.34	-1.88
Size30	0.76	-0.68	0.90	-0.26
Size75	0.40	-1.34	0.40	-1.33
Size300	0.54	-1.21	1.18	0.39
Log Likelihood	*-434.78*			
Pseudo R2	*0.1724*			

(i) Matching Jobs versus Underskilling

The probability of being underskilled was strongly related to occupational status, job specific characteristics and industrial relations. For example technicians were vastly more likely to be less skilled than their job requirements demand. Similar results were apparent for clerical workers and the unskilled, although less striking. These latter two findings are intriguing in the sense that we might typically expect that the types of job tasks demanded are fairly simple and require relatively little experience and skill. This result suggests that training might be appropriate, even for unskilled jobs.

This finding is further compounded by our results concerning job specific characteristics of underskilled workers. On this we observe that tasks tend to be repetitive, governed by norms of production, and in an environment where the pace of work is directly controlled by the boss, where workers have little scope to adopt the methods they choose to fulfil their work requirements. All this points to a rather Dickensian type work environment where disadvantaged workers are further subjected to regimentation of work patterns in a climate of direct and oppressive control.

Here we observe clear firm size effects in that the self-employed and workers in micro firms (0-9 employees) have a significantly higher probability of being matched than underskilled. This might imply that the more direct recruitment methods of this type of firm are more appropriate for aligning workers to jobs. An alternative explanation is apparent if we consider the oft identified lack of training provision in smaller firms (Cowling and Storey,1998, Brown, Hamilton and Medoff,1990, Creedy and Whitfield,1988). Here in situations where no training is provided it becomes imperative for firms to ensure that new recruits are capable of fulfilling their job requirements immediately. Further findings were that workers who perceived themselves as having high levels of job security were also more likely to be matched than underskilled. The same was true for workers given more autonomy over their ordering of work tasks.

(ii) Matching Jobs versus Overskilling

Here we find that male workers have a significantly higher probability of being too skilled for the demands of their jobs. We also find that longer tenure is associated with job matching rather than overskilling. This presumably reflects the greater opportunity that is afforded over time for correctly matching an individual workers skills to her job requirements. This is further supported by the positive effect of opportunities for on-the-job learning on the probability of achieving a job-skills match. It was also apparent that worker involvement in the decision-making process of the firm enhanced the likelihood of a job-skills match. This suggests that an environment of co-operative industrial relations where workers have an input to the strategic decision-making process of the firm can achieve tangible benefits for the firm and worker. Finally, we once again observe that micro firms are better at matching workers to their jobs rather than overskilling.

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5 Conclusion

We have used data from a sample of employed workers to initially identify the extent to which workers are matched to their jobs in the UK. Our basic finding was that two in every ten workers were not appropriately matched to the demands of their jobs. These unmatched workers were split fairly equally between those who were underskilled and those who were overskilled. We then identified those personal, job and firm specific characteristics that were most closely associated with underskilling, matching and overskilling.

Our results suggest that there is a fairly well defined threshold that distinguishes between the worker who is underskilled and the worker whose skills broadly fit their job demands. The nature of the work environment for the underskilled worker appears to be oppressive to say the least. Here work is strictly regimented, repetitive and closely monitored. By contrast the work environment for workers whose skills equate with the demands of their jobs is extremely pleasant by comparison. The typical worker in this case

has job security, lengthy tenure, a degree of personal autonomy and is involved in the strategic decision-making of the firm. She also has opportunities for workplace learning.

We also find that micro firms are extremely good at matching workers to jobs. Whether this is due to better recruitment methods driven by the need to hire workers specifically capable of doing a job from the moment they start or whether job characteristics are more observable by potential workers who then self-select for such jobs is unclear. But it provides a plausible explanation for the consistent empirical finding that training increases exponentially with firm size.

As to the policy implications of our results there is implicitly scope for some firms to reallocate training resources towards specific types of workers who are clearly in need of human resource development more than most. On the face of it the findings suggest that this does occur over time for individual workers as they adjust their skills to the demands of their jobs over time. There may also be a case for public provision of training for the lowest skilled jobs in the economy, given the horrific conditions this underclass of unskilled workers find themselves in at work. The advantage of public provision of training is that it might then force oppressive employers to treat these workers more favourably and provide a better working environment for them.

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Appendix

Variable Definitions

Male	Coded 1 if male, else 0.
Age	Measured in years.
Married	Coded 1 if married, else=0.
Cohab	Coded 1 if cohabiting, else=0.
Divorce	Coded 1 if divorced, else=0.
Split	Coded 1 if separated, else=0.
Kids	Coded 1 if at least one child, else=0.
Degree	Coded 1 if finished full-time education >20 years of age, else=0.
A Level	Coded 1 if finished full-time education between 16 and 19 years old, else=0.
Agri	Coded 1 if agriculture, forestry, fishing, else=0.
Manu	Coded 1 if manufacturing, mining ,quarrying, else=0.
Const	Coded 1 if construction, else=0.
Retail	Coded 1 if retail, wholesale, repairs, else=0.
Cater	Coded 1 if hotels, restaurants, else=0.
Trans	Coded 1 if transport, communications, else=0.
Estate	Coded 1 if real estate, else=0.
Othser	Coded 1 if other services, else=0.
Fin	Coded 1 if financial services, else=0.
SE	Coded 1 if self-employed freelance, else=0.
FCE	Coded 1 if fixed term contract, else=0.
PE	Coded 1 if permanent employment contract, else=0.
TCE	Coded 1 if temporary contract of employment, else=0.
SIZE0	Coded 1 if total employment in organisation is 0, else=0.
SIZE5	Coded 1 if total employment in organisation is between 1 and 9, else=0.
SIZE30	Coded 1 if total employment in organisation is between 10 and 49, else=0.
SIZE75	Coded 1 if total employment in organisation is between 50 and 99, else=0.
SIZE300	Coded 1 if total employment in organisation is between 100 and 499, else=0.
Legman	Coded 1 if legislator, manager, else=0.
Prof	Coded 1 if professional, else=0.
Tech	Coded 1 if technician, else=0.
Clerk	Coded 1 if clerk, else=0.
Sales	Coded 1 if sales, servicing, else=0.
Craft	Coded 1 if craft, related trades, else=0.
Oper	Coded 1 if plant, machine operator, else=0.
Farm	Coded 1 if agricultural, forestry, fisheries worker, else=0.
SOLVE	Coded 1 if job involves solving unforeseen problems on your own, else=0.
DECISION	Coded 1 if job involves deciding on departmental issues, else=0.
DIRECT	Coded 1 if pace of work depends upon the direct control of your boss, else=0.
NORMS	Coded 1 if pace of work is dependent upon production norms, else=0.
ORDER	Coded 1 if you are able to choose the order of tasks, else=0.

METHOD	Coded 1 if you are able to choose your methods of work, else=0.
LEARN	Coded 1 if job involves learning new things, else=0.
CONSULT	Coded 1 if you have been consulted over organisational change, else=0.
SHORT	Coded 1 if work involves short, repetitive tasks of less than 10 min, else=0.
QUALITY	Coded 1 if job involves meeting precise quality standards, else=0.
HOME	Coded 1 if home worker, else=0.
TENURE	Years in current employment.
SECURITY	Coded 1 if you have a secure job, else=0.