SKILLS PAY: THE CONTRIBUTION OF SKILLS TO BUSINESS SUCCESS

RESEARCH REPORT 5
SEPTEMBER 2004

To obtain copies of this document, contact
Sector Skills Development Agency
Callflex Business Park
Golden Smithies Lane
Wath-upon-Dearne
South Yorkshire
S63 7ER

Tel 01709 765 444
Email: info@ssda.org.uk
Web: www.skillsforbusiness.org.uk

ISBN: 0-9545358-7-1

skills FOR BUSINESS

Skills Pay: The contribution of skills to business success

Penny Tamkin
Lesley Giles
Mike Campbell
Jim Hillage

September 2004

ies
institute for employment studies

Prepared for SSDA by:

INSTITUTE FOR EMPLOYMENT STUDIES
Mantell Building
Falmer
Brighton BN1 9RF
UK

Tel. + 44 (0) 1273 686751
Fax + 44 (0) 1273 690430

http://www.employment-studies.co.uk

Sector Skills Development Agency: Research Series

Foreword

In October 2002 the Department for Education and Skills formally launched Skills for Business, a new UK-wide network of employer-led Sector Skills Councils (SSCs), supported and directed by the Sector Skills Development Agency (SSDA). The purpose of SfB is to bring employers more centre stage in articulating their skill needs and delivering skills-based productivity improvements that can enhance UK competitiveness and the effectiveness of public services. The remit of the SSDA includes establishing and progressing the network of SSCs, supporting the SSCs in the development of their own capacity and providing a range of core services. Additionally the SSDA has responsibility for representing sectors not covered by an SSC and co-ordinating action on cross cutting and generic skills issues.

Research, and developing a sound evidence base, are central to the SSDA and to Skills for Business as a whole. It is crucial in: analysing productivity and skill needs; identifying priorities for action; and improving the evolving policy and skills agenda. It is vital that the SSDA research team works closely with partners already involved in skills and related research to generally drive up the quality of sectoral labour market analysis in the UK and to develop a more shared understanding of UK-wide sector priorities.

The SSDA is undertaking a variety of activities to develop the analytical capacity of the Network and enhance its evidence base. This involves: developing a substantial programme of new research and evaluation, including international research; synthesizing existing research; developing a common skills and labour market intelligence framework; taking part in partnership research projects across the UK; and setting up an expert panel drawing on the knowledge of leading academics, consultants and researchers in the field of labour market studies. Members of this panel will feed into specific research projects and peer review the outputs; be invited to participate in seminars and consultation events on specific research and policy issues; and will be asked to contribute to an annual research conference.

The SSDA takes the dissemination of research findings seriously. As such it has developed this dedicated research series to publish all research sponsored by the SSDA and results are being made available in both hard copy and electronically on the SSDA website.

Lesley Giles

Head of Research at the SSDA

The Institute for Employment Studies

The Institute for Employment Studies is an independent, apolitical, international centre of research and consultancy in human resource issues. It works closely with employers in the manufacturing, service and public sectors, government departments, agencies, and professional and employee bodies. For over 30 years the Institute has been a focus of knowledge and practical experience in employment and training policy, the operation of labour markets and human resource planning and development. IES is a not-for-profit organisation which has over 60 multidisciplinary staff and international associates. IES expertise is available to all organisations through research, consultancy, publications and the Internet.

IES aims to help bring about sustainable improvements in employment policy and human resource management. IES achieves this by increasing the understanding and improving the practice of key decision makers in policy bodies and employing organisations.

Contents

Executive Summary

UK productivity has shown a relative decline since the late nineteenth century and as a consequence the UK has moved from being one of the most productive industrialised countries in the World to occupying only a middle-ranking position with regard to its OECD neighbours. This has caused policy makers to seek underlying causes and one of the most durable concerns has focused on skill levels in the UK. The most straightforward comparisons of qualification levels in the workforce for different countries demonstrate that the UK has lower skill levels than our competitor nations. This may therefore be a contributor to the productivity gap. More complex research has implicated skills much more convincingly. The NIESR group of matched plant studies (begun in the mid 1980s) compared various UK industries with their competitors and sought to understand different approaches to production and the contributing factors including skills, investment in capital equipment and maintenance practices. Across a wide range of studies, UK producers tended to produce lower quality goods and be less productive. The studies strongly implicated skills gaps as contributing to these differences in productivity performance. NIESR have calculated that skill gaps contribute as much as a fifth of the productivity gap between the UK and Germany. Other research has confirmed this relationship and that better educated workforces are associated with higher productivity and other organisational outcomes.

Research has also lent support to the impact of training on productivity. For instance, work by IFS has suggested that an increase of five percentage points in the proportion of workers trained raises value added per worker by four per cent. As might be expected, better performing firms also tend to have better qualified and better trained employees.

The research which has focused primarily on skills is complemented by a body of literature which has explored skills in the context of wider people management policies. This burgeoning body of research shows strong associations between what have been termed 'high performance working practices' and firm performance. Amongst the high performing practices frequently included are those to do with the development and training of staff but the exact practices studied and the way they are measured might vary.

There is still healthy debate on just which practices are most strongly associated and the degree to which practices need to be aligned internally to create cohesive bundles of practice or externally to align with the organisational strategy. However, the research does present a persuasive argument for good people management. Yet despite the evidence of beneficial effects the uptake of such practices in the UK has been relatively low.

The literature is also helpful in cautioning against too simplistic an interpretation of the contribution of skills to performance. Skills and training are nested within a wider system where organisations use skills differently. Some compete on a quality basis and therefore call on a higher skilled workforce, others compete on cost and therefore produce goods to a lower specification with a lower demand for skills. We have also seen that skills are only one aspect of performance. Increasingly the literature reflects the role of good management and the motivation and morale of individuals.

We propose a model of human capability within organisations reflecting both the development and deployment of capability from both an individual and organisational perspective. Skills are one key element of this mix but need to be seen in context.

Parts of this model have been much better explored and researched than others. Any attempt to develop policy in raising skill levels and productivity needs to consider the impact of the wider aspects of the model and the implications of these gaps.

Skills Pay: The contribution of skills to business success

Introduction

The UK's economic performance, in particular the competitiveness of UK-based industry relative to other countries, has been the subject of a long running public policy debate in recent decades. As international economic pressures have intensified, there has been growing concern within government about the persistence of a productivity gap between the UK and international competitors.

Recent policy developments[1] have been predicated on the basis that improvements in national economic performance and competitiveness, *ie* at a macro level, largely depend on changes at a micro, firm level. This is not solely about increasing skill levels and supplying ever higher skills in the labour market but achieving the right skills that meet employers' needs. Essentially this means ensuring businesses have the skills needed to innovate, respond to changing market pressures, enhance their productivity and profitability and retain their competitive advantage in the market. It is also increasingly about encouraging the on-going modernisation of UK businesses[2], improving their efficiency and effectiveness in the way employees are utilised in the workplace and improving the quality and relevance of workforce development to meet changing skill needs in different sectors and to sustain on-going business development and growth. This is not just the responsibility of employers. When public agencies intervene, perhaps due to market failures, public skills policy and provision must also fully meet employers' needs.

Delivering this agenda are a large number of policy players involved in UK Vocational Education and Training — DWP, DTI, DfES, the LSC, the RDAs, all taking slightly different perspectives and with different but overlapping stakeholders. In April 2002, the government set up the Skills for Business Network, created to work with and for employers in key sectors of the UK economy in the drive for better productivity and effectiveness. The Network consists of a number of new employer-led Sector Skills Councils

1 DfES (2003), *21st century skills: realising our potential,* skills white paper

2 Taylor R (2003), *Skills and Innovation in Modern Workplaces*, ESRC Future of Work Programme seminar series

(SSCs) supported and directed by the Sector Skills Development Agency (SSDA). It provides a basis for employers from specific sectors to work together and with other partners on skills issues of common interest, and to co-ordinate action around workforce development and employment practice. The aim is to more effectively meet changing sector skills and business needs and, by so doing, to increase business competitiveness, productivity and performance above current levels.

In many ways, government and its agencies act in the belief that skills make a difference. But how strong is the *evidence* that workforce development and raising skills in the economy bring real benefits to business and efficiency? The search for 'proof' that skills make a difference might be seen as merely stating the obvious. It is intuitively convincing that a more highly skilled workforce should be beneficial to organisations and the human capital approach reflects the view that the market value of the firm increasingly depends on intangible rather than tangible resources. The three main components of human capital are described as (Blundell *et al.* 1999[1]):

- early ability
- qualifications and knowledge acquired through education and
- skills competencies and expertise through on and off the job training.

This would suggest that individual capability is enhanced by greater qualifications and higher skill levels. If this can be accessed and used to good effect in the firm then better human capital should, *ceteris paribus*, enhance organisational performance. Better organisational performance should, in turn, translate into better national performance.

This paper, undertaken on behalf of the Skills for Business Network, reviews the latest research evidence and explores how skills embed within a broader model of workforce capability to impact on business performance. We start by considering why skills have been such an enduring element of concern for policy makers and then move on to explore the evidence for the role skills may play in raising performance levels of individuals, firms, sectors and ultimately the whole economy. The paper concludes by considering the implications for policy and outlining further research questions that will strengthen the evidence and our understanding in this policy area. The paper presents a model that will help policy makers to capture what we already know and provide a framework to explore what we still don't know.

---

[1] Blundell R, Dearden L, Meghir C, Sianesi B (1999), 'Human Capital Investment: the Returns from Education and Training to the Individual, the Firm and the Economy', *Fiscal Studies* Vol. 20, No. 1

The productivity challenge

A national issue

There has been considerable discussion since the 1970s about the poor performance of the UK economy relative to other countries,[1] much of which has centred around the contribution that UK-based industries have been making to this overall performance and what action can be taken to improve the position.

There are a variety of measures used to assess economic performance and these assessments have taken place at a number of levels, including the individual employee and/or firm, sectors, regions or for the whole national economy. Examples of performance measures in the literature have included a mixture of financial and operational measures including profits, turnover and sales, share price dividend, value added per employee, new products as a percentage of product range, quality standards (and/or defects), scrap rates, machine breakdowns and downtime, absenteeism, employee satisfaction, employment growth, output and labour productivity. They have also included employer and employee perceptions of performance. The most commonly and widely used measure to assess economic performance, and the efficiency with which different sectors, firms and/or the economy produce goods and services, is productivity.

Productivity measures how well an economy uses the resources available by relating inputs to outputs. There are essentially two measures which take into account the contribution of labour: GDP per worker (the productivity of each person in active employment) or GDP per hour worked (also takes account of part time work and time spent not working). GDP per hour worked is seen as a better comparative measure because it does not suffer from differences in the way labour is used (it does not, for example, vary simply due to differences in the length of the working week, holiday entitlement *etc.*). Another measure of productivity is Total Factor Productivity (TFP) which also takes into account capital and therefore requires accurate measures of capital stock which are not often available.[2]

With productivity as the key measure, the evidence for the UK makes depressing reading. Despite being the fourth largest economy in the world, the UK historically has had a poor national productivity record, measured by GDP per head, compared to its international competitors. The size of the gap depends on how labour productivity is measured. Productivity levels in Europe

---

1 DfES (2003), *21st Century Skills: Realising our Potential,* skills white paper

2 HM Treasury (2000), *Productivity in the UK: the Evidence and the Government's Approach*

overtook those in the UK during the 1970s but a gap between the UK and the US had existed with the US since the early 1900s.

Despite the fact that GDP per head for the economy has increased five fold since 1870[1] and has grown faster in the UK during the 1990s than other G7 countries (especially within the service sector), internationally the UK still only has a middle ranking position. The reality is that productivity in the UK has grown more slowly relative to a number of other countries and therefore the British experience has been of relative economic decline. In relation to the 15 EU countries, the UK ranks 12th and recent figures from the Office for Economic Co-operation and Development (OECD) put it at fifteenth place out of 30 countries.[2] Craft (2002) concludes that the relative decline in the UK has resulted from poor productivity performance rather than simply low investment. A relatively low capacity for innovation and for making effective use of technological change is at the heart of this decline. Craft places the blame at the door of weak competition and managerial failure in firms.

Recent measures of labour productivity show that gradual progress on productivity may be paying off. This improvement is most visible using GDP per worker. Since 1990, UK productivity has grown faster that its main competitors and as a result, UK workers on average produce more than those in Japan, as much as those in Germany. The gap between France and the UK has narrowed by 17 percentage points. However, US workers are still just under 30 per cent more productive than UK workers. On GDP per hours worked the UK remains behind all our major competitors (Figure 1).

Interestingly, the productivity gap with the US diminishes using GDP per hour worked, as a consequence of a longer working week, the extent of workers undertaking more than one job and fewer holidays in the US. Figure 2 shows where UK productivity per hour worked comes in relation to the OECD countries and overall hours worked (*ie* labour utilisation). It would appear that our European neighbours work smarter while the US works smarter and harder.

A regional issue

In addition to international differences, there is also variation *within* the UK in terms of productivity. In particular there are significant and persistent variations in GDP per capita amongst the UK regions (see Figure 3).[3] For example, GDP per capita in the

---

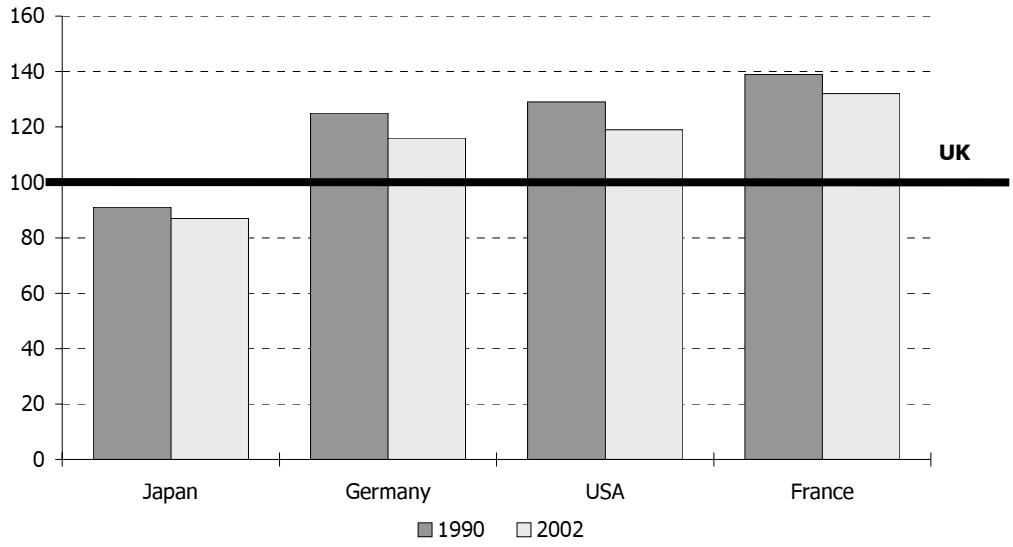
1 Crafts N (2002), *Britain's Relative Economic Performance 1870-1999*, Institute of Economic Affairs Research Monograph No. 55, IEA London

2 DTI (2003), *Prosperity for all*, DTI Strategy Analysis

3 HM Treasury (2001), *Productivity in the UK: Progress Towards a Productive Economy*

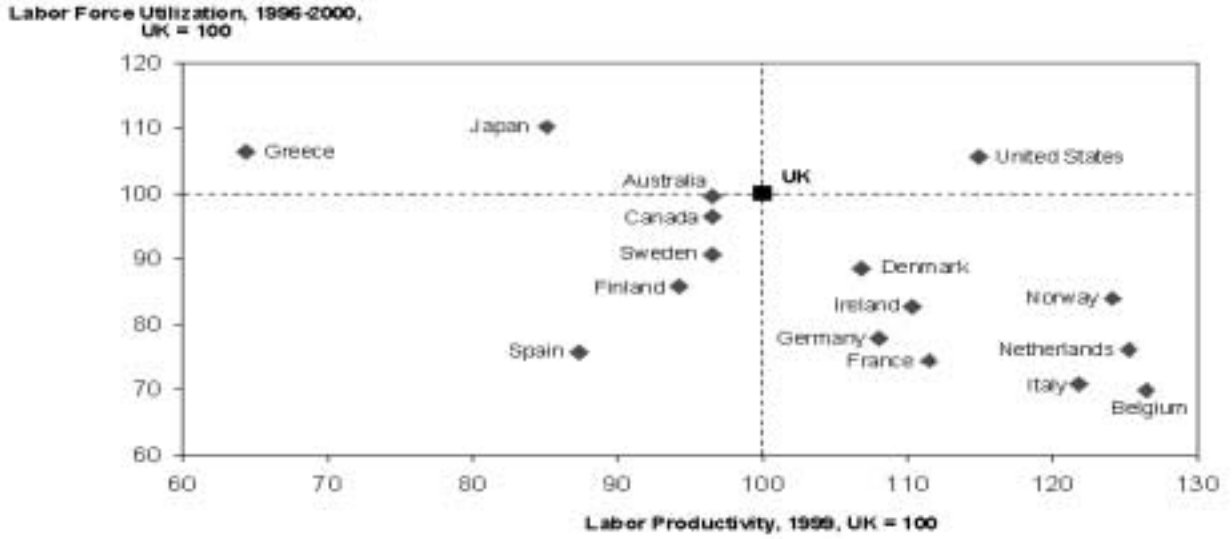
North East was more than 40 per cent below that of London in 1999 and these differences in regional GDP have been persistent over the last 30 years. The main source of these regional variations differences in unemployment rates, participation rates and working-age population share affecting productivity to a lesser extent.

Figure 1: International comparisons of labour productivity (GDP per hour worked, UK = 100)



Source: ONS, 2004

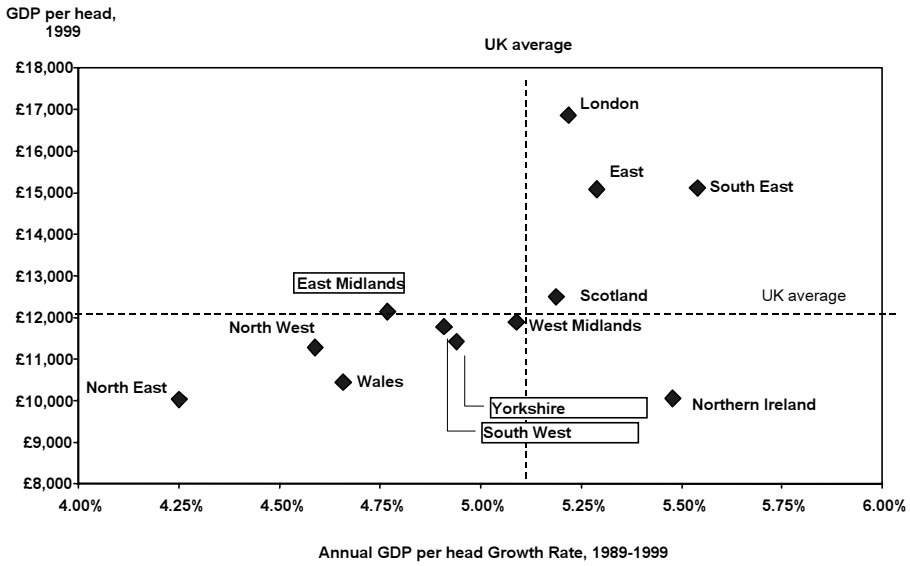
Figure 2: Labour force utilisation and productivity



Note: Labour Force Utilisation measured as hours worked per working age population; Labour Productivity measured as output per hour worked

Source: OECD (2001), IMF (2003)

Figure 3: Regional differences in economic performance



Source: Campbell and Giles, 2003

A sectoral issue

A sectoral analysis of labour productivity shows that the existence of the gap is common across all parts of the UK economy and affects most sectors, therefore any improvements must be economy wide.[1] A recent report by the Advanced Institute of Management (AIM)[2] suggests that more than half the gap in productivity between the UK and US can be attributed to three sectors: 'wholesale and retail', 'financial intermediation' and 'machinery and equipment'. Their analysis of changes in the gap since 1990 suggest that, although the size has not changed particularly, the sectoral composition giving rise to the gap has shifted considerably. The gap has narrowed in the service industries such as gas and water, in manufacturing (with the exception of machinery and equipment) and in business services. The share of the gap accounted for by manufacturing (excluding machinery and equipment) declined more than any other sector over the decade. The gap has risen over the decade in 'wholesale and retail', financial intermediation, hotels and restaurants and machinery and equipment. In many sectors, the UK's relatively poor performance can be attributed to a greater acceleration in productivity growth in the US rather than low growth in the UK. Both countries are increasing productivity but the US is doing so faster.

[1] O'Mahoney M, De Boer (2002), *Britain's Relative Productivity Performance*, Updates to 1999, NIESR Final Report to DTI; Campbell M, Giles L (2003), *The Skills and Productivity Challenge: A Summary of the Evidence Base for the SSDA Strategic Plan 2003-2006*

[2] Griffith R, Harrison R, Haskel J, Sako M (2003), *The UK Productivity Gap and the Importance of the Service Sectors*, summary report of the AIM Management Research Forum

Other analyses by sector support this overall picture.[1] Productivity has been rising across the UK economy but much faster in manufacturing than in services. Manufacturing output grew by over five per cent in the 12 months to December 2000, the strongest performance since 1994. Output per worker in manufacturing has been growing strongly since 1999.

A firm issue

A firm level analysis helps to reveal what is contributing to the sectoral and national picture. It seems that the spread in productivity levels between individual firms is important. Recent analysis of variations in firm level productivity in the UK, shows that the worst performers have productivity levels significantly lower than their international competitors[2] and there is a much bigger spread across UK firms. Whereas the best UK performers had productivity levels equivalent to the best international competitors, there is a large tail of low performers. This suggests that a significant wholesale increase in performance is required to close the gap. The best performing firms in the manufacturing sector were around five times more productive than the worst. However, there is also a significant positive relationship between productivity and market share *ie* the biggest producers tend to be the most productive.

Thus despite the numbers, the lowest performing organisations are not holding down national productivity as they amount to a relatively small proportion of national output. Raising the performance of these poorer performers to the median productivity level in the industry would still be insufficient to close the overall international productivity gap (raising the lowest performing firms to the median would raise performance by eight to ten percentage points). In fact, given the gaps in productivity noted above, the UK would have to raise average productivity to the current eightieth percentile to close the gap.

To summarise:

- There is a productivity gap between the UK and our main competitor nations.
- The gap has been closing since the late 1990s but mostly as a result of workers in the UK working longer hours.
- There are marked and persistent regional variations in productivity with a North/South divide.

---

1 HM Treasury (2001), *Productivity in the UK: Progress Towards a Productive Economy*

2 Haskell J, Martin R (2002), *The UK manufacturing productivity spread*, CeRIBA Discussion Paper

- The productivity gap is echoed in most sectors but there is a shifting picture on sectoral contribution to the gap with evidence that in manufacturing, productivity is rising faster than in other sectors.
- Most firms are under-performing —the best may be 'top class' but we have too many organisations not up to scratch.

The skills and workforce development challenge

As we have seen there is persuasive evidence of a significant productivity problem in the UK. The key questions are what gives rise to this economic position in the UK relative to other countries, and what gives rise to the variation in sectoral and firm level labour productivity? There has been a strongly held belief at policy level for more than two decades that skills are an important contributing element to the productivity gap. Commentary on UK competitiveness[1] has highlighted the importance of skills in modern economies, which increasingly demand a highly trained labour force.[2] The DTI has also stressed that large parts of the UK economy are now dependent on the management and processing of knowledge and information. Service industries have already been transformed by new technology and the demand for ICT skills has increased. In addition, several commentators have pointed to the growing importance of communication and inter-personal skills with the expansion of service work. So although there is a commonly held belief that skills are an important part of the equation, we now explore the evidence that might lend weight (or otherwise) to this belief.

Comparative skills profiles

At the simplest level of analysis, there have been numerous direct comparisons between the UK skill profile and that of other nations who are more productive than ourselves. It is noted in the DTI reviews that although the UK performs reasonably well against our European competitors in terms of higher level skills, at intermediate level skills the UK performs considerably below France and Germany (see Figure 4). Whilst a recent update to this work suggests some improvement in the UK, (particularly amongst the 19 to 21 year olds), a significant gap still exists, especially concerning the up take of vocational qualifications.[3]

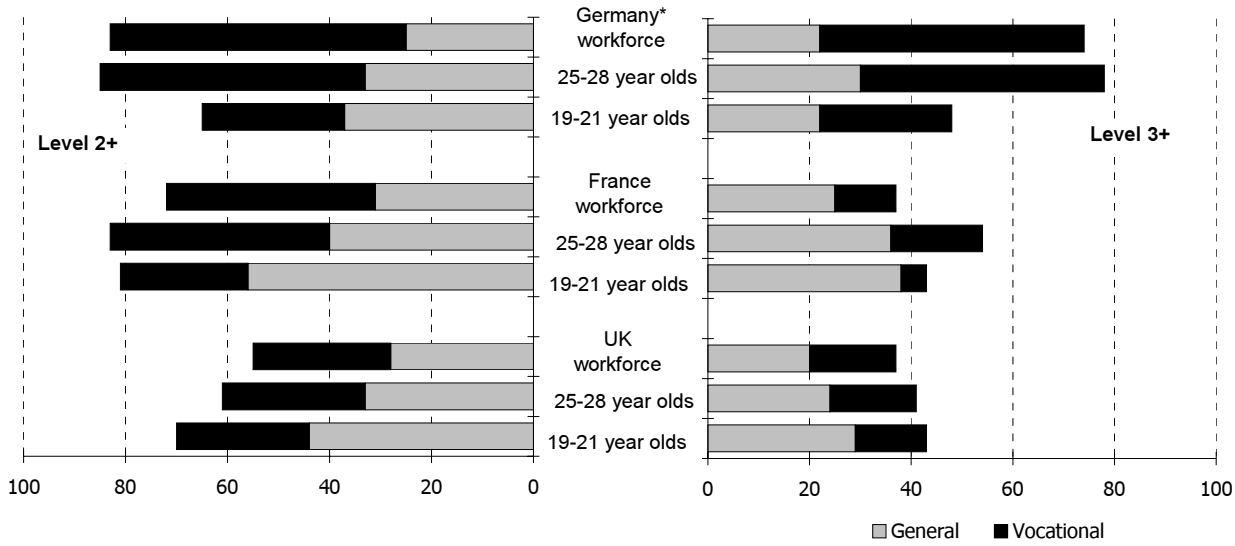
---

1 DTI (2001), *UK Competitiveness Indicators second edition*, and DTI (2003) *UK Productivity and Competitiveness Indicators 2003*, DTI Economics Paper No 6

2 DfEE (1988), *The Learning Age and Renaissance for New Britain*, White Paper; DTI (1998), *Our Competitive Future: Building the Knowledge Driven Economy*

3 Steedman H (forthcoming) *Updating of the Skills Audit 2004*, DfES

Figure 4: Qualification levels at NVQ 2 and 3: UK, France and Germany

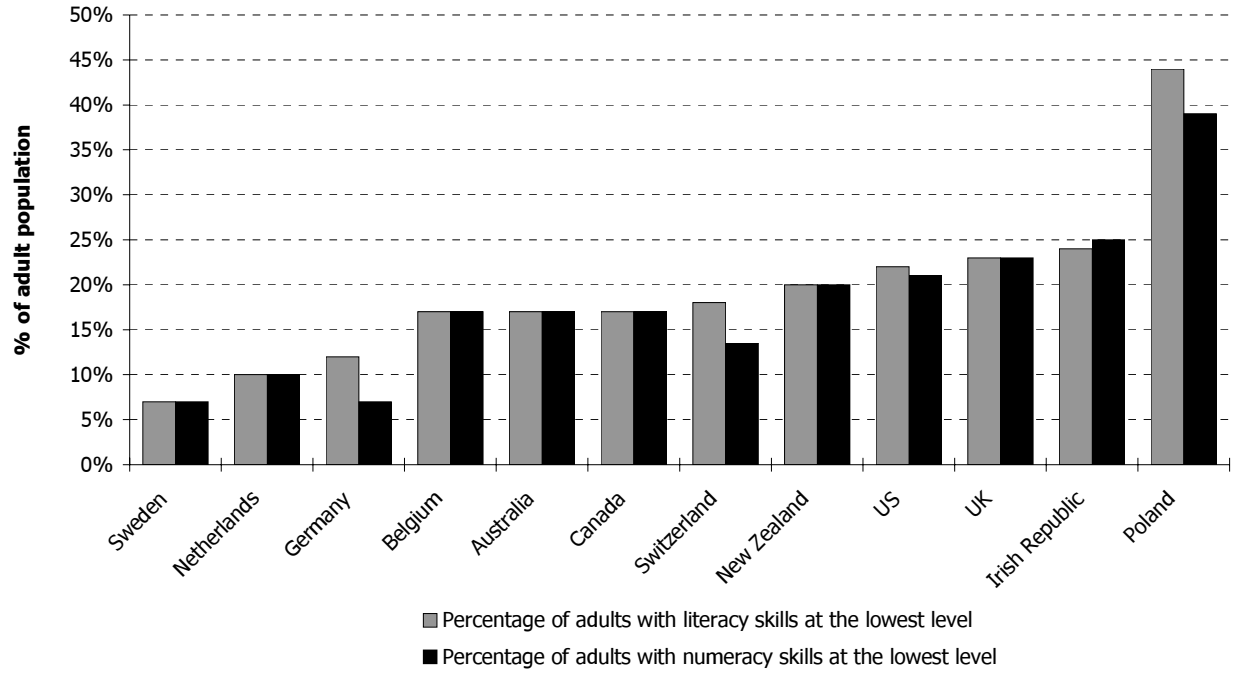


Note * Germany data are 1997

Source: DTI from Steedman

There is a long tail of adults with no or low skills; just over one-third of the working age population in the UK either have no qualifications or are qualified below level 2. Poor literacy and numeracy skills are also much more prevalent in the UK than nearly all other countries (see Figure 5).[1]

Figure 5: Adults with literacy and numeracy skills at the lowest level



Source: Literacy Skills for the Knowledge Society, OECD, 1997

[1] OECD (1997), *Literacy Skills for the Knowledge Society: Further Results from the International Adult Literacy Survey*

This basic skill deficit may remain of concern in the UK for some time:

- The labour market is set to expand more slowly over the next 20 years compared to the previous 20 and the average age is increasing. This means that there will be proportionally more older workers who tend to be less well qualified than younger workers.
- High drop-out rates at 16 contribute to the problem. The UK has one of the lowest participation rates in education at 17 of the OECD.
- Over one-third of British minority ethnic economically active adults hold qualifications below level 2 and yet minority ethnic groups are expected to account for more than 50 per cent of growth in the working population over the next ten years.[1]
- The UK labour market is tight with a high employment rate (at around 75 per cent) and low unemployment. Many areas of the UK are already experiencing full employment yet a further 1.3 million new jobs are forecast over the next ten years. Also, 13.5 million jobs will need to be filled as people leave the labour market because of retirement and so on.

Regional skills

There are substantial skills differences between UK regions (see Figure 6). In England, the proportion of those of working age qualified to level 3 is just 36 per cent in the North East but is 46 per cent in the South East. Indeed the proportion varies considerably across LSC area from 32 per cent in the Black Country and 36 per cent in South Yorkshire to 49 per cent in Hertfordshire and 53 per cent in Surrey.[2] HM Treasury suggests[3] that the difference in the skill composition of the workforce in UK regions is the main underlying factor associated with regional productivity differentials.

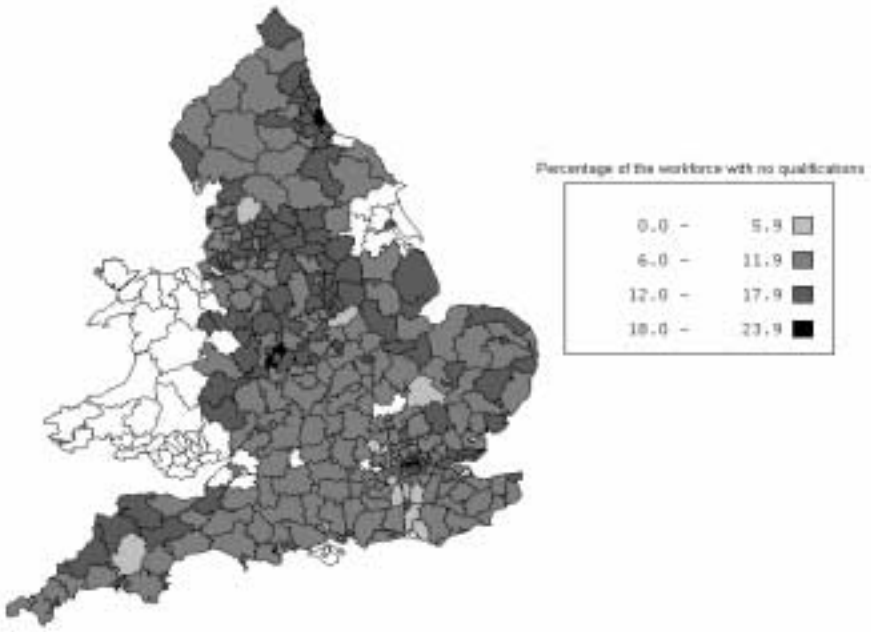
---

1 Campbell M, Giles L (2003), *The Skills and Productivity Challenge: a Summary of the Evidence Base for the SSDA Strategic Plan 2003-2006,* SSDA

2 Campbell and Giles *op.cit.*

3 HM Treasury (2001), *Productivity in the UK: Progress Towards a Productive Economy*

Figure 6: Regional variations in percentage of workforce with no qualifications



Source: Campbell et al. *2001*[1]

Sectoral skills

The national picture does not apply equally at sectoral level. While all sectors undoubtedly need to take action to ensure they have the right balance of skills, some sectors are clearly operating from a lower skill position than others and arguably therefore have a greater challenge to raise skill levels and tackle deficiencies (see Table 1 modified from skills white paper). Table 1 highlights those sectors with the most poorly qualified workforces at levels 3 and above: textile and clothing manufacture; food and drink, agriculture, hotels and catering and retailing. Indeed, around two-thirds of the employees in these sectors respectively have qualifications at or below level 2. This compares to around a quarter in parts of the public sector such as education.

The implications of these differences are, however, not clear as there are considerable differences in skill needs across sectors. The important dimension is the degree to which current skills meet sectoral needs and how skill levels in these sectors compare internationally.

Surprisingly, the link between skills and productivity at the sectoral level has been little studied. However, a parallel SSDA funded project undertaken by IES ('Innovation Indicators') aims to address this issue using international comparisons.

[1] Campbell M, Chapman R, Hutchinson J (2001), *Spatial Skill Variations: their Extent and Implications* Skills Task Force, Research Paper 14

Table 1: Level of qualification by detailed (27) sector

Sector	S/NVQ 5 (%)	S/NVQ 4 (%)	S/NVQ 3 (%)	S/NVQ 2 (%)	S/NVQ 1 (%)	None (%)	*Weighted base (=100%)*
Textiles & clothing manufacture	*	9	15	29	12	34	244,960
Food, drink & tobacco manufacture	*	10	19	33	16	18	465,210
Agriculture	*	13	17	31	11	25	381,452
Hotels & catering	1	10	24	36	13	16	1,260,570
Retailing	1	11	22	37	11	17	2,973,697
Other manufacturing and recycling	*	12	20	34	12	19	245,288
Transport & storage	2	12	22	35	17	12	1,362,963
Wood & paper manufacture	*	9	26	35	13	15	199,276
Wholesale distribution	2	14	20	36	13	14	764,909
Sale and maintenance of motor vehicles	*	7	34	34	10	14	562,052
Communications	3	17	22	34	10	13	640,312
Construction	1	12	34	31	9	13	2,088,263
Metals and metal goods manufacture	*	15	29	29	11	13	536,583
Chemicals and non metallic minerals manufacture	5	22	20	28	11	13	769,321
Whole economy	**5**	**23**	**22**	**29**	**9**	**11**	**28,422,836**
Miscellaneous services	5	22	24	28	9	11	1,529,839
Engineering manufacture	4	23	26	27	9	11	1,041,604
Transport equipment manufacture	4	21	29	26	9	11	558,073
Printing and publishing	5	23	26	28	7	10	412,704
Health and social work	6	37	14	25	9	9	3,131,282
Professional services	8	28	22	28	7	7	617,220
Financial services	5	27	27	32	6	3	1,279,194
Public administration and defence	6	28	24	29	6	6	1,907,543
Other business services	8	33	18	24	8	9	2,116,999
Utilities	*	26	31	27	7	5	217,385
Mining & quarrying	*	29	21	22	*	11	112,785
Education	22	38	11	17	6	6	2,315,669
Computing services	11	43	21	18	4	*	524,019

Source: SSDA skills matrix/LFS, 2001/02 (average: 2001q4 - 2002q3)

Three critical roles have emerged for skills at the sector level:

- Skilled workers are important for R&D, and the development of innovative products and services.[1]
- Organisations also benefit from skilled workers through spillover and through new methods and products from other sectors.[2]
- Finally, skilled production workers are more important in high-technology sectors than in low-technology sectors.[3]

Skill deficits

Most of the research mentioned compares qualification levels. However, there is a problem with comparisons between qualification levels in the UK with elsewhere and the assumption that they reflect skill levels. Strong evidence of qualification deficits may not equate to a skills problem but may reflect different qualification systems rather than a less skilled workforce. An alternative indicator might be the degree to which organisations report skill deficiencies –- can they find the workforce they are looking for?

Evidence from UK employer skills surveys[4] gives us an indication of the level and nature of current skill deficiencies in the labour market by measuring external skills shortages and internal skills gaps. This evidence shows that a fairly small proportion of employers experience skills shortage vacancies *ie* they have vacancies that are hard to fill because of a shortage of suitably skilled applicants. In England for example this equates to only four per cent of employers and around 135,000 vacancies. These tend to be concentrated in small (but not the very small) firms and those in certain sectors: construction, transport and communication, parts of manufacturing and health and social care. By occupation,

---

1 Adams J D (1999), 'The Structure of Firm R&D, the Factor Intensity of Production and Skill Bias', *The Review of Economics and Statistics,* Vol. 81, No. 3, pp. 499-510

2 Engelbrecht H J (2002), 'Human capital and International Knowledge Spillovers in TFP Growth of a Sample of Developing Countries: an Exploration of Alternative Approaches', *Applied Economics*, Vol. 34, pp. 831-841

3 Anderson M A, Robertson R, Smith S L S (2001), *Measuring Skill Intensity: Production Worker vs. Education Data in the NAFTA Countries*, US International Trade Commission, Office of Economics Working Paper, No. 2001-07-B

4 Hogarth, *et al.* (2004), *National Employers Skill Survey 2003: Key Findings;* Future Skills Wales (2004), *Wales Generic Skills Survey 2003;* Future Skills Scotland (2003), *Skills in Scotland;* Department for Employment and Learning in Northern Ireland (2004), *Skills Monitoring Survey 2002*

skilled manual trades and associate professionals are most affected, perhaps lending some support to the view that intermediate skills are a key issue. This is not exclusively the case and in Northern Ireland and Scotland skills shortages occur in other occupations too, namely plant and machine operatives in the former and personal services, sales and elementary jobs in the latter. The latest data from these surveys indicate that the level of external recruitment problems is both stable and persistent. These skill shortages also still tend to be most acute in sectors requiring technical skills such as construction and manufacturing.

On the other hand skills gaps are much more prevalent than skills shortages across the UK. For example in England just under a quarter of employers (accounting for around 2.5 million employees) report skills gaps, which outnumber shortages by nearly 20. Across the UK regions, skill gaps are most apparent within England accounting for 11 percent of all employees. This compares to three per cent in Northern Ireland, nine per cent in Scotland and five per cent in Wales. Skill gaps seem to affect the larger employers and the very small disproportionately and are a more universal problem with less extreme variation between sectors. However industries where there are slightly greater numbers of staff with gaps include retail, business services, and hotels and catering. By occupation, sales, customer service and elementary jobs are the most affected and generic skills such as communication and customer handling are the skills most lacking.

The fact that organisations experience skill deficiencies may not present a strong enough case for a UK skills deficit. But when this is considered alongside the UK skills profile (outlined earlier) and the fact that these deficiencies have persisted for some time, the case perhaps does become more compelling. Furthermore there is evidence[1] that the degree of skills problems may be greater than the level recorded in official surveys. Organisations do not always report skills problems because they have learnt to make do with what they have; that is they have latent skills gaps.

Training and development

Education and qualifications may be one element of human capital but training and development is another and we turn now to look at the data on levels of training and development in the UK. Whilst the proportion of the UK workforce participating in training is high compared to other OECD countries, the duration of training is low and access is uneven (see Figure 7); the lower skilled and qualified are less likely to receive training. There is thus a tendency to reinforce existing inequalities in skill attainment. Some commentators have also questioned whether training is of an adequate quality to meet skill needs and

[1] Hogarth T, Wilson R (2001), *Employer Skills Survey Synthesis Report*, DfES

overcome any skill deficiencies. Most training periods are short (*ie* half of training lasts for less than six months and two fifths for less than one week). Much is driven by statutory requirements such as health and safety (*eg* in England 69 per cent of training is for this need) rather than business needs. A lot of training activity is not driven by a formalised training or business plan and therefore can be reactive and dominated by short term needs rather than supporting business development and growth (*ie* a third of employers have no plan and two fifths of employers do not undertake performance reviews to assess their employees skill needs). Only half of training leads to a formal qualification, raising questions about completeness and coverage of sufficient underpinning knowledge.[1] Furthermore there are significant sectoral variations in the level and nature of training activity which may only serve to exacerbate problems in some sectors. For instance, public sector organisations and those in energy and utilities and finance provide more training than those in textiles, parts of manufacturing and retail.

Attempts to increase workforce development in the labour market are likely to be affected by the composition of the organisation. It has been consistently shown that smaller establishments have less well-qualified staff and are less likely to provide formal off the job training than larger ones.[2] This pattern has persisted over time and been reported in various training surveys.[3]

Whilst some of these small businesses do develop people informally, through experiential learning and in ways that are not always picked up by official training surveys, there are still questions about the scale and adequacy of these approaches.

Although most of the gaps in skill levels compared to other countries are attributed to historic failures of the education system, the lack of participation in high quality and relevant job-related education and training is believed to be a further contributory factor to this national and sectoral skills shortfall, especially in keeping pace with the continual structural changes in the labour market. The manufacturing and primary industries have been in decline for decades, taking with them traditional full-time, manual work and are being replaced by jobs which challenge conventional modes of working. The increasing demand in the service sector for higher skilled professional and technical jobs is set to continue. With these changes comes greater employment flexibility, more job moves in a typical career and diminishing notions of 'a job for life'. Indeed, the median length of service for men has fallen by a fifth since 1975. This places a

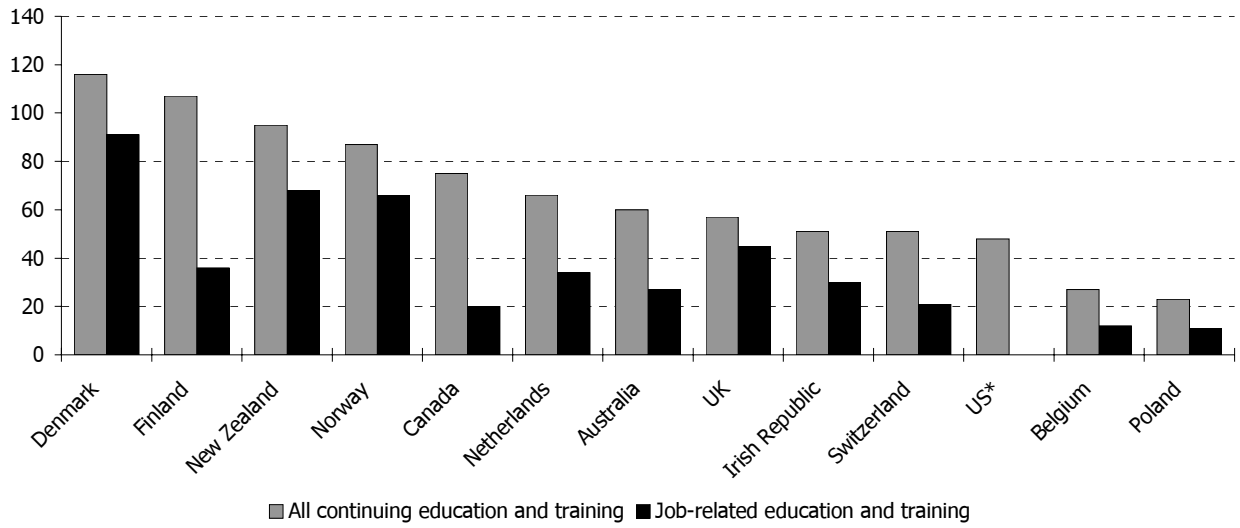
---

1 Hogarth *et al* (2004), *op.cit.*

2 *eg* Small Firms Enterprise Development Initiative (2002), *Small Firms Skills Assessment*, SFEDI

3 Spilsbury D (2003) *Learning and Training at Work*, DfES

Figure 7: Average hours of continuing education and training



* US = 1999

Average hours of continuing education and training, by type of training. Selected OECD country comparison, 1994-1998. Mean number of hours, adult population, aged 25-64

Source: International Adult Literacy Survey, and national surveys

growing emphasis on continual re-training and upskilling amongst firms to maintain their competitive advantage.

To summarise:

- The review of the UK's productivity gap demonstrates that the UK does face significant problems compared to its main competitors.
- There is evidence that productivity gaps are accompanied by gaps (proxied by qualifications) at intermediate and basic skill levels in comparison with France and Germany and at high skill levels in comparision with the US.
- There are considerable regional variations in skill/ qualification level broadly in line with differences in productivity.
- Reports of skill shortages are at a generally low level but there is some concern that employers may be 'making do' with sub-optimal levels of skill without recognising that they do so.
- The proportion of the workforce participating in training is good compared with competitors but the actual duration of training is low and access is uneven.
- The evidence we have reviewed here focuses on whether there is a UK skills (qualifications and training) gap which echoes the productivity gap, this does not however necessarily mean that the relationship is causal *ie* that it is the absence of skills that results in the productivity gap.

Linking training and skills to performance

We now turn to research that has attempted to relate skills more directly to performance at individual, organisational or national levels. It is important to point out that most research evidence of the link tends to demonstrate an *association* between skills and measures of individual benefit or organisational performance, rather than *proving* a link by monitoring relationships or impact *over time*. The latter is methodologically more difficult and therefore more scarce but more compelling.

The research has to deal with a number of difficulties inherent in the measurement:

- Not all investments in education are considered equal in the labour market *eg* there are very different rates of return from arts and science degrees.
- Educational attainment may be an indicator of *ability* rather than *skill*.
- Education is only part of the input to skill, ongoing learning is much harder to codify.
- Not everyone fully utilises the skills they have or applies them to their current job.
- The traditional unit of skills measurement is some indicator of educational attainment but education, qualifications and training are all proxies for skills.
- As has been noted elsewhere,[1] much of the discussion on skills assumes that training and skills are synonymous and it needs to be remembered that training is only one route to skill acquisition.

Others have highlighted the difficulties in defining skills and the multiple functions of training apart from skill enhancement.[2]

The relevant research has tended to fall into three broad camps, all throwing light on the issues of skills and performance from slightly different research perspectives:

1. The first block is the most traditional. It seeks to address the relationship between skills and performance head on, deliberately looking for evidence of a direct link between performance and either qualifications and knowledge

[1] Bloom N, Conway N, Mole K, Moslein K, Neely A, Frost C (2004), *Solving the Skills Gap*, Summary Report from a CIHE/AIM Management Research Forum

[2] Keep E, Mayhew K, Corney M (2002), *Review on the Evidence of the Rate of Return to Employers of Investment in Training and Employer Training Measures*, SKOPE Research Paper No. 34

acquired through education, or skills, competencies and expertise through on or off-the-job training.

2. The second block is more tangential and throws light on skills while focusing on HR practices. HR practices, including those designed to improve the skills and capability of the workforce, have been linked to organisational performance.
3. The third block is slightly different in that it does not aim to identify positive relationships but seeks to enhance the understanding of why skills are not enough and what other factors might crucially affect any relationship between skills and business performance.

If higher skills do enhance performance we might expect certain hypotheses to be upheld by the evidence. Returning to our measures of human capital as early ability, qualifications and knowledge acquired through education and skills, competencies and expertise through on and off the job training, we might reasonably expect that:

a) If better skilled people enhance organisational performance, organisations will recognise the greater value of skilled people, and be willing to pay more.
b) If training raises skill levels, those receiving training should be valued more.

We might also expect better performing firms to be those which have recognised the importance of skill and therefore:

c) Better performing firms should have more skilled workforces.
d) Higher levels of training should be associated with better firm performance.

More compellingly:

e) Investment in training and development should *improve* organisational performance.
f) Recruiting more qualified and better educated staff should *improve* performance.

We turn now to the literature to see what support it gives for these hypotheses.

Benefits to and through the individual

As we have suggested, evidence of individual gains to education, qualifications, skills or training support the argument that they enhance individual capability and the individual's value to the firm. A number of studies have looked at the benefits to the individual of attaining higher skills (*eg* higher wages). This relationship has primarily been assessed by looking at the effect of

Table 2: Wage premia from obtaining qualifications (percentage)

Qualification	Men	Women	Qualification	Men	Women
CSE/lower GCSEs	9	5	Level 1-2 NVQs	Nil	Nil
O level/higher GCSEs	21	19	BTEC First	Nil	Nil
A level	17	19	Level 3-5 NVQs	6	5
First degree	28	25	RSA Higher	4	12
Higher degree	8	18	C&G Craft	7	Nil
			C&G Advanced	7	Nil
Professional qualifications	35	41	ONC/BTEC National	10	8
Nursing	13	21	HND/HNC	15	9
Teaching	Nil	27			

Notes:

1. The wage premiums are additive. For example, a man with 'O' levels/higher GCSEs and 'A' levels and a first degree will earn 66% more than a man with no qualifications.
2. Results control for age, ethnicity, region, firm, size, public/private sector.

Source: Campbell, 2002 using data from Dearden et al, 2001[3]

varying years of education or of having attained different levels of qualifications, and to a more limited extent, of having undertaken varying amounts of training. There is now considerable UK evidence of an association between the amount of education, level of qualifications and individual benefits, *eg* salary level or likelihood of being unemployed.[1] A notable exception to this evidence is the lack of individual return on the acquisition of vocational qualifications in marked contrast to the benefits accruing to academic qualifications (see Table 2).[2]

There have however, been criticisms of the fundamental assumption behind such calculations which is that the increase in earnings can be attributable to the added benefit of the study undertaken.

Others have argued that the education may not in fact be adding value but instead may signal to employers the higher capability

1 *eg* Greenhalgh C, Stewart M (1987), 'The Effects and Determinants of Training', *Oxford Bulletin of Economics and Statistics*, 49; Booth (1991), 'Job Related Formal Training, Who Receives it and What is it Worth', *Oxford Bulletin of Economics and Statistics*, 53; Wilson R, Hogarth T (2003) *Skills in England 2002*, LSC, Coventry

2 *eg* Sianesi B (2003), *Returns to Education*, CEE mimeo; McIntosh S (2003), *What Difference Does it Make? Vocational Education for Low-Achieving School-Leavers*, CEE mimeo

3 Campbell M (2002), *Learn to Succeed: The Case for a Skills Revolution*, Policy Press, Bristol; Dearden L, Macintosh S, Myck M, Vignoles A (2001), *The Returns to Academic, Vocational and Basic Skills in Britain*, DfEE Research Report 192, DfEE

and potential of the individual — what is termed the 'screening' hypothesis.[1]

Importantly to help counter this perspective, there is evidence that acquisition of skills during a working lifetime can have benefits to the individual. Improving basic skills can improve UK labour market outcomes.[2] There is therefore evidence in support of higher skills conferring labour market advantage on individuals.

There is also evidence that training received from a current or previous employer brings wage benefits, improved promotability, and reduced likelihood of redundancy for the individual.[3]

As summarised by Campbell (2000):[4]

> *'For those not in employment, skill acquisition can reduce labour market exclusion and unemployment by increasing employability and improving access to evolving job opportunities. For those already in work: acquiring skills can improve people's future job prospects and their earnings potential in the future.'*

Some studies have sought to explore the impact of different kinds of training. It has generally been found that off the job training has a greater wage effect than on the job.[5]

There is considerable evidence that the higher trained and qualified are also more likely to receive further training investment such that differences in earnings are amplified rather than compensated:

> *'The current accumulated stock of human capital provides both strong incentives and more opportunities for future investment.'* (Blundell *et al.* 1999[6])

---

1 Keep E, Mayhew K, Corney M (2002), *op.cit.*

2 *eg* Machin S, McIntosh L S, Vignoles A, Vitanen T (2001), *Basic Skills, Soft Skills and Labour Market Outcomes: Secondary Analysis of the National Child Development Study*, DfES 250 and Bynner J, McIntosh S, Vignoles A, Dearden L, Reed H, Van-Reenan J (2001), *Improving Adult Basic Skills Benefits to the Individual and to Society*, DfEE Research Report, RR251, HMSO

3 Blundell R, Dearden L, Meghir C, Sianesi B (1999), 'Human Capital Investment: the Returns from Education and Training to the Individual, the Firm and the Economy', *Fiscal Studies*, Vol. 20, No. 1

4 Campbell M (2000), *Learning Pays and Learning Works*, NACETT, Sheffield, p. 2

5 Blundell, Dearden and Meghir (1996*),The Determinants and Effects of Work-Related Training in Britain*, 1996, Institute for Fiscal Studies, London

6 Griffith *et al.* (2003) *op.cit.*

AIM[1] report a study by Jenkins *et al.* (2003) which uses panel data to explore lifelong learning on individual economic outcomes. They confirm that lifelong learning is more likely amongst those with some qualifications and found that one episode of lifelong learning increased the probability of undertaking more. However, there was little evidence of wage effects. One exception was for men who left school with only low level qualifications who then go on to study for a degree later in life, for whom there are significant earnings effects. Lifelong learning was associated with reduced probability of being unemployed.

Amongst this literature there are a few UK studies that have sought to contrast the benefits to the individual with those to the organisation. These have tended to show that benefits to the individual are associated with additional advantages for the firm, that tend to off-set any increases in labour costs associated with training and rewarding a more highly skilled workforce. The consensus is that the gains for the organisation exceed the greater wage costs.[2]

So far so good. There is nothing in the literature on individual benefits of education, qualifications, skills or training which would contradict our hypotheses. We turn now to evidence of benefits to the firm.

Benefits to the firm

The impact of education

Various econometric studies have sought to understand the ways in which education impacts on national productivity. Early studies have tended to support a view that considerable proportions of differences in productivity are accounted for by differences in education.[3] Work by Sianesi and Van Reenan[4] have estimated that in the US, investments in human and physical capital account for 83 per cent of the productivity growth between 1948 and 1986. Growth in labour input is estimated at 61 per cent of productivity growth, of which under half -- 42 per cent — was due to changes in labour quality.[5] Criticism of this body of research has noted that these studies rely on 'levels estimation' across countries, relating levels of education with levels of

1 Bloom *et al.* (2003) *op.cit.*

2 *eg* Dearden *et al.* (2000), *op.cit.*, Blundell *et al.* (1999) *op.cit.*

3 HM Treasury (2000), *op.cit.*

4 Sianesi B, Van Reenan J (2002), *The Returns to Education: a Review of the Empirical Macroeconomic Literature*, IFS, WP02/05

5 Bloom N, Conway N, Mole K, Moslein K, Neely A, Frost C (2004), *Solving the Skills Gap*, summary report from a CIHE/AIM Management Research Forum

productivity. The removal of idiosyncratic country level fixed effects (*eg* work ethic, language, climate), weakens the correlation significantly and it may be that some other factor is driving the relationship such as culture.

The impact of skills

If human capital is associated with better performance, then we would expect there to be evidence of a strong association between performance and skills. Studies have sought to isolate whether high skills are a contributory factor behind successful and higher performing firms. Altogether, these studies have identified a significant association between a highly skilled workforce and organisational performance, most commonly measured by the level of labour productivity. For instance Haskel[1] has shown that the top performers in UK manufacturing hired workers with, on average, an extra qualification level compared to the lower performers. Haskel also found that higher skill levels support innovation and more sophisticated production processes and were associated with the production of higher quality products.

Using matched establishment and workforce data Haskel, Hawkes and Pereira (2003)[2] showed that more productive UK firms hired more skilled workers (the establishments in the top decile had workers with an average of two years extra schooling compared to those in the bottom decile). Both hard and soft skills were positively related to TFP and the skill gap between the top and bottom performing firms explained some eight per cent of the productivity gap. In addition, Lynch and Black (1995)[3] found in the US, that an extra year of education raised productivity by between 4.9 and 8.5 per cent in the manufacturing sector and between 5.9 and 12.7 per cent in services.

These results have been supported by Mason *et al.* in 2003 for the UK.[4] Green *et al.* (2003)[5] has also found a strong relationship between different levels of UK workforce skills and the sophistication of products. Other research has suggested that a more highly skilled workforce can bring other benefits such as

---

1 Haskel J, Hawkes D (2003), *How Much of the Productivity Spread is Explained by Skills*? UK evidence using matched establishment/ workforce survey data, CeRIBA discussion paper

2 Haskel J, Hawkes D, Pereira S (2003), *Skills and Productivity in the UK using Matched Establishment, Worker and Workforce Data*, CeRIBA

3 Lynch L, Black S (1995), *Beyond the Incidence of Training*, Evidence from a National Employers Survey, NBER working paper 5231

4 Mason and Wilson (2003), *Employer Skill Survey, New Analysis and Lessons Learned*, DfES Research Report, NALL1

5 Green F, Mayhew K, Molloy E (2003), *Employer Perspectives Survey*

enhancing company survival. For instance Reid[1] suggested that a more skilled UK workforce was related to a greater commercial orientation and strategic awareness and propensity to innovate to retain competitive advantage. In the US, Bates (1990)[2] found that higher qualification levels were related to improved access to finance and increasing probability of business survival. Bosworth (2004) has cautioned against too simple an interpretation of survival studies as they do not account for the different life cycle stage at which any firm will be.

An OECD study looked at innovation in UK SMEs and found that higher qualification levels of both managers and staff boosted innovation.[3] Higher training expenditure per employee was also associated with higher technological complexity and originality.

Perhaps some of the most influential work in this area has focused on the investment in skills and training and the association between skills and productivity. This relationship was at the heart of a number of well known studies by the National Institute for Economic and Social Research (NIESR). Through a series of 'matched plant' studies[4] the impact of workforce skills and development on productivity was considered alongside a range of other factors such as investment in capital equipment and maintenance practices. The studies have compared UK businesses with similar firms in competitor countries within a variety of sectors including engineering, food, clothing, chemical and furniture manufacture and the hotel sector. A clear connection between higher skills and higher productivity has been identified particularly at the intermediate skills level. All the studies found that the higher average levels of labour productivity in firms in continental Europe were closely related to the greater skills and knowledge of their workforces, especially intermediate skills. Within manufacturing, lower skills levels in the UK were found to have a negative effect directly on labour productivity and on the types of machinery chosen, the ways in which machinery was modified in line with particular needs, the smoothness of machinery running and the introduction of new technology. The proportion of employees holding a relevant vocational qualification at the intermediate level in these establishments in the UK was well below that in Europe. A study of the hotels sector suggested similar lower skills and productivity in services.

---

1 Reid G C (2000), *The Development and Survival of New Small Businesses.* Centre for Research into Industry, Enterprise, Finance and the Firm, St Andrews University

2 In Bosworth forthcoming *op.cit.*

3 Albaladejo M, Romijn H (2001), *Determinants of Innovation Capability in Small UK Firms,* ECIS working paper No. 00.13

4 See, for example, Keep E, Mayhew K, Corney M (2002), *op.cit.*

A more recent study returned to the automotive sector to discover whether the findings from the original NIESR studies had moved on.[1] They found that the UK had made gains in reducing inventory and reject rates but value added per employee was still 15 to 25 per cent higher in Germany. The study concluded that investment in capital equipment, human capital and R&D spend remained higher in Germany and there were still significant differences in qualification levels.

The NIESR reviews also noted that there are specific skills gaps compared to nation competitors. Britain produced only a quarter as many skilled craft employees as France and Germany (Steedman, Mason and Wagner, 1991),[2] and although Britain did somewhat better at higher levels, it had no national equivalent to the German 'Meister' qualifications for first line supervisors with resultant impact on capability. These problems of education were seen to be aggravated by similar gaps in training, with relatively few British firms having a feasible strategy to upgrade foreman capability.

NIESR[3] have been able to break down the productivity gap into component parts to establish how much of an influence these factors have on productivity differences between the UK and its competitors. They suggest that most of the productivity gap between UK and Europe is accounted for by differences in the amount of investment in physical capital and skills. Indeed, NIESR estimate that as much as one-fifth of the productivity gap between the UK and Germany is a result of the UK's relatively poorly skilled workforce, which was highlighted earlier.

There is evidence that skill levels are associated with innovation performance. Using US data, Hall[4] argues that R&D spend is associated with higher market valuation. Others have focused on the relationship between the skills of the workforce and the ability to absorb and benefit from new technologies.[5]

Altogether, the evidence supports our hypothesis that high skills are related to high performance and low skills to low performance.

---

1 Mason G, Wagner K (2002), *Skills, Performance and New Technologies in the British and German Automotive Components Industries*, DfES

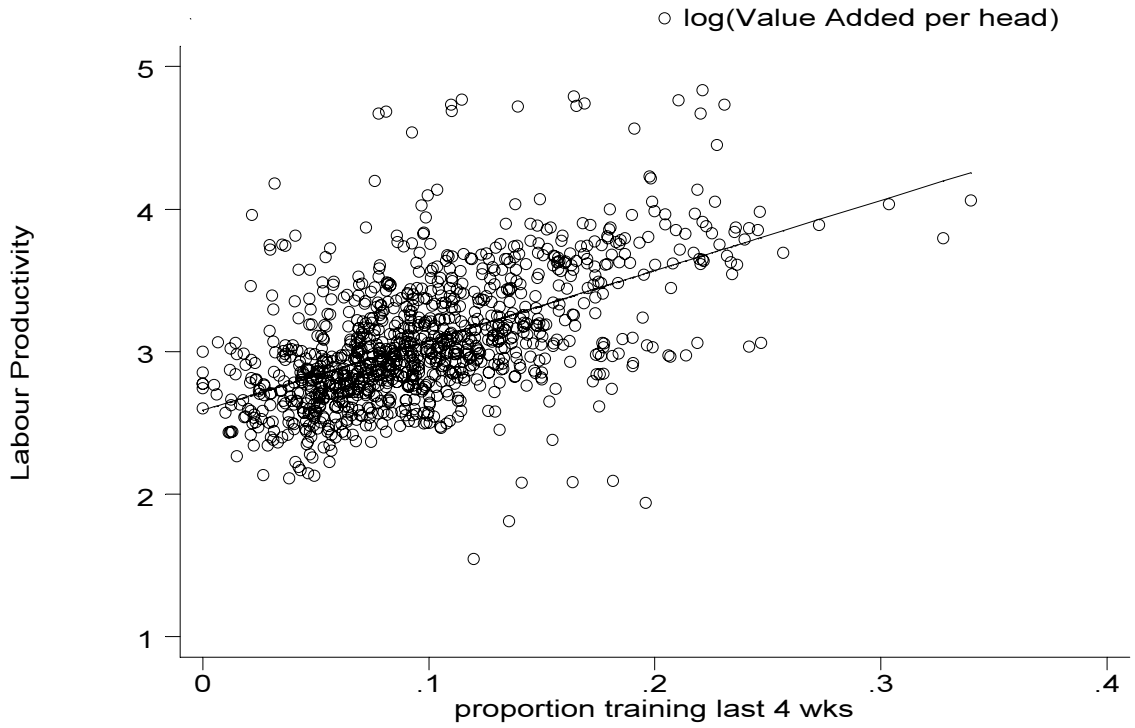
2 Steedman H, Mason G, Wagner K (1991), *Intermediate Skills in Workplace; Deployment, Standards and Supply in Britain, France and Germany*, National Institute Economic Research No. 136

3 O'Mahoney M, De Boer (2002), *Britain's Relative Productivity Performance, updates to 1999*, NIESR, Final report to the DTI

4 Hall B H (1995), 'The Stock Market Valuation of RD Investment during the 1990s', *American Economic Review, Papers and Proceedings*, Vol. 83, No. 2

5 *Eg* Solo (1966), Amsden (1989), from Bosworth (forthcoming) *op.cit.*

Figure 8: Labour productivity and training in British industries



Source: Dearden, Reed and Van Reenan

The impact of training

If skills are a positive influence, then it might also be expected that skill development *ie* ongoing investment in training, should also be associated with performance outcomes. This is unlikely to be a simple relationship as training is a complex intervention of variable duration, complexity and quality. However, if training is a good thing we might expect relationships between the quantity and quality of training and performance. Several studies at the level of the firm have highlighted the performance benefits associated with ***increasing*** training activity, the ***type*** of training provided and the ***depth***. For instance:

Increasing activity

Several earlier US studies[1] compared training investment to subjective measures of productivity. Although they have tended to find positive associations there are clearly methodological weaknesses in these analyses. Dearden, Reed and Van Reenen[2] analysed the impact of training on performance for a variety of

[1] Bartel A P (1995), 'Training, Wage Growth and Job Performance: Evidence from a Company Database', *Journal of Labor Economics*, 13, 3; Barron J M, Black D A, Loewenstein M A (1989), 'Job Matching and on the Job Training', *Journal of Labor Economics*, 7. 1

[2] Dearden *et al.* (2000), *Who Gains When Workers Train?* IFS

measures including value-added output, profits and wages for a group of British industries between 1983 and 1996. They found connections between higher training and higher labour productivity across a number of sectors. In essence, manufacturing firms undertaking training were found to be more productive, to have higher capital intensity, to conduct more research and development and have a more highly qualified workforce (see Figure 8). They concluded that the effects of training on wages are only about half the size of the effects on industrial productivity and that it is misleading to ignore the pay-off firms take in higher profits from training. For instance, raising the proportion of workers trained in an industry by five percentage points (say, from the average of ten per cent to 15 per cent) was associated with a four per cent increase in value added per worker and a 1.6 per cent increase in wages. They note that this level of increase has also been found by other researchers *eg* Blundell *et al.* (1996)[1] and Booth (1991).[2]

In a broad review of the literature, Keep *et al.* 2002[3] report a UK study of management training (Amos *et al.*, 1997) which explored the relationship between investment in education, training and development and various business outcomes. A relationship was found between overall investment and a range of outcome indicators but not for a number of specific training and development measures individually. A possible explanation for the relatively weak association was the absence of a strategic association between training and development policy and business strategy which others have found to be important.[4]

The research has been criticised by some *eg* Keep, Mayhew and Corney, 2002 for only covering manufacturing, looking at gains to sectors rather than individual firms and focusing on training quantity rather than quality.

Type of training

Lynch and Black (1995)[5] in the US, examined the impact of training in terms of the number of workers being trained, the type of training and how it was delivered (*eg* off the job and/or out of office hours) on company productivity. They found that in

---

1 *op.cit.*

2 Booth A (1991), 'Job Related Training; Who Receives it and What is it Worth?', *Oxford Bulletin of Economics and Statistics*, 53, 3

3 *op.cit.*

4 Thomson A, Storey J, Mabey C, Gray C, Farmer E, Thomson R (1997), *A Portrait of Management Development*, OU business school; Mabey C, Thomson A (2001), *The Learning Manager: A Survey of Management Attitudes to Training and Development*, London: Institute of Management

5 Lynch L, Black S (1995), *op.cit.*

manufacturing, greater productivity improvements were achieved when more training was undertaken off the job. In contrast, specific types of training were more important in the service sector; in particular training in IT and computing skills was associated with higher productivity gains. Bishop (1994)[1] noted that in the US on-the-job training from a previous employer raises productivity by 9.5 per cent but had no lasting effect whereas off the job training raised productivity by 16 per cent and was longer lasting. Other studies suggested that generic training was likely to produce greater returns than firm-specific training (*eg* Black and Lynch, 1996).[2] The premia to computing training was also confirmed by Green (1999).[3]

Barrett and O'Connell in 1998[4] and in 2001[5] used a firm level dataset to explore the link between general and specific training and then went on to review a number of studies examining the business benefits of continuing vocational training and organisational performance. They, like Lynch and Black (above) also highlight the importance of the type of training. They report that in many studies continuing vocational training is found to have a positive influence on productivity and wages. Furthermore, it seems that this type of training has the greatest impact when it is specific to the firm providing it. General training, which may provide transferable skills and/or knowledge relevant to many firms, tends to have less impact on firm performance. This is interesting in comparison to the Lynch and Black study which found off-the-job training, which might be assumed to be less firm specific than on-the-job, to have greater impact on productivity. It may be that off-the-job training tends to also be more comprehensive and thorough.

Depth and consistency of training

Cosh, Duncan and Hughes (1998)[6] used a panel data set of 1,600 UK firms tracked between 1987 and 1995. They concluded that training makes little difference to business survival in addition to existing profit, level of maturity and past innovation. There was a

---

1 Bishop J (1994), *The Incidence of and Pay-off to Employer Training: A Review of the Literature with Recommendations for Policy*, Cornell

2 Black S, Lynch L (1996), 'Human Capital Investments and Productivity', *American Economic Review*, Vol. 86, No. 2

3 Green F (1999), *The Market Value of Generic Skills*, Paper 12, NSTF

4 Barrett A, O'Connell P J (1998), *Does Training Generally Work; the Returns to In-Company Training,* Centre for Economic Policy Research (CEPR) Paper No 1879, London

5 *op.cit.*

6 Cosh A, Duncan J, Hughes A (1998), *Investment in Training and Small Firm Growth and Survival; an Empirical Analysis for the UK 1987-1996*, DfEE Research Brief No. 36

relationship between business growth and training between 1987 and 1990 but not in the later period. Similarly, larger firms showed a link between training and profitability in the earlier period but not later.

In a follow up study in 2000, Cosh, Hughes and Weeks[1] explored the impact of increasing investment in skills and training on business success in terms of employment growth, assuming that successful establishments were those most likely to be expanding. They found a strong significant effect of training on employment growth for small firms which were persistent trainers but not for those who were *ad hoc* trainers. They also established a positive relationship between sales growth and training but not at such significant levels. In a more recent study in 2003, examining the impact of training on business performance, and extending their earlier work, Cosh *et al.*[2] found that training was viewed positively by business, especially larger firms. Indeed, half the businesses studied felt that the training they had provided had increased their turnover and profit margin. Three quarters thought that it had improved their labour productivity. Furthermore, the research found a significant link between the intensity of training and performance: training spend per firm was significantly related to changes in profit margins (but training spend per employee was much less so). There was no relationship between productivity growth and training intensity.

Kitching and Blackburn (2002)[3] found that higher intensities of training were associated with employment growth and sales growth in UK SMEs, however they did not find a relationship with profit.

Green (1997)[4] in a review of the literature urges caution on interpretation of the results:

- Although many studies find positive effects on productivity, they do not assess the costs of training and therefore cannot comment on the rate of return.
- Problems arise because training is an endogenous variable *ie* whether or not a firm trains its employees is likely to depend on certain other characteristics of the company which may themselves be related to productivity.

---

1 Cosh, Hughes and Weeks (2000), *The Relationship between Training and Employment in SMEs,* DfEE Research Report RR245

2 Cosh A, Hughes A, Bullock A, Potton M (2003), *The Relationship between Training and Business Performance,* RR 454 DfES

3 Kitching J, Blackburn R (2002), *The Nature of Training and Motivation to Train in Small Businesses*, DfES

4 Green F (1997), *Review of Information on Benefits of Training for Employers,* DfEE Research Report No. 7

- Causality is frequently not proven and may be reversed *ie* more profitable firms train more.
- Companies do not just undertake a training initiative. A number of other internal and external changes will be taking place simultaneously with the training.
- There is differing understanding as to what constitutes training.
- The measures used tend to be crude and may only pick up incidence rather than amount of time spent.

To summarise:

- For most forms of qualification, individuals benefit in earnings and other employment outcomes.
- The evidence is that the benefits to the firm exceed the wage costs paid back to the individual.
- High performing firms employ better educated people than low performers.
- Better educated workforces are associated with higher productivity and other organisational outcomes.
- Matched plant research has suggested skills are an important component of the skills gap with competitor nations.
- Higher levels of training are associated with positive business benefits in several studies but not all.
- There is mixed evidence regarding the kinds of training and their link to business outcomes.
- Evidence suggests consistent trainers achieve greater returns.

Embedding skills within the wider context of HR practice

We now turn to studies which have taken a rather different perspective. There is a body of literature which, although not focusing on skills *per se*, is of relevance to our skills and training debate because it highlights a range of factors which appear to influence outcomes. The literature begins to paint a picture of skills as part of a wider approach to human capital and its contribution to organisations; it shows that the effects of skills or training are not always realised in isolation.

There has always been some literature that has explored the impact of skills or training within a broader context such as training and development strategy. Amongst these have been various studies that evaluated the impact of the Investors in People Initiative. One such study was conducted by the Hambledon Group in 2000.[1] This found a better performance

[1] Hambledon Group (2000), *Corporate Financial Performance Observed Before and After Investors in People Recognition,* DfEE, 222

amongst those employers with IiP than without it, in a four year period, on a range of measures, including return on sales, growth in net worth, return on capital, return on assets, salary levels, growth in export performance. Although the research cannot prove that the achievement of IiP has *caused* the improved performance, it nevertheless is an interesting association. A number of other evaluations of IiP have also found a positive relationship between having IiP and a range of business benefits reported by employers, including improved service quality, increased turnover, and higher profitability.[1] Whilst there can be problems of subjectivity and possible personal bias with studies reliant on self reporting of performance, a number of studies have reported similar findings.

More recent work on management development has also highlighted the importance of context. In one study of European firms, organisational performance correlated significantly with the degree to which line managers believed management development demonstrated attributes of best practice (Mabey and Gooderhan, 2003[2]).

The NIESR studies already mentioned have also played a key role in highlighting the complexity of achieving higher performance due to the interplay of factors and the importance of achieving the right compliment of different business practices. It is not a simple case of selective policy borrowing and/or implementing a single high skills strategy. Indeed, they have shown that for substantial improvements in productivity to occur, investment in skills is not sufficient in itself but needs to be contextualised into the business. For instance, new investments in skills and training need to be complemented by effective management practices alongside a clear market strategy and higher levels of investment in new capital equipment and product and service innovation. It is important within this context to understand how skill needs are derived and how they are set within a broader business strategy. They will be both determined, and refined, by the nature of the product and/or service market strategy, organisation of work and the production and delivery process. The importance of this is examined further in the next section.

High performance work systems

Increasingly there has been a move away from straightforward assessments of skill or training and business performance and

[1] Hillage J, Moralee J (1996), *The Return on Investors*, IES report 314, Tamkin P, Hillage J, Cummings J, Bates P, Barber L, Tackey N, (2000), *Doing Business Better: the Long Term Impact of Investors in People*, FOCUS central London

[2] Mabey C, Gooderhan P N, (2003), *The Impact of Management Development on the Organisational Performance of European Firms*, seventh conference on HRM

towards an exploration of much more complex relationships where, attention to skills is seen as one element of a strategic approach towards managing people. (Indeed several earlier studies investigating skills have noted a relationship between levels of training and other HR practices[1].) Such studies have suggested that the full benefits of workforce development and raising skill levels are only realised when bundled together within a wider array or package of workplace changes, re-organisation and human resources practices. It is the bundling of a critical mass of measures and the implementation of these measures in conjunction with one another that increases the magnitude of the effect.[2] This body of literature can be seen to have developed in parallel with the literature on skills, frequently focusing on HR systems in general rather than skills or training in particular. It has thus examined the role of skills investment as part of a wider system of management practices and sought to draw out how these practices critically link with, and ultimately impact on, performance. These systems have been given varying terms, ranging from good people management systems, through high performance working and high involvement management to strategic HRM. For simplicity we refer to them as HPWP (high performance working practices). Much of the earlier work has taken place in the US and has focused on the identification of HR practices that might contribute to strategic advantage *eg* Pfeffer, 1994; Huselid, 1995; Huselid and Becker, 1996.[3]

Whilst there may be disagreement about what combination of practices constitutes a 'perfect system' and how this should be defined, there is a shared understanding about the general effects. Indeed, this evidence commonly highlights positive improvements to organisational performance. For instance, Wood, de Menezes and Lasaosa[4] using the UK WERS (Workplace Employee Relations Survey) data, found that the implementation of high involvement

---

1 *eg* Lynch L M, Black S E (1995), *Beyond the Incidence of Training: Evidence from a National Employers Survey,* NBER Working Paper W5231 and Kitching and Blackburn *op.cit.*

2 Becker B E, Huselid M A (1998), 'High Performance Work Systems and Performance: a Synthesis of Research and Managerial Implications Research' *Personnel and Human Resources Journal,* 16, (1), pp.53-101

3 Pfeffer J (1994), *Competitive Advantage through People,* Harvard University Press; Huselid M A (1995), 'The Impact of Human Resource Management Practices on Turnover, Productivity and Corporate Financial Performance' *Academy of Management Journal* 44:1; Huselid M A, and Becker B E (1996), 'Methodological Issues in Cross-sectional and Panel Estimates of the Human Resource-Firm Performance Link'. *Industrial Relations*, 35

4 Wood S, de Menezes L, Lasaosa A (2001), 'Quality Time', *Centrepiece*, Spring

management raised the rate of productivity growth. Patterson *et al.*[1] (1998) found that nearly a fifth of variations in productivity and profitability were associated with differences in HR practices. Guest[2] also identified a link between high commitment practices and financial performance although a later study using WERS data, (Guest, Michie, Conway and Sheehan, 2003[3]) failed to find a link with profitability once the previous year's profit was controlled for. However, the consensus from these studies was that high performance HR systems had economic benefits for firms' financial performance.

High Performance Working can be considered as an emerging organisational model[4] and there is still a lively debate in the literature between competing perspectives of how it operates in practice. One of these is the differences between a contingent or universalist model of HRM (see Guest *et al.* 2004[5]). A universalist perspective argues that there are a number of HR practices which if adopted will always result in superior performance, whatever the context (*ie* some have concluded that it is the intensity with which HR practices are adopted that has greater effect on performance than organisational fit — Huselid and Becker 1997[6]), whereas the contingency model argues that a distinct combination will work only under specified conditions or with specific groups of staff. Complementing the contingency view are other concepts such as the resource based view of the firm (Barney 1991[7]), which argues that resources internal to the organisation are a source of competitive advantage to the extent that they are rare, inimitable and difficult to substitute. HPWP have two attributes associated with inimitability -- path dependency (developed over time rather than acquired off the shelf) and causal ambiguity (easily understood in concept but requiring subtle and numerous interrelationships which are less easy to see in practice — Collins

---

1 Patterson M, West M A, Lawthom R & Nickell S (1998), *Impact of People Management Practices on Business Performance,* London: IPD

2 Guest D (2000) *The Future of Work*, CIPD

3 Guest D, Michie J, Conway N and Sheehan M, (2003) 'Human Resource Management and Corporate Performance in the UK', *British Journal of Industrial Relations*, Vol. 41, June

4 Strategy Unit (2001), *In Demand: Adult Skills in the 21st Century – Part 1*, Cabinet Office, November

5 Guest D, Conway N, Dewe P (2004), 'Using Sequential Tree Analysis to Search for 'Bundles' of HR Practices', *Human Resources Management Journal*, 14:1

6 Becker B E, Huselid M A, Pickus P S, and Spratt M, 'HR as a Source of Shareholder Value: Research and Recommendations', *Human Resource Management Journal*, 31 (1), Spring

7 Barney J (1991), 'Firm Resources and Sustained Competitive Advantage', *Journal of Management*, Vol. 17

and Montgomery, 1995[1]). This perspective can be seen to be compatible with the concept of core competence (Hamal and Prahaled, 1994[2]) *ie* what are the unique abilities that differentiate an organisation from its competitors.

There is some evidence in support of the contingency views *ie* that it is not practices *per se* that make the difference but the degree to which they align with each other to create meaningful 'bundles' of practice (*eg* Huselid, Jackson and Schuler, 1997[3]). A recent study of HPWP in the Netherlands (Den Hartog and Verburg, 2004[4]) found a bundle of practices labelled 'employee skill and direction', were positively related to perceptions of employees' willingness to go beyond contract, negatively to employee absence, and positively to the perceived economic performance of the firm.

Reviews of such 'bundles' of practices have sought to find which practices are most often included. It has been argued[5] that practices relating to employee development and training; participation and empowerment; information sharing; and compensation systems, are most often combined. An evolving understanding of high performance work systems suggests that they generally focus on high skill requirements, discretion at work, team working and incentives enhancing organisational commitment (Batt, 2002; Delaney and Huselid, 1996[6]) Bosworth (forthcoming[7]) refers to a meta analysis by King (1995) which considered the impact of three specific working practices: training, compensation linked to worker or firm performance, and employee involvement in

---

1 Huselid M A, Becker B E (1997), *The Impact of High Performance Work Systems, Implementation Effectiveness and Alignment with Strategy on Shareholder Wealth,* Academy of Management Meetings HR Division

2 Hamal G, Prahaled C (1994), *Competing for the Future,* Harvard Business School Press

3 Huselid M A, Jackson S E and Schuler R S (1997), 'Technical and Strategic Human Resource Management Effectiveness as Determinants of Firm Performance', *Academy of Management Journal*, 40:1

4 Den Hartog D N, Verburg RM (2004), 'High Performance Work Systems, Organisational Culture and Firm Effectiveness', *Human Resources Management Journal*, Vol. 14, No. 1

5 Bosalie and Dietz (2003), 'Commonalties and Contradictions in Research on Human Resource Management and Performance', the Academy of Management conference, Seattle, August

6 Batt R (2002), 'Managing Customer Services: Human Resource Practices, Quit Rates and Sales Growth' *Academy of Management Journal* 45: 3; Delaney J T, Huselid M A (1996), The impact of Human Resource Management Practices on Perceptions of Organisational Performance, *Academy of Management Journal* 39:4

7 Bosworth D (forthcoming), *The Determinants of Enterprise Performance*, Manchester University Press

decision making, across a number of predominately US studies. King concluded that all three practices seemed to improve labour productivity and were complementary in their effects — systems of interrelated practices had greater impact than the sum of practices adopted independently. Table 3 is reproduced from Bosworth (forthcoming). Training is sometimes not included in the practices measured and, where it is, it is often bundled with other HR practices in searching for effects and therefore it is difficult to separate out contribution.

Huselid[1] maintains a very comprehensive list of recent studies linking HRM systems with firm performance, and the table is reproduced at the end of this paper.

A recent study published by the CIPD[2] examines the ways in which HR practices may impact on performance. The authors seek to move the debate on, from whether HR practices do have an impact, to understanding how they do so. The researchers assert that for people to perform above minimal requirements they must:

- have the ability, *ie* the requisite knowledge and skills
- be motivated to work well
- be given the opportunity to deploy their skills and contribute.

HR practices act to turn these three elements into action with managers having a key role in implementing policy and practice. The importance of employee attitude to business performance is another layer of complexity in seeking to understand the skills-performance link. The body of research on engagement has shown that employee motivation is a key intervening variable in producing higher performance.[3]

Whereas some have sought to align practices into internally coherent bundles, others have looked to external alignment with business strategy. Various studies have failed to find support for the external fit argument (Huselid, 1995; Huselid and Becker 1995, 1996)[4] whilst MacDuffie (1995)[1] found some evidence of positive

---

1 Huselid M, internet page http://www.rci.rutgers.edu/~huselid

2 Purcell J, Kinnie N, Hutchinson S, Rayton B, Swart J (2003), *Understanding the People and Performance Link: Unlocking the Black Box* CIPD

3 Barber L, Hayday S, Bevan S (1999), *From People to Profits*, IES Report 355, Institute for Employment Studies; Rucci A J, Kirm S P, Quinn R T (1998), 'The Employee-Customer-Profit Chain at Sears', *Harvard Business Review,* January-February

4 Huselid M A, Becker B E (1996), 'Methodological Issues in Cross-Sectional and Panel Estimates of the Human Resource-Firm Performance Link', *Industrial Relations*, 35; Huselid M A (1995), 'The Impact of Human Resource Management Practices on Turnover, Productivity and Corporate Financial Performance', *Academy of Management Journal*, 38

results related to fit with business strategy. In a review of British aerospace companies Thompson (2000)[2] found that it was both the number of HR practices adopted and the percentage of the workforce covered, that was a differentiating factor in terms of performance. He also found that establishments with high skill densities use HPWP more widely which may be evidence of 'fit'. Those firms which were following a high skill, high HPWP route also spent a high percentage of their non-management training budget on behavioural skills training. There is evidence that high skill strategies are particularly important at times of change and risk[3] and that they are associated with a higher qualified management team.

The research on high performance work practices and systems is not without problems of interpretation. One of the difficulties with the body of research is that there has been relatively little consistency with regard to the practices measured, and therefore some confusion over what HR practices are the important ones in raising performance. There has also been debate on how practices should be combined[4] with suggestions that practices might be additive (combinations may produce additional and non overlapping benefits), or substitutable (*ie* either on or off the job training will do and there may be no additional benefits in both), synergistic (more than the sum of the parts) or negatively synergistic (where certain combinations may be worse than no practice at all). It has been suggested that the positive results associated with much of the research on individual HR practices may be due to the underlying HR systems.[5]

Even where the focus was on more systematic elements of HR *eg* employee involvement, the exclusion of other elements affecting performance such as training, appraisal or compensation may lead to rather narrow conclusions. It is also not always clear when an HR policy or practice becomes a system or a bundle (*eg* Bosalie and Dietz, 2003[6]). For example, training and development might

---

1 MacDuffie J P (1995), 'Human Resource Bundles and Manufacturing Performance: organisational logic and flexible production systems in the world auto industry', *Industrial and labor relations review* 48:2

2 Thompson M (2000), *The Competitiveness Challenge: The Bottom Line Benefits of Strategic Human Resources*, DTI

3 Bosworth (2004), *op.cit.*, Bosworth D L (2001) *Goals, Strategies and Targets: Empirical Evidence from the Employer's Skill Survey*. Report to the Council for Excellence in Management and Leadership, UMIST

4 Delery J E (1998), 'Issues of Fit in Strategic Human Resource Management: Implications for Research', *Human Resource Management Review* 8:3

5 Becker B E, Huselid M A (1998), *op.cit.*

6 *op.cit.*

Table 3: Summary of HPWP Literature

Author (date)	Type/ coverage	Work practice	Performance measure	Results
Bartel (1994)	All industries	Training	Net sale per employee	Productivity increased by 19% over 3 years in the firms with training
Holzer, et al. (1993)	Michigan manufacturing	Training	Scrap rate	A doubling of training resulted in a 7% decrease in the scrap rate
Bishop (1994)	Literature review	Training	Wage	Wages of trainees rose between 0 and 12%
Kruse (1993)		Profit sharing	Various	Resulted in 3-5% increase in productivity
Kaufman (1992)	Manufacturing	Gain sharing	Relative labour productivity	15% increase in productivity over 3 years
Cooke (1994)	Michigan manufacturing	Profit/gain sharing teams	Value added per employee	5-25% increase in VA in establishments with incentive pay
Levine and Tyson (1990)	Literature review	Participation in decision making	Various	Majority of studies showed that participation was positively correlated with productivity
Macy and Izumi (1993)	Meta-analysis	Various: job design, team work, training, communication,*etc.*	Various	Changes in work practices were associated with productivity improvements of up to 40%
Kelly and Emison (1995)	Metalworking and machinery	Decentralised responsibility, problem-solving teams	Machining time per unit of output	Production time decreased with worker participation
Ichniowski, et al. (1994)	Steel	Team incentives, training, communication, *etc.*	Up-time, prime yield	Changes in work practices associated with productivity gains of up to 40%
Arthur (1994)	Steel	Employee involvement, team working, others	Labour hours per ton	Lines with most progressive practices had 7% higher up-time
MacDuffie (1995)	Automobiles	System: teams, training, rotation, others	Standardised production time per vehicle	"Commitment" system had 12% higher productivity
Cutcher-Gershenfeld (1991)	Components manufacturing	System: problem solving, worker autonomy, others	Labour hours per standardised task	Non-traditional work groups had 17% higher productivity
Huselid (1995)	All industries	System: skills motivation, others	Sales per worker	System associated with 16% higher productivity
Ichniowski (1990)	Manufacturing	System: job design, training, others	Sales per worker	System associated with higher productivity
Hendricks and Singhai (1994)	All industries	Quality award recipient	Daily stock price	Quality award announcement coincided with 0.6% jump in share price
Easton and Jarrell (1994)	All industries	System: training, team work, organisational structure, others	Share price, accounting profit	Firms implementing the system had 20% higher share price after 6 years

Source: Kling (1995); from Bosworth (forthcoming)

be considered a single practice but may be expressed through management development, internal labour markets, succession planning processes, or training. These kinds of practices have also appeared as a development bundle. Some researchers have focused on related concepts such as a high involvement system Lawler *et al.*, 1995[1]) or a high commitment system (Wood and Albanese, 1995[2]).

There is also an absence of consensus over which aspects of firm performance it is that work practices are proposed to affect[3] with measures ranging from financial performance, productivity, employee commitment, absenteeism and customer satisfaction. Some studies have looked at hard data, others have focused on managerial perceptions of performance.

In the UK, studies using the WERS dataset have arrived at different conclusions regarding the penetration of the high performance model, ranging from two per cent to 26 per cent of companies (see Keep *et al.* 2002[4]). Other datasets have suggested lower results; Guest *et al.* 2000 found only one per cent of companies in the Future of Work survey use three quarters of 18 progressive practices. Thompson (2000) found generally higher results for aerospace with some 20 per cent of UK aerospace establishments using high performance HR practices to a significant degree. This would indicate that despite strong evidence of positive effects, employers are either not necessarily convinced that adoption of such processes will work for them or find the process of doing so too difficult. It is also likely that there are sectoral variations in uptake.

Despite these methodological questions and concerns, the weight of evidence and the consistency of the general direction of results — even if not the finer detail — presents a strong and persuasive case that skills embedded within other HR practices do make a difference to business performance. The critical value of the research in high performance work systems is in highlighting the importance of considering investment in skills and workforce development in the context of the broader company structure, practices and company strategy. It is important to see skills as one input, which in combination with a number of other inputs, can make a positive contribution to organisational performance.

---

1 Lawler F N, Mohrman S, Ledford G (1995), *Creating High Performance Organisations: Practices and Results of Employee Involvement and Total Quality Management in the Fortune 1,000 Companies*, San Franciso, Jossey Bass

2 Wood S, Albanesse M T (1995), 'Can We Speak of Human Resource Management on the Shop Floor?' *Journal of Management Studies*, 32:2

3 Den Hartog D N, Verburg R M (2004), *op.cit.*

4 Keep E, Mayhew K, Corney M (2002), *op.cit.*

To summarise:

- Several studies have linked IiP accreditation to improved business performance.
- The HPWP literature generally finds a positive association between HR practices and firm performance.
- The impact of training and development within measures of HR practices is not always clear.
- There are ongoing debates regarding the importance of the intensity of HR practice adoption and the need to align practices with the organisations business or product strategy.
- HR practices would appear to affect staff motivation as well as skill levels.
- Despite the evidence of beneficial effects, the uptake of such practices in the UK has been relatively low.

Other intervening factors

Our final block of literature is included because it has taken issue with the skills-performance link. This literature, on examining other factors which may affect the skills-performance link, has been highly influential in putting skills into context and questioning the orthodoxy that says increasing skills will improve business performance. The research finds common ground with some of the literature on HPWP (that has focused on the importance of contingency and places skills very much within the context of the business strategy of the organisation).

Low skill equilibrium

The phrase 'low skill equilibrium' was first coined by Finegold and Soskice (1988).[1] They argued that Britain was trapped in a low skill equilibrium *'in which the majority of enterprises staffed by poorly trained managers and workers produce low quality goods and services'*. Finegold and Soskice used the term to capture the concept of a self-reinforcing system which acts to stifle the demand for improvements in skill levels. Others have developed the concept (*eg* Keep and Mayhew 1999[2]) to argue that it is a major inhibitor of UK productivity and needs to be considered in any discussion of the UK and skills. This might explain why so few organisations adopt HPWP and why demand for skills is low in the UK. It has been suggested that the concept of an equilibrium might be better

[1] Finegold D, Soskice D (1988), 'The Failure of British Training; Analysis and Prescription', *Oxford Review of Economic Policy*, Vol. 4, No. 3

[2] Keep E, Mayhew K (1999), 'The Assessment: Knowledge, Skills and Competitiveness', *Oxford Review of Economic Policy*, Vol. 15, No. 1

rephrased as a trajectory[1] to better capture the dynamic nature of the relationship. The essence of a low or high skills trajectory is that the goals and product market strategy of the company, product quality, HRM systems, work organisation, work design, management skills and skill demands are intimately bound together and interrelated. As the work of Finegold and Soskice in 1988 has shown, and more recently Kitching and Blackburn in 2002,[2] the demand for different skills and the drivers behind new training needs are closely related to business strategy. Any attempts to upskill and move an organisation up-market will depend on firm modernisation, innovation and new technologies and products, organisational change and the re-organisation of work. This line of thinking might be seen to have its antecedents in much earlier UK work *eg* Green *et al*.[3] who have also found evidence that increases in skill requirements were more likely to be associated with technological change and the NIESR case studies with their recognition of the role of contextual factors. This evidence thus encourages a broader thinking about the route to achieving higher skills and how this approach might sit within, and be complemented by, the wider production and people management process.

Critical role of managers in organisational performance

Managers are a critically important group of staff when it comes to looking at the link between skills and performance and there is evidence that they are both part of the problem and part of the solution. One of the reasons highlighted for the performance shortfall with the UK is believed to be a function of a skills deficit amongst UK managers. Porter and Ketels (2003)[4] question that the quality of UK management is the most important determinant of economic performance but also goes on to note that UK firms are often slow to adopt modern management practices such as Total Quality Management, and even once they are implemented, they then achieve lower returns than other countries. Such a situation may be explained by a skill deficiency and by the inadequacy of management training. More detailed evidence from other studies reinforces the view that there may be qualitative shortfalls in management skills, for example some recent surveys on perceptions of management quality have found high levels of

---

1 Wilson R, Hogarth T (2003), *Tackling the Low Skills Equilibrium: A Review of Issues and some New Evidence*, November, DTI Skills Research Programme

2 Kitching and Blackburn (2002), *op.cit*.

3 Green F, Machin S, Wilkinson D (1996*), An Analysis of Workplace Training and Skill Shortages*, DfEE, Research Studies RS7

4 Porter M E, Ketels C H M (2003), *UK Competitiveness: Moving to the Next Stage*, DTI economics paper No. 3

dissatisfaction with the quality of leadership within organisations as judged by other managers.[1]

Keep and Westwood (2003)[2] use wider business arguments, for example the low business gains from business process re-engineering programmes and mergers, to argue that there is a lack of managerial skill. They also point out these failures are by no means unique to the UK.

Other studies have critically emphasised the important role played by managers in achieving productivity and performance improvements within high performance work systems. The decisions and actions managers take are undoubtedly vital to the nature of working practices in place, the organisational structure and strategies, the degree of innovation and R&D, the organisation and management of the workforce and the mix of skills demanded, and hence the overall success of the business. Studies have shown that firms with a more qualified management workforce and a dedicated programme of management development, pursue more sophisticated and higher quality market strategies and achieve greater profits. For example Bosworth, 1996 found a positive relationship between the employment of professional scientists and engineers, within the company and at board level, and business performance. Other studies have also found a link between the skill levels of senior managers and business performance. Those employing senior managers with degree level qualifications outperformed those who did not, (with greatest benefits where the manager possessed an accountancy qualification).

> *'The performance gap between the unqualified and qualified is so stark that this factor alone may go a long way to explain the poor performance of British industry when compared with American, French or German industry. The more so when we recall that until 50 years ago few British TEs (Top Executive) had academic qualifications of any kind, whereas French and German TEs have been outstandingly well qualified certainly since the 19th Century.'* (Barry, quoted in Bosworth, 1999)

This finding is also supported by Woods (1992)[3] who suggested that organisations managed by Chief Executives with a degree outperform those without, regardless of the degree discipline.

---

1 Horne M, Stedman Jones D (2001), *Leadership the Challenge for All?* The Institute of Management and Charlesworth K, Cook P, Crozier G (2003), *Leading Changing in the Public Sector: Making the Difference*, Chartered Management Institute

2 Keep E, Westwood A (2003), *Can the UK Learn to Manage?* The Work Foundation.

3 Woods W J (1992), 'Who is Running British Manufacturing?' *Industrial Management and Data Systems*, Vol. 92

Cockerill (1993)[1] tried to link management capability with organisational performance using a framework of seven competencies and found that six of the selected competencies were positively related to measures of organisation performance. Overall, the competence of a manager explained about 15 per cent of unit performance in dynamic, but not stable, environments. A growing area of interest is the crucial role of the manager in motivating staff. Rucci *et al.* (1998)[2] analysed of data from 800 stores in the Sears retail group in the US. The data covered business information, customer and employee attitudes. Causal pathway modelling was used to unpick the cause and effect relationships linking employee attitudes, customer attitudes and business results. Employee attitudes towards the job and attitudes towards the employer both emerged as key factors associated with customer attitudes and in turn with business results. The line manager emerged as a key link in this chain through a critical item *'how does the way you are treated by those who supervise you influence your overall attitude about your job?'*.

Barber *et al.* (1999)[3] conducted a similar study with nearly 100 stores of a major UK retailer. The data collected spanned 65,000 employees and 25,000 customers. Employee satisfaction and employee commitment were related to sales increases. There were also more indirect links to sales through improved staff attendance and increased customer loyalty (linked with customer service). The quality of line management as perceived by staff emerged as an important link in this value chain via its impact on employee commitment. Most recently, Purcell *et al.* (2003)[4] have used an in-depth case study approach to try and shed light on the HRM-performance link in the UK. The case studies in a retail organisation show strong association between employee attitudes, employee views on the quality of HR management applied to them, and store performance. The study also showed that the number and extent of HR practices was less important than the effectiveness of their implementation. These studies tend to support the view of managers as motivators of staff who in turn produce better business results.

In a cross national study of European managers, relationships were found between management development activity and perceived organisational performance. In particular the study emphasised the importance of strategic fit (the degree to which a strategic stance is taken by HR), organisational fit (the extent to which the organisation takes responsibility, sets criteria and takes a long term view) and perceived congruence (the fit between what

---

1 Cockerill A P (1993), *Validation Study into the High Performance Managerial Competencies*, London Business School

2 Rucci A J, Kirm S P, Quinn R T (1998), *op.cit.*

3 Barber L, Hayday S, Bevan S (1999), *op.cit.*

4 *op.cit.*

organisations promise in terms of management development and managers' first hand experience of such policies and activities). These relationships were much greater than the links between amount of development, the diversity of development practices and performance.

To summarise:

- Some have argued that the UK's poor performance on productivity may be linked to the adoption of low skill and low added-value business strategies, any attempts to upskill must be in the context of appropriate changes in product/ market strategy.
- There is evidence that managers play a key role in performance with their own skill levels influencing business strategy and business performance.

Conclusion and implications for action

There is considerable evidence of the value of skills to individuals and to organisations. This evidence is not perfect and most studies have been criticised in some way or another: for the sample being too narrow either sectorally or hierarchically; using perceptions rather than hard outcome measures; adopting too narrow a set of outcome measures; failing to collect data on other possible outcomes; for variability in research design and underlying philosophy, or perhaps most importantly, for failure to resolve the thorny question of causality.[1] But despite these concerns the evidence is striking in its weight and consistency and increasing methodological sophistication. From different theoretical perspectives, using widely different methodologies, and research in organisational and national contexts, there is a weight of evidence that acquiring skills makes positive differences to people, to organisations and to regions and countries. So overall there is a positive picture, albeit one with many questions unanswered and uncertainties remaining.

What we also see emerging is a deeper understanding of the *ways* in which skills impact, which has shifted from an initial and straightforward belief that skills improve performance on to an exploration of a more complex dynamic where skills sit alongside and are linked to other HR practices, then on to believing skills to be contextually embedded, and finally to an understanding that culture and support may attenuate or exaggerate the action of skills at work. This can be seen to be a journey from relative simplicity to a growing acknowledgement of the range of other variables that influence the picture. What is beginning to emerge is an understanding that skills and their development (through

[1] *eg* Green F (1997), *op.cit.* and Keep E, Mayhew K, Corney M (2003) *op.cit.*

education and training) affect performance but so does the way people are managed and the opportunities organisations provide to use higher levels of skills. Underlying this complexity we think there are two key dimensions:

1. the inputs to and deployments of individual capability
2. the partnership between the individual and the firm.

Inputs to and deployments of capability

Training and skills focus respectively on the growth and stock of human capital but workforce capability also depends on the degree to which this stock is deployed. The motivation and engagement of employees, their attitudes to their organisation, their manager, their colleagues, customers and their job will all affect their performance. The outcome is what Purcell *et al.* (2004) has called discretionary effort. Skills alone are not enough and neither is enthusiasm, put them both together and you have the potential for extraordinary performance.

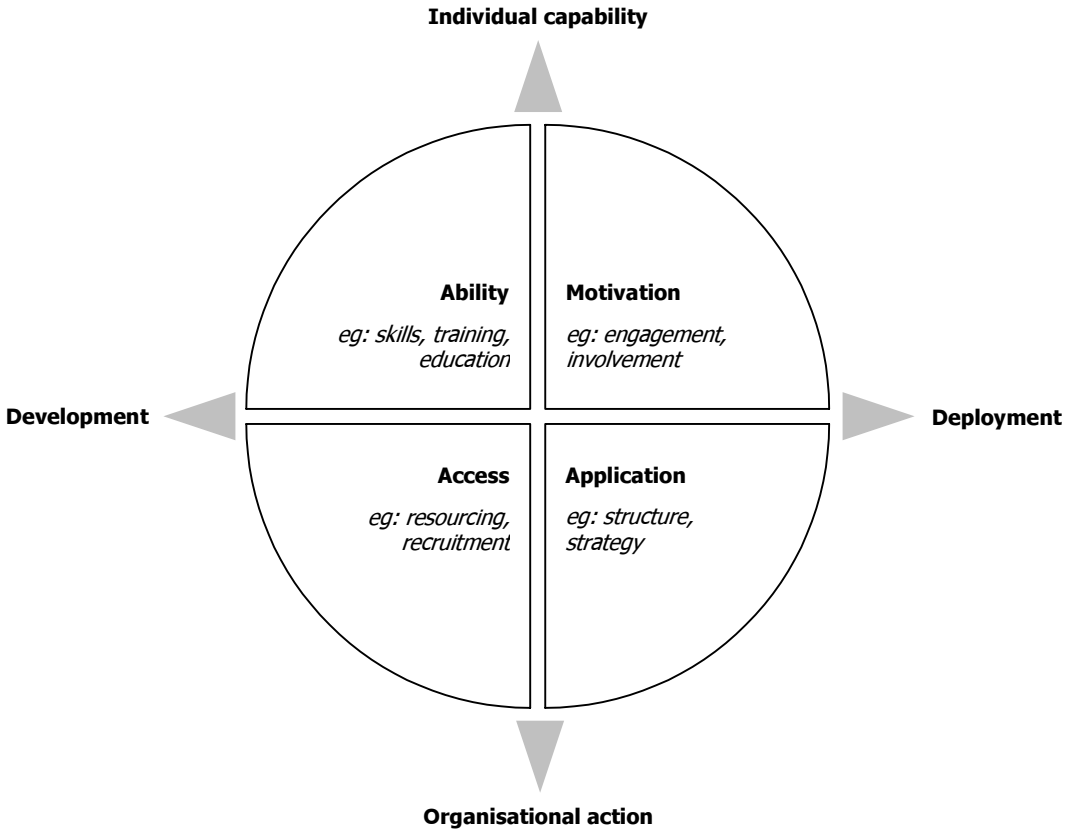
The individual/organisational partnership

The organisation is a partner in the processes by which individual capital is both developed and deployed. On the development side, organisations provide the policies and processes by which people can access the organisation and the different roles within it and thus apply their skills. Organisations only allow some people to join them and their resourcing strategy and recruitment processes act to keep many out. Access encompasses processes which allow people to participate in the first place and those which determine contribution over time. Organisational access does not just apply at recruitment but also to promotion and the opportunity to contribute at a different level.

Organisations do not only provide access, they also play a critical role in providing the context within which skills and enthusiasm are applied: how work is organised, the strategy of the organisation, the organisational structure, the utilisation of capital — in short the opportunity for skills and enthusiasm to make a difference. Skills and enthusiasm are attributes of the individual, but they can only make a difference when the organisation provides access to roles and an appropriate context within which they can be applied.

Putting these two dimensions (figure 9) together we can begin to understand better how skills fit into a broader concept of organisational capability and performance. Training and skills are the growth and stock of individual capability, their deployment is through engagement and motivation. But individuals acting alone will not create business success. The organisation also creates the environment within which individuals act and develop capability,

Figure 9: A model of capability



Source: IES, 2004

by providing access (resourcing appropriately skilled people in the first place), and in allowing them to continue to develop and contribute (through internal job markets and ongoing development). Organisations are also major players in the deployment of capability through providing the context for application. No matter how skilled or enthusiastic a workforce, if they are boxed into repetitive and constrained roles, or if the organisation is following a misguided business strategy, they will not be able to display the kind of performance that can really make a difference. Organisations therefore also provide the opportunity for skilled and enthusiastic people to apply themselves, through the jobs they design, the infrastructure they invest in and the strategies they pursue. The result is a holistic model of individual and organisational capability.

A model of business performance

High performance working practices can be seen to act on all areas of the model. HR practices create resourcing policy and practice, employee development systems and culture, engagement and reward strategies and job structures *etc.* (see Figure 10). Managers and leaders similarly are critical to success because they are the decision makers at all stages. They resource, develop and motivate people, design organisations and dictate investment and strategic direction (see Figure 11).

Figure 10: The role of HR

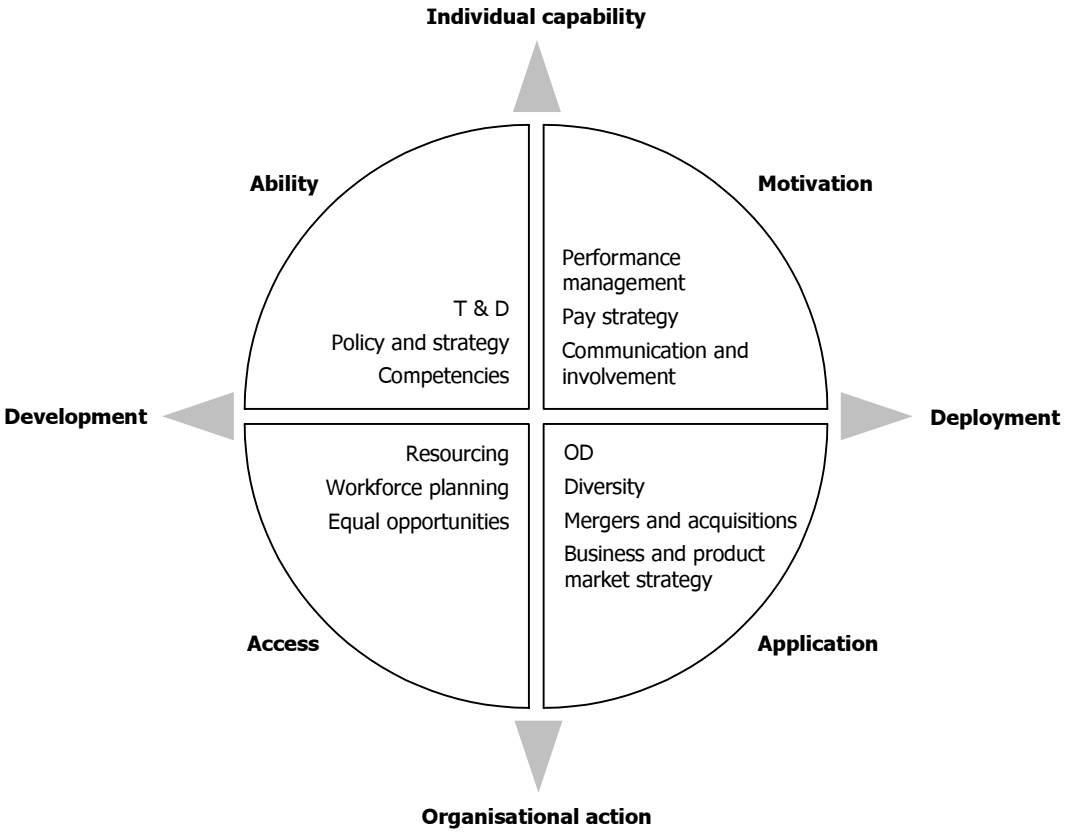
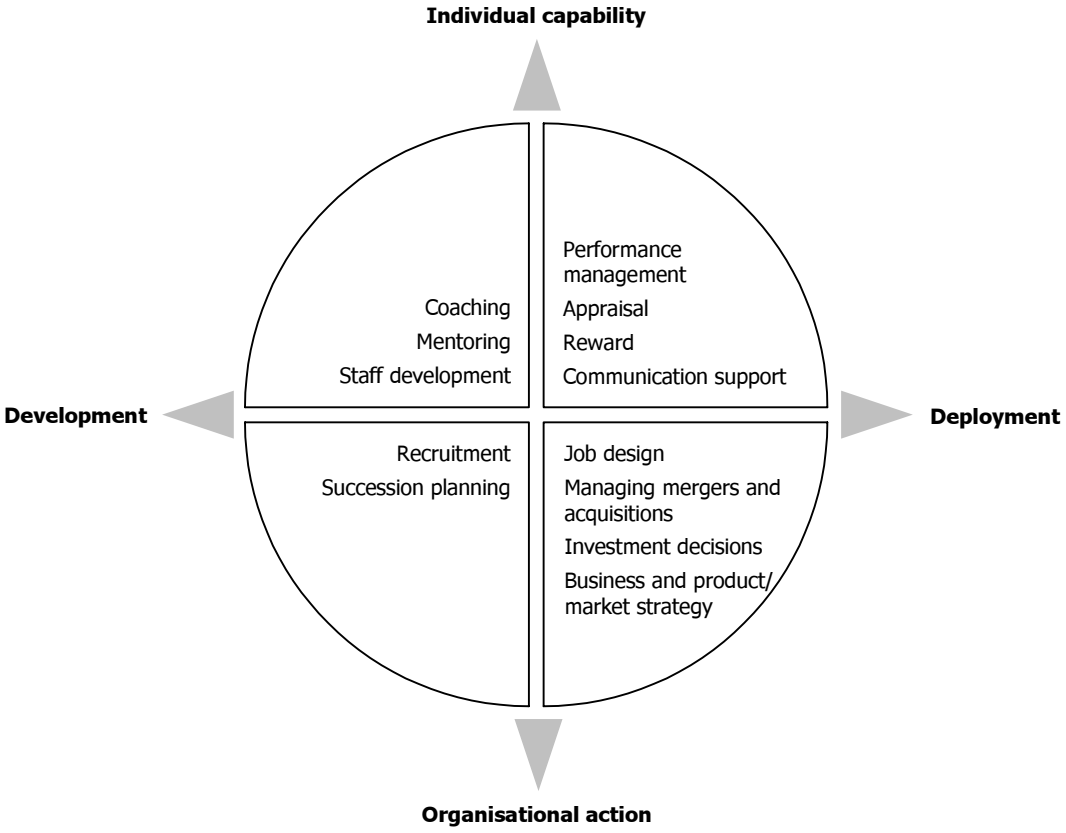


Figure 11: The role of managers



Source: IES, 2004

Implications for research and policy

The model provides a unique attempt to make sense of what we know already and provides a framework to explore what we don't know. There is considerable information about the contribution of skills and the development of people. We know too that HR practices appear to make a difference. There are also hints that motivation is a critical variable and that managers play a key part in bringing to live HR practices in order to have a positive impact on employees. Some research has suggested that context is important - some organisations do not encourage performance, don't provide jobs of sufficient size and don't pursue product market strategies that emphasise skills. The focus to date has been on the upper left portion of our capability cake, we know we do less well than we would like and we know skills are lower than our competitors — but what of the other portions and how do they relate together: How does the UK compare to our competitors across the various elements of the model? Are our people as enthused as those in other countries? What kind of jobs do we allow people to do? What strategies do we pursue? How are the various components of high performance working practices distributed across the model? What is the contribution of the various 'bundles' of practices to overall impact?

We really do not know enough about these areas and how they contribute to performance or how they might compare between the UK and elsewhere, or between organisations or sectors pursuing high value added strategies and those pursuing low cost strategies. The initial need is to discover more through both structured reviews of existing research and some further test and development of other aspects of the model.

This model also provides a coherent framework for organisations to understand the place of training and skills in business performance and the ways in which organisations support their development and deployment. It can be used to explore the human capital debate and provide a vehicle for organisations to think about how they get the most out of their employees and how managers, leaders and HR can help.

It strikes us that the most dynamic interplay within the model is the diagonal between application (*ie* business strategy) and ability (*ie* the skills and capability of the workforce). This is the dynamic which has plagued policy makers in their attempts to improve UK economic success. Is this best done by increasing the supply of skills so that organisations find themselves awash with human capital and raise their game to utilise it better, or should we rely on measures to lift business and product market strategies, increasing and encouraging competition and knowledge exchange to increase the demand for skills? In reality, most organisations find themselves locked more or less into an equilibrium, which is resistant to movement and where all the various parts of the

model are in harmony. Their focus of activity is, albeit implicitly, in balancing the circle, ensuring that each aspect of the growth and utilisation of human capital meets their needs. The overwhelming challenge is how we move to a position where demand for skills is raised and organisations seek to increase the skills and motivation of their workforces and to utilise them more demandingly. This is a shift from equilibrium to a dynamic state. It is our contention that this requires concerted action in each quadrant of the model to create a positive circular flow of activity. The static circle then has the potential of becoming a dynamic helix; a spiral of success.

Appendix A: Research Linking HRM Systems with Firm Performance

Research Linking HRM Systems with Firm Performance

No.	Study	Year	Level of Analysis	Sample	HPWS Indicator	Performance Measure	Main Effect?	Interaction	Effect Size
1	Ahmad & Schroeder	2003	Manufacturing plants	107	HRM Practices	operational performance	Weak	NA	NA
2	Allen, Shore & Griffeth	2003	Employee (sales and insurance agents)	215 sales; 197 insurance agents	Perceived organisational support (HR practices)	voluntary turnover	Yes	Yes	
3	Applebaum, Bailey, Berg & Kalleberg	2000	Plant and individual; 40 plants; 4374 workers	45-3622	HRM Systems	Quality, productivity labour costs; ee outcomes	Yes	NA	NA
4	Appleyard & Brown	2001	Semiconductor firms	23 fabs	Employment System	Productivity; defects	Mixed	NA	NA
5	Agarwala	2003	Firm (Indian)	7	HR Practices	Org commitment	Yes	Partial	NA
6	Bacon & Blyton	2001	Employees (Mfg firms)	401	Teaming	Attitude to change; job satisfaction	No	NA	NA
7	Bae & Lawler	2000	Firm (Korean)	138	HRM Strategy	Perceived performance	Yes	NA	NA
8	Ballou, Godwin & Shortridge	2001	Firm (100 best to work for)	110	Quality of work life	Stock price	Yes	NA	NA
9	Banker, Field, Schroeder & Sinha	1996	Establishment	328 periods	Team program	Quality; productivity labour costs; ee outcomes	Yes	Yes	NA
10	Banker, Lee, Potter & Srinivasan	1996	Firm (one retailer)	2618 store months	Incentive pay	Sales, profitability, customer satisfaction	Yes	Weak support	NA
11	Barnard & Rodgers	2000	Firm (Singapore)	105	Internally orientated HR practises	Successful implementation of HPWS	Mixed	NA	NA
12	Barrette & Ouellette	2000							
13	Bartel	2000	Bank branches	3 branches (63-150 ee's)	HR practices; ee attitudes	Sales growth	Yes	NA	16-26% increase deposits & loans
14	Bartel, Freeman, Ichniowski & Kleiner	Find this	Find this	Find this	Find this	Find this	Find this	Find this	Find this
15	Batt	1999	1 Firm (customer service reps)	202	TQM; self managed teams	Sales	Mixed	Weak	9.3% sales/ee
16	Batt	2002	Service and sales establishment	270	HR practices	Sales growth; turnover	Yes	Partial	46% lower turnover; 16.3% sales growth
17	Batt, Colvin & Keefe	2002	Telecommunications firms	302	HR practices (emp voice)	Quit rate	Yes	NA	NA
18	Bayo-Moriones & Huerta-Arribas	2002	Manufacturing plants	719	HR practices	Incentives	Yes	NA	NA

No.	Study	Year	Level of Analysis	Sample	HPWS Indicator	Performance Measure	Main Effect?	Interaction	Effect Size
19	Becker & Huselid	1996	Firm	Check	HRM systems	Profitability; stock value	Yes	Check	Find out
20	Becker & Huselid	1998	Firm	548-699	HRM systems	Profitability; stock value	Yes	Yes	$63k mkt value; $4752 GRATE
21	Becker & Huselid	1999	Find this	Find this	Find this	Find this	Find this	Find this	Find this
22	Berg, Applebaum & Bailey	1996	Firm (apparel)	117-131 ee's (2 firms)	HR Policies	Work team quality	Yes	NA	NA
23	Berman, Wicks, Kotha & Jones	1999	Fortune 100 firms	81	Stakeholder relations	ROA	Mixed	Yes	NA
24	Bjorkman & Xiucheng	2002	Firm (manufacturing) Chinese/Western joint ventures & subsidiaries	62	HRM systems	Subjective assessment foreign parent's satisfaction w/performance	Yes	NA	NA
25	Black & Lynch	1997	Establishment	1621	Find this	Productivity	Yes	Mixed	If all HPWS, +20% productivity
26	Black & Lynch	2000	Private establishments	1621	HPWS	Productivity	Yes	Yes	NA
27	Black & Lynch	2001	Private establishments	1621	HR practices	Productivity (Cobb-Douglas production function)	Yes	NA	NA
28	Boslie, Paauwe & Jansen	2001	Review						
29	Boxall & Steenveld	1999	Professional service firms	6	HR strategy; HRM practices	Industry leadership	NA	NA	NA
30	Brynjolfsson & Hitt	1998	Firm	380	Org design	Information technology	Yes	Yes	NA
31	Brynjolfsson, Hitt & Yang	Find	Firm	1031	Computer capital; work practices	Stock price	Yes	Mixed	+$1 installed computer capital->$5 mkt value
32	Brynjolfsson, Hitt, Yang, Bailey & Hall	2002	Firm (large)	1216	Computer investment; work practices	Market/book	Yes	NA	+$1 computer investment=>$10 mv
33	Burton & O'Reilly	2000	High technology startups	101	HR practices; leadership values	IPO	Yes	Yes	NA
34	Cabera & Cabera	2000	Banks	4	HR practices	HR strategy	NA	NA	NA
35	Caligiuri & Stroh	1995	Multinational firms	46	HR practices	Strategy	Mixed	NA	NA
36	Cappelli & Neumark	1999	Establishment	433; 201; 660	Work practices	Efficiency (labour costs & productivity)	Weak	Yes	NA
37	Collins, Smith & Stevens	2001	High technology firms	78	HR practices; knowledge creation	Sales growth	Mixed	Mixed	NA
38	Colvin, Batt & Katz	2001	Establishment (telecom)	242	HR Practices	Manager pay	Yes	NA	NA
39	Conyon & Read	1998	Firm	139	HRM Practices	Productivity	Yes	NA	NA

No.	Study	Year	Level of Analysis	Sample	HPWS Indicator	Performance Measure	Main Effect?	Interaction	Effect Size
40	Cormier, Magnan & St-Onge	2001	Bank SBU's	95-1148	Profit sharing plans	ROA	Yes	Yes	NA
41	Coyle-Shapiro, Morrow, Richardson & Dunn	2002	Employee (engineering)	141	Perception of profit sharing	Org commitment; trust in management	Yes	NA	NA
42	D'Arcimoles	1997	Firms	61	HR policies	Firm performance	Mixed	NA	NA
43	Das, Handfield, Calantone & Shosh	2000	Manufacturing firms	290	Quality management	ROA, sales growth	Yes	Mixed	NA
44	Deery & Iverson	1999	Bank branches	460 banks; 1145 ee's	IR climate	Productivity	Yes	Yes	NA
45	Delaney	1997	Find this	Find this	Find this	Find this	Find this	Find this	Find this
46	Delaney & Huselid	1996	Firm (34 industries)	590	HR practices	Perceived performance	Yes	Weak support	NA
47	Delery & Doty	1996	Firm (banks)	101	HR practices	Profitability	Yes	Weak support	NA
48	Delery, Gupta, Shaw, Jenkins & Ganster	2000	Trucking cos	379	HR practices	Quit rate	Mixed	NA	NA
49	Dunlop & Weil	1996	Business units	42	Modular production	Lead time, profitability	Weak support	NA	
50	Eriksson	2001	Firm (Denmark)	1605	Work practices (TQM teams)	Productivity	Yes	Mixed	NA
51	Fernie & Metcalf	1995	Find this	Find this	Find this	Find this	Find this	Find this	Find this
52	Fey & Bjorkman	2000	Subsidiaries (in Russia)	101	HRM practices	Performance	Weak support	NA	NA
53	Fey, Bjorkman & Pavlovskaya	2000	Firms (Russia)	101	HRM practices	Performance (subjective)	Yes	NA	NA
54	Freeman, Kleiner & Ostroff	1997	Firm	260	Employee involvement	Productivity	Weak support	NA	NA
55	Fynes & Voss	2001	Manufacturing plants (Ireland)	200	Quality practices	Quality	Yes	NA	NA
56	Gant, Ichniowski & Shaw	Find this	Find this	Find this	Find this	Find this	Find this	Find this	Find this
57	Gardner, Moynihan & Wright	2002	Business unit	40 (one firm)	HR practices; org citizenship	Quality; profitability	Yes	NA	17% incr profitability
58	Gerhart & Milkovich	1990	BU's and firms	219 orgs; 70,684 observations	Human capital	Org performance	Yes	NA	NA
59	Gould-Williams	2003							
60	Guest, Milchie, Conway, Trenberth & McDonald	2001	Firm (mfg & service)	237	HR practices; effectiveness	Firm perf; productivity; quality	Yes	NA	NA

No.	Study	Year	Level of Analysis	Sample	HPWS Indicator	Performance Measure	Main Effect?	Interaction	Effect Size
61	Guest & Pecci	1997	Partnership organisations	54	Partnership practices	Subjective org perf.	Mixed	NA	NA
62	Guest & Pecci	2001	Members of IPS	54	Partnership practices	Productivity, employee attitudes	Yes	NA	NA
63	Guthrie	2001	Firms	164	HR practices	Productivity; ee retention	Yes	Yes	High HIWP= +$184k productivity Low HIWP= -$89k
64	Guthrie	1999	Firms (New Zealand)	164	HIWP	Retention; productivity	Yes	Yes	High HIWP= +$184k productivity Low HIWP= -$89k
65	Guthrie, Spell & Nyamori	2002	Firms (New Zealand)	137-165	HIWP	Performance	Yes	Yes	NA
66	Harel & Tzafrir	1999	Firm (Israel)	76	Indiv. HR practices	Org perf. Perception; market performance	Weak Tmg only	NA	NA
67	Harel, Tzafir & Baruch	2003	Firm (Israel)	102	HR practices and fairness in promotion	Org effectiveness	Partial	Yes	NA
68	Harris & Ogbonna	2001	Firms (UK)	342	SHRM (mkt orientation as mediator)	Subjective performance (sales, growth, market share)	Yes	NA	NA
69	Hitt, Bierman, Shimizu & Kochhar	2001	Law firms	93 (252 observations)	Human capital	Firm performance	Mixed	Weak	NA
70	Hoque	1999	Hotels	209	High commitment practice	Commitment; job satisfaction; productivity; quality; perf	Yes	NA	NA
71	Huang	2000	Firms (Taiwan)	315	HRM practices	Subjective firm performance	Yes	Mixed	NA
72	Huang	2001	Firms (Taiwan)	315	HRM practices	Subjective firm performance	Yes	Mixed	NA
73	Hunter & Hitt	Unpub	Retail banks and branches	35 branches (101 banks)	Flexibility, commitment	Productivity; sales	Yes	Yes	********
74	Hunter & Lafkas	2003	Bank branches	303	Work practices	Wages	Yes	Weak	NA
75	Huselid	1995	Firm	816	HRM systems	Turnover, stock value, profitability	Yes	Weak support	7% TO;$27k sales; $19k mv; $4k profits
76	Huselid & Becker	1995	Firm	628	HRM systems	Market value	Yes	NA	$38k - $73k market value
77	Huselid & Becker	1996	Firm	218	HRM strategy	Profitability, stock value	Yes	NA	+1sd HPWS=+q14% & GRATE + 13-28%
78	Huselid & Becker	1997	Firm	548	HRM systems	Profitability, stock value	Yes	NA	+1sd HPWS=$41000
79	Huselid, Jackson & Schuler	1997	Firms	293	HRM effectiveness	Firm performance, productivity	Mixed	NA	Sales $44k; MV: $9k; cash flow $9673

No.	Study	Year	Level of Analysis	Sample	HPWS Indicator	Performance Measure	Main Effect?	Interaction	Effect Size
80	Ichniowski	1990	Business unit	176	HRM systems	Productivity, firm value	Yes	NA	NA
81	Ichniowski & Shaw	1999	41 steel productions	2594 monthly periods	HRM systems	Quality, productivity	Yes	NA	NA
82	Ichniowski, Shaw & Prennushi	1997	36 steel production lines	2190 line periods	HRM systems	Quality, productivity	Yes	Yes	NA
83	Ittner & Larcher	1999	Individual (customers of telecommunications co)	2491	Customer satisfaction	Financial performance	Mixed	NA	NA
84	Jayaram, Droge & Vickery	1999	First tier suppliers	57	HRM practices	Subjective mfg. Performance	Yes	NA	NA
85	Katz, Kochan & Gobeille	1983	Automotive plants	18 (176 observations)	IR systems	Quality & efficiency	Mixed	NA	NA
86	Kelly	1996	Establishment (mfg plants)	301-1301	Group participation	Hours per unit of output	Yes	NA	NA
87	Khatri	1999							
88	Khatri	2000	Firm (Singapore)	194	HR practices	Performance	Modest	Yes	NA
89	Koch & McGrath	1996	Business unit	318-319	HRM sophistication	Productivity	Yes	Yes	NA
90	Konrad & Mangel	2000	Firm	658 (195 public)	Work life programs	Productivity	Weak	Weak	NA
91	Koys	2001	Restaurant chain	28	EE attitudes & behaviours	Profitability	No	NA	NA
92	Lahteenmaki, Storey & Vanhala	1998	Firm (Finland)	428	HR policies; HR bundles	Subjective performance	Weak	Weak	NA
93	Lam & White	1998							
94	Laursen	2001	Firm (Danish)	726	HRM practices	Innovation	Yes	NA	NA
95	Laursen & Foss	2003	Firm (Danish)	1884	HRM practices	Innovation performance	Yes	NA	NA
96	Lee & Chess	1996	Mfg firms (Korean)	48	High involvement mgt	Firm performance	No	No	NA
97	Lee & Miller	1999	Firm (Korean manufacturing)	138	Org commitment	Financial performance	Yes	Yes	NA
98	Lepak & Snell	2002	Firm	148	Employment modes	HR configurations	Yes	NA	NA
99	Lepak, Takeouchi & Snell	In press	Firm	148	Employment modes/flexibility	Firm performance	Yes	NA	NA
100	Lewin	2002	Firm; BU; plant; field office	249-457	HIWP	Performance	Mixed	NA	NA
101	Li	2003	MNEs (China)	296	Higher pay, long term employment policy	Turnover, productivity, profitability (ROA, sales/ee)	Mixed		

No.	Study	Year	Level of Analysis	Sample	HPWS Indicator	Performance Measure	Main Effect?	Interaction	Effect Size
102	Lieberman, Lau & Williams	1990	Motor vehicle manufacturers	6	Labour utilisation	Productivity	Yes	NA	NA
103	Liouville & Bayad	1998	Find this	Find this	Find this	Find this	Find this	Find this	Find this
104	Lowe, Delbridge & Oliver	1997	Plant	71	HR practices	Productivity	Mixed	NA	NA
105	MacDuffie	1995	Establishment (auto assembly)	57	HRM policies	Production	Yes	Yes	
106	Martell & Carroll	1995	Business units	115	Executive HRM practices	Performance	Mixed	NA	NA
107	Martell,, K., Gupta, A. & Carroll	1996							
108	McNabb & Whiffield	1997	Establishment	587	Flexibility, teamwork	Financial performance	Yes	Mixed	NA
109	McNabb & Whiffield	2001	Establishment	688-703	HR practices	Subjective financial performance	Yes	Yes	NA
110	Mendelson	2000	ROVA	63	Organisational IQ	ROS, ROVA, Growth	Yes	NA	NA
111	Meyer & Smith	2000	Individual	281	HRM practices	Employee commitment	Mixed	NA	NA
112	Michie & Sheehan	1998	Firm	487	HRM practices	Innovative activities: R&D, new technology	Yes	NA	NA
113	Michie & Sheehan-Quinn	2001							
114	Michie & Sheehan	2003	Manufacturing and service sector firms (UK)	361	HRM practices, flexible working practices	Innovation activities	Yes	NA	NA
115	Miller & Lee	2001	Firm (Korean)	129	Org commitment	Firm performance	Weak	Yes	NA
116	Montemayor	1996	Find this	Find this	Find this	Find this	Find this	Find this	Find this
117	Moriones & deCerio	Unpub	Factory (Spanish)	965	HRM practices	Efficiency, quality, time	Mixed	NA	NA
118	Morishima	1998	Firm (Japanese)	1054	HRM practices	Performance	Yes	NA	NA
119	Patterson, Wall & West	Find this	Firm (manufacturing)	80	Integrated manufacturing	Productivity, performance	Yes	NA	NA
120	Patterson & West	Find this	Firm (manufacturing)	42 firms (3977 ee's)	Employee attitudes (job sat; org commit; mental health)	Productivity, performance	Yes	Yes	NA
121	Patterson, West, Lawthorne & Nickell	1997	Firm (manufacturing)	67	HR practices	Productivity, performance	Yes	Yes	NA
122	Richard & Johnson	2001	Banks	73	SHRM effectiveness	Productivity, turnover	Mixed	Mixed	NA

No.	Study	Year	Level of Analysis	Sample	HPWS Indicator	Performance Measure	Main Effect?	Interaction	Effect Size
123	Rogg, et al	2001	Small business firms	351	HR practices	Customer satisfaction	Yes	Yes	NA
124	Schuster	Find this	Canadian & Chinese firm	2 (pilot studies)	Employee centred mgt (HR index)	Operating income	Yes	NA	NA
125	Schuster, Dunning, Morden, Hagan, Baker	1997	Firm	1	Employee centred mgt (HR index)	Operating income	Yes	NA	NA
126	Sesil	1999	Mfg establishments (UK)	118	ee involvement	ROS, ROA	Yes	NA	NA
127	Shaw, Delery, Jenkins, Jr. & Gupta	1998	Firm (trucking)	141-148	HRM practices	Turnover	Yes	Yes	NA
128	Shaw, Gupa & Delery	2002	Plant; firm (trucking)	141; 379	Voluntary turnover; HRM investment	Productivity; financial perf	Yes	Yes	NA
129	Sheppeck	1998	Firm	106	HRM practices; mgt support for HRM	Org effectiveness	Yes	Mixed	NA
130	Sheppeck & Militello	2000	Theory piece						
131	Snell & Youndt	1995	Firm	102	HRM control systems	ROA, sales growth	Yes	Mixed	NA
132	Spell, C.S.	2001	Employees	139	HRM strategies	Developmental activities	Limited	NA	NA
133	Storey	2002	Middle sized companies	314	Education, trng, dev	4 economic performances	Weak	NA	NA
134	Takeuchi	2002	Employees	269	Commitment-orientated HR philosophy	Org climate; OCB	Mixed	Yes	NA
135	Teo & Waters	2002	White collar employees	109	HR practices	Stress	Yes	NA	NA
136	Tier	Find this	Review	NA	NA	NA	NA	NA	NA
137	Tregaskis	1997	Firm	531 French; 879 UK	HR practices; HRM strategy	Employee development	Yes	Yes	NA
138	Vandenberg, Richardson & Eastman	1999	Firm	49 (3579 ee's)	HR practices	Org effectiveness	Yes	NA	NA
139	Varma, Beatty, Schneier & Ulrich	1999	Firm	39	Culture, HR practices	Fin & operational perf	Yes	NA	NA
140	Voos	1987	Bargaining units	343	Profit sharing plans	Quality; productivity; labour costs	Yes	NA	NA
141	Way	2002	Firm (small business)	446	HR practices	Turnover; productivity	Mixed	NA	NA
142	Welbourne & Andrews	1996	IPO firms	82	HR "values"	Profitability, IPO price	Weak support	NA	NA
143	Welbourne & Ctr	1999	IPO firms	360	Senior HRM executives	Stock price growth	No	Mixed	NA

No.	Study	Year	Level of Analysis	Sample	HPWS Indicator	Performance Measure	Main Effect?	Interaction	Effect Size
144	West, Borrill, Dawson, Scully, Cater, Anelay	2002							
145	West & Patterson	1999	Firm	>100	HRM practices	Productivity, performance	Yes	NA	NA
146	West, Patterson & Dawson	Find this	Top management teams	42	Team processes	Productivity, performance	Yes	NA	NA
147	West, Pattersonn, Pillinger & Nickell	1999	Firm (manufacturing)	81	Training	Innovation, firm performance	Yes	NA	NA
148	Whiffield & Poole	1997	Review	NA	NA	NA	NA	NA	NA
149	Whitener	2001	Credit unions	180 (1689 ee's)	HR practices	Org commitment	Yes	Yes	NA
150	Wilkinson, Godfrey & Marchington	1997	Establishment	9	HR practices	TQM	Non- empirical	Find this	Find this
151	Wilmalasiri	1995	1 publishing co	151 employees	HRM practices	Work performance	Yes	NA	NA
152	Wood	1999	Review	NA	NA	NA	NA	NA	NA
153	Wright, McMahan, McCormick & Sherman	1998	Petrochemical factories	86	HR effectiveness	Perceived HR effectiveness; financial performance	Mixed	No	NA
154	Wright. McMahan, Snell & Gerhart	1999	Petrochemical factories	38	HR practices	Financial performance	Mixed	Yes	NA
155	Yang	1998	Firms	105	HR practices	Sales / employee	Mixed	Yes	NA
156	Youndt & Snell	1999	Find this	Find this	Find this	Find this	Find this	Find this	Find this
157	Youndt, Snell, Dean & Lepak	1996	Establishment (mfg plants)	97	HR practices	Perceived performance	Mixed	Weak support	Find this
158	Zheng	2001	Firm (medium & small)	74 (Chinese)	HRM practices	Firm performance	Mixed	Yes	NA

Source: Huselid M, internet site, http://www.rci.rutgers.edu/~huselid/

Appendix B: Bibliography

Adams J D (1999), 'The Structure of Firm R&D, the Factor Intensity of Production and Skill Bias', *The Review of Economics and Statistics,* Vol. 81, No. 3, pp. 499-510

Albaladejo M, Romijn H (2001), *Determinants of Innovation Capability in Small UK Firms*, ECIS working paper No. 00.13

Anderson M A, Robertson R, Smith S L S (2001), *Measuring Skill Intensity: Production Worker vs. Education Data in the NAFTA Countries*, US International Trade Commission, Office of Economics Working Paper, No. 2001-07-B

Barber L, Hayday S, Bevan S (1999), *From People to Profits*. IES Report 355 Institute for Employment Studies

Barney J (1991), 'Firm Resources and Sustained Competitive Advantage', *Journal of Management* Vol. 17

Barrett A, O'Connell P J (1998), *Does Training Generally Work; the Returns to In-Company Training*, Centre for Economic Policy Research (CEPR) Paper No. 1879

Barron J M, Black D A, Loewenstein M A (1989), 'Job Matching and on the Job Training', *Journal of Labor Economics*, 7, 1

Bartel A P (1995), 'Training, Wage Growth and Job Performance: Evidence from a Company Database', *Journal of Labor Economics*, 13, 3

Batt R (2002), 'Managing Customer Services: human resource practices, quit rates and sales growth,' *Academy of Management Journal*, 45, 3

Becker B E, Huselid M A (1998), 'High Performance Work Systems and Performance: A Synthesis of Research and Managerial Implications Research', *Personnel and Human Resources Journal,* Vol. 16, (1), pp. 53-101

Becker B E, Huselid M A, Pickus P S, Spratt M (1997), 'HR as a Source of Shareholder Value: Research and Recommendations', *Human Resource Management Journal*, Vol. 31 (1), Spring

Bishop J (1994), *The Incidence of and Pay-off to Employer Training: A Review of the Literature with Recommendations for Policy*, Cornell

Black S, Lynch L (1996), 'Human Capital Investments and Productivity', *American Economic Review*, Vol. 86, No. 2

Bloom N, Conway N, Mole K, Moslein K, Neely A, Frost C (2004), *Solving the Skills Gap*, summary report from a CIHE/AIM Management Research Forum

Blundell R, Dearden L, Meghir C, Sianesi B (1999), 'Human Capital Investment: the returns from education and training to the individual, the firm and the economy', *Fiscal Studies,* Vol. 20, No. 1

Blundell, Dearden, Meghir (1996), *The Determinants and Effects of Work-Related Training in Britain*, Institute for Fiscal Studies

Booth A (1991), 'Job Related Training; Who Receives it and What is it Worth?', *Oxford Bulletin of Economics and Statistics*, Vol. 53, 3

Bosworth D L (2001), *Goals, Strategies and Targets: Empirical Evidence from the Employer's Skill Survey,* Report to the council for Excellence in Management and Leadership, UMIST

Bosworth D L (forthcoming), *The Determinants of Enterprise Performance,* Manchester University Press

Bosalie, Dietz (2003), 'Commonalties and Contradictions in Research on Human Resource Management and Performance,' *the Academy of Management Conference*, Seattle, August

Bynner J, McIntosh S, Vignoles A, Dearden L, Reed H, Van-Reenan J (2001), *Improving Adult Basic Skills benefits to the individual and to society*, DfEE Research Report, RR251, HMSO

Campbell M (2000), *Learning Pays and Learning Works*, NACETT, Sheffield, p. 2

Campbell M (2002), *Learn to Succeed: the Case for a Skills Revolution*, Policy Press, Bristol

Campbell M, Giles L (2003), *The Skills and Productivity Challenge: A Summary of the Evidence Base for the SSDA Strategic Plan, 2003-2006,* SSDA

Campbell M, Chapman R, Hutchinson J (2001)*, Spatial Skill Variations: their Extent and Implications*, Skills Task Force, Research Paper 14, DfEE

Charlesworth K, Cook P, Crozier G (2003), *Leading Changing in the Public Sector: Making the Difference*, Chartered Management Institute

Cockerill A P (1993), *Validation Study into the High Performance Managerial Competencies*, London Business School

Cosh A, Duncan J, Hughes A (1998), *Investment in Training and Small Firm Growth and Survival; an Empirical Analysis for the UK 1987-1996*, DfEE Research Brief No. 36

Cosh A, Hughes A, Weeks M (2000), *The Relationship between Training and Employment in SMEs*, DfEE Research Report RR245

Cosh A, Hughes A, Bullock A, Potton M (2003*), The Relationship between Training and Business Performance*, RR 454, DfES

Crafts N (2002), *Britain's Relative Economic Performance 1870-1999*, Institute of Economic Affairs Research Monograph No. 55, IEA London

Dearden L, Macintosh S, Myck M, Vignoles A (2001), *The Returns to Academic, Vocational and Basic Skills in Britain,* DfEE Research Report 192, DfEE

Dearden L, Reed H, Van Reenen J (2000), *Who Gains when Workers Train?* IFS

Delaney J T, Huselid M A (1996), 'The Impact of Human Resource Management Practices on Perceptions of Organisational Performance', *Academy of Management Journal*, Vol. 39:4

DfEE (1988), *The Learning Age and Renaissance for New Britain*, White Paper, DfEE

DfES (2003), *21st Century Skills: Realising Our Potential*, Skills White Paper, DfES

Delery J E (1998), 'Issues of Fit in Strategic Human Resource Management: Implications for Research', *Human Resource Management Review* 8:3

Den Hartog D N, Verburg R M (2004), 'High Performance Work Systems, Organisational Culture and Firm Effectiveness', *Human Resources Management Journal*, Vol. 14, No. 1

Department for Employment and Learning in Northern Ireland (2003), *The Northern Ireland Skills Monitoring Survey, 2002*, Skills Unit Research and Evaluation Branch, June

DTI (1998*), Our Competitive future: Building the Knowledge Driven Economy*

DTI (2001), *UK Competitiveness Indicators second edition*

DTI (2003), *UK Productivity and Competitiveness Indicators 2003*, DTI Economics Paper No. 6

DTI (2003), *Prosperity For All*, DTI Strategy Analysis

Engelbrecht H J (2002), 'Human Capital and International Knowledge Spillovers in TFP Growth of a Sample of Developing Countries: an Exploration of Alternative Approaches', *Applied Economics*, Vol. 34, pp. 831-841

Finegold D, Soskice D (1988), 'The Failure of British Training; Analysis and Prescription', *Oxford Review of Economic Policy*, Vol. 4, No. 3

Future Skills Wales (2003), *Generic Skills Survey*

Green F, Machin S, Wilkinson D (1996), *An Analysis of Workplace Training and Skill Shortages*, DfEE, Research Studies RS7: London

Green F, Mayhew K, Molloy E (2003), *Employer Perspectives Survey*, DfES, Nottingham

Green F (1999), *The Market Value of Generic Skills*, Paper 12, NSTF

Green F (1997), *Review of Information on Benefits of Training for Employers*, DfEE Research Report No. 7

Greenhalgh C, Stewart M (1987), 'The Effects and Determinants of Training', *Oxford Bulletin of Economics and Statistics*, 49

Griffith R, Harrison R, Haskel J, Sako M (2003), *The UK Productivity Gap and the Importance of the Service Sectors*, summary report of the AIM Management Research Forum

Guest D (2000), *The Future of Work*, CIPD

Guest D, Michie J, Conway N, Sheehan M (2003), 'Human Resource Management and Corporate Performance in the UK', *British Journal of Industrial Relations*, Vol. 41, June

Guest D, Conway N, Dewe P (2004), 'Using Sequential Tree Analysis to Search for "Bundles" of HR Practices', *Human Resources Management Journal*, 14:1

Hall B H (1995), 'The Stock Market Valuation of RD Investment during the 1990s', *American Economic Review, Papers and Proceedings*, Vol. 83, No. 2

Hambledon Group (2000), *Corporate Financial Performance Observed Before and After Investors in People Recognition*, DfEE, 222

Haskell J, Martin R (2002), *The UK Manufacturing Productivity Spread*, CeRIBA Discussion Paper

Haskel J, Hawkes D (2003), *How Much of the Productivity Spread is Explained by Skills? UK Evidence Using Matched Establishment / Workforce Survey Data*, CeRIBA discussion paper

Haskel J, Hawkes D, Pereira S (2003), *Skills and Productivity in the UK Using Matched Establishment, Worker and Workforce Data*, CeRIBA

Hillage J, Moralee J (1996), *The Return on Investors*, IES report 314, Institute for Employment Studies

Hamal G, Prahaled C (1994), *Competing for the Future,* Harvard Business School Press, Boston

HM Treasury (2001), *Productivity in the UK: Progress Towards a Productive Economy*

HM Treasury (2000), *Productivity in the UK: The Evidence and the Government's Approach.*

Hogarth T, *et al.* (2004), *National Employers' Skill Survey 2003: key findings*, LSC, Coventry

Hogarth T, Wilson R (2001), *Employer Skills Survey Synthesis report*, DfES

Horne M, Stedman Jones D (2001), *Leadership the Challenge for All?*, The Institute of Management

Huselid M, internet site, http://www.rci.rutgers.edu/~huselid/

Huselid, M A (1995), 'The Impact of Human Resource Management Practices on Turnover, Productivity, and Corporate Financial Performance', *Academy of Management Journal*, 38, 635-672

Huselid M A, Becker B E (1996), 'Methodological Issues in Cross-Sectional and Panel Estimates of the Human Resource-Firm Performance Link', *Industrial Relations*, 35

Huselid M A, Becker B E (1997), *The Impact of High Performance Work Systems, Implementation Effectiveness and Alignment with Strategy on Shareholder Wealth,* Academy of Management Meetings HR Division

Huselid M A, Jackson S E, Schuler R S, (1997), 'Technical and strategic human resource management effectiveness as determinants of firm performance', *Academy of Management Journal*, 40:1

Keep E, Mayhew K (1999), 'The Assessment: Knowledge, Skills and Competitiveness', *Oxford Review of Economic Policy*, Vol. 15, No. 1

Keep E, Westwood A (2003), *Can the UK Learn to Manage?* The Work Foundation, London

Keep E, Mayhew K, Corney M (2002), *Review on the Evidence of the Rate of Return to Employers of Investment in Training and Employer Training Measures,* SKOPE Research Paper No. 34

Kitching J, Blackburn R (2002), *The Nature of Training and Motivation to Train in Small Businesses*, DfES

Lawler F N, Mohrman S, Ledford G (1995), 'Creating High Performance Organisations: Practices and Results of Employee Involvement and Total Quality Management', *the Fortune 1,000 Companies*, San Franciso, Jossey Bass

Lynch L, Black S (1995), *Beyond the Incidence of Training, Evidence from a National Employers' Survey*, NBER working paper W 5231

Mabey C, Gooderhan P N, (2003), 'The Impact of Management Development on the Organisational Performance of European Firms', *seventh conference on HRM*

Mabey C, Thomson A (2001), *The Learning Manager: A Survey of Management Attitudes to Training and Development,* Institute of Management

MacDuffie J P (1995), 'Human Resource Bundles and Manufacturing Performance: Organisational Logic and Flexible Production Systems in the World Auto Industry', *Industrial and Labor Relations Review,* 48:2

Machin S, McIntosh L S, Vignoles A, Vitanen T (2001), *Basic Skills, Soft Skills and Labour Market Outcomes: Secondary Analysis of the National Child Development Study*, DfES 250

Mason, Wilson (2003), *Employer Skill Survey. New Analysis and Lessons Learned*, DfES Research Report, NALL1

Mason G, Wagner K (2002), *Skills, Performance and New Technologies in the British and German Automotive Components Industries*, DfES

McIntosh S (2003), *What difference does it make? Vocational Education for Low-Achieving School-Leavers*, CEE mimeo

OECD (1997), *Literacy Skills for the Knowledge Society: Further Results from the International Adult Literacy Survey*

O'Mahoney M, De Boer (2002), *Britain's Relative Productivity Performance, Updates to 1999*, NIESR Final Report to DTI

Patterson M, West M A, Lawthom R, Nickell S (1998), *Impact of People Management Practices on Business Performance*, IPD

Pfeffer J (1994), *Competitive Advantage through People*, Harvard University Press

Porter M E, Ketels C H M, (2003), *UK Competitiveness: Moving to the Next Stage*, DTI economics paper No. 3

Purcell J, Kinnie N, Hutchinson S, Rayton B, Swart J (2003) *Understanding the People and Performance Link: Unlocking the Black Box,* CIPD

Reid G C (2000), *The Development and Survival of New Small Businesses,* Centre for Research into Industry, Enterprise, Finance and the Firm, St Andrews University

Rucci A J, Kirm S P, Quinn R T (1998), 'The Employee-Customer-Profit Chain at Sears', *Harvard Business Review,* January-February 1998

Scottish Enterprise (2003), *Skills in Scotland (2003): key results of the Employers Skill Survey*, Future Skills Scotland, Scottish Enterprise

Small Firms Enterprise Development Initiative (2002), *Small Firms Skills Assessment*, SFEDI

Sianesi B (2003), *Returns to Education*, CEE mimeo

Sianesi B, Van Reenan J (2002), *The Returns to Education: A Review of the Empirical Macroeconomic Literature*, IFS, WP02/05

Spilsbury D (2003), *Learning and Training at Work*, DfES

Steedman H, Mason G, Wagner K (1991), *Intermediate Skills in Workplace; Deployment, Standards and Supply in Britain, France and Germany,* National Institute Economic Research No. 136

Steedman H (1999), *Report to the Department for Education and Employment: Updating of the Skills Audit 1998,* Centre for Economic Performance, LSE

Strategy Unit (2001), *In Demand: Adult skills in the 21st Century – Part 1*, Cabinet Office, November 2001

Tamkin P, Hillage J, Cummings J, Bates P, Barber L, Tackey N, (2000), *Doing Business Better: the Long Term Impact of Investors in People*, FOCUS central London

Taylor R (2003), *Skills and Innovation in Modern Workplaces*, ESRC Future of Work programme seminar series

Thompson M (2000), *The Competitiveness Challenge: The Bottom Line Benefits of Strategic Human Resources*, DTI

Thomson A, Storey J, Mabey C, Gray C, Farmer E, Thomson R (1997), *A Portrait of Management Development*, OU business school

Wilson R, Hogarth T (2003), *Tackling the Low Skills Equilibrium: a Review of Issues and some New Evidence*, November DTI skills Research Programme

Wood S, Albanesse M T (1995), 'Can We Speak of Human Resource Management on the Shop Floor', *Journal of Management Studies*, 32:2

Woods W J (1992), 'Who is Running British Manufacturing?', *Industrial Management and Data Systems*, Vol. 92

Wood S, de Menezes L, Lasaosa A (2001), *'Quality Time'*, *Centrepiece,* Spring