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Department for Work & Pensions

GOVERNMENT SOCIAL RESEARCH

Social Science in Government

Older workers and the workplace

Evidence from the Workplace Employment Relations Survey

February 2017

Research Report No 939

A report of research carried out by the National Institute of Economic and Social Research (NIESR) on behalf of the Department for Work and Pensions

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Summary

This report aims to understand more about the working experiences of older individuals as well as the potential impact changes in the age composition of workplaces may have on their performance. It extends the evidence base on these issues using data from the Workplace Employment Relations Survey (WERS), a nationally representative survey of British workplaces and their employees. Data were used from the two most recent surveys in the series, which took place in 2004 and 2011.

The research has multiple objectives. First it investigates the types of workplaces in which older workers are more commonly employed. Existing studies have established variations in the prevalence of older workers by industry and occupation, among other factors. The analysis focuses on the workplace characteristics that are associated with employing a higher proportion of older workers. The second objective is to explore the prevalence of age-related equal opportunities policies and practices among employers and consider how these relate to the employment of older workers. Legislation requires employers to treat employees equally regardless of age, but some firms adopt practices which go beyond statutory requirements. The third objective is to explore outcomes for older workers and whether these are affected by employer practices. The final objective is to explore the relationship between the age composition of the workforce and workplace performance; this study is the first to do so using nationally representative data on British workplaces.

Key findings

- The proportion of workers aged 50 and over in the workforce rose from 21 per cent in 2004 to 24 per cent in 2011.
- The proportion of older workers in workplaces varies depending on a number of characteristics: industry; region; occupational group; workplace age; size; union recognition; and the presence of equal opportunities policies.
- The age composition of private sector workplaces does not have a significant role to play in explaining performance.
- Equal opportunities policies have become more widespread, but practices have not.
- Older workers are less likely to receive training than other workers, but those that do are satisfied with the training offered.
- On average, older workers report higher job satisfaction, wellbeing and perceptions of fair treatment than younger workers.
- Employees of all ages, who were able to work flexibly were more likely to be positive about their job.

Contents

Acknowledgements 8

The Authors 9

Executive summary 10

1 Introduction 13

1.1 Background 13

1.1.1 An ageing workforce 13

1.1.2 Older workers' experiences in the labour market 15

1.2 Research objectives 16

1.3 Structure of report 17

2 Data and methodology 18

2.1 The Workplace Employment Relations Survey 18

2.2 Nature of analyses 18

2.3 Identifying older workers 19

2.4 The Annual Survey of Hours and Earnings 20

3 Where are older workers found? 21

3.1 Key findings 21

3.2 The distribution of older workers across workplaces 21

3.3 Explaining variation in the proportion of older workers 22

3.3.1 Workplace characteristics 23

3.3.2 Age-related policies and practices 29

3.3.3 Other employer practices and characteristics 33

3.4 Change since 2004 34

3.5 Summary 37

4 Outcomes for older workers 38

4.1 Key findings 38

4.2 Introduction 38

4.3 Perceptions of fair treatment 39
4.4 Training 40
4.5 Job satisfaction and wellbeing 44
4.5.1 Job satisfaction 44
4.5.2 Wellbeing 47
4.6 Pay 48
4.6.1 Are age-related practices associated with higher pay for older workers? 49
4.6.2 Are age-related practices associated with higher pay for workers of other ages? 50
4.7 Summary 51
5 Older workers and workplace performance 52
5.1 Key findings 52
5.2 Background 53
5.3 Existing evidence on older workers and workplace performance 55
5.4 Measuring workplace performance 58
5.5 Change in age composition, age diversity and workplace performance 60
5.6 Summary 64
6 Conclusions 65
Appendix A Tables 68
References 99

List of tables

Table 3.1 Older workers and workplace characteristics: key associations 24
Table 3.2 Percentage of workplaces with special procedures to encourage applications from certain groups, 2004 and 2011 31
Table 4.1 Job satisfaction, job-related wellbeing and job quality among older workers (employees aged 50 and over), 2011 46
Table 4.2 Average hourly earnings (£), by age band, 2011 49
Table 5.1 Empirical Evidence on the impact of Age and Age Diversity on Organisational Performance 58
Table 5.2 Change in age composition, age diversity and workplace perfo rmance: summary of results 61

Table A.1 Percentage of workers aged 50 and over by selected workplace characteristics, 2011 68

Table A.2 Workplace characteristics associated with the proportion of older workers, 2011, regression results, workplace weighted 70

Table A.3 Workplace characteristics associated with the proportion of older workers, 2011, regression results, employment weighted 72

Table A.4 Proportion older workers and market competition, private sector, 2011, regression results 74

Table A.5 Correlations between age-related policies and practices, 2011 75

Table A.6 Workplace characteristics associated with age-related policies and practices, 2011 76

Table A.7 Percentage of older workers and equal opportunities and age-specific recruitment practices, 2011, regression results 78

Table A.8 Other workplace features associated with the proportion of older workers, 2011 79

Table A.9 Age-related practices in 2004 and change with the proportion of older workers 2004-2011, panel analysis 80

Table A.10 Employee perceptions of whether managers treat employees fairly, probit regression results 81

Table A.11 Employees receiving at least one day of training in year prior to survey, probit regression results 81

Table A.12 Log hourly earnings, by presence of age-related practices, older workers, regression results 82

Table A.13 Log hourly earnings, by presence of age-related practices, workers aged 25 and under, regression results 83

Table A.14 Log hourly earnings, by presence of age-related practices, workers aged 26-49, regression results 84

Table A.15 WERS workplaces matched to ASHE, 2011 87

Table A.16 Employee characteristics in linked ASHE-WERS and full ASHE sample, 2011 86

Table A.17 Average hourly earnings (£) from ASHE and the linked ASHE-WERS, 2011 87

Table A.18 Average hourly earnings (£), by age band, 2011 87

Table A.19 Change in labour productivity, 2004-2011 95

Table A.20 Change in quality of output, 2004-2011 96

Table A.21 Change in financial performance, 2004-2011 96

Table A.22 Change in additive performance scale, 2004-2011 96

Table A.23 Change in quit rate, 2004-2011 97

Table A.24 Change in absence rate, 2004-2011 97
Table A.25 Performance outcomes in 2011 (no lagged dependent variable)..... 97
Table A.26 Performance outcomes in 2011 (with lagged dependent variable) 98

List of figures

Figure 1.1 Percentage of employment accounted for by age group, 2004, 2011 and 2016 14
Figure 3.1 Percentage of the workforce aged 50 or more, workplaces and employees, 2011 22
Figure 3.2 Percentage of the workforce aged 50 or more, by workplace age, 2011 26
Figure 3.3 Age-related equal opportunities practices, 2004 and 2011 30
Figure 3.4 Percentage of the workforce aged 50 or more, 2004 and 2011 35
Figure 4.1 Percentage of employees agreeing or strongly agreeing ‘Managers at this workplace…treat employees fairly’, 2011..... 39
Figure 4.2 Percentage of employees receiving at least one day of training in 12 months prior to survey, 2011 41
Figure 4.3 Percentage of employees satisfied or very satisfied with training received, 2011..... 43
Figure 4.4 Percentage of employees satisfied or very satisfied with opportunity to develop skills, 2011 43
Figure 4.5 Job satisfaction scale, by age band, 2011..... 45
Figure 4.6 Wellbeing scale, by age band, 2011..... 47
Figure A.1 Within-Workplace Changes in Workplace Performance (unweighted number of workplaces), 2004-2011, Panel Survey, Private Sector 89
Figure A.2 Within-Workplace Changes in Additive Workplace Performance, Absence Rates and Quit Rates (weighted), 2004-2011, Panel Survey, Private Sector..... 90
Figure A.3 Within-Workplace Changes in Age Shares and Age Diversity (weighted), 2004-2011, Panel Survey, Private Sector..... 91

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Executive summary

Older workers account for a growing proportion of the UK workforce. As such, it is increasingly important to understand more about the working experiences of older individuals as well as the potential impact changes in the age composition of workplaces may have on their performance.

This report extends the evidence base on these issues using data from the Workplace Employment Relations Survey (WERS), a nationally representative survey of British workplaces and their employees. Data were used from the two most recent surveys in the series, which took place in 2004 and 2011.

The research has four objectives. First we investigate the types of workplaces in which older workers are more commonly employed. Existing studies have established variations in the prevalence of older workers by industry and occupation, among other factors. Our analysis focuses on the workplace characteristics that are associated with employing a higher proportion of older workers. The second objective is to explore the prevalence of age-related equal opportunities policies and practices among employers and consider how these relate to the employment of older workers. Legislation requires employers to treat employees equally regardless of age, but some firms adopt practices which go beyond statutory requirements. Our third objective is to explore outcomes for older workers and whether these are affected by employer practices. Our final objective is to explore the relationship between the age composition of the workforce and workplace performance; to our knowledge, this study is the first to do so using nationally representative data on British workplaces.

The prevalence of older workers

There is considerable variation among workplaces in the proportion of older workers they employ (older workers are defined in this report as those aged 50 and over). In 2011, 19 per cent of workplaces did not employ any older workers, while in 14 per cent of workplaces, at least half the workforce were aged 50 or above. On average, the percentage of the workforce aged 50 and over had risen from 21 per cent in 2004 to 24 per cent in 2011.

Around 25 per cent of the variation in the proportion of older workers employed across workplaces can be explained by structural workplace characteristics, such as differences in industry, region, the largest occupational group at the workplace, workplace age, workplace size and union recognition.

Age-related policies and practices

More than three-quarters (77 per cent) of workplaces had a formal written policy on equal opportunities or managing diversity in 2011, an increase from 66 per cent in 2004. The percentage of workplaces with an equal opportunities policy that explicitly mentioned age had also increased over this period, from 42 per cent to 58 per cent. The prevalence of formal equal opportunities practices relating to age had not changed however, and these remained less common than employer policies. In 2011, for example, 17 cent of workplaces monitored recruitment and selection by age, while seven per cent monitored promotions by age. Both formal equal opportunities policies and practices are typically more common in the

public sector, in larger workplaces and in workplaces with a recognised union. Just three per cent of workplaces had special recruitment procedures to encourage applications from older workers.

We see some evidence of higher proportions of older workers in workplaces with a greater number of equal opportunities practices relating to age and where special recruitment procedures for older workers are in place. However, the presence of these practices was not associated with an increase in the proportion of older workers over time.

Outcomes for older workers

The workplace experiences of older workers differ from those of employees aged between 22 and 49 and those of young workers (aged between 16 and 21).

Older workers were less likely to have received at least one day of training in the year prior to the survey, even after accounting for a range of job, demographic and workplace characteristics. There was also a notable decline in training rates by age among older workers; 65 per cent of those aged between 50 and 59 had received training, compared with 45 per cent among those aged 65 and over. Yet despite the lower incidence of training among older workers, they are no less satisfied than other workers with the training they do receive and with opportunities to develop their skills.

Overall job satisfaction and job-related wellbeing are higher among older employees than those in their 20s to 40s, consistent with existing evidence. Perceptions of fair treatment are higher among employees aged 65 or over, but employees aged between 50 and 64 were no more or less likely than employees aged 22-49 to agree managers treated employees fairly. The higher average job satisfaction, wellbeing and perceptions of fair treatment among older employees may at least in part reflect the fact that less satisfied employees may be more likely to have left employment.

The age-related policies and practices considered in this report were not associated with outcomes for older workers in terms of job satisfaction and wellbeing, access to training and perceptions of fair treatment. Instead, other features of the job and workplace were more important in explaining the variation in outcomes – many of these are common across employees of all ages. However, a positive association between the presence of equal opportunities practices and pay for older workers remained apparent even after controlling for these factors.

Age composition of the workforce and workplace performance

Evidence from existing research on the relationship between the age composition of the workforce and workplace performance is mixed. These studies have been conducted in a range of settings and countries, and use various measures of performance. However, to our knowledge, our analysis is the first to explore this relationship using nationally representative data on British workplaces and their employees.

We focus on private sector workplaces only and consider a range of workplace performance measures, based on managers' subjective assessments of workplace labour productivity, quality of product or service and financial performance. We also make use of measures of quit rates and absence rates.

In general, we find no significant associations between changes in the proportion of older workers employed between 2004 and 2011 and changes in workplace performance over the same period. Changes in age diversity also typically show no association with change in workplace performance. This suggests that overall the age composition of private sector workplaces does not have a sizeable role to play in explaining their performance.

We do find some evidence that workplace labour productivity falls where the proportion of workers aged 22-49 falls, either due to a rise in the proportion of older or younger workers. The association between a fall in the proportion of workers aged 22-49 and falling workplace labour productivity does not, however, carry through to financial performance.

Conclusions and implications

The majority of British workplaces do employ at least some older workers. But although the number of older individuals in employment is rising, employment rates still drop sizeably when people reach their 50s and 60s. Existing legislation has already sought to encourage participation and retention of older individuals in the labour market, and to address age-related discrimination.

While there has been an increase in the prevalence of formal equal opportunities policies explicitly mentioning age, far fewer workplaces have age-related equal opportunities practices in place. Findings from qualitative research commissioned alongside this study (DWP, 2017) suggest some employers are wary of monitoring by age in case this is seen as discriminatory. This may be an area in which employers need reassurance.

Improving the experiences of older workers is important if individuals are to be encouraged to remain in employment for longer. While for some outcomes, such as job satisfaction, older workers on average appear to fare better than other workers, this conceals variation among this group. It may therefore be worthwhile to consider placing particular emphasis on improving outcomes for those older workers who currently have the poorest experiences at work.

The presence of age-related policies and practices was not typically associated with outcomes for older workers, with the exception of pay. Generating better outcomes for older workers may therefore require greater focus on other employer practices, such as provision of flexible working or job design. These may have benefits for employees of all ages, not just older workers.

Our results indicate that for private sector workplaces, the age composition of the workforce does not appear to play a sizeable role in explaining workplace performance. While a fall in the proportion of workers aged 22-49 was associated with a fall in workplace labour productivity, this was not carried through to financial performance. Research has indicated that many employers value older workers, recognising their experience, loyalty and reliability (DWP, 2017). There may also be broader benefits for others within the workplace; we find some evidence that job satisfaction was higher among young workers in workplaces which employed higher proportions of older workers.

1 Introduction

For many years economists and social policy analysts have studied the fortunes of various demographic groups in the labour market, focusing on concerns regarding potential discrimination against minority groups, women and younger people. One strand of the literature has considered the costs and benefits of equal opportunities and other policies designed to mitigate discrimination and promote fair opportunities for all. Another focuses on diversity at work and its implications for firm performance. Yet, despite an increase in labour market participation among older people relatively little is known about where they work, the effects of workplace policies and practices on their working experiences, or the effects of older workers on workplace performance. It is only possible to address these evidence gaps through analyses of data which link employees to the workplaces that employ them.

1.1 Background

1.1.1 An ageing workforce

Older workers account for an increasing proportion of the UK workforce. This is partly a result of demographic changes; in 2015 individuals aged 50-64 accounted for 18.5 per cent of the population (an increase from 17.4 per cent in 2001) and those aged 65 and over made up a further 17.8 per cent of the population (rising from 15.9 per cent in 2001).[2] Population projections from the Office for National Statistics (ONS) estimate that the percentage of the population aged 50 and over will rise to 40 per cent by 2030 (ONS, 2015a).

Changes to the age composition of the workforce are driven not only by an ageing population but also by rates of labour market participation. Participation rates among workers aged between 50 and State Pension age (SPa) have been rising fairly steadily since the mid-1990s, from 68.5 per cent in 1994 to 75.3 per cent in 2014 (ONS, 2015b). Participation rates have also been increasing among individuals older than SPa. After remaining fairly stable from the mid-1990s to the early 2000s, participation among this age group rose from 8.1 per cent in 2001 to 12.7 per cent in 2011 and stood at 12.1 per cent in 2014. In interpreting these figures it is, however, important to bear in mind the increases in SPa for women since 2010.[3] When considering participation among individuals older than SPa by gender, the participation rate has continued to rise for men since 2011, but appears to have decreased for women. This is at least in part likely to reflect the fact that the figures for women are based on a progressively older age group over time, who are more likely to be inactive (ONS, 2015b).

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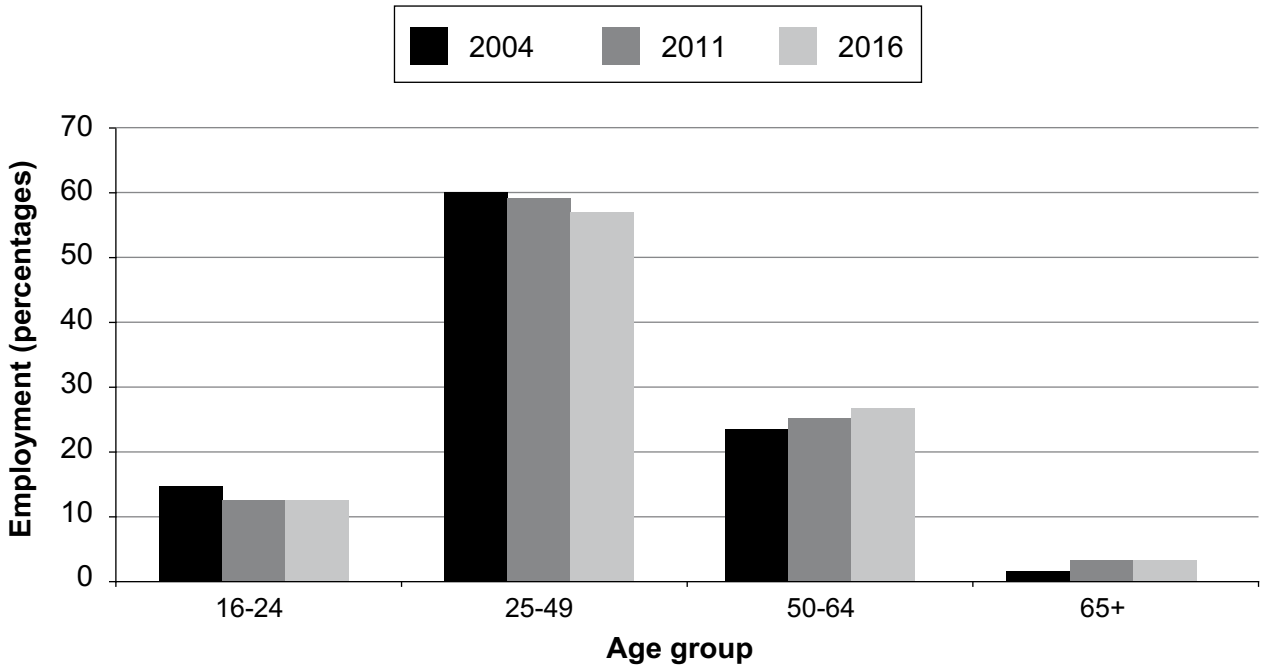
2 2015 figures based on ONS Population Estimates Summary for the UK, mid-2015 (ONS, 2016a); 2001 figures based on Mid-2001 Population Estimates: United Kingdom (ONS, 2012).

3 The Pensions Act 1995 provided for the equalisation of SPa for men and women, with SPa for women to be gradually increased from 60 to 65 over the period April 2010 to April 2020. Following the subsequent Pensions Acts (2007, 2011 and 2014), this process was accelerated, so that the SPa for women would be 65 by November 2018. By April 2016, the SPa for women had risen to 63 (see Thurley, 2016 for further discussion). Full details of the increases in SPa for women, by date of birth, are provided in the SPa timetables available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/310231/spa-timetable.pdf

The age composition of the workforce is also changing as a result of falling labour market participation among 16 to 24 year-olds, largely as a result of increased participation in further and higher education among this age group (ONS, 2015c).

These changes mean older workers now account for a greater share of employment. Among all those in employment aged 16 and over, the percentage aged between 50 and 64 has risen from 23.6 per cent in 2004 to 26.7 per cent in 2016 (Figure 1.1). The percentage aged 65 and over has increased from 1.9 per cent to 3.7 per cent over the same period.

Figure 1.1 Percentage of employment accounted for by age group, 2004, 2011 and 2016



Source: ONS Labour market statistics, authors' calculations. Based on data for Q1 of each year (ONS, 2016b).

Most European countries are experiencing an ageing population and an ageing workforce. Based on data for 2014, the UK has a higher participation rate for workers aged 50-64 than the average for the EU-28 (ONS, 2015b), however, this remains below that of some European counties, such as Germany and Sweden (participation is highest in Iceland). The participation rate for workers aged 65 and over in the UK is also above the average for the EU-28.

Yet while the number of older individuals in employment[4] is increasing, employment rates drop sizeably when people enter their 50s and 60s.[5] There are a number of reasons why governments might want to raise the employment participation rates of older people.

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4 Our focus throughout this report is on employment as the data used in our analysis only covers employees, and not self-employment. However, it is important to note that self-employment has become more prevalent among older workers (George *et al.*, 2015).

5 For example, in the first quarter of 2016, the employment rate among 35 to 49 year-olds stood at 83.7 per cent, compared with 70 per cent for individuals aged 50 to 64 (ONS, 2016b: Table 2, Labour market by age group).

First, many older people aspire to work for longer, but sometimes face barriers to doing so (Smeaton *et al.*, 2009). Second, employment can be good for older people in terms of health and wellbeing (Waddell and Burton, 2006) as well as providing income, not just while remaining in work but also potentially raising income in retirement. Third, it can raise economic output (Barrell *et al.*, 2011).

It can be argued that, with increases in life expectancy and a growing dependency ratio, encouraging people to work for longer is necessary to ensure prosperity. If people remain in work for longer this may also contribute towards reducing the burden on State Pension provision. However, it is sometimes stated that increasing labour market participation among older people may restrict employment opportunities for younger workers, although there is little evidence to support this argument (Banks *et al.*, 2008; George *et al.*, 2015; Munnell and Wu, 2011).

Recent years have seen the introduction of various policy reforms to encourage the participation and retention of older workers in employment. Some have targeted older workers specifically, such as the abolition of the Default Retirement Age in October 2011 (employers can no longer compulsorily require workers to retire at age 65) and the increases in SPa. Other policies not specifically targeted at older workers may nevertheless act to encourage work among this age group, such as the extension of the right to request flexible working to all employees in 2014 and the requirement on employers to make reasonable adjustments for employees with disabilities.

The Department for Work and Pensions published *Fuller Working Lives – A Framework for Action* in 2014, recognising that both government and employers have a role in helping people extend their working lives (DWP, 2014). Yet studies have indicated that many employers appear unprepared for an ageing workforce (CIPD, 2015; Parry and Harris, 2011; DWP, 2017). Advice issued by the CIPD has suggested employers need to accommodate older people by focusing on inclusive recruitment, improving capability of line managers, investing in training and performance management, supporting health and wellbeing, and facilitating flexible working.

1.1.2 Older workers' experiences in the labour market

Older individuals' reasons for remaining in or leaving employment vary considerably. A study of individuals working beyond SPa found that around half were working because they 'were not ready to stop work', while 17 per cent were doing so to 'pay for essential items' (ONS, 2015b). There are likely to be substantial differences in outcomes between those individuals who choose to stay in employment (for example because they enjoy their work), those who feel they have to stay (for example, through financial necessity) and those who are forced out (perhaps through redundancy or ill health).

Common reasons for early exit from the labour market include poor health, caring responsibilities and difficulty in finding new work after redundancy (CIPD, 2015). At the same time, individuals may be motivated to continue in employment through financial necessity – while some individuals have sufficient resources to retire early, for others this is not the case (Humphrey *et al.*, 2003; Lain, 2015).

The nature of the work itself may serve to encourage employees to either leave or remain in employment. Work which is overly physically or mentally demanding may lead employees to leave; at the same time, a job which lacks variety or challenges may also provide little incentive to remain in work. Existing evidence has suggested that there is high demand

for more flexible work among older employees (Smeaton *et al.*, 2009), which may help employees to better manage the demands of their work as they age. It is no surprise, therefore, that part-time work and self-employment are much more common among those working beyond age 65 than among younger age groups, based on analysis of the 2011 Census (ONS, 2015d). Furthermore, of those older individuals in the 2011 Census who were also observed as being in employment at the time of the 2001 Census, many had reduced their hours of work over this period. It may be the case therefore that where such hours flexibility is not available, older employees could feel compelled to leave, whereas they may have been willing to remain with some adjustments to their working patterns.

It is difficult to ascertain the exact benefits older people might get from remaining in work as these will vary according to the individual's circumstances, the type of work they do and the working conditions they face. In addition to providing income, work can potentially help to maintain cognitive and physical activity, a sense of identity and social support. The health implications of remaining in work are unclear because individuals' circumstances are varied. Much will depend on older people's 'outside options', that is, opportunities they have to work elsewhere or, in the absence of paid employment, what they would be doing. While work is generally beneficial for health, this depends on the nature and quality of the work. Involuntary exit is associated with negative effects on health and wellbeing, but other studies suggest retirement reduces stress. Clark and Fawaz (2009) show that the change in wellbeing on moving from work to retirement varies considerably according to the type of job held.

The experiences of older workers in finding and remaining in employment will also be affected by employer attitudes. Various studies have identified positive attitudes among employers to older workers, who rate them for their reliability, experience and skills (Barnes *et al.*, 2009; DWP, 2015a). But it is widely acknowledged that negative perceptions of older workers are also apparent, with such workers seen to be slower or less productive, less motivated and more likely to be in poor health. While there is no systematic evidence that older workers are less productive, this perception persists. And while employers may be more favourably disposed to retaining their existing older workers and recognise their skills and experience, they are less willing to recruit 'new' older workers. ONS (2015b) find that among those working beyond SPa in 2014, the vast majority (80 per cent) were already working for their employer prior to 2010. However, among employees aged 65 and over in 2011, one in ten had not been in employment in 2001, suggesting there is potential for older individuals to return to work (ONS, 2015d).

1.2 Research objectives

This research uses data from the Workplace Employment Relations Survey (WERS), a nationally representative survey of British workplaces and their employees. We highlight the various caveats of our methods and the data in Chapter 2. We make use of data from the two most recent surveys in the WERS series, 2004 and 2011.

Existing studies have established variations in the prevalence of older workers by industry and occupation, among other factors. Such analysis is often undertaken using household surveys, but WERS allows us to explore a broader range of workplace characteristics based on information reported by managers. Our first objective in this report is therefore to **investigate what characteristics of workplaces are associated with employing a higher proportion of older workers**.

Legislation requires employers to treat employees equally regardless of age, but some firms adopt specific procedures to recruit older workers (and other minority groups) which go beyond the minima prescribed in legislation. Furthermore, some employers are more assiduous than others in monitoring and reviewing how their policies and procedures are working in practice. Our second aim is to **explore employer equal opportunities policies and practices and how these relate to the employment of older workers**.

It is well-established that workplace factors play a role in determining whether older workers remain in employment. But less evidence exists regarding the feelings and perceptions of those older people who remain in work, and how this may vary depending on the type of work and working conditions they face. We also know relatively little about how younger workers respond to older workers. Therefore we **consider whether particular workplace policies and practices are associated with better outcomes for older workers, and whether outcomes for younger workers are affected**.

While studies have investigated the relationship between age and productivity, few explore the relationship between age composition and performance at the workplace level. Additional factors come into play when considering performance at a workplace-level rather than at individual level. For example, performance may depend upon the mix of ages in a workplace rather than the proportion employed in a single age group. Finally therefore, for private sector workplaces, **we explore whether workplace performance is affected by the age composition of the workforce**. To our knowledge, our analysis is the first to explore this relationship for Britain, using nationally representative data on workplaces and their employees.

1.3 Structure of report

The remainder of this report is structured as follows:

Chapter 2 describes the WERS data and provides an overview of the methodology used in this report.

Chapter 3 explores the types of workplaces in which older workers are found. It begins by identifying which workplace characteristics are associated with employing a higher proportion of older workers. It then goes on to explore the prevalence of policies and practices specifically related to age and equal opportunities, and whether such practices are associated with employing more older workers. Finally, it considers the role of a broader set of employer practices and characteristics.

Chapter 4 focuses on outcomes for older workers, considering outcomes in terms of job satisfaction and wellbeing, access to training, pay and perceptions of fair treatment. These are compared with outcomes for workers from other age groups. The chapter also explores whether outcomes for older workers are more favourable in workplaces with age-related policies and practices.

Chapter 5 explores the relationship between the age composition of the workforce and a range of measures of workplace performance. Age composition is considered in terms of both the share of older and younger workers at the workplace, as well as the age diversity of the workforce.

Finally, Chapter 6 provides a discussion of the findings and draws conclusions.

2 Data and methodology

2.1 The Workplace Employment Relations Survey

The primary data source for this analysis is the Workplace Employment Relations Survey (WERS).[6] We make use of data from the two most recent surveys in the series, which took place in 2004 and 2011. WERS:

- is a large nationally representative survey of workplaces with five or more employees (with responses from 2,680 workplaces in 2011 and from 2,295 workplaces in 2004);
- contains data from face-to-face interviews with Human Resources managers on workplace practices and procedures (including those relating to the recruitment of older workers), workforce composition (including age distribution) and workplace performance;
- 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;
- includes panel data tracking around 1,000 workplaces and their employees between 2004 and 2011; and
- contains unique workplace identifiers permitting linkage of the survey to other data sources, notably the Annual Survey of Hours and Earnings (ASHE).

The survey includes workplaces which have five or more employees and 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. This population accounted for around a third of all workplaces and around 90 per cent of employees in Britain in 2011.[7] It should be noted that the survey does not cover micro-employers (those with fewer than five employees) or the self-employed.

Using the WERS data allows us to explore a wider range of workplace factors than is possible in analysis based on household surveys. For example, it allows consideration of whether the workplace has various practices and policies in place (such as those relating to equal opportunities), as well as employer attitudes (such as whether they consider age to be an important factor in recruitment). Furthermore, it is only through workplace-level data that it is possible to examine the relationship between employment of older workers and performance at the workplace level.

2.2 Nature of analyses

We conduct simple descriptive analyses to identify the incidence of older workers, as well as the prevalence of practices relating to equal opportunities and age. We also undertake multivariate analyses to identify independent associations between variables of interest, such as the presence of equal opportunities policies and the percentage of older workers

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6 For further information on WERS, see the website here: http://www.wers2011.info/

7 Note that WERS covers workplaces in Britain, and not the whole of the UK (i.e. it does not include Northern Ireland).

employed. These analyses, which are also survey weighted to permit extrapolation to the population of workplaces at large, allow us to take account of the contribution of multiple factors. For instance, when exploring the relationship between the presence of an equal opportunities policy and the percentage of older workers employed, we wish to know what independent effect the existence of such a policy has among workplaces that are otherwise observationally equivalent. It should be noted that such analyses can identify associations but do not identify causal relationships.

Some of our analyses focus on the panel component of the WERS data, where the same workplaces are observed in both 2004 and 2011. An advantage of using the panel data is that it allows us to look specifically at change within the same workplaces over time. One potential drawback is that the panel consists of a smaller sample of workplaces. While there are almost 1,000 workplaces in total in the panel sample, the sample size reduces when focusing on particular subsets of workplaces (by industry, for example). This limits our ability to look at particular subgroups of workplaces. The nature of the panel data also means we only observe workplaces at two points in time, and over a period in which the economy experienced a significant downturn. It is possible that exploring change over a longer timeframe could produce different results; the availability of just two time points also limits our ability to identify the direction of any relationship with certainty.

2.3 Identifying older workers

Managers participating in WERS are asked to report the number of employees in their workplace in each of the following age bands: 16-17, 18-21, 22-49 and 50 and above. This information is collected through the Employee Profile Questionnaire. This is distributed to managers prior to the face-to-face interview, allowing them time to consult their records, which should improve the accuracy of the data collected.

Throughout this report, we use the term ‘older workers’ to refer to employees aged 50 and over, unless stated otherwise. In large part, this is a result of the nature of the WERS data. There is no consensus on what age constitutes being an ‘older worker’, with a range of definitions in existence (Burgmann, 2013). However, many previous studies have also adopted the same definition of 50 and above (for example, Yeomans (2011) in a review of the literature on age and employment; Canduela *et al.*, 2012, Smeaton *et al.*, 2009, among others). The English Longitudinal Study of Ageing focuses on the population aged 50 and over. Many government statistics relating to older workers have also been produced on the basis of those aged 50 and over, although these sometimes additionally distinguish those aged 50-64 from those aged 65 and over (DWP, 2015b, ONS, 2015b).

We also use data from the Survey of Employees Questionnaire (SEQ) within WERS to explore outcomes for older workers. The SEQ is distributed to 25 randomly selected employees within each workplace participating in WERS (or the entire workforce in workplaces with 25 or fewer employees). While the workplace-level data available in WERS do not allow us to further disaggregate by age among those aged 50 and over, in the SEQ we are able to do so, as employees are asked to report their age within specified age bands which include 50-59 years, 60-64 years and 65 or over. Ideally it would have been of interest to further distinguish by age among those aged 50 and older in the workplace-level data too, in order to gain greater insight into the incidence of older workers and also in our analysis of workplace performance.

In identifying younger workers, we are again constrained by the data available to us and therefore in our WERS analysis we define younger workers as those aged between 16 and 21.[8] As for older workers, there are various definitions of 'younger workers' in use, although it is fairly common for this to encompass a slightly broader age group. ONS labour market statistics, for example, identify young people as those aged 16-24 (ONS, 2016c).

Throughout the report we also draw comparisons with workers aged between 22 and 49 years of age (i.e. all employees who are not categorised as younger or older workers, based on the definitions above). In practice, in many studies the definitions of older and younger workers used reflect the information that is available in the data being analysed, and our study is no exception. How to appropriately define older and younger workers is an issue that is always likely to be contested, especially since expectations governing who is fit to do what are often context-specific.

2.4 The Annual Survey of Hours and Earnings

In our analysis of pay among older workers, we also make use of data from the ASHE, linked to a subset of WERS workplaces. We use this data to conduct employee-level analysis, with the link to WERS allowing us to control for a greater range of workplace characteristics than would be possible from the ASHE data alone. Although information on earnings is collected through the SEQ within WERS, employees are only asked to report this within banded earnings categories. As well as providing continuous earnings data, as ASHE is taken from employer payroll records the information on earnings is also likely to be more accurate than that reported by employees in WERS (see Davies and Welpton, 2008, for further discussion on the rationale for linking the two datasets). One drawback of using ASHE however, is that it does not contain information on employees' qualifications, which are known to be an important determinant of earnings.

ASHE provides continuous data on age. For consistency with our WERS analysis, older workers are identified as those aged 50 and over. However, we do expand our definition of younger workers to those aged 25 and under, as the small sample sizes for younger workers within our linked ASHE-WERS sample prevent us from using the same definition of 16-21 applied in our WERS analysis. This also means that when comparing against workers of all other ages, here the definition differs from that used in our WERS analysis, and is based on those aged 26 to 49.

Further discussion regarding the linkage of ASHE to WERS is provided in Appendix 8.2.

[8] With the exception of our analysis using the linked ASHE-WERS data, due to the small sample size available for this age group, as discussed in Section 2.4.

3 Where are older workers found?

While the prevalence of older workers has been rising in recent years, there is considerable variation across workplaces in the proportion of older workers they employ. In this chapter we use data from WERS to identify how older workers are spread across workplaces. Multivariate models are used to identify which workplace traits are independently associated with the percentage of older workers employed by workplaces. Using the panel element of the survey we also explore what workplace features are associated with rising or falling percentages of older workers at the workplace between 2004 and 2011.

3.1 Key findings

This chapter explores the prevalence of older workers. We find that:

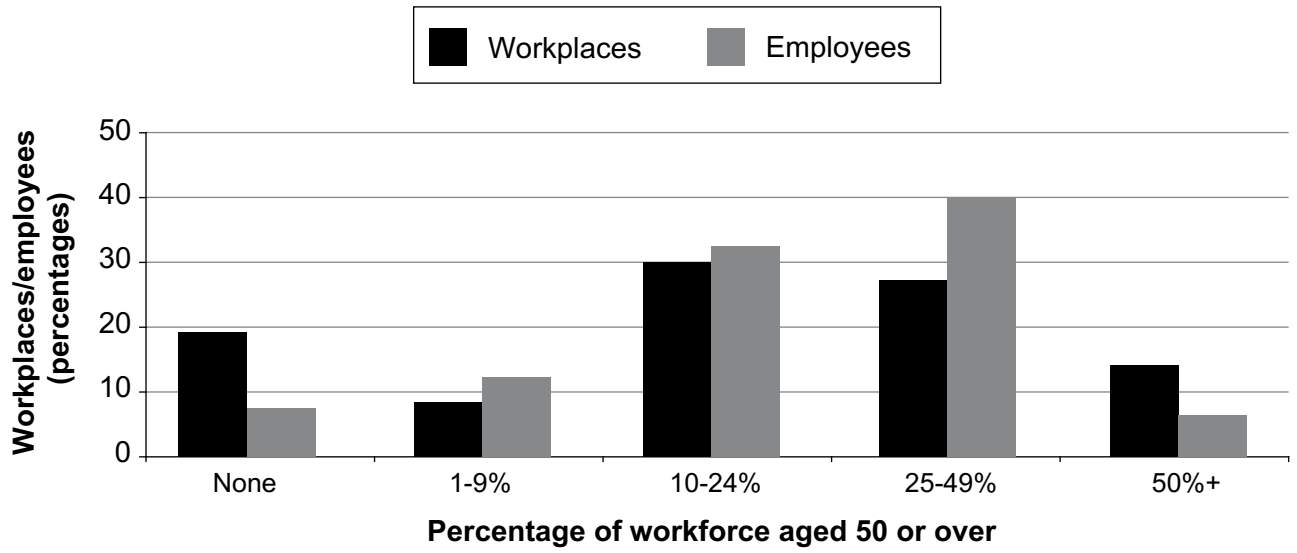
- There is considerable variation across workplaces in the percentage of older workers they employ. In 2011, 19 per cent of workplaces employed no workers aged 50 and over, while in 14 per cent of workplaces at least half the workforce were aged 50 or above.
- Part of the variation across workplaces in the percentage of older workers employed can be explained by structural workplace characteristics, such as differences in industry, region, the largest occupational group at the workplace, workplace age, size and union recognition.
- The proportion of workplaces with an equal opportunities policy that explicitly mentions age has increased, rising from 42 per cent in 2004 to 58 per cent in 2011. However, equal opportunities practices in relation to age showed no statistically significant change over this period.
- We see some evidence of higher proportions of older workers in workplaces with a greater number of equal opportunities practices relating to age. However, these practices were not associated with an increase in the proportion of older workers over time.
- Other factors also contribute to explaining variation in the percentage of older workers. For example, older workers accounted for a smaller proportion of the workforce in workplaces which had undergone a greater number of changes in the two years prior to the survey.

3.2 The distribution of older workers across workplaces

In 2011, around one-quarter (24 per cent) of employees in workplaces with five or more employees were aged 50 or more. There is, however, considerable variation across workplaces: around one-fifth (19 per cent) of workplaces had no employees aged 50 or above, while in 14 per cent of workplaces at least half of the workforce were aged 50 or

over (Figure 3.1, darker bars).[9] The majority of workplaces are small, but larger workplaces account for a greater share of employment. It is therefore also of interest to consider the distribution of older workers in terms of the proportion of employees in workplaces employing older workers. Around three-quarters of employees work in workplaces where older workers constitute between ten and 49 per cent of all employees, while only six per cent are employed in majority older-worker workplaces (Figure 3.1, lighter bars).

Figure 3.1 Percentage of the workforce aged 50 or more, workplaces and employees, 2011



Base: all workplaces with five or more employees (2,627 workplaces).

3.3 Explaining variation in the proportion of older workers

Existing evidence points to a range of factors associated with differences in the employment of older workers, with, for example, older workers more commonly found in particular industries and occupations (DWP, 2013; 2015b). Such analysis has typically been undertaken using household surveys, and while these provide valuable information, such surveys are limited in the number of employer characteristics that they are able to collect. In contrast, an advantage of using an employer survey such as WERS is that it offers the

[9] It is worth noting that the nature of the data affects the observed distribution. So in workplaces where there are five employees for example, the percentage of older workers can only take the values 0 per cent, 20 per cent, 40 per cent, 60 per cent, 80 per cent and 100 per cent. Therefore even if there were no difference in the distribution of older workers by workplace size, small workplaces would be more likely to report 0 per cent than larger ones. If we explore the distribution excluding the smallest workplaces (those with less than ten employees), we still observe that 14 per cent of these workplaces have no employees aged 50 or above.

opportunity to explore a wider range of workplace factors.[10]

Whether a workplace employs older workers will be affected both by the employer's desire to employ older workers, as well as the willingness of older individuals to work in that workplace. Furthermore, as highlighted in Chapter 1, while employers may see value in retaining older workers, they can be less willing to recruit older workers (Daniel and Heywood, 2007). In the WERS workplace data we are only able to observe the number, or 'stock', of older workers at the workplace. This stock will be determined both by the recruitment of 'new' older workers, as well as the retention of existing older workers. Some factors may potentially act to boost both recruitment and retention of older workers, for example, providing flexible working arrangements. However, other workplace features may not necessarily have the same effect for both groups: if a job requires a high level of training, this may serve as an incentive to retain existing older workers, but perhaps discourage recruitment of new older workers, especially if there are particular returns to firm-specific human capital.

In this section, we begin by exploring the relationship between the prevalence of older workers and various 'structural' features of workplaces, such as industry, region and workplace size. We then explore the role of policies and practices specifically designed to promote equal opportunities, and whether employers focus on age in recruitment. Other employer practices and characteristics, such as whether workplaces offer flexible working, are also considered. To explore these relationships we run regression models allowing us to identify the independent association between various workplace characteristics and the proportion of older workers they employ. This allows us to identify the factors most strongly associated with employing a greater proportion of older workers having adjusted for characteristics which commonly co-exist.

3.3.1 Workplace characteristics

It is already known that older workers are more commonly found in particular industries and occupations (see for example, CIPD, 2015, DWP, 2013, DWP, 2015b). As discussed below, evidence also points to variation in the employment of older workers by region, workplace age and the presence of unions, among other factors.

As a starting point, and to help provide context for the remainder of the report, we begin by exploring variation in the percentage of older workers employed according to key structural features of workplaces, namely industry, sector, region, workplace size, workplace age, whether the workplace has a recognised union, the largest occupational group, whether the workplace is foreign-owned, family owned, and whether the workplace is a single independent establishment or part of another organisation. Appendix Table A.1 shows the percentage of older workers according to each of these characteristics. For example, among workplaces in the manufacturing industry, on average 25 per cent of the workforce were older workers.

[10] A further potential advantage is that workplace characteristics may be more accurately reported by employers than by employees. For example, to some employees it may not be clear whether they work in a public or private sector workplace.

However, as these workplace characteristics are often inter-related, here we focus our discussion on the results of regression models which allow us to identify which of these factors are most strongly associated with employing older workers. We present results on the basis of both workplace and employment-weighted estimates. The workplace-weighted estimates indicate, for example, whether workplaces in certain industries are more likely than those in other industries to have a higher proportion of older workers. The employment-weighted estimates show whether employees in workplaces in particular industries are more likely to be in workplaces employing higher proportions of older workers. These can give different results as while the majority of workplaces are small, most employees are found in larger workplaces (as discussed in Section 3.2). In practice, for many of the factors considered here the results are similar regardless of whether workplace or employment weights are applied. Table 3.1 summarises the key relationships; the full underlying regression results are provided in Appendix Table A.2 (workplace-weighted) and Appendix Table A.3 (employment-weighted).

Table 3.1 Older workers and workplace characteristics: key associations

	Proportion of older workers	
	Workplaces	**Employees**
Workplace age (ref. less than 5 years)		
5-9 years		
10-24 years	+	+
25-49 years	+	+
50+ years	+	+
Industry (ref: Manufacturing)		
Electricity, gas and water	(+)	
Construction		
Wholesale and retail trade		
Hotels and restaurants		-
Transport and communications		(+)
Financial services		-
Other business services		
Public administration		
Education		+
Health and social work	+	+
Other community services		

Continued

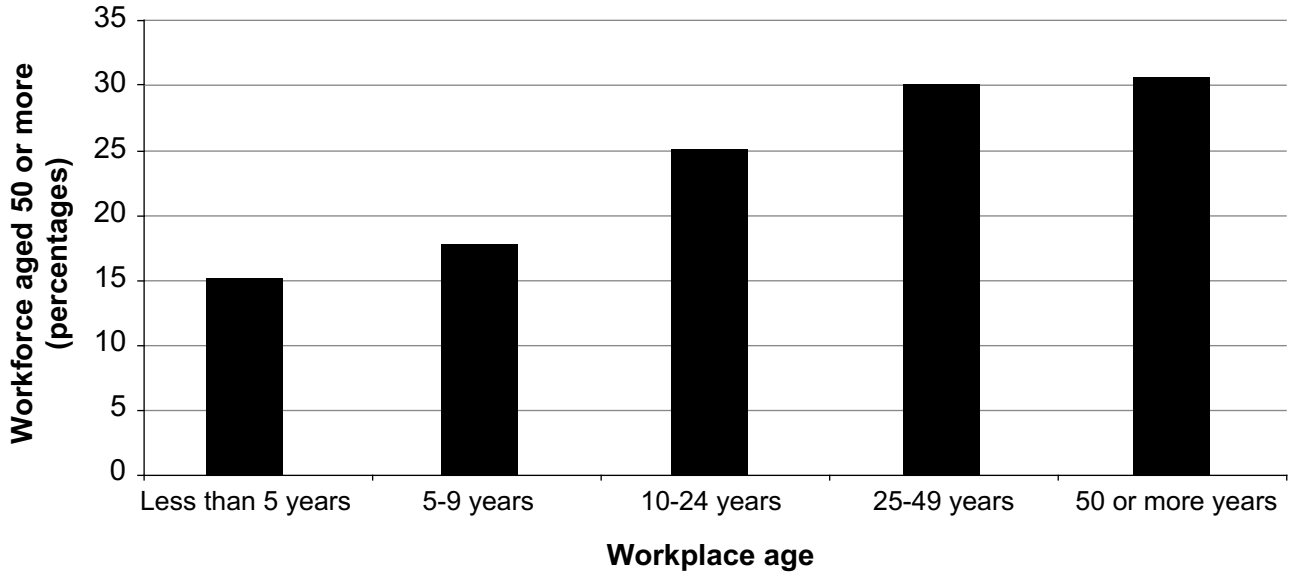
Table 3.1 Continued

	Proportion of older workers	
	Workplaces	**Employees**
Largest occupational group (ref: Professional)		
Associate professional and technical		
Administrative and secretarial	+	+
Skilled trades	+	+
Caring, leisure and other service occupations	-	-
Sales and customer service		
Process, plant and machinery		+
Elementary		
Any recognised union	+	+
Region (ref: South East)		
North East		
North West	(-)	-
Yorkshire and Humber		
East Midlands		
West Midlands		
East of England		
London	-	-
South West		
Scotland	-	
Wales		
Workplace size (ref: 500+ employees)		
5-9	+	+
10-19		+
20-49		
50-99		+
100-499		+
Private sector		
Single independent establishment		
Foreign owned	(-)	
Family owned		

Note: This table summarises the results from the underlying regression models reported in Appendix Table A.2 and Appendix Table A.3. A '-' indicates a negative association which is significant at least the five per cent level of statistical significance; '+' indicates a positive association at least the five per cent level; parentheses indicate the association is statistically significant at the ten per cent level. Base: all workplaces with at least five employees. Based on responses from 2,617 workplaces.

One notable pattern is that older workers accounted for a higher proportion of the workforce among more established workplaces, that is, workplaces which had been in operation for a greater number of years (Figure 3.2). Even once other factors are accounted for, differences by workplace age persist; compared to those workplaces that had been established for less than five years, workplaces that had been operating for ten years or more had higher proportions of older employees. This lower prevalence of older workers among newer workplaces is consistent with the fact that while employers may seek to retain older workers, they are less likely to recruit older workers (Daniel and Heywood, 2007). It is also consistent with previous evidence indicating that younger workplaces more commonly employ younger workers (Gennard and Judge, 2005).

Figure 3.2 Percentage of the workforce aged 50 or more, by workplace age, 2011



Base: All workplaces with five or more employees (2,627 workplaces).

Older workers are found across all industries, but are more prevalent in particular sectors. This variation is partly driven by differences in the demands of the work, but is also likely to be affected by factors such as skill shortages, as well as variation in the generosity of pension provision (CIPD, 2015). Based on data from the Annual Population Survey for 2013-14, the industries with the highest percentages of older workers (defined as those aged 50-64) are education, transport, health and care, and public administration (DWP, 2015b). In contrast, hospitality and finance employ smaller proportions of older workers. Similarly, our results show industry is important in explaining variation in the proportion of older workers; although our data use a different industry classification[11], employment-weighted results show similar patterns. Relative to manufacturing[12], older workers were more common in health and social work, education and transport and communication, but less prevalent in the hotels and restaurants and financial services sector. Workplace-weighted estimates also show higher proportions of older workers in the health and social work sector, relative to workplaces in the manufacturing industry.

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11 The Standard Industrial Classification (SIC) 2003.

12 Here we use manufacturing as our reference category. The proportion of older workers in the manufacturing industry is around the average found across all workplaces.

Occupations differ in the extent to which they create both physical and mental demands. Therefore it is not surprising to see variation in the proportion of older workers employed according to the largest occupational group at the workplace.[13] Relative to workplaces where the largest occupational group consisted of professionals, older workers were more prevalent in workplaces where the largest occupational group consisted of administrative and secretarial roles. Such occupations may perhaps be more suited to older workers compared to more physically demanding manual roles. At the same time, older workers were also more prevalent in workplaces where the largest occupational group comprised skilled trades, consistent with the idea that employers may be particularly keen to retain older workers where they face skills shortages. In contrast, older workers were less commonly found in workplaces where the largest occupational group was caring, leisure and other service occupations.

Workplaces with a recognised union had a higher proportion of older workers than those without such recognition. This may reflect the fact that older workers are more likely than younger workers to be union members (Department for Business, Innovation and Skills, 2015). However, unions also have a potentially important role to play in helping ensure better quality of work for older employees and avoiding age discrimination (Flynn, 2014), so the higher proportion of older employees in workplaces with a recognised union may also reflect better support in such workplaces for this age group.

There are differences in labour market participation rates across different regions of the UK (ONS, 2015c), and regional differences in the age profile of the population. Regional variation in the proportion of older workers remained after controlling for other workplace characteristics, with workplaces in London and the North West both having smaller proportions of older workers (compared against workplaces in the South East of England). Such differences may also reflect differences in the location of the population across regions.

We saw earlier that older workers are less prevalent in newer workplaces. New workplaces are typically smaller in size, but controlling for workplace age, smaller workplaces (those with five to nine employees) were more likely than larger workplaces to have a higher proportion of older workers. Previous studies have identified that formal pro-age policies tend to be more common in large workplaces (Barnes *et al.*, 2009). However, it may be that smaller workplaces adopt more informal methods for the recruitment and retention of older workers, in the same way that smaller workplaces are less likely to have formal practices in general (Forth *et al.*, 2006).

The analysis above does not control for the proportion of workers in other age groups, and there is likely to be considerable heterogeneity across workplaces in the age composition of the remainder of their workforce. If we additionally control for the proportion of younger

[13] The largest occupational group is identified on the basis of the most common occupational group (based on the Standard Occupational Classification) among all non-managerial employees at the workplace. From these data, we cannot identify the age composition of the largest occupational group; it may be the case that older workers are employed within other occupations at the workplace. It is important to bear this in mind when interpreting these findings, as it is not strictly possible to say that particular occupational groups have greater (or smaller) proportions of older workers.

workers at the workplace (here defined as those aged 16 to 21)[14], this is negatively and significantly associated with the proportion of older workers, that is, workplaces with a higher proportion of younger workers have a lower proportion of older workers. However, controlling for the proportion of younger workers makes no substantial difference to the associations observed between the other workplace characteristics and the proportion of older workers. We also introduced measures of workforce composition according to other employee characteristics, including gender, ethnicity, disability and whether any employees were non-UK nationals.[15] These factors generally showed few significant associations with the proportion of older workers employed, with the exception of migrant workers – older workers accounted for a smaller proportion of the workforce in workplaces employing at least some non-UK nationals.[16]

On average, older workers make up a greater proportion of the workforce in public sector workplaces than in the private sector. However, no statistically significant difference in the proportion of older workers by sector remained once controlling for other workplace characteristics. If we explore the relationship between workplace characteristics and the employment of older workers separately for the two sectors, we find that workplace age is only statistically significant for private sector workplaces. There are also some differences by largest occupational group. Only private sector workplaces employed fewer older workers where the largest occupational group comprised caring, leisure or other service occupations, while the public sector had a higher proportion of older workers where the largest occupational group was process, plant or machine operatives.

For private sector workplaces, we are also able to incorporate measures of market competition.[17] As discussed in Section 1.1, there remains a perception that older workers are less productive. Older workers may also be considered more expensive than younger employees, whether in terms of actual pay or perceptions of increased sickness absence. For these reasons, it is plausible to anticipate that workplaces operating in a highly competitive market will employ fewer older workers. Managers are asked to assess the degree of competition in the market in which their workplace operates, on a five point scale from ‘very high’ to ‘very low’. They are also asked to assess, again on a five point scale, to what extent demand for their main product or service depends on offering lower prices than their competitors, and thirdly, they are asked to what extent this depends on offering higher quality than their competitors. We find that fewer older workers were employed in workplaces which faced greater competition in terms of price (Appendix Table A.4).[18] This may reflect greater costs, or perceived greater costs, of employing older workers. At the same time,

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14 We are restricted to defining younger workers as those aged 16-21, due to the categories used in the questions asked in Workplace Employment Relations Survey WERS.

15 Ideally it would also be of interest to consider the incidence of older workers according to their characteristics – for example, whether there are differences for male and female older workers, especially given differences in State Pension age (SPa). However, the data are only able to tell us the proportion of older workers at the workplace, and do not identify the proportion of older workers by gender (or by any other characteristics).

16 This is based on whether the workplace employed any non-UK nationals or none.

17 These questions are asked of all trading sector workplaces, however, in practice the small sample sizes for public sector trading workplaces mean that we focus here only on private sector workplaces.

18 This analysis also controls for the other workplace characteristics listed in Table 3.1.

no significant differences in the proportion of older workers were apparent on the basis of competition in terms of quality, or according to differences in the degree of competition in the market.

In all, these structural features of workplaces are able to explain around 25 per cent of the variation in the proportion of older workers employed (although this was higher in the public sector at around 42 per cent compared with 23 per cent in the private sector, rising to 27 per cent with the inclusion of measures of market competition). This leaves a substantial proportion of the variation unexplained. In the next section, we consider whether variation in age-related practices and policies among employers can further explain differences in the prevalence of older workers across workplaces.

3.3.2 Age-related policies and practices

In this section we explore employer policies and practices specifically relating to age. We consider the role of equal opportunities policies and practices, employers' attitudes regarding the role of age in recruitment, and the existence of special procedures for recruiting older workers. We first identify how the prevalence of such practices has changed between 2004 and 2011, as well as exploring the types of workplaces in which such practices are found. We then investigate whether these age-specific practices are associated with employing a higher proportion of older workers. Throughout this section, it is important to bear in mind that with the exception of special recruitment procedures for older workers, all the other policies and practices discussed here simply refer to age and not specifically to older age.

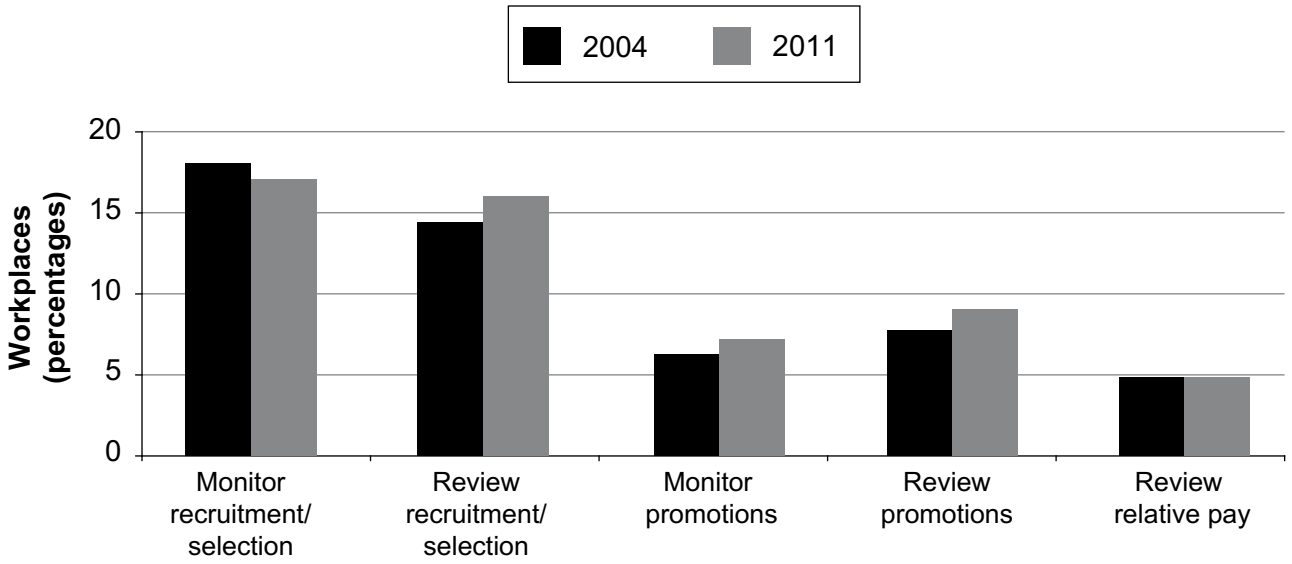
The prevalence of age-related policies and practices

In the workplace, the existence of an equal opportunities policy can demonstrate an employer's commitment to ensuring fair treatment of workers and eliminating both direct and indirect discrimination. Since the introduction of the Employment Equality (Age) Regulations in 2006, later superseded by the Equality Act 2010, employers have been prohibited from discrimination on the grounds of age. Age discrimination can affect workers of any age, but a policy covering age may provide some indication that an employer takes seriously the issues surrounding discrimination against older workers.

More than three-quarters (77 per cent) of workplaces had a formal written policy on equal opportunities or managing diversity in 2011, an increase from 66 per cent in 2004. There has also been an increase in the proportion of workplaces with an equal opportunities policy that explicitly mentions age, rising from 42 per cent in 2004 to 58 per cent in 2011. Around one-quarter (26 per cent) of equal opportunities policies did not explicitly mention age, however, in the majority of these cases, the policy did not specify any particular groups.

The existence of a formal policy does not necessarily reflect what happens in practice. Managers participating in WERS were asked whether their workplace had various equal opportunities practices in place. In 2011 17 per cent of workplaces monitored recruitment and selection by age and 16 per cent reviewed recruitment and selection procedures to identify indirect discrimination by age (Figure 3.3).[19] Fewer workplaces (seven per cent) monitored promotions by age, with nine per cent reviewing promotion procedures for indirect age discrimination. Just five per cent of workplaces reviewed relative pay rates by age.[20] There was no statistically significant change in the prevalence of any of these practices since 2004. Therefore while equal opportunities policies covering age had become more common over this period, this did not appear to be reflected in a rise in the prevalence of practices. It is possible that this reflects a reluctance among employers to implement such practices in case doing so is actually seen as discriminatory; findings from qualitative research commissioned alongside this study suggest some employers are wary of monitoring by age for this reason (DWP, 2017).

Figure 3.3 Age-related equal opportunities practices, 2004 and 2011



Base: All workplaces with five or more employees. Figures are based on responses from at least 2,623 workplaces in 2011 and at least 2,258 workplaces in 2004.

19 Specifically, managers were asked, 'Do you monitor recruitment and selection by any of the characteristics on this card?' and 'Do you review recruitment and selection procedures to identify indirect discrimination by any of these characteristics?' The characteristics listed were gender, ethnic background, disability, age, sexual orientation and religion or belief.

20 Here managers were asked 'Do you monitor promotions by any of these characteristics?', 'Do you review promotion procedures to identify indirect discrimination by any of these characteristics?' And 'Do you review relative pay rates by any of these characteristics?'.

As noted earlier, while employers may be keen to retain their existing older workers, they are typically less likely to recruit them. Figure 3.3 has shown that there has been little change in the number of workplaces that monitor or review recruitment or selection by age (which could cover both younger and older workers). There were some signs that managers may have become more open to employing older workers over time: in 2011, managers in 12 per cent of workplaces reported that age was an important factor when recruiting new employees, a decline from 2004 when 17 per cent of managers reported this to be the case. However, as managers are simply asked whether age is important in recruitment, without reference to young or older age, it is not possible to say with any certainty whether an employer who reports age to be important has a favourable attitude towards the recruitment of older workers or not.

At the same time, just three per cent of workplaces had special procedures to encourage applications from older workers, representing a slight, but statistically significant fall from 2004, when this applied for five per cent of workplaces. However, special procedures to encourage applications from any of the specified groups were relatively uncommon (Table 3.2).[21]

Table 3.2 Percentage of workplaces with special procedures to encourage applications from certain groups, 2004 and 2011

	2004	2011
Older workers	5	3
Women and women returners	11	8
Minority ethnic groups	8	5
Disabled people	8	8
Long-term unemployed	4	4
Gay, lesbian and transgender communities	-	8
Part-time workers/job sharers	-	6

Note: Part-time workers/job sharers and gay, lesbian and transgender communities were not included in the list of response options in the 2004 WERS management interview.
Base: all workplaces with five or more employees. Figures are based on responses from 2,654 workplaces in 2011 and 2,289 workplaces in 2004.

Which workplaces have age-related policies and practices?

Formal equal opportunities policies and practices are typically more common in public sector workplaces than in the private sector, and among larger workplaces (Van Wanrooy *et al.*, 2013). Barnes *et al.*, (2009), in analysis of the 2004 WERS, find employers with 'pro-age' policies are more typically found in larger, unionised workplaces, workplaces which make use of teams (which they suggest may reflect such employers recognising the benefits of age diversity), and are less common in male-dominated industries.

[21] The decline in the percentage of workplaces with special procedures to encourage applications from ethnic minority groups was also statistically significant, but for the other groups there was no statistically significant change between 2004 and 2011 (at the five per cent level of statistical significance).

As to be expected, the various age-related policies and practices discussed above are typically correlated with one another (Appendix Table A.5). The highest positive correlations are between the existence of the five different equal opportunities practices for monitoring and reviewing recruitment and selection, promotions and pay; in our following analyses, we therefore typically combine these into one measure which counts the number of these practices that were in place.[22]

We consider which workplace characteristics are associated with having an equal opportunities policy that explicitly mentions age, the number of equal opportunities practices relating to age, and the presence of special recruitment procedures for older workers (Appendix Table A.6 presents the regression results).

In line with the findings reported by Barnes *et al.*, (2009) for the 2004 WERS, we find that, in 2011, equal opportunities policies relating to age are more common in larger workplaces, those with a recognised union and where at least some employees work in teams. Broadly similar patterns are apparent for the number of equal opportunities practices relating to age, which is not surprising given the presence of an equal opportunities policy mentioning age is positively correlated with having a greater number of equal opportunities practices relating to age. No significant relationship was apparent between the presence of a recognised union and the existence of special procedures to recruit older workers, however, again such procedures were more common where at least some of the workforce were employed in formally designated teams. Compared to workplaces where the largest occupational group comprised elementary occupations, special recruitment procedures for older workers were more common where the largest occupational group comprised Professional occupations, perhaps reflecting their specialist skills, and also for Caring, leisure and other service occupations. Notably, our earlier analysis indicated fewer older workers were employed in workplaces where the largest occupational group comprised caring, leisure and other service occupations (Section 3.3.1). This may suggest that while some employers are keen to recruit older workers into these occupations, older employees may perhaps be less willing to work in such roles.

Are age-related policies and practices associated with employing a higher proportion of older workers?

We then consider whether the presence of such practices is associated with employing a higher proportion of older workers.[23] Patterns between the presence of these policies and practices and the proportion of older workers varied across the private and public sectors. In the public sector, there were no statistically significant relationships between either the equal opportunities policies and practices or age-specific recruitment practices and the proportion

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22 The existence of an equal opportunities policy explicitly mentioning age is also positively correlated with the number of equal opportunities practices and the presence of special recruitment procedures for older workers, but the correlations are of a lower magnitude (Appendix Table A.5). There was no significant correlation between the number of practices and whether managers thought age was an important factor in recruitment, and a small negative correlation between the presence of an equal opportunities policy mentioning age and whether age was considered important in recruitment.

23 Here we regress the proportion of older workers on the age-related policies and practices variables, additionally controlling for the same workplace characteristics explored in Section 3.3.1.

of older workers. In private sector workplaces, however, the proportion of older workers was higher in workplaces which had a greater number of equal opportunities practices. In contrast, the presence of an equal opportunities policy that explicitly mentioned age was associated with a lower proportion of older workers; it may be the case that workplaces employing fewer older workers feel greater need to adopt such policies. Once we additionally control for our standard set of workplace characteristics these relationships remain evident (we also include teamwork given its association with presence of these policies, although this showed no significant association with the proportion of older workers). In addition, once controlling for these factors, we also find a positive association between the proportion of older workers and the presence of recruitment procedures specifically targeted at this group (Appendix Table A.7).

3.3.3 Other employer practices and characteristics

The age-related practices discussed above may play a role in retaining and recruiting older workers. Other features of the workplace may also act to make a workplace more or less attractive to older employees, or equally, may lead an employer to be more or less willing to recruit or retain older employees. We therefore incorporate a number of additional workplace characteristics into our models (Appendix Table A.8).

Practices put in place by employers may help to both attract and retain older workers. It has been argued that one means of retaining older workers is to offer greater flexibility in working arrangements, such as the option to reduce working hours (CIPD, 2014; Smeaton *et al.*, 2009). Such arrangements may be appealing to employees who no longer wish to work full time, perhaps due to poorer health or caring responsibilities, or simply to enjoy more leisure time. We find no statistically significant difference in the proportion of older workers according to whether flexible working arrangements were available. However, as managers were asked whether flexible working arrangements were available to **any** employees at the workplace, this measure may not reflect differences in availability to different employees within the workplace. There was also no significant association between the proportion of older workers and the proportion of employees working part time.

Some features of the work may serve to make a job less attractive to older workers or to make employers less willing to recruit older workers. For example, concerns are often raised around the physical demands of jobs for older workers, and as such we might expect lower proportions of older workers to be employed in workplaces where health and safety risks are considered to be higher. In fact we find no significant relationship with the level of risk itself. However, there was some tentative evidence that older workers were less commonly employed in workplaces where employees had less **control** over health and safety risks, although this was only statistically significant at the ten per cent level.

In jobs where new employees typically take longer to be able to do their job as well as experienced employees, there may be a reluctance to recruit older workers. Employers may be less willing to make this investment for older workers as they may perceive there to be fewer years in which to reap the benefits.[24] At the same time, however, this may serve to boost retention of existing older workers. Older workers were less prevalent in those workplaces where managers estimated it took average employees more than one year to get up to speed, compared with those workplaces where this took one week or less. The presence of an internal labour market may act to increase or decrease the number of older workers. An internal labour market may favour older workers in that it encourages

[24] See also the discussion in relation to training in Section 4.4.

progression within the firm, however, it may act as a barrier against the recruitment of older workers. In fact, we find no difference in the proportion of older workers employed depending upon whether workplaces preferred to fill vacancies internally or externally.

As noted in Section 3.2, older workers made up a smaller proportion of the workforce in workplaces where competition was more heavily dependent on price. Such workplaces may have a particular need to keep wages low. It is therefore perhaps not surprising that we find older workers were less prevalent in those workplaces where a greater proportion of employees were low-paid; older workers were less common in workplaces where at least ten per cent of employees earned £5.93 or less per hour.[25] However, if we additionally control for the proportion of employees aged 16-21 this relationship becomes insignificant, suggesting that the proportion of low-paid workers is acting as a proxy for the proportion of younger employees in the workplace.

While few strong associations were apparent between particular practices and the proportion of older workers, those workplaces that had made a greater number of changes in their workplaces in the two years prior to the survey employed fewer older workers. Managers were asked whether they had introduced any of the following changes: introduction of performance related pay; introduction or upgrading of new technology (including computers); changes in working time arrangements; changes in the organisation of work; changes in work techniques or procedures; introduction of initiatives to involve employees; introduction of technologically new or significantly improved product or service. This relationship did not appear to be driven by a particular change(s), instead, it was the total number of changes made that mattered. It may be the case that more innovative workplaces tend to rely more heavily on younger workers.

Overall, the inclusion of these additional employer characteristics is able to explain relatively little additional variation in the proportion of older workers, accounting for around 31 per cent of the variation in the proportion of older workers. The relationships with the structural workplace features described in Section 3.2.1 were largely unchanged by the inclusion of these additional employer variables.

Exploring these relationships separately for the private and public sectors, some differences are apparent (Appendix Table A.8). In the private sector (once accounting for market competition), the number of changes that had taken place in the two years prior to the survey was significantly associated with a lower proportion of older workers. In public sector workplaces, however, no significant relationship was apparent.

3.4 Change since 2004

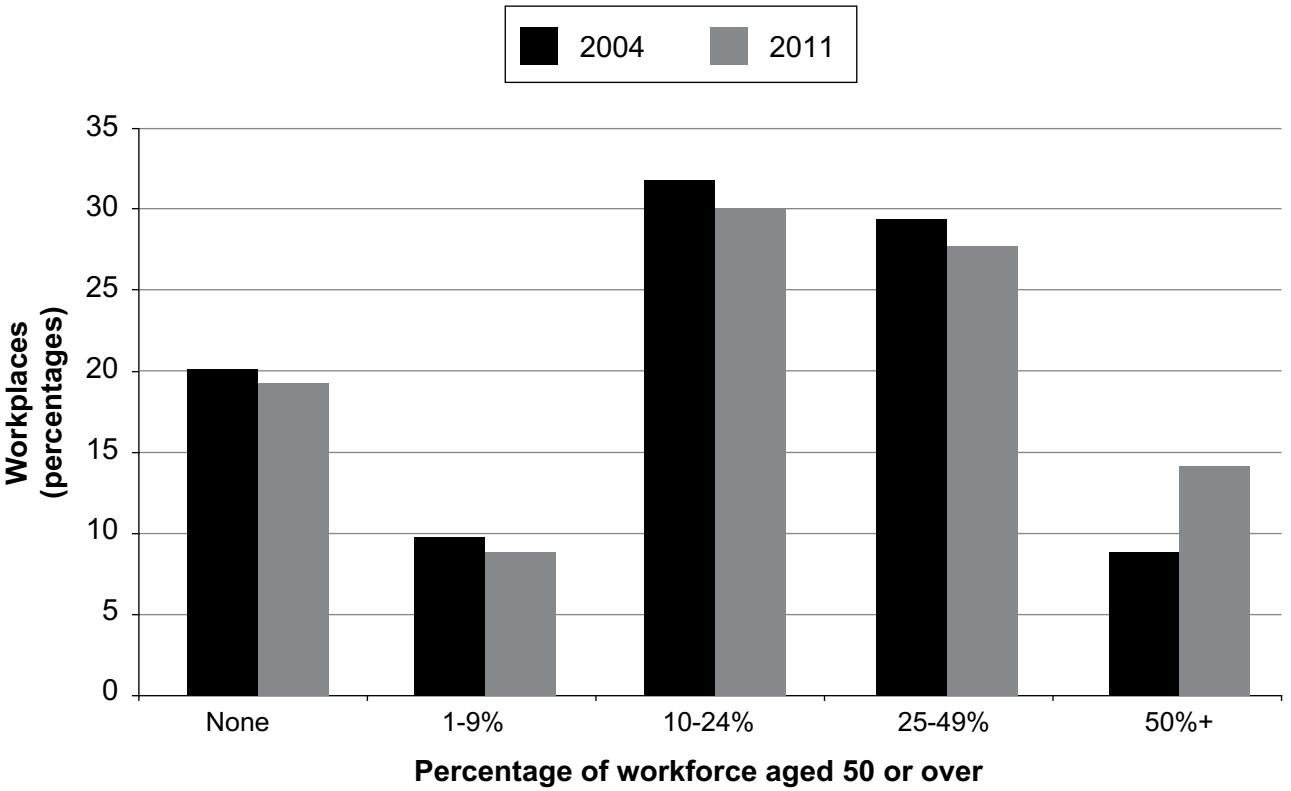
The earlier sections of this chapter have focused primarily on associations between features of the workplace and the proportion of older workers employed in 2011. However, it is also of interest to consider which workplaces have increased the proportion of older workers they employ over time, and whether this is associated with particular characteristics or practices. In thinking about change between 2004 and 2011, it is also worth bearing in mind that during this period the economy faced one of the longest recessions in living memory. Employment levels proved more resilient to recession than might have been anticipated (Gregg and Wadsworth, 2011). However, it is conceivable that the flows of older workers into and out of

[25] At the time of fieldwork for the 2011 WERS, the National Minimum Wage was £5.93 for those aged 21 and over.

employment were affected by the recession, relative to the flows for workers of other ages. It is possible that this may have affected the changes in age composition that we observe over this period.

In line with the changes in the age composition of the workforce outlined in Section 1.1, comparison of the 2004 and 2011 WERS shows a rise in the proportion of the workforce aged 50 and above over this period; on average, the percentage of the workforce aged 50 or over rose from 21 per cent in 2004 to 24 per cent in 2011. While there was no change in the percentage of workplaces with no employees aged 50 or over, there had been a rise in the percentage of workplaces where at least half of employees were 50 or above, rising from nine per cent in 2004 to 14 per cent in 2011 (Figure 3.4).[26]

Figure 3.4 Percentage of the workforce aged 50 or more, 2004 and 2011



Base: All workplaces with five or more employees. Figures are based on responses from 2,627 workplaces in 2011 and 2,263 workplaces in 2004.

[26] If we consider instead change in the percentage of employees in these workplaces (that is, using employment weighted rather than workplace weighted estimates) we also see no change in the percentage of employees in workplaces that employ no older workers, along with an increase in the percentage of employees in workplaces where at least half the workforce are older workers (from four per cent to six per cent). There is also an increase in the percentage of employees in workplaces where between 25 and 49 per cent of the workforce are older workers, rising from 29 per cent to 40 per cent.

As we have seen earlier, the proportion of older workers is partly related to various structural workplace characteristics; the relationships for 2004 show broadly similar patterns to those observed for 2011. One notable difference however, is that for private sector workplaces in 2004, there was no significant association between the proportion of older workers and the extent to which the workplace competed heavily on price, whereas in 2011 older workers were less prevalent in workplaces facing greater price competition. It is possible this could reflect a more competitive environment in 2011 given the economic downturn.

Change in the aggregate proportion of older workers over time may reflect both changes within workplaces, but also changes brought about by changes in the composition of the workplace population, for example, if there are more workplaces in industries where older workers are more commonly found. However, the results of models which pool the data for 2004 and 2011 show an increase is still apparent (and of roughly the same magnitude) even when we control for these structural workplace features. Thus the observed increase is not just a result of compositional change in the population of workplaces.

By focusing on those workplaces that participated in the panel survey in both 2004 and 2011, we can look specifically at change within the same workplaces over time. This removes any concerns that change is due to change in the composition of workplaces participating in the survey.

The increase in the proportion of older workers was more pronounced within the panel sample than for the cross-section, rising from 20 per cent in 2004 to 26 per cent in 2011.[27] Yet there is considerable variation across workplaces; the proportion of the workforce aged 50 and above increased by five per cent or more in around half (49 per cent) of panel workplaces. In 28 per cent the proportion remained fairly stable (decreasing or growing by less than five per cent), and in the remaining 23 per cent the percentage of older workers fell by five per cent or more. Changes in the age composition of the workforce are not necessarily the result of intentional change on behalf of employers; as existing workers age, the age profile of the workforce will adjust automatically. However, there may potentially be greater likelihood of changes in age composition where employers are increasing or reducing the size of their existing workforce, or in workplaces where there is a higher rate of labour turnover. Using the sample of panel workplaces we find that 44 per cent of workplaces which expanded in size between 2004 and 2011 (defined here as an increase in the total number of employees by five per cent or more), saw an increase in the proportion of older workers employed. In contrast, among those workplaces that had reduced in size, the percentage of workplaces experiencing an increase in the percentage of older employees was higher at 56 per cent.

[27] This is likely to reflect the fact that workplace age is related to the proportion of older workers; by definition, those workplaces in the panel sample have been in existence since at least 2004 – we saw earlier that newer workplaces typically employ fewer older workers.

Section 3.2.2 showed that some age-related practices were associated with higher proportions of older workers (at least in the private sector). We can use the panel to explore whether the presence of these practices in 2004 was associated with an increase in the proportion of older workers between 2004 and 2011 (Appendix Table A.9). However, we do not find this to be the case, either when considering the age-related practices alone, or when additionally controlling for other workplace characteristics. In terms of significant relationships between other characteristics and change over time, we find few clear patterns, although increases in the proportion of older workers were apparent in workplaces where a higher proportion of the workforce were female, in foreign-owned workplaces and where the largest occupational group were elementary occupations.

We can also consider whether changes in such practices are associated with change in the proportion of older workers. If such practices help to boost recruitment or retention of older workers, then we would anticipate that their introduction (or increase) would be associated with increases in the proportion of older workers. Again, however, we find no significant relationships between the introduction or increase in such practices and changes in the proportion of older workers. This applies even if we restrict analysis to the private sector alone.

3.5 Summary

There is considerable variation across workplaces in the proportion of older workers they employ. Part of this variation relates to structural characteristics, with higher proportions of older workers in particular industries, occupations and regions, in more established workplaces and in workplaces with a recognised union. We also see some evidence of higher proportions of older workers where workplaces have a greater number of equal opportunities practices in relation to age and where they have special procedures for recruiting older workers. While more workplaces had adopted a formal equal opportunities policy that explicitly mentioned age since 2004, workplaces with such a policy actually employed smaller proportions of older workers. Other employer practices and characteristics show an association with the proportion of older workers: for example, there was some suggestion that more innovative workplaces (as proxied by the number of changes in the two years prior to the survey) employed fewer older workers.

While we are able to explain a reasonable amount of the variation in the proportion of older workers employed, we are able to explain much less of the variation in the change in the proportion of older workers between 2004 and 2011. In the cross-section analysis, we see a positive association between practices and the proportion of older workers. But there was no significant association between a change in the number of age-related practices and change in the proportion of older workers employed in the panel analysis. This suggests that it may not be the practices themselves which result in greater employment of older workers, but rather that these practices may be correlated with other features of workplaces employing greater proportions of older workers that are not observed in our data.

4 Outcomes for older workers

In this chapter we consider outcomes for older workers. How employees feel about their work may be a significant factor in how long they choose to remain in employment. This may include financial rewards in terms of pay, but also intrinsic rewards such as job satisfaction and perceptions of fair treatment.

4.1 Key findings

This chapter explores outcomes for older workers. We find that:

- Employees aged between 50 and 64 were no more or less likely than employees aged between 22 and 49 to agree that managers at their workplace treated employees fairly. However, perceptions of fair treatment were higher among employees aged 65 or over.
- In common with existing studies, older workers report higher job satisfaction and higher job-related wellbeing than employees aged between 22 and 49. But these better average outcomes conceal variation among older workers.
- The higher average job satisfaction, wellbeing and perceptions of fair treatment among older workers may at least in part reflect the fact that less satisfied employees may be more likely to have left employment.
- Older workers are less likely to receive training than employees in younger age groups. However, older workers are no less satisfied with the training they receive, or the opportunity to develop skills, than employees aged 22-49.
- Age-related equal opportunities practices were not associated with employee perceptions of fair treatment, job satisfaction or wellbeing among older workers. Instead, other features of the job and workplace were more important in explaining the variation in perceptions of fair treatment – many of these are common across employees of all ages.
- While employee, job and workplace characteristics also play an important role in explaining differences in pay among older workers, a positive association between the presence of equal opportunities practices and pay for older workers remained apparent even after controlling for these factors. Furthermore, there is little to suggest that such practices have negative association with pay of workers in younger age groups.

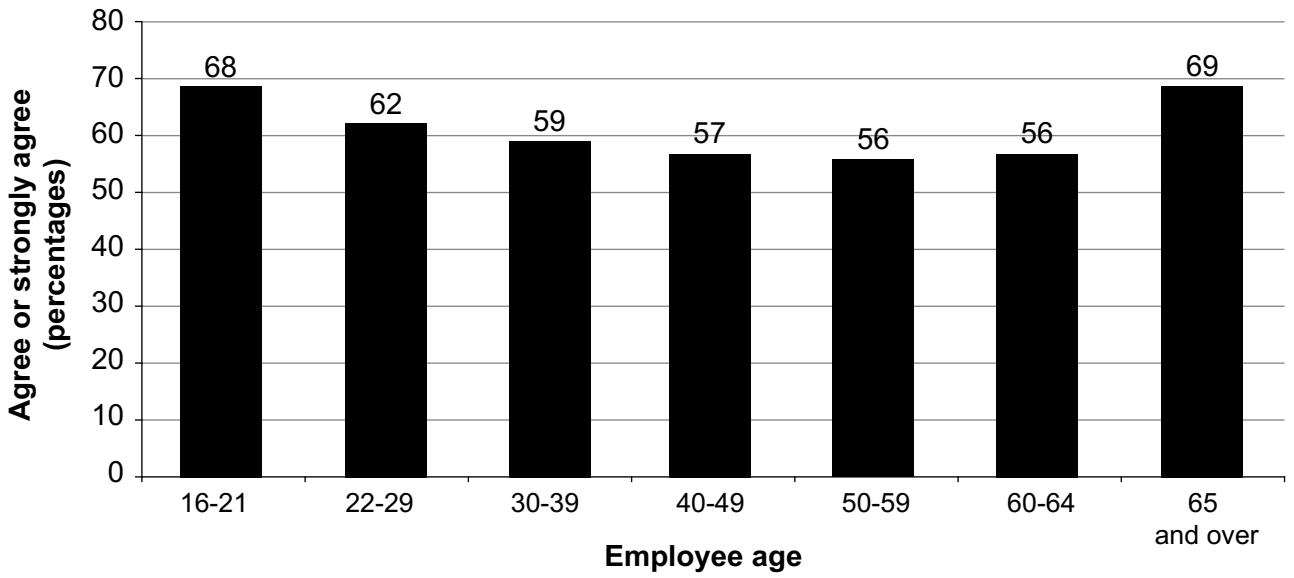
4.2 Introduction

The analysis in this chapter focuses primarily on information collected from the employees participating in WERS, through the Survey of Employees Questionnaire (SEQ). The SEQ allows us to further distinguish by age among workers aged 50 and over; in 2011, 22 per cent of employees were aged 50-59, six per cent were aged 60-64 and two per cent were aged 65 or over. In this chapter, we use information from the SEQ to consider outcomes for older workers in terms of their perceptions of fair treatment, training, job satisfaction and wellbeing. We also explore outcomes in terms of pay, using data from the Annual Survey of Hours and Earnings (ASHE) linked to a subset of WERS workplaces.

4.3 Perceptions of fair treatment

The percentage of employees agreeing or strongly agreeing that managers at their workplace treated employees fairly varied by employee age (Figure 4.1). A u-shaped relationship with age is evident, with both young and older employees more likely to agree that employees were treated fairly. There was little difference in perceptions of fair treatment among those aged between 40 and 64, it was only among the oldest workers, those aged 65 and over, where employees were more likely than those aged between 22 and 49 to agree that employees were treated fairly. This may reflect the fact that individuals are more likely to have left employment where they do not perceive managers as treating employees fairly. Therefore among those remaining in employment, we see a higher proportion agreeing that managers are fair.[28]

Figure 4.1 Percentage of employees agreeing or strongly agreeing 'Managers at this workplace…treat employees fairly', 2011



Base: All employees in workplaces with five or more employees (21,474 employees).

[28] See also the discussion in relation to job satisfaction and wellbeing in Section 4.5.

These findings were largely unchanged when controlling for employee and workplace characteristics.[29] Employees aged between 50 and 64 were no more or less likely than employees aged between 22 and 49 to agree that managers treated employees fairly. But employees aged 65 or over were more likely to think managers treated employees fairly. Notably, while younger workers (aged 16-21) were more likely than employees aged between 22 and 49 to think employees were treated fairly before the inclusion of other controls, this relationship was no longer significant once accounting for other employee and workplace factors.

We might expect employees in workplaces with equal opportunities policies and practices to be more likely to agree that employees were treated fairly. However, among older workers, once controlling for other employee and workplace characteristics, there were no significant associations between the presence of equal opportunities policies or practices and employee perceptions of fair treatment (Appendix Table A.10). Instead, this varied by job and workplace characteristics – employees in smaller workplaces and organisations were more likely to agree that employees were treated fairly, as were those in professional occupations, employees who worked fewer hours per week and those with shorter job tenure (employees who had joined the workplace in the two years prior to the survey).[30] However, employees were more likely to agree managers treated employees fairly where managers reported that age was an important factor in recruitment.

There was also no association between the presence of equal opportunities practices and perceptions of fair treatment among young workers. However, among workers aged between 22 and 49, employees were more likely to agree managers treated employees fairly where there was a formal written policy on equal opportunities, regardless of whether this explicitly mentioned age or not. Relationships between other characteristics of the job and workplace and perceptions of fair treatment were generally similar to those observed for older workers. However, young employees working in the private sector were less likely to agree that employees were treated fairly than those working in the public sector; this sectoral difference was not apparent for other age groups.

4.4 Training

Training was most prevalent among employees aged between 22 and 39, with 73 per cent having receiving at least one day of training in the 12 months prior to the survey. This compared with 66 per cent of employees aged 16 to 21. Employees aged over 50 were least likely to have received training, with 62 per cent having done so. There was a notable decline by age band within this group: 65 per cent of those aged between 50 and 59 received training, 59 per cent of those aged between 60 and 64 and 45 per cent of those aged 65 and over (Figure 4.2).

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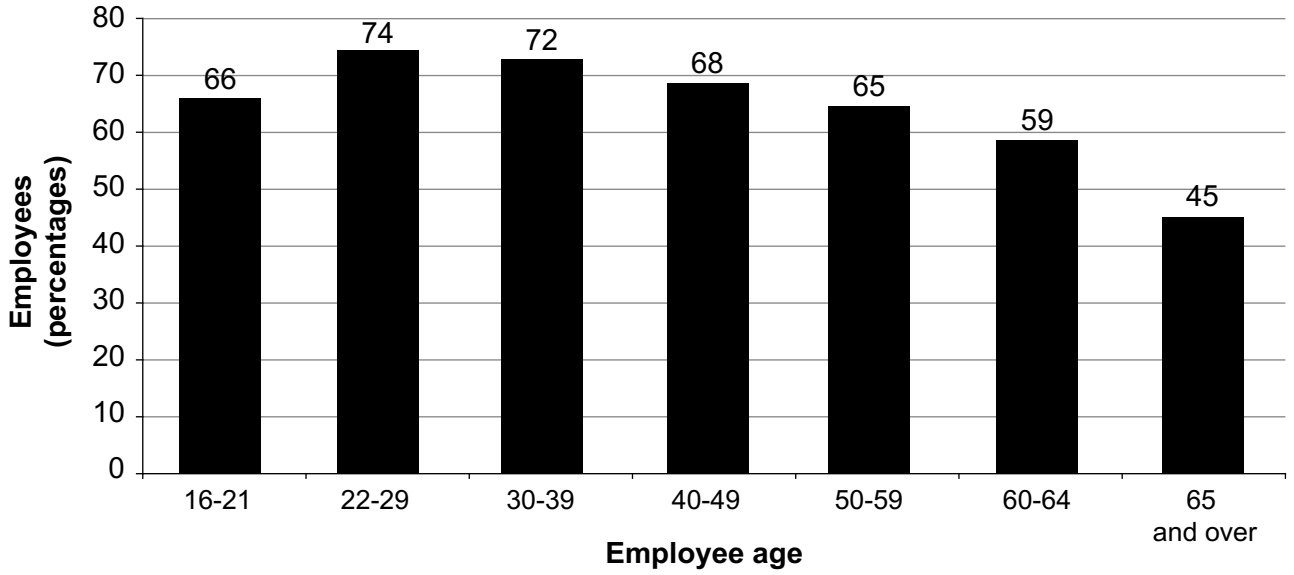
29 Employee characteristics controlled for are: gender, occupation, qualifications, ethnicity, marital status, union membership, whether any dependent children, job tenure, contract type and hours worked. Workplace characteristics are: workplace and organisation size, industry, largest occupational group, region, sector and whether any recognised union. The results were also robust to additionally controlling for pay.

30 Full regression results available from the authors upon request.

Figure 4.2 Percentage of employees receiving at least one day of training in 12 months prior to survey, 2011



Base: All employees in workplaces with five or more employees (21,824 employees).

It is not surprising to observe that older employees are less likely to have received training – this is consistent with existing evidence (for example, Canduela *et al.*, 2012, Taylor and Urwin, 2001). Employers may well be less willing to invest in training for their older workers, as they perceive there will be fewer years in which to reap the benefits (although of course it is not necessarily the case that younger workers will remain with the same employer for a longer period of time). It is also sometimes suggested that older employees are less motivated to participate in training (Warr and Fay, 2001, Zwick, 2015), and so the lower incidence may reflect both employer and employee factors. However, others have suggested negative stereotyping by employers may at least in part play a role (McGregor and Gray, 2002).

Differences in the prevalence of training will partly reflect differences in job and workplace characteristics. Van Wanrooy *et al.*, (2013), for example, show that training is more common among employees who had joined the workplace more recently and those working at least 30 hours per week. However, even once controlling for a range of other demographic, job and workplace characteristics, we find employees aged 50 and over were still less likely to have received at least one day of training than employees aged between 22 and 49. For younger workers, once we control for employee, job and workplace characteristics, employees in this age group were no less likely than those aged 22-49 to have received at least some training.[31] Canduela *et al.*, (2012) find that only men over 50, and not women, were less likely to have participated in training. We find that both men and women over 50 were less likely to have received at least some training compared with younger workers, but the decline by age was more pronounced for men.

[31] These findings refer to the results of a probit regression of whether employees received at least one day of training, according to age (young workers and older workers, relative to those aged 22 to 49) and the employee, job and workplace characteristics listed in footnote 29. The full regression results are available from the authors upon request.

If the lower prevalence of training among older employees were a consequence of age discrimination among employers (whether direct or indirect), we might expect older employees to be more likely to access training in workplaces with equal opportunities policies and practices. Once taking account of employee and workplace characteristics, there were generally no significant relationships between the presence of equal opportunities practices and the probability of receiving training among older workers (Appendix Table A.11). Older employees in workplaces where there was a formal equal opportunities policy, were, at the ten per cent level of significance, more likely to have received training. But there was no difference according to whether the policy explicitly mentioned age or not. However, employees in workplaces where managers reported that age was an important factor in recruitment were less likely to have received some training, which may perhaps reflect a less favourable attitude towards older workers in more general in these workplaces. This contrasts with the finding that perceptions of fair treatment were higher among workplaces where age was considered to be an important factor in recruitment.

In terms of relationships between other characteristics and the probability of receiving training among older workers, this varied by occupation, with employees in skilled trades, sales and customer service and elementary occupations less likely than professionals to have received training. Employees with higher qualifications were more likely to have received training, as were those working in larger organisations, those in workplaces with a recognised union[32] and employees who worked more hours per week. Industry variations were also significant. Differences by age among older workers were still also apparent, with no significant difference in the likelihood of receiving training for those aged 60-64 compared with those aged 50-59, but a decline for those aged 65 and over. Earlier we highlighted that while employers can be keen to retain their existing older workers, they are often less willing to recruit new older workers. Older employees who had joined the workplace within the year prior to the survey were more likely to have received at least one day of training than employees with longer job tenure, which may well reflect a need to provide training to familiarise the worker with the job and workplace.[33]

We consider overall job satisfaction in Section 4.5, however, we highlight findings relating specifically to satisfaction with training and skill development here. Employees were asked how satisfied they were with the training they received and with the opportunity to develop skills in their job, using a five point scale from very satisfied to very dissatisfied. For both measures, the lowest levels of satisfaction seem to be concentrated in the middle age groups (Figure 4.3 and Figure 4.4). This u-shaped relationship with age persists when controlling for employee, job and workplace characteristics (including whether the employee had received any training – unsurprisingly, employees were more likely to be satisfied with training and the opportunity for skill development where they had received at least one day of training in the year prior to the survey).

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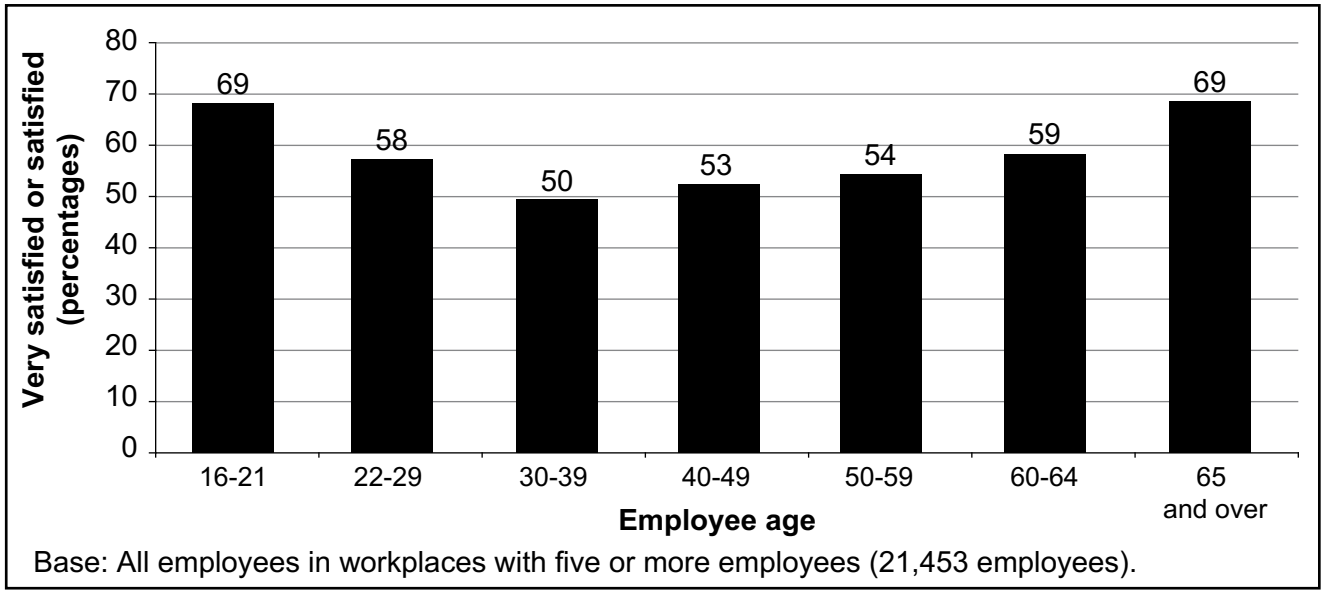
32 We also considered whether age-related policies and practices might only be effective in workplaces where a union was present. We find some tentative support for this, as older employees in workplaces with a recognised union were more likely to receive training where there was an equal opportunities policy mentioning age. However, none of the equal opportunities practices were significant.

33 Training is also more common among newer recruits amongst employees aged 22-49, although here this is the case even for those who have been at the workplace less than ten years, compared with those employed at the workplace for more than ten years.

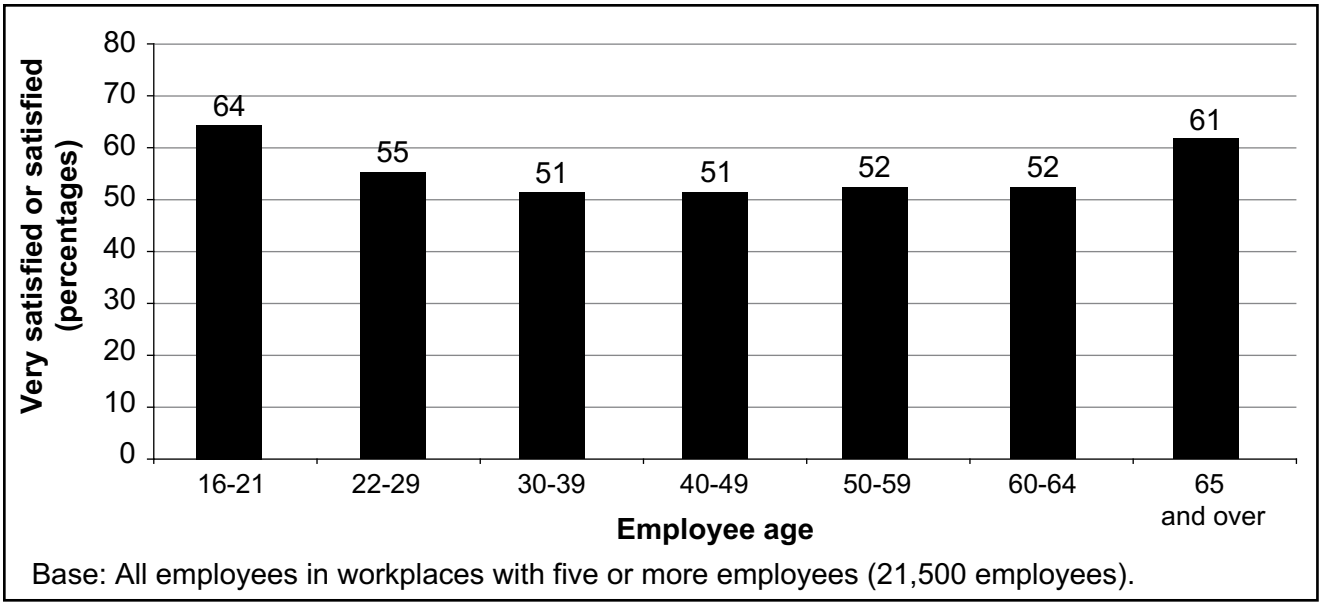
In terms of satisfaction with training, satisfaction was higher among those aged 60 and above, and for those aged under 22, compared with employees aged between 22 and 49. In terms of satisfaction with the opportunity to develop skills, again this was higher among the youngest employees, but was only higher for those aged 65 and over (not for those aged 50-64) when compared with employees aged 22-49. The u-shaped relationship between age and job satisfaction is well-established by existing studies (in line with satisfaction measures more generally, as discussed in Section 4.5).

Figure 4.3 Percentage of employees satisfied or very satisfied with training received, 2011



Base: All employees in workplaces with five or more employees (21,453 employees).

Figure 4.4 Percentage of employees satisfied or very satisfied with opportunity to develop skills, 2011



Base: All employees in workplaces with five or more employees (21,500 employees).

4.5 Job satisfaction and wellbeing

The higher average job satisfaction and job-related wellbeing among older workers has been documented in several studies (see Warr, 2007, for a review). The analysis presented in this section shows this pattern is also evident in the 2011 WERS.

Warr puts forward a number of potential explanations for higher average job satisfaction and wellbeing among older workers, including the fact that those who are happier in their work are more likely to have remained in employment. Other potential contributing factors are identified as different (lower) expectations among older workers, a different point of reference (as older workers may aspire to a different set of jobs than younger workers), and different preferences regarding job characteristics (for example, pay and promotion opportunities may be of less significance to older employees).

Existing studies have shown job satisfaction to be related to performance at both the level of the individual and at the level of the workplace (Bryson *et al.*, 2015). Greater wellbeing among older workers may therefore have consequences for workplace performance – we discuss this further in Chapter 5.

4.5.1 Job satisfaction

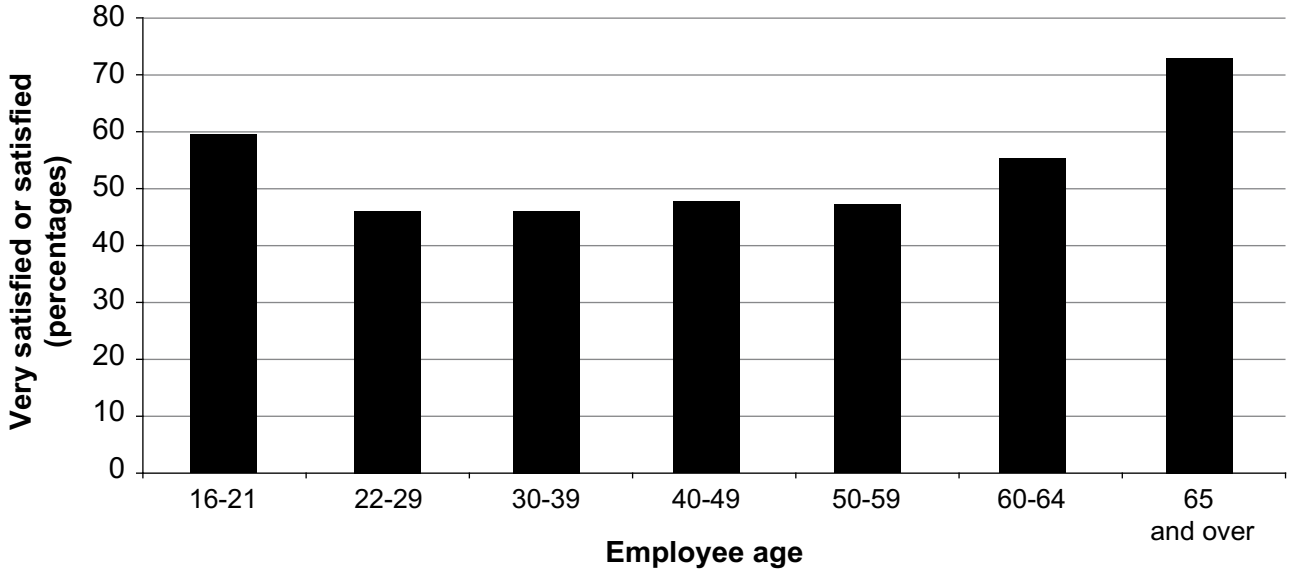
Our measure of job satisfaction is constructed from responses to nine different items, asking employees to rate their satisfaction on a five point scale from very satisfied to very dissatisfied with:

- 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.

Following the approach adopted by van Wanrooy *et al.*, (2013), 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 -18 to +18, with a higher score reflecting greater satisfaction. The mean scores on this scale by age band are presented in Figure 4.5. From this we can see that employees aged 65 and over report the highest overall job satisfaction scores of any age group. As noted by Warr (2007), this greater satisfaction among older workers is at least in part likely to reflect selection – that is, those employees who are remaining in employment beyond State Pension age (SPa) are more likely to be those who find their work satisfying. Even once we control for other employee, job and workplace characteristics the u-shaped relationship between age and job

satisfaction remains evident, with higher job satisfaction among young workers, and among workers 60 and over, compared to employees aged between 22 and 49. However, overall job satisfaction was not significantly different for employees aged 50-59 to that observed for employees aged 22-49.

Figure 4.5 Job satisfaction scale, by age band, 2011



Base: All employees in workplaces with five or more employees (20,481 employees).

Nevertheless, there is still considerable variation in job satisfaction among older workers. None of the equal opportunities policies or practices relating to age showed a significant association with overall job satisfaction among older workers once controlling for other employee, job and workplace characteristics.

Existing analysis of the 2011 Workplace Employment Relations Survey (WERS) has shown that job quality is important in explaining variation in job satisfaction (van Wanrooy *et al.*, 2013). As Warr (2007) notes, if older workers tend to have jobs of higher quality (with, for example, greater autonomy or pay) then they may also be expected to have greater job satisfaction and wellbeing. However, even after additionally controlling for a number of aspects of job quality (as listed in Table 4.1), we still find greater job satisfaction among older workers compared to those aged 22-49.

Focusing specifically on older workers, job satisfaction was higher where employees reported greater autonomy over their work, where they had received training in the year prior to the survey, when they felt their job was secure, where they felt management was supportive and where they had access to flexible working arrangements (Table 4.1). Older employees were less satisfied where they felt they never had enough time to get their work done and when they felt they were either under- or over-qualified for their job. These relationships between job satisfaction and job quality are generally evident for employees of all ages (van Wanrooy *et al.*, 2013), and are not just important for older workers.

Table 4.1 Job satisfaction, job-related wellbeing and job quality among older workers (employees aged 50 and over), 2011

	Job satisfaction	Job-related wellbeing
Work intensity		
Working hours (per week) (ref: 30-47 hours)		
… Less than 30 hours	ns	+
… 48 hours or more	+	-
My job requires that I work very hard	+	-
Never enough time to get work done	-	-
Autonomy		
… Employee control over work	+	+
… Team work	ns	+
Job security	+	+
Any training in past 12 months	+	ns
Skill mismatch – over-qualified	-	ns
Skill mismatch – under-qualified	-	ns
Any flexible working available	+	ns
Supportive management	+	+
Work-life conflict	-	-
Pay (ref: 1st quartile)		
… 2nd quartile	ns	ns
… 3rd quartile	+	ns
… 4th quartile	+	-

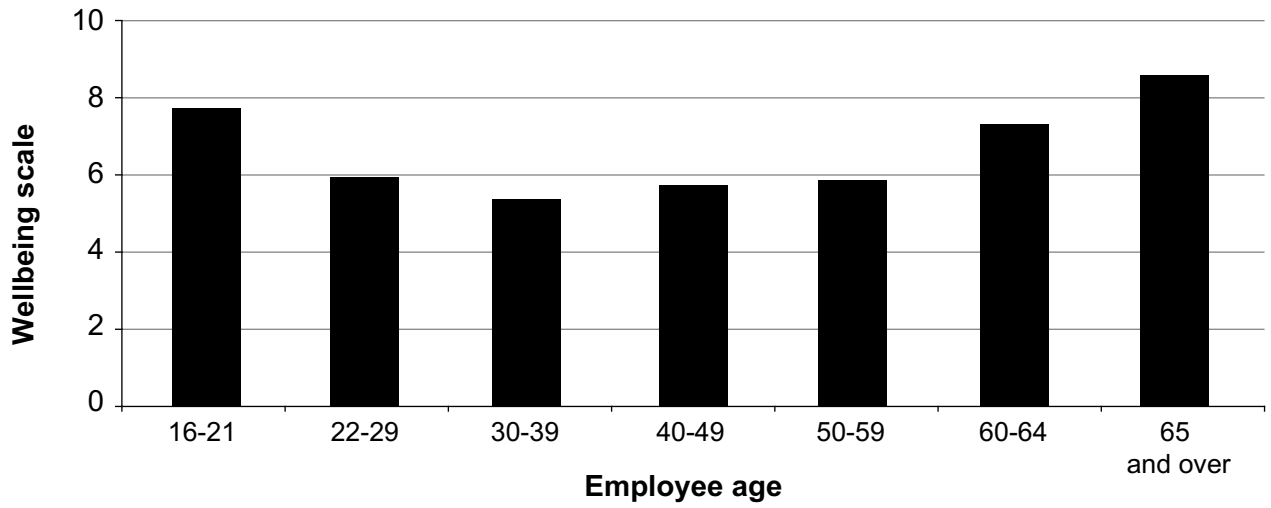
Notes: A '-' indicates a negative association which is significant at least the five per cent level of statistical significance; a '+' indicates a positive association statistically significant at least the five per cent level of statistical significance; 'ns' indicates no statistically significant association.
Models also control for the employee and workplace characteristics listed in footnote 29, as well as the degree of health and safety risks and control at the workplace.
Base: all older workers (aged 50 and over) in workplaces with five or more employees. Figures are based on responses for 6,483 employees for job satisfaction and 6,815 employees for job-related wellbeing.

The age composition of the workforce may also impact upon job satisfaction. In Chapter 5, we discuss some of the possible implications of workforce diversity – some employees may have a preference for greater diversity, while others may prefer to work with individuals who they perceive to be more like themselves. Among older workers, we find no significant relationship between overall job satisfaction and either the proportion of older or younger workers, once controlling for other employee, job and workplace characteristics, including job quality. However, among young workers, even once controlling for these same factors, overall job satisfaction is higher where there are a higher proportion of workers aged 50 or over (and did not show a statistically significant association with the proportion of young workers).

4.5.2 Wellbeing

Employees were also asked about their wellbeing at work. More specifically, employees were asked 'Thinking of the past few weeks, how much of the time has your job made you feel each of the following: tense, depressed, worried, gloomy, uneasy, miserable'. For each of these employees could respond on a five point scale from 'All of the time' to 'Never'. Each of these items are scored from -2 for 'All of the time' to +2 for 'Never', and summed across all six items, to give a total score ranging from -12 to + 12, with a higher score indicating greater wellbeing. Mean wellbeing scores by age are shown in Figure 4.6. As for overall job satisfaction, mean wellbeing is highest among employees aged 65 and over. Once controlling for employee, job and workplace characteristics, wellbeing remained higher amongst both younger and older workers compared with employees aged between 22 and 49. In contrast to the findings for job satisfaction, workers aged between 50 and 59 showed higher average wellbeing than workers aged between 22 and 49, although this was greater still for employees aged 60 and above.

Figure 4.6 Wellbeing scale, by age band, 2011



Base: All employees in workplaces with five or more employees (21,317 employees).

Again, as for job satisfaction, no significant relationships were apparent between the presence of equal opportunities policies and practices and the wellbeing of older workers. And again wellbeing was higher among older employees than for employees aged 22-49 even once controlling for job quality.

In common with existing studies, our analysis explains less of the variation in wellbeing than it does for job satisfaction (around 35 per cent in the case of wellbeing compared with around 60 per cent for job satisfaction).[34] Many of the aspects of job quality that were associated with higher job satisfaction were also associated with greater wellbeing, such as supportive management, greater autonomy and greater job security (Table 4.1). In contrast, however, some relationships were different – for example, teamwork was associated with greater wellbeing, but not with satisfaction, as was working fewer than 30 hours per week. These differences have also been noted in analysis of all employees, and suggests that the factors driving variation in wellbeing among older workers are similar to those driving variation in wellbeing among other employees as well. Wellbeing among older workers showed no significant association with either the proportion of older or younger workers. In contrast to the findings for job satisfaction reported above, among young workers, job-related wellbeing was higher where there was a higher proportion of young employees, but showed no significant relationship with the proportion of older workers employed.

4.6 Pay

It is well-established that on average pay differs by age. Earnings are typically lowest for the youngest workers, rising through to middle age, and then declining in the approach to retirement. Provisional figures from the 2015 ASHE, for example, show median weekly earnings for men rise with age, reaching a peak of £653 for men aged between 40 and 49, and then falling afterwards. Wages for women follow the same trajectory but the peak in earnings happens slightly earlier, for women aged 30 to 39 (ONS, 2015e). This decline in average earnings as individuals age may at least in part reflect a change in the composition of those remaining in work, as employment rates start to fall among this age group (as discussed in Chapter 1). While on average, older workers earn less than employees in the middle age groups, there is considerable variation. Pay is likely to be an important part of an employee's decision as to whether to remain in employment and equal opportunities policies and practices have in part aimed to ensure that employees do not receive lower pay due to age (or other forms of) discrimination.

To undertake analysis of pay we make use of data from the ASHE linked to the 2011 WERS. Average hourly earnings by age band, based on the linked ASHE-WERS sample, are shown in Table 4.2.[35]

Although information on earnings is collected through the SEQ within WERS, employees are only asked to report this within banded earnings categories. As well as providing continuous earnings data, as ASHE is taken from employer payroll records, the information on earnings is also likely to be more accurate than that reported by employees in WERS (see Davies and Welpton, 2008, for further discussion on the rationale for linking the two datasets). A discussion of the linkage between ASHE and WERS 2011 is provided in Appendix 8.2 of this report.

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34 Based on the R-squared from the regressions underlying Table 4.1.

35 The data are weighted to adjust for the fact that the subset of employees in the linked ASHE-WERS data differs in terms of its characteristics to that of the full ASHE sample. This is discussed further in Appendix 8.2.

Table 4.2 Average hourly earnings (£), by age band, 2011

	Mean hourly pay (£)	Number of observations
Age band:		
16-21	6.50	133
22-29	11.26	672
30-39	15.86	1,075
40-49	16.98	1,345
50-59	14.48	1,022
60+	13.21	320
All employees	14.06	4,567

Note: the ASHE estimates presented in this table do not exclude employees whose earnings were affected by absence, however, we control for this in our regression analyses.

4.6.1 Are age-related practices associated with higher pay for older workers?

We find no statistically significant relationship between the presence of an equal opportunities policy mentioning age and pay[36] of older workers. However, each of the five equal opportunities practices is positively and significantly related to pay, as is the total number of such practices that were in place (Appendix Table A.12).[37] The presence of a special recruitment procedure for older workers was also positively associated with pay. In contrast, pay for older workers was lower where managers stated that age was an important factor in recruitment. A count of 'age-positive practices' was also positively related to pay (this sums the number of equal opportunities practices in place along with the presence of an equal opportunities policy mentioning age and having a special recruitment procedure for older workers).

Once we additionally control for employee and workplace characteristics[38], we find that the total number of equal opportunities practices and the total number of age-friendly practices, both remain positively and significantly associated with pay of older workers; most individual practices, with the exception of monitoring recruitment, were also significant at the five per cent level. However, no significant relationships were apparent for the presence of an equal opportunities policy mentioning age, or for special recruitment procedures for older workers, or according to whether age was an important factor in recruitment.

36 Log hourly earnings.

37 Here we run separate models for each of the individual policies/practices, for our sample of older workers. The results of the regressions are presented in Appendix Table A.12.

38 See the notes to Appendix Table A.12 for full details of the included control variables.

In all our models we are able to account for around two-thirds of the variation in pay among older workers. In terms of relationships between other characteristics and pay, relationships are in line with expectations.[39] Occupation was an important factor in explaining differences in pay among older workers (lowest among those in elementary occupations and process, plant and machine operatives), industry and region were both also significant. Pay was higher among male employees, where pay was set with reference to a collective agreement, in larger firms, and in some specifications, higher among those with longer tenure.

4.6.2 Are age-related practices associated with higher pay for workers of other ages?

The majority of the equal opportunities policies and practices considered here do not relate specifically to older workers, but simply specify age (employers may also discriminate against younger workers, for example). The results above have suggested a positive association between equal opportunities practices and the pay of older workers, but it is also relevant to consider whether we also see higher pay for workers of other ages in workplaces that implement such practices.

As the sample size for those aged 16 to 21 is small, we expand our definition of young workers here to include all those aged 25 and under. The results of estimating equivalent models for this age group are provided in Appendix Table A.13. Before including any controls, we find that average hourly earnings are higher for younger workers in workplaces which implement each of the five equal opportunities practices. However, with the inclusion of controls, these associations are no longer significant, although the total number of practices (both the equal opportunities practices alone and for all age-friendly practices) was positively and significantly associated with pay of younger workers at the ten per cent level.

We then estimate models for employees aged over 25 and under 50 (Appendix Table A.14). Again before controlling for other characteristics, there are some positive associations between the equal opportunities practices and average hourly earnings of this age group. However, none of these remain significant once controlling for other employee and workplace characteristics, and in fact for one practice – monitoring promotions by age – average hourly earnings are lower for employees in the 26-49 age group where this occurs.

These results point to a positive association between equal opportunities practices and pay for older workers. We cannot of course state that is a causal relationship, but nevertheless this suggests this may be worthy of further exploration. Furthermore, the presence of such practices does not appear to have a negative association with pay of either younger or older workers.

[39] Full results are available from the authors upon request.

4.7 Summary

This chapter has explored outcomes for older workers in terms of job satisfaction and wellbeing, perceptions of fair treatment, access to training and pay. In comparing outcomes of older workers with those of employees in other age groups it is important to bear in mind that the average outcomes we observe may be affected by the fact that some older individuals have left employment by this point, and that those who have left may well be those who were least satisfied at work. This may at least in part explain the higher job satisfaction and higher job-related wellbeing we observe for older workers. Similarly, this may contribute to the greater perceptions of fair treatment among employees aged 65 or over. Employees aged between 50 and 64 were no more or less likely than employees aged between 22 and 49 to agree that managers at their workplace treated employees fairly.

Older workers are less likely to receive training than employees of other ages. This is consistent with a reduction in incentives to invest in training as employees age. However, older workers are no less satisfied with the training they receive, or the opportunity to develop skills, than employees aged between 22 and 49.

Age-related equal opportunities practices were not associated with employee perceptions of fair treatment, job satisfaction or wellbeing among older workers. Instead, other features of the job and workplace were more important in explaining the variation in perceptions of fair treatment, many of which are common across employees of all ages.

While employee, job and workplace characteristics also play an important role in explaining differences in pay among older workers, a positive association between the presence of equal opportunities practices and pay for older workers remained apparent even after controlling for these factors. Furthermore, there is little to suggest that such practices have a negative association with pay of employees in other age groups. There was also no evidence that younger workers were less satisfied in the presence of older workers; in fact job satisfaction among younger workers was higher in workplaces employing a higher proportion of older workers.

5 Older workers and workplace performance

In this chapter we examine the relationship between the age composition of the workforce and workplace performance. More specifically, we consider whether changes in the proportion of older (and younger) workers employed at the workplace, as well as changes in age diversity, are associated with change in workplace performance. This analysis is conducted solely for the private sector and considers a range of measures of workplace performance, as reported by managers.

5.1 Key findings

In this chapter we use panel data for private sector workplaces to explore whether changes in the age composition of the workforce are associated with changes in workplace performance, over the period 2004 to 2011.

- Workplace performance is measured according to managers' subjective assessments of workplace labour productivity, quality of product or service and financial performance, as well as measures of quit rates and absence rates.
- Evidence from existing studies on the relationship between age and workplace performance is mixed. These studies have been conducted in a range of settings and countries, and use a range of different performance measures. However, to our knowledge, our analysis is the first to explore this relationship using nationally representative data for British private sector workplaces.
- In general, we find no significant associations between changes in the proportion of older workers employed and changes in workplace performance. Changes in age diversity also typically show no association with change in workplace performance. This suggests that overall the age composition of private sector workplaces does not have a sizeable role to play in explaining their performance.
- We find some evidence that workplace labour productivity falls where the proportion of workers aged 22-49 falls, either due to a rise in the proportion of older or younger workers.
- The association between a fall in the proportion of workers aged 22-49 and falling workplace labour productivity does not carry through to financial performance. One possible explanation is that workplaces benefit from older or younger workers in other ways, perhaps, for example, by reducing labour costs. However, our findings are unchanged when we additionally account for change in hourly wages, a key component of labour costs.

5.2 Background

As discussed in Chapter 1, the ageing population and growing labour force participation among older people mean, there is a shift in the age profile of those supplying their labour to employers. Government has amended legislation to ensure employment prospects and progression in employment are not affected adversely by the age of individuals. Employers have responded to these changes with alterations in (at least some of) their age-related policies, as noted in Chapter 3. However, it remains unclear whether employers are making these changes in the expectation that retaining or recruiting more older workers will benefit their business, or whether they are simply responding to meet legal requirements.

Subject to the laws governing equal treatment of older people in hiring and firing, whether an employer hires older people, how they are deployed, and how long they are employed at the workplace, are matters over which employers have considerable discretion. The equal treatment legislation governing older workers does not prescribe quotas. Consequently the employment of older workers is essentially an employer 'choice', in much the same way as employers choose whether or not to introduce a new management practice or production technology. Since employers are usually assumed to be profit maximising – at least in the market sector – we can assume that this choice is made with reference to the costs and benefits of employing older workers, as opposed to younger workers (either in their middle age or youth) or no workers at all.[40] Firm-level employment practices and policies may influence workplace managers' recruitment decisions. Nevertheless, it seems reasonable to assume that they are unlikely to be decisive in the number of older workers a workplace manager employs. The substantial variation in the percentage of older workers employed across workplaces presented in Chapter 3 is consistent with this assumption.

In a standard economic framework it is assumed that employers combine factors of production efficiently such that they will continue to recruit older workers until their marginal productivity means it is no longer optimal to do so. If employers have optimised then the share of older workers at the workplace will be neither positively nor negatively correlated with performance outcomes. However, there are a number of reasons why we might expect the share of older workers employed at workplaces will not be optimal:

- First, labour market frictions such as the costs of matching workers to job slots means the actual number of older workers employed at a given time will not reflect what might be best for the workplace. For example, it may be that there is a shortage of older job seekers in the local labour market where the employer is recruiting.
- Second, employers may lack knowledge about the value of older workers and the effect they may have on workplace performance. This lack of knowledge or information about the value of older workers may relate to the expected costs or benefits of employing older workers. It may be, for example, that some employers are unaware of the skills newer cohorts of older workers offer.

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[40] It is sometimes stated that rising labour market participation of older people restricts employment opportunities for younger people. However, as discussed in Section 1.1.1 there is little evidence to support this argument. While at a firm level an employer may weigh up the costs and benefits of employing older or younger workers, the number of jobs in the economy as a whole is not fixed (what economists term the 'lump of labour fallacy').

- Third, employers may discriminate against older workers, either directly where they refuse to hire suitable candidates purely on the grounds or age, or indirectly, for instance, by drawing up job specifications that can only be met by younger people. Changes in legislation, such as the removal of the Default Retirement Age and the Equality Act, offer employers greater scope to employ who they like, regardless of age, potentially helping them to achieve an optimal mix of workers.

It is in circumstances where employers have too few older workers that we would expect to see a positive correlation between the share of older workers and workplace performance.[41] However, as discussed further in Section 5.3, it may be the case that some employers will benefit more than others from a high share of older workers. For example, where the customer-base for a particular product or service consists primarily of older people, firms may choose to serve those customers with older workers, in the belief that similarities between the seller and buyer may enhance customer satisfaction or increase sales. Alternatively, in firms which rely on employees having high-levels of firm-specific knowledge (what economists term 'firm-specific human capital') it may make sense to retain a higher share of older workers who have had the time to build up that firm-specific knowledge.

[41] One can draw an analogy between the deployment of older workers and the diffusion of high-involvement management practices (HIMPs). In a world in which all workplaces would benefit equally from using HIMPs those that are the first to do so have a comparative advantage over their competitors. However, this comparative advantage will diminish over time when other workplaces recognise the value of HIMPs and begin to use them too. The fact that workplace performance continues to be positively associated with HIMPs such as training (Bryson and Forth, 2016) and with HIMPs in general (Amossé *et al.*, 2016), indicates that these practices have yet to diffuse fully across workplaces, perhaps due to a lack of employer knowledge regarding their potential benefits, or else because workplace managers face severe constraints in implementing the practices that they know might be beneficial for performance. However, it may be that net benefits from introducing HIMPs are not common across workplaces. If some workplaces benefit from them more than others the diffusion of HIMPs may, in fact, be optimal, since some employers have correctly identified that their adoption may not be beneficial for their firm.

5.3 Existing evidence on older workers and workplace performance

There is a growing literature on the relationship between workforce demographics and organisational performance. Much of this literature has been concerned with the adverse effects direct and indirect discrimination play in limiting the talent pool available to employers which adversely affects organisational performance. This concern has prompted research into the impact of increasing the presence of under-represented groups in the workforce, including recent studies on the gender mix of corporate boards.[42, 43] The implication is that the talent of some parts of the population is being under-utilised, such that their representation in the labour market is sub-optimal from the perspective of both firms and society.

However, most of the empirical literature on the link between the demographic characteristics of the workforce and organisational performance does not focus on discrimination. Instead it is concerned with the potential value of workforce diversity to employers, and the effects of changing workforce composition on organisational performance.

This section focuses on the age composition of the workforce, but much of the discussion is equally pertinent to other features of the workforce such as gender and race. The literature draws a distinction between workforce composition on the one hand and workforce diversity on the other. A workplace's workforce composition refers to the proportion of employees in the workplace belonging to different age groups. A workplace's workforce diversity captures the spread of workers across the age distribution. This is sometimes captured using the standard deviation in workers' ages, or the coefficient of variance (the standard deviation divided by the mean). An alternative metric, which is the one we use in this study, is a Herfindahl index. It is related to workforce composition but combines two quantifiable measures: the number of age categories used to distinguish employees on the age dimension, and the proportion of the workforce that falls into each category (further details on the construction of this measure are provided in Appendix A.3, Section A.3.2).

The dual-focus in the literature – on employee shares and workforce diversity – is important because both may have effects on organisational performance, at least in theory. Workplace performance may benefit from increasing the share of older workers for several reasons. We identify three here. First, if an employer's customer base is ageing, firms may find 'matching' their staff profile to that of their customers enhances customer satisfaction or increases sales. Second, if firms become increasingly reliant on firm-specific knowledge – as might be the case where a firm is moving towards the production and sale of more specialised goods or services which are not readily available elsewhere in the market – their need for workers with considerable experience in that firm may grow. Third, increasing the percentage of older workers in the workplace may raise worker wellbeing at the workplace, something which is known to be linked to improved workplace performance (Bryson *et al.*, 2015). This is because wellbeing follows a u-shape over the life-course, starting to rise again when individuals are in their 50s (Cheng *et al.*, forthcoming).

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42 For example, see Bertrand *et al.*, (2014) for an examination of the effects of female quotas for corporate board membership in Norway.

43 One of the earliest examples of employers recognising the adverse effects of discrimination on their performance is Goff *et al.* (2002) account of the way in which black players were assimilated into professional baseball and basketball in the United States.

Conversely, an increase in the percentage of older workers employed at a workplace may adversely affect workplace performance if it is reliant on employees who are physically very fit and agile, or in circumstances where older workers are slower at adopting new procedures or technologies introduced by the firm. These putative disadvantages of older workers tend to invoke a certain characterisation of the older worker (less agile, technophobic, or more prone to absence or illness) which, some argue, is outdated and are not necessarily linked to age per se.

The link between workforce diversity and organisational performance is also theoretically ambiguous. This is because there are potential costs as well as benefits to workforce diversity, so that any overall effect is likely to reflect the net outcome from potentially competing mechanisms.[44] First, diversity may affect worker performance via their wellbeing: if greater diversity is preferred – that is, they derive greater utility from being in a more diverse workforce – this may feed through to workers' productivity and thus firm performance. However, the opposite may happen if they derive greater utility from working alongside others who are 'like them'. Second, greater diversity can entail increased costs where it increases problems of co-worker communication or lowers co-operation (for instance, through lower trust relations or weaker social ties). Third, diversity in production teams can enhance decision-making, lead to increased problem-solving capacity and result in more creativity. Fourth, the degree to which organisations will derive benefits from greater diversity will depend on the extent to which the skills and knowledge of older and younger workers are complementary, or if there are spillovers across different worker types, as may be the case where younger workers can learn from older workers. Lazear (1998) argues that age-related complementarities derive from the fact that younger employees tend to have greater knowledge of new technologies while older employees have better understanding and experience of operational matters.

These considerations suggest that the performance effects of age shares and age diversity are likely to vary across workplaces according to their production technologies and worker preferences. The latter are very difficult to establish, the former less so. At one extreme, age diversity will have negative effects on firms where production is characterised by workers of similar skills performing tasks together.[45] At the other extreme, gains from diversity will be greatest where complementarities across different types of worker are high and information can be learned at low cost (Lazear, 1999).

None of the above refers directly to dynamic organisational settings in which the age composition of the workforce is changing. These changes can present their own challenges, as described in Kunze *et al.,* (2011), who find increased age diversity can result in increased perceptions of age discrimination. In turn, this can undermine organisational affective commitment, thus reducing organisational performance. It is possible that such effects may be mitigated by appropriate equal opportunities policies which monitor and review age-related aspects of recruitment, promotion and rewards.

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44 For an excellent review of this literature and its empirical counterpart see Ilmakunnas and Ilmakunnas (2011). Our brief comments draw, in part, on their review.

45 Referred to in the literature as O-ring production functions (Kremer, 1993).

Table 5.1 summarises empirical evidence regarding the links between age, age diversity and organisational performance.[46] All studies incorporate both age diversity measures and average age or age share measures, though their precise derivation varies across studies. In all but one study (Kunze *et al.*, 2011) the dependent variables are confined to a measure of labour productivity (either sales, value added, total factor productivity (TFP) or scrap rates) and so can tell us nothing about the impact of age-related factors on firms' overall performance or profitability. This is an issue to the extent that older workers may be either less or more costly than younger workers, depending on their bargaining power and the importance of seniority wage setting in firms. The effects of age and age diversity on organisational performance might conceivably switch once those cost-related factors are taken into consideration.

It is notable how disparate the findings are, reflecting differences in samples and settings, but also perhaps the countervailing theoretical impacts that age and age dispersion are likely to have on performance. Older average age, or a higher percentage of older workers, is not normally negatively associated with performance; it is positive and robust in Garnero *et al.,* (2014) study of Belgian private sector firms and Backes-Gellner and Veen's (2009) study of German workplaces, while it has a non-linear effect in Grund and Westergaard-Nielsen (2008) and Parrotta *et al.,* (2014). Age diversity is positively linked to productivity in Ilmakunnas and Ilmakunnas's (2011) Finnish study, but is negatively linked to sales in Leonard and Levine's (2003) U.S. retail firm and in Garnero *et al.,* (2014) Belgian study. Elsewhere age diversity has either no significant effect, effects that are not robust across specifications or an inverse-u shaped relationship with organisational productivity.

Some of the studies are notable for testing particular theoretical propositions. Backes-Gellner and Veen (2009) build on Lazear's (1999) framework arguing that increasing marginal costs to age diversity and decreasing marginal returns will result in an inverse-u shaped relationship between age diversity and productivity. They further argue that the optimal point in that inverse-u shape will be low in settings characterised by routine tasks but high in settings characterised by creative tasks. Their empirical evidence supports these propositions. As noted earlier, Kunze *et al.*, (2011) outline ways in which increasing age diversity can lead to increased perceptions of age discrimination, lowering affective organisational commitment which, in turn, decreases productivity. They find support for this model in their cross-sectional data using a structural model. Furthermore, they find no direct effect of age dispersion on productivity.

Although the studies reviewed cover an array of workplaces and firms from different countries none are conducted for Britain. The analyses presented in the remainder of this chapter are the first to do so.

[46] The table does not contain all empirical studies ever conducted. Instead studies are chosen based on the quality of the data, the robustness of estimation methods used and one's ability to extrapolate from the results more broadly.

Table 5.1 Empirical Evidence on the impact of Age and Age Diversity on Organisational Performance

Study	Age Measures	Outcome	Results	Comments
Leonard and Levine (2003)	Mean age s.d. of log(age)	Sales, sales growth	Positive or n.s. Negative	U.S. single retail firm, 800 stores
Ilmakunnas *et al.*, (2004)	Mean age s.d. of age	Plant TFP	Positive to 40 n.s.	Finland
Borsch-Supan and Weiss (2007)	Mean team age, non-linear splines	Team-level scrap rate	Non-significant	Single plant, large car manufacturer
Grund and Westergaard-Nielsen (2008)	Mean age s.d. of age	Value added per employee	Inverse-u Inverse-u	Firm panel, OLS and fixed effects. Denmark, private sector, firms with 20+ employees
Backes-Gellner and Veen (2009)	Mean age s.d. of age coefficient of variance	Productivity	Positive Negative but positive in creative tasks and innovative companies	Panel 18,000 German workplaces
Kunze *et al.*, (2011)	Median age s.d. of age	Various, including financial performance, growth, productivity	n.s. negative via perceived discrimination. No direct effect	128 companies, Germany. Cross-section.
Ilmakunnas and Ilmakunnas (2011)	Mean age and its square s.d. of age Age dissimilarity index	Value added, TFP	n.s. but sensitive to model Positive Positive	Finland, manufacturing and production plants with 20+ employees
Garnero *et al.*, (2014)	Mean age s.d. of age Age dissimilarity	Log value added per hour Log profits (value added minus wages)	Positive Negative Negative	Belgian panel, 2,431 medium and large private sector firms
Parrotta *et al.*, (2014)	Mean age Herfindahl index	Log value added	Inverse-u Negative or n.s.	Danish, firm level, firms with 10+ employees

5.4 Measuring workplace performance

Before presenting the results of our analysis we first describe our measures of workplace performance. We make use of a range of measures of workplace performance, namely labour productivity, the quality of goods and services produced, financial performance, and quit and absence rates.

The first three measures rely on the workplace Human Resources (HR) manager's subjective assessment. The managerial respondents to the survey 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 ranging from 'a lot better than average' to '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.[47] Thus, although distinct, these three measures may relate to a single underlying workplace performance scale.[48] We therefore also constructed an additive scale from three performance items, summing the items then subtracting three, such that the scale ran from zero ('below average' performance on all three items) to nine (performance 'a lot better than average' on all three items).[49]

When investigating workplace influences on performance it is more conventional to rely on accounting measures such as sales per employee and value added per employee. They have the advantage of being measured along a cardinal scale against which one can readily quantify correlations with other workplace factors, such as the average of employee wellbeing at the workplace. Although Workplace Employment Relations Survey (WERS) collects such measures through its Financial Performance Questionnaire (FPQ) we prefer to focus on the subjective measures of workplace performance for two main reasons. First, a much higher percentage of workplace managers feel able to provide an answer along the ordinal scale presented in the show card. Eighty-seven per cent are able to do so on all three subjective performance measures, whereas the number of responses to the FPQ is low (n=545, which is 20 per cent of the respondents to the management questionnaire). 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).[50] In contrast the managers responsible for employment relations who complete the WERS managerial questionnaire find it difficult to obtain the information necessary to provide accurate responses to the FPQ. For instance, they are often only able to provide information at the firm level, rather than workplace level. Consequently, the accounting measures of performance are not immune to concerns about sizeable measurement error. A third potential advantage of the subjective measures is that managers are asked about performance relative to other workplaces in their industry, and therefore this should take account of any common industry shocks, which may be correlated with changing age composition.

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47 Similarly those scoring low on one indicator tend to score low on the other two indicators. The correlation coefficients in the weighted data are: financial performance and labour productivity 0.44; financial performance and quality 0.25; labour productivity and quality 0.33. They are all statistically significant at the one per cent level.

48 This is confirmed by a high scale reliability coefficient, or alpha, for the three performance items of 0.79.

49 Further detail on these measures, as well as their distributions, is provided in Appendix A.3.

50 In our estimation sample those reporting poorer financial performance in 2004 were more likely to have closed by 2011.

Quit and absence rates were calculated using HR managers' responses to questions regarding labour turnover one year prior to the survey. Managers were first asked 'In total, how many employees (full and part time) were on the payroll at this workplace 12-months ago?' They were then asked 'And how many of these employees stopped working here, because they … left or resigned voluntarily?' The quit rate is simply the share of those working at the workplace 12 months ago who had left or resigned voluntarily. Absence rates were based on the following question: 'Over the last 12 months what percentage of work days was lost through employee sickness or absence at this workplace?' Interviewers were instructed to tell managers to 'exclude authorised leave of absence, employees away on secondment or courses or days lost through industrial action'.[51]

5.5 Change in age composition, age diversity and workplace performance

Our analysis uses panel data for private sector workplaces in WERS to establish the association between changes in age shares and age diversity with changes in the measures of workplace performance described above. We focus on the private sector because it is subject to market forces and, as such, employers in that sector are more likely to weigh the costs and benefits of employing older workers in the manner envisaged by theory.[52]

The analyses use two age-related measures. Firstly, we use the share of employees in one of three age brackets (under 22, 22-49 and 50 or over). Secondly, we use the Herfindahl index as a measure of age diversity (from here onwards, when using the term 'age diversity' we are referring to the Herfindahl index). This is based on the number of age categories used to distinguish employees on the age dimension, and the proportion of the workforce that falls into each category. The Herfindahl index is simply calculated as one minus the sum of the squared age share terms (see Appendix A.3, Section A.3.2). The index has a minimum value of zero if there is only one category represented within the workplace and, as in our data, where we have three age categories, a maximum value of 0.667 if all categories are equally represented. Both the age share measures and age diversity measure are included in the models presented in this chapter, following the practice adopted in the rest of the literature reviewed above. Although the two measures are positively correlated[53] the associations between age shares and workplace performance are robust to the exclusion of the age diversity measure.

The analysis focuses on within-workplace change and controls for unobserved fixed workplace traits and a range of observed time-varying variables that might conceivably affect workforce age composition and workplace performance. Full details of the underlying methodology are provided in Appendix A.3.

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51 The distributions of change in these measures are presented in Appendix A.3.

52 That said, it is arguable that public sector organisations are facing increasing pressures to deliver services efficiently to tight budgets and, as such, will be in a similar to position to workplaces in the private sector. This is an issue that could be tackled in future research.

53 In our estimation sample the Herfindahl index and the share of older workers has a correlation coefficient of 0.46 in 2004 and 0.49 in 2011. Both are statistically significant at the one per cent level.

The key associations between change in age composition, age diversity and workplace performance are summarised in Table 5.2. The underlying regression results are provided in Appendix A.3 (Section A.3.4). We discuss the results for each performance measure in turn below. In general, we find no significant associations between change in the proportion of older workers, or change in age diversity, and changes in workplace performance. We find some evidence that self-reported workplace labour productivity falls where the proportion of older workers rises; this is also the case where the proportion of younger workers increases. However, this is not the case for the other measures of workplace performance considered here.

Table 5.2 Change in age composition, age diversity and workplace performance: summary of results

	Change in:					
	Labour productivity	**Quality of output**	**Financial performance**	**Additive scale**	**Quit rate**	**Absence rate**
Change in share aged 50+	-	ns	ns	ns	ns	(+)
Change in share aged 16-21	-	ns	ns	(-)	ns	ns
Change in age diversity	(+)	ns	ns	ns	ns	ns

Notes: This table summarises the results from the underlying regression models reported in Appendix A.3, based on the models which control for workplace characteristics, specifically: number of employees; share female; gender diversity; share non-white; share part-time; share in largest occupational group; union density; number of age-related EO practices; EO policy mentioning age; EO policy not mentioning age; age important in recruitment; special procedures for recruiting older workers.
A '-' indicates a negative association which is significant at least the five per cent level of statistical significance; parentheses indicate that the association is statistically significant at the ten per cent level; 'ns' indicates no statistically significant association.

Workplace labour productivity (as measured by managers' subjective assessments) fell with an increase in the share of younger and older workers. This relationship is apparent in the raw data (Appendix Table A.1, Model 1), and remains apparent when controlling for other workplace characteristics (Appendix Table A.1, Model 2).[54] Furthermore, while the inclusion of these additional controls increases the amount of variance in changes in labour productivity that the model is able to explain, these controls make no difference to the size or statistical significance of the relationship with the share of older workers. Thus conditioning on other dimensions of workplace demographics and age-related policies and practices does not influence the size of the association.

[54] The workplace characteristics controlled for are: number of employees; share female; gender diversity; share non-white; share part-time; share in largest occupational group; union density; number of age-related EO practices; EO policy mentioning age; EO policy not mentioning age; age important in recruitment; special procedures for recruiting older workers.

For a subset of workplaces it is also possible to control for information based on employee responses. In this subset of workplaces, before the inclusion of any additional controls, the relationship between change in the share of older workers and change in labour productivity persists – the effect is actually larger, although only statistically significant at the ten per cent level (Appendix Table A.1, Model 3). When we additionally control for mean hourly pay, mean job satisfaction and mean job-related anxiety, the relationship with the change in the share of older workers is unaltered (Appendix Table A.1, Model 4). As discussed in Section 5.3, existing studies have not generally found older average age to be negatively associated with workplace productivity; some have found positive effects, while others have found evidence of non-linear relationships. It is important to bear in mind the different settings in which these studies have taken place (sometimes in particular industries and none for Britain). These studies have also made use of accounting measures of performance, rather than the subjective measures used in this report.

It is not just a rise in the proportion of older workers that was associated with a fall in workplace labour productivity. Increasing the share of younger workers was also negatively associated with changes in workplace labour productivity, the effect being somewhat larger than that for the share of older employees. Taken together these findings on older and younger worker shares imply that an increase in workers aged 22-49 years[55] is associated with increased labour productivity.

Section 5.3 discussed how age diversity has the potential to have both positive and negative consequences for workplace performance, and that the findings from existing empirical studies on this issue are mixed. In our analysis change in age diversity was not typically associated with changes in labour productivity, although when controlling for workplace characteristics, there was a positive and statistically significant association at a 90 per cent confidence level (Appendix Table A.1 Model 2). This did not remain significant once additionally controlling for average hourly pay and wellbeing among employees at the workplace. Results from identical analyses for workplace performance in terms of the manager's assessment of quality of output are presented in Appendix Table A.2. For this measure of performance, neither changes in age shares nor changes in age diversity were significantly associated with changes in the quality of output.

In spite of the negative association between increases in the share of older employees and changes in labour productivity, this does not feed through to financial performance. There is no statistically significant association between the change in the share of older workers and change in financial performance (Appendix Table A.3). In the smaller sample for which linked employee data are available there is weak statistical evidence to suggest an increase in younger employees does adversely affect workplace financial performance (Models 3 and 4). Age diversity is not statistically significant in any of the specifications. Few existing studies have considered the relationship between age of the workforce and financial performance, with the exception of Kunze *et al.*, (2011), who also find no significant direct effect.

The additive performance scale combines the changes in the subjective measures of labour productivity, quality of output and financial performance (Appendix Table A.4). Here there is weak statistical support for the proposition that an increase in the share of younger employees is associated with a reduction in the workplace performance additive scale, but otherwise the age-related variables are not statistically significant.

[55] As this group is the omitted reference category.

We also consider workplace performance in terms of quit rates and absence rates. Again there was little to suggest that changes in the proportion of older workers, or changes in age diversity, were associated with changes in workplace performance in terms of either measure. Although the coefficients for increases in the share of older employees are negative in the models for changes in employee quit rates they are not statistically significant (Appendix Table A.5). The coefficients for increases in the share of younger employees are positive in these models but, again, they are not statistically significant. Neither are changes in age diversity. There is weak statistical support for the proposition that an increase in older employees increases absence rates. There is a positive and statistically significant association at a 90 per cent confidence level both with and without controlling for workplace characteristics (Appendix Table A.6, Models 1 and 2). However, this becomes non-significant in the smaller sample which links the managerial and employee data (Models 3 and 4). No significant relationship with age diversity is evident once controlling for workplace characteristics.

Finally, we use the panel data to predict 2011 workplace performance using 2004 baseline traits. This permits us to see if age-related variables in 2004 can predict 2011 workplace performance, conditioning on a range of 2004 workplace characteristics which are more extensive than those used in the analysis presented so far in this section.[56] The results suggest that having a higher share of older employees in 2004 is associated with poorer financial performance and poorer performance on the additive scale in 2011, albeit only at a 90 per cent confidence level, whereas a higher share of older employees in 2004 is also linked to lower absence rates in 2011 – again only at a 90 per cent confidence level (Appendix Table A.7). Having a higher share of younger employees is only statistically significantly associated with lower absence rates in 2011. Age diversity in 2004 has no association with performance outcomes in 2011.

In an additional set of models we also control for workplace performance in 2004 (Appendix Table A.8). Additionally including a lagged measure of performance aims to soak up pre-existing performance differentials at the time of the 2004 survey. The introduction of the lagged performance measures increases the variance accounted for by the models[57], with the exception of the labour productivity model. This is because, with the exception of labour productivity, the lagged performance measures were highly statistically significant and positive, indicating persistence in performance over the period 2004-2011 within workplaces. The effect of the lagged performance measures' introduction is to reduce the size of the older worker share coefficients in all cases, leading them to be statistically non-significant across the board. The implication is that the share of older workers tends to be higher in workplaces that already had poor performance back in 2004.[58]

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56 The controls are: number of employees; share female; gender diversity; share non-white; share part-time; share in largest occupational group; union density; number of age-related EO practices; EO policy mentioning age; EO policy not mentioning age; age important in recruitment; special procedures for recruiting older workers; single-establishment organisation; industry; region; age of establishment.

57 As indicated by a comparison of the r-squared in Appendix Tables 8.7 and 8.8.

58 We can only speculate as to why this might be the case. One possibility is that workplaces that face a particularly difficult competitive environment are more likely to experiment with employment practices before others do so, in part out of concern for their own survival. This is the 'worst-first' hypothesis discussed by Goff *et al.*, (2002) in the context of employing black professional sports players.

The share of younger employees is also not significant. Neither is age diversity in 2004, apart from in the case of quits where there is weak statistical support for the proposition that greater diversity leads to lower quit rates.

5.6 Summary

In this chapter we have used panel data for private sector workplaces from the 2004-2011 Workplace Employment Relations Survey to establish the association between changes in age shares and age diversity with six measures of changes in workplace performance. The analysis focuses on within-workplace change and controls for unobserved fixed workplace traits and a range of observed time-varying variables that might conceivably affect workforce age composition and workplace performance.

In considering the findings it is worth recalling the period over which the study was conducted. It was a period in which the economy suffered one of its biggest recessions in living memory, one in which older workers did relatively well. It was also a period during which the workforce was ageing (see Chapter 1). This was the case in the WERS data too, as shown in Chapter 3. It was also a period in which government legislated more tightly on age-related equal treatment in the labour market and employers responded with an increase in the percentage of policies referring explicitly to age-related issues.

In general there are weak or no associations between changes in age shares, changes in age diversity, and workplace performance over the period. There is some evidence that both a higher percentage of older employees, and a higher percentage of younger employees, result in a reduction in labour productivity, but this does not carry through to financial performance. One possible reason for this is that workplaces benefit from their older workers in other ways, for example, by helping to reduce labour costs, thus compensating for lower older worker productivity. This could be the case if, for example, older workers received lower wages, were less likely to be absent, or could result from lower expenditure on training of older workers. However, we incorporate changes in hourly wages and training provision, two of the major components in labour costs, and this does not affect the association.

In general the significance and magnitude of the relationships between the age variables and workplace performance did not shift decisively with the inclusion of variables capturing other aspects of workplace demographics, mean wages, and mean worker wellbeing. The inclusion of such variables did, however, increase the amount of variance in performance accounted for by the models. In the models seeking to predict 2011 performance outcomes using 2004 workplace characteristics, some weak negative effects of a higher older worker share in 2004 disappeared with the inclusion of lagged 2004 performance, suggesting it was workplaces which already had poorer performance in 2004 that tended to employ a higher share of older workers.

Although other studies find some effects of age shares, average age, and age diversity on organisational performance, this is the first study for Britain. It suggests age-related workplace demographics do not play a big role in the performance of private sector workplaces in Britain. Of course there are a number of limitations to our analyses. Results could be sensitive to the inclusion of additional time-varying control variables, such as the introduction of new technology and changes in capital intensity, and there may be non-linear effects of age diversity which we have not examined. Another draw-back to our study is that the panel sample sizes are quite small making it difficult to obtain precise estimates of what appear to be relatively small effects in most instances.

6 Conclusions

Older workers account for an increasing proportion of the UK workforce. This is driven in part by demographic changes, but also by increasing rates of labour market participation among older individuals and falling rates of labour market participation among young people. There is considerable variation among British workplaces in the proportion of older workers they employ. In 2011, in 14 per cent of workplaces at least half the workforce were aged 50 or above, while 19 per cent of workplaces employed no older workers.

This study has used data from the Workplace Employment Relations Survey (WERS), a nationally representative survey of British workplaces and their employees, to explore the types of workplaces in which older workers are found, outcomes for older workers, and the relationship between age composition of the workforce and workplace performance.

Around 25 per cent of the variation across workplaces in the proportion of older workers employed can be explained by structural workplace characteristics, such as differences in industry, region, the largest occupational group at the workplace, workplace age, workplace size and union recognition. Other employer practices and characteristics also play a role in explaining variation in the percentage of older workers employed. For example, workplaces employed a smaller proportion of older workers where new employees typically took more than a year to get up to speed. This may reflect a lower willingness among employers to invest in recruiting and training older workers when they perceive there may be fewer years in which to recover their investment. We see some evidence of higher proportions of older workers in workplaces with a greater number of equal opportunities practices relating to age and where there are special recruitment procedures for older workers, although only three per cent of workplaces have such procedures in place. However, the presence of these practices was not associated with an increase in the proportion of older workers over time.

The experiences of older workers are likely to prove important in determining how long individuals remain in employment. Although many of the factors driving variation in outcomes for older workers were similar to those driving variation for workers in other age groups, older workers did express greater overall job satisfaction and job-related wellbeing than employees aged between 22 and 49. Perceptions of fair treatment are also higher among the oldest employees.

However, while on average older employees fare better than employees aged 22-49 in terms of job satisfaction, wellbeing and perceptions of fair treatment, there are notable differences in outcomes by age among older workers – employees aged 65 and over generally fared best in terms of job satisfaction, wellbeing and perceptions of fair treatment, although were less likely to receive training. The better average outcomes in terms of job satisfaction, wellbeing and perceptions of fair treatment may reflect the fact that less satisfied employees have left employment by this age.

Existing legislation has sought to encourage participation and retention of older individuals in the labour market, and to address age-related discrimination. The presence of age-related policies and practices were not associated with outcomes for older workers in terms of job satisfaction and wellbeing, access to training or perceptions of fair treatment. Generating better outcomes for older workers may therefore require greater focus on other employer practices, such as provision of flexible working or job design. These may have benefits for employees of all ages, not just older workers. However, on average, pay was higher among older workers where they worked in a workplace with equal opportunities practices.

Furthermore, there is little to suggest that such practices have a negative association with pay of workers in younger age groups. This analysis can only identify associations, rather than causal relationships, but nevertheless suggests further exploration of the role of such practices may be worthwhile. In particular, it may be of interest to consider whether such practices matter for different groups of older workers – such as whether they differ for new recruits in comparison to long-serving employees.

As the workforce ages, there is considerable interest in the potential consequences for workplace performance. Evidence from existing research on the relationship between the age composition of the workforce and workplace performance is mixed. These studies have been conducted in a range of settings and countries, and use various measures of performance. However, to our knowledge, our analysis is the first to explore this relationship using nationally representative data on British workplaces and their employees. We focus on private sector workplaces only and consider a range of workplace performance measures, based on managers' subjective assessments of workplace labour productivity, quality of product or service and financial performance, as well as measures of quit rates and absence rates.

In general, we find no significant associations between changes in the proportion of older workers employed between 2004 and 2011 and changes in workplace performance over the same period. Changes in age diversity also typically show no association with change in workplace performance. This suggests that overall the age composition of private sector workplaces does not have a sizeable role to play in explaining their performance. We do find some evidence that workplace labour productivity falls where the proportion of workers aged 22-49 falls, either due to a rise in the proportion of older or younger workers. The association between a fall in the share of workers aged 22-49 and falling workplace labour productivity does not, however, carry through to financial performance. Existing studies (although none are conducted for Britain) suggest there may be a non-linear relationship between age and workplace performance; this may well be worth exploring in future research. Furthermore, while the data available for our analysis of workplace performance restrict us to considering older workers as those aged 50 and over, ideally it would be useful to be able to understand how the results may change if a more detailed disaggregation by age were available.

Research has indicated that many employers value older workers, recognising their experience, loyalty and reliability. Furthermore, while we find no association between change in age diversity and change in workplace performance, age diversity may bring other benefits in the workplace; we find that job satisfaction was higher among young workers in workplaces which employed higher proportions of older workers.

What can we take from this research and what future research should be undertaken to improve understanding of the experiences of older workers and their effects on firm performance? Although we find little evidence of an association between changes in the employment of older workers and workplace performance it is sensible to conduct further research on this issue. As our review indicates, studies have produced disparate findings about the association between the share of older workers and organisational performance. This may reflect a number of study-specific features such as the methodological approaches adopted and the samples of organisations investigated. But it may also reflect genuine differences in the effects of older workers across time and place, something that theory predicts. Ours is the only study for Britain and the analysis is conducted for all private sector workplaces. It is possible that future studies may produce different results, either

because circumstances have changed, different methodologies are adopted, or because the data used are different. Our study examined older worker effects in a period that included a recession: it is quite possible that results will vary with changes in the economic environment.

Our study faced some particular limitations that could be overcome in the future with appropriate data. First, the sample sizes were quite small for the panel analysis needed to examine change within workplaces over time. Larger samples would provide the opportunity to establish effects with greater precision than we were able to do. Larger samples would also permit investigation of potentially quite different effects of older workers in different parts of the economy and for different sorts of workplaces. Second, we only had a short two-period panel to analyse. We were examining change between two time points (2004 and 2011) seven years apart. It is possible that changes over a longer time-frame may produce quite different results. Third, and related to the nature of the data, we are unable to make clear causal inferences about the relationship between changes in older workers and changes in workplace performance. Instead, we identify partial correlations having accounted for unobservable fixed differences across workplaces and some time-varying characteristics of those workplaces. With a two-period panel it is not possible to unpick the direction of causality in a wholly convincing fashion. Finally, we rely on subjective measures of workplace performance. Although, as we have argued, they have merit in their own right and, arguably, warrant greater attention in the literature than they currently receive, it would be beneficial to be able to compare and contrast results based on subjective performance measures with accounting-type measures often preferred by economists.

Future research is also merited because our study leaves a number of questions unanswered. Whether additional research in this area is feasible will depend, in large part, on the size and shape of any future WERS-type study. Existing evidence has suggested that while employers often recognise the benefits of retaining their existing older workers, they can be less willing to recruit ‘new’ older workers. Our data identify the proportion of older workers at a workplace, but do not distinguish between those that have been recruited as older workers and those who have aged at the workplace. Understanding more about the types of workplaces that recruit older workers would be a valuable subject for future analysis. In addition, while in this report we have briefly touched on variation in outcomes among older workers, in future research it may be useful to identify in more detail which groups of older workers fare best and worst at work. This may enable policy interventions to focus particularly on improving outcomes for those older workers who currently have the poorest experiences at work.

Perhaps one issue that is of key significance for public policy is the effect of equal opportunities policies and practices on workers and employers. We typically found little or no association between the presence of such policies and practices and outcomes for older workers. Although there are legal requirements to adopt minimum standards, there is great scope for employers to choose how much they invest in such policies and practices, and these investments are likely to reflect the costs and benefits of adoption to employers. A careful examination of the effects of such policies and practices seems merited, not least because this is an area of public policy that is likely to attract attention in future with the ageing of the workforce.

Appendix A Tables

Table A.1 Percentage of workers aged 50 and over by selected workplace characteristics, 2011

	Percentage of older workers (workplace weighted)	Number of observations (unweighted)
All workplaces	**24**	**2,624**
Industry (SIC 2003)		
D: Manufacturing	25	256
E: Electricity, gas and water	29	56
F: Construction	30	98
G: Wholesale and retail trade	24	282
H: Hotels and restaurants	11	165
I: Transport and communications	28	157
J: Financial services	25	45
K: Other business services	21	345
L: Public administration	31	231
M: Education	27	335
N: Health and social work	31	419
O: Other community services	23	235
Region		
North East	22	106
North West	20	348
Yorkshire and Humber	30	209
East Midlands	30	164
West Midlands	23	206
East of England	24	225
London	18	381
South East	24	347
South West	28	222
Scotland	20	271
Wales	31	145
Sector		
Public	34	798
Private	23	1,826

Continued

Table A.1 Continued

	Percentage of older workers (workplace weighted)	Number of observations (unweighted)
Workplace size (number of employees)		
5-9	27	295
10-19	21	373
20-49	20	482
50-99	23	379
100-499	25	651
500+	26	444
Workplace age (years)		
Less than 5	15	158
5-9	18	302
10-24	25	792
25-49	30	651
25+ but DK	18	72
50+	30	640
Single independent establishment		
No	23	1,950
Yes	25	674
Foreign-owned		
No	25	2,295
Yes	18	300
Family-owned		
No	25	1,987
Yes	23	601
Largest occupational group		
Professional occupations	24	569
Associate professional and technical	22	298
Administrative and secretarial	36	353
Skilled trades	30	186
Caring, leisure and other service	22	326
Sales and customer service occupations	20	331
Process, plant and machine operatives	26	222
Elementary occupations	17	329
Any recognised union		
No	21	1,294
Yes	33	1,273

Base: all workplaces with five or more employees. Workplaces for which information on the proportion aged 50 or over are excluded, as are three workplaces for which information on industry was missing.

Table A.2 Workplace characteristics associated with the proportion of older workers, 2011, regression results, workplace weighted

	All workplaces		Public sector		Private sector	
Industry (ref: Manufacturing)						
E: Electricity, gas and water	0.071	*			0.065	*
F: Construction	0.025		-0.267		0.031	
G: Wholesale and retail trade	0.044		-0.028		0.046	
H: Hotels and restaurants	-0.046		-0.15		-0.041	
I: Transport and communications	0.034		-0.097		0.037	
J: Financial services	0.062				0.065	
K: Other business services	0.017		-0.089		0.016	
L: Public administration	-0.008		-0.137		0.017	
M: Education	0.034		-0.108		0.083	**
N: Health and social work	0.112	***	0.014		0.095	**
O: Other community services	-0.003		-0.154		-0.002	
Region (ref: South East)						
North East	-0.042		0.058		-0.051	
North West	-0.048	*	0.001		-0.051	*
Yorkshire and Humber	0.036		0.051		0.044	
East Midlands	0.034		0.169	**	0.017	
West Midlands	-0.016		-0.012		-0.018	
East of England	-0.004		-0.025		0.002	
London	-0.057	**	-0.001		-0.059	**
South West	0.023		0.115	**	0.019	
Scotland	-0.069	**	0.116	**	-0.094	***
Wales	0.013		0.052		0.021	
Private sector	-0.033		-		-	
Workplace size (ref:500+ employees)						
5-9	0.074	***	0.094		0.074	**
10-19	0.016		0.027		0.018	
20-49	-0.004		-0.016		0.007	
50-99	0.001		0.005		0.005	
100-499	0.013		0.007		0.021	
Workplace age (ref: less than five years)						
5-9	0.016		0.033		0.018	
10-24	0.077	***	0.036		0.082	***
25-49	0.109	***	0.078		0.107	***
25+ but DK	-0.049		-0.06		-0.084	*
50+	0.11	***	0.033		0.146	***

Continued

Table A.2 Continued

	All workplaces		Public sector		Private sector	
Single independent establishment	0.018		0.041		0.018	
Foreign-owned	-0.056	*			-0.059	**
Family-owned	-0.021				-0.019	
Largest occupational group (ref: Professional)						
Associate Professional and Technical	-0.026		-0.077		-0.019	
Administrative and Secretarial	0.103	***	0.139	***	0.092	***
Skilled Trades	0.083	**	0.154	*	0.076	**
Caring, Leisure and Other Service	-0.067	***	-0.042		-0.066	**
Sales and Customer Service Occupations	-0.014		-0.08		-0.015	
Process, Plant and Machine Operatives	0.037		0.227	**	0.029	
Elementary Occupations	-0.008		0.074		-0.02	
Any recognised union	0.086	***	0.096	***	0.088	***
R-squared	0.253		0.42		0.234	
N workplaces	2,617		794		1,823	

Notes:

a. Models estimated using OLS.

b. Dependent variable: proportion older workers (aged 50 and over).

c. *** statistically significant at the one per cent level, **indicates statistically significant at the five per cent level, *indicates statistically significant at the ten per cent level.

Table A.3 Workplace characteristics associated with the proportion of older workers, 2011, regression results, employment weighted

	All workplaces		Public sector workplaces		Private sector workplaces	
Industry (ref: Manufacturing)						
E: Electricity, gas and water	0.007				0.012	
F: Construction	0.025		0.112		0.022	
G: Wholesale and retail trade	0.008		0.286		0.013	
H: Hotels and restaurants	-0.082	***	-0.056		-0.071	***
I: Transport and communications	0.028	*	-0.014		0.031	*
J: Financial services	-0.039	**			-0.031	*
K: Other business services	-0.016		-0.02		-0.01	
L: Public administration	0.029		0.018		-0.014	
M: Education	0.045	**	0.028		0.074	***
N: Health and social work	0.089	***	0.07		0.097	***
O: Other community services	-0.01		-0.004		-0.014	
Region (ref: South East)						
North East	-0.011		-0.018		-0.003	
North West	-0.046	***	-0.017		-0.054	***
Yorkshire and Humber	-0.011		-0.017		-0.007	
East Midlands	0.004		0.044		-0.004	
West Midlands	-0.003		-0.004		-0.002	
East of England	0.01		-0.016		0.019	
London	-0.048	***	-0.013		-0.056	***
South West	0.009		0.008		0.009	
Scotland	-0.02		0.057	**	-0.043	***
Wales	0.015		0.029		-0.004	
Private sector	0.005		-		-	
Workplace size (ref: 500+ employees)						
5-9	0.09	***	0.123	*	0.096	***
10-19	0.033	**	0.059	*	0.04	**
20-49	0.013		-0.015		0.028	*
50-99	0.028	**	0.014		0.036	**
100-499	0.03	***	0.015		0.042	***

Continued

Table A.3 Continued

	All workplaces		Public sector workplaces		Private sector workplaces	
Workplace age (ref: less than five years)						
5-9	0.019		-0.005		0.022	
10-24	0.046	***	0.011		0.049	***
25-49	0.071	***	-0.008		0.086	***
25+ but DK	0.038	*	0.001		-0.016	
50+	0.081	***	0.001		0.108	***
Single independent establishment	0.013		0.005		0.013	
Foreign-owned	-0.015				-0.013	
Family-owned	-0.014				-0.009	
Largest occupational group (ref: Professional)						
Associate professional and technical	-0.016		-0.053	**	-0.005	
Administrative and secretarial	0.043	***	0.055	**	0.033	*
Skilled trades	0.055	***	-0.044		0.054	***
Caring, leisure and other service	-0.054	***	-0.033	*	-0.062	***
Sales and customer service Occupations	-0.02		-0.041		-0.02	
Process, plant and machine operatives	0.038	**	0.141	*	0.032	*
Elementary occupations	0.000		0.074	**	-0.013	
Any recognised union	0.075	***	0.053	***	0.077	***
R-squared	0.26		0.182		0.263	
N workplaces	2,617		794		1,823	

Notes:

a. Models estimated using OLS.

b. Dependent variable: proportion older workers (aged 50 and over).

c. *** statistically significant at the one per cent level, **indicates statistically significant at the five per cent level, *indicates statistically significant at the ten per cent level.

Table A.4 Proportion older workers and market competition, private sector, 2011, regression results

	Private sector
Degree of competition (ref: neither)	
Very high	-0.009
High	-0.026
Low	-0.011
Very low	0.076
Not trading	-0.03
Extent to which demand is dependent on price(ref: where one equals not at all dependent on price)a:	
2	-0.005
3	-0.055**
4	-0.058**
5 = Heavily dependent	-0.061**
Extent to which demand is dependent on quality (ref: where one equals not at all dependent on quality)b:	
2	0.026
3	-0.015
4	0.009
5 = Heavily dependent	-0.024
R-squared	0.273
N workplaces	1,823

Notes:

a. Based on managers responses to the question, 'Looking at the scale on this card, to what extent would you say that the demand for your [main] product or service depends upon offering lower prices than your competitors?'. Responses can be given on a scale from one to five where one equals 'Demand does not depend at all on price' and five represents 'Demand depends heavily on offering lower prices'.
b. Based on managers responses to the question, 'To what extent would you say that the demand for your [main] product or service depends upon you offering better quality than your competitors?'. Responses can be given on a scale from one to five where one equals 'Demand does not depend at all on quality' and five represents 'Demand depends heavily on superior quality'.
c. Models estimated using OLS.
d. Dependent variable: proportion older workers (aged 50 and over).
e. Controls: all variables listed in Table A.2.
f. *** statistically significant at the one per cent level, **indicates statistically significant at the 5 per cent level, *indicates statistically significant at the ten per cent level.

Table A.5 Correlations between age-related policies and practices, 2011

	EO policy mentioning age	Monitor recruitment/ selection	Review recruitment/ selection	Monitor promotion	Review promotion	Review relative pay	Age important in recruitment	Special recruitment procedures
EO policy mentioning age	1.00							
Monitor recruitment/ selection	0.29	1.00						
Review recruitment/ selection	0.28	0.58	1.00					
Monitor promotion	0.22	0.52	0.57	1.00				
Review promotion	0.23	0.46	0.67	0.73	1.00			
Review relative pay	0.16	0.34	0.40	0.50	0.46	1.00		
Age important in recruitment	-0.09	0.05	-0.01	0.02	0.02	0.02	1.00	
Special recruitment procedures	0.06	0.08	0.13	0.11	0.13	0.10	0.01	1.00

Notes: All workplaces in 2011 with non-missing data on age (2,496 workplaces). Correlations are weighted.

Table A.6 Workplace characteristics associated with age-related policies and practices, 2011

	(1) EO policy mentioning age		(2) Number of EO practices		(3) Special procedures for older workers	
Industry (ref: Manufacturing)						
E: Electricity, gas and water	0.381		-0.183		-0.231	
F: Construction	-0.073		0.178		0.376	
G: Wholesale and retail	-0.414		-0.119		0.23	
H: Hotels and restaurants	-0.27		0.088		0.835	**
I: Transport and communications	-0.078		-0.331	**	-0.223	
J: Financial services	0.313		0.057		-0.217	
K: Other business services	0.057		-0.046		-0.086	
L: Public administration	0.882	*	1.489	***	0.412	
M: Education	-0.047		0.026		-0.354	
N: Health and social work	0.242		0.14		-0.002	
O: Other community services	0.009		0.152		-0.352	
Region (ref: South East)						
North East	0.286		-0.215		0.293	
North West	0.204		-0.058		0.878	***
Yorkshire and Humber	0.387	*	0.169		0.61	**
East Midlands	0.36		0.033		0.794	***
West Midlands	0.642	***	0.229		0.698	**
East of England	-0.502	***	-0.066		0.766	***
London	0.199		0.062		0.726	***
South West	0.611	***	-0.102		-0.156	
Scotland	0.665	***	0.079		0.808	***
Wales	0.203		-0.113		0.376	
Private sector	0.348		0.007		-0.318	
Workplace size (ref: 500+ employees)						
5-9	-1.041	***	-0.576	***	-0.029	
10-19	-0.93	***	-0.567	***	0.089	
20-49	-0.583	**	-0.635	***	0.106	
50-99	-0.498	*	-0.52	***	0.196	
100-499	-0.361		-0.378	**	0.31	

Continued

Table A.6 Continued

	(1) EO policy mentioning age		(2) Number of EO practices		(3) Special procedures for older workers	
Workplace age (ref: <5yr)						
5-9yr	0.002		-0.075		0.602	
10-24yr	0.213		0.092		1.08	***
25-49yr	0.006		-0.095		1.125	***
25+ but DK	0.387		0.277		0.573	
50+ yrs	0.177		-0.156		0.661	*
DK	0.513		0.759		0.577	
Single independent establishment	-0.593	***	-0.266	***	0.201	
Foreign-owned	0.15		0.012		-0.029	
Family-owned	0.092		-0.157	**	-0.367	**
Largest occupational group (ref: Elementary)						
Professionals	0.301		0.186		1.081	***
Associate professional and technical	0.183		0.181		0.467	
Administrative and secretarial	0.072		0.162		0.553	*
Skilled trades	-0.355		0.085		-0.297	
Caring, leisure and other service	0.418	*	0.14		0.73	**
Sales and customer service occupations	0.412	**	0.231		0.092	
Process, plant and machine operatives	0.109		0.115		0.38	
Any recognised union	0.572	***	0.668	***	-0.041	
Any team-working	0.621	***	0.309	***	0.614	***
Constant	-0.048		0.731	**	-4.305	***
R-squared			0.253			
N	2,531		2,467		2,540	

Notes:

a. Models (1) and (3) estimated using probit models based on a binary variable for whether the workplace has the policy/practice or not, model (2) is estimated using OLS where the dependent variable is a count of the number of practices at the workplace.

b. *** statistically significant at the one per cent level, **indicates statistically significant at the five per cent level, *indicates statistically significant at the ten per cent level.

Table A.7 Percentage of older workers and equal opportunities and age-specific recruitment practices, 2011, regression results

	No controls			Including controls		
	(1) All workplaces	(2) Public	(3) Private	(4) All workplaces	(5) Public	(6) Private
EO policy – does not mention age	-0.024	0.036	-0.043	-0.038	-0.094	-0.037
EO policy – mentions age	-0.053**	-0.037	-0.066***	-0.06***	-0.085	-0.061***
Number of EO practices	0.024***	-0.007	0.027***	0.01*	-0.01	0.015**
Age important in recruitment	0.012	-0.065	0.019	0.007	-0.046	0.011
Special recruitment procedures for older workers	0.038	-0.001	0.046	0.037	-0.03	0.063**
R-squared	0.023	0.03	0.031	0.275	0.466	0.273
N	2,503	734	1,769	2,440	721	1,719

Notes:

a. Models estimated using OLS.
b. Dependent variable: proportion older workers (aged 50 and over).
c. Controls: left-hand panel, no controls; right-hand panel, includes controls listed in Appendix Table A.2, as well as a variable for whether any of the workforce are employed in formally designated teams.
d. *** statistically significant at the one per cent level, **indicates statistically significant at the five per cent level, *indicates statistically significant at the ten per cent level.

Table A.8 Other workplace features associated with the proportion of older workers, 2011

	All		Public sector		Private sector	
Number of changes in 2 years prior to survey	-0.013	***	0.003		-0.015	***
Time to be able to do job as well as experienced employee (ref: one week or less)						
More than one week, up to one month	-0.047		-0.007		-0.043	
More than one month, up to 6 months	-0.053	*	-0.045		-0.037	
More than 6 months, up to one year	-0.045		-0.041		-0.032	
More than one year	-0.086	**	-0.078		-0.059	
Flexible working arrangements available	0.014		-0.023		0.004	
Proportion part-time employees (ref: none)						
Less than 10%	-0.01		-0.065		-0.002	
>10%<=25%	-0.025		-0.004		-0.033	
>25%<=50%	0		0.069		0.001	
>50%<=75%	-0.011		0.027		0	
>75%	0.019		0.041		0.01	
High H&S risk	-0.004		-0.01		0.003	
Low control over H&S risk	-0.028	*	-0.004		-0.032	**
Per cent workforce low-paid						
10% or more	-0.04	**	-0.125	***	-0.034	*
Prefers to recruit internally/externally (ref: no preference)						
Internal applicants preferred	0.008		0.011		0.005	
External applicants preferred	0.031		-0.149		0.035	
R-squared	0.307		0.505		0.335	
N	2,493		730		1,763	

Notes:

a. Models estimated using OLS.
b. Dependent variable: proportion older workers (aged 50 and over).
c. Controls: age-related policies and practices – as in Appendix Table A.6, workplace characteristics – as in Appendix Table A.2. For the private sector (third column), model also controls for the measures of market competition shown in Appendix Table A.4.
d. *** statistically significant at the one per cent level, **indicates statistically significant at the five per cent level, *indicates statistically significant at the ten per cent level.

Table A.9 Age-related practices in 2004 and change with the proportion of older workers 2004-2011, panel analysis

	No controls	Controlling for structural workplace characteristics	Controlling for workplace characteristics, practices and percentage of workforce aged 16-21
Number of EO practices	0.014	0.014	0.011
EO policy – does not mention age	0.018	0.018	0.011
EO policy – mentions age	0.019	0.020	0.001
Age important in recruitment	-0.023	-0.018	-0.020
Special recruitment procedures for older workers	0.020	0.002	0.005
R-squared	0.014	0.138	0.169
N	913	913	890

Notes:

a. Models estimated using OLS.
b. Dependent variable: change in proportion older workers (aged 50 and over). 2004-2011.
c. Controls: as in Appendix Table A.2. For the private sector (third column), model also controls for the measures of market competition shown in Appendix Table A.4.
d. *** statistically significant at the one per cent level, **indicates statistically significant at the five per cent level, *indicates statistically significant at the ten per cent level.

Table A.10 Employee perceptions of whether managers treat employees fairly, probit regression results

	Older workers		Younger workers	Workers aged 22-49
	Raw	Controls	Controls	Controls
EO policy – does not mention age	-0.169	0.008	-0.049	0.267**
EO policy – mentions age	-0.365***	-0.08	-0.035	0.216**
Number of EO practices	0.002	-0.009	-0.079	0.003
Age important in recruitment	0.161	0.190**	-0.13	0.127*
Special recruitment procedures	-0.11	-0.183*	-0.279	-0.032
N	6,550	6,550	819	13,085

Notes:

a. Models estimated using probit regression.
b. Dependent variable: Binary variable equals one where employee agrees/strongly agrees that managers at their workplace treat employees fairly and zero otherwise.
c. Controls: Employee characteristics: gender, occupation, qualifications, ethnicity, marital status, union membership, whether any dependent children, job tenure, contract type and hours worked. Workplace characteristics: workplace and organisation size, industry, largest occupational group, region, sector and whether any recognised union.
d. *** statistically significant at the one per cent level, **indicates statistically significant at the five per cent level, *indicates statistically significant at the ten per cent level.

Table A.11 Employees receiving at least one day of training in year prior to survey, probit regression results

	Older workers	
	Raw	Controls
EO policy – does not mention age	0.499***	0.232*
EO policy – mentions age	0.545***	0.209*
Number of EO practices	0.084***	-0.001
Age important in recruitment	-0.285***	-0.188**
Special recruitment procedures	0.07	0.007
N	6,605	6,602

Notes:

a. Models estimated using probit regression.
b. Dependent variable: Binary variable equals one where employee received at least one day of training in year prior to survey and zero otherwise.
c. Controls: Employee characteristics: gender, occupation, qualifications, ethnicity, marital status, union membership, whether any dependent children, job tenure, contract type and hours worked. Workplace characteristics: workplace and organisation size, industry, largest occupational group, region, sector and whether any recognised union.
d. *** statistically significant at the one per cent level, **indicates statistically significant at the five per cent level, *indicates statistically significant at the ten per cent level.

Table A.12 Log hourly earnings, by presence of age-related practices, older workers, regression results

	EO age policy	Monitor recruitment/ selection	Review recruitment/ selection	Monitor promotion	Review promotion	Review relative pay	Number of EO practices	Age important in recruitment	Special recruitment procedures	Number age-friendly practices
Raw	0.162	0.217**	0.262***	0.361***	0.303***	0.289***	0.090***	-0.327**	0.146*	0.084***
R-squared	0.011	0.041	0.058	0.087	0.063	0.044	0.09	0.028	0.004	0.094
N observations	1,342	1,310	1,305	1,247	1,277	1,307	1,211	1,342	1,339	1,208
Controls	0.004	0.052	0.075**	0.096*	0.065*	0.103**	0.030**	0.084	-0.002	0.027**
R-squared	0.661	0.663	0.665	0.667	0.665	0.665	0.669	0.662	0.667	0.674
N observations	1,342	1,310	1,305	1,247	1,277	1,307	1,211	1,342	1,339	1,208

Notes:

a. Models estimated using OLS with clustered standard errors.

b. Dependent variable: log hourly earnings.

c. Controls: from ASHE: gender, government office region, broad industry (7 groups), private sector, pay set with reference to a collective agreement, occupational group, hours worked, firm size, tenure; from WERS: workplace size, workplace age, whether single independent establishment, foreign-owned, family owned.

d. *** statistically significant at the 0.1 per cent level, **indicates statistically significant at the one per cent level, *indicates statistically significant at the 5 per cent level.

Table A.13 Log hourly earnings, by presence of age-related practices, workers aged 25 and under, regression results

	EO age policy	Monitor recruitment/ selection	Review recruitment/ selection	Monitor promotion	Review promotion	Review relative pay	Number of EO practices	Age important in recruitment	Special recruitment procedures	Number age-friendly practices
Raw	0.13	0.188*	0.151*	0.254***	0.180*	0.203**	0.064**	-0.093	-0.075	0.059**
R-squared	0.015	0.065	0.041	0.065	0.042	0.032	0.079	0.007	0.002	0.078
N observations	392	384	383	360	371	384	356	392	391	355
Controls	0.014	0.036	0.036	0.052	0.071	0.043	0.026	-0.024	0.061	0.025
R-squared	0.697	0.697	0.702	0.704	0.7	0.697	0.708	0.697	0.698	0.708
N observations	383	375	374	351	362	375	347	383	382	346

Notes:

a. Models estimated using OLS with clustered standard errors.

b. Dependent variable: log hourly earnings.

c. Controls: from ASHE: gender, government office region, broad industry (seven groups), private sector, pay set with reference to a collective agreement, occupational group, hours worked, firm size, tenure; from WERS: workplace size, workplace age, whether single independent establishment, foreign-owned, family owned.

d. *** statistically significant at the 0.1 per cent level, **indicates statistically significant at the one per cent level, *indicates statistically significant at the five per cent level.

Table A.14 Log hourly earnings, by presence of age-related practices, workers aged 26-49, regression results

	EO age policy	Monitor recruitment/ selection	Review recruitment/ selection	Monitor promotion	Review promotion	Review relative pay	Number of EO practices	Age important in recruitment	Special recruitment procedures	Number age-friendly practices
Raw	0.132	0.147*	0.170**	0.118*	0.072	0.091	0.042**	-0.317*	0.002	0.041**
R-squared	0.026	0.041	0.047	0.032	0.026	0.026	0.042	0.037	0.023	0.043
N observations	2833	2791	2786	2707	2725	2799	2649	2831	2825	2643
Controls	-0.115	-0.016	-0.038	0.004	-0.102**	-0.011	-0.014	-0.044	0.069	-0.013
R-squared	0.585	0.583	0.585	0.585	0.591	0.583	0.589	0.584	0.585	0.589
N observations	2,819	2,777	2,772	2,693	2,711	2,785	2,635	2,817	2,811	2,629

Notes:

a. Models estimated using OLS with clustered standard errors.

b. Dependent variable: log hourly earnings.

c. Controls: from ASHE: gender, government office region, broad industry (7 groups), private sector, pay set with reference to a collective agreement, occupational group, hours worked, firm size, tenure; from WERS: workplace size, workplace age, whether single independent establishment, foreign-owned, family owned.

d. *** statistically significant at the 0.1 per cent level, **indicates statistically significant at the one per cent level, *indicates statistically significant at the 5 per cent level.

A.2 Linking Annual Survey of Hours and Earnings and Workplace Employment Relations Survey in 2011

Of the 2,680 workplaces participating in the 2011 Workplace Employment Relations Survey (WERS), a total of 2,477 consented for their information to be linked to external data sources. Following the methodology used by Davies and Welpton (2008) in linking the 2004 WERS and Annual Survey of Hours and Earnings (ASHE), we match ASHE employees to 2011 WERS workplaces using a combination of the enterprise reference number and the postcode of the establishment. We are only able to do this for those workplaces which form part of the refreshment sample in WERS, due to differences in the enterprise reference details available for panel workplaces. This relates to the fact that the sample for the panel cases was drawn at the time of the 2004 WERS, whereas that for the refreshment sample was drawn at the time of the 2011 WERS. Davies and Welpton (2008) link the 2004 WERS cross-section to the 2004 ASHE, which is possible for 785 WERS workplaces. Of these, we find that 370 workplaces form part of the WERS 2004 to 2011 panel dataset, comprising 3,104 linked ASHE employee records. In the analysis presented in this draft report we focus purely on the link between the 2011 WERS and ASHE and thus on the refreshment sample only.

In all, we find ASHE employees in 575 WERS workplaces in 2011, around one-fifth of the original sample (Table A.15). A total of 4,600 ASHE records relate to these 575 workplaces. In 204 workplaces there is only a record for one ASHE employee, while in 109 workplaces there were more than ten ASHE employees in each workplace.

Table A.15 WERS workplaces matched to ASHE, 2011

	Number of workplaces	Per cent
Matched to ASHE record	575	21
Consented but no match	1,902	71
Did not consent	203	8
All workplaces	2,680	100
Number of ASHE observations among matched workplaces:		
1	204	35.5
2	92	16.0
3-5	109	19.0
6-10	61	10.6
More than 10	109	18.9
Total	575	100

As Davies and Welpton (2008) report for the link between the 2004 WERS and ASHE, workplaces with at least one employee in ASHE are more likely to be larger workplaces. We can also consider whether the sample of employees in our linked ASHE-WERS data are representative of the full ASHE sample for 2011. They are different on a number of characteristics, as demonstrated in Table A.16. To address this in our analysis, we derive an alternative set of weights which take account of the differences in key characteristics between the samples.[59]

Table A.16 Employee characteristics in linked ASHE-WERS and full ASHE sample, 2011

	ASHE 2011	ASHE-WERS
Percentage male	50.5	44.2
Mean age	40.4	41.7
Median age	41	42
Percentage full time	70.0	71.4
Mean hourly earnings (£)	14.20	17.70
Median hourly earnings (£)	10.92	14.44
Employer provided pension	47.9	76.4
Occupation:		
Managers, directors and senior officials	9.1	5.0
Professional	20.0	35.8
Associate professional and technical	13.4	14.1
Administrative and secretarial	12.4	13.0
Skilled trades	8.1	4.3
Caring, leisure and other service	9.7	13.7
Sales and customer service	9.1	3.9
Process, plant and machine operatives	6.0	2.9
Elementary occupations	12.3	7.3
Number of observations	182,827	4,600

Note: Estimates in both columns are weighted using the standard ASHE weight.

After applying our new weights, average hourly earnings in the matched ASHE-WERS sample are similar (both at the average and in the distribution) to the full ASHE sample for 2011 (Table A.17). They are also broadly similar for estimates of average earnings by age (Table A.18).

[59] This takes into account the following characteristics: gender, age, whether job is full-time, whether job is permanent, occupation, industry, public/private sector, region, any incentive pay, any employer pension contribution, firm size, hourly earnings, whether pay is set by a collective agreement, whether individual has more than one job.

Table A.17 Average hourly earnings (£) from ASHE and the linked ASHE-WERS, 2011

	ASHE 2011	ASHE-WERS
Mean hourly pay	14.20	14.06
Median hourly pay	10.92	11.09
Pay band (%):		
Less than £6	7.18	7.29
£6-10	37.28	34.79
£10-15	24.27	27.36
£15-20	13.91	13.99
More than £20	17.36	16.57
Number of observations	181,323	4,567

Note: the ASHE estimates presented in this table do not exclude employees whose earnings were affected by absence, however, we control for this in our regression analyses.

Table A.18 Average hourly earnings (£), by age band, 2011

	ASHE		ASHE-WERS	
	Mean hourly pay (£)	N observations	Mean hourly pay (£)	N observations
Age band:				
16-21	6.86	11,637	6.50	133
22-29	11.05	31,225	11.26	672
30-39	15.53	40,566	15.86	1,075
40-49	16.20	47,619	16.98	1,345
50-59	15.61	36,637	14.48	1,022
60 plus	13.48	13,639	13.21	320
All employees	14.20	181,323	14.06	4,567

Note: the ASHE estimates presented in this table do not exclude employees whose earnings were affected by absence, however, we control for this in our regression analyses.

A.3 Estimating the relationship between age composition of the workforce and workplace performance

This appendix provides further detail on the methodology underlying our analysis of the relationship between change in the age composition of the workforce and change in workplace performance. This analysis is based on the 2004-2011 panel of private sector workplaces within WERS. These workplaces had at least five employees in 2004 and 2011 when they were surveyed and were continuously trading throughout the period. We drop the small number of cases that switched into or out of the private sector between 2004 and 2011. We observe shifts in the share of older workers for workplaces that survived and were

sampled over the period 2004-2011.[60] We establish how these within-workplace movements in the share of older employees are linked to workplace performance, taking account of other time-varying features of the workplace such as workplace size and the age-related policies and practices deployed at the workplace.

Unless otherwise stated all analyses are survey weighted using workplace-level sampling weights which adjust for the probability of sample selection and adjust for non-response biases (see van Wanrooy *et al.*, 2013 for further details). The weighted data allow us to extrapolate the findings to the population from which the sample was drawn, namely private sector workplaces with five or more employees that survived the period 2004-2011.

A.3.1 Performance measures

As discussed in Chapter 5, workplace performance is measured in terms of labour productivity, the quality of goods and services produced, the workplace's financial performance, and quit and absence rates. The unweighted distributions for the three subjective measures of performance (labour productivity, quality of output and financial performance) and the additive scale are presented in Figure A.1. In the survey-weighted data, as in the unweighted data, there is substantial persistence in the performance of workplaces. Around two-fifths report no change between 2004 and 2011 relative to the industry average.[61] Nevertheless there is substantial movement among the remainder with around one-third reporting a deterioration in performance on all three measures and around one-quarter reporting improvement relative to the industry average. The merit of the additive scale is that there is greater variance in performance outcomes, with only 22 per cent of the weighted sample reporting no movement over the period 2004-2011.

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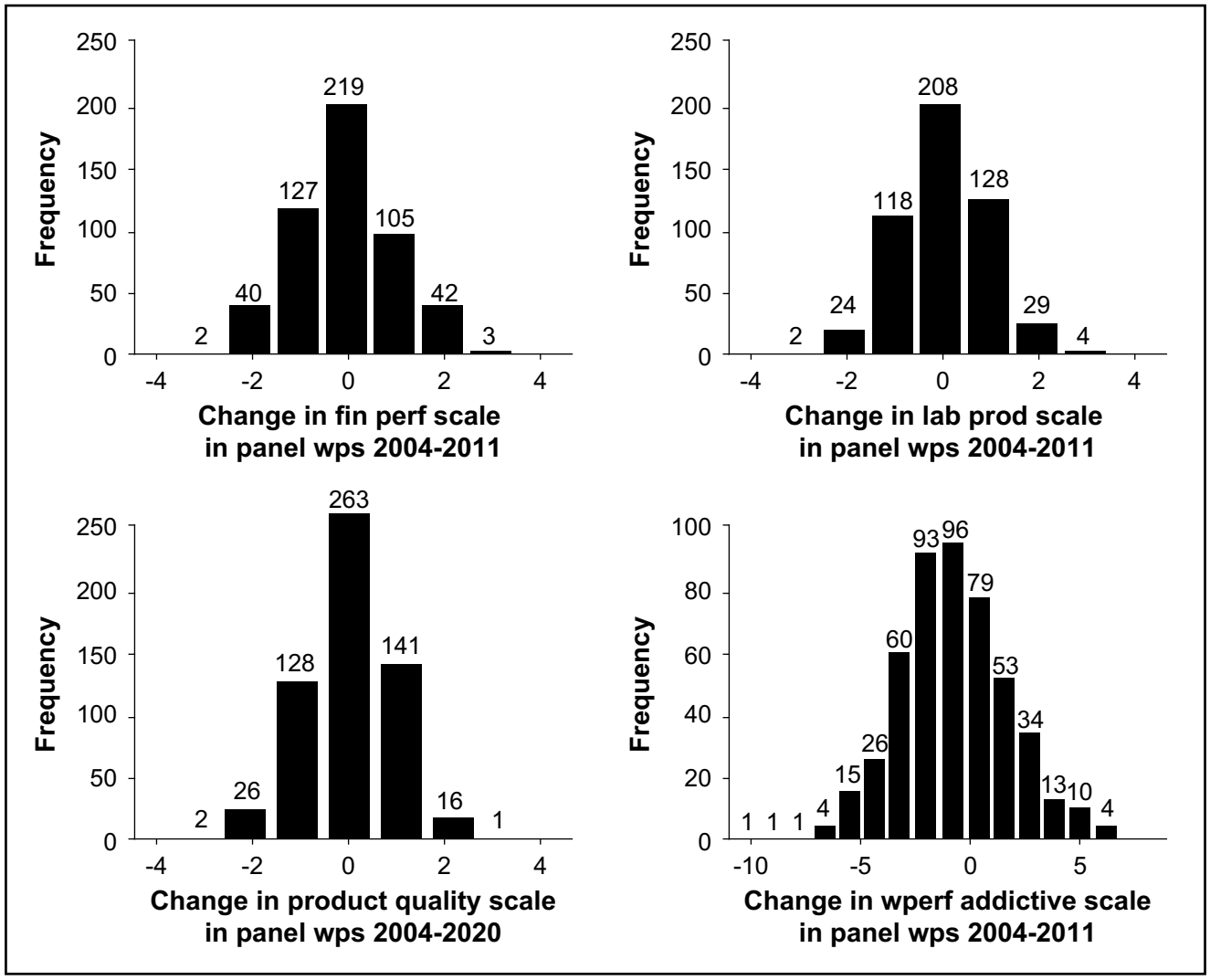
60 We are able to observe whether workplaces surveyed in 2004 had closed by 2011. We ran models predicting the likelihood of closure with 2004 workplace co-variates including age shares and age diversity. Age diversity in 2004 was not predictive of closure by 2011. Nor was the proportion of older workers in the workplace relative to the proportion of prime-age workers. However, a higher proportion of older workers in 2004 was associated with a higher closure probability by 2011, relative to having a higher share of young workers (aged below 22 years). The share of older workers relative to prime age workers was not a significant predictor of closure. Thus, although the age profile of employees in 2004 resulted in a non-random subset of workplaces surviving throughout the period 2004-2011 this appears unrelated to the negative association between growth in the share of older workers relative to prime age workers and declining labour productivity in surviving workplaces.

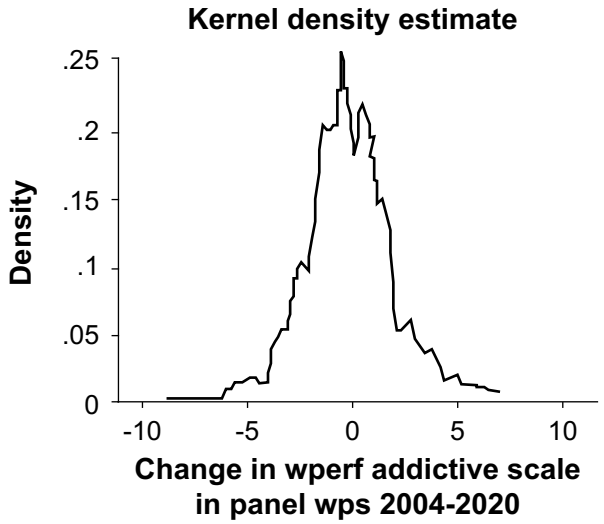
61 In the case of financial performance the percentage is 45 per cent, for labour productivity it is 40 per cent and for quality of output it is 43 per cent.

Figure A.1 Within-Workplace Changes in Workplace Performance (unweighted number of workplaces), 2004-2011, Panel Survey, Private Sector

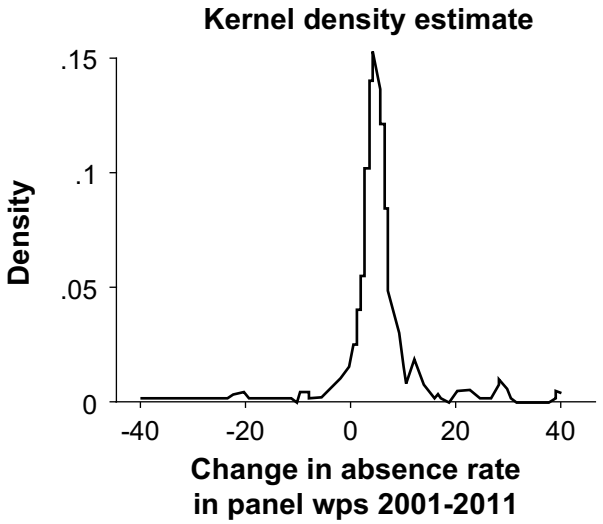


The distribution of within-workplace changes in absence and quit rates is presented in Figure A.2, together with the workplace performance additive scale (for completeness), using survey-weighted data. Mean annual absence rates among the private sector workplaces in the WERS panel rose from 3.8 to 4.5 per cent of working days between 2004 and 2011, but the median within-workplace change is zero. Those at the 90th percentile of the absence change distribution experienced an increase in absence rates of eight percentage points, while those at the 10th percentile experienced a reduction of four percentage points. The mean quit rate among panel private sector workplaces fell from 17.6 per cent in 2004 to 11.6 per cent in 2011, perhaps in response to limited outside options post-recession. But the median difference was -2.3 percentage points.

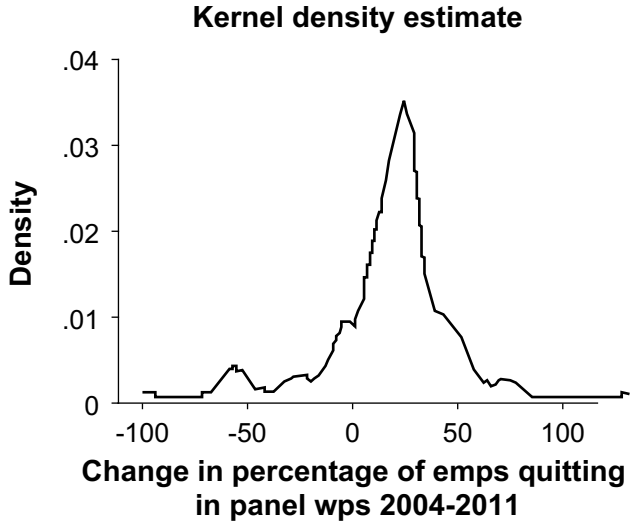
Figure A.2 Within-Workplace Changes in Additive Workplace Performance, Absence Rates and Quit Rates (weighted), 2004-2011, Panel Survey, Private Sector



Kernel = epanechnikov, bandwidth = 0.3866



Kernel = epanechnikov, bandwidth = 0.6272



Kernel = epanechnikov, bandwidth = 3.0798

A.3.2 Age measures

The analyses use two age-related measures: the share of employees in one of three age brackets (50 or more, under 22 and those aged 22-49 years) and the Herfindahl index based on the number of age categories used to distinguish employees on the age dimension, and the proportion of the workforce that falls into each category. The Herfindahl index is calculated as follows:

(1-((shareold*shareold)+(shareyoung*shareyoung)+(sharemid*sharemid)))

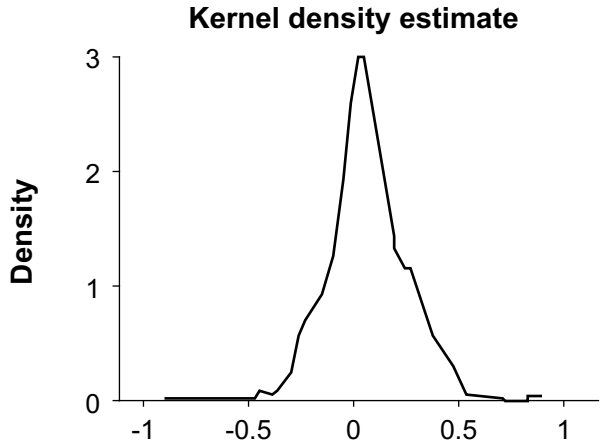
where ‘shareold’ is the share of employees in the workplace aged 50 or more, ‘shareyoung’ is the share aged between 16 and 21, and ‘sharemid’ is the share aged 22-49 years.

The index has a minimum value of 0 if there is only one category represented within the workplace and, in the case with three categories, a maximum value 0.667 if all categories are equally represented.

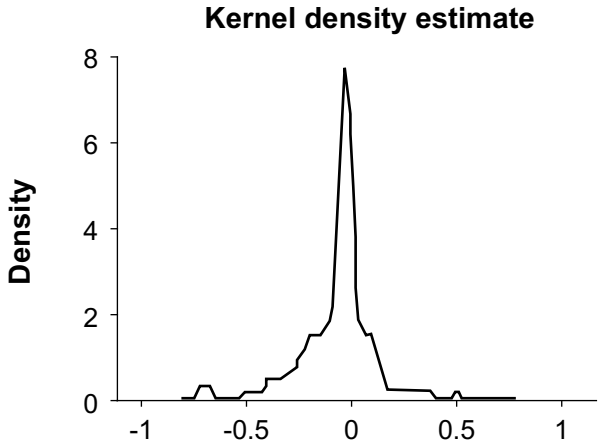
In 2004 the workplace mean share of older workers employed in the panel of workplaces was 0.19. This had risen to 0.25 by 2011. The median workplace in the distribution of the change in the share of older employees witnessed an increase of 4.3 percentage points in the share of older workers at the workplace. The workplace mean for the share of young workers at the workplace fell marginally (from 0.14 to 0.11). At the median the change was zero. The top two panels of Figure A.3 indicate much more dispersion in the change in older employee shares at workplaces compared to the fairly compressed dispersion of change in the share of young employees.

Mean age diversity was roughly constant (0.39 in 2004 and 0.41 in 2011) but, as the bottom panel of Figure A.3 indicates, there is substantial variance in the change in age diversity within workplaces over time with the distribution skewed somewhat to the right.

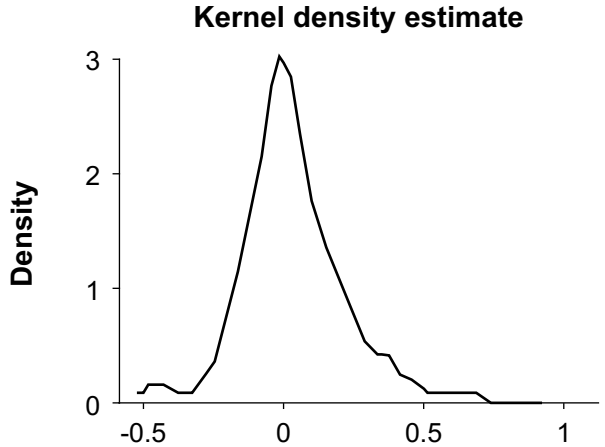
Figure A.3 Within-Workplace Changes in Age Shares and Age Diversity (weighted), 2004-2011, Panel Survey, Private Sector



Kernel = epanechnikov, bandwidth = 0.0357



Kernel = epanechnikov, bandwidth = 0.0194



Kernel = epanechnikov, bandwidth = 0.0346

A.3.3 Estimation

We estimate first difference panel models which simply regress changes in our performance measures for workplace i (Δp_i) on changes in age shares (ΔS_i) – with the share aged 22-49 years omitted as the reference category – change in age diversity (ΔD_i), and other time-varying workplace-level covariates captured in the vector ΔX_i.[62] This vector consists of: change in the total number of employees at the workplace, the share female, gender diversity, the share non-white, the share part-time, the share in the largest non-managerial occupational category, the per cent union membership. In addition the vector contains variables capturing change in the age-related policies appearing in the analysis reported in Appendix Table A.6. These are four dummy variables identifying the presence of an equal opportunities policy mentioning age, equal opportunities policies that do not mention age, having special recruitment procedures for older individuals, age being an important consideration in recruitment decisions, and the five point equal opportunities index identifying the degree to which the workplace monitors and reviews age-related practices in relation to hiring, pay and promotion.

Controlling for changes in other aspects of workforce composition helps capture the relationship between changes in performance and age-related changes, thus helping to tackle any biases in the age-performance relationship that might occur through the omission of other workforce composition changes.[63] Changes in union density are controlled for because these are known to affect workers' bargaining power which, in turn, can affect workplace performance.

The inclusion of changes in age-related policies and practices is motivated by the idea, referred to in some of the literature reviewed in Chapter 5, that effective policies can help ameliorate some of the potential adverse consequences associated with increased age diversity or a shift towards the employment of older workers. We experiment with their inclusion and exclusion to see whether their inclusion affects the coefficients on our key variables of interest, namely the age share and age diversity measures.

The baseline model (1) therefore takes the following form where beta is the coefficient for the age shares, delta is the coefficient for age diversity and the thetas are the coefficients for the control vector variables:

$$\Delta p_i = \beta \Delta S_i + \delta \Delta D_i + \theta \Delta X_i + \epsilon \qquad (1)$$

ϵ is the error term.

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62 In a two-period model such as ours first difference and workplace fixed effects models are identical.

63 Of course, it is possible that there are changes in other aspects of workforce composition that we do not control for here (such as changes in the proportion of non-UK nationals, for example).

The above models are run on data collected solely from HR managers. As such they rely solely on the management questionnaire data. However, in the majority of cases the data also contain information from sampled employees of those workplaces which we are able to link to the workplace which employs them. In these cases we can use these data to create workplace-level means, thus enriching our analyses by taking account of time-variance in other employee traits which might, if excluded, confound the relationship we are trying to identify between changes in age shares and diversity and workplace performance. This vector of workplace mean variables constructed from employee responses is identified in equation (2) below as $\Delta\overline{E}_\iota$ denoting change in the workplace means. These variables are simply added to model (1) thus:

$$\Delta p_\iota = \beta\Delta S_\iota + \delta\Delta D_\iota + \theta\Delta X_\iota + \gamma\Delta\overline{E}_\iota + \epsilon \qquad (2)$$

We have incorporated three such variables, namely mean hourly pay at the workplace, mean job satisfaction and mean job-related anxiety. Mean hourly pay is incorporated to account for any differential shift in labour costs which results from changes in the age composition of the workforce: comparing equation (1) with equation (2) can therefore, at least in principle, help identify whether any performance effects of age changes are amplified or nullified by changes in labour costs. The incorporation of mean worker wellbeing variables is motivated by the possibility that an older workforce may be 'happier' than a younger workforce which can lead to increased workplace performance, as discussed earlier. In sensitivity checks we also controlled for change in mean workplace tenure, mean training duration and mean highest academic qualifications. None were statistically significant and they had no effect on the age-related coefficients so they were omitted from our preferred specifications.

In addition to these models with controls we present raw correlations excluding controls for comparison purposes. We have experimented with other model specifications. These include models containing only age shares, age shares plus age diversity, and employment size. But the results presented in the report were robust to these alternative specifications.

The great advantage of a panel first difference model compared to cross-sectional estimates is that the panel estimator nets out unobserved fixed differences across workplaces that might otherwise bias our estimates of the relationship between the age variables and workplace performance. It does so by focusing solely on that part of the variance within workplaces, thus ignoring variance across workplaces. Although we have incorporated a number of items capturing time-varying covariates our estimates remain vulnerable to omitted time-varying variables that are correlated with performance and age shares and age diversity. Furthermore, our estimates are unable to account for the potentially endogenous nature of change in the age composition of the workforce. However, we do test for reverse causation by regressing change in age composition between 2004 and 2011 on performance in 2004. In these tests workplace performance in 2004 is not predictive of age shares or age diversity in 2011, nor changes in age-related variables.

Finally we supplement our first difference models with models estimating performance in 2011 as a function of baseline covariates measured in 2004. These models incorporate a rich array of 2004 covariates[64], together with age shares in 2004 and age diversity in 2004, to see whether these are correlated with performance in 2011. Variants of these models also incorporate a lagged dependent variable.

A.3.4 Results

Tables A.19 to A.24 report first difference models for each of the six dependent variables respectively namely labour productivity, quality of output, financial performance, the additive performance scale for these three items, quit rates and absence rates. Each table reports four models. Model (1) contains only the age share and age diversity models without controls. Model (2) incorporates the controls from the management respondent as per equation (1) above. Models (3) and (4) are run on the smaller sample which contains employee-level data too. Model (4) incorporates mean hourly earnings, mean job satisfaction and mean job-related anxiety taken from employee responses, as per equation (2). Model (3) is run on the same sample as model (4) but is confined to the management survey data. A comparison of the coefficients for the age-related variables in Models (2) (3) and (4) allows us to establish whether changes in those coefficients across the models are related to the introduction of the additional controls from the employee data or the reduction in the sample size which occurs when linking the employee data to the management data.

Throughout only the coefficients for the age-related variables are presented. Full models are available on request.

Table A.19 Change in labour productivity, 2004-2011

	Model 1	Model 2	Model 3	Model 4
∆ Share 50+	-0.774**	-0.796**	-2.836*	-2.817*
∆ Share 16-21	-1.248***	-1.408***	-3.487**	-3.491**
∆ Age diversity	0.737	0.995*	0.498	0.574
Management controls	No	Yes	Yes	Yes
Employee Controls	No	No	No	Yes
R-sq	0.025	0.118	0.208	0.212
Observations	411	411	300	300

Notes:

a. Models estimated via first differences.
b. Controls from management survey: number of employees; share female; gender diversity; share non-white; share part-time; share in largest occupational group; union density; number of age-related EO practices; EO policy mentioning age; EO policy not mentioning age; age important in recruitment; special procedures for recruiting older workers.
c. Controls from employee survey: mean hourly wage; mean job satisfaction; mean job-related anxiety.
d. Significance: *** p<0.01, ** p<0.05, * p<0.10.

[64] These are: single digit industry; region; workplace size; single-establishment firm; age of establishment; share female; gender diversity; share non-white; share part-time; share in largest non-managerial occupational group; union density; and the five age-related policy and practice variables referred to above.

Table A.20 Change in quality of output, 2004-2011

	M1	M2	M3	M4
Δ Share 50+	-0.38	-0.428	-1.149	-0.994
Δ Share 16-21	-0.252	-0.319	-0.044	-0.094
Δ Age diversity	-0.026	0.05	0.714	0.656
Management controls	No	Yes	Yes	Yes
Employee Controls	No	No	No	Yes
R-sq	0.01	0.09	0.081	0.106
Observations	411	411	300	300

Notes: See Table A.1.

Table A.21 Change in financial performance, 2004-2011

	M1	M2	M3	M4
Δ Share 50+	0.006	0.186	-1.511	-1.459
Δ Share 16-21	-0.182	0.079	-2.315*	-2.325*
Δ Age diversity	0.259	0.197	0.248	0.414
Management controls	No	Yes	Yes	Yes
Employee Controls	No	No	No	Yes
R-sq	0.002	0.057	0.164	0.187
Observations	411	411	300	300

Notes: See Table A.1.

Table A.22 Change in additive performance scale, 2004-2011

	M1	M2	M3	M4
Δ Share 50+	-1.016	-0.91	0.918	1.281
Δ Share 16-21	-1.604*	-1.578*	-0.504	-0.545
Δ Age diversity	0.827	1.094	0.572	0.22
Management controls	No	Yes	Yes	Yes
Employee Controls	No	No	No	Yes
R-sq	0.011	0.081	0.127	0.189
Observations	411	411	241	241

Notes: See Table A.1.

Table A.23 Change in quit rate, 2004-2011

	M1	M2	M3	M4
Δ Share 50+	-11.684	-7.573	-8.859	-9.623
Δ Share 16-21	21.456	20.537	13.191	13.691
Δ Age diversity	5.003	3.958	18.254	16.471
Management controls	No	Yes	Yes	Yes
Employee Controls	No	No	No	Yes
R-sq	0.037	0.134	0.157	0.193
Observations	479	479	275	275

Notes: See Table A.1.

Table A.24 Change in absence rate, 2004-2011

	M1	M2	M3	M4
Δ Share 50+	1.016*	1.027*	0.889	0.997
Δ Share 16-21	-0.181	-0.164	-0.662	-0.548
Δ Age diversity	-0.978*	-0.844	-0.843	-0.831
Management controls	No	Yes	Yes	Yes
Employee Controls	No	No	No	Yes
R-sq	0.034	0.071	0.15	0.19
Observations	393	393	229	229

Notes: See Table A.1.

Table A.25 Performance outcomes in 2011 (no lagged dependent variable)

	Labour Prod.	Quality	Fin. Perf.	Additive Perf. Scale	Quits	Absence
2004 Share 50+	-0.5	-0.291	-0.721*	-1.512*	-6.594	-2.385*
2004 Share 16-21	-0.04	-0.232	0.327	0.056	1.671	-2.452*
2004 Age diversity	0.259	0.138	0	0.397	-16.661	1.993
Controls?	Yes	Yes	Yes	Yes	Yes	Yes
R-sq	0.197	0.219	0.168	0.19	0.324	0.191
Observations	459	459	459	459	435	402

Notes:

a. Ordinary Least Squares estimates for 2011 outcomes.
b. 2004 baseline controls: number of employees; share female; gender diversity; share non-white; share part-time; share in largest occupational group; union density; number of age-related EO practices; EO policy mentioning age; EO policy not mentioning age; age important in recruitment; special procedures for recruiting older workers; single-establishment organisation; industry; region; age of establishment.
c. Significance: *** p<0.01, ** p<0.05, * p<0.10.

Table A.26 Performance outcomes in 2011 (with lagged dependent variable)

	Labour Prod.	Quality	Fin. Perf.	Additive Scale	Quits	Absence
Share 50+	-0.458	-0.18	-0.552	-1.002	-4.608	-2.16
Share 16-21	0.012	-0.238	0.421	0.379	1.03	-2.008
Age diversity	0.248	0.171	-0.011	0.375	-19.178*	1.972
Controls?	Yes	Yes	Yes	Yes	Yes	Yes
R-sq	0.201	0.261	0.22	0.252	0.345	0.265
Observations	459	459	459	459	417	339

Notes: See Table A.7.

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