

**Does good work have a positive effect on productivity?  
Building the evidence base**

**A literature review prepared for  
Carnegie UK Trust**

**By**

**Chris Warhurst, Derek Bosworth,  
Wil Hunt and Sudipa Sarkar**

**Warwick Institute for Employment Research  
University of Warwick**

**Contact details**

Prof. Chris Warhurst  
Warwick Institute for Employment Research  
University of Warwick  
Coventry CV4 7AL  
c.warhurst@warwick.ac.uk  
<https://warwick.ac.uk/fac/soc/ier>

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**Note:** This research was commissioned by the Carnegie UK Trust and undertaken by the Warwick Institute for Employment Research in 2019. The first summary of the research findings was published in the Carnegie UK Trust’s essay collection *Can Good Work Solve the Productivity Puzzle* in January 2020. Publication of this literature review was delayed by the onset of the coronavirus pandemic. We publish now believing that the findings are highly pertinent as the phased lifting of many coronavirus restrictions allows businesses to turn their focus to their business models and approaches for the reopening and recovery of their operations. If businesses are to build back better from the pandemic and contribute to improved wellbeing, a focus on good work should be at the heart of plans for the economic recovery.

- *Gail Irvine, Senior Policy and Development Officer, Carnegie UK Trust*  
*June 2021*

## 1. Introduction

The UK Government has pledged to raise levels of both productivity and job quality. Potentially, the two can be linked. Productivity in the UK lags that of the other major advanced economies and improving it has been a major concern for policy makers. Unfortunately, delivering improved productivity has proved elusive in the UK and new solutions are needed.

In this context, exploring the potential role of 'good work' in boosting productivity is important. At the aggregate level, there is evidence that countries with higher job quality have higher levels of labour productivity (Siebern-Thomas 2005). If a business case exists for improving productivity through good work, it can then be used to persuade business of the instrumental benefits of good work. As such both UK productivity and the quality of working lives can be improved.

Examining the relationship between good work and productivity is not easy, particularly because there is no dedicated dataset by which the two can be easily integrated for analytical purposes. However, it is a task that needs to be undertaken if a robust business case is to be developed. This research adopts a three-part approach to developing this business case, comprising:

1. An indicative review of the literature on good work and its relationship with productivity;
2. A review of the available datasets that can be used to empirically investigate the effect of good work on productivity at the sectoral level;
3. A quantitative analysis of the effect of good work on productivity using the data identified at stage two of the research.

This paper reports the indicative review and is based on keyword searches in relevant literature databases. The review covers academic and grey literatures. The first stage of the review involved parameter setting, search and data extraction. The results were then collated and synthesised to enable examination of the relationship between job quality and productivity as reported in existing research. The review also identifies gaps in understanding and lessons for analysing the relationship at the sector/industry level in the UK.

The review first outlines what is meant by 'good work' and debates about the understanding and measurement of job quality. It then outlines the measurement and current debates around productivity in the UK. The review then reviews the extant literature on the effects of aspects of good work on productivity, focusing on the empirical evidence. The review concludes by summarising the main findings – that, overall, the literature suggests a positive link between productivity and some aspects of job quality – and highlights gaps in current research and understanding. It also suggests that the quality of management may be an important underlying theme in aligning productivity and good work.

## 2. Good work and job quality

Job quality is regarded as an important route to improved economic competitiveness and growth. The OECD wants to see the creation of more and better jobs as a route to economic growth, the European Commission sees job quality as a lever for boosting innovation within firms and creating sustainable economies, and the UN's International Labour Organisation (ILO) advocates 'decent work' as part of an inclusive economy. These international bodies want their member countries to develop policies that promote better job quality and, as part of the G20, the UK has committed itself to doing so with the signing of the Ankara Declaration in 2015.

In recent years, a number of significant initiatives were progressed across the UK to encourage the creation of more 'good work.' At a UK level, the [Taylor Review of Modern Employment](#), commissioned by then Prime Minister Theresa May, produced 50 recommendations for changes to labour market policy, with an overarching ambition that 'all work should be fair and decent, with realistic scope for development and fulfilment.' The UK Government's response to the Review, the [Good Work Plan](#), accepted the majority of these recommendations, including a commitment to measure and improve job quality in the UK. Scotland has a Fair Work Convention and Wales a Fair Work Commission, and both jurisdictions have sought to embed a fair work focus across government with dedicated policy directorates. Authorities at a regional and local level in many areas including Greater Manchester, North of Tyne and Greater London have sought to develop new approaches to foster good work or fair work practices in local economies, and more are planned, for example in the Midlands.

In order to measure progress in public policy towards the goal of improving quality of work, agreeing a measurement framework is vital. For example, whilst measures of job quality based only on wages typically find that the UK performs badly on job quality (e.g. Lloyd et al. 2008), composite indexes that include multiple measures indicate a lower level of poor-quality jobs in the UK. Nevertheless some sectors still perform badly in terms of the share of workers with poor-quality jobs (Anton et al.2012). In addition, as the *Taylor Review of Modern Working Practices* (2017) highlighted, there are also concerns about the rise in 'atypical' work and the decline in the standard employment relationship in the UK.

The problem is that there is no agreed measure of job quality and no dedicated dataset of job quality in the UK that would help central and devolved government develop the necessary policies and evaluate their impact (Warhurst 2017). Along with a number of similar terms, 'decent work', 'fair work' and 'good work' are part of the family of concepts that centre on job quality. All have different origins, often different uses and usually different associations. Their measurement also varies (Warhurst et al. 2017). Adopting the term 'good work', the Taylor Review sought to address this problem. Following the UK Government's acceptance of the Taylor Review's recommendation that the UK needed a standard measure of job quality, the Measuring Job Quality Working Group (2018) was constituted and tasked with developing these measures. Drawing on the work of the CIPD with its *UK Working Lives Survey*, the

Working Group recommends seven broad dimensions by which to measure good work.<sup>1</sup> These dimensions were developed from a review of the research literature that identified a number of common measures which were then scrutinised and agreed by stakeholders on the Working Group, including employer, trade union and charitable organisation representatives and the Office for National Statistics (ONS).

The seven dimensions are: terms of employment; pay and benefits; health, safety and psychosocial wellbeing, job design and the nature of work; social support and cohesion, work-life balance; and voice and participation. Each dimension has a number of sub-indicators. For example job design and the nature of work includes the use of skills and opportunities for progression; pay and benefits includes actual pay and satisfaction with pay. The seven dimensions are intended to have cross-UK utility and have recently been mapped on to Fair Work in Scotland (Zemanik 2020). It is these seven dimensions that form the starting point for the analysis of good work in relation to productivity in this report.

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<sup>1</sup> As job quality is a complex, multi-faceted concept, which may require varied policy and practice interventions, this Group concluded that a single metric of job quality would not be appropriate or instructive.

### 3. Productivity

Productivity measures the efficiency with which inputs into production are converted into the outputs of goods and services. Productivity improvements can be driven by technological and system improvements but can also be improved through people – by enhancing employee capabilities, as well as their motivation and willingness to give ‘discretionary effort’ (Appelbaum et al. 2000).

Academics and statistical offices use a range of measures of productivity, depending on the focus of their interest and the data available (e.g. labour productivity, total factor productivity, etc.). The ONS generally uses labour productivity – the level of gross domestic product (GDP) per person or per person hour of labour input – as its standard measure of productivity. GDP is a measure of the value added at each stage of production (e.g. a sector may buy in goods and services, which are modified and sold on, the difference in the cost of buying in and the price of selling on is the value added). The value added can be distributed, directly (e.g. through wages and dividends) or indirectly (e.g. through taxes and government spending) to workers and other individuals in the country.

GDP per person hour is the measure proposed for use in this research. This measure has the advantage that measures of GDP, employment and hours of work are available for all sectors of the economy (unlike other performance measures, e.g. market valuation) and it avoids the need to measure capital<sup>2</sup> (e.g. unlike the case of total factor productivity). However, a number of problems are concealed by the simplicity of the measure, which need to be addressed.

In particular, productivity is harder to capture in different sectors. Productivity in services is more complex to quantify than in manufacturing. Sectors such as healthcare and the public sector generally pose their own productivity measurement problems. These differences are partly due to the difficulties in measuring the quality of output. In the case of a tangible product, such as a car, it is possible to compare measures such as fuel efficiency, air pollution, safety, etc. In the case of services, with certain exceptions (such as air transport and banking) such dimensions of output are much more difficult to quantify. In the case of healthcare, for example, the number of individuals treated can be measured but it is much more difficult to quantify improvements to individual health (Dawson 2017). Former Chief Economist of the Bank of England, Andy Haldane (2017), is among those who concede that problems of measurement and comparability of outputs across sectors means ‘it certainly seems likely that official statistics underestimate economic activity to some, perhaps significant, degree and, with it, potential productivity gains.’

Fundamental to our investigation is that, insofar as productivity can be reliably measured, its determinants are not yet properly understood, including the relative contributions of good work and of capital or/ technological improvements, and where these factors might intersect. Technology can both enhance and diminish the number of good or bad jobs within a firm or, whilst leaving the number of jobs static, change the quality of those jobs for better or worse and, in each case, effecting levels of productivity (Muñoz de Bustillo et al. 2016). Recent literature on skills biased technological change is optimistic, arguing that ‘good work’ is likely to be intimately related with changes in technology, for example, as automation of certain groups of tasks occur (e.g. routine tasks, see Autor et al. 2003). Thus, the automation of

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<sup>2</sup> <https://www.ons.gov.uk/economy/nationalaccounts/uksectoraccounts/bulletins/capitalstocksconsumptionoffixedcapital/2018>

certain tasks may both raise productivity and improve the quality of work. Hence, while GDP per person hour captures the improvements caused by increased good work, it can only attribute these improvements to good work if it is possible to disentangle the more complex relationships between productivity, good work and technology.

## 4. The relationship between good work and productivity

This section discusses the existing research on the relationship between good work and productivity. It summarises what is known about this relationship and gaps in existing research. Table 1 presents the keyword search terms used in this indicative literature review. It examines the different approaches used to measure productivity and, as far as is practicable, adopts the measures of good work proposed by the Measuring Job Quality Working Group (2018).

**Table 1: Search terms used for good work and productivity**

Terms related to productivity	Terms related to job quality	Others
Productivity Performance Value added	Job Quality Good Work Employment status Job security Employment security Skill use Skill level Well-being/Wellbeing Stress Health and Safety Satisfaction Job design Representation Collective representation Union Pay Wages Reward	High Performance Working Practices High Performance Work Systems

The initial search using the keywords provided over 900 results. Reviewing titles and abstracts narrowed the field to around 450 articles and papers. Selection for full review was based on whether the article or paper featured research and the robustness of the evidence base in that research. Thirty-nine were then selected as indicative for full review (see Table 3 in the Appendix).

Most research focuses on a single dimension of good work, though some studies adopt multi-dimensional approaches to job quality. In terms of the specific dimensions, while a number of studies examine the productivity effects of some aspects of good work, the search failed to find evidence in relation to others. In particular, the search failed to find any empirical research examining the relationship between terms of employment and productivity, and social support and cohesion and productivity. These aspects are absent therefore in the findings reported here. Table 2 identifies where the evidence around the effects of job quality on productivity is strongest and where a lack of evidence exists.



**Table 2: Prevalence of evidence on different aspects of job quality and productivity**

Pay and benefits	Health, safety and psychosocial well-being	Job design and nature of work	Voice and representation	Work-life balance	Terms of employment	Social support and cohesion
Strong	Moderate	Moderate	Moderate	Weak	Missing	Missing

The following sub-sections present the findings on productivity and the five dimensions of good work for which evidence could be found: pay and benefits; health, safety and psychosocial well-being; job design and the nature of work; voice and representation; and work-life balance. A final sub-section also covers the multi-dimensional approaches to job quality and productivity.

#### **4.1. Pay and benefits**

The relationship between productivity and reward has received considerable attention over the years. In part this attention derives from the 'happy worker thesis'. Economic theory states that firms pay higher salaries to more productive workers. Other things being equal, workers are assumed to try to maximise their salaries and so work more productively. However, studies have found that the relationship between satisfaction and salary is not straight forward. Herzberg et al. (1959) showed the absence of salary causes dissatisfaction but its presence does not necessarily cause satisfaction. In the short term, subjective satisfaction increases with the increases in salary only up to a certain level (Kenny 1999; Munoz de Bustillo et al. 2005; Esteve 2000).

More recently, attention has turned to the productivity-inducing effects of different types of pay and reward system, such as performance related pay (PRP), within firms. Generally, a positive relationship is found between pay and benefits and productivity, though the type of payment system can be influential.

Pendleton and Robinson (2017) show that pay incentive schemes can have a positive effect on productivity but is dependent upon the type of scheme. Their research used data from the 2004 UK Workplace Employment Relations Study (WERS) to examine the effects of different reward systems on productivity. They examined three types of reward system: individual payment by results (IPBR), group payment by results (GPBR) and profit sharing (PS) schemes. They also examined different combinations of these schemes. The research focused only on private sector organisations, as public sector organisations often lack GPBR or PS schemes. The measure of productivity used was a self-reported measure of how productive the managerial respondent felt that the organisation was relative to other organisations in the same industry. The research found that:

- Combinations of incentive schemes had a stronger positive effect on productivity than single schemes;
- The productivity effects of IPBR increased if a group incentive scheme was added (but this effect was smaller if a GBPR scheme was added than if a PS scheme was added);
- PS schemes tend to work best, either alone or in combination.

Interestingly, combining all three types of scheme together had a negligible effect on productivity compared to no scheme at all. PS schemes were the only type of scheme to show

a statistically significant effect on productivity (albeit small) when used on its own, while the other types of scheme had no effect.

A number of studies have looked at the specific relationship between PRP and productivity. For example, Gielen et al. (2010) in their firm-level study of Dutch firms. The measure of productivity used in this study was a measure of per capita value added derived by subtracting materials costs from sales and then dividing by the number of employees. For firms in the non-profit sector budget was substituted for sales. The researchers estimated that use of PRP increased productivity by 9%. They note that at least part of this increase can be attributed to a 'worker sorting' effect identified by Lazear (1986) whereby use of piece rates acts to encourage only the most able workers to apply for jobs in these particular organisations. Booth and Frank (1999) estimated returns to PRP at the individual level. The authors estimated earnings effects of PRP to productivity gains. As the British Household Panel Survey's individual panel data does not have a direct measure of productivity, following Lazear (1986, 1996), the research estimated the productivity gain from the earnings differential. The earnings differential equals the average productivity gains from PRP. Overall, the research found a positive return to PRP on productivity, though the return was higher for men (9.3%) than for women (5.6%).

The effect of pay with other benefits has also been examined. For example, and again using WERS 2004, Pendleton and Robinson (2010) investigated whether employee stock ownership plans (ESOPs) and participation in decision making in the UK have a positive effect on productivity. The results find that stock plans have significant positive effect on productivity. While employee share ownership is interacted with decision making, findings reveal that the combination of stock plans and involvement in decision making can have positive productivity effects over a wide range of values for involvement in decision making. Jones and Kato (1995) also examined the effect of ESO and bonus payment systems on productive efficiency and found a significant positive effect. However they also found that whilst firms enjoy a 4-5% increase in productivity by introducing an ESOP, the effect did not appear immediately. Rather, it generally takes at least 3-4 years for the firm to reap the benefit of ESO introduction.

Significantly the relationship between wages and productivity can be bi-directional. Using industry level data for the manufacturing industry in the US, Millea and Fuess (2005) found that pay acts as a reward and an incentive in the non-durable goods manufacturing sector but found little evidence of a relationship in either direction in the durable goods sector. The researchers used output per hour as a measure of productivity and hourly compensation as a measure of wages. In a similar study using data on manufacturing in Japan, the authors found that productivity gains led to pay growth but that increases in pay did not generally result in productivity improvements (Fuess and Millea 2002).

#### **4.2. Health, safety and psychosocial well-being**

A number of studies have examined the direct relationship between health and safety at work and productivity. Health and safety includes both physical and psychosocial wellbeing. These studies tend to find that good health and safety positively impacts on productivity, though the robustness and generalisability of the data can be an issue.

Examples focused on physical health and safety include Putri et al. (2018), who analysed the effect of occupational health and safety, work environment and discipline on employee performance. They used data from employees of a single company. Findings show that

occupational health and safety, work environment and discipline are simultaneously significant to employee performance, though discipline is the most important factor. Shikdar and Salaqed (2005) used data from a small non-representative study of 50 companies in Oman. Production managers were surveyed and asked questions about demographics and company information; productivity and safety; ergonomics; environmental factors relating to the work environment; and organisation and management within the workplace. The researchers claim that lack of skills in ergonomics and training led to poor ergonomic conditions and consequent lack of worker productivity. However, it is not clear how the researchers arrived at these conclusions or what the outcome measures were.

An example of a study focused on psychosocial well-being is that of Hunter and Thatcher (2007), who examined the relationship between stress, commitment, levels of experience, and workers' performance. Data came from employees in branches of a large US bank. The findings suggested that for employees with high levels of commitment to the organisation, felt stress was channelled into improved performance, as measured by sales. Employee commitment also tended to be translated into improved sales performance when employees had more experience. However, for employees with lower levels of commitment or experience affective stress had a neutral to negative effect on performance.

Health and safety measures are sometimes combined with other factors. For example, Taiwo (2009) examined the impact of existing physical work environment (in terms of health and safety) to identify the type of work environment that would improve workers' future productivity. The subjective responses indicated that a majority of workers (70%) believe that high pay along with a better work environment are the factors that can lead to improvements in worker productivity.

It is currently more usual for the 'well-being' of workers to be the focus in debates about healthy workplaces. As we have noted elsewhere (Warhurst et al. 2017), workplace well-being is often very loosely conceived and typically proxied for measurement purposes by job satisfaction. Even before the current focus on well-being, job satisfaction was being used as a proxy in the measurement of job quality<sup>3</sup> and, in some cases, linking it to productivity. In other cases it transmutes into happiness and productivity (Clark and Oswald 1996; Watson et al. 1996; Grand and Sliwka 2001; Clark et al. 2008; Krekel et al. 2019). Parking these conceptual conflation, the data suggests a positive relationship between well-being and job satisfaction and productivity.

Based on a review of the literature, Miller (2016) argues that poor well-being diminishes productivity, and promoting and better supporting employee well-being benefits productivity. Miller further argues that an organisation with well-being at its core will reap productivity gains. The general consensus in the existing literature, Miller suggests, is that productivity improvements at national level can only be made through improved well-being strategies at the organisational level. In another review of existing evidence, Arends et al. (2017) found a negative relationship between job stress or job strain and individual productivity, while a positive relationship between job rewards and productivity was evident. Furthermore, fairness at work and social support from co-workers and productivity seem to have a positive relationship. One important finding was that health has an influence on the relationship

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<sup>3</sup> Despite job satisfaction being argued to be a poor measure of job quality (e.g. Munoz de Bustillo et al. 2011).

between the quality of the work environment and productivity. Specifically, the relationship is stronger for people in good health. Harter et al. (2002) also conducted a meta-analysis of the relationship between employee workplace well-being and business unit outcome based on Gallup Workplace Audit studies of 7939 business units from 36 companies. Employee engagement is a composite measure of job satisfaction, joy, fulfilment, interest, engagement and caring. Productivity measures include employee turnover, productivity and profitability, and which were amalgamated into a composite measure of performance. The estimated correlation coefficient between composite employee engagement and composite performance from the meta-analysis is between 0.26 and 0.33, with 0 implying no relationship between the two and 1 a perfect positive relationship. The finding thus suggests a modest but positive correlation.

The link between job satisfaction, happiness and productivity has been studied extensively in the literature. Much of this literature has studied the factors that determine job satisfaction and some recent studies have also looked at the influence of job quality on firms' productivity.

At the individual level, meta-analyses have found a modest average correlation of 0.17 between various facets of job-related satisfaction and performance (Iaffaldano and Muchinsky 1985). The average correlation is higher when overall job satisfaction is considered, with Petty et al. (1984) finding a correlation of 0.31). Judge et al. (2001) found the mean correlation between job satisfaction and job performance to be 0.30. However correlation coefficient merely indicates a possible association between the two variables, it says nothing about the causal relationship. The direction of causation, if any, is not known and a high correlation coefficient indicating a moderately strong relationship between the two may result simply because of a lack of control for other establishment characteristics. For example, high-productivity organisations are likely to consist of highly educated employees who may also have higher than average job satisfaction. Therefore, the failure to control for employee and organisation level characteristics may lead to upward bias in the estimated correlation between job satisfaction and job performance. The same can be said for a similar meta-analysis of studies of employee wellbeing (as measured by job satisfaction) and productivity covering 73 countries, 49 industries and nearly 2m employees (Krekel et al. 2019). Again a strong correlation between employee satisfaction and productivity was found ( $r = 0.2$ ) but with the authors admitting that claims of causality cannot be made from the meta-analysis. They do speculate, however, that the link may arise from workers having higher morale and more positive emotions (that is, being happier) at work or simply expecting higher reward for higher effort.

Böckerman and Ilmakunnas (2012) conducted econometric analysis at the firm level in order to establish a causal relationship between job satisfaction and productivity in Finnish manufacturing plants over the period 1996–2001. As noted above, employee job satisfaction can be affected by labour productivity itself or any other factors that may affect both productivity and job satisfaction. To overcome this problem, Böckerman and Ilmakunnas used a lagged job satisfaction and instrumental variable (IV) approach. They also calculated total factor productivity of the manufacturing plants and explain it by means of job satisfaction to avoid the problem of reverse causality. The results showed that the effect of an increase in the establishment's average level of employee job satisfaction on productivity is positive. Other things being equal, a one point increase in the average level of job satisfaction increases the level of value added per hours worked by 3.6%.

Halkos and Bousinakis (2010) examined the effects of stress and satisfaction on employee productivity using a sample survey of private and public sector employees in Greece. They found that while work-related stress decreased productivity, satisfaction with different aspects of their job increased employees' productivity. They also found that stress has a negative impact on productivity and satisfaction has a positive effect on productivity. The research shows that stress and satisfaction can have a separate effect on subjective levels of productivity but more research would be needed to examine whether this translates into objective productivity and to see whether the findings can be generalised to a wider context.

More explicitly resonating with the happy worker thesis, Oswald et al. (2015) provide evidence that happiness makes people more productive. In mood-affecting experiments with control groups treated individuals with induced happiness have higher productivity than the control group. Moreover lower happiness is systematically associated with lower productivity.

As with physical health and safety, there thus appears to be a positive relationship between well-being, satisfaction and happiness at work and productivity. Whilst the majority of the latter type of studies are analysed at the individual level, it might be assumed that the relationship can be aggregated to the establishment or firm level.

#### **4.3. Job design and nature of work**

There is a moderate level of research directly linking the indicators of this dimension with productivity. That there is not more research is surprising. Over the 1950s to 1970s, the highly influential UK-originating quality of working life (QWL) movement focused on job design as the route to maximising organisational outcomes (Rice 1958; Trist and Bamforth 1951). This movement has disappeared, though there are calls for its renewal (Grote and Guest 2017). Nevertheless, studies centred on job design within firms still exist and find that it can affect productivity but also create dilemmas for managers.

Moon (2009), for example, examined whether job design effects productivity and earnings. Job design was defined as the method used to assign workers to tasks, whether employees are assigned to narrow, specialised tasks or whether they are assigned to broadly-defined tasks (e.g. multi-tasking). Moon also investigated how job design changes bargaining power and rent-splitting between management and workers, and its effect on productivity. The theoretical analysis suggested that in the absence of bargaining, the choice about whether to assign workers to narrowly or broadly-defined tasks depends upon which is likely to elicit the most effort. However, the choice also has implications for the bargaining power of employers and workers by either making workers' efforts substitutable or necessary. With broadly-defined tasks, the worker becomes more substitutable giving the manager more power, whereas with narrowly-defined tasks workers have more bargaining power because they are less substitutable and have more control over production. Thus, management might be inclined to choose broadly-based job design even though this choice may illicit less effort from employees and result in lower wages for workers. This theoretical proposition, however, requires empirical testing.

Other, empirical research confirms the importance of particular task demands – that is the types of tasks that workers undertake. For example, Leyer et al. (2009) examined whether worker performance in manufacturing environments depends on task-related cognitive demands. Focusing on workers in two companies, they found a causal effect of cognitive demands of work (task complexity, worker adaptability, mental workload and goal motivation) and quality of work life (worker self-reports of supervision, empowerment, job satisfaction and

learning) on worker performance as measured by quality of outputs and scheduled duration to produce outputs. The main findings suggest that, in an adaptable production system in which multi-skilled workers are required to perform a range of tasks, worker performance is associated with the cognitive demands involved in performing a task as well as the worker's perceived quality of work life attributes.

More topical now than QWL are High Performance Work Systems (HPWS) and which are linked to both good quality jobs and productivity gains (Belt and Giles 2009). Evidence suggests a positive effect on productivity but there are challenges in both conceptualising and operationalising HPWS.

Meta-studies of HPWS have found a strong and positive relationship between HPWS and firm productivity (e.g. Combs et al. 2006; Jiang et al. 2012). For example, in their Australian survey, Boedker et al. found that firms with HPWS out-performed firms classified as being low performance workplaces, with 12% higher productivity. Similarly, based on data collected from 118 Jordanian firms across the financial and manufacturing sectors, Obeidat et al. (2016) found an association between HPWS and organisational performance. A UK case study by Tregaskis et al. (2013) also found that HPWS has a positive impact on productivity. Their findings also suggest a coexistence of positive high involvement effects for employees, such as higher levels of job satisfaction and commitment.

Unfortunately, there is considerable debate about what human resource practices constitute a HPWS and at what point a bundle of practices become an effective 'system' capable of delivering productivity gains. Between seven and 35 practices – such as training and PRP for employees – have been suggested by different studies. Moreover there is a question mark over manager's ability and willingness to adopt HPWS (Warhurst 2018). This last point is important: the quality of management, and the management of employees, matters. Bender et al. (2016) examined the relationship between productivity, management practices, worker ability and pay. The authors focus on the management practices of German manufacturing firms. The findings suggest that better-managed firms systematically recruit and retain workers with higher average human capital which in turn leads to higher productivity.

Parking the ambiguity issues with HPWS, the point raised by Bender et al. about the potential importance of human capital is worth further examination. It also allows the additional indicator of this dimension flagged by the Measuring Job Quality Working Group – training – to be included in the analysis. Here the evidence is mixed: some types of training but not others lead to productivity gains though the reasons are unclear.

Based on a meta-analysis of 62 studies, CEDEFOP (2011) examined the relationship between employee training and employer productivity gains. The study included various performance indicators such as productivity, sales, revenues, and profits, and training indicators such as training participation, training days, and training expenses. Findings suggest that studies focused on non-manufacturing sectors have a lower probability of finding positive and significant effects of vocational education and training (VET). However, since productivity measurement is difficult in the service sector, the results may not be capturing the true effect. Studies focused on manufacturing tend to find positive and significant effects. Positive effects of VET are found for firms of all sizes, including smaller ones.

Further research by Cedefop (2012) using Europe-wide industry level data found modest evidence of the productivity-inducing effects of employer-funded training. The research found that *employer-funded training* led to a positive and statistically significant increase in

productivity growth. The size of this effect increases as the number of days of employer-funded training increases (1% per 40 days of funded training). On-the-job and other on-site training also both were found to have a positive effect on productivity. However, there was no effect of *employee-funded training* on productivity growth.

The researchers noted, though, that adding a series of control variables to the analysis 'washed away' statistical significance of the effects of training on productivity growth, suggesting that perhaps that some of the effects of training on productivity may be explained by other variables, one of which may again relate to the quality of management.

This last point is significant. One of the core tenets of human capital theory is that workers with more skills are more productive (Schultz 1961; Becker 1993; Mincer 1974). However, the extent to which firms can benefit from an individual's full productive capacity depends on the extent to which the workers have the opportunity to deploy these skills in their work. The tendency however is to focus on the skills possessed by workers, typically proxied by qualifications, rather than skills deployed.

There is a whole body of literature looking at the effects of skills on productivity. In most cases, analysis is at the individual level with qualification level or years of education used as a proxy for skills and productivity is measured by wages, based on the assumption that skills tend to find their true value in the labour market (Rincón-Aznar et al. 2015). Examples of such studies estimating the effect of education on productivity using this approach in the UK alone, include studies looking at the effect of further education qualifications on productivity in England (Cambridge Economics, 2011, 2015) and the effect of different types of intermediate qualifications on productivity (Hayward et al. 2014). On the whole these studies suggest that more skilled workers tend to be more productive. Again, it might be reasonable to suggest that this productivity behaviour might be scaled up to affect the establishment or firm. It is noteworthy that these authors do not measure productivity directly but workers' wages, assuming that if individuals are paid more then they must be more productive.

However few studies have explicitly estimated the effects of skills on productivity at the firm level. One study that did attempt to estimate the effect of increases in skills on firm productivity was conducted by Dearden et al. (2006) who estimated the impact of engaging in job-related training on firm productivity using data from the UK Labour Force Survey and other sources. They found that for every additional 10% of staff who engage in training, productivity increased by 6%. However, there are even fewer studies that have examined whether workers have the opportunity to use these acquired skills in their work. It is instructive that analyses of HPWS tend to measure workers' skill development (typically in terms of the extent of training or training opportunities) rather than skill deployment. Yet, it is only through workers using the skills that they possess that productivity gains can be realised (Keep, 2016).

#### **4.4. Voice and representation**

A number of studies have examined the relationship between different forms of voice and representation on employee productivity. These studies often try to investigate whether union or non-union forms lead to greater productivity within firms. However, whilst the relationship is found to mixed, some of these studies rely on management views of employee performance rather than objective measures of productivity, which has implications for the robustness of the findings.

Findings for unions are mixed though can be good for particular sectors and countries. Older research for the UK found union impact on productivity to be declining. Machin and Stewart

(1996) examined the relationship between unions and financial performance using firm-level data from the UK Workplace Industrial Relations Survey (WIRS). The estimated overall impact of manual union recognition on financial performance in 1990 was roughly half of that 1984. The result also revealed that by 1990, there was evidence of less positive association. More recent, though not current, research and using a different methodology has found a positive outcome. For example, Haskel (2005) examined the relationship between unions and firms' productivity using matched Business Census productivity data from Annual Business Inquiry (ABI) and unionisation data from WERS. Haskel found a significant positive relation between productivity and union recognition at firm level.

Other single country studies such as that of Barth et al. (2017) for Norway similarly find a positive relationship. Their study used individual-level data on income, earnings, work hours, wages and union fees, as well as firm-level data on value added, revenues and capital, and covering around 8000 firms over 2001-12. The study found that increases in union density led to substantial increases in firm productivity and wages.

A new evaluation of the effect on collective bargaining on productivity is provided by the OECD (2018) drawing on a range of international research. The evidence is mixed. It shows that collective bargaining can have a positive effect on productivity growth (Braun 2011; Acemoglu and Pischke 1999; Haucap and Wey, 2004) and a negative effect (Malcolmson 1997) depending upon other factors such as whether wage floors exist or workers gain-share in productivity. In addition, and based on a meta-analysis, overall, union coverage tends to increase productivity in non-manufacturing industries but not in manufacturing industries (Doucouliagos et al. 2017).

In relation to the type of collective bargaining, the OECD (2018) cites research showing that: greater decentralisation is linked with higher levels of productivity in Swedish and Belgian firms (Andreasson, 2017; Garnero et al. 2018), and that firm rather than sector-level collective agreements has a positive effect on productivity in developing countries (Lamarche, 2013, 2015). Although one study suggested that decentralisation of collective bargaining in Sweden during the 1980s reduced aggregate productivity growth by slowing down the market exit of inefficient firms (Hibbs and Locking, 2000).

In terms of non-union forms of employee voice and representation, German manufacturing firms with a works council are on average 6.5% more productive than firms without a works council (Mueller 2009). The analyses estimated the effect of the presence of a works council in the organisation with productivity measured by value added. The positive effect was estimated at 6.5%. Furthermore, after controlling for self-selection effects in choosing to have a works council it was claimed that this estimate is likely to be a lower-bound estimate of the productivity effects of works councils. It should be noted, however, that works councils have a special status in Germany. The Works Constitution Act (WCA) gives workers in organisations with five or more employees to establish a workers' council and gives councils and employers particular rights and obligations, including an expectation that councils and management act in 'a spirit of mutual trust'. In the German system of industrial relations only unions have the exclusive right to conduct industry-wide collective bargaining, works councils are designed to be the collective voice of *all* workers within the establishment irrespective of union membership. Thus, the effects of work councils on productivity may not necessarily be the same in other national contexts.



One UK study covered both union and non-union forms of voice and representation. Using matched employer-employee data for private sector firms in the UK from WERS 2004, Bryson et al. (2006) examined the productivity benefits of different combinations of three broad types of employee voice:

- Union voice but no non-union voice;
- Non-union voice but no union voice;
- Union voice and non-union voice;
- No representative voice.

The analysis also controlled for a number of other variables such as: structural characteristics of the workplace (e.g. size, industry, age, ownership and whether single/multi-site), nature of the organisation's product market and competition strategy (e.g. number of competitors, market share, competition on price or quality) and whether the organisation made use of High Involvement Management (HIM) practices such as teamworking. The research failed to find a statistically significant relationship between representative voice and productivity. They found that direct voice was the best at eliciting managerial responsiveness. However, they did not find that it converted into perceived productivity. The researchers speculate as to why they failed to find the expected productivity benefits for employee voice, suggesting that their measures may not have adequately captured the heterogeneity of forms of voice. They also speculate that the payment of above-market rates of pay in unionised organisations and/or management indifference or hostility to union voice may affect outcomes. They conclude that further analysis using longitudinal data may be better at identifying causal relationships between voice and productivity. Interestingly, they also found that HIM practices, which are often aligned with HPWS, were not generally associated with higher productivity.

#### **4.5. Work-life balance**

A small number of studies examine the relationship between working hours and work-life balance and productivity. They find that working long hours negatively affect productivity but can be addressed through work-life balance (WLB) initiatives within firms.

In terms of working hours, Shepard and Clifton (2000) attempted to estimate the negative effect of longer working hours on productivity in manufacturing firms. Data was drawn from 18 industries covering the 36-year period of 1956 to 1991. The results suggest a significant negative effect of overtime hours on productivity. Quantitatively, a ten-percentage point increase in overtime hours, controlling for a range of other factors, leads to a reduction in productivity of 2-4% across most manufacturing industries.

If long working hours have a negative effect on productivity, it is reasonable to assume that ensuring work-life balance might at least neutralise this effect. In this respect, Beauregard and Henry (2009) examined the link between work-life balance practices and organisational performance. They conducted a comprehensive narrative review of empirical data rather than a meta-analysis. Findings suggest that work-life practices do not necessarily reduce levels of employee work-life conflict but are often associated with improved organizational performance. Similarly, Konrad and Mengel (2000) examined the impact of work-life programmes on firm productivity in 195 for-profit organisations in the US, using sales per employee as the measure of productivity. The results show that the adoption and development of such programmes had a positive impact on productivity. Furthermore, the effect was stronger when a higher proportion of women and professionals were employed in the workplace. Similar results were found by Bloom and Van Reenen (2006) in their international

survey on management practices and WLB practices that covered manufacturing firms in the UK, US, France and Germany. Findings highlighted that better-managed firms are both more productive and have better conditions for their employees and that WLB practices are associated with significantly higher productivity. However, again, this latter relationship disappears after controlling for the overall quality of management.

#### **4.6. Multi-dimensional indexes of job quality**

Going beyond analysis focused on particular dimensions of good work, a few studies have used multi-dimensional indexes of job quality to examine its relationship with productivity and unpack the nature of that relationship, particularly the direction of any causality. In this research, productivity appears to positively impact job quality, though the impact of job quality on productivity is mixed, dependent on the type of sector.

Indicative of this approach is Royuela and Surinach (2013). Their Spanish study used both objective and subjective indicators of job quality or what they term the 'quality of work'. The multi-dimensional objective indicators, bundled into a composite index, cover aspects of both work and employment. The subjective analysis is based on workers' self-reported job satisfaction in relation to these aspects of work and employment. The authors acknowledge that defining labour productivity and its measurement is not easy. Not untypically, they focus on what is available in the datasets, from which they build two different indicators of productivity: GVA/total employment and GVA/total hours worked.

In their analysis of the relationship between job quality of work and productivity, they consider that productivity or job quality can each be affected by each other or indeed, some other factors. As such, productivity and job quality cannot be treated simply as the outcome of the other. Their empirics cover seven regions and seven sectors in Spain.

Results from job quality as the dependent variable suggest productivity has no effect on job satisfaction as a measure of job quality. In contrast, productivity has significant and positive impact on the composite index of job quality in all sectors. In other words: higher productivity does not deliver higher subjective job satisfaction but does help to improve more objective aspects of job quality. This outcome holds particularly in sectors with higher human capital. The results are mixed for productivity as the dependent variable. There is a positive effect of the composite index of job quality on productivity in high human capital sectors; the effect is negative for job satisfaction in low human capital sectors.

The authors argue that improvements in productivity can be achieved by improving objective aspects of job quality in high human capital sectors, while productivity improvements in low human capital sectors may be achieved at the expense of job satisfaction. Therefore, in relation to human capital specifically, job quality and productivity are significantly related to each other. These findings point towards a virtuous circle: more productive workers receive better job quality, leading to higher job satisfaction which in turn increases productivity.

Although not positioned as good work (or even aspects of job quality), data from the UK 2017 Skills and Employment Survey is used to examine five aspects of work that would be included in some of the dimensions of good work in relation to productivity (Felstead et al. 2018). This survey is based on over 3300 employee respondents, mainly based in England.<sup>4</sup>

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<sup>4</sup> <https://www.cardiff.ac.uk/research/explore/find-a-project/view/626669-skills-and-employment-survey-2017>

The five indicators would sit within the job design and nature of work, and voice and representation dimensions of good work (taking initiative, acquiring and applying new knowledge, participating in problem solving and management consultation, and making suggestions). Respondents were then asked what about changes to their jobs would make them more productive. This subjective measure of productivity is then disaggregated into jobs with low, medium and high productivity impact potential.

Sensitive to factors such as the industry, occupation and education level of the respondent, the findings indicate that the greater involvement of workers is the key source of perceived productivity growth. This involvement features employees having influence over how to do their jobs and voice in what goes on at work and is underpinned by supportive management. However the authors also note that the prevalence of this involvement style of management has declined in the UK in recent years. Nevertheless, the study affirms the importance of good management in productivity growth.

## 5. Summary of findings and gaps in the literature

As an expression of job quality, good work provides a potential new solution to the UK's longstanding productivity challenge, and which is now likely to be further exacerbated by the coronavirus crisis. Through an indicative literature review, this paper has examined the relationship between the good work and productivity. With analysis pitched at different levels and different measure of productivity and job quality used, extant literature offers no conclusive evidence about a positive relationship between good work and productivity. However there are clear ground for optimism. For four of the five dimensions of good work for which research exists – pay and benefits; health, safety and psychosocial wellbeing; job design and the nature of work; and work-life balance – the literature indicates a positive impact on productivity. For the fifth dimension – voice and participation – the evidence appears mixed but not discouraging. Moreover, there is a paucity of existing research that captures two of the total seven dimensions of good work – terms of employment; social support and cohesion – indicating limited understanding of the relationship for good work in its totality. Overall, there are grounds for optimism without the evidence to date being conclusive.

There is heterogeneity in results (in terms of sign and size of the estimates) depending on the measurement or proxy used for good work and productivity. Good work, when considered as a multi-dimensional concept and measured by individual dimensions has a positive, negative and no relation with productivity depending on the dimension. The standard methodology which has been followed in the literature estimates a Cobb-Douglas production function with productivity (defined as GVA) as an outcome and good work (or rather some dimension of it) as input. However, endogeneity in good work remains an issue in terms of establishing a causal relationship between good work and productivity. Few studies have tried to establish a causal link between the two, despite indication of a possible virtuous circle, with a mutually beneficial, even reinforcing, relationship between good work and productivity.

With respect to the current gaps in the literature, two points are worth noting:

1. What is clear is that the current evidence base is fragmented and limited in scope. It is important that measures of good work and productivity are standardised if meaningful and robust analysis is to occur.
  - a. First, the relationship between good work and productivity tends to be examined through one of five dimensions of good work. Further, it is usually examined through particular indicators within that dimension rather than all indicators for that dimension.
  - b. Second, there are data gaps for research of the relationship between good work and productivity –that is, 'terms of employment', and 'social support and cohesion'. Neither appear in extant research.
  - c. Third, few studies use multi-dimensional indexes of good work in relation to productivity. That is, there is no study that measures good work as a whole against productivity. There is a dataset that covers all seven dimensions of good work – the CIPD's *UK Working Lives Survey*. Unfortunately, this survey does not ask questions about productivity.

- d. Fourth, when, within existing research, particular aspects of job quality are analysed in relation to productivity, various measures of productivity are used. Moreover, some are simply proxy measures.
2. The evidence base is further limited with respect to sectoral analysis. Although the extant literature covers individual, firm and sector level analyses, evidence is typically drawn from firm-level studies. In the UK, WIRS then WERS are frequently used surveys. Pitched at firm-level management (and union) respondents, this survey is a useful database and data can be aggregated to broad sector level but has a limited set of questions on good work. Moreover its periodicity is not stable. To date it has been a frequently but not regularly administered survey. Currently there are no plans to administer it again. Pre-Brexit, the UK participated in the more regular European Working Conditions Survey. It covers most of the seven dimensions and where gaps existed could be readily supplemented by other EU data. However the small size of the survey population prevents disaggregated analysis of the UK data by sector for example (Wright et al. 2018). Moreover, whilst the UK is participating in the delayed 2020 survey, continued UK participation beyond 2021 is at present uncertain.

What is required is the development of more robust evidence. It would be useful to have bespoke analysis of the relationship between good work and productivity at sector level. The value of this analysis would be enhanced if it could capture all or at least most of the seven dimensions of good work.

Incentive to cover all seven dimensions and using a multi-dimensional index will come if the recommendation of the Measuring Job Quality Working Group (2018) is adopted by the UK Government. These seven dimensions emerge from a review of extant measure that identifies commonalities in the research and grey literatures. Moreover they have the support of major stakeholders from across business as well as the ONS. Similarly, there should be more encouragement, particularly in applied research funded directly or indirectly by the UK Government for research that adopts a standard measure of productivity, most obviously the ONS' outputs per person per hour. Blue skies research can still seek to push the boundaries of conceptual understanding of productivity. However for policy impact, and for productivity and good work improvements to be assessed, standard measures and supportive data are needed.

Beyond the need for standard measures and better data per se, a recurring theme in the review is the effect of the quality of management on the relationship between good work and productivity. There is an increasingly influential literature that highlights that variations in organisational performance align with variations in the quality of managerial practices (e.g. Bloom et al. 2017; Sadun et al. 2017). Better managed firms seem more able to capture the benefits of the relationship between good work and productivity. Put bluntly, if good work is a new route to productivity gains, good work is underpinned by good management practices (e.g. Skills Australia 2012a, 2012b). Unfortunately, new survey data from 2017 shows that less than a third (28%) of British managers received training that might significantly improve their skills in the 12 months prior to the survey. More worryingly, the number of managers keen on

training has decreased slightly, from 24% in 2012 to 22% in 2017.<sup>5</sup> Awareness of this managerial skills deficit is growing. The ESRC is currently funding a number of large-scale research projects to explore and hopefully improve UK management practices.<sup>6</sup> In addition, the ESRC has recently funded a new UK Productivity Institute<sup>7</sup>, which includes further analyses of this issue and, moreover, is itself funding work by IER and the ONS to develop a database to enable analysis of the links between good work and productivity.<sup>8</sup> Providing the business case for good work improving productivity, and the need for good management to deliver good work, might act as a stimulus for further and more focused management development in the UK.

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<sup>5</sup> We are grateful to Professor Alan Felstead, of Cardiff University and Professor Duncan Gallie of Nuffield College, Oxford University, for providing the author's pre-release access to data from the 2017 Skills and Employment Survey.

<sup>6</sup><https://esrc.ukri.org/files/funding/funding-opportunities/management-practices-and-employee-engagement-peer-review-guidance/>

<sup>7</sup> <https://www.productivity.ac.uk/>

<sup>8</sup> <https://warwick.ac.uk/fac/soc/ier/research/jobquality>

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## 7. Appendix

**Table 3: Indicative evidence base for the relationship between good work and productivity**

	Reference	Level of analysis	Measure of job quality	Measure of productivity	Methodology	Summary
1	Arends et al. (2017).	Individual and organisational level	Multi-dimensional aspects of 'quality of work environment' such as fairness at work, job strain or stress, rewards, health and well-being.	Subjective measures: 1) Assessment of the proportion of time or number of days workers have been productive at work; 2) Overall assessment of workers' performance or productivity while at work.	Systematic literature review: 2,319 studies from a range of disciplines from economics to medical research, reviewing 48. (international)	The review found: 1) strong evidence for a negative relationship between stress/strain and productivity; 2) strong evidence of a positive relationship between job rewards and productivity; 3) moderate evidence of a negative relationship between work-family conflict and productivity; 4) moderate evidence of a positive relationship between fairness at work, social support from co-workers and productivity.
2	Böckerman and Ilmakunnas (2012)	Firm level	Job satisfaction of employees (6-point scale)	Gross Value Added (GVA) per person per hour	Econometric analysis using ECHP data on Finnish manufacturing firms from 1996-2001. Analysis employed lagged job satisfaction and instrumental variable (IV) approach.	Other things being equal, a one point increase in the average level of job satisfaction in the manufacturing plant increases the level of value added per hours worked by 3.6 percentage point.
3	Petty, McGee and Cavender (1984)	Individual level	Job satisfaction of individual (Job Descriptive Index measure)	Individual performance	Meta-analysis	The meta analysis investigated the relationship using Job Descriptive Index (JDI) as the proxy of job satisfaction and supervisor's rating as individual performance. Main finding suggests that individual job satisfaction and job performance are positively correlated.

4	Iaffaldano and Muchinsky (1985)	Range	Job satisfaction (measured in a variety of ways including global or specific facet)	Job performance measured in a range of ways (including subjective and objective measures)	Meta-analysis of 74 empirical studies of job satisfaction and job performance (from a range of countries).	The meta-analysis took into account sample size and measure of satisfaction and performance used. Findings: 1) best estimate of correlation between satisfaction and performance was relatively low (.17); 2) sample size is more responsible to variability between studies than measurement used; 3) the nature of the performance measure used in studies was only modestly related to the magnitude of the relationship.
5	Miller (2016)	Organisational level	Well-being at work considered in a range of ways (including psychosocial, social and physical)	Productivity and job performance measured in a range of ways (including objective and subjective measures)	Review of existing literature (from a range of countries). Considers: 1) costs of poor well-being on productivity; 2) Benefits of good workplace well-being; 3) Other outcomes of supporting workplace well-being.	The authors find that the research generally points to a positive relationship between workplace well-being and productivity. However, they note that there is a relative lack of empirical evidence on the link.
6	Royuela and Suriñach (2013)	Regional and sector level analysis	Two definitions of the concept 'quality of work': 1) objective measure using multiple objective characteristics of employment, specific characteristics of the job and subjective evaluation of these; 2) workers subjective self-reports of job satisfaction.	Two measures of productivity: GVA per person employed and GVA per hour worked.	Econometric analysis using data from Quality of Life in Work survey and the Employment Situation Survey in Spain. Panel data is used covering 2001-2006 for 7 regions and 7 sectors. Simultaneous Equation Modelling (SEM) is used.	Productivity has no effect on job satisfaction. But it has positive and significant effect on quality of work index.  Quality of work index was not found to be related to productivity overall but was found to have a positive effect on productivity in high human capital sectors and a negative effect in low human capital sectors.

7	Zwart and Baker (2018)	Firm level	Job satisfaction	Business productivity unit	Review of literature and OECD data from secondary sources, the authors discuss approaches to improving the skills and productivity of low-skilled workers in the UK.	Positive correlation between job satisfaction and business unit productivity.
8	Oswald, Proto and Sgroi (2015)	Individual level	Happiness (self-reports using 7-point scale)	'Human Productivity' proxied by performance of a cognitive task (GMAT-style Maths test)	Experiment (Randomised Control Trial) (n>700, UK)	There is a causal link between happiness and productivity. Happiness increases productivity and lower happiness was systematically associated with low productivity.
9	Taiwo (2010)	Individual level	Work environment based on subjective assessments of the work environment and self-reports of features of the job.	Subjective measure of workers' productivity, based on self-reports.	Quantitative survey based on a non-probability sample (n=61) of workers at four oil and gas industry firms in Lagos, Nigeria.	The findings from this research are not strictly generalisable due to the methodology used and size of the sample. However, the majority of workers reported high pay, conducive and better work environment are the factors that can lead to better productivity of workers.
10	Woo et al. , (2011)	Individual level	Mental health, in particular major depressive disorder (MDD).	Productivity: lost productive time (LPT) (absenteeism and presenteeism) and self-reported job performance.	Medical controlled trial in Seoul, South Korea. Patients with MDD (n=102) were matched with healthy controls (n=91). WHO Health and Work Performance questionnaire was administered at baseline and 8 weeks after treatment (psychotherapy and antidepressants)	Analyses the effect of work-related depression on productivity and the effect of treatment on these. LPT from absenteeism and presenteeism (i.e. reduced performance at work) were significantly higher among those with MDD (33.4% of average annual salary, compared to 2.5% for control group). Treatment reduced depression and improve self-rated job performance by 32% and resulted in a cost saving of \$7508.
11	Cedefop (2011)	Individual and firm level	Employee training (VET). Range of measures, including:	Various performance indicator such as productivity, sales, revenues, and profits.	Meta-analysis of studies looking at training and productivity.	Positive and significant effect of VET on productivity, particularly strong in manufacturing. Firms in non-manufacturing industries have a lower chance of seeing a positive relationship between training and productivity. The

			participation, days, expense.			measurement of productivity is harder in the service sector and so the relationship is harder to estimate.
12	Gielen et al. (2010)	Firm level	Performance Related Pay (PRP). Dummy variable identifying if the firm had PRP of any kind.	Productivity (per capita value added)	Panel survey of firms with 5 or more employees in the Netherlands (OSA Labour Demand Panel) covering 1995-2001 (n=791).	Use of PRP increases productivity by 9% and increased employment in the firm by 5%.
13	Millea and Fuess (2005)	Industry level	Pay/wages (hourly)	Productivity (output per hour)	Econometric analysis of data from the Bureau of Labour Statistics (BLS) on US manufacturing. Analyses used measures of 'feedback to estimate direction of relationship and simultaneity.	The researchers found that pay acts as a reward and an incentive in the durable goods manufacturing sector but found little evidence of a relationship in either direction in the non-durable goods manufacturing sector.
14	Pendleton and Robinson (2017)	Firm level	Type of pay incentive scheme: individual payment by results (IPBR), group payment by results (GPBR) and profit sharing (PS) schemes.	Productivity, measured by subjective self-reports of how productive the organisation is relative to organisations in the same industry.	Analysis of data from the 'Management' survey of the 2004 WERS, focussing on private sector organisations with 5 or more employees (in the UK). Employed a probit model.	Findings: 1) combinations of incentive schemes have a stronger effect on productivity; 2) the productivity effects of IPBR increase if a group incentive scheme is added; 3) PS schemes work best (in combination or on their own); 4) using all three types of scheme have negligible effect on productivity; PS schemes were the only type to work on their own.
15	Jones and Kato (1995)	Firm level	Pay incentives: employee stock ownership plan (ESOP)	Productivity (output/value added)	Eight years of panel data on 109 large unionised manufacturing firms in Japan (1973-1980).	The research found that although firms saw a 4-5% increase in productivity associated with ESOP the effect did not appear immediately.



			and bonus payment system.		Estimated production function of output regressed on ESOP, bonus payment and capital, labour and other control variables.	Rather the effect generally took three to four years.
16	Booth and Frank (1999)	Individual level	Performance Related Pay (PRP)	Productivity gain (estimated via increase in wages)	Waves 1-4 of BHPS data covering households in the UK.	The research found a positive relationship between PRP and productivity, and that the return on PRP (and therefore productivity increase) was higher for men (9.3%) than for women (5.6%).
17	Bloom and Van Reenen (2006)	Firm level	Management practices and Work-life Balance policies	Total Factor Productivity (using data from company accounts)	Firm level survey of 732 medium sized (50-1,000 workers) firms in the USA, Germany, France and the UK.	The findings challenge the idea that there is a 'trade-off' between WLB policies and productivity. WLB was associated with better management, and both of these were associated with productivity. Well-run firms are more productive and offer better terms of employment.
18	Pendleton and Robinson (2010)	Firm level	Pay and reward (employee share ownership (ESO) plans)	Productivity (subjective self-reports of how productive the organisation is relative to organisations in the same industry)	Using 'manager' survey data from WERS 2004 covering private sector workplaces with 5 or more employees in Britain.	The research found: ESO plans have a significant positive effect on productivity, but in firms where there is minority involvement in the scheme other forms of involvement and voice are needed for ESO to be effective. However, in firms where there is majority involvement, ESO has an independent effect on productivity.
19	Judge et al. (2001)	Range (mostly individual)	Job satisfaction (measured in a variety of ways including global or specific facet)	Performance (objective and subjective measures)	Meta-analysis covering 312 samples with 54,417 observations.	The analysis suggested a mean correlation between job satisfaction and job performance was 0.30. However, the researchers note that a high correlation could result from unmeasured characteristics not controlled for in the analyses (e.g. high productivity firms may consist of highly educated employees) biasing estimates upwards. In addition, correlation does not prove a causal relationship.

20	Harter et al (2002)	Range (individual, firm)	Well-being (broad concept including: job satisfaction, joy, fulfilment, interest, engagement, caring)	Productivity (range, including: employee turnover, value added and profitability)	Meta-analysis of Gallup Workplace Audit studies of 7,939 business units from 36 firms.	The analysis found that positive workplace feelings translated into business unit customer loyalty, higher profitability and productivity, and lower employee turnover. They estimate the correlation between engagement and performance as .26 to .33. The researchers theorise that engagement leads to positive affect, which in turn leads to efficient application or work, retention, creativity and ultimately business outcomes.
21	Halkos and Bousinakis (2010)	Individual level	Well-being (Stress and satisfaction with aspects of job/work)	Productivity (subjective self-reported productivity)	Two-stage random survey of employees in Greek organisations. Face-to-face interviews with employees (n=425).	Factor analysis using the well-being items looking at a range of job aspects confirmed two factors: job stress and job satisfaction. Regression analyses showed that stress and satisfaction can have a separate effect on self-reported productivity. The researchers highlight the need for further research to investigate the effect on objective measures of productivity.
22	Shikdar and Salaqed (2005)	Firm level	Work environment (ergonomics and training)	Productivity (managers' subjective assessments of employee productivity)	Small non-representative study of organisations in four industrial estates in Oman (n=50). Convenience sample.	The researchers claim that lack of skills in ergonomics and training led to reduced productivity. However, it is not clear whether the analysis used supports the researchers' conclusions.
23	Hunter and Thatcher (2007)	Individual level	Well-being/stress, commitment experience	Productivity (Sales and revenue)	Employee survey of employees at branches of a national bank in five US states.	The research found significant interrelations between stress, commitment, experience and productivity. Employees with high levels of commitment and job experience are likely to channel felt-stress into improved performance. However, for employees with low commitment or experience, felt-stress had a neutral to negative effect on performance.
24	Putri et al (2018)	Individual level	Health and safety (knowledge, physical health, occupational health and safety, availability of equipment)	Job performance (quality, quantity, work attitude, work interest)	Small employee survey in one firm in Indonesia. Measures of interest measured using self-reports. Health and	Regression analysis suggests that health and safety, work environment and discipline are simultaneously related to job performance.

			work environment (physical, security, peer relationships, manager/employee relationship).and discipline (willingness to comply to copr rules and prevailing norms)		safety included knowledge of health and safety, physical health, occupational health and safety, availability of equipment. Work environment (physical, security, peer relationships, manager/employee relationship).	However, dominance analysis suggests that of these, discipline is the dominant factor.
25	Obeidat et al (2016)	Firm level	HPWP, measured on three dimensions: ability-enhancing (e.g. job analysis, recruitment, selection); motivation-enhancing (e.g. appraisals, pay); and opportunity-enhancing (e.g. voice, communication).	Productivity (self reports of company performance over the past three years relative to organisations in the same industry)	Employer survey of HR managers at 118 Jordanian firms with 100 or more employees in the financial and manufacturing sectors.	The findings support an association between HPWP and organisational performance, and suggest that the ability, motivation and opportunity (AMO) model is a useful framework for conceptualising HPWPs.
26	Tregaskis et al (2013)	Individual/firm	HPWPs, introduction of a programme of HPWPs introduced across the organisation at different timepoints.	Productivity (measured by operating hours, tonnage of product produced, and time delays) and Safety (number of accidents).	Quasi-experimental study focusing on the introduction of HPWPs in a single organisation. Longitudinal data was collected from managers, employees and unions during a 30-month implementation period.	Implementation of HPWPs was associated with subsequent, sustain improvements to productivity and safety performance.
27	Bender et al (2016)	Firm level	Advanced Management Practices (AMPs), measured using an index based on practices including monitoring, goal setting and use of incentives.	Productivity, calculate a production function model	Analysis of matched employer/worker data on German manufacturing firms with 50-50,000 workers, using two sources: World Management Survey	Only a fraction of the productivity explained by TFP was attributable to human capital of the average worker. A much larger proportion was attributable to the highest skilled individuals (assumed to be managers) and a similar portion of productivity was attributable to pay. The researchers suggest that nearly 30% of the

					(WMMS) and the Integrated Employment Biographies (IEB) database. N= 365 firms, 251,872 employees.	impact on productivity was due to workforce selection and positive pay premiums.
28	Cedefop (2012)	Industry level	Training (VET)	Productivity measured by percentage change in value added per person over five years	Analysis of matched data from Europe-wide industry level data from EU KLEMS and individual level data from EWCS. Data covers 25 industries across 31 countries.	Employer-funded training led to a statistically significant positive increase in productivity growth. This increases with the number of days of training. On the job and other on-site training also have a positive effect on productivity. However, employee-funded training did not have a positive effect on productivity.
29	Moon (2009)	Theoretical level	Job design (whether jobs involve narrowly defined specialised tasks or broadly defined general tasks)	Productivity (at an abstract level)	Theoretical examination of economic models relating to job design, the labour market and earnings.	Jobs with broadly defined tasks are less productive but the worker becomes more substitutable and has weaker bargaining power. Thus, management might be inclined to choose broadly based job design even though this may elicit less effort from workers.
30	Konrad and Mengel (2000)	Firm level	Work-life Balance (measured by existence of 'work-life' programmes)	Productivity (logarithm of sales per employee)	Based on a survey of organisations carried out in 1990, the analysis focuses on for-profit firms (excluding the financial sector) in the US. The sample was skewed to larger organisations. Productivity data was added by matching data from CD Disclosure.	Work-life programmes were positively associated with productivity. Further, work-life programmes were found to have a stronger effect on productivity in organisations which had a higher proportion of female or professional employees.
31	Layer et al (2009)	Individual level	Job Quality or Quality of Work Life (QWL), as measured by supervision, empowerment, job	Productivity, measured as 'Human performance' (performance of a cognitive task, judged by quality and task duration)	A pseudo-panel study of two manufacturing firms in the US, both specialising in fabrication and assembly of electrical	The findings of the research suggest that cognitive demands of the job and perceived QWL have a causal effect on human performance.

			satisfaction and learning considerations.		and mechanical equipment. The pseudo-panel involved four waves and included administration of a questionnaire and a cognitive task (n=205).	
32	Machin and Stewart (1996)	Firm/establishment level	Collective representation, measured by presence of a trades union.	Productivity, subjective manager self-reports of firms' productivity relative to other organisations in the same industry.	Uses establishment level data from WIRS, covering UK establishments with 25+ employees. They investigated the impact of union presence on productivity using a probit model.	A positive association between presence of a union and productivity was expected, based on theory. However, the research found that the positive effect of presence of a union on productivity was less widespread than previously and had halved from 1984 to 1990. On the other hand, trade unions were only found to have a negative effect on productivity when a 'closed shop' was in place.
33	Haskel (2005)	Firm level	Collective representation, measured by union recognition in the workplace.	Productivity (log gross output per head)	Used matched Business Census productivity data from the ABI and union data from WERS.	The research found a significant positive relationship between union recognition and productivity.
34	Bryson et al (2006)	Firm level	Voice and collective representation (different combinations of union voice, non-union voice, and direct voice)	Productivity, subjective manager self-reports of firms' productivity relative to other organisations in the same industry.	Employer-employee data from WERS 2004 covering private sector organisations in the UK with ten or more employees (n=866). Ordered Probit regression analysis was used.	The research found a strong positive relationship between management responsiveness and productivity but failed to find a significant relationship between representative voice and productivity. Direct voice was found to be the best at eliciting managerial responsiveness. However, this does not always translate into productivity.
35	Mueller (2009)	Firm/establishment level	Voice and collective representation (works councils)	Productivity (value added)	Used the linked Employer-Employee Panel survey of German firms run by IAB. Matches administrative data on employees with employer survey at the	The research estimated that there was a positive effect of the presence of works councils on productivity of 6.5%. The author argues that this is likely to be a lower bound estimate once self-selection effects of choosing to have a works council are taken into account.

					establishment level. Analysis focuses on manufacturing establishments with 21-300 employees.	
36	Beauregard and Henry (2009)	Range	Work-life balance (WLB) practices	Productivity/organisational performance	Narrative literature review of empirical studies looking at the outcomes of work-life balance practices.	The authors concluded that adoption of WLB practices do not necessarily reduce instances of employee work-life conflict. However, they suggest that WLB practices are associated with improved organisational performance.
37	Shephard and Clifton (2000)	Firm level	Overwork/unpaid overtime	Productivity (Value added per total hours worked)	Uses data from US Department of Labor, Bureau of Labor Statistics, the US Department of Commerce, and the Federal Reserve Board, covering manufacturing firms from 18 industries over a 36-year period (1956-1991).	The results suggest a negative effect of overtime hours on productivity. Ceteris paribus a 10% increase in hours leads to a 2-4% reduction in productivity across most manufacturing industries.
38	Felstead et al. (2018)	Individual level	Five indicators of work: taking initiative, acquiring and applying new knowledge, participating in problem solving and management consultation, and making suggestions.	Employees' subjective assessment of their capacity in their job to make changes and the impact these changes would make on their own productivity.	UK employee survey of skills and employment, with responses drawn mainly from England. The survey is periodic. The sample is drawn using random probability principles. Total responses for the 2017 survey was 3,306.	The results suggest that some jobs have more productivity impact potential than others. Those jobs with greater potential include employees having influence over how to do their jobs and voice in what goes on a work and are underpinned by supportive management.
39	Krekel et al. (2019)	Individual/firm levels	Wellbeing measured by employee satisfaction with their place of work	Financial measures such as revenue or sales per person, growth in revenue or sales, quantity per time period,	Meta-analysis of 339 studies covering well-being and productivity, covering 73 countries, 49 industries and nearly 2m employees.	The results show a strong correlation between employee satisfaction and productivity.

				labour hours, or performance ratings.		
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