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**REVIEW OF THE EVIDENCE ON THE RATE OF RETURN TO
EMPLOYERS OF INVESTMENT IN TRAINING AND EMPLOYER
TRAINING MEASURES**

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By Ewart Keep, Ken Mayhew, SKOPE and Mark Corney MC Consulting

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Editor's Foreword

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Orders for publications should be addressed to the SKOPE Secretary, SKOPE,
Warwick Business School, University of Warwick, Coventry CV4 7AL.

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Review of the Evidence on the Rate of Return to Employers of Investment in Training and Employer Training Measures

EXECUTIVE SUMMARY

Overview

This report was commissioned to review the existing evidence on the returns to employer investment in training. What follows provides probably the most detailed and comprehensive, and certainly the most up to date, overview of the research base in this area.

From a policy maker's perspective, this research could serve two functions. First, it might be used to justify state expenditure (or other forms of intervention) to rectify identified market failures. Second, it might be used to try and convince employers of the benefits of increasing their investment in skills.

This review finds that the evidence base, at least as it relates to the UK, is generally patchy and in some cases either thin or wholly non-existent. In terms of its ability to fulfil either of the two functions identified above, it is of, at best, limited utility.

Methodological Issues

The report provides a clear overview of the methodological issues that confront this body of research. The main ones identified were:

- The bulk of extant research focuses on returns to the individual and/or society. There are difficulties with arriving at a social rate of return from individual investments.
- It is difficult to move from individual returns to employer returns and the main means by which this has been tried (by using wages as a proxy for the employer's gain) is fraught with difficulties.
- As a variable, training is potentially endogenous.
- Rate of return analysis provides a backward looking picture. It tells us what an investment earned in the past, not what it may earn in the future.
- There are major problems with measuring both the inputs and outputs.

General Measurement Issues

- Many of the proxies used to measure learning and skills (such as wages, formal qualifications, occupations, and years of schooling) create biases. They are not good at recognising informal learning or skills that are not certified.
- The meaning that employers attach to the notion of skill has broadened and changed in recent years, and these changes are not being captured by many of the data sets upon which researchers rely.
- Training performs a multiplicity of functions, only some of which are to do with skill formation.
- We have little data on the level of investment being made by employers in skills. Much of what we do have is out of date. Without this information rate of return analyses for employer investment are impossible.
- In much of the research the level at which paybacks to investment in training take place varies, covering nation state, region, sector, product market segment, firm or individual worker.
- The research uses measures of business performance, some of which would not be recognised as such by managers (for example, employment growth). Very few studies use financial measures such as profitability or earnings per share.
- The most popular measure of performance used in the research is productivity.
- A significant proportion of the research does not attempt to distinguish between different sources of investment, and does not specifically identify employer investment. For example, studies of the UK, Germany and the USA simply assess varying levels of higher education and apprenticeship training, without determining the scale and relative importance of investment by the state, individuals and employers.

Overview of Existing Research

- The vast bulk of the research on this topic has tried to examine the returns to investment in training as measured via productivity gains. Some has looked at sector level gains, and some at individual firms. There is research available based on both large-scale surveys and on more limited case studies. The largest body of UK research in this field has been undertaken by the National Institute of Economic and Social Research (NIESR). The overall conclusion from the majority of studies is that there is a positive relationship between increased levels of skill and productivity, but little agreement about the magnitude of the effect.
- Comparative studies of skill and productivity underline the fact that whereas the UK's relatively weak productivity performance vis-à-vis Europe can be explained (at least in part) by differences in workforce skill, skill is unlikely to be the determining factor in America's productivity leadership, as the US workforce is no more highly skilled than our own.

- Within the UK literature, only two studies were found that tried to link training levels and company profitability. One found a positive relationship between IIP status and company profits. The other found no clear relationship between training levels and SME profits.
- A number of the more detailed UK general investigations into the impact of skills on company level performance (broadly defined and going beyond simply productivity measures) found complex, weak and unclear linkages.
- No studies of employer investment in training leading to qualifications were found. It is therefore impossible to say whether the return on certified training is higher than on uncertified training, or what the return might be to employers of investing in equipping their workforce with particular types or levels of qualification.
- No studies examining the impact of targeting sections of the workforce without level 2 qualifications were found.
- Irish and US studies of the different payback to employers from general and specific training indicated no significant effects for firm-specific training, but positive effects from general training.

Problems Identified with the Existing Research

- Much of the research offers one-off, snapshot views and lacks a longitudinal element from which trends and causality might more readily be inferred.
- Some of the studies operate at sectoral level, rather than inside individual firms – the level at which investment decisions are made.
- Some of the studies have tiny samples and may be subject to bias.
- The relationship between skills, productivity and firm-level profitability is unclear.
- Overall, with the exception of the work by NIESR, much of the research is highly fragmented, small scale and piecemeal. Taken together, what is available within the UK does not yet amount to a body of evidence upon which ‘evidence-based policy’ can easily be founded, or which would necessarily convince a sceptical employer to change their investment patterns.
- Many of these problems stem from the limited quantity and quality of data that is available.
- Methodologically it is very difficult to isolate the impact of increased skill from the effects of all the other factors that are impacting on a firm (e.g. exchange rates, ownership, changing product range or product market strategy, new technology, and the wider state of the labour market).

- A significant amount of the research relies upon self-reporting by firms on their performance. This may be subject to reporting bias.

Skills and People Management Systems and Performance

The review considered the large amount of US literature and the growing body of UK research work that asserts that skills only have a significant impact on firm performance in combination with other aspects of people management. The evidence available suggests relatively strong linkages. If this is correct, then it makes limited sense to consider skill formation in the firm in isolation from the people management environment within which it takes place.

Skills and Product Market Strategies

The bulk of the literature on the returns to employers from investment in skills has relatively little to say about the impact of product market strategies within individual firms. Again, wider research evidence suggests that different product market strategies set limits on the levels of skill required in firms and on the payback that might result from investing in additional skills. Wider forms of business support may be needed to change product market strategies and thereby create the space for additional training to have a beneficial impact.

Gaps in the Evidence Base

- Studies that seek to examine the impact on firms' profitability over time.
- Detailed, up to date data on the levels of employer training spend.
- Detailed data on the type of training being provided by employers.
- Studies of training for the under-trained and under-qualified.
- Studies that look at employers use of qualifications
- Studies that examine management skills and their impact.

Issues for those Evaluating Government Interventions in Training

The practical and methodological problems referred to throughout the report suggest the need to 'triangulate' different sorts of data, and for longitudinal studies. Data collection will need to be improved in a number of areas, for example, employers' training spend. There is also a good case for trying to assess the impact of training on firms' performance within the broader context of people management systems and practices.

Review of the Evidence on the Rate of Return to Employers of Investment in Training and Employer Training Measures

“We believe ETD (education, training and development) to be at the heart of competitiveness, but if it is to move into that central position this implies a shift away from its ‘nice fluffy furry animal’ status, towards being viewed as a ‘hard nosed’ investment expected to yield clearly identifiable returns in the short to medium term”. (Amos, Spiller and Storey, 1997:v)

“It might seem, at first sight, to be a relatively simple question to ask: What is the pay-off to companies from training? But finding the answer is not an easy task. Not only does it require careful attention to the concepts which are to be measured, the information about companies needed to attempt an answer tends to be sensitive, detailed, and expensive to collect”. (Green, 1997:4)

“Low take up of existing initiatives and disparate levels of support for formal learning suggest that it is unlikely that further appeals to companies to make greater use of informal learning will have much effect.....Evidence of payback and success are needed if they are to believe the approach will work for them. This evidence exists and is supported by other research into bottom line benefits that will help convince the doubtful”. (DfEE Research Brief No 134, 1999:4)

1. INTRODUCTION

1.1. In the UK the search for evidence that ‘proves’ the business case for greater investment in skills has been a recurrent object of activity for at least a decade and a half. By many it is seen as a kind of philosopher’s stone that will transmute training performance, and a number of organisations have in the fairly recent past commissioned literature reviews on the benefits of investment in skills – the then IPD (see Lee, 1996), the DfEE/DfES, and NACETT.

1.2. That such reviews have been fashionable is not surprising. International comparisons, at different times, and focusing on different countries, skill levels and sectors, have tended to show that workforce skills in the UK appear to be lower than those found in many other developed countries (Cabinet Office/DfEE, 1996). These differences in stocks of skills in the workforce have been taken by some as the means (or one of the most important means) of explaining differences in productivity and economic growth between the UK and its rivals.

1.3. There has also been a belief on the part of policy makers and some academics that the UK’s lower levels of workforce skill must be the result of some form of market failure (for a clear overview of thinking on market failure in training, see Stevens, 1999; and Booth and Snower, 1996). For some, this failure stems from deficiencies within the skill supply system, particularly education. For others this is only a partial explanation, and they also point to a lack of good information on the benefits of investment in skills for employers. The provision of more and better information on this point, it is assumed, will improve the operation of the training market, leading

employers to increase their investment. This extra investment will improve company performance and the 'bottom line'. There is thus a need for actors within the VET system to be supplied with more and better evidence upon which to base their investment decisions.

1.4. From the policy makers' perspective, research on the payback to investment in training by employers can potentially be seen to serve to main functions. The first is that it might be used as a means of justifying state expenditure to rectify instances of market failure, and perhaps of identifying where such interventions should best be targeted. Second, it might be used to try and convince employers to invest more themselves, on the grounds that such research provided more and better information that could help overcome market failure.

1.5. The purpose of this review is to examine the evidence base in this area of research as it relates to the UK. To our knowledge, it is the largest and most up-to-date review of the research evidence available in the English-speaking world. The main focus is upon the returns to investment by employers in skills and training (as measured in a variety of ways). However, as we will see, much of the extant research does not centre on the firm. In some cases it is concerned with the returns to having a skilled workforce as measured at the level of the national economy or sector. In many instances, the researchers have not necessarily focused simply on employer investment in skills. They have simply measured skill levels in the workforce – much of it derived from education (and in some cases training) paid for in whole or in part by the state and the individual. The number of studies that try to isolate the employer investment and trace through its effects on performance at firm level is limited.

The Structure of What Follows

1.6. The rest of the report is structured as follows. We begin with an overview of the basic methodological issues involved in try to explore the return to employers' investment in skills and training; and then move on to look at what exactly is meant by skills and training, including issues such as the changing meaning of skill and the multiple functions of training as an activity. We next examine issues concerning the data on the cost of training, and the meanings being given to business performance and the 'bottom line'. There follows an overview of existing research in the field, which concentrates most attention on the UK work. The research is divided up in a number of ways. The problems, methodological and practical, with this body of research are discussed. We then focus on the degree to which the context for investments (and research into this investment) in skills is set by wider people management systems and by product market strategies. Finally, major gaps in the existing research base are identified, and some of the issues that these pose for those involved in evaluating government interventions in training are discussed.

2. AN OVERVIEW OF THE METHODOLOGICAL ISSUES

2.1. Before examining the existing research, it is useful to first review some of the methodological issues and problems that confront those seeking to probe the nature, scale and distribution of the payback from investment in skills. The vast bulk of research on rates of return to investment in training has adopted an individual perspective. Relatively little of this work relates directly to employer spending on work-based training. Most of it is concerned with estimating private or social rates of returns to qualifications obtained by individuals, regardless of where such

qualifications were obtained, though typically this would have been within the formal education system where the costs are shared by the individuals concerned and by the state.

2.2. The overwhelming bulk of this research used to be, and still is, devoted to estimating rates of return to qualifications obtained in higher education. However, today there is a minor trend to extend this procedure to lower level qualifications (sometimes vocational) and to the analysis of specific labour market interventions. It is possible, therefore, that inferences might be drawn for (say) employer spend on NVQ3 training from extant estimates of rates of return to NVQ 3 training and education more generally. For this reason, and to cover the limited number of direct estimates of employer rate of return, we discuss some of the pitfalls in rate of return analysis.

Rates of Return Analysis.

2.3. The key is to recognise that the theory behind such calculations is straightforward, but that the translation of this theory into numbers is difficult. In order to make the discussion manageable, first we will couch it in the familiar terms of returns to higher education and subsequently relate it more specifically to employer investments.

2.4. Economic theory tells us that the private gross return for any individual graduate is given by the extra lifetime earnings that he obtains over and above what she/he would have earned had he not gone to university plus whatever non-wage benefits (for example, a finer appreciation of the arts) accrue to them. The social gross return is represented by the social value of the extra output the individual produces as a consequence of having been made more productive by their university education plus social externalities. A number of things might be meant by social externalities. For example, if university makes better citizens of people, that would be included amongst the externalities. In recent years endogenous growth theories have stressed a rather different form of externality related to spill over effects that serve to make underlying growth rates higher than they would have been otherwise but where the returns do not fully accrue to the individual. For instance, their knowledge and attitudes might serve to influence the ideas or actions of others in economically beneficial way.

2.5. The problem is how we go about measuring the gross social return. The value of the extra output is not observable and it has to be proxied. Usually the proxy employed is the individual's extra earnings. In proceeding thus, two major assumptions are made. The first is that people are indeed paid according to their extra productivity. The second is that indeed it is the education that the individual has received that has made him more productive.

2.6. Let us accept the rather neo-classical approach underlying the first assumption and concentrate on the second. Labour economists have long discussed the distinction between the human capital hypothesis and the screening hypothesis. Under the human capital approach higher education directly increases the productive capabilities of the individual. Under the screening approach an individual is not made any more productive by their higher education. The fact that they obtained a place at

university and survived there signals to potential employers that they are and always have been more productive than those who have not made it to university.

2.7. There are a number of variants. The signal may be provided by the sort of university attended or by the course studied or by the quality of degree obtained. But the essential point of the advocates of the screening hypothesis remains – none of this necessarily suggests that the individual has had their productivity enhanced by attendance at university. There is a third, intermediate case. This is when the higher education does indeed enhance an individual's capabilities, but when that individual does not obtain a job, which utilises those capabilities. In either the screening or intermediate case, the estimation method we have described will produce an over-estimate of the social rate of return. The point is that even if we accept that the graduate's extra earnings reflect higher productivity, that productivity is not the consequence of the person's time at university. The screening/signalling function is worth something but not necessarily as much as the individual's extra earnings. It is worth what an alternative, equally efficient screening device would cost.

2.8. Unsurprisingly evidence does not allow us to judge with any precision the relative magnitude of these three different roles of higher education. But we know that the second and third roles are present to some extent.

2.9. Similarly the estimates of the beneficial externalities of higher education have to be educated guesses. If we think of them as of two types (the "more civilised person" externality and the "endogenous growth" externality), then clearly they exist. But it is not just a simple question of how big they might be, there is also the issue of what society might have gained in terms of similar externalities had individuals followed a different route after school. For example, is it really the case that people develop better as citizens or as cultivated individuals by going to university rather than by going into a job? In terms of endogenous growth theory, is something like the entrepreneurial spirit better cultivated in a different environment? In terms of personal development everything has an opportunity cost – even attending university.

2.10. Having calculated a social rate of return the normal procedure is to be sure that this estimate exceeds the appropriate Treasury test discount rate, in order to evaluate whether the expenditure should be undertaken. In making this comparison, account is being taken of the opportunity cost of capital. In other words, the money could be used for other purposes, which would also have a social return. The test discount rate is meant to represent the minimum return it is reasonable to expect given these other opportunities. However, in this case, it is possible that this procedure takes insufficient account of "scarce resources". Considering the whole of the education sector as one, from pre-school to post-experience, one could imagine a list, which ranks many different projects by social rate of return. Let us also imagine - and it seems reasonable to do so - that at any given time the total budget available for the education sector as a whole is fixed. One would then proceed by funding first those projects, which had the highest rates of return and move down the merit ordering until the fixed amount of cash ran out. It is perfectly possible that this would happen whilst there will still projects unfounded whose calculated return exceeded the test discount rate. Social rates of return for expenditure would therefore need to be calculated across the whole sector, that is from pre-school to post-graduate education. Leaving aside potential inadequacies of such measurements, we could expect that a whole

series of possible “projects” would be eligible according to comparison with the Treasury test discount rate. But the total amount of spending on such eligible projects would exceed the total amount available for the whole sector. It then becomes a matter of rationing different types of expenditure. Set against such criteria, it is far from clear that spending on higher education would come out as well as spending, for example, in junior schools or sub-degree post-16 education.

Lessons from Individual Studies for the Evaluation of Investment in Employer Training.

2.11. What are we to learn from this with respect to rates of return to employer investment in work-based training? Again we need to distinguish between the private and social rates of return. The costs are relatively straightforward to conceptualise. The private ones are any direct or indirect costs of training together with the difference between the value of output (net of wage and related costs) produced by the trainee and that which would have been produced had he not undergone training. The social cost would comprise in addition any state payments or subsidies. The private returns are the value of the extra output produced. The social returns would be this adjusted for any product market imperfections reflected in the price. In contrast to the returns to higher education, even the private gross returns are hard to operationalise empirically.

2.12. The value of the extra output might be proxied in several ways. The obvious one is by the extra earnings of those who receive training. Yet, even when data sets are available to calculate these, it is even harder than in the case of returns to individuals to hold constant other forces affecting these earnings. It is effectively impossible, given the limitations of data, to observe or calculate directly extra productivity of individuals. It might be done by the use of surveys which ask the individuals themselves or the employer to make judgements about this. Such evidence has some value but could not be used to give point estimates of rates of return.

2.13. Thus in evaluating estimates of the return to employer spending on training the following methodological points have to be kept in mind:

1. The key is an estimate of the value of the extra output of the individual worker(s) concerned.
2. This is almost certainly impossible to estimate directly with any confidence. Self-evaluation or employer evaluation of this is of doubtful reliability.
3. It is possible to use the higher earnings of the relevant individuals as a proxy. But great care would be needed to strip out other impacts on these earnings.
4. The care needed increases as we move from measures of individual improvement to measures of corporate improvement. For example, any correlation between some measure of corporate success like productivity or profitability is holding so many other influences constant as to make interpretations dangerous.
5. All of these difficulties apply of course to measures of the social returns to state financing of employer training. But there are additional pitfalls. Put crudely,

these involve making judgements about the benefits to society as a whole from the greater private success of individual companies. There are two broad dimensions here. The first is allowing for private gains which are not social gains, for example greater non-competitive profits. The second is allowing for externalities, which do not accrue, to the individual companies involved.

6. Finally it is essential to remember that any estimates of the employer return to training are likely to take a very narrow view of training. The requirements of quantification are likely to confine it to formal episodes and ignore informal training and development.

Endogeneity.

2.14. As Green underlines (1997:4-6), there is also a substantial risk of failing to fully recognise the potential endogeneity of training as a variable. Some firms are more likely to train than others, and these decisions may reflect characteristics of the firm that may impact on company performance, for example, product market strategy. Firms producing relatively simple, standardised goods and services sold on the basis of price may require fewer highly skilled employees or a different skill mix from other firms in the same sector who are aiming to satisfy a higher quality or higher specification segment of the market.

2.15. In passing, it should be noted that different product market strategies do not read across in any simple way to either firm survival or 'bottom line' measures such as profitability. In air travel, low cost, 'no-frills' operators such as Ryan Air and EasyJet are profitable and have survived, whereas Swissair, which consistently won awards for its high quality customer service, is defunct.

2.16. This means that dividing the sample of firms into those who train more and those who train less, runs the risk of providing a division that is non-random. It will reflect a range of firm characteristics, some of which may be relatively obvious (for example, size), and others of which (for example, management style) may not (Green, 1997:5). The problem of potential sample selection bias affects a number of the studies that will be reviewed below.

Backward Looking.

2.17. It is important to bear in mind that all rate of return analyses rely on past data. What they show is the rate of return that has occurred over a previous period on an investment. As with any other financial investment, past performance may not be a good predictor of future payback. Changes in the underlying market conditions may alter the rate of return quite markedly.

Measurement Problems.

2.18. The final main stumbling block to research in this area concerns the difficulty of specifying what it is we are seeking to measure – in terms of both inputs and outputs, and how reliable data to support measurement can be obtained. This area is reviewed in detail below.

3. WHAT DO WE MEAN BY SKILLS AND TRAINING?

Measures of Skill

3.1. As touched on above, one of the chief methodological problems faced in this area concerns measurement. Many of the measures of skills and training that are being used in the studies discussed below are less than perfect. As is so often the case, what is easily measured tends to get measured and then acts as the main indicator or proxy for skill. Put crudely, the readiness to hand of existing datasets often appears to override critical reflection on whether the data they contain are capable of telling us anything very useful about real skill levels in the individual workplace. The main measures that have tended to be utilised are:

- Years of schooling
- Wage levels (taken as a proxy for skill levels in many studies)
- Formal qualifications
- Occupations
- Courses and more formalised types of training

There are a number of weaknesses inherent in these kinds of indicators.

3.2. *Problems with Wages as a Proxy.* To begin with, the assumption that wage levels perfectly reflect the skills of workers is open to serious question. All sorts of other considerations intervene – gender, age, historical pay relativities that often prove sticky, place in the occupational hierarchy (which may not simply reflect skill), the impact of sector, and the various effects of industrial relations systems.

3.3. *Problems with Qualifications as a Proxy.* Heavy reliance on qualifications as a proxy for skill levels is also problematic. Official policy on skill formation favours the use of qualifications. As we will see, while there is evidence that the individual and society at large may benefit from acquiring certain types and levels of qualification, there is no real evidence to either support or reject the view that employers might gain from investing in training geared to the attainment to qualifications. We simply do not know whether investing in training leading to qualifications provides a better return to employers than uncertified training. The chief benefits of qualifications to employers that the PIU workforce development project could adduce were (Cabinet Office PIU, 2001:50) acting as a tool in the recruitment process, enabling assessments of skill needs, and as a way of securing Government funding and support for development activities.

3.4. *The Danger of Missing Informal Learning.* Even more importantly, the kinds of measures listed above exclude informal and on-the-job learning. Given that such informal training may make up the bulk of workplace learning (Eraut et al, 1998), this is a major problem. Qualifications and days spent on off-the-job courses are relatively easily quantified and counted; informal and uncertified learning is not.

3.5. Some studies suggest (see below) that UK employers are spending at least as much if not more than their continental European counterparts on investment in training, yet the UK workforce remains, on measures that rely upon formal qualifications held, lagging behind much of Europe on workforce skills. There are a number of possible explanations for this. One is that the figures on UK employers' spend on training are overly optimistic. Another is that the figures are accurate, but UK employers are hopelessly inefficient in getting value for money out of this level of training spend. A third, is that much of the money being invested in skills goes into the provision of more or less informal and generally uncertified learning, perhaps moreso than is the case elsewhere in Europe. As things stand, we have no real way of knowing which explanation (or combination of explanations) is correct.

The Changing and Widening Definition of Skill

3.6. Another cause for concern is that there is mounting evidence that the meaning employers' attach to skill has been shifting in the last two decades (Payne, 1999, Keep and Mayhew, 1999, Payne, 2000). Twenty years ago skill tended to be thought of in terms of theoretical knowledge, intellectual abilities (e.g. reasoning), and various forms of manual dexterity, or a combination of these elements, though even then research suggested that employers' conceptions of what made someone 'skilled' were malleable (Oliver and Turton, 1982). More recently, the notion of skill has acquired a number of additional aspects. These include generic skills or competences (such as the ability to work in teams, the ability to communicate, the ability to solve problems, etc); personal attributes (such as leadership, the ability to be easily motivated and to motivate others, politeness, a willingness to compromise, and positive attitudes towards change and authority); and appearance (what some have dubbed aesthetic labour - Warhurst and Nickson, 2001). These new ways of conceiving of skill appear to be of particular importance in the service sector, and in part the shifting meaning of skill reflects the shifting balance of employment in the UK economy.

3.7. These new facets of skill bring with them a number of consequences (see Keep, 2001). For the purposes of this paper it will suffice to note that these developments make it much harder to quantify and measure the whole range of skills that employers claim to deem important. The NSTF in its final report argued that:

We must maintain a broad definition of skill.
Employers require not only specific vocational
skills, but also softer and transferable
employability skills and the capacity for creativity,
initiative and continuing learning and development,
for the new and flexible forms of work organisation
that will be tomorrow's norm.
(NSTF, 2000a:13)

3.8. These new conceptualisations of skill, which are often important in determining which applicants obtain employment (Cullen, 2001), are simply not captured in any way by the vast bulk of the extant work on skill and organisational performance and very few of the data sets try to capture information on them. The chief exception here is the Skills Survey, which contains detailed information on a wide range of generic skills, such as IT and team working.

The Multiple Functions of Training

3.9. We also need to bear in mind that training, from a company's perspective may fulfil a wide range of functions (Barrett et al, 1998:29-30), of which adding to the stock of human capital may be just one (and not always the most important). Training can variously be seen as a form of reward or perk; a signifier of value (for example, being selected to go on an executive MBA); a means of securing workforce commitment, in part by offering an opportunity for the employer to show commitment to the worker by investing in them; as a means of socialising new members of the workforce into a company's culture and way of doing things, or re-socialising the existing workforce into new ways of doing things as part of corporate re-organisation and change. Initial training can be used as a form of extended interview or screening (for example, YTS) (Shackleton, 1992). Finally, much management training can be seen as offering an opportunity (perhaps the main opportunity) for managers in different parts of large organisations to meet, socialise and exchange ideas.

3.10. The foregoing suggest a number of difficulties with measuring the inputs – training and skill. These problems are mirrored by difficulties with determining the cost of making such an input, and with the appropriate measure for output (business performance). It is these issues that we now turn.

4. THE COST OF EMPLOYER TRAINING – A PROBLEM OF WEAK DATA

4.1. As Machin and Vignoles (2001) underline, one of the biggest weaknesses with existing research on employer-provided training and the benefits it might bring is the paucity of reliable and detailed information on the levels of investment being made by employers. What little we know about employers' training spend comes from large scale surveys, the most detailed of which are now dated, and with which there are significant methodological problems (a point returned to later). There appears to be no detailed, up-to-date information on training spend in different sectors, or which breaks down spending on particular types of training or levels of qualification (either at aggregate level, or for individual firms).

4.2. In part, this reflects the fact that many firms continue to have no training budget, and the costs (direct and indirect) that different employers attribute to training varies enormously from firm to firm. Such data as we do possess is thus, in large measure, based on estimates by employers rather than on hard figures. As Machin and Vignoles (2001:6) point out, "in order to measure the net benefit one needs information on the costs of provision...the lack of data on costs will particularly affect estimates of the net benefits of training for firms". As a consequence, the type of rate of return calculations that are generated in large volumes for investment by individuals in education and training simply do not exist for employers.

5. WHAT DO WE MEAN BY BUSINESS PERFORMANCE AND THE BOTTOM LINE?

5.1. At first sight, this may seem a simple-minded question. It is not. When policy makers talk about training and skills impacting on company performance or the bottom line they are often conflating a wide range of measures, and, in some instances, these are very different ones from those used by company managers in making managerial or investment decisions. If one of the objective of research is to prove that training pays to senior managers in order to influence their investment decisions, there may be little point in identifying measures of payoff that are of

limited or no relevance to managers or to companies' accounting and reporting systems.

Level at Which Training Investment Impacts on Performance

5.2. It is also often unclear at what level any given injection of extra amounts of human capital is meant to be producing better results. From study to study the focus varies from:

1. Nation state
2. Region
3. Sector
4. Product market segment
5. Individual organisation
6. Individual employee/worker

5.3. It should be noted that much of the research does not really focus on performance at the level of the individual enterprise. This is important because in a voluntary training system the focus for decision taking on investment normally rests at the level of the individual firm (or units therein), and decision takers at these levels may be relatively unconcerned about performance at levels that are of interest to policy makers (for example, national or regional). This problem was identified by in the first report of the National Skills Task Force, when it noted, "it would be a mistake to treat the current demands of employers and individuals as coterminous with the needs of the economy" (NSTF, 1999:33). This problem is exacerbated by the patchyness of effective sectoral foci for training activity and planning. It remains to be seen whether Sector Skills Councils will be able to rectify this weakness.

Different Measures of Payback Used in the Research on Employer Investment

5.4. Studies of the impact of employer investment in skills and learning have used a wide variety of measures of the payback that accrues (to individual firms, sectors, regions or national economies). These include:

- Productivity (which can be measured in many ways)
- Wages
- Scrap rates
- Defects/quality standards/customer complaints/customer satisfaction measures
- Machinery/plant down-time
- Employee motivation and commitment

- Absenteeism
- Value added per employee
- Profit per employee
- Turnover/sales per employee
- New products as a % of product range
- Employment growth
- Profitability

5.5. As underlined above, if the aim of policy interventions is to impact on the investment decisions being made by managers within organisations, then it seems vital to ensure that the case that 'training pays' provides data that shows an impact by training on those measures of organisational performance that are key to managers. All too often policy makers have simply assumed that the measures that interest them must also be crucial to managerial agendas. This is not always the case.

5.6. For example, while measures of relative labour productivity may have an impact in relatively labour intensive firms operating in global markets (for instance, engineering), their relevance and significance may be much more muted in areas like retailing, or personal and protective services, where the impact of direct international competition is limited and where some aspects of the 'output' or product are not easily quantifiable. This means that international comparisons showing the UK lagging behind in terms of intermediate skill levels and the effects that this is claimed to have upon relative productivity, in some sectors and industries may have limited force in changing employers' investment patterns.

5.7. The difficulties are all the greater because there is some research evidence that indicates that productivity is not simply or directly correlated with a firm's profitability. An example here is one of the NIESR international matched comparison case studies. The study in question was in banking (Mason, Keltner, and Wagner, 1999). It examined the operation of banks' lending departments business as it related to loans to SMEs in the UK, Germany and the USA. The study showed that the German banking workforce was far more highly qualified and trained than its UK or USA counterparts, and that productivity was higher. Unfortunately, the German banks, despite this record, achieved the lowest level of profitability of the three countries. Showing this study to the management of UK banks would arguably be unlikely to persuade them to increase investment in training.

5.8. It is also the case that some of the measures adopted by the various studies of the links between training and performance have chosen measures of performance that would not necessarily either be recognised as performance by many managers, or would not been seen as being particularly important. For example, employment growth (the focus of studies among SMEs by Cosh, Duncan and Hughes (1998), and Cosh, Hughes and Weeks (2000) for the DfEE) is not normally regarded as a

performance measure in managerial circles. Many businesses have as an explicit aim the concept of employment neutral growth and might actually see employing more people as a negative indicator. In large swathes of manufacturing firms have been able to maintain or expand levels of production while making very significant reductions in the size of their workforce (the chemical industry would be one example, steelmaking another). Proving that investing in training will mean that your business takes on more staff may therefore not be a headline grabbing finding among many SMEs, though proof that it boosts the chance of business survival might be.

5.9. Policy makers also need to recognise that the rationality of managers' decision making is bounded (at least in part) by the external incentive structures imposed on their organisation by the market (particularly the capital market) and the resultant internal organisational incentive structures. Where managerial rewards are determined by the achievement of specific targets, it is likely that rational managers will seek to achieve those targets or objectives, if necessary at the expense of other outcomes that are not within the golden circle of items that determine reward. Given current concerns about being seen to secure shareholder value, the main drivers of senior management reward packages in many large UK organisations appear tied to issues such as earning per share/returns on capital (usually as measured over a fairly limited time horizon). If investment in skills cannot be shown to influence these measures of performance (for example, return on capital employed, share price, or economic value added), the impact of such research on managerial behaviour and decision taking may be very limited. Indeed, the dominance of such financial measures may leave managers 'asleep behind the wheel', endlessly focusing on financial engineering and re-structuring rather than concentrating on the long-term future of the business and with limited interest in the workforce at large or what happens to it (Froud et al, 1999).

5.10. These considerations mean that much of the extant research, given the performance measures it has chosen, such as productivity, may have a smaller impact on managerial decision making than the policy community might wish. If proving that training pays is the objective, the proof has to come in the form of performance measures that are near the top of the managerial agendas of individual firms.

6. AN OVERVIEW OF EXISTING RESEARCH

6.1. What follows does not attempt to cover every single study in detail. UK research is dealt with at greater length than US studies, in part because there are far fewer of them. Research is initially grouped for the purposes of analysis around the type of outcome being explored – for example, productivity, profitability, or enhanced employment growth, but other ways of dividing up the field are then reviewed.

The Individual

6.2. As outlined above, many of the studies of links between skills and productivity have focused on the individual and used the wage gains accruing to those with higher training as proxy for increased productivity (for the UK, see for example Booth, 1991; Blanchflower and Lynch (UK and USA), 1992; and Blundell, Dearden and Meghir, 1996). All find significant effects. As Dearden, Reed and Van Reenen (2000), and Sturm (1993) underline, there are significant problems with this approach – not least the fact that in real life the employer often passes only a fraction of the gain back to the employee and uses the remainder to boost profits.

6.3. Another strand has been micro level studies of the impact of training on subjective measures of performance. One US example is Bartel (1995), which found a significant relationship between formal on-the-job training and the subjective performance ratings given through a performance appraisal system to professional employees in a large manufacturing company.

6.4. One point to bear in mind in respect of both the approaches outlined above is that there may well be individual characteristics for which the researchers may not be able to control. Class, gender and ethnicity are three well-known ones, but there are others which are much harder to detect and therefore to control for, for example ability to learn (Machin and Vignoles, 2001:5). Another is personality type. Psychologists, coming to the issue of earnings differentials from a rather different perspective from economists and human capital theorists, claim to have found evidence for the impact of personality traits on career success. For example, Seibert, Crant and Kraimer (1999) estimated that a 1-point difference on a scale of proactive personality was worth an additional \$8,677 in salary for a sample of US university employees. Plainly, determining the relative weight and interaction between personality characteristics and education and training experience is highly problematic. For example, would proactive personality types tend to seek out education and training more than others do?

Productivity Gains to the Firm and/or Sector

6.5. Research on productivity gains often looks at gains to the sector, sometimes to gains to the firm, and sometimes to both. There are a number of US studies seeking to link training to productivity gains (for example, McKinsey Global Institute, 1992; Bartel, 1994; Lynch and Black, 1995).

6.6. Probably the most useful of these is Lynch and Black's work, which uses data from the 1994 Educational Quality of the Workforce National Employers Survey. This produced a sample of 2,945 establishments and provided information on the number of workers trained in 1990 and 1993, the focus of that training (e.g. IT, team working), and the proportion of training that was informal and outside working hours. The study found that the number of workers being trained had no significant impact on either establishment turnover or productivity, but that the type of training did make a difference. The greater the proportion of training that was out off-the-job and out of hours, the more productivity was raised in manufacturing, while in the service sector training in computer/IT skills appeared to raise productivity. The other finding of note was that the average educational level of the establishment's workforce was important. An extra year of education raised manufacturing productivity by between 4.9 per cent and 8.5 per cent, and in the service sector by between 5.9 per cent and 12.7 per cent.

6.7. Green (1997:19) notes that the chief drawback of this study is that it is "unable to account for the endogeneity of training.....if those establishments that were training a lot of workers did so because, for whatever reason, productivity was low, this process of self-selectivity could account for the failure to observe any impact of training". This is important because there is some evidence (Black and Lynch, 1997) that firms are stimulated to change work practices in times of economic downturn, and that firms that have lower than average productivity were more likely to train than those

with average or above average productivity – probably in an effort to catch up (Bartel, 1991; Amos, Spiller and Storey, 1997; and Zwick, 2002).

6.8. The work by the National Institute for Economic and Social Research (NIESR) on the links between skills and productivity is probably the best known, certainly the most extensive, and also the most influential (at least in the UK). NIESR's work on productivity and skills has two main components. The first, and most well-known, focuses on a series of detailed matched plant comparisons across different countries, in some cases supplemented by survey work. The aim is to compare like with like within sectors and across countries. The second strand has centred on the use of large national data sets to undertake sectoral or national level analyses of productivity performance.

6.9. *The NIESR Case Studies and more narrowly-focused surveys.* We turn first to the case study based research. The most important or interesting studies are reviewed in detail.

6.10. The first of NIESR's comparative matched plant case studies was in engineering in Britain and Germany (see, Daly, Hitchen and Wagner, 1985). This found very large differences in the relative levels of skill of the shopfloor, supervisory and managerial workforces, and these were seen in large part to account for the much lower levels of productivity found in the British firms.

6.11. This was followed by Steedman and Wagner's 1987 examination of the kitchen furniture industry in Germany and the UK. This tried to examine the implications of labour force skill profiles in a sector where production was less technically complex than those, such as engineering, wherein comparisons were normally made. The question the research posed was whether German insistence on the formal training for nearly all members of the labour force was to the advantage of Germany in a relatively simple woodworking process to a similar degree as in the more complex processes of the metalworking industry.

6.12. The answer was yes. Steedman and Wagner showed that with the help of a thoroughly qualified workforce advanced machinery and advanced production methods were introduced, put into smooth operation and exploited. German manufacturers were operating at the upper end of the product specification and quality range and were producing high value-added products. British kitchen furniture production was in a low quality, low specification, low qualification, low wages, low productivity situation.

6.13. A broadly similar story emerges from Jarvis and Prais's (1989) research on retailing in France and the UK, and from Steedman and Wagner's examination of clothing manufacture in the UK and Germany (1989). In this latter study, the UK clothing firms had a much more lowly skilled workforce than their German counterparts (80 per cent of the German machinists had undertaken a two or three year off the job course, whereas the researchers found not a single British worker in their sample with an equivalent qualification). Product market strategies were also markedly different. In the UK firms relied upon producing long runs of standardised, low value added garments, while in Germany production was of much smaller batches

of higher value added clothes. Overall, German productivity levels were about 21 per cent higher than in Britain.

6.14. The Anglo-German studies were also extended to look at productivity differences in the service sector. The hotel trade was selected for this research, with a comparison between 14 mid-price hotels in Britain and 24 similarly-priced operations in Germany (Prais, Jarvis and Wagner, 1989). All the hotels were in the 22-90 bedroom range. As had consistently been the case in the manufacturing studies, there were substantially higher levels of human capital in the German hotels, and Germany was producing about twice as many trained staff as Britain each year. There were also significant differences in investment in physical capital and refurbishment, with Germany again higher. The effects of both human and physical capital differences, it was suggested, largely accounted for the much higher levels of productivity found in Germany (150 per cent of the norm in London hotels, and 200 per cent of British provincial hotels).

6.15. One focus of NIESR work has been the creation of supervisory staff. The first example of this is Prais and Wagner's (1988) survey-based study of the UK and Germany, which showed greater numbers qualifying in Germany, and a higher standard of qualification required there. The German training system was producing about seven times as many formally qualified as the British system.

6.16. In terms of its effects on productivity, the more intensive training received by foremen in Germany contribute to higher productivity; greater multi-supervision, lower rates of breakdown of machinery, greater automation and use of complex machine features, and tighter scheduling. Taken together, greater overall technical knowledge enabled more flexible production strategies.

6.17. This work was extended in 1991 by Steedman, Mason and Wagner's study, using a survey and case studies, which charted the causes and effects of national differences in the supply of intermediate skills (i.e. craft workers, foremen and technicians) on the organisation of production across a range of industries in France, Germany and the UK. Besides assembling data from the LFS and its overseas equivalents, the research encompassed visits to manufacturing plants, and further education colleges (and their equivalents in France and Germany).

6.18. Steedman, Mason and Wagner found that higher levels of intermediate skills aided the ability to make changes in manufacturing technology; that the quality of the supervisory workforce was important, and often (particularly in Germany) played a large part in the process of skill formation on the shopfloor; and that in the UK plants deficiencies at foreman and supervisory level meant that more highly qualified managerial staff were drawn down to the shopfloor to make these good. The research charts the relative flows of qualified foremen and technicians, finding that the UK lagged a long way behind both France and Germany.

6.19. One of the NIESR research projects (Carr, 1992) provided a longitudinal approach to the issues of skills and productivity in a single industry. This study looked at the vehicle component manufacturing sector in four countries (Britain, Germany, Japan and the USA) over a ten year period. It used case studies, with data collection via interviews with Chief Executives and other personnel down to

shopfloor level in matched vehicle components manufacturers. Performance was measured in terms of productivity comparisons by sales per employee and physical measures. UK skill levels and productivity were generally lower than in our competitors.

6.20. In an Anglo-Dutch comparison, Mason and van Ark (1992) looked at productivity and skills in the engineering and food manufacturing sectors. The sample for the research was 12 engineering plants in Britain and 9 in the Netherlands, and 10 biscuit manufacturers in Britain and 5 in the Netherlands. The main findings were that the Dutch plants had productivity levels between 15-40 per cent higher than their British counterparts. This difference could be accounted for in terms of differences in machine set-up times, in lower rates of machinery breakdowns and down time, and in the ease with which new technology could be introduced. These differences in turn appeared to rest on a Dutch workforce with a far higher proportion of craft-trained workers and higher level technicians.

6.21. Research on innovation and skill mix was provided by Mason and Wagner's (1994) case study on the role of education and training institutions in innovation performance in the chemicals and engineering industries in Britain and Germany. The data was collected via a series of semi-structured interviews with technical and personnel managers, plus direct observations of work in production and technical support departments. The study highlights several ways in which the different mix of workforce skills delivered by each country's education and training system affects relative innovative performance in the chemicals and engineering industries.

6.22. Another industry covered by the NIESR team was food manufacture, with the attention focused on the sub-sector of biscuit making in Germany, France, the Netherlands and Britain (Mason, Wagner and van Ark, 1994). The research aimed to produce findings about real - quality-adjusted - productivity levels. Visits were conducted to 29 biscuits manufacturing plants: 10 in Britain, 8 in Germany, 6 in France, and 5 in the Netherlands, taking into account plant sizes to secure adequate samples overlap for comparison.

6.23. A range of business performance measures were used, including:

- Estimated percentage change in output, employment and labour productivity in national biscuit industries, 1980-1990.
- Biscuit export and import shares, 1980-1990.
- Estimates of productivity levels in biscuit manufacturing: Tons per employee-hour.
- Distribution of quality-grades of biscuits and their relative prices in the four countries
- Quality-adjusted measures of labour productivity levels in biscuit manufacturing.

6.24. The findings were as follows. Quality-adjusted productivity levels were lower in Britain than the other countries. British manufacturers tended to favour the

production of lower quality and more standardised items. In terms of machinery and production organisation, the age of machinery showed little relation to the inter-country differences in productivity. Nor was the national origin of machinery significant. It was found that highly intensive utilisation of machinery worked best with a uniform type of production, less so when there are frequent changeover of machinery. In the British plants high levels of emergency maintenance militated against the introduction of preventive maintenance procedures.

6.25. On measures of vocational qualifications and training, the highest level of formal qualifications was found in Germany, the lowest in Britain, with the main difference arising in the more technically demanding occupational areas. The research explored the links between process skills and product quality, finding differences at the level of the production process workers (craft-trained bakers in Germany, semi-skilled workers in Britain), and production supervisors (with further technical and managerial training in Germany, few vocationally qualified in Britain). The tendency was to find multi-skilled and trained teams on the Continent, and narrowly-trained workers in Britain. Maintenance performance in Britain was poor and because of their limited skills, there was a lower level of transferability of process workers between different products and tasks in Britain.

6.26. When it came to upgrading workforce skills, there was a reliance on mainly short external courses for maintenance and other technical support staff in GB and Germany. In France, legal obligation since 1971 for companies to spend a minimum proportion of their total wage and salary bill in continuing training appeared to have resulted in multi-skilling, full adult apprenticeship and systematic technical and other types of training for key process workers.

6.27. The study's overall conclusion was that the British manufacturers' low skilled-low added value strategy provided little scope for competitiveness and future growth in real incomes. There were limited incentives for employers to devote more resources to adult training or for individuals to invest their own time and money in skills acquisition.

6.28. Having spent much time examining differences between the UK and European countries, NIESR extended their work to take in the USA. One of the most important of these pieces of research is Mason and Finegold's (1995) piece on the precision engineering sector. This was a three-way comparison between the USA (18 plants), UK (13 plants) and the Netherlands (9 plants). Where comparisons of operations were possible, the productivity ranking was clear. The Dutch plants reached around 80 per cent of the US level, while the UK plants managed around 58 per cent of the US levels.

6.29. US leadership was seen to have two dimensions. The first was skills – the US plants had access to a large supply of engineering graduates who provided technician and supervisory skills and compensated for the low levels of training and skill among the rest of the production workforce. This supply of graduates was financed not by employers, but through the state and the individual.

6.30. The second basis for the US plants' superior performance was ascribed to the much greater economies of scale that could be reaped in US markets. Where it was

possible to make direct comparisons, US batch sizes were four times larger than in the UK and Dutch plants. This meant less machine changeovers and down-time and reduced the need for workers to be capable of moving between different machines and product lines.

6.31. Mason and Finegold's (1997) study extends earlier work NIESR work on biscuit manufacture, with US case studies. The comparison suggests that the present development of US-style mass higher education system in Britain could make a positive contribution to British productivity performance.

6.32. Mason, Keltner and Wagner's (1999) study has been mentioned above in connection with the weak linkages between productivity and profitability. It is a US, UK and German comparison of productivity and service quality in commercial bank lending with a particular interest in the linkages between relative productivity performance, service quality and physical and human capitals inputs.

6.33. The research focused on matched samples of banking establishments engaged in lending to 'middle market' or 'mid-corporate' business customers: 17 offices each in the US and Germany, 16 in Britain. Data gathered through a combination of semi-structure face-to-face interviews with managers, and the managers were also asked to complete written questionnaires after the visit. The research team used national visits clustered in several different regions to capture some regional diversity. The sample-based findings were then compared against published information pertaining to commercial banking. The study adopted a production approach, based around a measurement of lending output and associated labour inputs.

- The qualitative/quantitative performance measures used were:
- The number of new business loans completed within the recent 12 months
- Total money value of such new lending
- The different sources of net income earned by each office over the same period
- The labour input associated with each phase of the client evaluation and loan decision-making process
- Detailed examination of business loan requests (rather than quick answer)
- Lending failure rates
- Speed of response to credit requests
- Quality of analysis in credit appraisal
- Productivity and financial performance, chiefly a comparison of net income per employee-hour / revenue generation and intensity of bank-customer relationships

6.34. The NIESR team discovered that pressures from high labour costs in Germany led to economy on staff number, and a highly qualified and trained workforce. This, combined with competition from public savings banks and co-operative banks, led to pressures to maintain service quality, and these factors explained the German leadership in lending productivity, which in terms of lending output per employee-hour was 23 per cent higher than in the US, and almost two thirds higher than in Britain. However, both the US and British banks were more profitable than their German counterparts. In the British sample offices the emphasis was upon a strong performance on net income per employee (profitability). This was consistent with the relatively high proportion of British lending office income derived from charges on customers and other type of non-lending activities.

6.35. *The NIESR Survey-Based Research.* Some of the early NIESR work using large-scale survey data culled from existing national data sets includes van Ark (1992). This provided a benchmark comparison of the relative level of manufacturing productivity in the US and the UK.

6.36. O' Mahoney (1999), using a consistent, long-term data series (1950-1996), examines the UK's productivity performance relative to the US, France, Germany and Japan. The data base, gathered from various national official statistics series, provides a number of broad measures:

- The indices of growth in real output
- Number of persons engaged
- Annual average hours per person engaged
- Indices of labour productivity (output per hour worked 1993=100)
- Indices of capital services (1993=100)
- Labour's share of value added
- Skill proportion of the workforce
- Relative levels of labour productivity and capital intensity (1993, UK = 100).

6.37. Labour force skills are measured by dividing the workforce into 3 qualifications categories: higher level (degree and above), intermediate vocational qualifications (more than general schooling but below degree) and a residual low-skilled category. Relative wage rates are used to weight the skill types to arrive at an overall measure of relative human capital.

6.38. The study examines labour force skill composition and productivity performance at sector level in the US, the UK and Germany. Both the US and the UK fall considerably behind Germany in respect of intermediate skills in all ten broad sectors of the aggregate economy: Agriculture, forestry and fishing / Mining and oil refining / Electricity, gas and water / Manufacturing / Construction / Transport and Communications / Distributive trades / Financial and business services / Miscellaneous personal services / Non-Market Services. The distribution of intermediate skills is compared. In Britain, intermediate skills are much more prevalent in more high technology sectors such as engineering, whereas in sectors such as textiles and clothing the use of workers with intermediate qualifications is much more limited, and far lower than in Germany.

6.39. Finally, the percentage point contribution of skills in explaining relative labour productivity levels is contrasted with the amount explained by physical capital and residual productivity. It shows the generally low contribution of skills relative to the other two components. Overall, there is a British productivity problem in all sectors compared to the US and Germany.

6.40. The latest piece of NIESR work on productivity is by O'Mahoney and de Boer (2002). It uses survey-based data from 1950 to 1999, covering the US, Germany, France and the UK. The data series gives estimates of relative levels and growth rates of labour productivity, capital intensity, skill intensity and total factor productivity. The measure of workforce skills is similar to that adopted in her earlier studies.

6.41. This shows that by 1999 the UK and the US has similar level of human capital with the greater proportion of graduate in the US compensated for by a higher proportion of the workforce with intermediate qualification in Britain. Both France and Germany lead the UK and the US in respect of human capital due to a large number of workers with intermediate skills. At present this work simply provides the data, as there is as yet no course of analysis.

6.42. Overview of the NIESR work. There is little doubt that in the UK NIESR work on skills and productivity has had a significant impact upon policy makers. In part, this reflects the longevity of the work and the consistency of the story that it tells. Unlike much of the other UK research it provides a cumulative and relatively complex narrative that goes beyond simply suggesting that there is an inter-relationship between skills and productivity levels, and seeks to probe how and why this might be the case. The matched plant comparative case study method used to do this allows issues of process and causation to be explored in greater detail. It also enables the researchers to take account of different product market strategies and issues of service quality (for example, Mason, Keltner and Wagner, 1999).

6.43. Perhaps the most interesting aspect of the work has been its extension to the USA. This has helped to qualify the view that superior skills are the main or sole factor in superior productivity. Compared to most of Europe, the USA lacks a successful enterprise-based training system (Green, 1997:32), and insofar as the USA can be viewed as having a reasonably highly-skilled workforce, this comes from individual and state investment in a mass higher education system. The NIESR studies (for example, Mason and Finegold, 1995) suggest that a major factor in the USA's better productivity performance was down to the size of its markets and the economies of scale in production that resulted.

6.44. The drawbacks to NIESR's case studies are that they are quite narrowly-focused and hard to replicate on a wider scale. It has also been argued that by closely matching the firms and plants that are being compared, this may actually help obscure national differences, such as plant size. It is also important to understand that the NIESR researchers were not particularly concerned to isolate employer investment in skill. They simply examined the stocks and flows of human capital into and within the firms they were studying. In many cases (for example, the USA and France), much of the inflow took the form of students who had been educated and/or trained in the education system at state and/or individual expense. There was little or no attempt to try and quantify employer spending.

6.45. Other Survey-Based UK Research. Besides the NIESR survey-based work by O'Mahoney, in the UK probably the most important recent example of survey-based research has been Dearden, Reed and Van Reenen (2000). This found positive linkages between training and productivity across a range of sectors, even after a range of controls were used. High training industries exhibited a range of characteristics, including being more productive, paying higher wages, having higher capital intensity, conducting more R&D, and having a more highly qualified workforce with longer job tenure. The study also found that productivity was positively related to lower labour turnover, hours worked per employee, fewer female employees, and R&D intensity. The authors conclude that, "there is a positive and significant impact of training on productivity. The exact magnitude of the effect varies somewhat in different specifications, but always remains above the estimates which treated training as exogenous" (2000:37). There was some evidence that off-the-job training had a greater effect on productivity than on-the-job training. In terms of its impact on wages, training was found to have a positive impact but the implied impact of training on wages was lower than its effect on productivity (2000:46), i.e. employers were not passing all of the benefits back to employees. The authors point out that this finding has implications for studies that use wage rates as a proxy for the impact of skills on productivity.

6.46. Unfortunately, the study has a number of limitations. To begin with, the usable data it generates only covers manufacturing. This is because the researchers found that information drawn from the ISDB, was problematic in respect of the non-manufacturing sectors, for example it indicated that in baking and financial services real value added per person declined every year between 1983 and 1996 (Dearden, Reed and Van Reenen, 2000:19).

6.47. Second, the data provides evidence of productivity gains to sectors rather than to the individual firm therein. Plainly a sectoral approach has some advantages (Dearden, Reed and Van Reenen, 2000:3-4) in that may capture inter-firm spillover effects, but aggregation may also lead to biases.

6.48. Finally, the single measure adopted for training is a fairly narrow one and potentially might offer misleading indications of employers' training activities. Dearden, Reed and Van Reenen use Labour Force Survey data on whether individuals have received training in the previous four weeks. This tells us little about training quality or focus, and, as the authors admit, might be misleading (2000:15). This is of concern because, as Felstead, Green and Mayhew (1997) found, while employers were offering a greater proportion of their employees some training, they were simultaneously reducing the average amount of training being provided to each individual, i.e. the overall level of training was not rising, the cake was simply being sliced differently.

6.49. Looked at in total, measures of productivity predominate in the research literature in the UK. However, as Green (1997:1) notes, while the bulk of studies from show a link between levels of skill and productivity, there is little agreement between many of the studies in terms of the magnitude of the effect, and the linkages to other measures of performance are weak.

Training and Profitability.

6.50. Green (1997) found no studies that looked at the relationship between training and firm profitability. The authors of this study could only locate two. One was a fairly minor addition to the literature, which looked at the impact of IIP accreditation on financial performance (Hambleton Group, 2000). See below for further details. The other was the study of a large sample of SMEs by Kitching and Blackburn (2002), which is reviewed at greater length below. It found no clear relationship between training investment and profitability.

Employment Growth and Business Survival

6.51. Two studies by researchers at Cambridge undertaken for DfEE (Cosh, Duncan and Hughes, 1998; and Cosh, Hughes and Weeks, 2000) provide useful evidence about the impact of skills investment on employment growth and business survival in UK SMEs. The earlier of the two studies, based on a sample of 1,600 SMEs, found that training appeared to have little impact on the probability of firm survival, except for businesses with between 10 and 20 employees, and that for the period 1987-1990 there was a positive relationship between employment growth and the provision of training as a whole, and management training. In the period 1990-1995 the relationship between training and growth remained positive, but not at levels that were statistically significant. The study showed a similar picture across the two periods for the relationship between training and sales growth. The authors speculate that the differences between these two periods may be attributable to the severe recession in the early 1990s. Overall, the study revealed few signs of a consistent link between training and profitability.

6.52. The second report revisits the earlier study, adding in data from 1997 (which included information on training spend). The main findings were that a strong significant effect of training on employment growth was detected among companies the researchers dubbed 'persistent trainers'. The effect of training on business growth over the period 1991-1997 was significant only for those trainers (both persistent and those who trained in 1997 but not 1991) that were using human resource practices such as TGM, quality circles, job rotation and performance pay. This issue of training's inter-relationship with the wider people management systems is returned to at greater length in a section below.

General Improvements in Business Performance

6.53. Management Development. DTZ Pinda Consulting (1998a) found that in a sample of 127 firms involved with TECs' efforts to promote more and better management development, the use of a wide range of management development activities was felt by respondents in firms to deliver a number of business performance benefits. These included improved staff morale, improvements in the quality of processes and outcomes, better management decisions, better monitoring of the firm's activities, and a greater understanding by managers of the value of HRD activity in general. However, less than a fifth of the sample felt that they could detect definite, direct and measurable financial benefits as a result of the MD they had undertaken, and less than 10 per cent could provide a monetary estimate of the impact of MD. Some firms reported the benefits as resting with increased revenue, others with cost reductions. Nine out of the eleven firms that could provide financial measures of the impact of MD held IIP status.

6.54. Winterton and Winterton's (1998) set of 16 UK case studies of competence-based MD activity found that firms reported a range of improvements in performance (improved turnover, reduced costs, shorter waiting times, greater productivity, improved quality, etc). However, as with the DTZ Pieda study, the researchers admit that firms found it hard to attribute improvements in performance unambiguously to MD as so many extraneous factors intervened.

6.55. *Investors in People.* DfES (2001) provides an excellent overview of existing research on the impact of IIP. The main studies it covers include: Hambledon Group, 2000; Hillage and Moralee, 1996; Rajan et al, 1998; and Tamkin et al, 2000. All find a range of positive benefits, but as the DfES note, although research indicates that attainment of IIP is associated with improved business performance no study has yet proved the link to be causal (DfES, 2001:1). For other perspectives on assessing the benefits of IIP, see Thorpe, (1998), and Down (1998).

6.56. The evaluations of IIP have tended to focus on a wide range of measures of business benefit. It should be noted that IIP accreditation is not necessarily expected to be dependent on or result in increased investment in training, and in about 10 per cent of cases training investment fell (Hillage and Moralee, 1996), perhaps as a result of better targeting of training spend.

6.57. A number of studies (Hillage and Moralee, 1996; Rajan et al, 1999; Tamkin et al, 1996) found that employers reported better business performance, including improved service quality, increased turnover, and higher profitability, but, as the DfES have noted, "there is a paucity of robust concrete evidence either to support or refute these perceptions" (DfES, 2001:3). The most exhaustive piece of research aiming to cover this issue (Hambledon Group 2000), examined the accounts of 16,399 employers of between 50 and 199 employees (of whom 473 had achieved IIP), and 8,242 employers of more than 200 workers (of whom 475 had achieved IIP). By comparing performance between 1994 and 1998, the researchers found that firms with IIP experienced superior performance relative to those without it in terms of growth of export performance, return on sales, growth in net worth, return on capital, return on assets, remuneration levels, increases in sales per employee, rate of increase in sales per employee, and rates of return on human capital per employee. The researchers, however, urged caution in interpreting these findings. IIP might be just one element among a number of associated changes taking place in these businesses, all of which taken together were producing the improved results.

6.58. *Employee Development Schemes.* HOST Consultancy (1998), looks at employee development schemes in general, and finds anecdotal evidence for a positive impact. The main finding of the latest general survey of the progress of EDS in England, besides the fact that their numbers appear to be in decline, was that information on the benefits to both individuals and organisations is weakly developed in most schemes, and few incorporate any meaningful evaluation of their impact (Berry-Lound, Rowe and Parsons, 2001).

6.59. *Broad-Ranging Studies of Upskilling and its Impact on Performance.* Johnson et al's (2000) report for NACETT uses case studies to examine 15 atypical firms (they were all winners of the National Training Awards). The research covers a range of sectors, company sizes and regional locations, and looked at many different

forms of training activity (formal and informal). It produces detailed anecdotal evidence of a positive association between well-planned and targeted training and organisational performance.

6.60. Next is Amos, Spiller and Storey's 1997 study of the impact of management training for the directors of 'middle market' firms and of directors' attitudes towards and provision of training for their employees. Their sample was 308 firms with turnovers ranging from £8 million to £2000 million, and employing between 50 and 800 people (the average size was 555). 47 per cent of the sample came from the service sector and 53 per cent from manufacturing. Data was gathered on firm performance, on attitudes towards the provision of education, training and development (both for the board and for the workforce at large), actual levels of ETD provision, and some information on training costs.

6.61. Their main findings were that they were able to find a weak relationship between investment in ETD and company performance across a fairly wide range of 12 outcome indicators. However, they could find no real evidence for a linkage between specific ETD measures and performance, nor that more ETD caused better performance. Overall, they comment that when it comes to performance, "what is apparent from this study is that currently the relationship between education, training and development is not blindingly apparent" (1997:v) (emphasis as in the original).

6.62. The researchers suggest that their work provides three reasons why the link between education, training and development and outcomes was so weak. First, in many businesses in the sample, ETD had only recently been introduced or boosted, and the effects might not have had time to show through. Second, ETD policy often appeared to be a bolt-on rather than central to companies' competitive strategies. Finally, very few senior managers were taking their own ETD seriously. Of all the occupational groups in the businesses surveyed, board directors undertook the fewest days of training.

6.63. Another detailed piece of research on the general inter-relationship between skills, wider company strategies and management systems, and performance comes in Kitching and Browning's (2002) recent study of a sample of more than 1,000 SMEs. This covers a broad range of different types of skills development activity (including informal training), and among other things seeks to map the levels of training provided to different groups of staff, probe employer motivation to train and the links between training and performance across a range of measures.

6.64. Only some of the more important findings can be summarised here. The main ones that are relevant to this review are that the data was inconclusive on the linkages between the provision of training and employment growth, sales growth, or profit performance. Moreover, the relationship between each of these performance outcomes and each type of training activity was found to be complex, with no simple positive association between them.

Studies of Employer Investment in General and/or Specific Skills

6.65. Barrett and O'Connell (1998) found significant effects for general but not firm-specific training on productivity in a sample of Irish firms. Black and Lynch (1996) produced similar results for the USA. The problem here is knowing what these

categories mean within individual institutional settings. As some commentators have argued (for example, Stevens, 1996), much training appears to contain elements of both general/transferable training and firm specific skills, routines and knowledge.

Studies of Employer Investment in Training Leading to Qualifications

6.66. We found no UK study that addressed the issue of whether there was a better payback to employers from certified as opposed to uncertified training, nor any research on what the return to employer investment in particular types or levels of qualification might be. No overseas studies were found in this area either. There are, as a result of the DfES's research programme, a growing number of UK studies that examine the rate of return to individuals from different levels and types of academic and vocational qualification.

Studies of Investment in Informal Learning/Employee Development

6.67. Studies identified included: HOST Consultancy, 1998; Johnson et al, 2000; and Berry-Lound, Rowe and Parsons, 2001. All provide general, anecdotal evidence of a link between skill and the bottom line.

Studies of Management Training and Development

6.68. These included DTZ Pinda Consulting (1998a), which covers most forms of MD activity; and Winterton and Winterton (1998), which is mainly concerned with competence-based management development using the MCI framework.

Studies that Look at the Effects of Training in SMEs

6.69. Westhead and Storey (1997) provide an overview of earlier research in the field. In addition, more recent studies include:
Cosh, Duncan and Hughes, 1998.
Cosh, Hughes and Weeks, 2000.
Amos, Spiller and Storey, 1997.
Kitching and Browning, 2002.

Studies that Examine the Impact of Targeting Sections of the Adult Workforce Without Level 2 Qualifications

6.70. Given the current interest in the notion of adult entitlements for those who have not yet reached level 2, it is disappointing to report that there are no studies on whether an improved level of training – whether supplied by state or employer - for relatively neglected groups of the workforce has any positive impact for their employers (as opposed to the individuals themselves). Indeed, as noted above, there are no UK studies that seek to probe whether employer investment in any form of qualification has a payback.

6.71. A report for the World Bank on training in the developing world (Tan and Batra, 1995) found no impact on productivity from providing unskilled workers with more training. As Green (1997:21) remarks, this finding might, with further verification, go “some way to support the proposition that unskilled workers tend to receive less training than skilled workers, because there is insufficient pay-off for companies”. This weak pay-off might be the result of the characteristics of the workers involved, for example they are harder to train, or it might be because the kinds of jobs they undertake offer limited opportunities for higher levels of skill to be utilised to any productive effect.

Studies of the Link Between Training and Worker Mobility/Labour Turnover

6.72. Although not in the strict sense a measure of firm performance, the potential for training to increase labour turnover (though poaching of skilled labour by companies that do not train) has often been adduced as a reason for market failure (see Stevens, 1999). Green (1997:2) summarises the evidence from studies such as Booth and Satchell, 1997; Campbell, 1993; Elias, 1994; Lynch, 1991; Dearden et al, 1996; and Wholey, 1990, as indicating that “training tends on balance to reduce labour turnover, but the effect is only small”. Interestingly, in their sample of UK SMEs, Kitching and Blackburn (2002) found that no more than 1 per cent of firms cited fear of poaching as a reason for not training.

Literature Reviews of the Links between Skills/Training and Company Performance

6.73. General literature reviews of the field include: Machin and Vignoles, 2001; Green, 1997; Sturm, 1993; Campbell, 2000; Barrett et al, 1998; and Dearden, Reed and Van Reenen, 2000.

Appendix A presents the results of some of the more important studies reviewed above in tabular form.

7. PROBLEMS WITH EXISTING RESEARCH ON THE RELATIONSHIP BETWEEN SKILLS AND ORGANISATIONAL PERFORMANCE

General Comments

7.1. In other fields of research (for example, the physical sciences or medicine) it is unlikely that many of the studies reviewed above would be seen as constituting useful evidence upon which either theory or practice could reliably be based. Many of the input measures are either very general and vague, or which rely upon a single indicator. Often the outcome measures are only proxies or substitutes for the ‘real world’ indicators of bottom line performance. Considerable reliance is placed upon impressionistic data that is not subject to any outside checks and which might be amenable to reporting biases. Many of the data sets utilised offer only one-off snapshot views rather than any longitudinal picture from which trends and causality might more readily be inferred. Sometimes data is only available at sectoral level, rather than from within firms – the unit at which the important investment decisions and consequent outcomes (or lack of them) actually take place. All too often the samples involved are tiny and may be subject to bias.

7.2. Overall, with the main exception of NIESR’s work, much of the research gives the impression of being highly fragmented, small scale and piecemeal. There appears to be little attempt to integrate earlier studies or to develop a research approach that would provide cumulative data. Taken together, what is available within the UK does not yet amount to a body of evidence upon which ‘evidence-based policy’ can easily be founded, or which would necessarily convince a sceptical employer to change their investment patterns.

7.3. In part, these weaknesses can be seen to stem from the limited amount and quality of data that is available (see below). They also reflect the way in which research has been commissioned, and the difficulties of separating out the effects of one intervention (training) from the multitude of other factors impacting on organisational

performance. With these general comments in mind, we review below some of the more specific problems and weaknesses that this review has revealed.

A Market Failure in Training Investment Evaluation?

7.4. It seems worth underlining at the outset one of the oddities of government-sponsored research (or literature reviews of this research) that searches for linkages between skills and performance. Why is such research necessary? Surely if firms are investing in skills (and the latest estimates generated for DfES suggest an annual training spend of £23.5 billion in the UK by employers – Spilsbury, 2001) they are best placed and best motivated to determine the benefits that accrue from such investment. Why do outside agencies have to spend time trying to undertake this for them, the moreso in world where policy makers often suggest that private sector management expertise is inherently superior to insights gained from other sources?

7.5. It can be argued that there are two main reasons for this apparent ‘market failure’ in training evaluation. The chief issue is the sheer technical difficulty of undertaking such evaluations (a point amplified below).

7.6. The result is that while most managers are willing to assume general benefits from training, they are reluctant to devote large resources to trying to demonstrate and quantify them (Dougherty, 1992). As a result, as many of the studies covered in this review note, business do not try to measure the impact of particular forms of training activity on business performance (DTZ Pieda Consulting, 1998a; Winterton and Winterton, 1998; Kitching and Blackburn, 2002). In a report on the more general impact of the MCI, DTZ Pieda Consulting (1998b) note:

There is no clear understanding by firms of the link between MD and bottom line business benefits. Many firms undertake MD because they believe they will obtain general improvements in their operations, rather than the achievement of specific objectives. They also believe that the benefits are difficult to quantify, and accrue over the longer term. There are very few firms that attempt to evaluate the impact of MD activity.

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7.7. Many books and articles aimed at HRM/personnel/training professionals have been written claiming to have discovered the means to tie investment in training or other aspects of HR to resultant improvements in business performance (for example, see Cooper, 2000). Despite the claims made by such studies, human resource accounting remains in its infancy, and progress will require significant practical and methodological hurdles to be surmounted (OECD, 1996). As a result, as Green (1997:3) comments, “overall decisions on training are in practice more a matter of strategy, company philosophy and judgement than precise planning”. For one UK study of the current, limited impact of management accounting techniques on strategic HRM, see Kouhy, 2000.

7.8. We turn now to the reasons for this limited take-up of human resource accounting, and the weak development of training investment evaluation.

7.9. Skills – One Factor Among Many. The extant research in this area, particularly those elements of it that have sought to go inside the black box of the firm and which have talked to managers, identify the key difficulty with trying to draw links between investment in skill and economic performance as being that skills are simply one element in a highly complex interaction between a large number of factors over time. Most attempts to measure the impact of greater investment in skills are therefore confronted with the problem of what else may be impacting on organisational performance and how the effects of these other elements can be abstracted in order to show the distinctive contribution (or lack of it) made by increased skill levels. Some of these factors include:

- Exchange rate fluctuations (not unimportant in the progress or otherwise of UK manufacturing industry)
- Interest rates
- Levels of rise in income (particularly among whatever segment(s) of the population the organisation's customers are to be found)
- Levels of public spending (if the organisation is in the public sector)
- Ownership of enterprise
- Technological change/introduction of new technology in the productive process
- Change in senior management personnel
- Change in product market strategy and the impact of movement into another market segment
- Introduction of new products
- Increased/decreased competitive pressure
- Diversification/re-focusing of business
- State of wider labour market

7.10. In addition to these, there is also the strong likelihood that in many firms there will be a range of other personnel management changes taking place alongside any investment in skills, for example new pay systems, forms of communication and involvement, quality improvement initiatives, etc, all of which may also be expected to impact on performance and from which it is hard to disentangle the contribution of skills. Indeed, as discussed below, an increasing volume of research evidence from the USA and UK suggests that in fact it is skills in combination with a 'bundle' of

such people management practices that leads to improved performance, rather than more skills alone.

7.11. *The Cost of Inputs is Uncertain.* Many organisations still lack training budgets (73 per cent according to Spilsbury, 2001:45)) and where these exist, the scope and nature of the costs that they cover varies very widely, even in relation to formalised training. Many organisations appear to keep limited records of even which workers have participated in particular formalised training events, let alone the costs of such activities. Informal training is very rarely captured in such statistics.

7.12. In addition, many aspects of a firm's investment in skills will be hard to quantify and therefore place a financial value upon. Managerial time in devising and supervising training activity is one example. Production reduced or lost through time spent in informal learning is another. If a worker cannot solve a problem and walks down the corridor to spend three quarters of an hour talking the issue through with a more experienced colleague, who is to know or to calculate and record the cost in staff time.

7.13. *Investment Levels, Not an Issue for Employers?* Besides the technical difficulties of the exercise, the second reason why firms appear to need outside stimuli and externally generated evidence on the benefits of training is that the bulk of individual employers may not be particularly worried about levels of investment in training – from their perspective there isn't a major problem. For instance, Kitching and Blackburn (2002) found that 52 per cent of organisations in their sample of SMEs thought that there was no need to provide more training for established workers.

7.14. As outlined above, preoccupations with perceived under-performance – whether described in terms of lower workforce qualification levels than in other developed countries, or lower levels of productivity – are often the preserve of public policy and policy making bodies. To put it another way, the term 'market failure' in the discourse of policy makers often appears to mean no more than that actors are failing to do what government wants them to do. The policy makers assume that this must be down to market failure, rather than to actors making what are (from their perspective) rational decisions based on reasonable levels of information. It is thus mainly policy makers (and those who work for them) who see a need to construct a compelling case for investment in skills over and above what is already taking place.

7.15. In terms of more specific problem areas with existing research in the field, the following are some of the most obvious.

Snapshot Views, 'Fit' and the Temporal Dimension.

7.16. Unfortunately, there has been a tendency for much of the research to generate isolated, one-off snapshot views. This may be dangerous. As many commentators within management studies have observed, what works at any given moment for any organisation may not do so for either that organisation in the future, or for another organisation in the present. There may not be a 'one best way'/best practice route to competitive success, success may be a matter of achieving a 'fit' between product market strategy, managerial systems and practices, and organisational structure. The optimal 'fit' for one organisation may not be appropriate for the circumstances of

another, particularly if the product market niches in which the organisations are operating are different (see below).

7.17. In addition, maintaining this optimal ‘fit’ may be very difficult. Organisations become stuck in their ways, and may tend to carry on doing what has led to success in the past, even when it is demonstrably failing to do so in the present. The example of Marks and Spencer springs to mind. More generally, many of the organisations cited as examples of ‘excellence’ in the early 1980s by Peters and Waterman (the gurus of the management excellence movement) have subsequently declined, been taken over, or simply ceased to exist.

7.18. It is also important to recognise other influences of time on training investment and its effects. One is that the effects of a training episode may continue for years, but over time the link between that episode and its effects becomes harder to see and measure (Shackleton, 1992). The other side of the coin is the tendency of skills to reduce in value over time, perhaps because of technical change which renders what was learned obsolete, perhaps because of the declining physical abilities of an ageing worker, or because they simply forget what they have learned (Barrett et al, 1998; Shackleton, 1992).

The Funding and Provision of Increased Skill Inputs

7.19. It is important to be aware that in a number of the studies surveyed by this review, the researchers were not concerned where the additional skills came from or who funded their creation, or where the study examined employer training that was funded in whole or in part via the government (often through TECs). The aim was to see if an increased input into the productive process resulted in some form of improved output – more or better goods and services, or higher profitability. Thus, whether the additional skills or qualifications were funded by the employer, the state, or the individual (or a mixture of all three) was not necessarily seen as being of great importance. This means that quite a significant element of the extant evidence will not be of great value in encouraging employers to increase their training spend, as the results that this research reports often stems in part from investment by the state or the individual, perhaps through training grants to firms, often through improvements to the outcomes of initial education. Examples of this approach include most of NIESR’s work, Layard, McIntosh and Vignoles, 2002; Holzer et al, 1993; Winterton and Winterton, 1998; Berry-Lound, Rowe and Parsons, 2001; Johnson et al, 2000; and much of the work by NIESR)

The Relationship Between Skills, Productivity and Performance

7.20. As suggested above, productivity has tended to be the performance measure that has captured the attention of policy makers at national level. A number of issues surround its centrality as a useful measure of linkages between skills and economic performance (at whatever level).

7.21. The first is the question of greater productivity of what exactly. UK government policy has indicated that it believes that it is essential that UK more firms move towards the higher quality and value added end of the product market spectrum. The possibility that UK firms may be getting better at producing low quality goods and services that may lack a sustainable market in the longer term is not necessarily good news. This suggests that, besides other measures, we need to have a clearer picture of

the current state of product and service quality/specification in the UK and of trends in this indicator. As del Bono and Mayhew (2001) indicate, the evidence that we have available at present is inconclusive on where the UK stands relative to other developed countries in terms of the sophistication or otherwise of product and service specifications.

7.22. The second is the problem posed by America. The USA is seen by many English policy makers as the most productive and dynamic of the developed economies, and therefore as a source of ideas and examples. There is certainly little doubt that on most conventional measures of productivity, the USA appears to be the world leader, setting a standard that even those European countries that have consistently outperformed the UK cannot match. Unfortunately, it is very unclear what part, if any, superior skills might play in underpinning America's productivity advantage. As both the Skills Audit (Cabinet Office/DfEE, 1996) and Crouch, Finegold and Sako (1999) make clear, on most conventional measures of training or workforce skill, the USA does not do particularly well. Its sole advantage appears to come from its high proportion of the workforce who have undergone some form of higher education, whether at degree or sub-degree level. In most other respects, its skills profile looks little different from, or better than, the UK's.

7.23. This situation causes difficulties for those who seek to ascribe differences in relative aggregate levels of international productivity solely to varying stocks of skills or qualifications within the workforce. Thus Layard, McIntosh and Vignoles (2002), use data from IALS to show the UK trailing much of Europe and advance this as the main reason behind our relatively poor productivity record vis-à-vis countries such as Germany. However, when they turn to consider America, they admit that, "there is no clear overall difference in skills", and are forced to put the USA's superior productivity down to "the exceptional quality of the research in leading universities in the US" (2002:3). Despite these rather inconsistent findings, they nevertheless ultimately conclude that, "if Britain wants its productivity to reach levels found in other countries, it will have to catch up with their skills. For where the skills are, there will the world's capital go" (2002:13) – a curious belief given the USA's success to date in attracting capital to service its huge trade deficit with the rest of the world.

Measures of Business Performance

7.24. As suggested above, many of the measures of business performance that have been chosen in the studies under review are not necessarily those that would have much resonance with senior private sector managers. Most, at best, might be seen as potentially possessing some sort of linkage (not necessarily particularly direct) with bottom line profitability or other financial measures upon which markets and investors judge the performance of companies.

Problems Associated with Self-Reporting of Performance

7.25. Quite a number of the studies reviewed relied upon self-reporting by individual respondents to form a picture of the organisation's performance, for example, Cully et al 1998 and 1999 (and all the studies based on data generated by WERS), DTZ Pieda Consulting, 1998; Johnson et al, 2000; Berry-Lound, Rowe and Parsons, 2002). In other words, the data was impressionistic and often rested on the judgement of a single individual. Very rarely was such data subject to cross-checking against

external sources, such as records in company reports or business databases (such as those maintained by Dunn and Bradstreet).

7.26. Although some argue that this approach produces robust information (see Cully et al, 1999), there are reasons to be cautious about elements of ‘reporting bias’ in this type of data gathering – many managers know the answer that they think the researchers want to hear. Moreover, there is a body of evidence that suggests that managers’ perceptions of their organisation’s performance is likely to be coloured by notions of self-worth and not always to be reliable. One recent study concluded, “the research findings raise an important observation regarding some companies’ self-perception of their own performance. Some have little idea. Worse still they delude themselves by thinking their performance is better than it actually is” (Brown, 2000:209).

Problem, What Problem? – reconciling the data

7.27. The final issue is the question of how the different pieces of data currently available can be reconciled. This is a large and general problem in the field of UK VET research and cannot be explored in any detail here. For the purposes of this paper it will suffice to point out that, taking selected items of semi-official data (or at least data that is sometimes quoted in official documents to sustain or support government policy), it is possible to construct a case that there is no real ‘training gap’ between the UK and many other developed countries, and that even if there was, it is not clear why it would matter.

7.28. Spilsbury’s Learning and Training at Work survey for the DfES finds that in 2000 UK employers were spending £23.5 billion on training, or an average of £1,300 per employee – a not inconsiderable sum. In addition, as the CBI have pointed out (CBI, 2000), both OECD and Eurostat surveys, “suggest that the UK trains as much as the best” (CBI, 2000:3). On no indicator used in the International Adult Literacy Survey (IALS), the European labour Force Survey (ELFS), or the Continuing Vocational Training Survey (CVTS) was the UK below average, and on expenditure the UK ranked first out of twelve in the only survey that tied to measure this indicator. The CBI also argues that more of the training being carried out in the UK is informal (and therefore does not show up in many official measures of training), and that transferable training is increasing. If one also throws in the problems posed by American productivity levels (which, as suggested above, are achieved with a workforce apparently no better qualified or trained than our own), then it becomes possible to suggest that official concern about training is misplaced. Employers, left to their own devices, are providing levels of training comparable with what is on offer in other developed countries, and that insofar as there is a problem, it pertains to the weaknesses of initial education in the UK (CBI, 2000).

7.29. The authors do not necessarily accept this argument, but do use it to underline a number of points. First, that the story about the linkages between skills and economic success (particularly at the level of the firm or the national economy) are not simple and linear. Second, that if policy makers want to push a line that argues for greater investment in skills (whether by business or the state, or a mixture of both), it makes a great deal more sense to construct that argument in a way that pays regard to issues to do with how skills are used and to what effect in different organisational contexts.

Simple blanket exhortations to do more may make little sense in the context of the goals that organisations have currently set for themselves.

7.30. This point brings us to twin issues of the relationship between investments in skill and the wider people management contexts in which they occur, and the impact of product market strategies on training investment.

8. BUNDLING, OR SKILLS AND WHAT ELSE MAKE THE DIFFERENCE?

8.1. As outlined above, many of the studies on skills and organisational performance find that the injection of higher levels of skill on their own into a workplace appear to have limited effect and that the impact of enhanced skill appears to come when it is 'bundled' in with wider changes in work organisation, job design and systems of people management. This leads us to the vast and growing body of literature that seeks to establish links between what is variously called 'good people management practice', high performance work organisation, high involvement management, high commitment work organisation, and strategic human resource management. Given the scope, scale and complexity of this work, a separate literature review would be required to do it justice. All that can attempted here is to sketch in some of the most salient features as they relate to the overall purpose of this review.

8.2. What the high performance literature seeks to do is to examine the linkages that might exist between the adoption of certain managerial practices, mainly relating to the management of employees and to aspects of work organisation, and their possible impact on organisational performance. The most important and consistent finding relates to the need to 'bundle' together these practices within any organisation in order to achieve a critical mass of measures that then do appear to have a positive effect upon organisational performance (Pil and MacDuffie, 1996). Taken on their own, the practices appear to have either very limited or no effect. Taken in conjunction with one another, they do appear to have a beneficial impact.

8.3. The bulk of this literature originates from the USA (see, for example, Pil and MacDuffie, 1996; Ichniowski, Shaw and Prennushi, 1995; Black and Lynch, 1997; Becker and Huselid, 1998, Pfeffer, 1998, and Osterman, 1992), but there is increasing interest in the topic in the UK. In this area, the lead has been taken, rather unsurprisingly, by the Chartered Institute for Personnel and Development (CIPD), who have commissioned a number of studies that try to prove that good people management practices have a positive impact on organisational performance. Recent UK contributions to the evidence include Guest et al (2000a and b), Cosh, Hughes and Weeks (2000), Patterson et al (1997). Richardson and Thomson (1999) provide a useful overall literature review on the links between people management practices and organisational performance, and for a more reflective overview of the field and the complexities of trying to find links between personnel practices and performance, see Edwards (2001).

8.4. As with the literature on training and performance, there are major definitional issues embedded in this body of research. To begin with, it is often unclear, (see Wood, 1999) exactly what constitutes high involvement, high performance work organisation. Proponents tend to offer checklists of organisational characteristics and management practices that, taken together, form the model. Unfortunately, many of these lists differ fairly fundamentally in what is included and what is excluded.

Wood, de Menezes and Lasaosa (2002) identify two broad strands in the debate. The first are those who see the high performance model as revolving around a best practice approach to human resource management which embraces a broad range of techniques and practices. Put crudely, this school of thought sets relatively high hurdles in judging whether organisations have adopted a high performance model.

8.5. The second school of thought, to which Wood belongs, argue for a narrower set of measures that are task-focused and which equip workers to operate in a participative way (e.g team briefing, induction, information disclosure, appraisal and training in group and interpersonal skills). It offers limited task centred involvement rather than workplace democracy (see Wood, de Menezes and Lasaosa, 2002, for full details).

8.6. One outcome of researchers adopting widely varying criteria or thresholds for what constitutes the high performance approach is that, even using the same dataset, different levels for the penetration of the model within the UK economy can be arrived at. Thus a wide range of interpretations have been placed upon the data generated by the DTI/ESRC Workplace Employee Relations Survey (WERS) (see Cully et al, 1998 and 1999). Bach and Sisson (2000:23), using the list of 16 new management practices (including appraisal, individual PRP schemes, profit sharing, regular meetings of the entire workforce, use of problem solving groups, use of teams, use of single status, and most employees receiving a minimum of five days per year training), find that only 20 per cent of companies had half or more of these practices in place, and only 2 per cent had more than ten. By contrast, Wood and colleagues, using a different interpretation of the WERS data and different thresholds for what combination of measures constitute high performance practices, arrive at the conclusion that the proportion of workplaces across the whole economy where managements have a “high involvement orientation is 26 per cent”, and that 38 per cent of the UK workforce is employed in high involvement workplaces (Wood, de Menezes and Lasaosa, 2002:28).

8.7. It should be noted that, compared to most other assessments of the UK situation, Wood and colleagues appear highly optimistic. Guest et al (2000a), using data from the Future of Work survey, show that of 18 progressive practices (covering recruitment, training, job design, appraisal, and communication) only 1 per cent of companies used three quarters or more extensively. Overviews produced for the CBI/TUC Submission to the Productivity Initiative also indicated that across a range of process innovation best practices (including just-in-time, empowerment of staff, TQM, ICT, supply chain partnering, and organisational learning) the UK companies appeared to have adopted fewer practices than their counterparts abroad (Wall, 2001).

8.8. To try and summarise, there is disagreement as to how high the hurdle needs to be set in order for an organisation to qualify as having some form of high performance regime in operation, and this, unsurprisingly, affects estimates of the proportion of UK organisations that can be said to have achieved this state. This means that the scale of organisations that may be prone to under-perform is unclear, and this in turn makes it harder to make the case for outside intervention to stimulate progress, or to know exactly at what measures of organisational configuration such interventions might best be targeted.

8.9. However, there is widespread agreement within the research literature that irrespective of which particular definition of high performance working is adopted, the evidence appears to support a positive correlation between having adopted the high performance model and organisational performance. Thus, Wood, de Menezes and Lasaosa find that adoption of their definition of high involvement management within the WERS sample appeared to raise the rate of productivity growth, and to impact favourably on quality (2002). Patterson et al, using a sample of manufacturing firms, found that 18 per cent of variations in productivity and 19 per cent of variations in profitability could be attributed to the people management practices (1997). Cully et al's analysis of the WERS data showed, "a close association between high commitment management practices, committed employees and a superior climate of employment relations" (1999:295), though the WERS team go on to pose the question, "why, if this is the case, are such practices not more widespread?" (1999:295), and Guest et al's analysis of WERS also found linkages to financial performance (Guest et al, 2000b). West and Johnson (2002) report on a study within the NHS that suggested that the use of certain bundles of HR practices impacted on patient services and clinical performance. From the perspective of training, work by Ashton and Felstead (1998), using data from the first Skills Survey, indicated that there appeared to be an association between the adoption of certain managerial practices (such as quality circles, formal appraisal systems, achievement of the IIP standard, and employee communication systems) and the creation of skills such as problem solving, communication and team working (see also Ashton and Sung, forthcoming).

8.10. Perhaps the most important point to grasp here is that, until very recently, there has been little if any attempt to link skills policy to policies that address employee relations systems. There is a growing body of evidence that suggests that consideration of the one without the other may not make sense, and that progress towards higher levels of skill formation and better and more productive usage of skills may best be achieved in conjunction with efforts to encourage the more widespread adoption of a range of people management practices that can help foster employee commitment and opportunities for problem solving. Plainly, given its responsibility for employee relations issues and the adoption of best practice management techniques, the DTI is well placed to pursue these issues in connection with skills.

9. SKILLS AND PRODUCT MARKET STRATEGY

9.1. As the authors have argued on a number of occasions (Keep and Mayhew, 1995, 1996, 1997), rather than see skills as some form of unqualified good that always delivers benefits for employers, it may make more sense to see them as inputs that, in combination with other inputs to the productive process, can make a contribution to raising organisational performance. In part, the scope for skills to improve the outputs generated by the organisation is dependent upon the product market strategy that has been adopted, and the type of production organisation/service delivery system that has been chosen to operationalise this strategy. Within these choices are nested the issues of people management/HRM, work organisation and job design, which together will tend to determine what skills are required and how they are utilised. For an informative overview of the picture on the interactions between demand for skill, product market strategies and HRM strategies, based on the case study and large scale survey data generated by the NSTF's Extent, Causes and Implications of Skill Deficiencies (ECISD) study, see Hogarth and Wilson, 2002.

9.2. Different product market strategies, even within the same sector, may lead to a very different profile of skills being demanded, in terms of both level and quantity (see, for example, the DTI/EMTA Skills Scoreboard for data on the engineering sector). A Michelin starred restaurant will require a very different kind of workforce from Burger King (Nickson et al, forthcoming). Some product market strategies may place a ceiling on the level of skills that can productively be utilised at any given moment. Thus, supplying Burger King with an entire workforce trained to level 4 might not generate any great benefits to the business, and could create problems of under-utilisation of skills and consequently lower levels of job satisfaction and motivation. Moreover, as a forthcoming SKOPE literature review on skills, product quality and organisational performance in the hospitality sector demonstrates, the links between product market strategies, product/service quality specification and their lead through into demand for skills are often highly complex and mediated through a range of factors, of which people management systems, work organisation and job design are among the most important (Nickson et al, forthcoming).

9.3. This being the case, as the Cabinet Office PIU project on workforce development concluded, workforce skills are best seen as being derived from wider organisational choices and strategies (Cabinet Office PIU, 2001).

For employers, development is a derived need – employers develop their staff because they believe it will help them achieve their business objectives. This suggests that an effective way to stimulate demand for development in businesses is through encouraging greater ambition in the planning process, the adoption of best practice, and the pursuit of high value-added and innovative product strategies that need staff capable of delivering them. (Cabinet Office PIU, 2001:33 (para 103))

9.4. It is noticeable that the bulk of the academic literature on returns to employer investment in training and skills has very little to say on this point. Much of it contains the assumption that all firms are competing with all other firms, that market segmentation does not exist, and that there will almost always be a positive return to any additional investment in human capital – both for the individual and for their employer – no matter what the prevailing product market strategy. The implicit belief is often that changes in the supply of skilled individuals will more or less automatically transform organisation's product market strategies.

9.5. This belief in the catalytic propensities of skill, and therefore the apparently limitless possibilities for supply side interventions has been termed by Grubb and Ryan (1999) the 'Field of Dreams' approach, following the American film wherein,

The protagonist builds a baseball field in the midst of the American Midwest, with the conviction that the great baseball players of previous years will somehow show up if only he provides them with a suitable place to play. The movie and its central motif – "If you build it,

they will come” – are an extended metaphor about faith in dreams and an approach that can be characterized as a supply-side belief.
(Grubb and Ryan, 1999:2)

9.6. That such a warning is apposite in the UK context is underlined by one of the findings generated by the very large scale ECISD study (see Hogarth and Wilson, 2002) which was undertaken as part of the NSTF’s programme of research. As part of ECISD’s attempts to probe employers’ future skill requirements, firms were asked to indicate how applicable the following statement was to them – ‘We are implementing or about to implement plans to move into new higher quality product or service areas with higher profit margins’. Firms that responded that this was ‘very applicable’ or ‘fairly applicable’ were considered to be moving up market. Leaving aside the possibility that the question was a slightly leading one – most managers responding to a government-sponsored survey probably guessed what the desired answer might be – the result was that 60 per cent of firms indicated that they were not planning to move up market (NSTF, 2000b:117).

9.7. Moreover, the evidence available suggests that, on their own, interventions aimed at boosting the supply of skills are unlikely to automatically transform organisational strategy (for a review of these issues, see Coleman and Keep, 2001). To do this other interventions made through different forms of business support may be necessary to securing and sustaining systemic change (see, for example, Esser et al, 1996) - a conclusion shared by the Cabinet office PIU’s project on workforce development.

9.8. As the DFES’s Research Brief on the study by Kitching and Blackburn notes:

Measures to encourage small firms with a ‘low trainer’ orientation to provide more training by reducing money, time or other such barriers are likely to enjoy only a very limited degree of success.

Policy may therefore need to be linked much more strongly to product and service development strategies for small firms. Such policy initiatives are more likely to be more costly and policymakers may therefore need to be discriminating in choosing who to target since a broad-brush approach may not be enough to stimulate continuing change in specific sectors.

(DfES Research Brief, RB330, 2002:4)

10. GAPS IN THE EVIDENCE BASE

10.1. As will be readily apparent from the foregoing, there are a number of significant gaps in the evidence base on the impact of skills and training on business performance. In part, these gaps reflect the absence of data sets that are capable of supporting exploration of the links between skills and organisational performance.

10.2. Overall, as Campbell notes in NACETT's *Learning Pays and Learning Works* (1999:40), "there are almost no real studies of the impact of enterprise training on profitability in the UK and few of its impact on productivity or other 'outcome' related variables, for the UK. The measures we use to 'measure' training are not sophisticated". The authors of this review would concur with this general finding. The evidence base upon which policy might be constructed is at best slender and partial.

10.3. The range of existing government-sponsored surveys do not currently provide the kind of data that is needed to explore skill impact issues properly. For instance, there are very few data sets that try to chart skills above and beyond formal qualifications. IALS and the skills survey are two sources that do try to capture the extent, importance and levels of non-certified and generic skills or competences. Nor is there longitudinal data that measures worker performance prior to a particular episode of training, or which provides matched firm-worker data, both needs identified by Machin and Vignoles (2001).

10.4. In more detail the relevant sources of survey data are:

Survey evidence on employers' training spend – Eurostat, Learning and Training at Work survey

Surveys of individual employees and the training they receive - Labour Force Survey and Skills Survey

Surveys of employers' training levels – Learning and Training at Work survey, WERS

Surveys of employers' skill needs – Learning and Training at Work survey, Employers Skills Survey, ECISD

Surveys of Employers training practices, planning systems, links with business strategy, etc – Workplace Employee Relations Survey, Learning and Training at Work survey, ECISD, Employers Skill Survey, second stage of Skills Survey (in progress).

Surveys that encompass measures of business performance alongside skills - WERS

Surveys that indicate whether employers are aiming their training at certification/qualifications – Learning and Training at Work survey.

10.5. There is also the growing mass of sectoral skills forecasts and skills forecasts/employer skill demand surveys being constructed by the 47 LLSCs and the RDAs (much of it being subcontracted to consultancies and other outside agencies). Many of these surveys appear to have different sample frames and methodologies, and comparability between them may be difficult to achieve. As Dearden, Reed and Van Reenen (2000) suggest, by far the most useful data on training would come from a data set that combined firm and sectoral level information over time. No such source currently exists, but it might be possible for some of Sectoral Skills Councils to be tasked with helping assemble and maintain this kind of resource.

10.6. In addition, the depth of information being provided by them on links between training/skills and product quality and business strategy is often very superficial (or non-existent). Only WERS has tried to measure business performance alongside employee skills, and this depended upon self-perception of business performance by managerial respondents rather than objective data (for example, company reports).

Training Cost, Quality, Type and Relevance

10.7. Comparatively little is known about the detail of the training being provided by UK employers (Hogarth and Wilson, 2002). We know which sections of the workforce receive it (and which generally do not), we have some information on the general categories into which it falls (health and safety, induction, technical, teamworking, etc), on the estimated cost, on whether it is certified, and on duration. This leaves significant gaps. First, we know very little about what goes on under the various broad categories. For instance, what exactly does comprise induction training, what skills and knowledge does it impart, and how effective is it?

10.8. Second, and following on from the last point, we know next to nothing about the overall effectiveness of employers' training investment. As suggested above, if employers really are spending £23.5 billion a year on training (a figure larger than the combined HE and FE budget in the UK), then it seems surprising that the outcomes of this massive investment are not more obviously apparent. As the NSTF noted, the bulk of the improvements in the workforce's qualifications appear to be being generated within the education system, largely as a result of greatly increased levels of post compulsory participation (NSTF, 2000b). It may be that uncertified, on-the-job and informal training that does not show up in official statistics explain this gap between input and outcome. It could be that employers are spending money on poorly conceived and ineffective training that produces little benefit. It could also be that the estimates of employer spending are substantially incorrect. Without better data we cannot tell what is happening.

10.9. Given the problems that have been outlined above, it may make sense to try and undertake further research on employers training spend. The data we have has been generated by surveys that rely upon self-reporting by employers, much of it based on guestimates rather than any hard internal company records. There may also have been problems of reporting bias. None of the major surveys have used detailed case studies to try and verify whether these estimates bear any relationship to actual spending levels, and this might be a worthwhile measure, not least as a means of probing informal training activity and its costs. As with many other types of information, longitudinal data on investment by individual employers will be of far more value than one-off snapshots. Finally, it should be noted that the only detailed information we have is now dating badly. The last major survey designed to probe this topic in any great detail took place in 1993. The figures currently being generated for the DfES come from one small section of a much wider, multi-purpose survey of employers and provide little detail.

Training for the Under Trained

10.10. Both the NSTF and the PIU project on workforce development identified a substantial section of the adult workforce (mainly those on the lower rungs of the occupational ladder) who appeared to receive at best limited, and at worst no, training.

As a result, the Treasury in its Pre-Budget Report, has announced a series of pilot schemes based around adult entitlements to level 2 qualifications.

10.11. What is apparent is that, with the possible exception of work by Groot, Hartog and Oosterbeek (1994) in the Netherlands, there is very limited evidence about the logical basis for why employers might be choosing not to offer training to large sections of their workforce (above and beyond the usual market failure arguments), and no studies whatsoever into what the business performance effects of subsidised training for such workers might or might not be. It is to be hoped that any evaluation of the pilot studies will seek to address these issues.

Management Skills

10.12. As the Cabinet Office PIU project on workforce development notes, “management and leadership skills and expertise are essential for achieving enterprising cultures, innovation, growth and success, all of which underpin the successful development of the UK economy” (2001:34 (para 105)). Unfortunately, there has, to date, little research seeking to explore how managerial skills impact on organisational performance – a point remarked on by the Cabinet Office/DfEE Skills Audit when it noted that, “while there is much research into UK management, none has established to what extent good training contributes to good management, and good management to good company performance” (1996:43).

10.13. Since the Skills Audit there have been a number of studies, some cited above (e.g. Winterton and Winterton, 1996; Amos, Speller and Storey, 1997; DTZ Pieda Consulting, 1998a & b), but there remain large gaps in our knowledge. SKOPE has currently under way a large-scale survey (being run in conjunction with the Chartered Institute of Marketing) that aims to try to tease out how different levels of marketing expertise and knowledge inter-act with business success.

11. ISSUES FOR THOSE EVALUATING GOVERNMENT INTERVENTIONS IN TRAINING

11.1. The most useful overview of the many issues that arise under this heading is provided by Grubb and Ryan (1999), but see also Heckman, LaLonde and Smith (1999), and, for a sceptic’s view, Shackleton, (1992). Grubb and Ryan’s main focus is the evaluation of state-sponsored and schemes, but much of what they have to say can also be applied to trying to gauge the impact of private investment decisions by firms.

11.2. One of their most important messages is critical impact of the temporal dimension. Changes to the supply of VET take time to feed through to how skills are then used, and there is liable to be a further time lag before these changes feed through into organisational performance. Short-term boosts to output or profitability may also not prove sustainable. Lasting gains are those most to be desired, but are the most problematic to evaluate because the modern political process is extremely impatient. It wants long-term results, but it wants them to be demonstrated fast. The field of UK VET is littered with training interventions, for example, youth credits, whose success was being trumpeted before even the pilot stage was up and running.

11.3. However, it may be that a change is taking place, and that policy makers have learned or are learning greater patience. The DfES’s current evaluation of

Educational Maintenance Allowances (EMAs) is an example of a large-scale, relatively long-term attempt to gauge the effectiveness of a major policy instrument before a decision is taken on the desirability of its extension nationwide. It is to be hoped that this example marks a trend towards more intensive and extensive evaluation of pilot projects.

11.4. A second issue for evaluators is one that has been touched upon a number of times above – namely the difficulty of separating out the impact of any single intervention within an organisation from all the other internal and external forces that are simultaneously acting upon it. Grubb and Ryan offer useful advice on how to tackle this (1999:155-166). They suggest the following:

1. Evaluation of VET programmes should never lose sight of labour market outcomes, but in addition they should be more concerned than they have been by the processes leading to the results.
2. The analysis of VET programmes and interventions should try to use a variety of evaluation methods, since each of them is imperfect and incomplete.
3. VET evaluations should consider a broader range of outcome measures, in preference to a narrower range.
4. Evaluations should consider long-run as well as short-run effects of VET programmes.
5. Countries and international agencies should seek to incorporate evaluation into tripartite discussions and other political forums, recognizing that the use of evaluation evidence depends on political factors.
6. Countries and international agencies should view the evaluation enterprise as a long-term activity, one that requires stability and longevity to become more influential and more sophisticated over time.
7. Rather than continuing with conventional ‘programme’ evaluation, countries should incorporate ‘systems’ perspectives into evaluation.

11.5. In the UK context, the authors would underline the importance of Grubb and Ryan’s first point. Besides a tendency to confuse input with output in VET policy terms, there has also been a marked reluctance to consider issues of process. Besides human capital theory’s assumption that the firm and its productive processes can be treated as a black box, this inattention to process issues may have been compounded by the pervasive influence of the theory underpinning competence-based qualifications, which has as a central tenet of belief the assertion that how a competence is gained is of no importance, as long it can be assessed and verified. This approach led to a lack of interest in the means by which skills were formed and issues of quality therein. Whatever the cause, there has been limited interest in how skills are created and maintained in specific institutional settings, in what ways skills do or do not transform production, or in the organisational characteristics, strategies and cultures that might impede or hasten skills’ impact on this transformation.

11.6. The ‘triangulation’ of a broad range of evidence over time that Grubb and Ryan favour may, in the UK context, sound like a costly council of perfection, but without such an approach it is difficult to see how a body of evidence of sufficient weight and robustness to be compelling can be developed. It suggests a more co-ordinated and sustained research effort than has hitherto been the case. This is not to say that a single body needs to direct or carry out the research, but an agreed research strategy between those bodies commissioning research in this field (DTI, Treasury, DfES, SBS, LSC, LSDA, Scottish Executive, Welsh Executive) and researchers with an interest in this field, might lead to less duplication, the deployment of a broader range of research techniques, and the development of datasets that are more compatible. The metaphor of moles burrowing away in parallel tunnels has been used elsewhere (Brown and Keep, 1999:124) to describe much of UK VET research, and nowhere does this seem more true than in this field. The danger of such fragmentation is that we add to understanding of the detail, without getting to grips with the larger picture and the connections and inter-actions that underlie it.

11.7. There may also be a requirement to try to assess training within the broader context of people management systems and practices. If the ‘bundling’ approach is correct, the largest benefits of training as a catalyst for organisational improvement will only be realised in combination with a number of complementary people management practices. In the CBI/TUC Submission on Productivity, Wall (2001) advocates the creation of a national census covering productivity, R&D, technology investment, innovation, people management, and skills.

11.8. A final point relates to the nature of the decision making process. There is a tendency to assume within official discourse that the interface between research and evaluation of training interventions and policy is rational and linear. As Grubb and Ryan underline (1999), experience in many developed countries indicates that research findings and evaluations of government-sponsored training measures and interventions often have limited impact on the course of policy. Evidence-based policy is an appealing notion and an admirable objective, but it is hard to accomplish, particularly when research findings are contrary to received wisdom or undermine a predetermined ideological standpoint.

11.9. The same problem may apply to the presentation of research evidence to managers in organisations. There is an implicit assumption in much of the research; not least that commissioned by bodies such as IPD/CIPD, NACETT and DfES that if employers are offered suitably compelling evidence they will automatically act upon it. This may not always be so. Leaving aside whether extant research does amount to an overwhelming case, or whether such a case has any meaning or force outside the context of wider business change and improvement, there are reasons to doubt that simply supplying such evidence to managers will induce changed behaviour.

11.10. Over the years academic research on the success of mergers and acquisitions has shown an increasingly clear story – that except in certain quite limited circumstances, takeovers generally do not enhance long-term organisational performance nor deliver good value to shareholders. Despite the increasing weight of such findings, managers continue to believe that in their case it will be different, that their takeover will be a success, and the UK remains the developed economy with the highest level of merger and acquisition activity. Bounded rationality and cognitive

dissonance, coupled with the impact of short-term financial incentives to managers, can, it appears, frequently over-ride the ability to make and execute decisions on the basis of the evidence available.

REFERENCES

- Amos, E., Spiller, J., and Storey, D. 1997. *The Middle Market – How They Perform: Education, Training and Development*, London: Foundation for Manufacturing and Industry.
- Ashton, D., and Felstead, A. 1998. 'Organisational Characteristics and Skill Formation in Britain: Is There A Link?', *CLMS Working Paper 22*, Leicester: University of Leicester, Centre for Labour Market Studies.
- Ashton, D. and Sung, J. (forthcoming), *Supporting Workplace Learning for High Performance Working*, Geneva: ILO.
- Bach, S., and Sisson, K. 2000. 'Personnel Management in Perspective', in Bach, S., and Sisson, K. (eds.), *Personnel Management*, (third edition), Oxford: Blackwell, 3-42.
- Barrett, A., Hovels, B., den Boer, P., and Kraayvanger, G. 1998. *Exploring the returns to continuing vocational training in enterprises*, Thessaloniki: CEDEFOP.
- Bartel, A. P. 1994. 'Productivity Gains from the Implementation of Employee Training Programmes', *Industrial Relations*, Vol 33, 411-425.
- Bartel, A. P. 1995. 'Training, Wage Growth and Job Performance: Evidence from a Company Database', *Journal of Labour Economics*, Vol 13, No 3, 401-425.
- Becker, B., And Huselid, M. 1998. 'High performance work systems and firm performance: a synthesis of research and managerial implications', *Research in Personnel and Human Resources*, Vol 16, No 1, 53-101.
- Berry-Lound, D., Rowe, V., and Parsons, D. J. 2001. 'Research on Recent Developments in Employee Development Schemes', *DfES Research Report RR310*, Nottingham: DfES.
- Black, S. E., and Lynch, L. M. 1996. 'Human Capital Investments and Productivity', *American Economic Review*, Vol 86, No 2, 263-267.
- Black, S. E., and Lynch, L. M. 1997. 'How to Compete: The Impact of Workplace Practices and Information Technology on Productivity', *National Bureau of Economic Research Working Paper No 6120*, Cambridge (MA): NBER.
- Blanchflower, D., and Lynch, L. 1992. 'Training at work: a comparison of US and British youths', *CEP Discussion Paper No 78*, London: LSE, Centre for Economic Performance.
- Blundell, R., Dearden, L., and Meghir, C. 1996. *The Determinants of Work Related Training in Britain*, London: IFS.

- Booth, A. L. 1991. 'Job-related formal training: who receives it and what is it worth?', *Oxford Bulletin of Economics and Statistics*, 53, 281-294.
- Booth, A. L., and Satchell, S. 1996. 'On apprenticeship qualifications and labour mobility', in Booth, A. L., and Snower, D. J. (eds.), *Acquiring Skills*, Cambridge: Cambridge University Press, 255-284.
- Booth, A. L., and Snower, D. J. 1996. 'Introduction: does the free market produce enough skills?', in Booth, A. L. and Snower, D. J. (eds.), *Acquiring Skills*, Cambridge: Cambridge University Press, 1-16.
- Brown, D. M. 2000. 'Corporate performance: the paradox of UK Plcs' management perceptions', *International Journal of Business Performance Management*, Vol 2, Nos1/2/3, 194-209.
- Brown, A., and Keep, E. (eds.) 1999. *Review of vocational education and training research in the UK*, Luxembourg: European Commission.
- Cabinet Office PIU. 2001. *In Demand – Adult skills in the 21st century*, London: Cabinet Office.
- Cabinet Office/Department for Education and Employment. 1996. 'The Skills Audit: A Report from an Interdepartmental Group', *Competitiveness Occasional Paper*, London: DfEE.
- Campbell, C. M. 1993. 'Do Firms Pay Efficiency Wages? Evidence with Data at the Firm Level', *Journal of Labor Economics*, Vol 11, No 3, 442-470.
- Campbell, M. 2000. *Learning Pays and Learning Works – A Review of the Economic benefits of Learning*, Sudbury: NACETT.
- Carr, C. 1992. 'Productivity and Skills in vehicle component manufacturers in Britain, Germany the USA and Japan'. *National Institute Economic Review*, No 139, 1/92, 79-86
- Confederation of British Industry. 2000. *Fact not fiction – UK training performance*, London: CBI.
- Cooper, C. 2000. 'In for the count', *People Management*, Vol 6, No 20, 12 October, 28-34.
- Cosh, A., Duncan, J. and Hughes, A. 1998. 'Investment in Training and Small Firm Growth and Survival: An Empirical Analysis for the UK, 1987-95', *DfEE Research Report RR36*, Nottingham: DfEE.
- Cosh, A., Hughes, A., and Weeks, M. 2000. 'The Relationship Between Training and employment in Small and Medium-Sized Enterprises', *DfEE Research Report RR245*, Nottingham: DfEE.

- Crouch, C., Finegold, D., and Sako, M. 1999. *Are Skills the Answer? The Political Economy of Skill Creation in Advanced Industrial Countries*, Oxford: Oxford University Press.
- Cullen, A. M. 2001. 'The Aesthetic Skill Requirements of Employers in the Service Sector – Report Produced for the WISE Group', Glasgow: University of Strathclyde, The Scottish Hotel School, (mimeo).
- Cully, M., O'Reilly, A., Millward, N., Forth, J., Woodland, S., Dix, G., and Bryson, A. 1998. *The 1998 Workplace Employee Relations Survey: First Findings*, London: DTI.
- Cully, M., Woodland, S., O'Reilly, A., and Dix, G. 1999. *Britain at Work*, London: Routledge.
- Daly, A., Hitchens, D., and Wagner, K. 1985. 'Productivity, Machinery and Skills in a Sample of British and German Manufacturing Plants', *National Institute Economic Review*, No 111, 48-61.
- Dearden, L., Machin, S., Reed, H., and Wilkinson, D. 1996. *Labour Turnover and Work-Related Training*, Sheffield: DfEE.
- Dearden, L., Reed, H., and Van Reenen, J. 2000. 'Who Gains When Workers Train? Training and Corporate Productivity in a Panel of British industries' *IFS Working Paper* 00/04, London: Institute of Fiscal Studies.
- Del Bono, A., and Mayhew, K. 2001. 'The specification and quality of British products', *SKOPE Research Paper* No 19, Coventry: University of Warwick, SKOPE.
- Department for Education and Skills. 2001. 'Review of Research and Evaluation on Investors in People', *Research Brief* No RBX 18-01, Nottingham: DfES.
- Dougherty, C. 1992. 'Evaluation of the economic and labour market effects of continuing education and training: practice and policy issues', *International Journal of Educational Research*, Vol 17, 549-564.
- Down, S. 1998. 'It Pays to be Nice to People: Investors in People and the Search for Measurable Benefits', in Bell, E., Taylor, S., Thorpe, R., and Harris, I., (eds.), *Getting the Badge*, Manchester: Manchester Metropolitan university, Department of Management, 16-21.
- DTZ Pieda Consulting. 1998a. 'Evaluation of the Business Benefits of Management Development', *DfEE Research Report* RR66, DfEE: Nottingham.
- DTZ Pieda Consulting. 1998b. 'A Review of MCI and the Management Development Programme', *DfEE Research Report* RR67, Nottingham: DfEE.

Edwards, P. 2001. 'The Puzzle of Work: Autonomy and Commitment Plus Discipline and Insecurity', *SKOPE Research Paper* No 16, Coventry: University of Warwick, SKOPE.

Elias, P. 1994. 'Job-related Training, Trade Union Membership and Labour Mobility: a Longitudinal Study', *Oxford Economic Papers*, Vol 46, No 4, 563-578.

Eraut, M., Alderton, J., Cole, G., and Senker, P. 1998. 'Learning from other people at work', in Coffield, F. (ed.), *Learning at Work*, Bristol: Policy Press, 37-48.

Esser, K., Hillebrand, W., Messner, D., and Meyer-Stamer, J. 1996. *Systemic Competitiveness – New Governance Patterns for Industrial Development*, London: Frank Cass.

Felstead, A., Green, F., and Mayhew, K. 1997. *Getting the Measure of Training*, Leeds: Leeds University, Centre for Industrial Policy and Performance.

Froud, J., Haslam, C., Johal, S., and Williams, K. 1999. 'Restructuring for shareholder value and its implications for labour', Egham: Royal Holloway, School of Management (mimeo).

Green, F. 1997. 'Review of Information on the Benefits of Training for Employers', *DfEE Research Report* RR7, Nottingham: DfEE.

Grubb, W. Norton, and Ryan, P. 1999. *The Roles of Evaluation for Vocational Education and Training: Plain Talking on the Field of Dreams*, Geneva: ILO.

Groot, W., Hartog, J., and Oosterbeek, H. 1994. 'Returns to Within Company Schooling of Employees: The Case of the Netherlands', in Lynch, L. (ed.), *Training and the Private Sector: International Comparisons*, Chicago: University of Chicago Press.

Guest, D., Michie, J., Sheehan, M., Conway, N., and Metochi, M. 2000a. *Effective People Management*, London: CIPD.

Guest, D., Michie, J., Sheehan, M., and Conway, N. 2000b. *Employee relations, HRM and business performance: an analysis of the 1998 Workplace Employee Relations Survey*. London: CIPD.

Hambledon Group. 2000. 'Corporate Financial Performance Observed Before and After Investors in People Recognition', *DfEE Research Report* RR222, Nottingham: DfEE.

Heckman, J., LaLonde, R. J., and Smith, J. A. 1999. 'The Economics and Econometrics of Active Labor Market Programs', in Ashenfelter, A., Card, D. (eds.), *Handbook of Labour Economics*, Vol 3.

Hillage, J., and Moralee, J. 1996. *The Return on Investors*, Brighton: IES.

Hogarth, T., and Wilson, R. 2002. *The Demand for Skills in England: from product market strategies to skill deficiencies*, SKOPE Monograph No 5, Coventry: University of Warwick, SKOPE.

Holzer, H., Block, R., Cheatham, M., and Knott, J. 1993. 'Are Training Subsidies for Firms Effective? The Michigan Experience', *Industrial and Labour Relations Review*, Vol 46, No 4, 625-636.

HOST Consultancy. 1998. . 'The Role of Employee Development Schemes In Increasing Learning at Work', *DfEE Research Report* RR73, Nottingham: DfEE.

Ichniowski, C., Shaw, K., and Prennushi, G. 1995. 'The Effects of Human Resource Management Practices on Productivity', *National Bureau of Economic Research Working Paper* No 5333, Cambridge (MA): NBER.

Jarvis, V., and Prais, S. J. 1989. 'Two Nations of Shopkeepers : Training for Retailing in France and Britain', *National Institute Economic Review*, 58-.

Johnson, S., Campbell, M., Devins, D., Gold, G., and Hamblett, J. 2000. *Learning Pays – The Bottom Line*, Sudbury: NACETT.

Keep, E. 2001. 'If it moves it's a skill – the changing meaning of skill in the UK context', Coventry: University of Warwick, SKOPE (mimeo).

Keep, E., and Mayhew, K. 1995. 'Training Policy for Competitiveness – Time for a Fresh Perspective?', in Metcalf, H. (ed.) *Future Skill Demand and Supply*, London: Policy Studies Institute, 110-145.

Keep, E., and Mayhew, K. 1996. 'UK Training Policy – Assumptions and Reality', in Booth, A., and Snower, D. J. (eds.), *Acquiring Skills*, Cambridge: Cambridge University Press, 303-334.

Keep, E., and Mayhew, K. 1997. 'Was Ratner Right? Product Market and Competitive Strategies and Their Links with Skills and Knowledge', *Employment Policy Institute Economic Report*, Vol 12, No 1, 1-14.

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

Kitching, J., and Blackburn, R. 2002. 'The Nature of Training and Motivation to Train in Small Firms', *DfES Research Report* RR330, Nottingham: DfES.

Kouhy, R. 2000. 'Performance measurement in strategic human resource management', *International Journal of Business Performance Management*, Vol 2, Nos 1/2/3, 137-156.

Layard, R., McIntosh, S., and Vignoles, A. 2002. 'Britain's record on skills', London School of economics: CEP, (mimeo).

- Lee, R. 1996. 'The 'pay-forward' view of training', *People Management*, 8 February, 30-32.
- Lynch, L. 1991. *Economic Review, Papers and Proceedings*, Vol 81 (May), 151-156.
- Lynch, L., and Black, S. E. 1995. 'Beyond the Incidence of Training: Evidence from a National Employers Survey', *National Bureau of Economic Research Working Paper* No 5231, Cambridge (MA): NBER.
- Machin, S., and Vignoles, A. 2001. 'The Economic Benefits of Training to the Individual, the Firm and the Economy: The Key issues', Background paper for the Cabinet Office PIU project on workforce development, Cabinet Office Website.
- Mason, G., and van Ark, B. 1993. 'Productivity, machinery and skills in engineering: an Anglo-Dutch comparison', *NIESR Discussion Paper* No 36, London: NIESR.
- Mason, G., and Finegold, D. 1995. 'Productivity, machinery and skills in the United States and Western Europe: precision engineering', *NIESR Discussion Paper* No 89, London: NIESR.
- Mason, G., and Finegold, D. 1997. 'Productivity, Machinery and Skills in the US and Western Europe', *National Institute Economic Review*, No.162, 4/97.
- Mason, G., Keltner, B., and Wagner, K. 1999. 'Productivity, Technology and Skills in Banking: Commercial lending in Britain, the United States and Germany', *NIESR Discussion Paper* No 159, London: NIESR.
- Mason, G., Prais, S. J., and Van Ark, B. (1992). Vocational education and productivity in the Netherlands and Britain. *National Institute Economic Review*, No140, 2/92, 45-68.
- Mason, G., and Wagner, K. 1994. 'Innovation and the Skill Mix: Chemicals and Engineering in Britain and Germany'. *National Institute Economic Review*, 3/94, 61-72.
- Mason, G., Wagner, K. and van Ark, B. 1994. 'Productivity, Product quality and Workforce skills: food processing in four European countries', *National Institute Economic Review*, 2/94, 62-83
- McKinsey Global Institute. 1992. *Service Sector Productivity*. Washington DC: McKinsey&Co
- National Skills Task Force. 2000a. *Skills for all: Proposals for a National Skills Agenda*, Sudbury: DfEE.
- National Skills Task Force. 2000b. *Skills for all: Research report of the National Skills Task Force*, Sudbury: DfEE.

- Nickson, D., Baum, T., Losekoot, E., Morrison, A., and Frochot, I. (forthcoming). *Skills, Organisational Performance and Economic Activity in the Hospitality Sector: A Literature Review*, Coventry: University of Warwick, SKOPE.
- Oliver, J. M., and Turton, J. R. 1982. 'Is there a shortage of skilled labour?' *British Journal of Industrial Relations*, Vol 20, No 2, 195-200.
- O'Mahony, M. 1999. *Britain's productivity performance 1950-1996: an international perspective*. London: National Institute of Economic and Social Research.
- O'Mahony, M., and de Boer, W. 2002. 'Britain's relative productivity performance: has anything changed?', *National Institute Economic Review*, No 179, 38-43.
- Organisation of Economic Co-operation and Development. 1996. *Measuring What People Know: Human Capital Accounting for the Knowledge Economy*, Paris: OECD.
- Osterman, P. 1992. 'How common is workplace transformation and how can we explain who adopts it? Results from a National Survey', *Industrial and Labor Relations Review*, Vol 47, No 2, 173-188.
- Patterson, M., West, M., Lawthorn, R., and Nickell, S. 1997. *The impact of people management practices on business performance*, London: IPD.
- Payne, J. 1999. 'All things to all people: changing perceptions of 'skill' among Britain's policy makers since the 1950s and their implications', *SKOPE Research Paper* No 1, Coventry: University of Warwick, SKOPE.
- Payne, J. 2000. 'The unbearable lightness of skill: the changing meaning of skill in UK policy discourse and some implications for education and training', *Journal of Education Policy*, Vol 15, No 3, 353-369.
- Pfeffer, J. 1998. *The human equation*, Boston: HBS Press.
- Pil, F. K., and MacDuffie, J. P. 1996. 'The adoption of high performance work practices', *Industrial Relations*, Vol 35, No 3, 423-455.
- Prais, S.J. and Wagner, K. 1988. 'Productivity and management: the training of foremen in Britain and Germany. *National Institute Economic Review*, No 123, 34-47.
- Prais, S. J., Jarvis, V., and Wagner, K. 1989. 'Productivity and Vocational Skills in Services in Britain and Germany: Hotels', *National Institute Economic Review*, No 130, 52-74.
- Rajan, A., Chapple, K., and van Eupen, P. 1999. *Building Capacity for the 21st Century*, London: IIP UK.
- Richardson, R., and Thompson, M. 1999. *The impact of people management practices on business performance: a literature review*, London: IPD.

- Seibert, S. E. , Crant, J. M., and Kraimer, M. L. 1999. 'Proactive Personality and Career Success', *Journal of Applied Psychology*, Vol 84, No 3, 416-427.
- Shackleton. J. R. 1992. 'Training Too Much? A Sceptical Look at the Economics of Skill Provision in the UK', *Hobart Paper* 118, London: Institute of Economic Affairs.
- Spilsbury, M. 2001. Learning and Training at Work 2000', *DfES Research Report* No 269, Nottingham: DfES.
- Steedman, H., and Wagner, K. 1987. 'A second look at productivity, machinery and skills in Britain and Germany', *National Institute Economic Review*, No 122, 84-96.
- Steedman, H., and Wagner, K. 1989. 'Productivity, machinery and skills: clothing manufacturing in Britain and Germany'. *National Institute Economic Review*, No 128, 40-57.
- Steedman, H, Mason, G. and Wagner, K. (1991). 'Intermediate skills in the workplace: deployment, standards and supply in Britain, France and Germany'. *National Institute Economic Review*, No 136, 60-71.
- Stevens, M. 1996. 'Transferable training and poaching externalities', in Booth, A. L. and Snower, D. J. (eds.), *Acquiring Skills*, Cambridge: Cambridge University Press, 19-40.
- Stevens, M. 1999. 'Human Capital Theory and UK Vocational Training Policy', *Oxford Review of Economic Policy*, Vol 15, No 1, 16-32.
- Sturm, R. 1993. *How Do Education and Training Affect a country's Economic Performance? A Literature Survey*, Santa Monica: RAND Corporation.
- Tamkin, P., Hillage, J., Cummings, J., Bates, P., Barber, L., and Tackey, N. F. 2000. *Doing Business Better: the long term impact of Investors in People*, London: FOCUS Central London.
- Tan, H. W., and Batra, G. 1995. *Enterprise Training in Developing Countries, Incidence, Productivity Effects and Policy Implications*, Washington: World Bank (Private Sector Development Department).
- Thorpe, R. 1998. 'The Employer's Experience: Comparative Case Study Research into Investors in People', in Bell, E., Taylor, S., Thorpe, R., and Harris, I. (eds.), *Getting the Badge*, Manchester: Manchester Metropolitan University, Department of Management, 32-39.
- van Ark, B. 1992. 'Comparing productivity in British and American manufacturing', *National Institute Economic Review*, No 142, 4/92, 63-74
- Wall, T. 2001. 'TUC/DTI Productivity Initiative: Innovation Sub-Group - A Digest of Evidence from Studies of Process Innovation and Performance', in CBI/TUC, *The*

UK Productivity Challenge, CBI/TUC Submission to the Productivity Initiative, London: CBI, 45-52.

Warhurst, C., and Nickson, D. 2001. *Looking good, sounding right – style counselling in the new economy*, London: Industrial Society.

West, M., and Johnson, R. 2000. 'A matter of life and death', *People Management*, Vol 8, No 4, 21 February, 30-36.

Westhead, P. and Storey, D. 1997. 'Training Provision and the Development of Small and Medium-Sized Enterprises', *DfEE Research Report* RR26, Nottingham: DfEE.

Wholey, D. R. 1990. 'The Effects of Formal and Informal Training on Tenure and Mobility in Manufacturing Firms', *The Sociological Quarterly*, Vol 31, No 1, 37-57.

Winterton, J., and Winterton, R. 1996. 'The Business Benefits of Competence-Based Management Development', *DfEE Research Series* RS16, Nottingham: DfEE.

Wood, S. 1999. 'Getting the measure of the transformed high performance organization', *British Journal of Industrial Relations*, Vol 37, No 3, 391-417.

Wood, S., de Menezes, L., and Lasaosa, A. 2001. 'Quality time', *CentrePiece*, Spring, 26-29.

Zwick, T. 2002. 'Training and Firm Productivity – Panel Evidence for Germany', *SKOPE Research Paper* No 23, Coventry: University of Warwick, SKOPE.