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Impact of Poor Basic Literacy and Numeracy on Employers

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Summary

This report presents the findings of a study to estimate the economic impact of poor basic skills on workplace performance. The study, undertaken by Ipsos MORI Social Research Institute in partnership with the National Research and Development Centre for Adult Literacy and Numeracy (NRDC) at the Institute of Education, aims to address the lack of evidence on the prevalence of poor basic skills in the workplace and its impact, as well as the costs and benefits associated with public-funded basic skills training.

Successive UK governments have focused on addressing basic skills deficit in the workforce in recognition of the economic and wider public benefits. However, much of the research evidence on the impact of basic skills interventions has focused primarily on employees' basic skills levels[1] rather than on the impact of these skills on employers. There is little reliable evidence on the scale of costs resulting from basic skills deficits in the workplace. Where research has been undertaken in this field, it has focussed on the routes through which employers might incur costs rather than attempting to estimate them. This study aims to bridge the evidence gaps by drawing on both primary and secondary data sources including:

- A **comprehensive literature review** of qualitative and quantitative evidence on the prevalence and costs of poor basic literacy and numeracy in the workforce, and the range impact to employers from providing workplace basic skills training.
- A **nationally representative survey of 4,234 workplaces in England** to estimate the prevalence of poor basic skills in the workplace, and a **survey of 4,239 workplaces that have delivered public-funded basic skills training** to estimate the costs and benefit of the training[2]. Where permission was given, the survey responses were augmented by observations on turnover and employment taken from the Business Structure Database held within the ONS Virtual Micro-data Laboratory.

[1] For example, the OECD Programme for the International Assessment of Adult Competencies (PIAAC).
[2] Though it should be noted that the large majority of these workplaces were delivering basic skills training as part of an Apprenticeship which posed challenges in terms of isolating the impact of the basic skills training – this is discussed in detail in sections 3.2 and 5.2.

- **In-depth follow-up case studies** which combine participant observation and employer and employee interviews at nine workplaces.

Prevalence of poor basic skills in workplaces

There is a lack of consensus on how to define (and, therefore, measure) literacy and numeracy needs and deficits within a workplace context. Employers often view employees' skills as a holistic group of functional and social skills of which literacy and numeracy are only two components. This research attempted to address this conceptual issue by moving away from abstract, broad-brush notions of literacy and numeracy and, instead, focused on specific real-world examples of work-based activities[3]. In this way, respondents would be encouraged to think about the use of literacy and numeracy within their workplace. One in eight (12%) workplaces in England report a literacy and/or numeracy gap whereby at least one member of staff is unable to perform certain literacy or numeracy tasks to the level required in their day-to-day job. More workplaces report a literacy gap than numeracy gap (8.6% vs 6.6%). Only 3.2% of workplaces report a deficit in both.

However, evidence from the case studies suggests that **the prevalence of basic skills deficits in England may be understated** for a number of reasons.

Firstly, a number of the employers interviewed for the case studies have **poor understanding of the basic skills elements within the tasks that their employees carry out.** For example, during the case study interviews it was common for employers to begin by asserting that their employees had the basic skills needed for their jobs. However, as the interviews progressed, examples of basic skill gaps started to emerge. **Employers also have poor awareness of the literacy and numeracy gaps within their workforce and, by implication, the impact of such gaps on their own workplace performance**. There is limited evidence from the case studies of employers requiring certain qualifications to verify levels of literacy and numeracy or of the mapping of these to job roles. Instead, for roles which involve specific literacy or numeracy tasks, employers

[3] A total of seven literacy and numeracy tasks were devised based on the literature review. These were: 1) Fully understand written procedures; 2) Complete day-to-day paperwork without errors; 3) Respond in writing; 4) Communicate verbally with clients, colleagues or subcontractors; 5) Spot numerical error; 6) Perform simple arithmetic/calculations; and 7) Use numerical data or information correctly in day-to-day activities.

created and used their own assessment tools as part of the recruitment process. In some cases they also assumed a certain level of literacy and numeracy had been achieved by potential recruits through vocational or professional qualifications that they hold. These findings are consistent with the survey results which show that **the majority of workplaces (56%) do not specify minimum levels in English or maths in their recruitment**. In addition, a sizeable minority (43% of workplaces) do not undertake an annual performance review for all their staff which point to **a lack of effective mechanisms to measure and monitor basic skills in the workplace**.

Secondly, the case studies also suggest that, **in the modern workplace limitations to employees' numeracy and literacy are masked by the use of ICT interventions**, such as software packages that help with account management, and templates for written correspondence. There was also evidence of use of **informal solutions such as peer support.**

These practices allow employers to compensate for deficits without having to explicitly tackle any training needs that employees might have. Indeed **two thirds of workplaces with a reported basic skills gap do not provide basic skills training**.

What's more, work processes designed to compensate for, or mask, literacy and numeracy deficits among employees may contribute to skills decline and poor take up of training opportunities by reducing the demands on employees' skills and their motivation to improve them.

Impact of basic skills deficits in the workforce

Workplaces with basic skills gap report a range of costs to their business with efficiency-related costs being most common: between a third to a half of employers with a basic skills gap reported an **increase in the number of errors made by staff**, a **constraint on the introduction of new and/or more efficient processes**, and/or a **reduction in product or output quality**.

The case study evidence identified the **primary impact of basic skills deficits in the workplace to be on its flexibility**, both in regard to the ability of that employer to adapt to changes in the market, especially those related to adoption of new technologies, and to adequately meet the needs of the full range of customers and clients.

A number of analyses were conducted to explore the strength of the relationship between basic skills deficiencies amongst employees and firm-level productivity[4] controlling for influential factors such as industry sector, type of organisation, firm size including composition of full-time and part-time employees. Overall no statistically significant relationship was detected. This finding is consistent with the broad results of the survey: low proportions of employers (12%) reported a gap in basic literacy or numeracy, with fewer still (8% of all employers) reporting that those gaps caused material impacts on the performance of their workplace. As such, the aggregate effect of these skills deficits might be expected to be of insufficient magnitude to be detectable through econometric analysis.

There are a number of possible explanations for this finding. As already highlighted, some employers have been able to mitigate against the impact of poor literacy and numeracy through use of ICT interventions and informal solutions and strategies such as peer support to reduce the extent to which these skills are required to complete many processes. The results also need to be taken in the context of prevailing labour market conditions. The survey was undertaken in late 2012, at a time when unemployment remained high relative to pre-recession levels meaning employers may have been more able to place workers with literacy and numeracy deficits in occupations where these skills are not required or have limited impact on efficiency or profitability.

Finally, failure to observe statistically significant effects at a firm level does not necessarily imply that there are no economic costs associated with poor basic skills in the workforce. For example, research suggests that employees with basic skills deficits may receive lower wages (e.g. Bassi, 1995; Ananiadou, 2003). Furthermore, if such deficits were to be addressed, the workers involved might be redeployed in higher value processes, leading in the longer term to an expansion in total output (i.e. GVA - Gross Value Added). However, the benefits of doing so may not accrue to the employers concerned (particularly if they have compensated for skills deficits through investment in

[4] The study was constrained to a proxy measure of productivity (turnover per worker). While this measure captures any direct effects of basic skills deficits on sales (potentially mediated through inefficiency in production, low product quality or poor customer service), it does not capture any effects driven by increased production costs. Such costs might emerge if basic skill deficits cause wastage in production processes or through greater requirements to invest in training. See section 3.2 for further discussions on methodological issues.

technology) as workers may need to move elsewhere to exploit these skills. If this is the case, incentives for employers to invest in basic skills training may not always be strong.

Prevalence of basic skills training

Nationally, 15% of workplaces report that they have provided basic skills training over the past year. The majority of workplaces with a reported basic skills gap (68%) do not provide basic skills training. Furthermore, the case studies did not identify formal basic skills training as a priority for employers or for employees.

The primary reason for not providing basic skills training (cited by 90% of employers who do not provide training) is that they **do not have basic skills needs** in the workforce. This reason was also cited by seven in ten employers who reported a basic skills gap in their workforce, further reinforcing the case study evidence that many modern workplaces are addressing the limitations to employees' numeracy through the use of ICT and informal solutions and strategies, including shadowing, peer support and scaffolding[5]. This system is seen as adequate to cover the deficits, but the more informal elements can also be precarious where higher skilled staff are not always present.

Impact of public-funded basic skills training

Employers that have delivered public-funded basic skills training to employees report a number of **business** benefits (though this may be conflated with the Apprenticeship training); the most commonly cited benefits are: a reduction in the number of errors made by the workforce (cited by 63%), an increase in the organisation's capacity to meet statutory and industry requirements (58%); being able to introduce more efficient or new processes (52%); and being able to produce higher quality products (51%).

In addition, these employers also report benefits for their **employees** following the public-funded basic skills training: 64% say they see an improvement in employees' ability to perform and complete job tasks; a similar percentage (64%) report an improvement in employees' ability to work independently; 55% cited employees' ability to work in teams; and 42% see an improvement in employees' abilities to use technology.

[5] The use of systems or processes that allow employers to reduce their requirements for higher level skills.

In terms of costs, half (52%) of employers indicated that they provided staff to cover the work of **all** employees receiving basic skills training, incurring financial costs through paying additional wages.

Further econometric analysis was undertaken to estimate the impact of basic skills training on: (i) the prevalence of basic skills deficits, and (ii) firm performance. This research focused on the impact on workplaces only and does not measure any benefits to individual learners.

For both analyses, no statistically significant relationship was detected. These results are consistent with the low levels of training provided in the workplace – on average, 2.4% of employees per workplace completed basic skills training.

The estimations of the impact of basic skills training may also be biased by the lack of an isolated training intervention – 97% of workplaces offering public-funded basic skills training were doing it as part of an Apprenticeship and it is possible that these employers may not perceive the basic skills element as necessary meaning that the econometric analysis could be looking for an impact within a much smaller group of learners with an actual need for the training. Linked to this, the survey data suggests that employers' motivations for providing training are more complex and the natural assumption of a direct relationship between training/education and competencies do not always hold true. For example, 83% of employers who provide public-funded basic skills training do so as a benefit to staff; less than half said the training was implemented to reduce waste and low productivity; and only 20% said the training was offered specifically as a result of skills deficiencies in the labour market.

Finally, as already discussed, employers may also be mitigating the impact of poor levels of basic skills within the workforce through use of technology and informal solutions and strategies.

Among the workplaces that do offer training to improve skills, it is possible that some positive impact is felt by them. This study sought to value this benefit for a single year. However, skills and training impacts represent a dynamic and ongoing relationship which is more readily observed using longitudinal data. Any impact of training will likely

be felt over an extended period. For example a study commissioned by BIS[6] suggested that every £1 spent on apprenticeship funding delivered a benefit (NPV) of £35-£40 over the working life of the employee. Given the low numbers receiving basic skills training (as part of an Apprenticeship), and the long-term nature of predicted benefits, the magnitude of any impact over the course of a year[7] could be very small indeed.

The ability to estimate this relationship would likely be improved with repeated observations over time – allowing for additional econometric techniques to be used that improve the accuracy of results – allowing for a more detailed picture of changes occurring over time in specific industries, sectors, or even specific employers.

Conclusions

Evidence from the case studies suggest that some employers may be underestimating the extent of their basic skills gaps, which could point to a lack of effective mechanisms to measure and monitor basic skills in the workplace. A recurring theme from the case studies was that some employers have a very narrow understanding of literacy and numeracy in relation to job roles and requirements and business performance. In order to better understand and support their employees in meeting the literacy and numeracy demands of the workplace, **employers need support in understanding the literacy and numeracy components of workplace tasks.**

Some employers make use of low cost and informal mechanisms, like scaffolding of tasks or explicit on-the-job training, in order to diminish the impact of poor skills. Informal solutions such as shadowing, scaffolding and peer support allow some firms to compensate for deficits without having to explicitly tackle any training needs that employees might have. However, there were also examples of employers using these methods to develop employees' skills as well as to compensate for deficits, and there is **a need to study these types of collaborative workplace practices in more detail.** The case studies have highlighted that this level of detail is vital for a fuller understanding of the impact of poor literacy and numeracy in the workplace.

[6] BIS Research Paper No. 38 – Measuring the Economic Impact of Further Education; March 2011.
[7] The time period selected in the current study.

The majority of employers (85%) do not provide any form of basic skills training, with the majority (90%) saying that they have no need for it. **The low number of staff undertaking public-funded basic skills training** (an average of 2.4% of employees per workplace) **and as part of an Apprenticeship means that such training may not be a vehicle for affecting a significant change in workplace performance;** as stated this research does not assess the impact of basic skills training on individuals and the wider economy.

The case study evidence suggests that the supply of training needs to be more closely aligned with the demands of the workplace. **There was little evidence that firms were interested in helping their employees' to gain a formal qualification, except where that qualification was deemed to have an external currency**. Many employers appear to feel that scaffolding of literacy and numeracy tasks and/or informal skills development between colleagues was a more appropriate solution. Further research could be done to **investigate the characteristics of organisations making use of these techniques, and identify factors influencing their impact on reducing or sustaining literacy and numeracy deficits**. The adoption of peer-learning and other informal techniques, in tandem with formal training via the Apprenticeship programme, may be a more effective vehicle for affecting widespread improvements in workplace performance.

1. Introduction

This report presents the findings of a study to estimate the impact of poor basic literacy and numeracy on employers in England. The study, undertaken by Ipsos MORI Social Research Institute in partnership with the National Research and Development Centre for Adult Literacy and Numeracy (NRDC) at the Institute of Education, brings together evidence from multiple sources including: a comprehensive literature review, a nationally representative survey of 4,234 workplaces in England, a survey of 4,239 workplaces that have delivered public-funded basic skills training and detailed case studies with employer and employees in nine workplaces.

This chapter first details the background to the study. The research aims and objectives are then discussed, prior to the chapter outlining the methodology used for the study.

1.1 Policy context

Basic skills deficits in England and the UK

Successive UK governments have focused on addressing basic skills deficit in the workforce in recognition of the economic and wider public benefits. Since the late 1960s, advances in technology and globalisation have led to major changes in the workplace and a move towards a more skills-based economy in England, resulting in a greater demand for workers to possess at least basic level skills in English and maths (e.g. Levenson, 2004; Hoyles et al, 2002).

The Moser Report[8], commissioned by the Labour government to tackle the *"vast basic skills problem in this country",* states that the minimum basic skill levels required by adults to function in work and society were Level 1 literacy and Entry Level 3 numeracy. The government responded by launching the *Skills for Life* strategy. When the strategy was launched in 2001, free literacy, language and numeracy training was made available to all adults without a Level 2 qualification (equivalent to a GCSE at A* - C). As part of the *Skills for Life* strategy, a nationwide survey of basic skills (Skills for Life Needs and Impact Survey) was published in 2003; the survey estimated that, in England 5.2 million adults aged 16-65 had literacy below Level 1, and 6.8 million adults aged 16-

[8] *A Fresh Start – Improving Literacy and Numeracy*, DfEE, 1999

65 had numeracy below Entry Level 3. A similar picture emerged in 2011 when the survey was repeated; whilst more adults were proficient at Level 2 literacy, there was no change at Entry Level 3 and below. The 2011 survey also indicated a slight decline in numeracy above Level 1, and an increase in the proportion falling below Entry Level 2.

More recently, the OECD Programme for the International Assessment of Adult Competencies (PIAAC) 2013 found that whilst the UK's mean literacy proficiency is around average for adults aged 16-65, it is in the bottom three countries for 16-24 year olds[9]. A similar picture emerges for numeracy; the UK is below average for 16-65 year olds and in the bottom four for 16-24 year olds. Thus, overall the UK performs worse in numeracy relative to literacy, and young adults are more disadvantaged relative to the overall population in both literacy and numeracy.

However, research such as the PIAAC does not include an employer perspective. Indeed, the research evidence has focused primarily on employees' basic skills levels rather than on the impact of these skills on employers. The Employer Skills Survey 2013 (UKCES) found that, 12% of employers said their employees' literacy needed improving or updating in the next 12 months and a similar proportion (13%) identified numeracy. However, there is little reliable evidence on the scale of costs resulting from basic skills deficits in the workplace. Where research has been undertaken in this field, it has focussed on the routes through which employers might incur costs rather than attempting to estimate them. The most prominent attempt to estimate costs to UK employers was undertaken by Gallup[10], which stated a figure of £4.8 billion a year. However, whilst widely cited, the reliability of the estimates have been highly criticised (Robinson, 1997).

Addressing basic skills deficits through workplace training

Between 2001 and 2008, the government invested £5 billion in the *Skills for Life* strategy[11], to meet targets for 'functional' literacy and numeracy levels by 2020. One of the most prominent initiatives was Train to Gain which funded brokers to encourage employers to take up training opportunities. In practice, employer take-up of the scheme

[9] The only other countries where young adults score worse than older people are Cyprus and Norway.
[10] Commissioned by the (then) Adult Literacy and Basic Skills Unit (ALBSU), 1992.
[11] Revised and updated on a number of occasions: see the *Leitch Review* (DIUS, 2007), *Skills for Life: Progress in Improving Adult Literacy and Numeracy* (NAO, 2008), and *Skills for Life: Changing lives* (DIUS, 2009).

was much lower than anticipated (NAO, 2008), and an Ofsted evaluation of the scheme reported that:

> *"The provision of skills for life training was a particular weakness. Those employees with language, literacy, or numeracy (skills for life) needs rarely received sufficient training or encouragement to improve their skills" (Ofsted, 2008, p.4)*

Train to Gain was cancelled by the Coalition Government, and in 2010 the *Skills for Sustainable Growth* strategy was launched. This re-iterated the need for a skilled workforce to drive growth in jobs and GDP, and committed to public-funded basic skills training that would be *demand-led* by employers and learners:

> *"We will therefore continue to fully fund literacy and numeracy provision for those who need it […] to focus on equipping individuals with the skills and qualifications they need to get a job, progress in work and play a full part in society" (BIS, 2010, p.32)*

The merits of programmes designed to improve basic skills are contested in the literature. A review of workplace literacy and numeracy training in and outside the UK suggested that such training does not lead to increased turnover, although there may be benefits in terms of staff retention (Ananidou, 2003). However, a review of a state-funded literacy programme in the US state of Indiana, found that both employers and employees reported productivity gains (Hollenbeck and Timmeney, 2009). Regardless, it remains that the evidence on the benefits of workplace skills training to employees vastly outweighs the evidence on the benefits to employers. Furthermore, evaluations have tended to rely heavily on qualitative data. As Bassi (1994, p.67) stated: *"The impact of workplace education programmes is known to be extraordinarily difficult (if not impossible) to quantify rigorously."*

1.2 Aims of the research

The aim of this study is to address the lack of robust evidence on the impact of poor basic skills to employers in England. Specifically the research seeks to:

1) Estimate the **prevalence** of basic skills deficits in the workforce and the **economic impacts** of poor basic literacy and numeracy on employers; and

2) Estimate the **costs and benefits** associated with public funding for workplace basic skills training.

1.3 Theoretical and methodological challenges

Meeting the aims of the research presents a number of theoretical and methodological challenges. These are described below along with the approach taken to mitigate them.

Defining and measuring 'poor' basic skills

There is a lack of consensus on how to define (and, therefore, measure) literacy and numeracy needs and deficits within a workplace context. Employers often view employees' skills as a holistic group of functional and social skills of which literacy and numeracy are only two components. In 2009 the UK Commission for Employment and Skills developed a theoretical framework which placed literacy and numeracy in a broader context of employability skills. Within this framework, literacy and numeracy are conceptualised as 'functional skills' which are supported by other personal characteristics sought by employers (e.g. readiness to participate, taking responsibility, self-management, problem solving). Defining 'poor' basic skills remains inherently challenging.

This research attempted to address this conceptual issue by moving away from abstract, broad-brush notions of literacy and numeracy and, instead, focused on specific real-world examples of work-based activities. In this way, respondents would be encouraged to think about the use of literacy and numeracy within their workplace.

Measuring impact of poor basic skills

It is very difficult to isolate the contribution that literacy and numeracy may have on productivity. Research suggests that respondents find it difficult to ascribe a monetary value to costs of basic skills. Therefore, this research used objective measures (e.g. turnover, training budgets etc.) to estimate the impact of poor basic skills as opposed to subjective assessments.

Data collection

The literature indicates that basic skills surveys have been conducted with a range of respondents including managers, supervisors and employee relations managers. However, there was a lack of evidence on which respondents were best placed to provide an accurate assessment on the prevalence and impact of basic skills in the workplace. Given that the survey covers establishments of all sizes, it was decided that

the interviews should be with "the most senior person at the workplace" since this individual would be best placed to answer *both* questions relating to employees' skills needs and firm-level performance[12].

Some research suggests that the impact of basic skills training on employees' abilities is limited and transient (Wolf and Evans, 2011), whilst other international research has shown that employers believe that such programmes are unlikely to have an immediate impact (Plett, 2007). In the absence of clear evidence on the most appropriate timescale for measuring the impact of basic skills training, an elapsed period of 12 months was chosen for the sample of employers who have delivered public-funded basic skills training.

Identifying basic skills training and isolating its impact

The Individualised Learner Record (ILR) was used to identify employers who had provided public-funded basic skills training. However, it should be noted that 97% of employers were delivering basic skills training as part of an Apprenticeship[13]. Therefore, similar to the difficulties in isolating the impact of skills deficits, there were inherent challenges in attempting to isolate the benefits of basic skills training. Firstly, because the vast majority of basic skills training was part of a broader package of training and, secondly, because it was delivered to small numbers of employees (Wolf & Evans, 2011). On average, the employers who provided public-funded basic skills training in this study had two employees complete the training during the reference period of September to December 2012. Finally, recent evidence from the Longitudinal Study of Adult Learning (LSAL)[14] in the US has shown that the impact of skills programs take many years to fully develop and short-term evaluation of programs may miss much of their eventual impact. These factors combined pose significant challenges to identifying the impacts of basic skills training at the level of the firm[15].

[12] This was often the owner for small, single-site businesses.
[13] From Academic Year 2012/13 all Apprenticeship providers are required to provide opportunities to support apprentices in progressing towards achievement of Level 2 functional skills or GCSE qualifications.
[14] Prof. Stephen Reder Portland State University, Oregon, USA.
[15] This research does not look at the impact of basic skills training on employees (i.e. the training could lead to long-term economic benefits for both the individual and the wider economy).

Finally, there are a number of methodological challenges associated with the econometric analysis. These are discussed in detail in sections 3.2 and 5.4.

1.4 Methodology

The study comprises three distinct phases:

Phase 1: Literature review

The first stage involved a systematic literature review to produce a theoretical framework of the routes through which business performance may be affected by workforce English and maths skills. The theoretical framework was subsequently used to inform the questionnaire design for the employer surveys and case studies.

The literature review synthesised evidence from qualitative and quantitative studies that shed light on the costs to employers of poor literacy and numeracy. It also addressed the benefits of, and the barriers to, workplace training, with a focus on employer perceptions of the need for and efficacy of workplace training in English and maths. The review also considered and summarises key theoretical and methodological issues.

Phase 2: Employer surveys

Ipsos MORI conducted a telephone survey with a nationally representative sample of 4,234 workplaces in England, and a telephone survey with 4,239 workplaces that had delivered public-funded basic skills training one year prior to the survey. Where permission was given, the survey responses were augmented by observations on turnover and employment taken from the Business Structure Database held within the ONS Virtual Micro-data Laboratory[16]. The survey fieldwork took place between October 2013 and January 2014.

For the survey of workplaces in England the sample was drawn from the Inter-departmental Business Register (IDBR), disproportionately stratified by size of worksite and sector to facilitate sub-group analyses. The final data has been weighted to be representative of all employers in England.

[16] This work contains statistical data from ONS which is Crown Copyright. The use of the ONS statistical data in this work does not imply the endorsement of the ONS in relation to the interpretation or analysis of the statistical data. This work uses research datasets which may not exactly reproduce National Statistics aggregates

For the survey of workplaces that had provided public-funded basic skills training, employers were identified using the Individualised Learner Record (ILR) which contains a flag to identify the employer for learners who had undertaken basic skills training. In-scope employers were matched to the Blue Sheep database to append employers' telephone numbers, addresses, and other 'firmographic' information such as industry and number of employees (which was verified and updated during the interview if necessary). The final data has been weighted to be representative of all employers who had employees finish basic skills training during September to December 2012.

Case studies

In order to contextualise the survey findings, nine detailed case studies were conducted in June 2014 with employers who had taken part in the survey. The case studies included interviews with a range of managers and employees, and also an observational component which focused on employee engagement with basic literacy and numeracy tasks and artefacts in the workplace. Lastly, the case studies collected and analysed documentation used by employees in their job roles.

1.5 The rest of this report

The rest of this report is divided into the following chapters:

Chapter 2 - Prevalence of poor basic skills across workplaces in England

Chapter 3 - Economic impacts of poor basic skills on firm performance

Chapter 4 - Characteristics of firms providing basic skills training

Chapter 5 - Costs and benefits of workplace basic skills training

Chapter 6 – Conclusions and implications.

2. Prevalence of poor basic skills

Key findings

Overall, 12% of workplaces in England report a basic skills gap whereby at least one of their employees is unable to perform a literacy or numeracy task to the level required in their day-to-day job: 5% indicates a literacy gap only, 3% indicates a numeracy gap only[17] and 3% state both.

Understanding written procedures and c*ommunicating verbally* are the most frequently cited skills ***required*** by employers, whilst *spotting numerical errors* and *responding in writing* are the least required (though overall the differences between the tasks are slight).

Employers who report basic literacy and/or numeracy deficits are more likely to be part of a larger organisation. This is because larger employers are more likely to have HR systems in place to identify skills problems among their workforce and to seek a solution to that problem. There is evidence from the case studies that the prevalence of skills deficits in England may be understated because employers have poor awareness of the literacy and numeracy gaps within their workforce, partly because they have adapted by putting in place coping strategies but also because they have a narrow understanding of literacy and numeracy in relation to job roles and requirements.

Employers reporting a basic skills gap are *more likely* than those that do not, to operate in Manufacturing and Wholesale, Retail and Motor Repairs. Basic literacy gaps are most prevalent among Skilled Trades, Process, Plant and Machine Operatives and Personal Service occupations. Basic numeracy gaps most prevalent in Elementary occupations and in Sales and Customer Service.

[17] The precise figures are 5.4% for literacy only and 3.4% for numeracy only. This rounding accounts for the percentage point difference compared to the overall figure of 12%.

This chapter looks at the prevalence of poor basic literacy and numeracy in workplaces in England, and the characteristics of employers who identify these skills deficits in their workforce. Where relevant, comparisons are made with a separate sample of employers who have provided public-funded basic skills training in the past year.

2.1 Definition of basic skills gaps

The definition of a 'basic skills gap' in this study is:

> ***A workplace reporting that at least one member of staff is unable to perform one or more specific literacy or numeracy tasks to the level required in their day-to-day job***

The literacy and numeracy tasks that respondents were asked about are outlined below in Table 2.1. By specifying real world tasks the research moves away from abstract notions of 'literacy' and 'numeracy' which are difficult for respondents to conceptualise and estimate.

Table 2.1: Basic literacy and numeracy tasks

Basic Literacy Tasks
1. Fully understand written procedures (e.g. for using equipment, machinery, or administrative processes)
2. Complete day-to-day paperwork without errors (e.g. end of shift reports, Health & Safety reports; activity logs)
3. Respond in writing (e.g. by letter or email) to queries or complaints from clients, colleagues or sub-contractors
4. Communicate verbally with clients, colleagues or subcontractors
Basic Numeracy Tasks
1. Spot numerical errors
2. Perform simple mental arithmetic / calculations
3. Use numerical data or information correctly in their day-to-day activities

2.2 Prevalence of poor basic literacy and numeracy

Overall

Overall, **12% of workplaces in England report a basic skills gap**, with 5% indicating a literacy gap only, 3% indicating a numeracy gap only[18] and 3% stating both. In total, **8% of workplaces report a basic literacy gap and 6% report a basic numeracy gap**. However, evidence from the case studies suggests that employers may be understating the extent of basic skills deficit in the workplace (section 2.3).

Looking specifically at the group of employers who have provided some form of public-funded basic skills training[19], the prevalence of reported basic skills gaps is higher which is to be expected since this group of employers have delivered the training to address identified skills needs: **22% of these employers report a basic skills gap** with 11% indicating a literacy gap only, 4% indicating a numeracy gap only, and 7% stating both. In total, **18% of these employers cite a basic literacy gap and 11% cite a basic numeracy gap**. The reasons for the higher incidence are explored in section 2.3. Overall fewer employers (regardless of whether or not they provide basic skills training) cite employees' numeracy problems, mainly because they are less likely to require their employees to perform these tasks.

Evidence on the prevalence of basic skills gaps in English workplaces is inconsistent. For example, Atkinson and Spilsbury (1993) reported that 10% of workplaces identified employees' basic skills as 'just adequate or worse'. In the Employer Skills Survey (ESS) 2013, 12% of workplaces said their employees' literacy needed improving or updating in the next 12 months, whilst 13% identified numeracy. In ESS 2011, 18% of workplaces reported a basic skills gap (though respondents were *not* asked about literacy and numeracy separately). This distinction was made in ESS 2009: 4.5% of workplaces reported a literacy gap and 4% reported a numeracy gap. Similarly, Robertson (1997) reviewed the results from three waves of the Skills Needs in Britain survey (1994-1996)

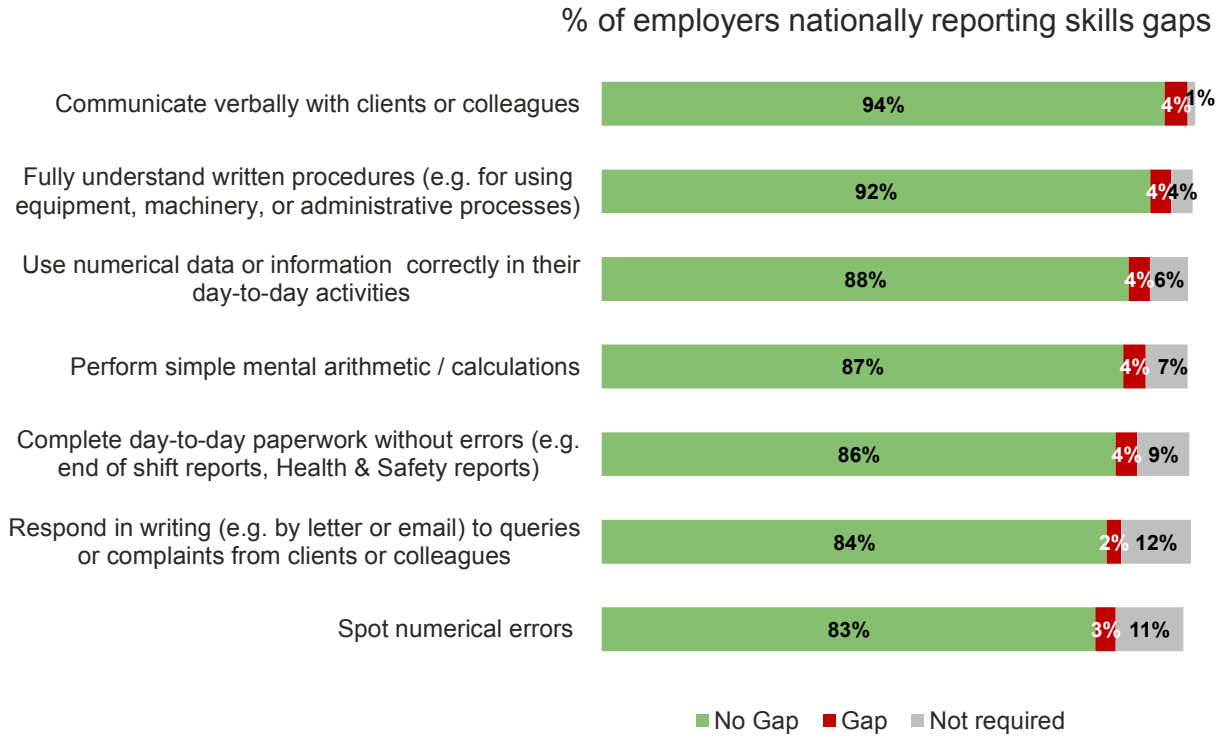
[18] The precise figures are 5.4% for literacy only and 3.4% for numeracy only. This rounding accounts for the percentage point difference compared to the overall figure of 12%.
[19] These employers were sampled from the Individualised Learner Record (ILR) which records all learners who have received post-16 training funded by the Skills Funding Agency.

and suggested that only 4% of employers felt that business objectives were impeded by poor basic skills.

By individual task

Looking across the individual literacy and numeracy tasks, there is some variation in employers' requirements for the different tasks. *Communicating verbally* and *understanding written procedures* are the most frequently cited skills required by employers, whilst *spotting numerical errors* and *responding in writing* are the least cited. There is limited variation by task for reported skills gap (see Figure 1).

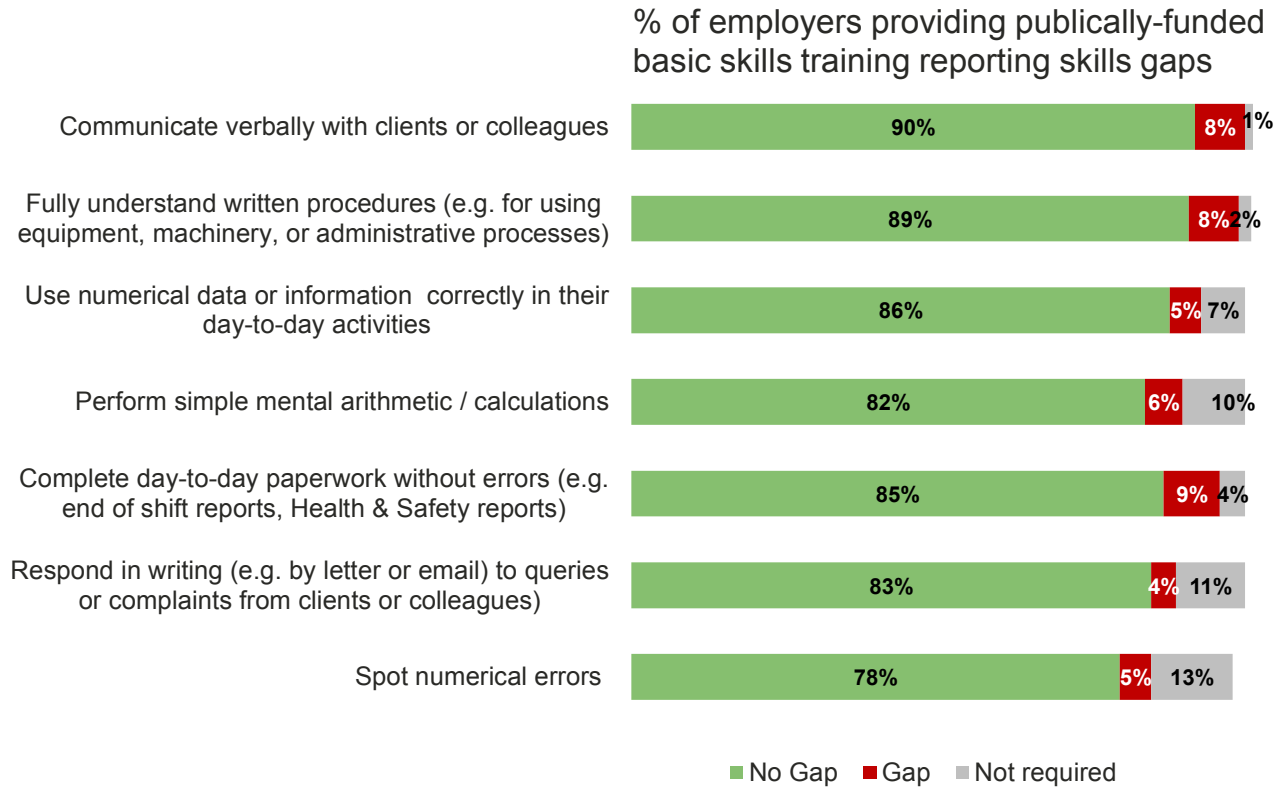
Figure 1: Proportion of employers reporting skills gaps



Base: Nationally representative sample 4,234 workplaces in England; "Don't know" responses not shown

Employers who have provided public-funded basic skills training in the past year are significantly *more* likely than average to indicate deficits across all of the skills tasks (Figure 2). The skills in which this difference is greatest are *communicating verbally, fully understanding written procedures, and completing day-to-day paperwork*. For these tasks, fewer employers who provide basic skills training report that their employees are able to perform the tasks *to the required level* compared with employers across England as a whole.

Figure 2: Proportion of employers providing public-funded training reporting skills gaps



Base size: Nationally representative sample of 4239 workplaces with employees completing public-funded basic skills training between September and December 2012. "Don't know" responses are not shown.

Responding in writing and *completing day-to-day paperwork* was frequently cited in the case study interviews, perhaps due to its high visibility and clear relation to basic skills. In case study one, a social enterprise in the North East, the manager expressed concern about the writing skills of the volunteers, who made up a large proportion of the workforce. She reported often feeling that emails were written too abruptly, conveying an aggressive attitude. She also noted that when using case notes to resolve grievances they were often written ambiguously and needed repeated readings to be clear on what they reported. She did not feel they were consistently of sufficient quality to gain the benchmarking they were aiming to achieve. She also felt that advisors generally were not always good at writing appropriately for different audiences.

A similar message emerged from case study eight, a clothing retailer. At the moment the store managers do not have access to external email. However, store managers feel that they now need external email because customers increasingly expect managers to email them about orders. However, the IT Director felt that most store managers did not have a strong enough command of written English to write accurate emails (with

standard grammar and punctuation) and mistakes in emails would reflect badly on the brand. The kind of mistakes made include spelling, homophones, grammar (verb tenses, non-standard forms like *'I done this…'*) and punctuation (in particular whole paragraphs without full stops or commas). This case study illustrates how company policy and practice is shaped by 'perception' of poor literacy in the workforce**.**

The CEO of a social enterprise, described in case study seven, emphasised the potential impact of poor numeracy. He said that his Administration Manager might make a calculation that was 50p out, or she might make one that was £500 out, and in the latter case, she would not necessarily notice that something was wrong, even when rechecking the figures. As she had primary responsibility for invoices and accounts, this occasionally caused problems.

However, *spotting numerical errors* was not often cited as a concern in the case study interviews. Indeed, in general employers expressed very little concern about the numeracy of their employees, feeling that few were required to use numeracy to fulfil their role. For example, the manager of the care home described in case study five felt that the maths the care assistants needed was 'as basic as it gets; for example, the resident has only eaten half their lunch'. They do need to be able to tell and record the time, but they do not have to do any calculations, with or without a calculator, and nor do they administer any drugs, or even take a residents' temperature.

Where employees were required to use numeracy, this was often supported through the use of software such as Excel. In some cases employees seemed unaware of the extent of the numeracy tasks that they carried out. For example, office workers in the cleaning company visited initially said that they were required to use very little numeracy in their roles. However, on further questioning they were able to identify a number of numeracy tasks that they carried out regularly.

Numbers of employees with skills deficits

Employers were also asked to estimate the number of *employees* who are *unable* to perform each task to the level required for their job, shown in Table 2.2. Nationally, employers indicate that the greatest deficit (in absolute and relative terms) occurs in employees' abilities to use *numerical data or information correctly* in their day-to-day activities: 11% of employees who are required to perform this task are unable to do it to

the required level; this is equivalent to 7% of all employees. The task with the lowest reported deficit is *respond in writing* – 5% of employees are unable to execute this task to the level required; this is equivalent to 2% of all employees.

When looking at employers who *have* provided public-funded basic skills training in the past year (Table 2.3), the reported volumes of employees unable to do each task to the required level is higher than average. However, this is to be expected given that these employers tend to be part of a larger organisation and have a much larger workforce.

Table 2.2: Volumes of employees with a gap in literacy and numeracy across employers nationally (weighted)

Workplaces in England					
Type of task	**Total volume of employees across all sites**	**Volume of employees who have to do each task**	**Volume of employees who cannot perform the task to the required level**	**Skills gap as a proportion of those required to do the task**	**Deficit as a proportion of all employees**
Use numerical data or information correctly in their day-to-day activities	152,311	94,040	10,724	11%	7%
Spot numerical errors	152,311	59,832	4,512	8%	3%
Communicate verbally	152,311	122,640	8,131	7%	5%
Complete day-to-day paperwork without errors	152,311	98,704	7,036	7%	5%
Understand written procedures	152,311	132,425	8,313	6%	5%
Perform simple mental arithmetic / calculations	152,311	89,042	4,977	6%	3%
Respond in writing	152,311	68,617	3,518	5%	2%
Base: Nationally representative sample of 4,234 workplaces in England					

Table 2.3: Volumes of employees with gap in basic literacy and numeracy across employers who provide public-funded basic skills training (weighted)

Workplaces delivering public-funded basic skills training in past year (ILR)					
Type of task	**Total volume of employees across all sites**	**Volume of employees who have to do each task**	**Volume of employees who cannot perform the task to the required level**	**Relative deficit (as a proportion of those required to do the task)**	**Deficit as a % of all employees**
Perform simple mental arithmetic / calculations	345,084	219,047	34,476	16%	10%
Spot numerical errors	345,084	122,032	15,883	13%	5%
Use numerical data or information correctly in their day-to-day activities	345,084	222,685	27,155	12%	8%
Communicate verbally	345,084	282,369	27,954	10%	8%
Respond in writing	345,084	103,836	9,685	9%	3%

Workplaces delivering public-funded basic skills training in past year (ILR)					
Type of task	Total volume of employees across all sites	Volume of employees who have to do each task	Volume of employees who cannot perform the task to the required level	Relative deficit (as a proportion of those required to do the task)	Deficit as a % of all employees
Understand written procedures	345,084	316,599	22,278	7%	6%
Complete day-to-day paperwork without errors	345,084	222,956	11,632	5%	3%
Base: Nationally representative sample of 4,239 workplaces with employees completing public-funded basic skills training between September and December 2012					

2.3 Awareness of workforce skills needs

There is a link between employers' reported basic skills needs and the presence of infrastructures in the workplace to identify skills deficits. For example, employers who report basic literacy and/or numeracy deficits are more likely than those that do not (Table 2.4):

- To provide all employees with a formal written job description.
- To conduct annual performance reviews with all employees.
- To have a training plan that specifies in advance the level and type of training their employees will need in the coming year.

These findings suggest that the prevalence of skills deficits in England may be understated because employers, especially small and medium sized businesses, do not have in place systems that would enable them to identify such skills gaps for all their workforce (see also section 4.4).

Table 2.4: Proportion of employers with skills review processes in place

Presence of:	Nationally No basic skills deficit reported	Basic skills deficit reported	Employers providing public-funded basic skills training
Formal written job description			
All employees have a formal written job description	71%	75%	89%
No employees have a formal written job description	13%	8%	2%
Annual performance review			
All employees have an annual performance review	54%	68%	80%
No employees have an annual performance review	33%	20%	9%
Training plan			

	Nationally		Employers
Have a training plan that specifies in advance the level and type of training that employees need in the coming year	47%	60%	78%

Base: Nationally representative sample of 3,739 workplaces with no skills deficits and 495 with skills deficits. Nationally representative sample of 4,239 workplaces with employees completing public-funded basic skills training between September and December 2012

There is also evidence in the literature to support the notion that skills deficits may be under-reported. For example, the National Audit Office (2004) and the House of Commons Public Accounts Committee (2006) have both highlighted that employees rarely have their literacy and numeracy assessed. In addition, a small scale study by Boyle et al (2001) found that managers may be unaware of the level of basic skills required by their workforce, or take it for granted that their employees possess such skills. Furthermore, in line with this, the 1992 Gallup survey indicated that only 27% of employers had a formal policy for addressing basic skills difficulties in the workforce (with 71% having no policy).

This lack of awareness may be accentuated by employers' inability to recognise the basic skills elements within the tasks that their employees carry out. During the case study interviews it was common for employers to begin by asserting that their employees had the skills needed for their jobs; that the basic skills requirements were very low and that they could cope with them. However, with further questions some examples did emerge as the interview proceeded: when first asked if he felt any of their employees lacked the English or maths needed to do their jobs effectively, the HR manager in case study eight said no, he did not think so. As the interview progresses, he maintained that overall this is the case, but also came up with four examples of potential skills gaps and their impact. One example was an area manager who makes mistakes when writing formal letters (grammar, punctuation and spelling) but this was deemed not to have a negative impact on their work because others in the team are able to write it for him. In another example, he expressed doubts about whether store managers understand the instructions given and able to impart this to junior members of staff because, as he puts it, '*no one is going to say they don't understand it'.*

Similarly, the HR Manager in a social enterprise in case study one, initially suggested that there were no obvious problems with literacy or numeracy, but then went on to

observe that she was concerned about the writing skills of the volunteers who made up the bulk of her workforce.

2.4 Characteristics of workplaces with basic skills gap

Size

Employers who indicated that they had a literacy and/or numeracy gap in the workforce were significantly more likely to:

- Operate as part of a multi-site organisation (50% vs 39% of those with no basic skills gap).
- Have more employees (17% with more than 100 employees at the worksite vs 6% of those with no basic skills gap).

This reflects previous research (e.g. CBI 2012 Education and Skills survey) in which larger organisations were more likely to cite skills deficits in the workforce. This is because, as the number of employees increases, so does the likelihood that at least one of them will have a basic skills gap. Larger organisations are more likely to have a dedicated HR team and systems for reviewing employees' skills and training needs.

Sector

Employers reporting a basic skills gap (especially in numeracy) were more likely to operate in the public sector (8% vs 4% of those with no basic skills gap).

The prevalence of reported basic skills deficits (i.e. where employees who are unable to perform the tasks ***required*** of them in their day-to-day role) also varies by industry sector. Employers in Wholesale, Retail and Motor Repairs have the highest reported incidences by far for both literacy and numeracy though they are also the group most likely not to report an issue. Other industry sectors reporting relatively higher incidences of literacy and numeracy gaps include Manufacturing and Professional, Scientific and Technical sectors (see Table 2.5).

Table 2.5: Sector profile of employers reporting skills gaps vs employers who do not report any

Industry sectors	Report skills gap	No basic skills gap
Literacy		
Manufacturing	11%	7%
Wholesale, Retail and Motor Repairs	26%	20%
Information and Communication	2%	6%
Real Estate	2%	6%
Professional, Scientific and Technical	6%	12%
Numeracy		
Manufacturing	10%	7%
Wholesale, Retail and Motor Repairs	24%	20%
Real Estate	4%	6%
Professional, Scientific and Technical	9%	12%

This finding is largely consistent with employer surveys undertaken by the CBI, and Levenson (2004) has suggested a number of occupational changes which have contributed to this pattern. Firstly, some manufacturing job roles have become less narrowly defined and now require more problem-solving and intra- and inter-team communication. Secondly, good customer service has increasingly come to be seen as a source of competitive advantage. This has highlighted the need for front line staff to have good interpersonal skills, and is particularly salient in the retail sector (and increasingly this includes writing - over electronic media - as well as spoken). These changes may have resulted in employers in these sectors looking for better quality basic skills and they may also be more sensitive to deficits.

This may be one reason why speaking and listening were frequently cited by employers interviewed as part of the case studies as the most important skills for them, and the most frequently mentioned aspects of speaking and listening were interpersonal and communicative skills. Employers often felt that they could compensate for poor literacy and numeracy by putting in place scaffolding for the literacy and numeracy elements of the tasks that their employees had to carry out. Such scaffolding included templates for writing, and for carrying out calculations and also informal systems of peer checking. However, such support was less easily put in place to compensate for any weakness in employees' speaking and listening.

2.5 Characteristics of employees with poor basic skills

Occupation

Previous research had indicated a link between basic skills deficits and certain types of occupation[20]. In the current survey employers were asked which occupation types they employed (from a nine-fold typology) and those employers who indicated a skills deficit were also asked which of their occupation types had the skills deficiency. The responses, summarised in Table 2.6, indicate that:

- Basic literacy gaps are most prevalent among employees in Skilled Trades (9% of employees in this occupation are unable to perform literacy tasks to the level required of them), Process, Plant and Machine Operatives (7%), and Personal Service (6%).
- Basic numeracy gaps are less commonly reported than literacy across many occupations, and are most prevalent in Elementary occupations and in Sales and Customer Service (5% each).

Table 2.6: Basic literacy or numeracy gaps by occupation

Occupation	Basic literacy deficits			Basic numeracy deficits		
	Base (all employers with occupation type)	Base (employers reporting deficit in occupation type)	Proportion of all employers with this occupation reporting deficiency	Base (all employers with occupation type)	Base (employers reporting deficit in occupation type)	Proportion of all employers with this occupation reporting deficiency
Administrative and secretarial	2,733	95	3%	2,733	92	3%
Elementary	1,275	72	6%	1,275	62	5%
Skilled trades	810	70	9%	810	34	4%
Sales and customer service	1,226	57	5%	1,226	59	5%
Managers, directors and senior officials	3,956	54	1%	3,956	33	1%
Process, plant and machine operatives	521	36	7%	521	23	4%
Personal service	363	22	6%	363	8	2%
Associate professional and technical	710	19	3%	710	17	2%
Professional	782	23	3%	782	17	2%

[20] However, this does not necessarily mean that these occupations lead to higher costs for firms through basic skills gaps.

This pattern is in line with the observation that skills deficits are reported relatively more frequently in the Manufacturing and Wholesale, Retail and Motor Repairs sectors, and less frequently in the Professional, Scientific and Technical sectors. Furthermore, they are consistent with the patterns observed in the Skills for Life (SfL) 2011 and PIAAC (2013). The SfL 2011 showed that workers in routine, semi-routine, and lower supervisory and technical occupations are most in need of basic skills training. Most recently, the PIAAC showed that, on average, semi-skilled white-collar occupations score lower in literacy and numeracy scales than skilled occupations. This pattern occurred across all countries but was most pronounced in Canada and the UK.

Young employees

Employers reporting a basic skills gaps are significantly more likely than those that do not, to employ young people (27% hire at least one 16-18 year old vs 11% of employers not reporting a basic skills gap)[21]. Research indicates that basic skills gaps are more prevalent amongst younger people in the UK (e.g. PIAAC, 2013), and more than two-thirds of employers in the 2012 CBI survey identified a "pressing need" to raise literacy and numeracy standards amongst 14-19 year olds.

English as a Second Language

Employers who report skill gaps are also significantly more likely to have employees with English as their second language (39% vs 22% of employers not reporting a basic skills gap), and this is particularly pronounced for those reporting a *literacy* gap (41% vs 22% of employers not reporting a basic skills gap). These results reflect the 2013 PIAAC study which shows that, individuals with a foreign-language background score significantly lower in literacy, numeracy and problem solving compared to those who take the tests in their native language[22].

[21] The same pattern is found for employers who provide public-funded basic skills training too, with 40% of those with a skills deficit hiring at least one 16-18 year old, compared to 30% of those without a skills deficit.

[22] Even after taking into account other factors such as country of birth, age, gender, occupation and socio-economic status. Although it should be noted that the differences in the UK are less pronounced than the OECD average.

3. Economic impacts of poor basic skills on workplace performance

Key findings

A number of analyses were conducted to explore the strength of the relationship between basic skills deficiencies amongst employees and firm-level productivity[23] controlling for influential factors such as industry sector, type of organisation, firm size including composition of full-time and part-time employees.

No statistically significant relationship was detected. This finding is consistent with the broad results of the survey: comparatively low proportions of employers (12%) reported a gap in basic literacy or numeracy, with fewer still (8% of all employers) reporting that those gaps caused material impacts on the performance of their workplace. As such, the aggregate effect of these skills deficits might be expected to be of insufficient magnitude to be detectable through econometric analysis.

The case studies also highlighted that some employers have been able to mitigate against the impact of poor literacy and numeracy through the use of ICT interventions and informal solutions and strategies such as peer support to reduce the extent to which these skills are required to complete many processes.

[23] The study was constrained to a proxy measure of productivity (turnover per worker). While this measure captures any direct effects of basic skills deficits on sales (potentially mediated through inefficiency in production, low product quality or poor customer service), it does not capture any effects driven by increased production costs. Such costs might emerge if basic skill deficits cause wastage in production processes or through greater requirements to invest in training. See section 3.2 for further discussions on methodological issues.

The results also need to be taken in the context of the prevailing labour market; unemployment was relatively high meaning that employers may have had greater choice in how they deploy workers to ensure minimal impact on efficiency and profitability.

Finally, failure to observe statistically significant effects at a firm-level does not necessarily imply that there are no economic costs associated with poor basic skills in the workplace. Low levels of basic skills may constrain the economy through lower levels of productive capacity and reduction in aggregate supply – this would not be captured in the econometric analyses which were focused on the microeconomic impacts.

Workplaces with basic skills gap also self-report a range of costs to their business – the most commonly *cited* impact is an *increased number of errors* by employees: reported by 43% of employers with a basic literacy gap and 50% of employers with a basic numeracy gap (equivalent to 3% to 4% of employers in England).

Employers reporting a basic skills gap are also more likely to report a higher volume of customer complaints (11% have had more than 50 complaints in the past year vs 4% of employers not reporting a basic skills gap).

Employers with basic skills gaps are significantly more likely to have experienced accidents (38% vs 20%), and significantly less likely to have had none (58% vs 76%) compared to employers without basic skills gaps.

One in ten (11%) employers with a numeracy deficit reported *fewer sales or lower profit margins* as the result. These impacts were not shared by employers with literacy deficits.

This chapter focuses on the cost to businesses of poor basic skills in the workforce. As noted elsewhere, UK research in this field has tended to focus on the ways in which employers might incur costs, rather than attempting to estimate the costs. The first part of this chapter summarises the perceived routes through which employers have experienced costs, and the second section presents the findings from the econometric analysis.

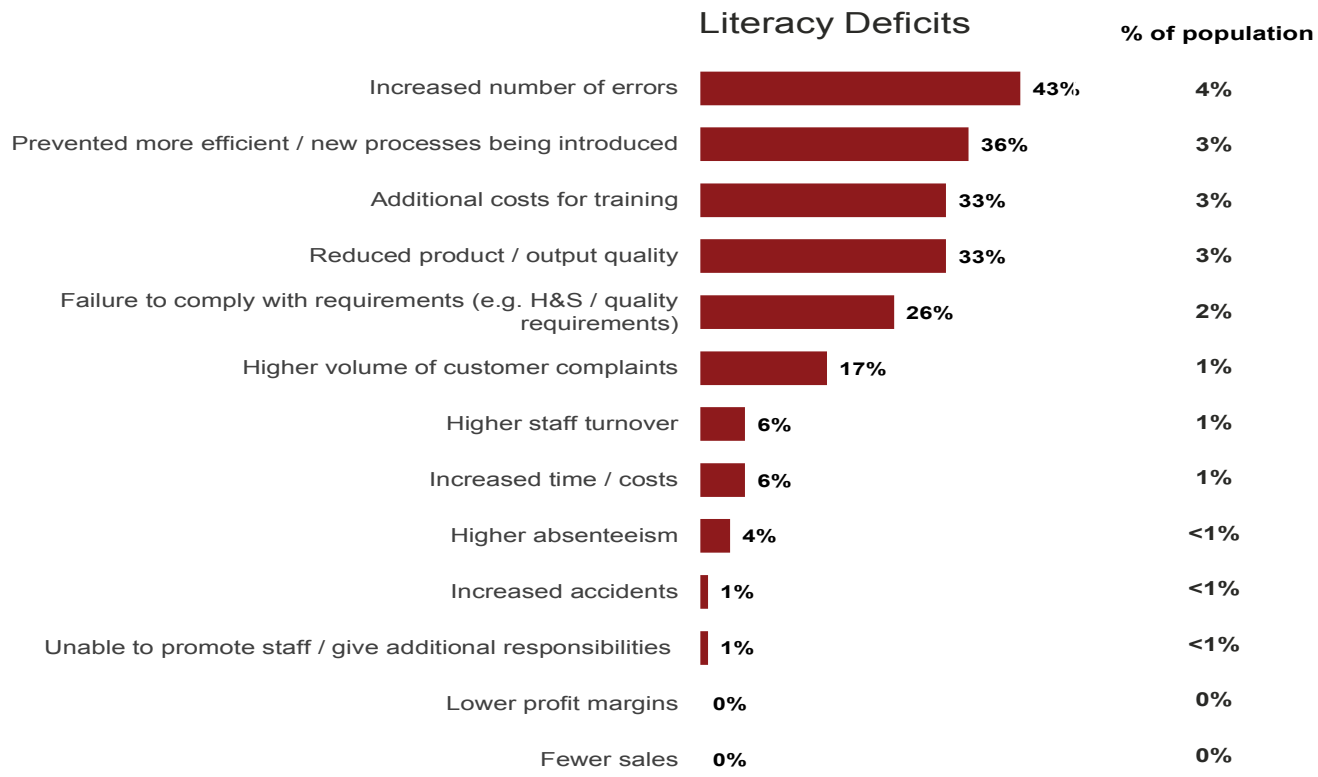
3.1 Impact of poor basic skills[24]

A systematic literature review was undertaken as part of this study to develop a theoretical framework of the routes through which business performance may be affected by poor basic literacy and numeracy among employees. The literature provides evidence on the range of impacts and costs to employers which can be summarised as: *Efficiency costs, Time costs, Accidents and Meeting Requirements, Turnover, and Human Resource costs.*

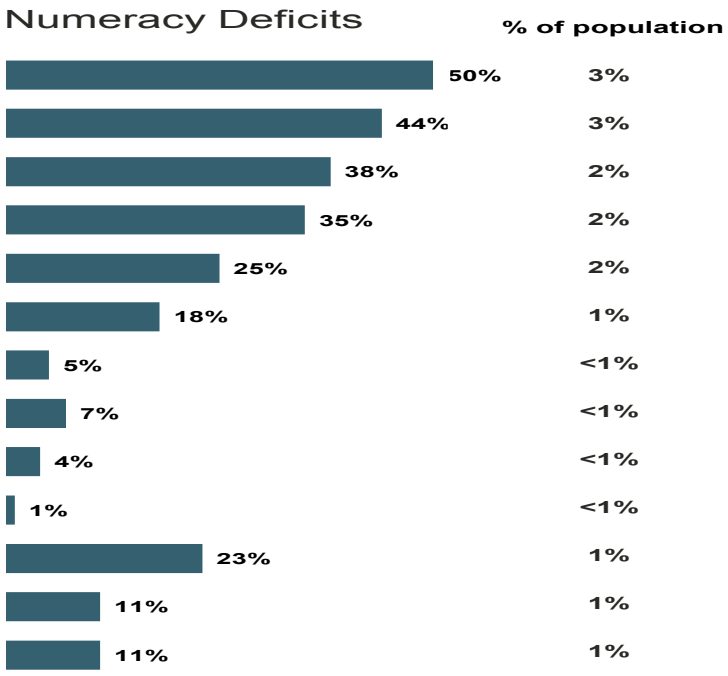
In the survey, each of these possible impacts was posed to employers reporting a basic literacy and/or numeracy deficit. In total, just 8% of all workplaces indicated that they had experienced some kind of impact as a result of basic skills deficits in their workforce. Their detailed responses are shown in Figure 2, but to summarise, the most frequently cited impacts – for both basic literacy and numeracy gaps – are: an increase in the number of errors by employees; an inability to introduce more efficient or new processes; additional training costs; and a reduction in product or output quality. Overall, around a third to a half of workplaces with reported basic skills gaps have experienced these impacts (equivalent to between 2% to 4% of all workplaces in England), with numeracy gaps causing the greater detrimental impact to businesses.

[24] Owing to small base sizes, sub-group analysis (e.g. by employee size, industry sector, occupation) is not possible in this section.

Figure 3: Impact of basic literacy and numeracy gap (self-reported)



Base: All employers with literacy skills deficits (540); All employers with numeracy skills deficits (344)



Efficiency costs

The efficiency of a firm can be negatively impacted in several ways by gaps in basic skills. Firstly, employees with basic skills gaps are more susceptible to making errors which results in increased waste and lost time (see next section for discussion on Time). In this study, *increased number of errors* is the most widely cited impact by employers; 43% of those with a basic literacy gap state that they have experienced increased errors as a result (which represents 4% of all workplaces). Whilst the absolute number of employers reporting a numeracy deficit is lower, these employers are relatively more likely to cite *increased numbers of errors* as a cost they have experienced (50% - which equates to 3% of the business population).

Efficiency can also be impeded because skills deficits in the workforce might constrain the *introduction of new, more efficient processes*, or reduced product/output quality. Respectively, these two impacts are the second and third most cited costs by respondents who report a literacy skill gap, with 36% and 33% (3% of the total population) indicating they have experienced them. The picture is similar for those reporting numeracy gaps, although proportionally more of these employers say that numeracy gaps have prevented *more efficient/new processes being introduced* (44% - which equates to 3% of the total population). Similar to literacy, 35% (2% of the total population) of those with a numeracy gap say that they have experienced *reduced product/output quality*.

In case study seven, the CEO of a social enterprise described the impact of poor writing skills on his company's ability to expand, adapt and incorporate new technologies, particularly the web. He felt that the organisation has not been able to meet customers' and clients' demand for a high quality website because none of his staff felt confident or competent enough to put material on the site.

The case studies also provided examples on the impact on a firm's flexibility. In case study five, a cleaning company, the high prevalence of poor reading skills among cleaners constrained where cleaners can be deployed (e.g. they would not be able to work in GP surgeries where they have to read and tick off a specific list of tasks to meet the requirements of the Care Quality Commission).

Supervision costs

There is evidence in the literature that basic skills deficits in the workforce can impede productivity because work needs to be re-done by employees or checked and corrected by line mangers. Looking in more detail, it appears that where time costs do arise they are more likely to place a burden on line managers than employees. Over half of workplaces (53%) with a basic skills gap (literacy and/or numeracy) indicate that employees spend less than 15 minutes a day correcting or re-doing work (with 81% citing less than 30mins) and only 8% report their employees spend more than 45 minutes a day. In contrast, over a third (36%) say that line managers spend less than 15 minutes a day checking work, and over a fifth (22%) state that line managers spend more than 45 minutes.

The case studies provided ample examples of organisations working around the basic skills issues they face, often by adopting a supportive and collaborative approach where fellow workers help to quality assure each other's work or, in some cases, undertake the tasks for less-abled staff altogether. For example, the HR Manager in case study two – a cleaning contractor – notes that most of the timesheets are completed by the supervisors or contract managers rather than the cleaners themselves; the cleaners just sign them and so their lack of English and maths skills is not an issue for them.

A further time cost can arise from basic skills deficits in the workforce because of increased customer complaints which take time to deal with[25]. The issue of increased customer complaints is cited by similar proportions of employers with literacy deficits (17%) as with numeracy deficits (18%). When asked about the actual number of customer complaints in the past year, employers who indicate that they have a basic skills gap are more likely to cite higher volumes of customer complaints (11% vs 4% have had more than 50 complaints in the past year), and less likely to say they have had none (38% vs 54%). The volume of customer complaints is similar for both literacy gap and numeracy gap.

Accidents

Errors resulting from basic skills gaps might lead to greater risks of accidents (e.g. NRDC, 2013) and their associated costs (e.g. one-off costs such as repairing damage,

[25] And which can also damage the reputation and image of a company and lead to fewer sales.

on-going costs from higher insurance premiums, and possible lost output if production is halted). This cost is rarely cited by employers with either literacy gaps (1%) or numeracy gaps (1%). However, a quarter of both groups (26% for literacy and 25% for numeracy) state that they have failed to comply with requirements (e.g. Health and Safety or quality requirements) as a result of the skills deficiencies in their workforce. Furthermore, when looking at the actual number of accidents over the past year, employers with skills gaps are significantly more likely to have experienced accidents (38% vs 20%) and significantly less likely to have had none (58% vs 76%) compared to employers without basic skills gaps. As with customer complaints, the profile of accidents is similar for literacy and numeracy deficits.

Sales or turnover costs

There is evidence in the literature that basic skills deficits can be detrimental to customer relationships and lead to *lost sales* and/or *lower profits*. In relation to these costs, this study shows a clear distinction between basic literacy deficits and basic numeracy deficit: whereas no employers with basic literacy gap say that they have experienced *fewer sales or lower profit margins*, 11% of employers with a basic numeracy skill gap reported that they have incurred these costs.

HR Costs

The final category of costs that employers might experience as a result of basic skills deficits is human resource costs. These can manifest in a number of ways including higher levels of *staff turnover*, higher levels of *absenteeism*, *additional training* for employees, and being *unable to promote staff or give them additional responsibilities*.

In terms of increased *staff turnover*, this is infrequently cited as an issue by employers with either a literacy gap (6%) or a numeracy gap (5%). A similar picture emerges for *staff absenteeism*, with just 4% of employers with a literacy or numeracy gap saying they have seen an increase.

In contrast, employers are more likely to say they have incurred *additional training costs* as a result of having basic skills deficits in the workplace. This cost is more commonly cited for numeracy than literacy gap (38% and 33%, respectively – though still accounting for just 2% to 3% of all workplaces).

The last HR cost that might arise due to basic skills deficits is that employers may find it harder to deploy workers or promote them to more senior positions. Only 1% of employers with literacy deficits (0.1% of the population) say that they have been *unable to promote staff or give them additional responsibilities*. However, this changes when looking at employers with numeracy deficits where 23% of these employers (1.4% of the total population) say they have encountered this issue. This is partly due to prevalence: numeracy deficit is more widespread among employees compared with basic literacy deficit (section 2.5).

3.2 Econometric analysis

As part of this study, a number of analyses were conducted to explore the strength of the relationship between basic skills deficiencies amongst workers and firm-level productivity (while controlling for other influential factors such as industry sector and firm size). In this context, the productivity of firms would ideally be understood in terms of the value of goods and services produced (net of the cost of raw materials, goods and services used in production) per worker (i.e. average labour productivity, or GVA per worker). Inefficiencies driven by basic skills deficits would in principle be reflected in lower average labour productivity: for example, as a consequence of higher levels of waste, or time lost in the production process caused by errors or difficulties operating plant equipment.

The analyses relied primarily on the results of the survey of the general business population, augmented by observations on turnover and employment taken from the Business Structure Database[26]. Although attempts were made to collect the information needed to estimate this measure of productivity amongst those surveyed, levels of non-response[27] were such that this was unviable. Alternative proxy measures of workplace productivity were adopted, including turnover per worker, as well as other indicators (such as staff turnover rates, accidents per employee, and major and minor illnesses). Weaknesses introduced by this approach are highlighted below.

[26] An annual snapshot of the Inter-Departmental Business Register held within the ONS Virtual Microdata Laboratory.
[27] In particular, it was challenging to collect the measures of profits and wages needed to implement these calculations.

The analysis explored the correlation between a variety of measures of the prevalence of basic skills deficits in the workplace and these proxy measures of firm-level productivity (as well as adopting a variety of approaches to handling the issues associated with causality).

Overall no statistically significant relationship between the prevalence of basic skills deficits in the workplace and proxy measures of firm-level productivity was found. In many ways, this finding is consistent with the broad results of the survey: comparatively low proportions of respondents reported literacy or numeracy deficits (accepting that there is may be a degree of under-reporting of basic skills gaps by employers, as discussed in section 2.2) with fewer still reporting that those deficits caused material impacts on the performance of their workplace. As such, the aggregate effect of these skills deficits might be expected to be of insufficient magnitude to be detectable through econometric analysis.

There are a number of possible explanations for this finding:

Role of technology

- Firstly, it is possible that some employers have been able to mitigate against the impact of poor literacy and numeracy through using technology to reduce the extent to which these skills are required to complete many processes. For example, the employees in an estate agent in case study six agreed that new technologies had made their job easier in terms of time and effort. REAPIT - a computer software widely used by estate agents – provides templates to aid report writing and help with mathematical algorithms (e.g. converting imperial to metric measurements). So while there was still the same amount of reading involved in an estate agent's job, there was less writing and less maths to do which have made their jobs easier and saved the company time.

Labour market conditions

- Secondly, this result needs to be taken in the context of prevailing labour market conditions. The survey was undertaken in late 2012, at a time when unemployment remained high relative to pre-recession levels. Under these conditions, employers may have faced less intense competition for workers with the attributes needed to function in their roles, leading to greater concentrations of those with literacy and numeracy deficits in occupations where these skills are not required or have limited impact on efficiency or profitability. The possibility that significant effects might be observed following a period of sustained economic recovery cannot be ruled out (for example, if employers are forced to place workers with basic skills deficits in occupations where such skills are more important).

  Thirdly, employers might also minimise the potential costs of low basic skills in their staff through the recruitment process. It is evident in the literature that numeracy and literacy are high on the employer agenda. For jobs where these skills are intrinsic to the role, employers may well screen out those who are unsuitable. In the current research, 39% of employers indicated that they do specify minimum English skills and 36% specify minimum maths skills (compared with 56% that do not).

  With one exception the case study sites reported that they did not include a requirement for basic levels of literacy and numeracy, in the form of a proxy qualification such as GCSE, when recruiting. However, even if the employer does not explicitly ask for literacy and numeracy qualifications, these abilities may be inferred as part of the interview process, explicitly through job-related interview tasks or implicitly through the candidates' application. In case study five this was certainly the case. One of the contract managers had been recently employed. While there had been no requirement for him to have GCSE English or maths, the HR manager noted that his application, in contrast to many that they receive, was well written and presented and that this had given him an advantage over other candidates. This was reflected elsewhere in the case studies. Most employers said that they were not as interested in the qualifications on the application form as the way the application form was completed; the form needs to be well written in accurate English. In one of the care homes visited, a poorly written application form would mean that the candidate would not get an interview.

In another case study, the HR manager noted that while they do not require GCSE English or maths for any of their roles, they felt that they address the English or maths requirements of specific roles by using other qualifications as a proxy for adequate literacy and numeracy levels. For example, an IT engineer is required to have an IT degree which would, in turn, have required and developed a great deal of maths, or a marketing manager would be expected to have a marketing or business degree which would have required and developed a high level of written English. Within the same company, the Customer Services team (which do not require degrees) give applicants English and maths tests at interview.

Broader economic issues

- Finally, failure to observe statistically significant effects at a firm level does not necessarily imply that there are no economic costs associated with poor basic skills in the workforce. For example, research suggests that employees with basic skills deficits may receive lower wages (e.g. Bassi, 1995; Ananiadou, 2003). Furthermore, if such deficits were to be addressed, the workers involved might be redeployed in higher value processes, leading in the longer term to an expansion in total output (i.e. GVA). However, the benefits of doing so may not accrue to the employers concerned (particularly if they have compensated for skills deficits through investment in technology) as workers may need to move elsewhere to exploit these skills. If this is the case, incentives to invest in basic skills training may not always be strong (see also section 5.3).

Methodological issues

Although the econometric results pointed to very little in the way of links between basic skills deficits in the workforce and productivity at a firm level, there were a range of methodological issues associated with the analysis that prevented a firm conclusion that such a link is not present:

- **Measurement of productivity:** As noted above, the study was constrained to a proxy measure of productivity (turnover per worker). While such a measure would capture any direct effects of basic skills deficits on sales (potentially mediated through inefficiency in production, low product quality or poor customer service), it would not capture any effects driven by increased production costs. Such costs might emerge if basic skill deficits cause wastage in production processes or through greater

requirements to invest in training. Indeed, additional training costs and time spent by employees correcting errors were both reported by employers with basic skills gap among their workforce (section 3.1).

- **Measurement of the prevalence of basic skills deficits:** The measurement of basic skills deficits was based on the self-reported views of the 'most senior person at the workplace' since this person would be best placed to answer *both* questions relating to the employers' skills needs and firm-level performance (with the assistance of an advance datasheet where appropriate). Whilst care was taken to improve the measurement of basic skills deficits by developing a questionnaire that captured competence in terms of specific literacy and numeracy tasks, it is possible that many respondents were not equipped with the information to respond to these questions accurately. The case studies provided a number of examples of employers that were unaware of basic skill deficits in their workplace, suggesting that at least to some extent, the measures collected may reflect awareness of these issues rather than prevalence. These measurement errors will reduce the precision of the statistical analysis, and may have contributed to the failure to identify a statistically significant effect.

- **Issues in identifying causal relationships:** There are a range of challenges in isolating a causal relationship between the prevalence of basic skills deficits in the workplace and the productivity of employer. In particular, if the employers choose to recruit those with a basic skills deficit as a consequence of wider managerial decisions around the organisation of the workplace (for example, purposefully adopting a low productivity business model) then comparisons between workplaces with high and low prevalence of basic skills deficits might overstate the impact of the skills deficiencies themselves on productivity. In some analyses, steps were taken to correct for this source of possible bias by using labour market information on the qualification profile of the local workforce to identify those workplaces that may have been constrained by the availability of suitably skilled workers[28]. However, as the expectation would be that the productivity costs would be overstated rather than

[28] The effectiveness of this strategy will have been limited by the extent to which skills supply is a major factor in firm location decisions.

understated by the analyses involved, it is unlikely that this was a major factor in the difficulties in identifying a link between basic skills deficits and workplace performance.

4. Characteristics of workplaces providing basic skills training

Key findings

Nationally, 15% of employers report that they have provided basic skills training over the past year. The provision of basic skills training increases with workplace size. It is also more common in sectors with a high public sector presence such as Public Administration and Defence, Education and Human Health and Social Work.

The large majority of employers nationally (85%) have *not* provided any basic skills training to their employees over the past year including seven in ten employers with a reported basic skills gap. The main reason (cited by 90% of employers) for not providing basic skills training is that they *do not have basic skills needs* in the workforce.

Focusing specifically on the group of employers who *have* provided basic skills training in the past year *using public funding*, the most commonly cited reason for providing this training is *as a benefit to workers* (cited by 83% of these employers). The second most commonly cited reason is because a *subsidy became available* (cited by 56%). Approaching half of employers (48%) did it to *reduce errors and waste, and to reverse low productivity.*

The vast majority (97%) of employers who provided public-funded basic skills training do so as part of an Apprenticeship so reported benefits may be conflated by their experience of the Apprenticeship training overall.

The provision of public-funded basic skills training is highest in semi- and unskilled occupations; among these groups, personal service occupations are most likely to receive public-funded basic skills training, followed someway behind by sales and customer services, skilled trades and elementary occupations.

This chapter explores the extent to which employers in England provide basic skills training and their rationale. The chapter then proceeds (in sections 4.3 and 4.4) to look **specifically** at employers who have provided public-funded basic skills training and their motivations for providing such training to their employees.

4.1 Provision of basic skills training

Workplaces in the general population

Nationally, 15% of employers report that they have provided basic skills training over the past year: 2% have provided literacy training only; 2% have provided numeracy training only and 11% have provided both. The provision of basic skills training is higher amongst employers who report a basic skills gap though still only accounting for just 31% of this group meaning that the majority of employers with a basic skills gap (68%) do not provide basic skills to their workforce.

These findings contrast with the 1992 Gallup survey in which 39% of respondents offered some form of basic skills training, but are more aligned to the 'Learning and Training at Work 2001' survey which found that amongst workplaces with 5 or more employees, 10% offered some form of literacy training and 11% offered numeracy training (Spilsbury, 2002).

The provision of basic skills training increases with the size of the worksite (e.g. from 9% of workplaces with 1-9 employees to 44% of workplaces with 250+ employees); this coincides with the higher prevalence of reported basic skills deficit among larger workplaces and is also in line with previous research into the UK Train to Gain programme which found that small to medium sized companies were exponentially more difficult to incentivise to offer training than larger employers. The provision of basic skill training is also more common in industries with a high public sector presence such as in Public Administration and Defence (27%), Education (25%) and Human Health and Social Work (20%). These sectors also feature high on the list of workplaces that have delivered basic skills training using public funding (section 4.3).

Table 4.1 Provision of basic skills training by size of workplace and sector

Size of workplace	Base[29]	Literacy only	Numeracy only	Both
2-4	1,396	1%	1%	4%
5-9	1,145	1%	1%	9%
10-24	801	3%	1%	15%
25-49	393	5%	2%	18%
50-99	189	5%	3%	22%
100-199	139	2%	1%	24%
200-249	43	11%	2%	37%
250-499	80	2%	1%	45%
500 or more	49	7%	1%	30%
Industry sector				
Agriculture, forestry and fishing	87	0%	0%	7%
Mining, quarrying and utilities; electricity, gas and steam; water supply, sewerage	27	2%	3%	26%
Manufacturing	292	3%	2%	7%
Construction	377	1%	2%	8%
Wholesale, retail and repair of motor	856	1%	1%	11%
Transport and storage	172	0%	0%	6%
Accommodation and food services	209	3%	0%	17%
Information and communication	225	1%	3%	12%
Finance and insurance	175	2%	2%	9%
Real estate activities	236	3%	0%	11%
Professional, scientific and technical	493	6%	2%	8%
Administrative and support services	265	3%	2%	7%
Public administration and defence	48	2%	0%	27%
Education	105	4%	1%	25%
Human health and social work	385	3%	1%	20%
Arts, entertainment and recreation	109	1%	4%	16%
Other service activities	173	4%	5%	10%

Base: Nationally representative sample of 4,234 workplaces in England

4.2 Reasons for *not* providing basic skills training

In total, 85% of employers nationally indicate that they have *not* provided any basic skills training to their employees; 10% of these employers (or 8% of the total population) have a basic skills deficit which they were not addressing with training.

All employers who had not funded any basic skills training in the past year were asked for their reasons.

[29] Figures associated with a base size of 50 or less should be treated as indicative only.

Lack of basic skills needs

By far and away the single biggest reason for not providing basic skills training (cited by 90% of employers) is that they *do not have basic skills needs* in the workforce. This reason was also cited by 69% of employers reporting a basic skills deficit; as the case studies illustrate, employers often feel they can compensate for poor literacy and numeracy by putting in place scaffolding for the literacy and numeracy elements of tasks that their employees are required to undertake. All other reasons are cited by 2% or less. This pattern is in line with the prevalence of skills gaps reported in Chapter 2, and draws some parallels to the work of Wolf & Evans (2011) who found that, contrary to policymakers' expectations, employers were not particularly concerned about the literacy levels of low skilled individuals.

In considering why employers are reluctant to invest in basic skills training two important messages emerge from the case study sites. Firstly, the dominant form of learning in the workplace appears to be informal learning by doing, with staff members learning from each other and working collaboratively on tasks requiring English and maths. Shadowing and mentoring were commonly used in the sites visited, so new members of staff were gradually seen by peers to be able to handle the literacy requirements of the role. However, in some workplaces, these practices were also used to compensate for deficits without having to explicitly tackle any training needs (i.e. staff with higher level skills undertaking certain tasks for their less abled colleagues). Secondly, many of the workplaces visited have quite sophisticated systems of scaffolding for their employees' English and maths in the form of templates and processes that reduce the requirements for high levels of skills. In a number of instances, these forms of scaffolding are also forms of informal learning as, though, using them, employees develop their skills in these areas. In this way scaffolding is not just about helping someone to do something when they do not have the skills, instead it is a way of developing those skills, in a supported way.

There are some minor differences across sectors with *more* employers in the Education (95%), Professional, Scientific and Technical (94%), or Manufacturing (94%) sectors saying they have no basic skills needs. In contrast, employers in Wholesale, Retail and Motor Repair (87%), Administration and Support Services (87%), or Accommodation and Food Services (86%) are *less* likely to indicate that they have no basic skills gaps.

However, it is important to consider the extent to which employers may or may not be aware of the skills needs of their employees (see Chapter 2, section 2.3), because employers' awareness is linked to the likelihood that they engage with basic skills training. For example, in the evaluation of Train to Gain, Ofsted (2008) found evidence of low uptake of training being linked to employers failing to recognise basic skills deficits in the workforce and the potential link to productivity.

Furthermore, some employers may identify specific skills gaps (i.e. punctuation) and may not see a 'whole' literacy course as the most efficient (in time and money) or appropriate way to deal with this skill gap. They may prefer informal support or bespoke training courses instead. Others do not offer training because they fear that staff would view it as patronising, or feel singled out and they do not want to cause ill feeling in the workplace or risk losing valuable members of staff; this is more common for basic literacy than numeracy. If the basic skills provision comes as part of something larger, e.g. an Apprenticeship or NVQs, then the employer will be less likely to be seen as making a comment on the employee's basic skills by offering the training (though there is still a general lack of appetite among employers for formal basic skills training).

Quality of basic skills training

The quality of basic skills training has been called into question (e.g. Ofsted, 2008; Wolf & Evans, 2011[30]), but this was not spontaneously cited as a reason for not providing basic skills training. However, when asked about quality explicitly, only 32% of employers nationally say that basic skills training is *not* 'poor' - considerably fewer compared with employers who have delivered public-funded basic skills training (60%), although Wolf and Evans (2011) have argued that employer satisfaction levels are likely to be overstated for government funded training.

Concerns about losing staff

Whilst a fifth of employers nationally (22%) express some concern about poaching externalities, it is no more than the level of concern expressed by employers who provide public-funded basic skills training (also 22%). According to Human Capital Theory (Becker, 1962) human capital can be conceptualised as 'general' and 'specific'.

[30] In this study employers felt that training providers focussed too much on ensuring they met requirements for Government funding as opposed to being driven by the needs of the employer/employees.

General capital is portable and could benefit more than one firm. In contrast, specific capital only benefits one company or a limited number of firms. From this perspective, firms should refuse to pay for basic skills training as this will increase employees' 'general' capital, which could potentially benefit other firms (Wolf & Evans, 2011). However, this does not appear to impact on employers generally any more so than on employers providing public-funded skills training.

Philosophical opposition

Past research has indicated that some employers are 'philosophically opposed' to providing basic skills training. When asked directly, only 2% of employers agree that basic skills training is *not their responsibility*. In addition, whilst a quarter (26%) of employers feel that the costs of basic skills training outweigh the benefits, the majority (62%) disagree. However, the survey does not define basic skills training though evidence from the case studies suggest that informal coaching and mentoring is more commonplace than formal training. The associated costs and benefits of basic skills training are explored in greater detail in the following, final chapter.

There is some evidence from the case studies that employers feel that it is their *employees' responsibility* to ensure that they have the required level of English and maths to be able to carry out their role.

4.3 Public-funded basic skills training

Type of training provided

The incidence of basic skills training nationally (15%) is too low to enable robust subgroup analysis. Therefore, **this section focuses on the group of employers that have provided public-funded basic skills training in the past year.**

Analysis of the Individualised Learner Record (ILR) shows that the large majority of these employers (83%) have provided *both* literacy *and* numeracy training to their employees; just 7% provided literacy training only and 10% have provided numeracy

training only. Therefore, the following two chapters refer to 'basic skills training' as a unitary construct which incorporates both literacy and numeracy elements[31].

In terms of the duration of the basic skills training, workplace literacy and numeracy courses subsidised by the government tend to be short, averaging no more than 30 hours (Wolf and Evans, 2011). The information on course duration in the ILR is limited. However, the Foundation Courses in Maths or English (which account for 16% of the basic skills training) have an average of 45 guided learning hours.

As outlined in Chapter 1, the vast majority of employers (97% of respondents) who offer public-funded basic skills training do so as part of an Apprenticeship[32], and the majority (86%) do not provide any further basic skills training beyond this.

Sector

Compared to the general business population, employers who provide public-funded basic skills training are *more* likely to operate in the Public Sector (14% vs 4% nationally) and *less* likely to be in the private sector (75% vs 85% nationally). Specifically, they are more likely to be in (Table 4.2): Accommodation and Food Services; Education; Human Health & Social Work; and Other Service Activities[33].

Table 4.2: Industry sector of employers nationally compared with those that provide public-funded basic skills training

Industry sectors	Employers nationally	Employers providing public-funded basic skills training
Public Sector	4%	14%
Private Sector	85%	75%
Accommodation and Food Services	5%	11%
Education	2%	12%
Human Health & Social Work	9%	29%
Other Service Activities	4%	8%

[31] Recall of the public-funded basic skills training was high among employers: 90% indicated that the information on the Individualised Learner Record was correct, with only 5% disagreeing with the number of learners, and 5% saying they could not confirm if the figures were accurate.

[32] As outlined in the *Richard Review*, and the *Future of Apprenticeships in England Implementation*, apprentices should study for the English and maths qualification a level below their apprenticeship (if they are not already qualified at this level) and should have the opportunity for higher study.

[33] This broadly reflects the profile of employers who offer Apprenticeships (Apprenticeships Evaluation: Employers 2014, BIS)

Profile of employees receiving basic skills training

According to the ILR, the 4,239 employers who have provided public-funded basic skills training had a combined total of 11,021 employees completing basic skills training between September and December 2012. The average number of employee per workplace is 82.

Nine in ten of these employers (91%) had 4 learners or fewer, with the majority (63%) having a single learner, 18% having 2 learners, and 7% having three learners[34]. The relatively low volumes of employees receiving basic skills training is an important consideration for the econometric impact analysis of this training (see section 5.4) as any impacts will be difficult to detect at the workplace level.

The proportions of employers who provide basic skills training to different occupational categories are ranked in Table 4.3. As would be expected, the provision of basic skills training is highest in semi- and unskilled occupations, with personal service occupations most likely to receive public-funded basic skills training (82% of employers with these occupations provide basic skills training to their employees), followed someway behind by sales and customer services, skilled trades and elementary occupations.

Table 4.3 Profile of employees who receive public-funded basic skills training

Occupation type	Base (number of employers with employees in occupation)	Number of employers providing basic skills training to this occupation	Proportion of employers providing public-funded skills training to that group
Personal Service occupations	1,806	1,479	82%
Sales and customer service occupations	1,158	638	55%
Skilled trades occupations	1,010	454	45%
Elementary occupation	2,265	1,003	44%
Administrative and secretarial occupations	2,543	943	37%
Process, plant and machine operatives	480	156	33%
Associate professional and technical occupations	560	180	32%
Managers, directors and senior officials	4,133	1,095	26%
Professional occupations	700	153	22%

Base: Nationally representative sample of 4,239 workplaces with employees completing public-funded basic skills training between September and December 2012

[34] These figures are based on the un-weighted data of the 4,239 respondents; however they are the same when using the weighted data to infer to all employers who provided publically funded basic skills training.

This profile broadly reflects the reported prevalence of skills deficits in Human Health and Social Work. This pattern is also partially reflected the literature. For example, Personal Service, Elementary, and Administrative occupations have been highlighted as having basic skills needs (e.g. Skills for Life Survey, 2011; PIAAC, 2013).

Beyond occupation, significantly more employers provide public-funded training to full-time members of staff (79%) compared to part-time (37%). In addition, the youngest members of the workforce are less likely to receive such training. Across all employers providing public-funded basic skills training, significantly fewer (14%) provide it to 16-18 years old compared to those who provide it to employees aged 19 and over (72%). However, this figure does increase when looking solely at employers who hire 16-18 years olds. For this group, 43% provide public-funded basic skills training to staff aged 16-18 years old.

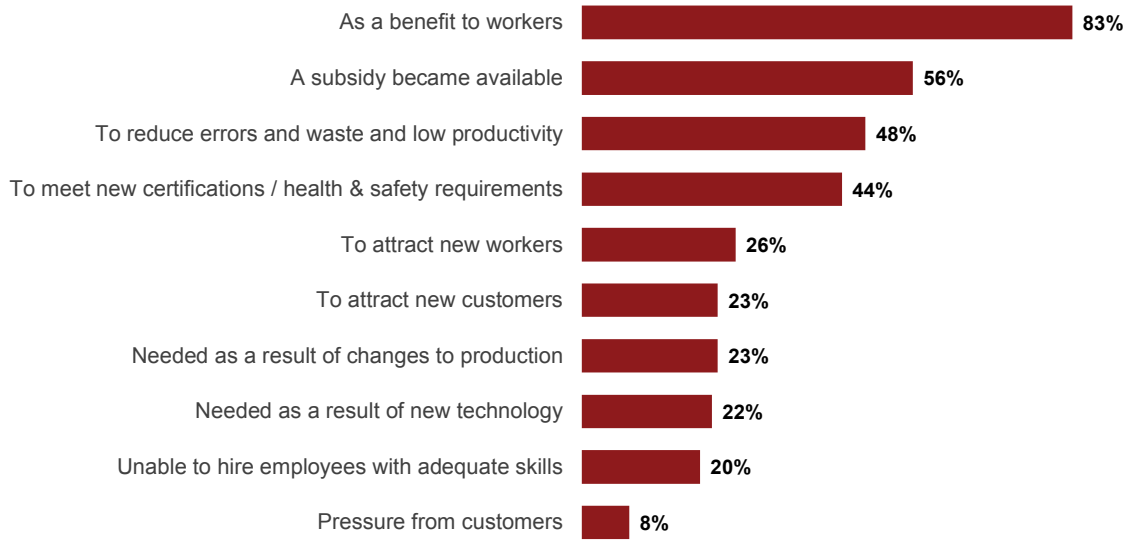
4.4 Motivations for providing basic skills training

Employers were asked why they had provided public-funded basic skills training, and the most commonly cited reasons are presented in Figure 4[35] and discussed further in this section. As the majority (97%) of employers who provide public-funded basic skills training do so as part of an Apprenticeship, it is possible that the findings reflect employers' motivations to offer Apprenticeships more broadly since the basic skills elements of the training are unlikely to be the main motivator for employers to commit to an Apprenticeship.

While the case studies provide some evidence of employers' awareness of the potential negative impact on their business of poor basic skills amongst their staff, basic skills training did not appear to be a priority. Instead, they encourage and support informal learning and put in place processes that obviate the potential impact of poor basic skills.

[35] Except for the first two reasons, the motivations are thematically structured under the headings outlined in section 3.1.

Figure 4: Top ten reasons for providing basic skills training



Base: **Nationally representative sample of 4,239 workplaces with employees completing public-funded basic skills training between September and December 2012**

An employee benefit

When asked what prompts them to offer staff basic skills training, by far the most commonly cited reason (by 83% of employers) is *as a benefit to workers.* This finding is in line with previous studies in both the UK (e.g. Wolf & Evans, 2011) and US (e.g. Hollenbeck & Timmeney, 2009) which found that employers were primarily motivated to provide basic skills training for non-economic reasons. In these studies, basic skills training was viewed as a staff benefit to boost morale[36] and other 'soft skills' which could ultimately benefit the business (although no attempt was made to measure these benefits). The extent to which this was identified as a reason in the current survey is similar across different sizes of worksite. It is also fairly consistent across sector, although less likely in Construction (76%) than some other sectors (e.g. Accommodation and Food Services - 85%; Human Health and Social Work - 85%; Education - 84%; and Wholesale, Retail and Motor Repair - 82%).

There is limited evidence in the case studies that employees themselves saw training as a benefit. In case study three the account manager explained at great length how he had

[36] Studies of Apprenticeships have also indicated that certain sectors provide Apprenticeships as a way of boosting staff morale https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/32305/12-813-evaluation-of-apprenticeships-employers.pdf

received valuable training at a previous employer which was highly relevant to his current role.

Availability of funding

The second most commonly cited reason for providing basic skills training (cited by 56% of employers) is because a *subsidy became available*. Many researchers (e.g. Hollenbeck & Timmeney, 2009) state that government subsidies play a key role in increasing basic skills training in the workplace. In the UK, Wolf & Evans (2011) found that companies were often happy to provide training funded by government, but discontinued the training once funding ceased. This pattern is also evident in this study. Whilst 38% of employers say that it would make no difference to their basic skills training provision if funding was not available, a quarter say that they would have trained fewer staff, and three in ten (30%) say they would not have trained any.

Interestingly, when looking at employers who *do not* provide public-funded basic skills training, the role of funding is less clear cut. Whilst awareness of funding amongst this group is limited (with less than half - 46% - of employers aware), when asked why they do not provide training only 1% say that cost is an issue, or that the benefits do not justify the investment. Furthermore, these employers are significantly less likely than employers who provide public-funded basic skills training to say that the government *should* subsidise workplace basic skills training (62% vs 85%)[37]. Nevertheless, these findings further reinforce the notion that government funding plays a crucial role for some employers in their decision to provide basic skills training (e.g. Hollenbeck & Timmeney, 2009).

Improve efficiency and productivity

The third most frequently cited reason for providing basic skills training is to increase efficiency. Approaching half of employers (48%) wanted to *reduce errors and waste and low productivity.* In addition, whilst less frequently stated, a quarter say that basic skills training is needed as a result of *changes to production* (23%), or the introduction of *new technology* (22%).

[37] However, this should be viewed in the context of most of these employers saying that they have no need for the training (see section 4.4 below).

The literature (e.g. Wolf & Evans, 2011; Hollenbeck & Timmeney, 2009) suggests that economic considerations are less salient for employers when deciding to offer basic skills training. However, this study indicates that, whilst less salient relative to "softer" factors, considerations about the impact on productivity is a key motivating factor for half of employers.

Meeting industry requirements

Whilst employers who provide public-funded basic skills training do not cite reducing workplace accidents[38] as a key motivating factor, 44% were motivated to provide basic skills training in order to *meet new certifications / health and safety requirements* (the fourth most commonly cited reason). This was significantly more likely in the Construction (51%) and Human Health and Social Work (58%) sectors. Again, this pattern is partly related to certain jobs in these sectors requiring staff to acquire minimum qualifications levels in order to practise.

Turnover

Approaching a quarter of employers (23%) provided basic skills training to help improve sales by *attracting new customers*. The relatively low salience of this factor contrasts with the work of Levenson (2004) in which four small-scale employer surveys were reviewed, and the most common motivations or objectives for providing workplace learning were found to be profit-focussed.

There was some evidence in the case studies of employers using qualifications to raise their business image and attract customers, rather than to address specific skills needs.

HR Motivations

One-in-five (20%) employers say that they offer basic skills training because they are *unable to hire employees with adequate skills,* and there is little difference across industry sector. This finding appears to support (at least in part) research which highlights basic skills gaps in the English labour market. For example, ESS 2013 found that 34% (up from 28% in 2011) of employers said they had skill-shortage vacancies

[38] Even though a quarter had indicated that they had experienced increased accidents as a result of basic skills gaps – see section 3.1.

arising from a lack of literacy, and 26% (up from 24%) cited skill-shortage vacancies arising from numeracy.

Related to this point is the fact that a quarter (26%) of employers say that they want to *attract new workers.* In this context, basic skills training could potentially make the employer seem more attractive and links back to employers seeing training as a *benefit to workers.* This may be even more pertinent if the supply of sufficiently skilled labour is limited. Whilst there is little difference across sector in terms of being unable to hire employees with adequate skills, there are some sector differences when looking at those who say they want to attract new workers. Employers in the Human Health and Social Care (30%) are significantly more likely to cite this as a motivation (most likely reflecting the compulsory nature of some qualifications in these sectors), whilst those in Manufacturing are significantly less likely to (18%).

5. Costs and benefits of workplace basic skills training

Key findings

Further econometric analysis was undertaken to estimate the impact of basic skills training on: (i) the prevalence of basic skills deficits, and (ii) firm performance. This research focused on the impact on workplaces only and does not measure any benefits to individual learners.

For both analyses, no statistically significant relationship was detected. These results are consistent with the low levels of training provided in the workplace – on average, 2.4% of employees per workplace completed basic skills training.

The estimations of the impact of basic skills training may also be biased by the lack of an isolated training intervention – 97% of workplaces offering public-funded basic skills training were doing it as part of an Apprenticeship.

The survey data also suggests that employers' motivations for providing training are more complex and the natural assumption of a direct relationship between training/education and competencies do not always hold true. For example, 83% of employers who provide public-funded basic skills training do so as a benefit to staff; less than half said the training was implemented to reduce waste and low productivity; and only 20% said the training was offered specifically as a result of skills deficiencies in the labour market.

Finally, the case studies highlighted that employers may also be mitigating the impact of poor levels of basic skills within the workforce through use of technology and informal solutions and strategies. Among the workplaces that do offer training to improve skills, it is possible that some positive impact is felt by them. This study sought to value this benefit for a single year. However, skills and training impacts represent a dynamic and ongoing relationship which is more readily observed using longitudinal data. Any

impact of training will likely be felt over an extended period. The ability to estimate this relationship would likely be improved with repeated observations over time – allowing for additional econometric techniques to be used that improve the accuracy of results – allowing for a more detailed picture of changes occurring over time in specific industries, sectors, or even specific employers.

Focusing on self-reported measures, the most commonly reported benefits of providing public-funded basic skills training are: a reduction in the *number of errors* made by the workforce (cited by 63%); increasing capacity to meet statutory and industry requirements (58%); and being able to introduce more efficient/new processes.

Employers also report improvements in their employees' skills and abilities following the public-funded basic skills training: 64% say they see an improvement in employees' ability to *perform and complete job tasks;* a similar percentage (64%) report an improvement in employees' ability to *work independently;* 55% cited employees' ability to *work in teams*; and 42% see an improvement in employees' abilities to *use technology*.

This chapter presents the costs and benefits associated with the provision of public-funded basic skills training. Firstly, it focuses on the self-reported measures of impact by employers with employees completing public-funded basic skills training one year prior to the survey. The second part of the chapter presents the economic analysis of the impact of the basic skills training on employers[39].

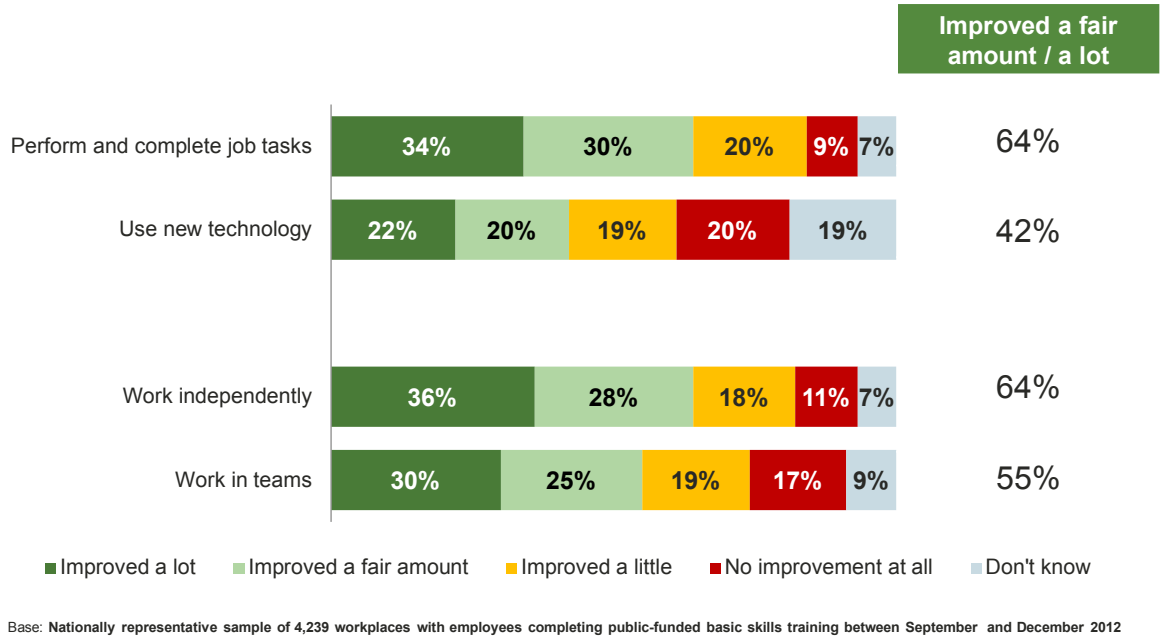
The literature presents conflicting evidence regarding the costs and benefits to both employees and employers. For example, several studies have shown that basic skills training in the workplace has little or no impact on either employees' basic skill levels or the bottom line of the firm (e.g. Abramovsky et al., 2005; Finlay et al., 2007). However, a review of workplace literacy and numeracy training in and outside the UK suggested that whilst the training does not lead to increased turnover, there may be benefits in terms of staff retention (Ananidou, 2003). In contrast, an RCT study in America (Moore et al., 1999) found that a federally funded literacy programme had led to several positive outcomes including increases in employees' skills, reduced absenteeism, and improved teamwork and supervisor performance ratings. In summary, the literature appears to indicate that basic skills training has no impact on the bottom line of firms who offer it, but may have some effects on aspects (e.g. absenteeism) that might indirectly affect productivity.

5.1 Impact on staff's ability

Taken together the patterns that emerge in the current study partially support the work of Moore et al., (1999) in that the majority of employers who provide public-funded basic skills training report improvements in employees' abilities to perform job tasks and work independently. However, employers are less positive about employees' abilities to use technology or work in teams (Figure 5). On the whole, small workplaces (with 1-9 employees) tend to report fewer impacts on staff abilities.

[39] It is important to note that the current research will not pick up on longer term benefits to the individual (e.g. better job, higher income).

Figure 5: Perceived improvements in employees' abilities following public-funded basic skills training



Base: **Nationally representative sample of 4,239 workplaces with employees completing public-funded basic skills training between September and December 2012**

Impacts on employees' skill levels

Two-thirds of employers who deliver public-funded basic skills training (64%) report an improvement in employees' ability to *perform and complete job tasks*, including a third (34%) citing that their employees had improved *a lot*. In contrast, three in ten reported that there was little to no improvement (with 9% saying none). Certain sectors (e.g. Education - 67% and Human Health and Social Work - 70%) are significantly more likely to cite improvements than others (e.g. Manufacturing - 57%, Construction - 58%, Wholesale, Retail and Motor Repair - 57%, Accommodation and Food Services - 53%, and Transport & Storage - 48%).

Employers are less likely to identify improvements in employees' abilities to *use technology* following basic skills training though a significant minority (42%) *did* see an improvement (including 22% citing *a lot of improvement*). However, a similar proportion saw little to none (39% including 20% citing none). The responses are fairly consistent across industry sectors.

Impacts on supervision requirements

Employers are most positive about their employees' ability to *work independently* following basic training. Approaching two-thirds (64%) reported an improvement with

36% saying their employees had improved *a lot.* In contrast, 29% do not perceive this benefit, with 11% saying that they see no improvement *at all* in their employees.

Employers are less likely to cite improvements in their employees' ability to *work in teams*. Just over half (55%) see improvement (with 30% seeing *a* lot), but just over a third (36%) perceive little to no improvement (including 17% saying none).

Staff morale

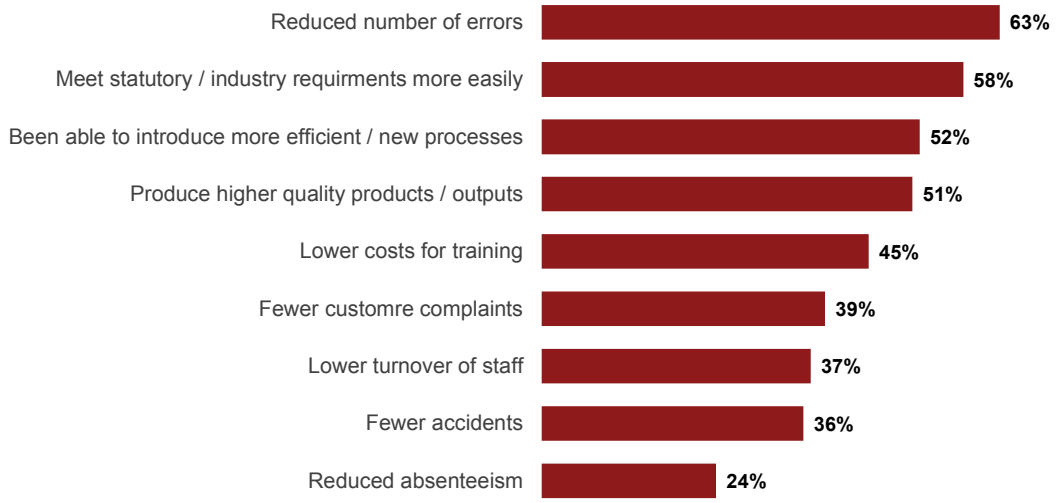
The literature evidence (e.g. Wolf & Evans, 2011) suggests that one of the principal benefits of basic skills training (at the level of the individual) is an increased in employee morale. However, whilst the most commonly cited reason for providing training is as an employee benefit (see section 4.4), when presented with a list of possible benefits just 3% of employers state that staff morale and confidence has improved and it was not a factor that was raised by employers in the case studies.

5.2 Benefits to the organisation

The most commonly cited benefits for the organisation are related to business performance (even though these may not have been the most important factors in motivating employers to provide public-funded basic skills training in the first place – see Chapter 4 section 4.4). The most frequently cited reasons are outlined below under the same thematic headings presented in Chapter 3 (section 3.1)[40]. Again, it should be noted that the majority of basic skills training takes place as part of an Apprenticeship, and, therefore, the benefits reported here may reflect employers' experiences of the Apprenticeship programme overall.

[40] It should be noted that virtually no employers (less than 1%) stated that they had experienced increased sales/turnover or increased profit margins as a result of providing basic skills training.

Figure 6: Organisational benefits following public-funded basic skills training



Base: **Nationally representative sample of 4,239 workplaces with employees completing public-funded basic skills training between September and December 2012**

Efficiency / productivity benefits

The most commonly reported benefit of providing basic skills training (cited by 63% of employers) is a reduction in the *number of errors* made by the workforce. In addition, 52% reported that they have been able to *introduce more efficient / new processes*, and 51% have been able to *produce higher quality products / outputs*. This could perhaps be expected in light of 64% of employers stating that they see improvements in the skills levels of their employees (see section 5.1). These self-reported improvements reflect international research by Hollenbeck and Timmeney (2009) who reviewed a state-funded literacy programme in the US state of Indianna, and found that both employers and employees reported productivity gains.

Time savings

As outlined in Chapter 3, dealing with customer complaints can impede productivity. Responses to the current survey suggest that this might be one avenue through which basic skills training can benefit an organisation. Two-in-five employers (39%) report fewer customer complaints, and this is significantly more likely for employers in the Retail and Accommodation sectors (46%) and those with employees in Sales & Customer Service (45%).

Accidents & Meeting industry requirements

The second most cited benefit, by 58% of employers, is that they are able to *meet statutory/industry requirements more easily*. However, this is significantly more

prevalent in the Education (67%) and Health (73%) sectors and, therefore, may reflect the compulsory nature of some qualifications in these sectors (e.g. care workers have to complete at least a Level 2 qualification). Over a third (36%) reported fewer accidents as the result and this is fairly consistent across industry sectors.

HR benefits

To a lesser extent, employers report a range of HR benefits from providing basic skills training. The most frequently cited HR benefit (cited by 45% of employers) is that they experience *lower costs for training*. Again, perhaps this is to be expected if employees' skill levels are improving. Beyond training costs, just over a third (37%) of employers state that they have seen a drop in *staff turnover*. The least cited HR benefit is *reduced absenteeism*, which is reported by a quarter of employers (24%).

5.3 Costs to the organisation

The literature evidence shows that employers are particularly reluctant to pay for basic skills training, and such courses are also expensive for providers as they tend to have small numbers of learners (Wolf & Evans, 2011). A potential solution of employers grouping together has been looked at (e.g. Hollenbeck and Timmeney, 2009) but programmes involving multiple employers proved very difficult for providers to administer, and were time and resource intensive resulting in additional costs which employers are unwilling to pay. These findings are consistent with the widespread use of informal methods of coaching and mentoring basic skills tasks observed in the case study workplaces.

Providing staff to cover the work of trainees

There is limited evidence in the broader literature on the costs incurred by employers in providing basic skills training in the workplace. The current study asked employers the extent to which they provide staff to cover the work of employees whilst they receive basic skills training. Providing cover creates a financial cost for employers in the form of additional wages. However, it should be noted that *not* providing cover creates opportunity costs (through foregone work), which are not captured in the current survey.

In total, 52% of employers who delivered public-funded basic skills training provided cover for *all* their trainees, whilst 41% provided no cover at all[41]. The potential cost of covering staff who are training is likely to be influenced by the size of the employer and the sector in which they work. The provision of cover is significantly greater at worksites with 10-49 employees (58% cover all staff), and significantly lower for worksites with 1-9 employees (where 53% do not provide any cover), although there is no difference when looking at the size of the entire organisation. When looking at sector, employers working in Manufacturing or Construction are significantly less likely to provide any cover (with, respectively, 61% and 73% saying they provide no cover at all).

5.4 Econometric Analysis of costs and benefits

Further to the analysis reported earlier, in Chapter 3.2, similar econometric techniques were used to estimate the impact of basic skills training on: (i) the prevalence of basic skills deficits, and (ii) workplace performance. It was assumed that basic skills training would positively impact on the capabilities of employees and, as a result, the performance of the employer. Analysing the impact of training on workplace performance directly would allow us to consider alternative paths of interaction should they exist.

The analyses were run using the same measures of basic skills deficits and productivity described in the previous econometric analysis (see Chapter 3.2). In addition, two measures of training were included in this estimation; an indicator of the employer's participation in public funded training (recorded in the ILR database) and an indicator of non-public funded training (collected in the survey). The current method sought to compare the impact of training, whilst controlling for the inherent bias generated by the self-selection aspect of training provision.

For the impact of training on the prevalence of basic skills, no significant relationship was found. As with the first analysis, this result is perhaps unsurprising given the very low levels of training provided in the workplace

Similarly, no statistically significant relationship between training and firm performance was found. This result was consistent across all methods employed. Given the

[41] 3% provided cover for over half of trainees and 2% provided cover for less than half.

conclusions regarding the impact of basic skills on workplace performance (outlined in Chapter 3), it is perhaps unsurprising that no relationship was observed here[42].

Both results, along with our analysis in Chapter 3, give a consistent picture that is also in line with survey findings. The low numbers of workplaces offering training along with low demand suggests that business may not see the value in providing this training, or have alternative ways of minimising the impact of basic skills gap, such as paying lower wages for example.

The estimations of the impact of basic skills training may be biased by the lack of an isolated training intervention. As previously outlined, 90% of basic skills learning aims are provided as mandatory part of Apprenticeships. It is, therefore, possible that these employers may not perceive the basic skills element as necessary (i.e. their employees do not have basic skills deficiency that warrants the training). The analysis could be looking for an impact within a much smaller group of learners with an actual need for training.

Basic skills training is only provided to a low percentage of employees

A review of basic skills training activity suggests it may not be a vehicle for significant change given its low intensity nature and the low number of staff undertaking it (on average, two employees *per firm* completed basic skills training from an average of 82 employees; equivalent to 2.4% of employees per workplace). Both factors make it difficult to identify impacts at the workplace level, and the current design did not measure any benefits to the individual learners.

In case study nine, basic skills training were done by Health Care assistants as part of their NVQ qualifications. The manager was happy to facilitate the training though her own assessment was that the personal qualities of the staff, their communication and attitudes, were far more important to the organisation than acquiring the qualification.

Employers may take mitigating action

[42] The economic model used in the estimations (presented in this chapter) further tested the robustness of the initial regression (presented in Chapter 3), as the methodology looked at the relationship as a direct interaction, and indirectly through training impact on basic skills.

As already discussed employers may be mitigating the impact of poor levels of basic skills within the workforce through use of technology, testing at recruitment stage, or, in a number of instances, making use of work-based, low cost methods of supporting new or inexperienced staff.

The case studies provide a number of examples of the use of informal learning and explicit scaffolding of tasks requiring English and maths in the workplace as mechanisms to mask or obviate basic skills deficits. Such mechanisms were not limited to new or inexperienced staff. The case study employers appear to view their employees' basic skills as one factor in determining their value to the business, with other skills and dispositions equally, or more valued, leading to a willingness to compensate for any deficiencies through enhanced processes and human collaboration.

However, as well as compensating for basic skills deficits among staff by reducing the demand for basic skills within work tasks and processes, such approaches may also impact negatively on the English and maths of employees. Employees develop their skills informally on the job through completing work tasks, often collaboratively. When the English and maths requirements to carry out such work tasks are minimal, such informal skills development is likely to be replaced by skills decline. With low demand on English and maths, employee motivation to improve their skills is also likely to be negatively impacted.

The case studies also found little evidence of employers using basic skills qualifications as a requirement for employment, preferring instead to assess potential recruits' skills in a holistic and informal way. Reasons cited for this include a desire to not miss out on good applicants just because they had done poorly at school; a lack of confidence in the relevance of GCSEs to the demands of the workplace; and a belief that prior qualifications (in some cases, gained many years previously) do not always provide an accurate assessment of *current* skills and abilities.

The offer of training may not reflect actual basic skills deficits

Whilst the natural assumption would be to propose a relationship between training/education and competencies, the estimations and survey results point to more complex reasons for providing and completing skills based training in the workplace.

The large majority (83%) of employers who provide public-funded basic skills training do so as a benefit to staff; less than half said training was implemented to reduce waste and low productivity; and only 20% said training was offered specifically as a result of skills deficiencies in the labour market. Therefore, further consideration should be given to current conditions in the labour market as higher levels of unemployment nationally, and increased levels of youth unemployment means that employers have greater choice when recruiting[43].

Methodological challenges

Lack of longitudinal data

Finally, given that some workplaces do offer training to improve skills, it is possible that some positive impact is felt by them. The current study sought to value this benefit for a single year. However, skills and training impacts represent a dynamic and ongoing relationship which is more readily observed using longitudinal data. Any impact of training will likely be felt over an extended period. For example a study commissioned by BIS[44] suggested that every £1 spent on apprenticeship funding delivered a benefit (NPV) of £35-£40 over the working life of the employee. Given the low numbers receiving basic skills training (as part of an Apprenticeship), and the long-term nature of predicted benefits, the magnitude of any impact over the course of a year[45] could be very small indeed.

The ability to estimate this relationship would likely be improved with repeated observations over time – allowing for additional econometric techniques to be used that improve the accuracy of results – allowing for a more detailed picture of changes occurring over time in specific industries, sectors, or even specific employers.

Potential inaccuracies in reported skills deficits

As outlined in earlier chapters and the existing literature, it is inherently difficult to obtain accurate measures of skills deficits in the workforce and this may have impacted on the econometric estimations of the impact of basic skills training. For example, basic skills training may lead to improvements in employees' skill levels, but this could potentially be

[43] This may explain why fewer employers offer basic skills training now than in the past (e.g. Gallup, 1992).
[44] BIS Research Paper No. 38 – Measuring the Economic Impact of Further Education; March 2011.
[45] The time period selected in the current study.

masked if employers who do not provide such training under-report the level of basic skills deficits in the workforce (see section 2.3).

6. Conclusions and implications

Prevalence and impact of basic skills deficits

The econometric analyses undertaken found no statistically significant relationship between the prevalence of basic skills gap in the workplace and proxy measure of firm-level productivity. This finding is consistent with the broad results of the survey: just 12% of workplaces in England reported a gap in basic literacy and/or numeracy, with fewer still (8% of all workplaces) reporting that those gaps caused material impacts on the performance of their workplace. As such the aggregate effect of these skills deficits might be expected to be of insufficient magnitude to be detectable through econometric analysis.

The case studies also highlighted that some employers have been able to mitigate against the impact of poor literacy and numeracy through the use of ICT interventions and informal solutions, and strategies such as peer support to reduce the extent to which these skills are required to complete many processes.

The results also need to be taken in the context of the prevailing labour market; unemployment was relatively high meaning that employers may have had greater choice in how they deploy workers to ensure minimal impact on efficiency and profitability.

Finally, failure to observe statistically significant effects at a firm-level does not necessarily imply that there are no economic costs associated with poor basic skills in the workplace. Low levels of basic skills may constrain the economy through lower levels of productive capacity and reduction in aggregate supply – this would not be captured in the econometric analyses which were focused on the microeconomic impacts.

Evidence from the case studies also suggest that **some employers may be underestimating the extent of their basic skills gaps** (and by implications the impact on their performance), which could point to a lack of effective mechanisms to measure and monitor basic skills in the workplace.

Indeed a recurring theme from the case studies was that some employers have a low awareness of literacy and numeracy gaps in their workplace, and only through probing from interviews did such gaps emerge. In part this is due to the coping strategies discussed below masking any problems but it also seems to be related to a very narrow

understanding among employers of what literacy and numeracy are in relation to job roles and requirements. Individuals have different understandings of what 'counts' as literacy and numeracy. For example, one person may see using excel spreadsheets as a numeracy practice but another person may not, or the extent of the active reading required may be underestimated. In order for employers to appreciate the impact of poor basic skills on their workplace performance and, by implication, make them more willing to understand and support their employees in meeting the literacy and numeracy demands of the workplace, **employers need support in understanding the literacy and numeracy components of workplace tasks.**

Rather than literacy and numeracy, the main area of interest to employers thinking of skills deficits in the case studies was ICT skills. This underscores the importance of digital skills in the modern workplace. Several firms had taken advantage of ICT to help employees with tasks – software packages such as Excel, templates for accounts and letters. However, the use of new media also means that there are new job roles emerging and employers do not always have the necessary training or skills to support these new roles suggesting a **potential role for skills diagnostic and training brokerage support.**

For most of the workplaces in the case studies, the literacy and numeracy qualifications of prospective employees were not a priority in the recruitment process. For workplaces recruiting at a higher level, assumptions were made that the employee's qualifications would exceed any minimum thresholds. Other workplaces either considered communication skills (especially speaking and listening) to be more important to the job roles they recruited for, or assessed an individual's literacy and numeracy as part of the recruitment process. **For these employers, GCSEs "on paper" held little currency.**

Compensating for poor skills

A wealth of research evidence shows that individuals with low literacy and/or numeracy develop coping strategies that enable them to get along in everyday and working life; often it is the disintegration of these coping strategies at times of change that propels individuals to improve their skills. Evidence from a number of case study sites suggests that employers, too, develop coping strategies to compensate for literacy and numeracy deficits among staff. Some employers, for example, indicated that they make use of low cost and informal mechanisms, like scaffolding of tasks or explicit on-the-job training, in order to diminish the impact of poor skills (there were also examples of employers using

these informal practices to *develop* employees' skills as well). **Informal solutions such as shadowing, scaffolding and peer support allow some firms to compensate for deficits without having to explicitly tackle any training needs that employees might have.** These processes may lead to skills decline and reduced motivation to improve skills.

Some case study evidence suggests that such informal systems are precarious, particularly where employees work in shift patterns and there is no guarantee that someone with higher level skills will be on site to provide support with basic skills tasks where it is needed. Another implication of this informal approach, which some case studies bear out, is that **these solutions are adopted instead of formal training because the perception is that the impact of low skills is minimal and certainly not enough to merit investment in training**. This is especially the case in workplaces where staff turnover is high or where those with skills deficits are volunteers.

The case studies also reveal that the impact of 'poor' literacy or numeracy depends greatly on whether or not employees work in teams. For example, an employee who struggles to write a formal letter with correct punctuation and grammar may regularly work with a colleague who either writes these letters with them or for them. This 'works' for all concerned because the particular employee with punctuation issues has other strengths that they bring to the team and is able to help their colleagues out as well, where appropriate.

There is a need to study collaborative workplace practices in more detail, including the ways in which collaborative workplace practices could be considered to be informal learning, i.e. that they develop skills as well as compensate for deficits, and **there is a need for more in-depth studies of workplace literacy and numeracy practices.** The case studies have highlighted that this level of detail is vital for a fuller understanding of the impact of poor literacy and numeracy in the workplace; this is especially important in light of employers' limited appetite for formal basic skills training or standalone courses.

Prevalence and impact of basic skills training

The majority of employers (85%) do not provide any form of basic skills training, with the majority (90%) saying that they have no need for it. The current research found no relationship between the provision of basic skills training and the prevalence of basic skills

deficits. In addition, no statistically significant relationship between basic skills training and firm performance was detected. **The low number of staff undertaking the training, together with its low-intensity nature, means that basic skills training delivered as part an Apprenticeship may not be a vehicle for affecting a significant change in workplace performance;** as stated this research does not assess the impact of basic skills training on individuals or the wider economy.

The case study evidence suggests that the supply of training needs to be more closely aligned with the demands of the workplace. Even where employers identified literacy or numeracy gaps they were unlikely to believe literacy or numeracy qualifications/courses to be the appropriate solution. Employers said their employees would not be interested in stand-alone literacy courses, for example, and employers did not conceive of basic skills courses as professional development.

There was little evidence that firms were interested in helping their employees' to gain a formal qualification, except where that qualification was deemed to have an external currency, in that it enhanced the reputation of the firm (e.g. gave reassurance to those using a care home), or gave the firm an edge over its competitors (e.g. the estate agent example).

Some employers suggested that bespoke in-house courses on specific literacy and numeracy practices would be more attractive. However, many employers appear to feel that scaffolding of literacy and numeracy tasks and/or informal skills development between colleagues was a more appropriate solution.

The merits of programmes designed to improve basic skills are contested in the literature (e.g. Ananidou, 2003; Hollenbeck and Timmeney, 2009) and the evidence on the benefits of workplace skills training to employees vastly outweighs the evidence on the benefits to firms. In addition, given the prevalence of scaffolding techniques, further research could be done to **investigate the characteristics of organisations making use of these techniques, and identify factors influencing their impact on reducing or sustaining literacy and numeracy deficits**. The adoption of peer learning and other informal techniques to skills development, in tandem with formal training via the Apprenticeship programme, may be a more effective vehicle for affecting widespread improvements in workplace performance.

Appendix A: Econometric analysis

This Annex details the results of the econometric analysis, providing an overview of the objectives of the analysis, the methodology employed and underlying data collected, and a discussion of the results.

Objectives of the Analysis

The econometric analysis performed as part of this study had two key objectives:

- To provide an assessment of the economic costs of poor basic English and maths skills on the performance of English workplaces; and
- To provide a rigorous assessment of the costs and benefits accruing to employers investing in basic skills training in the workplace.

Analytical Framework

A literature review was undertaken by the National Research and Development Centre for Adult Literacy and Numeracy (NRDC) to gather evidence to inform our analytical approach to the survey and estimation methodology. Evidence was gathered from a range of sources both nationally and internationally.

In the UK there is little quantitative evidence on the financial impact of basic skills deficiencies in the workforce. Many studies did identify skills gaps across a range of occupations and industries. Several sources identified issues associated with these gaps. Whilst the potential impact across these occupations varied, common themes were identified that would likely be observed as impacts across all groups. These effects guided the selection of variables in our estimations:

- Efficiency – where difficulties in interpreting information and instructions from superiors and/or customers by employees could result in lower productivity. Deployment of staff/delegation may also be hindered if employees lack the skills to perform competently across a range of tasks within their business.
- Time Cost – duplication of tasks within a firm due to incorrect completion in the first instance, as well as the likely opportunity cost of supervisors dealing with errors and complaints when more productive tasks could be undertaken.
- Accidents – errors resulting from basic skills needs may cause unnecessary and costly problems such as accidents, whether these involve individuals, machinery and/or products. This could result in increased levels of sickness/absence.
- Human Resources (HR) – basic skills gaps could potentially add to the HR costs of a firm through the need for a more costly recruitment process as well as repeat employee searches if new employees fail probationary periods, leave as a result of their own skills gap or their contracts are terminated.

All of the above would impact on the Gross Value Added (GVA) of firms and should be quantifiable through measures of firm profit and/or productivity, with a hypothesised inverse relationship between levels of basic skills needs and firm performance.

Additionally, variables specifically measuring accidents, illness, staff turnover, labour cost, complaints and supervision/correction time were included within the survey design.

The tables below list the variables used in the model.

Y - *Firm performance variables*

Outcome variables	Description
Turnover per employee	Productivity divided by number of employees. (This variable was transformed by taking logs).
Staff Turnover	Number of resignations divided by the number of employees in the firm. (Denominator and numerator were both taken from the survey so the full sample could be used). This variable was transformed by taking cube roots.
Accidents per employee	Number of accidents divided by the number of employees in the firm. (Denominator and numerator were both taken from the survey so the full sample could be used). This variable was transformed by taking cube roots.
Minor illnesses per employee	Number of illnesses divided by the number of employees in the firm. (Denominator and numerator were both taken from the survey so the full sample could be used). This variable was transformed by taking cube roots.
Major illnesses per employee	Number of illnesses divided by the number of employees in the firm. (Denominator and numerator were both taken from the survey so the full sample could be used). This variable was transformed by taking cube roots.

Further variables related to resignations and complaints were explored. However, graphical analysis suggested that no impact was likely to be present.

S – *Measures of skills gap*

Skills gap	Description
Proportion lacking skills (skills_lack)	The proportion lacking skills in each of seven areas (understanding written procedures, completing administrative paperwork, responding in writing, communicating verbally, spotting incorrect data, performing mental calculations, using numerical data) was calculated from questions C1 (*Number of employees at the workplace who are required to perform the seven skills areas listed above in their current job*) and C2 (*Number of employees at C1 who are able to perform the seven tasks to the level required for their job*). A weighted average of these proportions was then taken, weighted by the number of employees needing these skills.
sklgap	This is a four-category (categorical) variable based on whether lacking skills in numeracy or literacy, both or neither (essentially

Skills gap	Description
	an indicator of one of these 3 options)

T – *Training variables*

Measures of training	Description
ILR indicator	Binary variable
Any training given	Based on question D3 (Number of staff who have received learning or teaching to develop their literacy or numeracy skills).

Sources of data

Our estimations were conducted using data from several sources. The Inter-Departmental Business Register (IDBR) is a key data source on UK business and is the main sample frame used by the UK government. The database contains 2.1 million businesses from all sectors of the UK economy. This was the main sample for firms not engaged in basic skills training. This database also provided information on individual firms, such as turnover, location, industry and employee base.

Firms offering publicly funded numeracy and/or literacy training were identified using the Individual Learner Records (ILR). This database details all post-16 training activity in England funded by the Skills Finding Agency. It also records firms benefitting from funding.

These sample frames were used to select 8,473 employers for the survey, of which 4,239 were engaged in publicly funded training. The results of this survey were combined with information from both databases to develop a dataset for regression analysis, undertaken at the ONS Virtual Microdata Laboratory (VML).

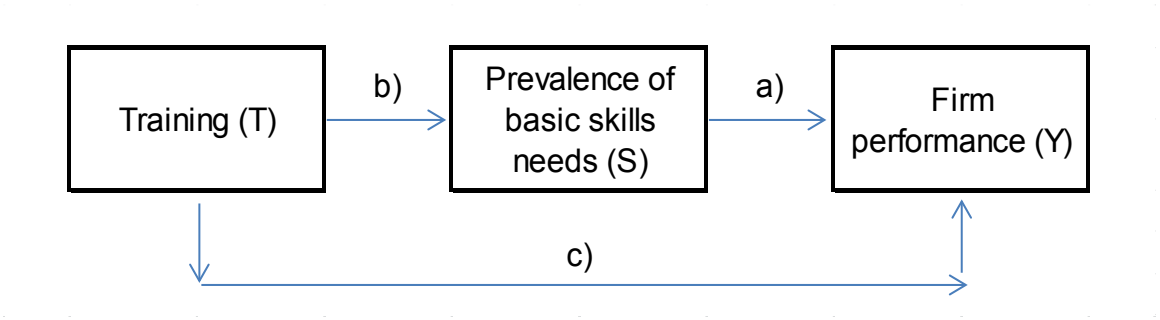
Data-linking

For both databases to be combined a data-linking procedure was carried out. Details of training activity from the ILR were combined with firm level data from the IDBR. This was achieved by using the Business Structure Database (BSD) to identify individual business units from ILR data and matching it with overall firm data in the IDBR. As with many data-linking procedures, links cannot always be made. The success rate for data linking was 70%, however this still represented 5,974 turnover records matched.

Methodology

The combined dataset was used for all regressions. Our model sought to estimate the following causal relationships:

a) The impact of basic skills needs on firm performance;
b) The impact of training on the prevalence of basic skills needs; and
c) The impact of investment in basic skills training on firm performance.



Mediation model

The above diagram describes a mediation model. It is assumed that the impact of investment in training for basic skills would be mediated through the change in prevalence of basic skills needs. Use of this formulation should allow us to fully identify the causal path in detail by testing the proposed path of causation.

A statistically significant relationship between basic skills and firm performance (path a), as well as training investment and firm performance (path c), will be observed if the proposed relationship exists. However, when both training investment and basic skills needs are regressed with firm performance, such that the impact of basic skills on firm performance is estimated using training investment as a control variable, the mediation model predicts that the coefficient for training will be greatly reduced.

Regression techniques

Three distinct regression methodologies were used to estimate each causal path in the model above; ordinary least squared (OLS), kernel matching, and instrumental variable (IV) regressions. Each method seeks to make use of the quasi experimental nature of the data to generate unbiased estimations.

An **OLS** regression model will generate unbiased results if the selection of the treatment or independent variable (such as providing training to staff, for example) is indeed independent from the treatment outcomes. OLS will also be biased if causality runs in both directions, (i.e. level of basic skills causing the need for training and training impacting on the level of basic skills). Whilst these are debatable assumption for the causal paths under investigation, estimations using OLS allow for some baseline comparisons with the other models used.

A **matching** methodology was also employed to develop the control or counterfactual group for all estimations. Given the potential bias inherent in estimations with a self-selecting treatment group (i.e. firms that have chosen to provide some sort of basic skills training) this is the most appropriate treatment of the data in the absence of a

randomised controlled experiment. For example, respondents were identified in one of the two databases; ILR for those firms offering training and IDBR for those who were not for the estimation of training impact on basic skills.

The matching process used propensity score kernel matching. These variables were used as indicators for selecting the treatment: number of employees at the site, type of organisation, industry, unemployment rates at the local authority (LA), proportion with a Level 4 qualification at the LA, percentage of employees aged 16-18 years and whether the employer offered an employee assistance program as a benefit, birth year of company and Government Office Region. The first three variables were included because they were related to the study outcomes, the remaining variables were included after a selection model indicated the two groups differed on them. The matching was carried out within organisation type to ensure there was an exact match by this variable. These variables were then regressed against the treatment itself. This generated a probability score, based on those variables, of the likelihood of take-up of the treatment.

Kernel matching uses a weighted average of *all* respondents not treated, to create a control group. The weights employed are inversely proportionate to the difference in propensity score between both groups. This version of matching avoids the loss of data from unsuccessful matches (a common issue with other matching techniques). Matching relies on observed characteristics; if a significant variable is unobserved, or simply omitted from the matching process, results will be biased.

The quality of the matching on Industry (A12) is shown in Table 1 below (note that two categories are excluded for disclosure reasons). This shows how the variation between samples prior to matching is removed once the kernel weights are applied. Post-matching the ILR/IDBR split is close to 50/50 on each category.

	Unweighted N			*Unweighted %*		*Weighted %*	
Industry sector	**IDBR**	**ILR**	**Total**	**IDBR**	**ILR**	**IDBR**	**ILR**
Agriculture	56	18	74	75.68	24.32	48.54	51.46
Manufacturing	398	264	662	60.12	39.88	49.12	50.88
Water supply & sewage	26	12	38	68.42	31.58	51.18	48.82
Construction	319	173	492	64.84	35.16	48.61	51.39
Wholesale, retail & motor repair	858	688	1,546	55.50	44.50	51.62	48.38
Transport & storage	127	86	213	59.62	40.38	50.81	49.19
Accommodation & food services	288	504	792	36.36	63.64	52.14	47.86
Information & communication	120	23	143	83.92	16.08	49.77	50.23
Financial & insurance	111	42	153	72.55	27.45	46.59	53.41
Real estate	116	61	177	65.54	34.46	50.19	49.81
Professional & scientific	332	76	408	81.37	18.63	49.03	50.97
Admin & support	218	98	316	68.99	31.01	50.40	49.60
Public admin & defence	87	80	167	52.10	47.90	52.15	47.85
Education	215	486	701	30.67	69.33	46.85	53.15

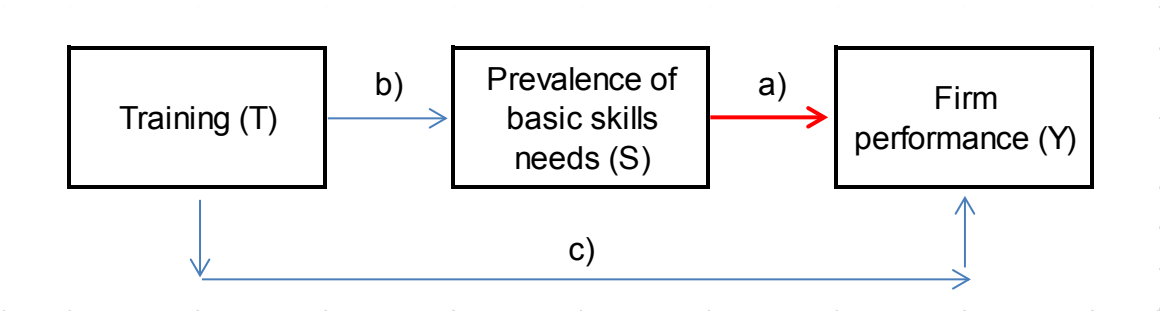
	Unweighted N				*Unweighted %*		*Weighted %*	
Human health & social work	700	1,178	1,878		37.27	62.73	49.97	50.03
Arts & entertainment	131	156	287		45.64	54.36	52.52	47.48
Other services	124	290	414		29.95	70.05	46.95	53.05
Total	**4,226**	**4,235**	**8,461**					

Finally, **IV** regressions were used. This is a two stage regression process that makes use of an additional variable, the instrument, used as a proxy for the independent variables within a model. This method is normally employed when estimations are likely to be biased by endogeneity in the dependent variable, or simultaneous causality. Instruments selected must satisfy two conditions to be valid: they must be both relevant and exogenous from the dependent variable and residual errors. Furthermore, instruments need to be good predictors of the independent variable.

The first stage is a standard OLS regression of the instrument on the independent variable. This estimation decomposes the independent variable into two parts, the portion that is correlated with the error term – which will bias estimation – and the portion explained by the instrument, uncorrelated with the error term and therefore exogenous.

Whilst IV regression is regularly used to overcome the aforementioned issues with data, the results have to be interpreted with caution. Estimations describe only a portion of the population of interest, the results are said to be local area treatment effect (LATE). Interpretation of results, therefore, must include an explanation of the sub group population being described.

Economic cost of basic skills needs – Estimation



The first estimation conducted, path a), is that of the impact basic skills needs has on firm performance.

The literature review conducted as part of this evaluation suggested several variables to use in this estimation process. An important variable within this model was turnover per employee. This data was stored within the BSD, which does not have full coverage of the sample collected in our survey.

Additional variables were sought to measure firm performance in more details, such as GVA, however the necessary information to match into our sample was not available within the BSD/VML.

Each of the three methods described above (OLS, Matching and IV regressions) were used to investigate the impact of skills needs on firm performance (turnover), resignations, accidents and minor and major illnesses. Thirty analyses were run in total as each method was used to investigate the impact of the two skills gap variables on the five company outcomes. The results are given in Table 2. It shows the coefficients for the training variables from the OLS and IV regressions.

Having matched the two samples, the effect of training can be estimated by looking at the difference in means between the ILR and IDBR samples. However, in order to control for differences in sample composition that remained post-matching, we used a regression where the explanatory variables were the ILR indicator, Industry and number of employees at the site. Table 2 therefore presents the coefficients for the training variables from these regressions. For the IV regression, the instruments used in this model was the prevalence of employee benefits schemes (1_ben_1 relates to the provision of travel allowance and 1_ben_4 employee assistance programmes). Estimations of this causal path could be biased, given that firms may make decision on location based on the skills profile of a local labour force. The instruments selected were hoped to be independent of firm performance, whilst still being a good predictor of basic skills needs in the local economy.

Table 2: Results for analysis on the economic cost of basic skills (a)

	Outcome	Training indicator	Coefficient	Std. Dev	T-test	P-value
OLS regression	Turnover	ILR indicator	-0.021	0.028	-0.74	0.462
	Turnover	Any training given	0.006	0.029	0.19	0.849
	Resignations	ILR indicator	0.024	0.006	4.10	0.000
	Resignations	Any training given	0.026	0.006	4.26	0.000
	Accidents	ILR indicator	0.042	0.005	8.10	0.000
	Accidents	Any training given	0.044	0.005	8.72	0.000
	Minor illness	ILR indicator	0.317	0.012	2.59	0.010
	Minor illness	Any training given	0.050	0.013	3.89	0.000
	Major illness	ILR indicator	0.043	0.015	2.82	0.005
	Major illness	Any training given	0.044	0.016	2.78	0.005
IV regressions	Turnover	ILR indicator	0.607	0.487	1.25	0.212
	Turnover	Any training given	0.485	0.388	1.25	0.211
	Resignations	ILR indicator	0.210	0.090	2.33	0.020
	Resignations	Any training given	0.188	0.078	2.40	0.016
	Accidents	ILR indicator	0.545	0.124	4.38	0.000
	Accidents	Any training given	0.472	0.093	5.05	0.000
	Minor illness	ILR indicator	0.390	0.202	1.93	0.054

	Outcome	Training indicator	Coefficient	Std. Dev	T-test	P-value
	Minor illness	Any training given	0.338	0.166	2.04	0.042
	Major illness	ILR indicator	1.225	0.340	3.60	0.000
	Major illness	Any training given	1.044	0.266	3.92	0.000
Matching	Turnover	ILR indicator	0.042	0.035	1.19	0.233
	Turnover	Any training given	0.038	0.042	0.91	0.364
	Resignations	ILR indicator	0.020	0.006	3.09	0.002
	Resignations	Any training given	0.022	0.007	3.12	0.002
	Accidents	ILR indicator	0.033	0.006	5.51	0.000
	Accidents	Any training given	0.040	0.007	6.14	0.000
	Minor illness	ILR indicator	0.030	0.013	2.28	0.023
	Minor illness	Any training given	0.049	0.014	3.56	0.000
	Major illness	ILR indicator	0.026	0.017	1.56	0.118
	Major illness	Any training given	0.041	0.019	2.20	0.028

No statistically significant results were found for turnover in either the OLS, IV or matching. There is some indication that training has a negative impact on resignations, accidents and minor illnesses, although these results are in the 'wrong' direction – suggesting that the presence of training leads to an increase in these measures; something that is not supported by the literature. The evidence on major illnesses is less conclusive, as the results for the matching are non-significant, whereas the results for the regressions are significant. This is different to the other outcomes, where the results from each of the three analyses are in agreement with each other.

Our estimation suggests no causal link exists between training and turnover. This contradicts previous studies conducted. This could be due to one of three possible scenarios:

- Basic skills deficiencies are not as prevalent as is reported in our survey, hence the absence of measurable effect;
- Basic skills deficiencies are not impacting on firm performance sufficiently to be measured; and
- The underlying assumptions of the models have not been met. In the case of the IV regression this relates to the instruments used, in the case of matching this might be evidence that the models are not robust or omitted variable bias (i.e. there are unknown factors in play that we have been unable to control for).instruments are not suitable, or sufficiently strong to measure the impact.

Below we explore these scenarios in more detail. The underlying reasons are generally applicable to the results from each method hence we restrict our discussion to the IV regression for reasons of brevity.

Discussion of the results

Firstly, looking at the method employed here some factors may bias the estimations. The instruments used in the turnover regressions are both very weak. This alone may impact on estimations. Below we show the coefficients of both variables from the first stage models[46], neither have a strong relationship with levels of basic skills, further reducing the portion of basic skills that may be impacting on firm performance.

Instrument coefficients from the first stage regression

					95% CI	
	Coef.	**Std Err**	**z**	**P>|z|**	**Lower**	**Upper**
Estimate ILR						
_1_benft_1	-0.0123	0.0144	-0.85	0.3940	-0.0406	0.0160
_1_benft_4	0.0678	0.0142	4.77	0.0000	0.0399	0.0956
Estimate Train						
_1_benft_1	-0.0090	0.0143	-0.63	0.5290	-0.0370	0.0190
_1_benft_4	0.0834	0.0140	5.96	0.0000	0.0560	0.1109

The Instruments may also be endogenous – meaning that they are impacted by other factors within the residual term. However, the summary statistics from the first regressions suggest otherwise (Wooldridge's robust score test of over-identifying restrictions indicates that the instruments are valid and the equation has been specified correctly). This intuition is supported by the fact that the same result is given by our additional models; the OLS regression and matching results do not show a relationship either.

Assuming the model has been correctly specified, issues may occur in our approach to the variables selected. Our measure of productivity is based on turnover and does not include a measure of cost. Increased costs as a result of basic skills deficiencies will not be captured in our method.

Additionally, our method focusses on the microeconomic level. However, the proposed impacts may occur at an economy wide level. Low levels of educational attainment overall may constrain the economy through lower levels of productive capacity, reducing aggregate supply; firms may pay higher wages due to insufficient competition within the jobs market. If this is the case, they will also not be captured by our method. Alternatively a longitudinal approach may better capture change as impacts could be more easily identified in the long term – as is suggested in some of the literature (Plett 2007).

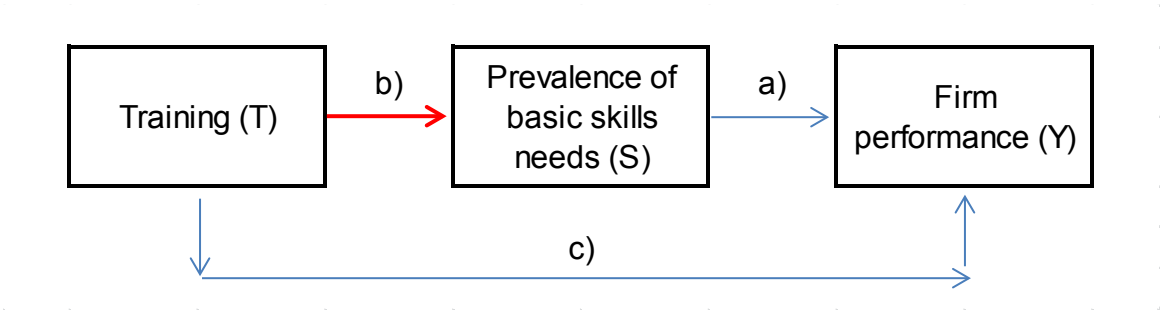
While the demands of firms on its employees continue to increase so does the proliferation of technology. Within many industries technology allows for less use of

[46] There are two sets of coefficients, since one model estimated the ILR indicator in the first stage regression, whereas the second estimated whether any training was given.

basic numeracy and literacy skills; this could also be a contributing factor to the lack of effect here.

Finally, firms may be minimizing the potential cost of low basic skills through their recruitment procedures. As is evidenced in the literature, numeracy and literacy skills are high on the employer agenda. For tasks where these skills are required it is unlikely that firms would not attempt to screen out those who were unsuitable; and whilst the Skills for Life Survey does highlight gaps across a range of vocations, there is a trend towards greater skills gaps at the lower occupation classes.

Impact of training on prevalence of basic skills needs



Estimation of the impact of training on basic skills was run using the same measures of basic skills gap and one of two binary variables for basic skills training (listed above). Again, estimation of the impact of training on basic skills was done using all three regression techniques. Here, causation may run in both directions, with basic skills needs motivating employers to invest in training as well as training improving basic skills in the workplace.

The instruments used were two "employee benefits" variables (time off for medical appointments and employee assistance programme) these were suggested in the literature as having a strong relationship with provision of skills training. Again, results from an IV regression must be interpreted as LATE, a simple understanding of the population described is possible in this instance.

Table 3: Results for analysis on effect of training on the skills gap (b)

	Outcome	Training indicator	Coef.	Std. Dev	T-test	P-value
Standard regressions	PCT skills	ILR indicator	-0.005	0.001	-3.90	0.000
	PCT skills	Any training given	-0.007	0.001	-6.19	0.000
	Skill gap	ILR indicator	-0.324	0.062	-5.23	0.000
	Skill gap	Any training given	-0.546	0.068	-8.03	0.000
IV regressions	PCT skills	ILR indicator	0.018	0.018	1.01	0.313
	PCT skills	Any training given	0.014	0.015	0.89	0.374
	Skill gap	ILR indicator	0.024	0.541	0.04	0.965
	Skill gap	Any training given	-0.031	0.477	-0.06	0.948

No significant results were found in the IV regression, suggesting no impact of training on skills. The results of the OLS regression are significant, although (as discussed earlier) the assumptions behind the OLS regression are questionable for these outcomes. The IV results are likely to be more robust and are discussed here.

The instruments used in this regression were again weaker than was expected from the literature. Below we show the coefficients for the first stage model in the PCT skills IV regression. Travel allowance as an instrument (_1_benft_1) is not significant.

	Coef.	Std Err	z	P>|z|	95% CI Lower	Upper
Estimate ILR						
_1_benft_1	-0.003	0.012	-0.240	0.813	-0.027	0.021
_1_benft_4	0.069	0.012	5.830	0.000	0.046	0.092
Estimate Train						
_1_benft_1	0.004	0.012	0.330	0.739	-0.019	0.027
_1_benft_4	0.077	0.011	6.810	0.000	0.055	0.099

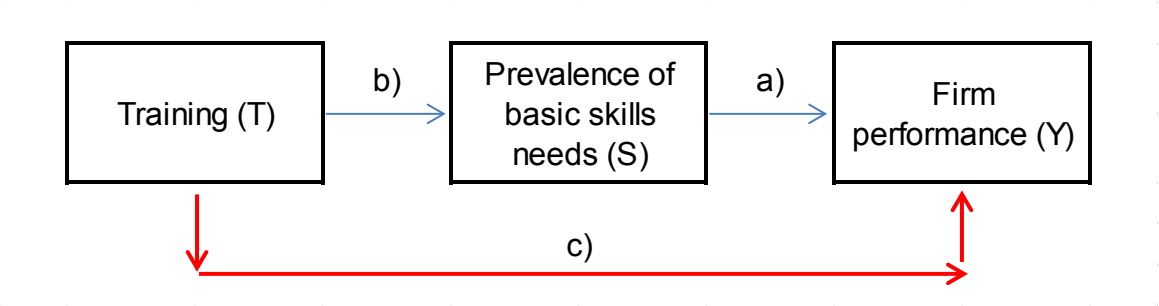
The results from Wooldridge's robust score test of over-identifying restrictions again suggests the model has been correctly specified and the instruments are valid, however, their predictive power is weak. However, the method employed, given the size of our sample, should have picked up the impact had it been present. This could be for several reasons.

Again, our data on basic skills gap was essentially anecdotal in nature and this may have impacted on estimation. As described in the main body of the report there is inconsistency in the levels reported in different studies.

Any estimation of impact may also be biased by the lack of an isolated treatment. As is indicated in the survey results, 97% of basic skills training are provided as part of apprenticeships. This could also be interpreted as further indication that basic skills, whilst important to employers when recruiting, are not a priority in day-to-day trading and/or production activity.

Furthermore, a review of the nature of basic skills training intuitively suggests it is unlikely to be a vehicle for change given the low intensity nature of this type of training when provided as part of an overall apprenticeship, as well as the number of staff undertaking this training overall.

Impact of training investment in basic skills on firm performance.



The final estimation conducted as part of this moderation model is the impact of basic skills on firm performance, using the training investment variables as a control. Given the two previous results, and our theoretical model, we would not expect to observe a causal relationship in these estimations.

Analysis

	Outcome	Skills measure	Coef.	Std Dev	T-test	P-value
Standard regression	Turnover	noskillsgap	0.061	0.034	1.78	0.074
	Turnover	PCT skills	0.542	0.312	1.74	0.083
	Resignations	noskillsgap	-0.038	0.007	-5.79	0.000
	Resignations	PCT skills	-0.240	0.057	-4.19	0.000
	Accidents	noskillsgap	-0.042	0.007	-6.21	0.000
	Accidents	PCT skills	-0.191	0.057	-3.37	0.001
	Minor illness	noskillsgap	-0.079	0.014	-5.60	0.000
	Minor illness	PCT skills	-0.340	0.138	-2.47	0.014
	Major illness	noskillsgap	-0.117	0.018	-6.37	0.000
	Major illness	PCT skills	-0.721	0.159	-4.53	0.000
Matching	Turnover	noskillsgap	0.055	0.039	1.40	0.162
	Resignations	noskillsgap	-0.057	0.008	-6.92	0.000
	Accidents	noskillsgap	-0.046	0.007	-6.23	0.000
	Minor illness	noskillsgap	-0.100	0.016	-6.17	0.000
	Major illness	noskillsgap	-0.139	0.022	-6.45	0.000

The results above are in line with previous estimations showing no significant effects discovered in these regressions.

As highlighted in earlier sections, whilst there is some concern over the strength of the instruments used in these regression, the results are consistent with the model described and do not point to bias in any one causal path.

Discussion

The results of our estimation give a consistent answer regarding the causal relationships of interest. Whilst there are some issues with the variables used and methodology, this consistency suggests accurate results from our estimations overall.

Our survey and the literature go some way to supporting these results in several ways. Firstly, whilst firms report skills gaps within their workforce, basic skills training are often only provided to staff through an apprenticeship programme. Additionally, very few employees are offered this training overall. Many sources indicate the importance of literacy and numeracy in the workplace; however, the low incidents of training suggest firms do not prioritise this issue in their budget.

Further consideration should also be given to conditions in the labour market at present. With higher levels of unemployment nationally, and increased levels of youth unemployment, employers have greater choice when looking to fill vacancies. This may explain why, as noted in our survey, fewer employers are offering basic skills training now than in the past (Gallup Survey, 1992).

The literature also suggests that results may be impacted by the lack of awareness in the IDBR employer groups. Our survey results may underrepresent skills gap amongst employers not currently engaged with state funded training provisions.

A further issue for consideration is firms' motivations for providing training. In our survey 83% of ILR employers stated that training was offered as a benefit to staff. Whilst less than half said training was implemented to reduce waste and low productivity; and only 20% said training was offered specifically as a result of skills deficiencies in the labour market. In addition to this array of motivations, the vast majority of firms who did not offer training (90% from the IDBR sample) said it was simply due to a lack of need. These survey results may support a more complex understanding of training provision, where the objective is not necessarily as would be expected from naïve assumptions on cause and effect.

Certainly the idea of signalling – using alternative mechanisms for conveying information in a market (for example, the labour market) - is well known to economists; in this setting firms may be using the offer of training as a positive signal to employees; perhaps suggesting better labour relations within the firm, or greater career prospects. Employees may wish to complete training so the qualification can be used as a signal; validating their ability.

However, given that some firms do offer training to improve skills, it is possible that some positive impact is felt by firms. The ability to estimate this relationship would likely be improved with repeat observations over time.

Skills and training impact may be a dynamic relationship that must be observed over time to estimate correctly. Any impact of training will likely be felt over an extended period of time. For example a BIS paper[47] suggested that for every £1 spent on

[47] BIS Research Paper No. 38 – Measuring the Economic Impact of Further Education; March 2011.

apprenticeship funding delivered a benefit (NPV) of £35-£40 over the working life of the employee. Given the numbers receiving training in our sample, this suggested value of impact in one time period could be very small indeed.

Our data sought to value this benefit for one period in time. Time series data would likely be a more fruitful option, allowing for a more detailed picture of changes occurring over time in specific industries, sectors, or even specific firms – the focus of our study.

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