Skill mismatch among older workers and workplace performance in Britain

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Abstract

Older workers may face greater risk of their skills being under-utilised in the workplace, with potential consequences for both the employee and the organisation in which they work. This paper explores the experiences of skills mismatch as reported by employees in British workplaces, and examines the relationship between skills mismatch and the performance of these workplaces. It exploits a linked employer-employee dataset, the Workplace Employment Relations Survey (WERS), a nationally representative survey of British workplaces, covering 2,680 workplaces and 21,981 employees.

The paper first examines the extent of skills mismatch among older workers, as measured by whether workers report having skills lower/higher than they need to do their current job. It then considers whether mismatch is related to job control and job satisfaction for these workers. Finally, the paper explores whether skill mismatch is associated with the financial performance and labour productivity of the workplace, as reported by their employers.

Keywords: older workers, skill mismatch, job satisfaction, workplace performance.

JEL Classification: J21, J24, J28, L25

Introduction

The aim of this paper is to examine the extent and impact of skill mismatch among workers in Britain with a focus on older workers, aged over 50.

Recent work by Stokes et al. (2017), using the same data as examined in this paper, highlights that older workers were less likely to have received training, but overall job satisfaction and job-related wellbeing were higher among older employees (aged 50 plus) than those in their 20s to 40s. However, age-related policies and practices were not associated with outcomes for older workers in terms of job satisfaction and wellbeing, access to training and perceptions of fair treatment. Furthermore, evidence on the relationship between the age composition of the workforce and workplace performance is mixed.

There has been extensive research into the measurement and implications of skill mismatch on workers, workplaces and the whole economy, but little focus on how this relates to workers' age. The notion of skill has several meanings and has different definitions across different disciplines. Furthermore, there are a variety of concepts that are considered in relation to skill mismatch (Green, 2016) covering 'skill shortage' (supply is less than demand); 'skills deficit' (supply equals demand, but both are sub-optimal); 'skill gap' (employees perceived to lack some competencies needed to carry out their job); 'under (over) education' (an employee's education is lower (higher) than required to do the job".

We do not focus on these debates here. Our indicator of skill mismatch is one that relies on the self-reporting of a survey respondent's own skills relative to the skills needed to do their present job. Hence, this is open to the respondents' own interpretation of the meaning of skills; yet is broadly akin to the skill gap or under (over) education definition.

Studies using the Survey of Adult Skills (PIAAC) find that skill mismatch was negatively associated with job satisfaction, highlighting that workers not optimally matched to the skill requirements of their job are not as satisfied as workers whose skills are matched to the requirements of their job. These studies cover a number of countries, for example, the OECD (2016a) examined 24 countries and found that more effective skill use is connected with higher job satisfaction and employee well-being. Similar conclusions are reached by Stokes et al. (2017) for Britain.

Haile (2015) highlights the age dimension of job satisfaction showing that in 2004 workers aged 50 plus have significantly higher overall job satisfaction than younger workers, in line with other evidence suggesting a U-shaped relationship between age and job satisfaction (Clark, 1996; Clark et al., 1996; Sloane and Ward, 2001, Warr, 2007). In addition, Haile shows that having a job with skill requirements that match one's own skills is also found to be associated positively and statistically significantly with overall job satisfaction, but he does not explore the relationship between age and skill requirements.

Bönisch et al. (2018) explored the relationship between skill mismatch and age using PIAAC for five countries (Austria, Germany, Flanders (Belgium), Spain and England/Northern Ireland). They found that older workers over-utilise their skills more than younger workers (aged 25-49), a relationship that was significant in all countries except England/Northern Ireland. Yet in England and Northern

Ireland the overall over-utilisation rates are quite high in comparison to the other countries, which points to a fuller use of the available human capital.

There is also a body of work that examines the impact of mismatch on workplace performance, typically in terms of labour productivity. This literature draws on a human capital approach which examines the relationship with wages under the assumption that wages equal marginal productivity. Over- (under-) skilled workers should be inherently more (less) productive at their jobs and the associated gap in wages should be reflected in different levels of productivity. See Mahy et al., (2015) and Quintini (2011) for examples supporting this idea.

The studies cited above in relation to job satisfaction can also be seen as indirectly estimating the productivity impact of mismatch, with the idea that dissatisfied workers are less productive than satisfied ones. Furthermore, Bryson et al, (2017) show that job satisfaction is related to workplace performance..

In general, the effect of skill mismatch on productivity is not directly estimated with individual measures of skill-mismatch and workplace performance measures not often collected in the same dataset. Our approach uses linked employer-employee data for the UK which provides direct measures of workplace performance, including productivity; as well as indicators of employee-level reporting of skill mismatch and job satisfaction; note this is the same dataset used by Bryson et al. discussed above.

The data used is introduced in the following section, followed by a methodological overview, results and conclusions.

Data

Our analysis is conducted using the Workplace Employment Relations Study (WERS). WERS is a large nationally representative survey of workplaces with five or more employees. We make use of data from the two most recent surveys in the series, which took place in 2004 and 2011 (with responses from 2,680 workplaces in 2011 and from 2,295 workplaces in 2004). The survey covers all industries with the exception of Agriculture, Forestry and Fishing and Mining and Quarrying. All our analyses are weighted to be nationally representative of this population of workplaces.

WERS contains data from face-to-face interviews with Human Resources managers on workforce composition and workplace performance; and has a linked survey of employees containing detail on demographic characteristics (including banded age), job traits and attitudes/perceptions of management, their job and the employer. The Survey of Employees Questionnaire (SEQ) was distributed to 25 randomly selected employees within each workplace participating in WERS (or the entire workforce in workplaces with 25 or fewer employees). In 2011, managers in 2,170 workplaces gave permission to select a sample for the SEQ, however, 247 of these workplaces returned no questionnaires at all. Similarly, in 2004, there were 562 workplaces with no data from the SEQ. Our analysis of workplace performance that relies on data from the SEQ to examine skill mismatch is therefore conducted using this reduced sample of workplaces.

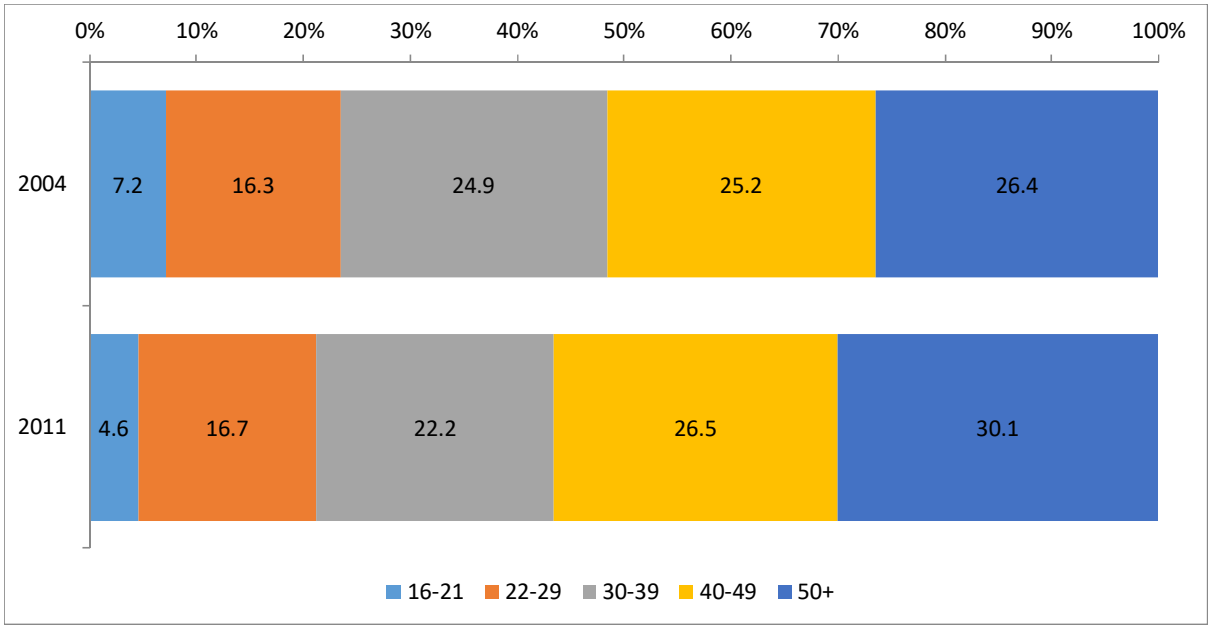
Having linked employer-employee data provides the opportunity for analysis to control for employer characteristics and outcomes that are not always possible in analysis of workers as well as a broader set of questions for employees than are available in PIAAC.

Some 989 workplaces had previously been surveyed in the 2004 WERS. The 2011 survey therefore incorporates a substantial panel component, which allows for an examination of the changes that took place at the workplace between 2004 and 2011.

The Age Profile of the workforce

Figure 1 shows the age profile of the workforce in 2004 and 2011. Older workers accounted for an increasing proportion of the UK workforce. This is partly a result of demographic changes as well as increasing proportions of younger people staying in Higher Education and hence having delayed entry to the labour market. Workers aged 50 plus accounted for 30.1 per cent of the workforce in 2011, an increase from 26.4 per cent in 2004.

Figure 1 – The Age Profile of the workforce 2004 and 2011



Skill mismatch

The survey of employees in both years includes a question:

> '*How well do the work skills you personally have match the skills you need to do your present job?*'

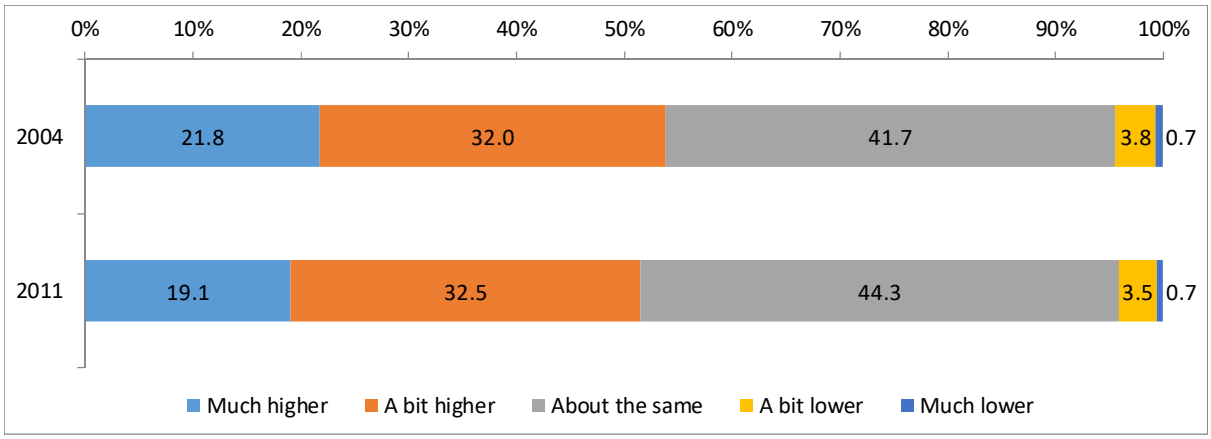
With the following response options – 'My own skills are:

- Much higher,
- A bit higher,

- About the same,
- A bit lower,
- Much lower.

Responses to this question are shown in Figure 2. Very few respondents, less than one per cent, reported that their own skills are much lower than needed to do their present job, so in our analysis the responses 'a bit lower' and 'much lower' are combined. In contrast, more than half the respondents reported that their own skills are 'a bit higher' or 'much higher' than needed to do their present job. The remaining 41.7 per cent in 2004 and 44.3 in 2011 had skills about the same as needed to do their job. Overall, these figures indicate a substantial degree of skill mismatch.

Figure 2 – Skill Mismatch in the workforce 2004 and 2011 – percentage of workers who reported how their own skills related to the needs of their current job



Job satisfaction

A series of questions were also asked about different aspects of job satisfaction. There were nine questions in 2011, with eight of them asked about in 2004. Employees were asked to rate their satisfaction on a five point scale from very satisfied to very dissatisfied with:

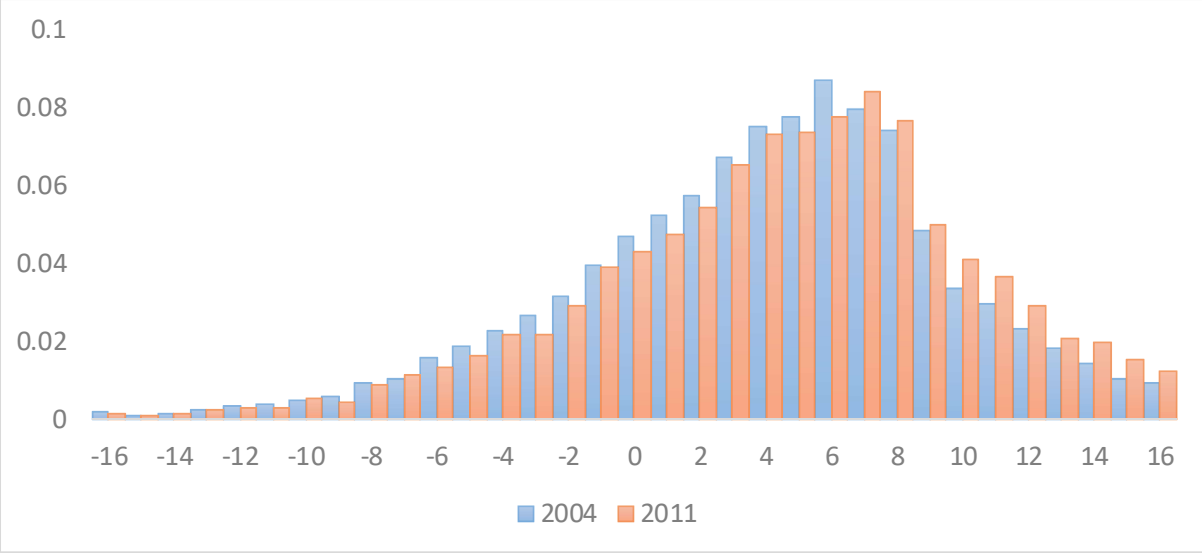
- The sense of achievement you get from your work.
- The scope for using your own initiative.
- The amount of influence you have over your job.
- The training you receive.
- The opportunity to develop skills in your job.
- The amount of pay you receive.
- Your job security.
- The work itself.
- The amount of involvement you have in decision-making at this workplace.

The question on opportunities to develop skills in your job was introduced in 2011, so to allow comparison with 2004 data, we restrict our analysis to the remaining eight aspects of job satisfaction. Following the approach adopted by van Wanrooy *et al.*, (2013) and Stokes et al., (2017),

to form our overall job satisfaction scale we score each item from +2 for 'very satisfied' to -2 for 'very dissatisfied'. We then sum across all items to form an overall scale ranging from -16 to +16, with a higher score reflecting greater satisfaction.

The distribution of these scores in 2004 and 2011 is presented in Figure 3. Scores are skewed towards positive values, indicating on average more satisfaction than dissatisfaction. As noted by van Wanrooy *et al.*, (2013) employees in 2011 were more likely to report being very satisfied or satisfied with the scope of using their initiative (75 per cent), the work itself (75 per cent), and the sense of achievement they derived from work (74 per cent). They were least likely to be satisfied with their pay (42 per cent) and the extent of their involvement in decision-making (43 per cent).

Figure 3 – The distribution of job satisfaction scores in the workforce 2004 and 2011



Job control

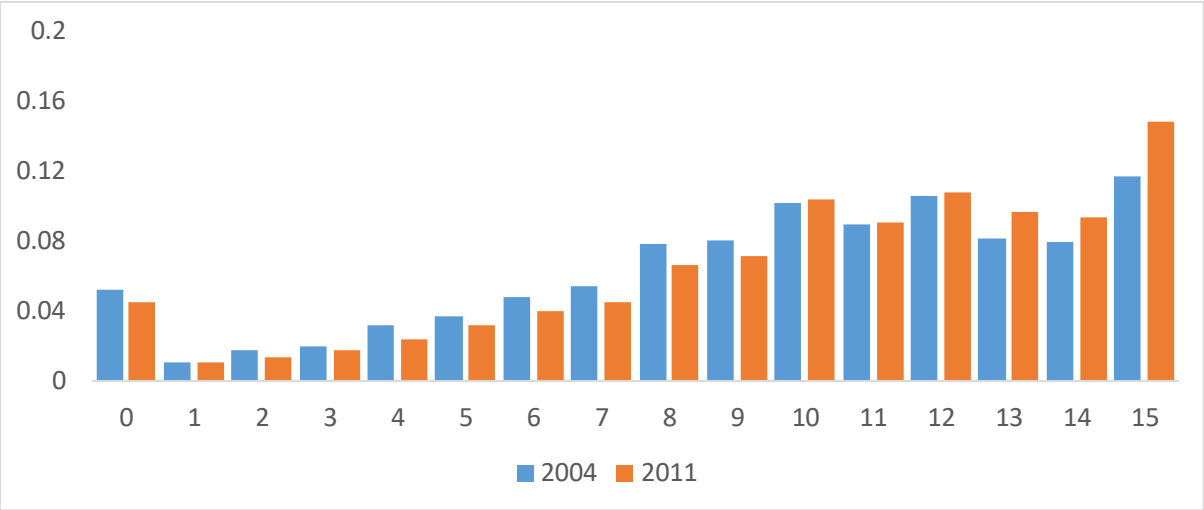
The survey also asks about the extent of influence employees have over their jobs – "In general, how much influence do you have over the following?":

- The tasks you do in your job
- The pace at which you work
- How you do your work
- The order in which you carry out tasks
- The time you start or finish your working day

Here response options were: A lot, Some, A little, and None. In a similar way to the construction of a job satisfaction index, we calculate a job control index where a response of None is scored 0, A little (1), Some (2) and A lot (3), giving an overall scale from 0 to 15.

The distribution of these scores in 2004 and 2011 is shown in Figure 4. Wanrooy *et al.*, (2013) report a small but statistically significant increase on each individual measure between 2004 and 2011, and also in the proportion of employees reporting a lot of influence over all five items. These patterns are evident in higher proportions of employees with scores of 10 or more in 2011 than in 2004.

Figure 4 – The distribution of job control scores in the workforce 2004 and 2011



Workplace performance

Our measures of workplace performance come from the Human Resources manager's subjective assessment of performance. The managerial respondents were asked 'Compared with other workplaces in the same industry how would you assess your workplace's…:

- financial performance;
- labour productivity;
- quality of service or product?'

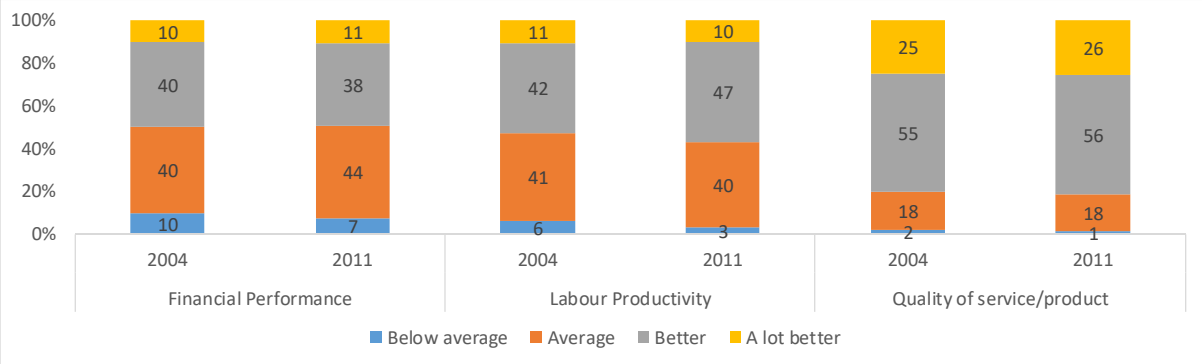
They chose one of five responses presented to them on a show card: 'a lot better than average', 'better than average', 'about average', 'below average' and 'a lot below average'.

The percentage of managers saying their workplace performance was 'a lot below average' was very small, so these responses were combined with those saying 'below average' to form a four point scale (where one represents 'below average' or 'a lot below average' and four represents 'a lot better than average'). The three subjective workplace performance measures are positively and significantly correlated such that those scoring high on one indicator tend to score high on the other two (Stokes et al, 2017). Thus, although distinct, these three measures may relate to a single underlying workplace performance scale. Given this, we also analyse an additive scale from the three performance items, with a score of 0 assigned to responses 'below average', 1 if 'about average', 2 'above average' and 3 'a lot above average'. The resulting scale runs from 0 to 9.

These subjective measures are preferred to more conventional accounting measures. First, because workplace managers are much more able to provide a response than they are to financial questions and second, earlier studies have validated the subjective performance measures, confirming that they are predictive of subsequent workplace closure, for example, and are associated with other workplace features in the way theory might predict (Forth and McNabb, 2008; Machin and Stewart, 1990, 1996)

Figure 5 shows that in roughly half the workplaces, managers' report financial performance that is better or a lot better relative to other workplaces in the same industry. The percentages are higher for labour productivity and quality of service/product.

Figure 5 – Workplace performance in 2004 and 2011



Method

The aim of the paper is to estimate the relationship between job satisfaction and job control and mismatch by age for workers; and then to see whether having more mismatched workers influences workplace performance. The relationship between age and mismatch with job satisfaction and control is estimated using equations 1 and 2 below.

$$JS_i = MM_i b + Age_i c + X_i d + u_i \qquad (1)$$

Where JS_i is the Job Satisfaction or Job Control index for employee i; MM_i is a dummy for employee i of whether their skills were higher or lower than required to do their current job; Age_i is a dummy indicating which age band for employee i (we examine age bands 16 to 21, 22 to 29, 30 to 39, 40 to 49 and 50 plus). X_i is a vector of other control variables including dummies for occupation, industry, qualification level, number of employees at workplace, and organisation, private sector, any union recognised at the workplace, largest non-managerial occupational group in the workplace, marital status, whether have dependent children, ethnicity, whether a trade union member, job tenure, nature of contract: permanent or temporary, hours worked, region, and a year dummy identifying whether the data comes from the 2004 or 2011 survey. u_i is an error team, parameters b, c and d are to be estimated.

$$JS_i = MM_i b + Age_i c + (MM_i * Age_i)e + X_i d + u_i \qquad (2)$$

The difference between equations 1 and 2 is the inclusion of an interaction term between the age bands, in this case focused on employees aged 50 plus and the mismatch indicators, with an additional set of parameters, e, to be estimated.

In these models, the dependent variable is a scale, going from -16 to +16 in the case of Job satisfaction and 0 to 15 for Job Control. Models are estimated using Ordinary Least Squares. We do not exploit the multiple observations per workplace here, noting findings from Haile (2015) are substantively the same from OLS and fixed effects estimation.

Workplace performance is estimated using equations 3 and 4. Here workplace performance is a subjective managerial response on workplace performance in terms of financial performance, labour productivity or quality of service or product compared with other workplaces in the same industry. Responses are ordered and models are estimate using ordered probit models. A combined overall performance indicator is calculated and estimated using Ordinary Least Squares.

$$WP_j = MM_j b + Age_j c + X_j d + u_j \qquad (3)$$

In these models, WP_j is performance of workplace j, MM_j is the percentage of employee respondents in workplace j who report that that their skills were higher or lower than required to do their current job. Age is a series of dummy variables identifying the percentage of older workers in workplace j. X_j is a vector of other control variables identifying the mean of workplace respondents scores on the job satisfaction and job control scales, workplace size (number of employees), age and region of the workplace, the industry it operates in, the largest non-managerial occupational group, sector, whether any trade unions were recognised and whether it's a single independent establishment as opposed to a multi-site establishment.

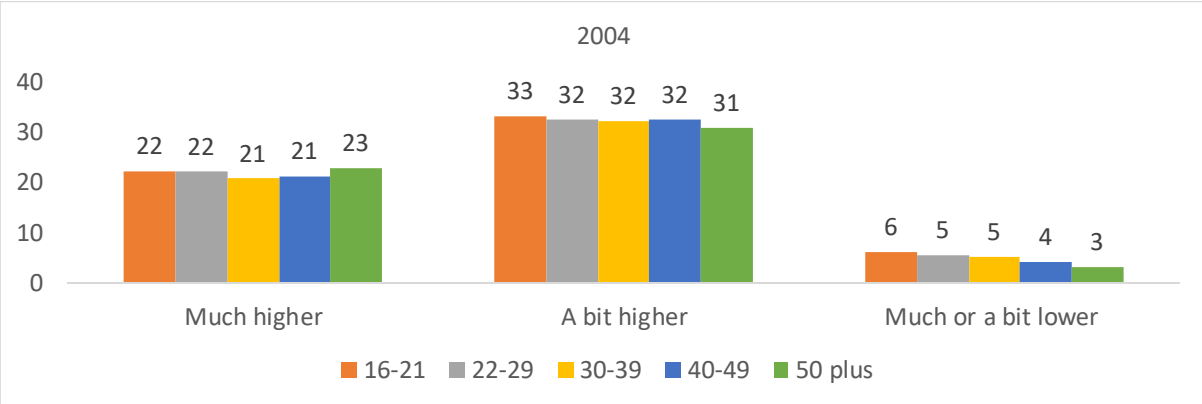
$$WP_j = MM_j b + Age_j c + (MM_j * Age_j)e + X_j d + u_j \qquad (4)$$

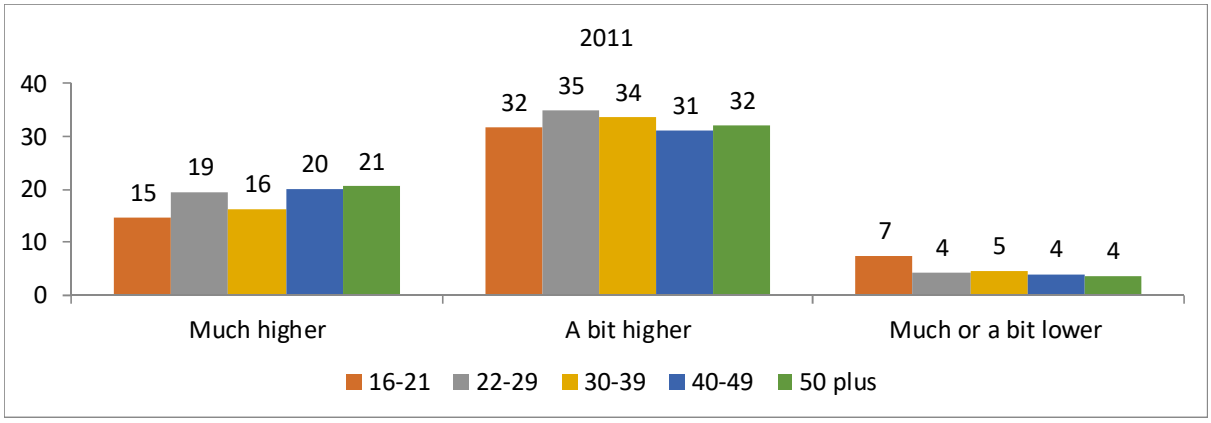
In the same way that we add interactions of the age and mismatch indicators in model 2, we interact the mismatch percentages with whether workplaces had more than 50 per cent of their employees aged 50 plus in model 4.

Results

The extent that skill mismatch varies by age is shown in Figure 6, which reports the percentage of employees who reported that their own skills were higher or lower than required to do their job (the matched group is not shown). In both years variations were minimal, although older workers (aged 50 plus) were the most likely to report that their own skills were much higher than required to do their present job; 23 per cent of them reported this in 2004 and 21 per cent in 2011.

Figure 6 – Skill Mismatch in the workforce 2004 and 2011 by age – percentage of workers who reported how their own skills related to the needs of their current job





Job satisfaction

We next turn to examine the relationship between age and skill mismatch on job satisfaction. In the first two columns of Table 1 we report results for 2004 and 2011 combined. In the remaining columns we present results first for 2004 and then 2011.

For the full sample (Model 1) we find that mismatched workers have lower levels of job satisfaction than workers who reported that their skills were about the same as required to do their jobs. The magnitude of the coefficients for those who reported skills much higher (-3.25) and a bit or much lower (-3.13) were similar, and considerably higher than for mismatched workers whose own skills were a bit higher than needed to do their jobs (-0.90). We also observe the expected relationship with age whereby the youngest and oldest workers were the most satisfied. These results hold for 2004 and 2011, except that in 2004 higher job satisfaction for workers aged 16-21 is not observed.

In model 2 we explore whether older mismatched workers were more or less satisfied than their equivalent mismatched younger workers by including interaction terms for the extent of skill mismatch and age. For the full sample, none of the interaction terms for workers aged 50 plus were statistically significant indicating that they were no more/less satisfied than mismatched workers on average. However, some of the interaction terms at younger age groups were significant. These indicate that workers aged 22-29 whose own skills were much higher than needed to do their jobs were more dissatisfied with their jobs than workers of other ages who were similarly mismatched; yet workers aged 16 to 21 whose own skills were lower than required to do their jobs were more satisfied with their jobs than older workers who were similarly mismatched.

Considering 2004 and 2011 separately, the 2004 results mirror the full sample findings. However, in 2011 older workers whose own skills were lower than required to do their jobs were particularly dissatisfied with their jobs.

Table 1 Job satisfaction estimates

	All		2004		2011	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
			Coefficient (SE)			
Own skills (About the same):						
Much Higher	-3.25 (0.11) ***	-2.73 (0.20) ***	-3.07 (0.14) ***	-2.68(0.26) ***	-3.41 (0.17) ***	-2.74 (0.29) ***
Age (40-49)						
16-21		-0.73 (0.51)		-0.46 (0.59)		-0.75 (0.51)
22-29		-1.54 (0.34) ***		-1.34 (0.44) ***		-1.82 (0.51) ***
30-39		-0.59 (0.29) **		-0.46 (0.37)		-0.84 (0.46) *
50 plus		-0.33 (0.27)		-0.11 (0.38)		-0.54 (0.38)
A bit Higher	-0.90 (.08) ***	-0.71 (0.15) ***	-0.78 (.10) ***	-0.55 (0.19) ***	-0.98 (.12) ***	-0.84 (0.24) ***
Age (40-49)						
16-21		-0.69 (0.40) *		-0.37 (0.43)		-1.16 (0.75)
22-29		-0.17 (0.24)		-0.59 (0.30) **		0.17 (0.38)
30-39		-0.27 (0.20)		-0.11 (0.26)		-0.47 (0.32)
50 plus		-0.21 (0.20)		-0.32 (0.28)		-0.07 (0.30)
Lower	-3.13 (0.19) ***	- 3.60 (0.41) ***	-3.21 (0.25) ***	- 4.48 (0.53) ***	-3.00 (0.27) ***	-2.64 (0.58) ***
Age (40-49)						
16-21		1.98 (0.77) ***		3.35 (0.97) ***		0.45 (1.14)
22-29		1.19 (0.64) *		2.03 (0.72) ***		0.33 (1.06)
30-39		0.71 (0.56)		1.66 (0.64) ***		-0.33 (0.89)
50 plus		-0.56 (0.58)		0.35 (0.87)		-1.52 (0.76) **
Age (40-49)						
16-21	0.44 (0.21) **	0.69 (0.29) **	0.19 (0.24)	0.22 (0.30)	0.83 (0.36) **	1.29 (0.51) **
22-29	-0.14 (0.14)	0.17 (0.18)	-0.25 (0.16)	0.13 (0.22)	-0.07 (0.22)	0.21 (0.29)
30-39	-0.14 (0.11)	0.04 (0.14)	0.09 (0.13)	0.14 (0.18)	-0.37 (0.17) **	-0.04 (0.21)
50 plus	0.49 (0.11) ***	0.64 (0.13) ***	0.58 (0.15) ***	0.68 (0.19) ***	0.40 (0.15) ***	0.58 (0.19) ***
Sample size	41,363	41,363	20,905	20,905	20,458	20,458
R-squared	0.15	0.15	0.15	0.15	0.15	0.15

Models also include dummies for occupation, industry, qualification level, number of employees at workplace, and organisation, private sector, any union recognised at the workplace, largest non-managerial occupational group in the workplace, marital status, whether have dependent children, ethnicity, whether a trade union member, job tenure, nature of contract: permanent or temporary, hours worked, region, and a year dummy identifying whether the data comes from the 2004 or 2011 survey.

Job control

In a similar way we examine the relationship between age and skill mismatch on job control. We find that mismatched workers have lower levels of job control than workers who reported that their skills were about the same as required to do their jobs (Model 1 in Table 2). Here the magnitude of the

coefficients for those who reported skills a bit or much lower (-1.09) were more than double those for those who reported skills much higher (-0.43). Mismatched workers whose own skills were a bit higher than needed to do their jobs reported no difference in job control than matched workers. Job control is found to increase with age. These results are true for 2004 and 2011 combined, as well as the years analysed separately. Older mismatched workers had no more or less job control than younger mismatched workers on average (Model 2 in Table 2).

Table 2 Job control estimates

	All		2004		2011	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
			Coefficient (SE)			
Own skills (About the same):						
Much Higher	-0.43 (0.07) ***	-0.43 (0.13) ***	-0.31 (0.10) ***	-0.53 (0.17) ***	-0.55 (0.11) ***	-0.28 (0.18)
Age (40-49)						
16-21		0.66 (0.51) **		0.86 (0.36) **		0.56 (0.53)
22-29		-0.18 (0.34)		0.30 (0.30)		-0.73 (0.37) **
30-39		0.04 (0.29)		0.16 (0.24)		-0.17 (0.31)
50 plus		-0.33 (0.27)		0.28 (0.24)		-0.39 (0.26)
A Bit Higher	0.05 (.06)	0.15 (0.11)	0.03 (.07)	0.13 (0.13)	0.08 (.08)	0.18 (0.16)
Age (40-49)						
16-21		0.04 (0.30)		0.30 (0.35)		-0.34 (0.52)
22-29		0.07 (0.17)		-0.08 (0.23)		0.21 (0.24)
30-39		-0.23 (0.15)		-0.21 (0.19)		-0.26 (0.23)
50 plus		-0.22 (0.15)		-0.18 (0.20)		-0.22 (0.22)
Lower	-1.09 (0.14) ***	- 1.46 (0.24) ***	-1.03 (0.17) ***	- 1.79 (0.31) ***	-1.15 (0.21) ***	- 1.14(0.38) ***
Age (40-49)						
16-21		0.45 (0.48)		1.13 (0.64) *		-0.48 (0.75)
22-29		0.78 (0.40) *		1.34 (0.47) ***		0.23 (0.67)
30-39		0.49 (0.37)		0.88 (0.45) *		0.08 (0.60)
50 plus		0.28 (0.36)		0.79 (0.59)		-0.07 (0.46)
Age (40-49)						
16-21	-0.52 (0.14) ***	-0.68 (0.29) ***	-0.69 (0.18) ***	-1.04 (0.25) ***	-0.32 (0.22)	-0.24 (0.32)
22-29	-0.41 (0.09) ***	-0.43 (0.18) ***	-0.55 (0.12) ***	-0.65 (0.16) ***	-0.28 (0.13) **	-0.22 (0.19)
30-39	-0.18 (0.07) ***	-0.14 (0.14)	-0.08 (0.09)	-0.08 (0.13)	-0.28 (0.10) ***	-0.16 (0.16)
50 plus	0.13 (0.07) *	0.20 (0.10) **	0.19 (0.10) *	0.16 (0.14)	0.10 (0.11)	0.26 (0.15) *
Sample size	43,925	43,925	22,234	22,234	21,691	21,691
R-squared	0.14	0.14	0.14	0.14	0.15	0.15

Models also include dummies for occupation, industry, qualification level, number of employees at workplace, and organisation, private sector, any union recognised at the workplace, largest non-managerial occupational group in the workplace, marital status, whether have dependent children, ethnicity, whether a trade union member, job tenure, nature of contract: permanent or temporary, hours worked, region, and a year dummy identifying whether the data comes from the 2004 or 2011 survey.

Workplace Performance

Finally we examine if mismatch and, in particular mismatch related to age has an impact on workplace performance. Table 3 shows the coefficients from including the percentage of workforce respondents who reported skill mismatch. Here, because the number of respondents per workplace is small, we do not distinguish between workers with 'much' or 'a bit' higher skills, instead we consider the percentage of employee respondents who reported own skills higher or lower than needed to do their jobs.

Our results for both years (Table 3 – top panel) show that having a higher percentage of mismatched employees does not have a significant impact on any of the workplace performance measures. However, in line with Mahy et al. (2015) and Quintini (2011), the coefficients on the percentage of workers with higher skills than required to do their jobs are all positive and the coefficients on the percentage of workers with lower skills than required to do their jobs are all negative.

In addition, in line with Bryson et al., (2017) workplaces with higher job satisfaction is positively related to better workplace performance. Workplaces with more workers who have more job control is associated with worse workplace performance.

Considering the two years separately, some significant differences emerge, particularly for 2004. In 2004, workplaces with more workers with higher skills than required to do their jobs have significantly better financial performance and overall performance, whilst workplaces with more workers with lower skills than required to do their jobs have significantly worse labour productivity and overall performance. The relationship between job satisfaction, job control and performance discussed above remains.

In 2011, the results are not as strong; the only significant coefficient is for workers with lower skills than required to do their jobs and this shows a higher quality of product/service. The relationship is weak, significant at the 10 per cent level and opposite to the significant relationships observed in 2004. Also in 2011, we find that workers with more job control no longer has a significant negative association with any of our performance measures, although the coefficients all remain negative.

Table 3 Workplace performance estimates

	Financial Performance	Labour productivity	Quality	Overall
		Coefficient (SE)		
Percentage of workforce with own skills (about the same)		All		
Higher	0.14 (0.15)	0.02 (0.14)	0.07 (0.15)	0.08 (0.21)
Lower	-0.30 (0.29)	-0.56 (0.35)	-0.21 (0.41)	-0.76 (0.50)
Percentage of workforce aged 50 plus (None)				
1-9	0.20 (0.14)	0.09 (0.14)	0.36 (0.12)***	0.49 (0.20)**
10-24	0.19 (0.12)	0.08 (0.12)	0.14 (0.11)	0.33 (0.18)*
25-49	0.05 (0.13)	-0.19 (0.13)	0.08 (0.11)	-0.03 (0.19)
50-74	-0.00 (0.16)	-0.22 (0.16)	0.01 (0.14)	-0.11 (0.23)
75 plus	-0.36 (0.21)	-0.49 (0.22)**	-0.10 (0.27)	-0.57 (0.35)*
Workplace average Job Satisfaction score	0.05 (0.01)***	0.04 (0.01)***	0.06 (0.01)***	0.10 (0.02)***
Workplace average Job Control score	-0.04 (0.02)**	-0.00 (0.02)	-0.04 (0.02)**	-0.06 (0.02)**

Sample size	3,267	3,199	3,414	3,109
Percentage of workforce with own skills (about the same)		2004		
Higher	0.44 (0.21)**	0.27 (0.22)	0.14 (0.21)	0.55 (0.31)*
Lower	-0.21 (0.35)	-0.78 (0.45)*	-0.80 (0.54)	-1.11 (0.50)**
Percentage of workforce aged 50 plus (None)				
1-9	0.46 (0.18) **	0.37 (0.20)*	0.39 (0.16)**	0.89 (0.28)***
10-24	0.27 (0.16)	0.40 (0.16)**	0.07 (0.15)	0.56 (0.23)**
25-49	-0.05 (0.17)	-0.01 (0.18)	-0.00 (0.16)	0.02 (0.24)
50-74	-0.04 (0.24)	0.25 (0.244	0.00 (0.22)	0.22 (0.33)
75 plus	-0.31 (0.25)	-0.38 (0.28)	-0.26 (0.40)	-0.51 (0.43)
Workplace average Job Satisfaction score	0.06 (0.02)***	0.05 (0.02)***	0.06 (0.02)***	0.11 (0.02)***
Workplace average Job Control score	-0.07 (0.02)***	-0.01 (0.02)	-0.06 (0.02)***	-0.09 (0.03)***
Sample size	1,517	1,481	1,596	1,432
Percentage of workforce with own skills (about the same)		2011		
Higher	-0.05 (0.20)	-0.21 (0.20)	-0.04 (0.19)	-0.36 (0.28)
Lower	-0.08 (0.47)	0.00 (0.48)	0.73 (0.41)*	0.25 (0.59)
Percentage of workforce aged 50 plus (None)				
1-9	-0.15 (0.22)	-0.30 (0.18)	0.33 (0.17)*	-0.01 (0.24)
10-24	0.03 (0.18)	-0.33 (0.18)*	0.18 (0.15)	-0.04 (0.23)
25-49	0.03 (0.19)	-0.54 (0.18)***	0.11 (0.15)	-0.28 (0.24)
50-74	-0.07 (0.22)	0.75 (0.21)***	0.07 (0.18)	-0.45 (0.28)
75 plus	-0.44 (0.28)	-0.80 (0.30)***	0.02 (0.37)	-0.69 (0.48)
Workplace average Job Satisfaction score	0.05 (0.02)***	0.03 (0.02)**	0.06 (0.02)***	0.08 (0.02)***
Workplace average Job Control score	-0.03 (0.03)	0.01 (0.02)	-0.02 (0.02)	-0.03 (0.03)
Sample size	1,750	1,718	1,818	1,677

Models also include dummy variables identifying the size, age and region of the workplace, the industry it operates in, the largest non-managerial occupational group, sector, whether any trade unions were recognised and whether it's a single independent establishment as opposed to a multi-site establishment.

The models also include indicators for the percentage of workers aged 50 plus. Here we typically find better performance is associated with a low percentage of older workers and worse performance is associated with a high percentage of older workers.

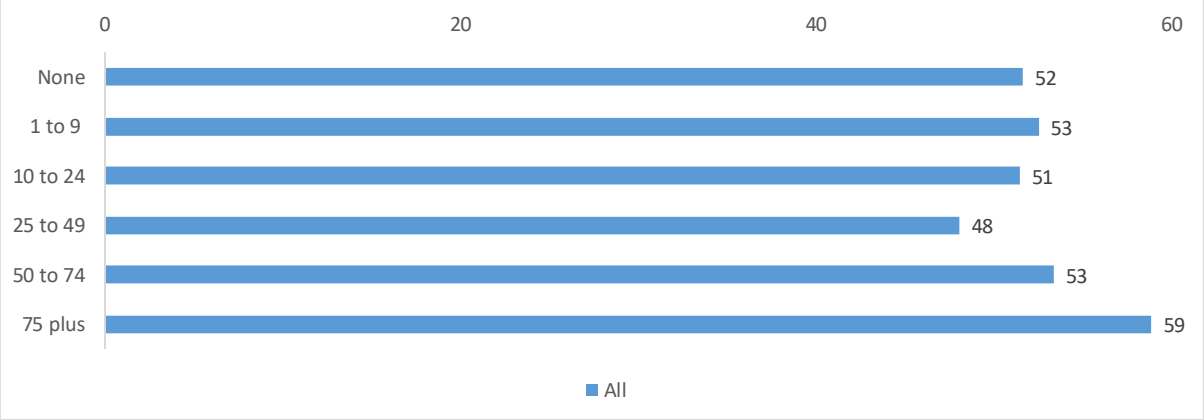
These results are far from clear cut, but do suggest a relationship between skill mismatch and workplace performance as well as a relationship between the share of older employees in the workforce and workplace performance. We then explore whether these associations offset or complement each other.

As noted in the description of the data the survey only includes up to a maximum of 25 employees per workplace. We want to focus on employees aged 50 plus; on average just four employees were aged 50 plus. For roughly a quarter of workplaces there were either none or one employee aged 50 plus who completed the employee questionnaire, even though most workplaces had older workers. It is therefore not possible to derive an age specific workplace measures of skill mismatch. What we do instead is interact the per cent of older workers in the workplace with the percentage of mismatched workers. The idea is that workplaces who have a lot of older workers and also have a lot of mismatched workers are the most likely to have mismatched older workers.

To illustrate this Figure 7 shows the percentage of workers whose skills were higher than required to do their job by the percentage of older workers in the workplace. Here we see that the highest proportion of mismatched workers (59 per cent) were in workplaces where 75 per cent or more workers were aged 50 plus compared with 53 per cent where 50-74 per cent of workers were aged 50 plus and 48 per cent where 25-49 per cent of workers were aged 50 plus.

We take as a cut off, 50 per cent or more workers aged 50 plus and find that 55 per cent of workers in these workplaces had skills that were higher than required to do their job compared with 50 per cent of workers who had few older workers.

Figure 7 The percentage of workers whose skills were higher than required to do their job by the percentage of workers aged 50 plus in the workplace.



The results of this estimation are shown in Table 4. We just show the mismatch coefficients, first the overall percentage of mismatched employees and then the percentage of mismatched employees in workplaces with more than half the workforce aged 50 plus. For the full sample of workplaces in 2004 and 2011, having more employees with skills higher than needed to do their job in combination with more than half the workforce aged 50 plus is associated with higher quality of service/product and higher labour productivity, albeit this latter relationship is only significant at the 10% level. Lower labour productivity and overall performance associated with more workers with lower skills than needed to do their jobs is limited to workplaces with less than half the workforce aged over 50. Whilst this does not give a definitive indication of the relationship between mismatch by age and workplace performance, it is suggestive that skill mismatch may be more costly for employers who employ fewer older workers.

In line with the results shown in Table 3, the findings are much stronger for 2004, particularly in relation to having workers with lower skills than required to do their jobs. In terms of labour productivity and overall workplace performance, this type of mismatch overall is associated with worse performance, but when combined with a large proportion of older workers in the workplace this is completely reversed. For these performance indicators, the estimated coefficients are statistically significant.

Table 4 Workplace performance estimates

	Financial Performance	Labour productivity	Quality	Overall
		Coefficient (SE)		
Percentage of workforce with own skills (about the same)		**All**		
Higher	0.15 (0.16)	-0.07 (0.15)	-0.06 (0.16)	-0.05 (0.22)
50% or more aged 50 plus	-0.04 (0.41)	0.59 (0.34)*	0.94 (0.38)**	0.87 (0.59)
Lower	-0.35 (0.29)	-0.75 (0.36)**	-0.27 (0.43)	-0.94 (0.49)*
50% or more aged 50 plus	1.02 (1.08)	3.17 (2.02)	0.02 (1.23)	2.87 (2.06)
Percentage of workforce with own skills (about the same)		**2004**		
Higher	0.49 (0.23)**	0.25 (0.23)	0.06 (0.23)	0.53 (0.32)
50% or more aged 50 plus	-0.41 (0.61)	0.41 (0.59)	0.81 (0.77)	0.34 (0.91)
Lower	-0.30 (0.36)	-1.03 (0.43)**	-0.85 (0.56)	-1.34 (0.50)***
50% or more aged 50 plus	2.93 (1.90)	7.25 (2.76)***	0.68 (2.01)	6.44 (2.31)***
Percentage of workforce with own skills (about the same)		**2011**		
Higher	-0.12 (0.22)	-0.32 (0.22)	-0.24 (0.21)	-0.58 (0.28)**
50% or more aged 50 plus	0.43 (0.54)	0.70 (0.46)	1.24 (0.43)***	1.42 (0.73)*
Lower	0.10 (0.49)	-0.04 (0.50)	0.69 (0.43)	0.17 (0.62)
50% or more aged 50 plus	-0.09 (1.48)	0.06 (1.61)*	-0.53 (1.80)	-0.09 (2.54)

Models also include dummy variables identifying the size, age and region of the workplace, the industry it operates in, the largest non-managerial occupational group, sector, whether any trade unions were recognised and whether it's a single independent establishment as opposed to a multi-site establishment.

Conclusions

Older workers account for an increasing proportion of the UK workforce. In 2011, 30.1 per cent of the workforce was aged 50 plus, up from 26.4 per cent in 2004. They were slightly more likely to report that their own skills were higher than required to do their job, and slightly less likely to report that their own skills were lower than required to do their job than younger workers. Here, the mismatch of skills is self-reported.

Overall, mismatched workers reported lower levels of job satisfaction than workers who reported that their skills were about the same as required to do their jobs. This was true for all categories of mismatched workers: those who reported their own skills were lower, much higher, and a bit higher than needed to do their jobs, with stronger dissatisfaction for the first two types of mismatch. Furthermore, the youngest and oldest workers were the most satisfied.

Older mismatched workers were in general no more/less satisfied than their younger mismatched counterparts, except in 2011; here workers who reported that their skills were lower than required to do their jobs were the most dissatisfied.

Job control increased with age. Furthermore, whilst mismatched workers have lower levels of job control than matched workers, there were differences in job control by the type of mismatch. Workers with skills lower than required exhibited less job control than workers who reported skills much higher than required, they in turn had lower job control than matched workers and workers with skills only a bit higher than required.

For our full sample having a higher percentage of mismatched workers does not have a significant impact on any of the workplace performance measures, although the direction of the estimated relationships are consistent for all our performance measures. Workers with lower skills than required exhibiting lower productivity and workers with higher skills than needed higher productivity. These patterns are statistically robust for 2004 in terms of better financial performance and overall performance where more workers have higher skills than needed and poorer labour productivity and overall performance where more workers have lower skills than required. These relatively strong findings for 2004 dissipate in 2011, perhaps as a result of skill demands in relation to the economic downturn at this time.

There may be an age element to the relationship between skill mismatch and workplace performance, in that workplaces with more mismatched workers who also employ a lot of workers aged 50 plus (more than 50 per cent of their workforce) often demonstrate higher performance. This was observed for labour productivity, quality of goods/service and overall performance, in particular in relation to workers whose skills were higher than needed to do their jobs. It seems then, that employing older workers with higher skills than needed may be good for firms in terms of performance, without the skill mismatch affecting the job satisfaction of these workers.

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