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Employers' Perspectives on the Roles of Human Capital Development and Management in Creating Value

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Employers' Perspectives on the Roles of Human Capital Development and Management in Creating Value

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Employers' Perspectives on the Roles of Human Capital Development and Management in Creating Value

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April 2006

We thank our colleague, Dr. Jens Ludwig, who contributed to the third section of this paper, and Hays Golden and Kathleen Rubenstein for their able research assistance. Portions of this paper were included in an earlier paper by the authors published by the U.K. Sector Skills Development Agency (forthcoming).

ABSTRACT

Human capital – the productive capacity that is embedded in people – is one of the most important contributors to the growth in nations' output and standard of living. Globalisation and technological change have increased the importance of human capital in recent years, to the point that there are now only two options to sustain high profits and high wages in developed nations: escalating the skill levels of individuals or developing superior capacity for managing those skills and "human capital" more broadly.

Employers have responded to these new phenomena by increasing wages for employees with more skills and by increasing their use of downsizing and other methods (such as "offshoring") intended to reduce labour costs. There is little evidence, however, that such efforts by employers have improved profits, productivity, or stock price performance.

Employer-provided training for employees represents one method of improving the skill level of a nation's workforce. Although long-standing economic theory suggests that existing incentives for employers and employees should naturally yield the delivery of an optimal level of training, there is new awareness of a variety of market failures that may be causing a sub-optimal level of training, despite evidence that points to a positive relationship between employer-provided training and firm outcomes (productivity, profitability, employee retention, customer retention, stock performance).

Return on training investments is higher than return on other similar types of investments, suggesting that firms are, indeed, under-investing in that area. Financial reporting requirements that treat training investments as costs are one cause of under-investment in publicly-traded firms, but cannot explain training under-investment in other firms.

We suggest that employee skills are only a portion of the human capital management issues that must be solved by a firm in order to maximize its productivity and profits. Indeed, it is now possible to systematically measure the maturity of the leadership and other human capital management practices that are in place in an organisation and to determine which practices are most important in determining organisational outcomes.

Analysis of these practices points to the complexity of human capital management within and across organisations. The most important practices vary across organisations. One theme that has emerged, however, is that many organisations are lacking in leadership skills in particular. It is not sufficient simply to develop employee skills; an organisation must also have in place the leadership and management capable of taking full advantage of those skills. In firms that lack such leadership, it is reasonable to limit the provision of employee training investments since the firm is unlikely to fully benefit from those investments. Organisational capacity must be developed, not just individual skills.

In light of the findings in this paper, we suggest that governments should pursue three categories of policies: (a) improving the education and skill levels of individuals; (b) improving human capital management itself, by promoting managerial capacity; and (c) addressing informational deficiencies in financial markets.

RÉSUMÉ

Le capital humain – la capacité productive qui est une partie intégrante de chacun – est une des plus importantes contributions à la croissance économique et des niveaux de vie des nations. La mondialisation et les changements technologiques ont augmenté l'importance du capital humain ces dernières années, au point qu'il existe désormais seulement deux options pour maintenir des profits importants et de hauts salaires dans les pays développés : intensifier les niveaux de compétences des personnes ou développer une plus grande capacité à gérer ces compétences et le « capital humain » de façon plus étendue.

Les employeurs ont répondu à ces nouveaux phénomènes en augmentant les salaires des employés plus qualifiés et en ayant plus souvent recours à la réduction de personnel et à d'autres méthodes (telles que le « offshoring ») dans le but de réduire le coût de la main-d'œuvre. Il n'est cependant pas vraiment prouvé que de tels efforts de la part des employeurs aient augmenté les profits, la productivité ou encore les performances des résultats boursiers.

La formation des employés fournie par les employeurs représente une méthode d'amélioration du niveau de compétences de la main d'œuvre d'un pays. Bien qu'une théorie économique de longue date suggère que les motivations pour les employeurs et les employés devraient naturellement réaliser la provision d'un niveau de formation optimal, il a été récemment fait le constat d'une variété de failles du marché qui peut résulter à un niveau sous-optimal de la formation, malgré les preuves démontrant une relation positive entre la formation fournie par l'employeur et les résultats des entreprises (productivité, rentabilité, maintien des employés dans l'entreprise, maintien de la clientèle, résultats boursiers).

Le rendement sur les investissements dans la formation est plus élevé que tout autre type d'investissement similaire, ce qui suppose que les entreprises sous-investissent dans ce domaine. Le fait que les règlements en matière de rapport financier traitent les investissements dans la formation comme des coûts est une des causes du sous-investissement dans les entreprises cotées en bourse, mais cela n'explique pas le sous-investissement dans les autres entreprises.

Nous suggérons que les compétences des employés ne représentent qu'une partie des questions de gestion du capital humain devant être solutionnées par l'entreprise afin de maximiser sa productivité et ses bénéfices. En effet, il est possible de mesurer systématiquement la qualité de la direction et des autres pratiques de gestion du capital humain qui sont en place dans une organisation et de déterminer quelles pratiques sont les plus importantes dans les résultats.

L'analyse de ces pratiques met l'accent sur la complexité de la gestion du capital humain à l'intérieur et à travers les organisations. Les pratiques plus importantes varient d'une organisation à l'autre. Un thème émergeant cependant est que beaucoup d'organisations manquent particulièrement de compétences en matière de leadership. Il ne suffit pas simplement de développer les compétences des employés, une organisation doit également disposer d'un leadership et d'une gestion capable de profiter pleinement de ces compétences. Dans les entreprises où il manque un tel leadership, il est raisonnable de limiter les investissements dans la formation des employés puisque il est improbable que l'entreprise bénéficie complètement de ces investissements. La capacité organisationnelle doit être développée et pas uniquement les compétences des personnes.

À la lumière des résultats présentés dans ce document, nous suggérons que les gouvernements suivent trois catégories de politiques en vue de : (a) améliorer les niveaux d'éducation et des compétences des personnes ; (b) améliorer la gestion du capital humain, en augmentant la capacité de la direction ; et (c) de parer les carences en matière d'information dans les marchés financiers.

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Human capital – the productive capacity that is embedded in people – has long been recognised as one of the most important contributors to the growth in nations' output and standard of living over time. Moreover, it is an important determinant of individuals' employability and earnings capacity, as well as organisations' value creation and profitability. Indeed, there is a growing "skills premium"—both for individuals and organisations.

This growing skills premium, in turn, has profound implications for nations' evolutionary paths—particularly those that have historically been comparatively "high wage." As economies continue to become more global and technological change continues to favour the highly educated and skilled, the already-significant role of human capital is likely to increase.

The continued ability of nations, firms and individual employees to enjoy high wages and high profits will increasingly depend on the efficacy of policies and practices—both public and private—that promote skill development and the optimisation of human capital.

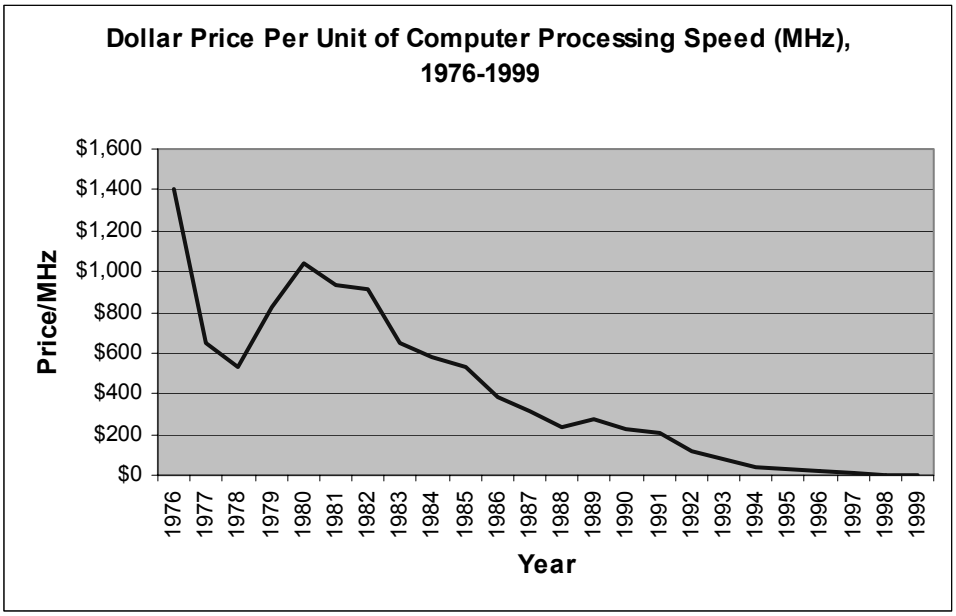
This paper addresses these issues by examining the issue of value creation by human capital for enterprises. The paper begins with a brief overview of the current economic reality and the impact that technology and globalisation are having on both employees and employers. The second section discusses human resource management—wage and employment decisions—as a strategic source of flexibility for employers. With this as backdrop, the third section discusses economists' understanding of employers' demand for investments in training—a primary mechanism by which human capital is developed in the workplace. The next section lays out the logic and evidence that points to the conclusion that the future competitive advantage of both firms and individuals in high-wage, developed nations will depend upon superior human capital management and development. The final section outlines the implications for both public policy and private (organisational) policies and practices.

I. INTRODUCTION: VALUE CREATION IN THE CURRENT ECONOMIC ENVIRONMENT— THE CHANGING ROLES OF TECHNOLOGY, GLOBALISATION, AND SKILLS

The past quarter of a century has brought with it dramatic changes in technologies. Tremendous increases in computing power have been accompanied by equally significant reductions in the price of that power. Research by Berndt, *et al.* (2000) finds that the average processing speed of a desktop computer is over 300 times greater in 1999 compared to 1976. And adjusted for quality change, their best estimate is that the price of personal computers has fallen by a factor of about 1 000 during the same time period. See Figure 1 for a graph of the decline in price per unit of processing speed.

The resultant increases in digital capacity and accompanying declines in the price of that capacity have caused fundamental and dramatic shifts in the very nature of work. The tremendous power of significant computing ability, now increasingly available to all organisations, has changed the way work is done, the way business is conducted, and even what products and services are offered by organisations. Indeed, firms are increasingly seeking profit not just from selling their traditional products, but also by breaking up the value creation process to extract profits from its component parts (*e.g.*, R&D, patents, software, and brand names).

Figure 1.



Source: Berndt, *et al.* (2000).

At the same time that these technological changes have been underway (and no doubt in part because of these changes), economies have become much more globalised. For example, among OECD member nations the average percentage of their economies that consist of imports or exports has increased from less

than 26 percent of GDP in 1970 to nearly 44 percent of GDP in 2004 (see Figure 2).[1] Similar trends have occurred for most, but not all, major economies. For example, among the G7 countries, imports and exports as a percentage of GDP has increased in the last 30 years for all but Japan and the United Kingdom.[2]

Figure 2.

As markets for goods and services have become more globalised, so too have the labour markets that support the production of those goods and services. The globalisation of labour markets is largely independent of the movement of people/workers across national boundaries. Rather, it is driven by the movement of products and services across boundaries. As economies have opened, and manufacturing (and more recently service) jobs have moved from high-wage, developed nations to low-wage, developing nations—labour markets have *de facto* become globalised.

This globalisation of labour markets has two effects for both individual workers and for their employers. First, it increases the size of the market available for the products and services being produced. This has the effect of raising wages and profits for the workers and employers. Second, it increases the numbers of competitors—both for workers and for employers. This has the effect of lowering wages as well as profits.

For workers and employers in high-wage, developed economies, the net effect of these two offsetting forces appears to vary across the skill distribution. For low-skill workers and their employers, the second effect appears to dominate the first. Hence, while the size of the market for the goods/services they produce has increased because of globalisation, competition has increased more. Hence, those employees (and some of their employers) at the bottom of the skill/education distribution in high-wage economies have suffered (effects on wages are described in additional detail in the following section).[3]

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1 OECD Factbook 2006: Economic, Environmental and Social Statistics.

2 Based on authors' analysis of International Financial Statistics data available from the International Monetary Fund. Data definitions for imports/exports are not strictly comparable across countries, although it is unlikely this would account for significant differences in observed trends.

3 Firms that operate in sectors of the economy that are impervious to international competition—those whose products and or services must be locally produced—are buffeted from the negative consequences of globalisation. The workers in these sectors, however, are not immune from these forces, since they must compete with workers who are being dislocated from import-sensitive industries.

Given these changes, there are only two options for sustaining high profits and high wages in developed nations. The first is to work relentlessly to escalate the skill levels of individuals and societies. The second is to develop superior capacity for managing those skills and "human capital" more broadly. Employers' decisions and capabilities will be instrumental in determining whether either or both of these avenues prove successful. Before tackling these skills-related questions, however, the discussion that follows examines two alternative responses—changes in wage structures and employment levels.

II. HUMAN RESOURCE MANAGEMENT AS A SOURCE OF STRATEGIC FLEXIBILITY: AN OVERVIEW

One potential response to this new competitive landscape would be for employers to increase compensation for employees with skills that are in increased demand, while reducing compensation for those that lack such skills. Collectively, these employer changes in compensation would be reflected in a change in the overall structure of wages within an economy.

Alternatively (or in addition), employers could make changes to their employment (hiring/firing) practices. For example, they could seek to reduce organisational costs by laying off workers, or they could stop hiring employees entirely within an organisation's home country.

There is evidence – both at the firm level and at a more aggregate or macroeconomic level – that suggests that changes have occurred in recent decades to both employers' wage structures and their employment practices. Those changes, and their potential consequences, are discussed below.

Changes in the wage structure

The shifts in technology and globalisation have helped to drive an increase in demand for "skilled" labour in advanced economies. Those individuals who have the cognitive capacity, along with the skills and knowledge, to work in this new, digital environment are increasingly in demand. At the same time, there has been a decrease in demand for "unskilled" labour—particularly for those categories of workers in industries most affected by globalisation, or for which machines can, with increasing cost-effectiveness, be substituted for brawn.

The evidence suggests that this has contributed to the increase in the "price" of brains and a decrease in the price of brawn, leading to increasing wage inequality in many advanced economies. The research literature in this area is extensive and complex and a full review is beyond the scope of this paper. Overall, there is agreement that technological change has indeed had a significant effect on the wage structure[4] (although the literature is not unanimous on this point).[5] In a nutshell, the technological change that developed nations have experienced is what economists refer to as "skills-biased" – by increasing demand for more highly skilled workers, the changes favour those workers with higher skill levels (such as college graduates), while disadvantaging less skilled workers (such as those with less than a high school education, and increasingly, high school graduates as well).

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4 See, for example, Juhn, Murphy, and Brooks (1993); Berman, *et al*. (1998); Machin and Van Reneen (1998).

5 Card and DiNardo (2002), for example, raise a number of challenges to this conclusion.

There is somewhat less agreement on the role of globalisation in changing the wage structure. Katz and Autor (1999), for example, argue that international trade is not a significant contributor to changes in the wage structure in advanced economies.[6] Others (such as Feenstra and Hanson, 2001) make the opposite argument, using a variety of empirical methods to estimate the effect of trade on relative wages. At a minimum, it can be comfortably stated that there is much suggestive evidence of the effect of both globalisation and technological change on wages.

The evidence suggests that the changes have been quite substantial. Table 1, for example, shows inflation-adjusted hourly wages in the United States, by different education levels (with education serving as an admittedly imperfect proxy for skills). Real wages for college graduates increased by approximately 19 percent from 1973 to 2003, while wages for high school graduates were almost identical in the two years, and wages for workers with less than a high school education declined by over 14 percent.

Table 1. Real Hourly Wages, United States, by Level of Education (2003 dollars)

Year	Less than High School	High School Graduate	College Graduate
1973	$11.83	$13.56	$19.77
1978	11.62	13.44	19.09
1983	11.01	12.83	19.14
1988	10.73	13.06	20.80
1993	9.84	12.43	20.24
1998	9.76	12.85	21.91
2003	10.12	13.57	23.44

Source: Mishel *et al.* (2005), Table 2.17.

Similarly, regression analysis by Mishel *et al.* (2005) finds that, after controlling for various demographic variables, the wage premium for college graduates relative to high school graduates increased by 16.2 percentage points for males between 1973 and 2003, and by 8.4 percentage points for females, all else being equal. Similar comparisons of high school graduates versus individuals with less than a high school education found that the wage premium for high school graduates increased only slightly over the same time period.

Changes in employment decisions

Over the last two decades or more, employers have also changed the nature of their employment decisions in two notable ways. First, as discussed extensively in the press in recent years, employers are more likely to reduce the size of their workforce, a development known as "downsizing." Some employers have also begun to "offshore," or move some or all of their operations to other countries. Each of these decisions represents a fundamental change in the way that work is done – and in the relationship between employers and the skills that they employ, as embodied in their employees.

Increased use of layoffs (or downsizing)

Under what circumstances would an organisation choose to reduce the size of its workforce? There are multiple possible motivations, but two are the most common. The first is because an organisation is experiencing a significant period of "slack demand." For a variety of reasons – typically macroeconomic

[6] It is possible, of course, that Katz and Autor's conclusion would change if their very extensive analysis were updated to included data beyond the mid-1990s. Because of the failure to achieve consensus on the extent to which globalization has affected wage structures, there has been little systematic investigation of the conditions under which globalisation most affects wages.

in nature, often related to the business cycle – the demand for the organisation's products or services is significantly lower than its capacity to provide the products or services. In an effort to keep its production capacity matching the new (lower) demand for its products or services, the firm reduces its workforce.

The second motivation is a belief that an organisation can realise financial benefits – often described in terms such as "achieving greater efficiency" or "reducing redundancies" or "streamlining operations" by reducing its labour costs (usually a significant component of total operating costs), even while seeking to maintain a similar level of output. This type of workforce reduction has often been referred to as *downsizing.* Capelli (2000) suggests that the key distinction between the two forms of workforce reduction might be that downsizing is driven by developments *inside* a firm, as distinguished from changes in demand in the external market.

Anecdotal evidences and press accounts have long suggested that a trend toward downsizing developed in the United States in the 1980s and 1990s and that it represented something new – a previously-unseen form of behaviour by employers, with layoffs seen as an economic tool available for use in improving profit (and/or stock performance).

A number of studies have examined this question, exploring the extent to which downsizing has increased, and using a variety of different methods to distinguish downsizing from the more traditional form of layoff. Farber (2003) examines U.S. job loss data from 1981 to 2001 and finds that there has indeed been an increase in job loss over time, after controlling for economic cycles. Comparing job loss rate changes to changes in the unemployment rate, he finds that the most significant increase occurred during the mid-1990s.

Baumol, Blinder, and Wolff (2003) use a different data set and find that downsizing is substantial, but that it declined through much of the 1990s, before increasing again significantly in the early 2000s. Hallock (2005) uses data on all Fortune 500 layoff announcements between 1970 and 2000 and observes a recent "explosion" in the number of layoffs that are described as occurring for reasons of "reorganisation or restructuring," while confirming through supplemental interviews of managers that the reported reasons for layoffs are typically reported relatively accurately.

Researchers have also found that downsizing has been more likely to affect white-collar, more educated workers. Farber (2003) finds that the job loss rate for more educated workers increased substantially in the early- to mid-1990s, although the highest rates of overall job loss continue to be experienced by less-educated workers (with clear cyclical patterns, indicating that they are more likely to lose their jobs during periods of economic slowdown). The cyclical pattern is weaker for more educated workers, and since the early- to mid-1990s, the job loss rate increased significantly for college-educated workers, consistent with reports that a substantial number of white-collar jobs were being eliminated in some organisations during that period. Hallock's (2005) analysis of layoff announcements finds a "dramatic increase" in the percentage of layoffs that are associated with white-collar workers relative to blue-collar workers.

Who downsizes? Baumol, Blinder, and Wolff (2003) find that downsizing is "common" only among large manufacturing firms, but not small manufacturers, and not any other economic sectors. They also find that unionised industries are more likely to downsize, and speculate that this may be because of the higher cost of unionized labour. Consistent with the earlier discussion, they also observe a positive correlation between the extent of downsizing and share of imports in a given sector.

Thus, the available research evidence is consistent with the general perception that the use of downsizing for purposes other than cyclical shortfalls in demand has indeed increased in recent decades.

This leads to the question of whether employers who have pursued this strategy have achieved their desired end: improved financial performance through greater operational efficiency.

To date, there is still only limited research available on the question of the relationship between downsizing and subsequent firm performance. The literature that does exist is relatively ambiguous, although most generally points to a conclusion that the desired benefits do not accrue to firms that pursue a downsizing strategy. There are three different improvements in outcomes that firms might reasonably hope to achieve through downsizing: (1) improved financial performance indices (profit margins, return on assets, etc.); (2) improved operating efficiency or productivity (although this would be expected to appear in financial metrics, it is possible that it could be offset by other factors); and (3) an increase in valuation by financial markets (*i.e.*, a higher stock price).[7]

Effects on overall financial performance: The study that examined the longest-term effects of downsizing on firms' financial performance indices is DeMeuse *et al.* (2004). They tracked 31 companies (14 with no layoffs during the study period; 17 with layoffs in 1989) from 1987 to 1998. After examining five measures of financial performance for each firm, they found no significant difference in the subsequent 9-year financial performance of firms that used layoffs versus those that did not. Firms that used larger layoffs (as a percentage of the workforce) did perform significantly worse than firms that used smaller layoffs, as did firms that made 3 or more separate layoffs.

In an earlier study that tracked firm results using a shorter time horizon, Cascio (1998) examined 311 S&P 500 firms that downsized between 1981 and 1990. He examined four financial measures as well as stock price for the three years preceding the layoff and the three years after the layoff and found that none of the five variables examined was significantly different following the downsizing. In a similar earlier exercise, DeMeuse *et al.* (1994) found similar results in tracking 52 Fortune 100 companies between 1987 and 1991, examining financial results two years before and two years after layoffs. They found significant differences in financial performance between firms with layoffs and firms without layoffs, finding no evidence that downsizing increased profits or otherwise improved financial performance.

Effects on firm productivity: The evidence on the effect of downsizing on firm productivity is mixed. Capelli (1998) examines data at the establishment level and finds that downsizing reduces sales per employee. Baily, Bartelsman, and Haltiwanger (1996) find that productivity declines in plants that downsize during recessions. On the other hand, Espahbodi, John, and Vasudevan (2000) find that operating performance improved significantly following downsizing in 118 firms that downsized between 1989 and 1993.

Effects on stock price: Most studies have consistently observed a negative effect on organisations' stock prices in the short-term following announcements of job cuts (there has been less attention given to long-term effects).[8] The most extensive examination of the short-term effect is a recent study by Farber and Hallock (2004). They examine more than 4 000 job loss announcements among Fortune 500 companies over a 30-year period (1970 to 1999) in order to identify stock market reactions to the announcements, as well as changes in market reaction over time. They find that stock market reaction to layoffs have been negative throughout the entire period examined.

However, Farber and Hallock also observe that the results have become significantly less negative over time, and propose that one possible explanation is that those job loss announcements designed to

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7 See Section III for a theoretical discussion of the relationship between stock price and the incentives faced by many operating executives.

8 See, for example, Abowd, Milkovich, and Hannon (1990); Blackwell, Marr, and Spivey (1990); Caves and Kreps (1993); Hallock (1998); and Baumol, Blinder, and Wolff (2003).

"improve efficiency" have become more common than ones designed to respond to reductions in product demand, and that it is the latter category of announcements that are most likely to generate negative stock market reactions.

Examining effects on stock prices over a longer period of time (2 years following a job loss announcement), Cascio, Young, and Morris (1997) find that firms that downsized did not show higher returns, even after controlling for industry. (They did find, however, that downsizing in combination with restructuring of the firms' assets generated higher returns when compared to averages for the firm's industry.)

Increased use of "offshoring"

Offshoring, a development somewhat related to downsizing, is the decision by employers to move their operations across national boundaries. The increase in "offshoring," while currently still relatively limited,[9] is testimony to the power of the globalisation forces heretofore noted. Since it is a newer phenomenon, there is relatively little research literature on either the scope or the effects of offshoring, so it cannot be explored as extensively as the downsizing phenomenon.[10]

It is still possible, however, to provide some analysis of its likely effects and role. First, it should be noted that offshoring itself (despite the prediction of some expected overall economic gains from economic theory[11]) may represent only a stop-gap solution for employers in high-wage, developed economies that rely on low-wage labour in developing economies. As local knowledge and expertise grows as a result of increased offshoring, this strategy for preserving profits may become less viable as the world economy continues toward ever-greater globalisation.

At the very high, end of the skills distribution, the net effect of increased market size accompanied by increased competition would be expected to be the reverse. In other words, the positive effects from the increase in the size of the market for the goods/services that highly skilled workers and their employers produce tends to outweigh the negative effects of increased competition. These employees and their employers might continue to view the world as "their oyster," even as low-wage workers find themselves in an increasingly difficult economic position.

Between the two extreme ends of the skills continuum, the net effect becomes more difficult to predict. It is undoubtedly very much influenced by technological change. Although the movement toward offshoring began with production jobs, it soon extended into some areas in the low end of the service industry. Data processing jobs were among the first to move oversees, follow by call centers and programming positions. Now, even some accounting and R&D jobs are being offshored.[12]

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9 U.S. Department of Labor data indicates that about 2.3 percent of all extended layoffs were due to companies relocating work out of the country (Brown 2004). (This affected approximately 10 700 jobs in the first three quarters of 2004.) A policy brief by the Brookings Institution, on the other hand, used existing estimates to assess the possibility that offshoring could result in 250 000 layoffs per year, yielding a large effect on the labor force over time (Brainard and Litan 2004).

10 In a recent OECD (2005) analysis, trade data are used to make inferences about the potential magnitude of offshoring.

11 For a discussion of the theory and current contradictory evidence on this topic, see Brainard and Litan (2004).

12 For an additional summary of offshoring trends, including non-production jobs, see the white paper prepared by the Office of Senator Joseph Lieberman (2004).

This sequence suggests that the net negative effect of globalisation on wages will have a growing effect on service workers higher up in the skills distribution with the passage of time. The title of a provocative 1995 article asked "Are Your wages Set in Beijing?"[13] It seems increasingly likely that the answer to that question will be "Yes" for a growing segment of the labour force.

And ultimately, if some pundits are correct, not only may high wages be in jeopardy, but so too high profits, as offshoring enables developing, low-wage economies to more easily develop the expertise necessary to out-compete companies and industries that have turned to offshoring as a current solution.

Summing up changes in management of human resource to maximise value creation

There is significant evidence that firms – especially in manufacturing – have made increasing use of layoffs for non-demand-related reasons (*i.e.*, those reasons that are not driven by changes in macroeconomic activity) over the last two decades, likely at least partly in response to the new economic environment. Similarly, it is clear that offshoring represents an even newer response by firms to the same economic phenomena. While there is not yet research evidence on the effects of offshoring, the research on downsizing clearly suggests that there is little reason to expect downsizing to have a positive effect on the firm, whether considered in terms of its overall financial metrics, its productivity, or its treatment by external financial markets.

III. THE ECONOMICS OF EMPLOYER-PROVIDED SKILLS

Employer-provided skill training represents an alternative response to the forces of technological change and globalization. This section discusses the theory and the evidence on work-based training.

Theory

The Nobel prize-winning economist, Gary Becker, produced the seminal work on the economics of employer-provided training (1962, 1964). Becker's approach still remains the principal theoretical construct that is used for understanding human capital investment, both from the perspective of the individual and the firm. An important contribution of Becker's work was the distinction that he made between skills that are "general" (*i.e.*, have broad application and use across many employers) and those that are "specific" (*i.e.*, those that have use within a particular firm). Reading is, for example, a very general skill—being of use in almost every line of work in virtually every firm. Examples of specific skills are knowledge of the unique production aspects used within one firm or the work practices and process of a team of employees who work together within a firm.[14]

This distinction between general and specific skills is important because it has implications for the nature of the markets that arise both for skill provision and use, as well as who benefits from (and therefore

[13] Freeman (1995).

[14] There are, of course many examples of skills that are neither completely general nor completely specific. Metal working, for example, is of great value in many firms, but of absolutely no value in other firms. The complications that arise from skills that are neither completely general nor completely specific will be discussed later.

pays for) those skills. The predictions that emerge from Becker's model, in which he describes the incentives that workers and firms face for investing in human capital, are the following:

a. Firms and workers "share in" investments in training workers to develop firm-specific skills that are productive at the current firm but not at other firms. Firms finance such training, but the cost is also borne partially by workers who are paid lower wages than they could earn elsewhere if they were not receiving training. After training, these workers receive a wage that is higher than they could earn elsewhere, but lower than the value of the product/service that they produce (hence enabling the firm to recoup the value of that portion of the training that was firm-financed, while avoiding the cost of employee turnover).

b. Firms are unwilling, however, to invest in general skills training (that which has uses at a variety of firms)for their workers, because they cannot recoup their investments in general skills training since workers can simply move to new firms if they are paid less than their marginal value product. As a result, workers themselves must bear the cost of any general skills training that they receive, either directly or by accepting lower wages.

c. There are no particular public policy concerns that arise, since the market creates the optimal level of skills (that which equates the marginal cost to the present discounted value of the future stream of marginal benefits).

Potential market failures in the provision of training

Becker's human capital theory has proven to be a remarkably resilient one. Nonetheless, it is not without its critics. Specifically, more recent authors have pointed to three categories of "market imperfections"—in capital markets, in labour markets, and as a result of risk aversion and information asymmetries—that generate different implications than those summarised above. Most importantly, the existence of these market imperfections results in a systematic under-provision of training (*i.e.*, the present discounted value of the future stream of marginal benefits exceeds the marginal cost of additional training). This, in turn, has potentially important implications for public policy initiatives that could correct the under-provision of training (a topic that is discussed in Section IV of this paper).

Capital market imperfections

Credit constraints that result from imperfectly competitive capital markets can place limits on individuals' abilities to take advantage of superior opportunities to invest in their general human capital — those investments for which the present discounted value of the future stream of marginal benefits exceeds the marginal cost of additional training (Stevens, 1999). In combination with difficulties in diversifying one's human capital as noted below, capital market imperfections result in sub-optimal investments in general skills. These types of imperfections point to an appropriate role for public policy in reducing the cost (price) for individual investments in general training (a topic that is discussed in Bo Hansson's paper.)

It is also possible that firms (especially smaller) ones could face liquidity constraints that prevent them from borrowing to invest in training that could generate returns in excess of the cost of the borrowed funds.

For the perspective of publicly traded firms, current accounting and reporting requirements may generate under-investments in training, since training investments are typically accounted for as a "cost",

and are generally not reported (resulting in higher "overhead costs" that negatively impact short-term earnings).[15]

Labour market imperfections

Stevens (1999) discusses the implications of "a third" category of skills—which he refers to as "transferable skills"—those that are neither completely specific nor general. An example of these type of skills is metal working, which has value in some types of firms (and hence has some "generality") but is not valuable in all firms (and hence is not "completely general").

The existence of these transferable skills, particularly in combination with other "frictions" in the labour market (such as mobility costs, and search and matching costs), tends to generate an "imperfectly competitive" labour market. In essence, these costs tend to turn general skills into specific skills, thereby reducing the scope of the market that workers have for them (Acemoglu and Pischke, 1998, 1999a, 1999b). If there are a small number of firms that employ workers with a particular set of skills, competition among these firms may not be sufficient to drive wages up to the marginal value of the workers' product. This, in turn, reduces workers' willingness to "invest" in the skills in question, by accepting lower wages during the training period, and can result in a sub-optimal level of investment in training.

A related issue in known as the "hold up" problem. This occurs when employers renegotiate the wage rate to be paid after an investment in specific skills has been made (Prendergast, 1993; MacLeod and Malcomson, 1993). The fact that specific (or transferable) skills have no (or limited) value outside of the current employer, generates a "hold up" incentive, which in turn, generates an *ex ante* incentive to under-invest on the part of the workers.

Perhaps the most obvious labour market imperfection results from the positive externalities that training creates. Because of turnover, the investment made by one employer in an employee's training has the potential for generating profit for another employer (to whom the employee moves after the training occurs). This externality creates an incentive for poaching, which increases turnover and reduces the incentives to train (Stevens, 1996; Katz and Ziderman, 1990).

The poaching problem that arises from positive externalities is likely to be most severe in geographic areas where there is a dense population of employers within a particular industry. However, positive networking effects (*i.e.*, greater innovation and flow of ideas) are more likely to occur under these circumstances, possibly partially or completely offsetting the negative effects of density (Brunello and Gambaratto, 2004).

Externalities, in combination with "coordination problems" between workers and firms, give rise to the possibility of multiple equilibrium emerging with regard to skills and wages. Firms make decisions on the technologies in which to invest, and workers make decisions on investments in human capital (particularly general human capital). These investments are complimentary to one another. Firms' returns to their investments in technology are contingent upon workers' investments in the necessary human capital to support those technologies. Similarly, workers' return on their human capital investments are contingent upon firms' decisions to invest in technologies that are complimentary to their human capital. Hence when skills are in short supply, firms may choose not to invest in technologies for which a high level of human capital is complimentary. This would, in turn, reduce individual's incentives to invest. The result would be a low-skill, low-wage equilibrium (Snower, 1996). However, the networking externalities noted above could lead to a high-skill, high-training, high-wage equilibrium (Acemoglu, 1996; Redding, 1996; and Acemoglu and Pischke, 1998).

[15] See Section III for a more detailed discussion.

Finally, Becker noted that the existence of minimum wages—which could be characterised as a labour market imperfection—can generate under-investment in training, as employers are precluded from lowering wages below the minimum level during the period during which training is taking place. But in the presence of monopsonistic power on the part of employers, minimum wages might result in an increase in training for minimum wage workers (Stevens, 1994). The greater is the monopsonistic power, the greater is the potential difference between wages and the marginal value of workers' productivity, and hence the greater is the potential for wage reduction to be used as a mechanism for financing training.

Risk aversion and information asymmetries

As previously noted, diversification of human capital investments can be quite expensive, and as a result, individuals tend to specialise. Risk averse individuals will under-invest because of uncertainties about their ability to acquire a specific qualification or skill level or because of potential, but unforeseeable declines in demand for specific skills (Layard, Robinson, and Steedman, 1995). Since, in general, insurance does not exist for these types of risks, risk averse individuals are unable to spread their risks.[16]

Trendle and Siu (2005) note because workers typically will have limited information about the quality and value of (specific or transferable) skills that a prospective employer may provide. This information asymmetry (firms know more about this than do prospective employees) will further reduce workers willingness to invest in skills—once again, resulting in a sub-optimal level of investment in training.

Another potential information asymmetry arises from what is referred to as the "principal/agents" problem—the class of issues that arise when the mangers of a firm (the "agents") have more information about its operations, along with potentially different preferences than do the owners of the firm (the "principals"). This problem is likely to be particularly acute in publicly traded firms, but could exist in any environment where the managers are not the owners.

Stock options are an attempt to solve principal/agents problems by aligning the interests of the two parties. But such contracts—which are implicitly tied to share price—"can create incentives for managers to try to manipulate the share price rather than maximise the value of the firm" (Grant, King, and Polak, 1996). Since investments in training are typically accounted for as a "cost", these investments have the effect of lowering short-term earnings. This, in turn, has a negative effect on share price. Hence, managers who are focused on share price (because of stock options), have an incentive to reduce training investments because of their short-term effect on share price, despite their potential for maximising the long-term value of the firm. Consequently stock options—which are intended to align the interests of agents with their principals—may have the unintended consequence of doing the opposite when it comes to making investments in training. Evidence that is consistent with this possibility is discussed at length later in this section.

Evidence on the effects of training on workers

Becker's arguments (as well as most subsequent arguments) assume that training enhances the productivity of workers and their firms. Empirically determining the degree to which this is true in practice has proven to be difficult. That firms voluntarily train workers might be viewed by some as *prima facie* evidence that training produces a sufficiently large gain in productivity to justify the costs. Yet private training may simply be a form of worker consumption, as appears to be the case with employee involvement programs (Freeman and Kleiner 2000). Alternatively, training may simply serve as a

[16] Unemployment insurance does provide some minimal level of insurance against the latter risk, as do programs such as trade adjustment assistance.

signaling device for productive worker attributes that are difficult for firms to observe directly (Spence 1973, 1976).

Much of the research to date on the effects of private training on productivity has relied on micro-data for individual workers, in which productivity is typically measured through wages.[17] This type of analysis, however, will miss any gains in productivity that arise from training that are captured by the firm rather than the worker, as may occur when there are labour market frictions (Acemoglu and Pischke 1998, 1999a,b),[18] or may confound the effects of training with those of worker ability.[19]

Moreover the micro-data that have been used in this literature are limited in a number of ways (Brown, 1990). First, many studies obtain individual-level data by asking firms to report information on the most recently hired worker. This practice may lead studies to understate both the prevalence and effects of private training if workers in high-turnover jobs are less likely to receive or benefit from training (Lynch and Black 1998). National population surveys such as the Panel Study of Income Dynamics and the National Longitudinal Survey may provide more representative samples of workers, but typically provide relatively little information about respondents' firms (Brown 1990; Lynch and Black 1998). And most studies rely on workers to self-report their training experiences, which may lead to substantial measurement error with the key explanatory variable of interest (Bartel 1995).

Evidence on the effects of training on firms

Findings in Europe

Other research uses firm-level data to identify the impact of human capital investments on firm performance. Two reviews of this research are particularly noteworthy. The first literature review concludes that "increasingly, studies provide evidence that training generates substantial gains for employers. The most compelling evidence is presented in several recent papers connecting training investment with changes in productivity, profitability, and stock market performance." This review (Hansson *et al.* 2003) highlights six specific studies that most strongly support this general conclusion: Barrett and O'Connell (1999), Dearden *et al.* (2000), Groot (1999), Hansson (2001), d'Arcimoles (1997), and Bassi *et al*. (2001).

The Hansson review is the most comprehensive review of the firm-level evidence. It should be noted that, with the exception of the last article cited above, all of the key articles cited by Hansson *et al.* used data from one or more European countries. This reflects the fact that there is generally better data on firms' investments in employee development available in Europe than there is in the United States.

The second recent review of literature that uses firm-level data focuses primarily on U.K. research (Tamkin *et al.* 2004) summarises the main findings of that research as follows:

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17 These studies relate the training participation and productivity of individual workers using data obtained from surveys of either individuals directly, or of firms (who are then asked to report on selected workers). See for example Barron, Black and Loewenstein (1989), Brown (1989), Lillard and Tan (1986), Holzer (1990), Booth (1991), Bartel (1992), Lynch (1992), Mincer (1993), Groot, Hartog and Oosterbeek (1994).

18 Studies by Bishop (1994) and Bartel (1995) attempt to address many of the problems with wages by focusing on worker performance as judged by subjective supervisor ratings (either on a survey or as part of the company's performance scoring system). Krueger and Rouse (1998) supplement earnings and subjective productivity assessments with other productivity measures such as job attendance, although these data are only available for employees in two firms.

19 Bartel (1995) attempts to address this endogeneity problem by using the employee's salary relative to others within the firm in the same job category as an instrument for training participation.

- "The evidence is that the benefits to the firm exceed the wage costs paid back to the individual.
- High performing firms employ better educated people than low performers.
- Better educated workforces are associated with higher productivity and other organisational outcomes.
- Matched plant research has suggested skills are an important component of the skills gap with competitor nations.
- Higher levels of training are associated with positive business benefits in several studies but not all
- There is mixed evidence regarding the kinds of training and their link to business outcomes.
- Evidence suggests consistent trainers achieve greater returns."[20]

A recent European study that is particularly noteworthy (Hansson; 2005) analyzes data on nearly 6 000 private sector organisations in 26 countries (primarily in Europe, but including a small number of non-European countries). This study concludes that "Staff turnover (mobility) does not appear to be a decisive factor in explaining the provision of training on a national or company level though it is to some extent associated with profitability. However, the single most important factor associated with profitability is how much is invested in training (intensity), suggesting that the economic benefits of training outweigh the cost of staff turnover."

Findings in the United States

The firm-level data that served as the basis for the studies summarised in the two literature reviews noted above have been unavailable to most researchers on U.S. firms, and hence, most of the U.S.-based literature has been confined to examining aspects of firms' training other than the actual spending level on training. Nonetheless, there are important conclusions that have emerged from the analysis in the United States as well.

Effects on productivity, sales, and profitability

Bartel (1994) presents one of the first attempts to estimate the effects of training on productivity in U.S., using a 1986 sample of 495 U.S. manufacturing firms. She finds that the provision of training programs between 1983 and 1986 is positively correlated with firms' 1986 sales per employee. However, the key explanatory variable of interest in her analysis is simply an indicator for whether the firm provides any formal training to employees, and not the dollar amount spent on training.

Holzer *et al.* (1993) analyze data for 157 Michigan manufacturing firms that had applied for state subsidies to support private training programs. They find that receipt of a training subsidy increases training hours within a firm by a factor of two to three in the short term, and reduces output "scrap rates" by around 13 percent. The dollar value of this reduction in scrap rates is between $30 000 and $50 000 per year. The survey does not, however, identify the training costs actually borne (invested) by the firm.

Black and Lynch (1996) analyze data from the National Center on the Educational Quality of the Workforce (EQW)'s national 1994 telephone survey of 2 945 private firms with more than 20 employees.[21]

[20] Tamkin, *et al.* (2004), p. 29.

Respondents were asked to report on a variety of 1993 firm characteristics, as well as questions about training practices such as whether the firm provides any formal or structured training or any informal training to its employees. The survey does not include information on firm training expenditures, or any information that would enable us to convert the available indirect training measures into dollar terms. Black and Lynch find that the log of the number (or proportion) of workers who are trained in either 1990 or 1993 does not have a statistically significant correlation with the log of the firm's 1993 sales for either manufacturing or non-manufacturing firms. The provision of computer training has a positive, statistically significant correlation with sales for non-manufacturing firms (although only at the 10 percent significance cutoff), but not for manufacturing establishments. Interpretation of these estimates is complicated further by the fact that the EQW provides only cross-sectional data on firms, which limits the authors' ability to control for unmeasured firm characteristics.[22]

In one of the few U.S.-based studies that analyzed actual training expenditures, a recent analysis of financial institutions conducted for the American Bankers Association (2004) found that those financial institutions with higher-than-average training expenditures per employee subsequently had better outcomes than other institutions on five key financial measures examined: return on assets, return on equity, net income per employee, total assets per employee, and stock return.

Effects on employee retention

Heskett *et al.* (1994) found that one of the most important predictors of whether an employee will stay with his/her current employer is the employee's satisfaction with the opportunities provided for learning and development. Further, the same study found that a firm's ability to retain its key employees is, in turn, a fundamental determinant of a number of important outcomes, such as customer satisfaction, sales per employee, and market capitalization. In an examination of truckers in the United States, Shaw *et al.* (1998) found no significant relationship between voluntary turnover (*i.e.*, quitting) and the level of training provided, but that there was a significant relationship between discharges and the level of training, with employees less likely to be fired or laid off in organisations with higher rates of training.

Effects on customer retention

Research by ASTD (2000) found that there is a powerful correlation between training expenditures per employee and firms' customer retention rates. This can have a significant effect on firm performance. One study found that a 1 percent reduction in customer attrition can add as much as 5 percent to a company's bottom line (Peppers and Rogers 1993).

Other significant factors affecting firms' training decisions

It is an accepted tenet of economics that a necessary condition for maximising profitability is for the firm to invest in each "factor of production" – labour, capital, natural resources, etc. – up to the point at which the marginal return on an additional dollar spent is the same for each of the factors. Over-investment in any particular factor will result in a lower return on that factor. Similarly, an under-investment in a factor will result in a *higher* return on that factor.[23]

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21 The discussion of the EQW survey data draws on Black and Lynch (1998); also see www.irhe.upenn.edu/~shapiro/.

22 For further discussion of this literature see Bartel (2000).

23 The marginal return is higher on factors in which there has been under-investment (*i.e.*, an inefficiently low level of investment) because additional higher returns could have been achieved with additional marginal dollars of investment.

To put it another way, if a business is allocating its scarce resources efficiently, it would find that, at the margin, its "return" on investments in its people is identical to its returns on investments in its other factors of production. If returns on certain factors are higher than returns in other areas, it can be concluded that the firm is under-investing in that factor. As discussed in the following subsection, this is exactly what is fould in the area of human capital investments. Specifically, our research suggests that returns to investments in employee training are consistently "super-normal." This suggests that there is a general under-investment in human capital; the average firm tends to invest less than the efficient amount in its people.

Why would firms ignore the obvious and under-invest in this particular factor? One primary explanation is that financial markets pressure firms to minimise any investment that is accounted for as a "cost." Consider two organisations that are identical in all but one respect: Company A makes substantial investments in skills, while Company B does not. What will be evident to an investor comparing the companies' income statements is that Company A has higher overhead (selling, general, and administrative expenses, or SG&A) and correspondingly lower reported earnings than Company B. What will not be evident, however, is that some of what was classified as an expense for Company A is actually an investment in future productivity.[24] Consequently, Company A's stock prices would be expected to be lower – at least in the short-run – than Company B's. The decision of Company A to invest in learning and development thus occurs *despite* pressures from financial markets. All firms – even those that have made significant human capital investments in the past – continually face this structural pressure to cut those investments in the short run to generate temporary increases in earnings. This pressure creates behaviour that yields a "super-normal" return on human capital investments.

Moreover, workers' mobility (*i.e.,* the possibility that the investment can "walk out the door" one day and not return) hinders firms' ability to recoup their return on investments in human capital. This introduces a unique element of risk into human capital investments, above and beyond the usual level of risk inherent in any form of investment. To the extent that firms are risk-averse, disincentives to invest in human capital development are compounded.[25]

Evidence on training's impact on stock prices

It has proven quite difficult to identify the effect of training on stock prices, precisely because the current invisibility of firms' investments in developing their employees is a root cause of the under-investment in them. Unlike all other major categories of investments that firms make to enhance their future productivity and profitability (*e.g.,* physical plant and equipment, research and development), investments in developing human capital are neither separately accounted for, nor are they publicly reported. These investments are thus essentially invisible to most investors (with the important exception of the fact that they raise costs in some indeterminate way)

Over the course of the past 10 years, the authors have systematically collected data on how much firms spend on employee education and training, which has created the opportunity to examine this "invisible" investment. The data collection effort began in 1996, when both authors worked in the research department at the American Society for Training and Development (ASTD), a large membership organisation that represents the individuals responsible for workplace employee development inside of corporations.

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24 Research and development investments are also accounted for as expenses. However, unlike training investments, they are separately reported.

25 If firms are risk-neutral, as is typically posited in the classical theory of the firm, the risk that results from worker mobility would not have the effect outlined above.

At the time the work began at ASTD, little was known about how much firms were spending on employee development. In fact, there wasn't even common agreement about the definition of what should constitute spending or investment on employee development. A consortium of large firms worked with the authors to correct the definitional deficiencies, and established a system to collect comparable data across a large number of organisations. (The system included a key incentive for firms to report their data to ASTD: each would receive a free customised benchmarking report that analyzed their investments relative to other comparable organisations.)

Over the course of a few years, the database grew to over 3 000 organisations from both inside and outside the United States, including for-profit firms, not-for-profit organisations, and government agencies. Of these 3 000 organisations, 575 of them were publicly-traded firms that were based in the United States. As publicly-traded firms, each of them was required to publicly report extensive financial information each year. In combination with data on financial performance, the database of training expenditures, therefore, provided the opportunity to examine whether the economic logic outlined above was correct.

Our analysis found that those firms that made large investments in employee development subsequently outperformed the stock market, with returns that were significantly higher ("super-normal") relative to those for other factors of production.[26] Training and development expenditures per employee proved to be an important leading indicator of future stock prices.

As part of the analysis, a series of hypothetical annual portfolios of firms that made the largest investments in employee development between 1997 and 2001 (see Figure 3 below) were constructed. These firms *subsequently* outperformed the S&P 500 index (including dividends) by more than a factor of two in the years following the investment (117 percent versus 66 percent). This corresponds to an annualised return of 16.3 percent over the five years for the "high investors," compared with an annualised return of 10.7 percent for the S&P 500 for the same period. Although these results held true in both bull and bear markets, and across sectors of the economy, they must nonetheless be interpreted with caution.[27]

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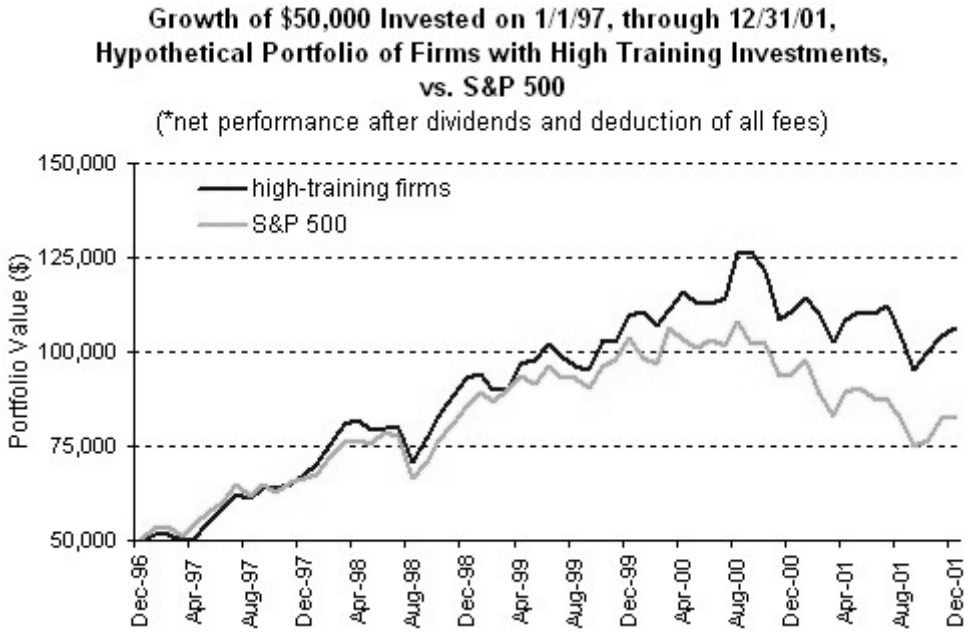
26 See Laurie Bassi, et al., "Human Capital Investments and Firm Performance," white paper, June 2001. Available in the Research section of www.bassi-investments.com.

27 There are limitations inherent in any hypothetical results, including the fact that the results do not represent actual trading and may not reflect the impact of material economic and market factors on qualitative decisions that investors (or their advisors) might make when managing assets. Moreover, hypothetical results may not include the performance of securities and classes of securities that would be included in actual portfolio recommendations, and any revisions to the model may affect future results. Finally, hypothetical performance is not a guarantee of future results, and is not indicative of actual results for any past or present clients. S&P 500 performance is based on published data of S&P 500 price change index, including dividends.

Figure 3.



In sum, firms' investments in employee development were found to be the single most powerful predictor of future stock prices.

Explaining the evidence on training's impact on stock prices

How could information on education and training investments represent such a powerful predictor of stock performance? The answer can be found in a mainstream model of how the stock market works. In general, the stock market behaves quite efficiently. As Burton Malkiel has convincingly demonstrated in his well-known treatise *A Random Walk Down Wall Street*, stock price movements are, in general, impossible to predict because markets are quite efficient in rapidly incorporating all known relevant information about a firm into its current share price. Hence, all known information quickly ceases to predict *future* prices. Consequently, leading indicators of stock prices are virtually impossible to find, precisely because the market is so efficient at reflecting all available information in current prices.

Given this efficiency, two conditions must be met in order for a piece of information to represent a leading indicator of future stock prices. First, of course, the information must be relevant (*i.e.*, material to a firm's future performance). Second, this information must *not* be publicly known (because if it were, it would already have been incorporated into the share price). Information about firms' investments in employee development meets both of these conditions. Indeed, not only is information on investments in employees unknown to market observers, but it actually appears to be something very different. As noted in the thought experiment, "high-investment" firms actually appear to analysts to be "high-cost" firms, and they are actually penalized in the short-run, rather than rewarded, for these investments (which are instead seen simply as high costs).

Box 1. Testing the evidence

These findings outlined in the text have been used (along with ongoing data collection and analysis) as the basis for an investment management firm (operated by the authors of this paper). The live track record of the firm's three recommended is summarised below.

Performance of Recommended Portfolios

	Performance since 1/2/03	
	Including fees	Excluding fees
Portfolio A	58.2%	64.5%
Portfolio B	65.8%	72.3%
Portfolio C	59.0%	65.3%
S&P 500	*53.5%*	*53.5%*

*Portfolio performances as of 1/31/06 and includes dividend reinvestment and (except where noted) all fees and expenses.
**S&P 500 price change index; provided for comparison only.

All three recommended portfolios have outperformed the market (both with and without fees included in the calculation). This provides important "real world" evidence in support of the logic, as outlined in the text, that there is widespread under-investment in employee development.

Caution is, of course, in order. First and foremost, past performance is not a guarantee of future results. And the evidence is currently based on results from a relatively short period of investment.

Summing up

In summary, pressures from financial markets are likely to create incentives for publicly-traded firms to under-invest in employee development. Paradoxically, such investments appear to earn a high return for those firms that resist existing pressures and make significant investments in their employees' learning.

The theoretical issues discusses earlier in this section suggest, however, that this under-investment is probably *not* limited only to publicly-traded companies. But if firms that make investments in employee education and training perform better than comparable firms that don't, then why don't more firms make larger investments? Pressures from financial markets can't explain the under-investment that seems to occur in privately-held companies or other organisations. This issue is addressed in the next section.

IV. ENHANCING MANAGEMENT OF HUMAN CAPITAL

Employee skills, however necessary, are not sufficient to generate productive and profitable workplaces. Most of us have been in situations, at one time or another, where we were unable to put our skills to their maximum use because the work environment made it impossible to be highly productive. Put differently, the development of employees' skills is only a part (albeit a very important part) of the larger set of issues associated with the management of employees.

As discussed below, the complexity and difficulty of getting these broader "human capital management" issues right may represent a constraint that firms must overcome before they are able to benefit from investments in training. Looked at from a somewhat different perspective, this may be another version of the "coordination problem" discussed in the previous section. Firms may not be able to make optimal use of human capital (or the investments that they make in it) unless the requisite human capital management expertise exists within the firm (or can be readily developed or "purchased"). The return to that expertise hinges upon the existence of (or the capacity to efficiently invest in) the requisite level of human capital. Hence, it may be rational for firms to "choose" a low-wage/low-skill equilibrium.

The discussion that follows is designed to shed light on this possibility by examining the factors that must be addressed within organisations that are seeking to improve its work environment in an effort to increase overall effectiveness and productivity.

Evidence on human capital management and value creation

The "high performance work practices" literature seeks to address this set of issues by examining the bundles of human capital practices that, taken together, optimise performance. In addition to training, the practices that have been examined in this literature include the following: profit and gain sharing, employee participation in decision making, team work, job design, and worker autonomy. Identifying the effects of these practices, either separately or in groups, has proven to be quite challenging. A big part of the challenge is that these practices do not arise in a vacuum, but rather are in response to a set of business circumstances that a firm faces. Hence, it can be quite difficult to isolate and separate out the effects of these circumstances from the effects of the human capital practices that arose as a result of them.

A recent review of this literature concludes that, "Despite these methodological questions and concerns, the weight of evidence and the consistency of the general direction of results—even if not the finer detail—presents a strong and persuasive case that skills embedded within other HR practices do make a difference to business performance. The critical value of the research in high performance work systems is in highlighting the importance of considering investment in skills and workforce development in the context of the broader company structure, practices and company strategy. It is important to see skill as one input, which in combination with a number of other inputs, can make a positive contribution to organisational performance."[28]

[28] Tamkin, et al. (2004), 37.

A number of U.S. studies are also particularly noteworthy because they are based on large-scale empirical studies and employ consistent measurement methodologies. Pfau and Kay (2002) used a sample of 750 large, publicly-traded firms and found evidence that superior human capital practices are a *leading* indicator of financial performance, and that those organisations with the best human capital practices provide returns to shareholders that are three times greater than those of companies with weak human capital practices. The study then delves more deeply into specific practices, finding that there are some that improve shareholder value: total rewards and accountability; collegial, flexible workplaces; recruiting and retention; communications integrity; and focused HR service technologies.[29]

Low and Kalafut (2002) examined the importance of "intangible" factors in firms' performance, and found that the quality of a firm's human capital is one of the four most important determinants of a firm's future financial performance (along with networks and alliances; brand equity; and technology and processes). Similarly, Buckingham and Coffman (1999) co-authored a study by Gallup that found that the quality of management was a key factor in determining employee retention, customer satisfaction, and productivity. Becker, Huselid, and Ulrich (2001) point to the importance of high performance work practices generally in creating superior financial results.

Applying research results to human capital management

Thus, there is a growing body of evidence has identified a variety of human capital practices that can play an important role in improving firms' financial performance and other key operational outcomes. Since 2001, we have been building on the results of that literature to develop tools that enable a systematic exploration of those elements of human capital management that can predict future business performance. Our approach has been designed to deploy the most important elements from a variety of research designs, including the studies noted in the text, and combine them into a single methodology capable of capturing key measurement information in almost any type of organisation. The intent of our approach has been to create an enhanced understanding of the human capital drivers—including employee training, but also including a wide variety of additional factors related to employee development, management, policies, and practices—that allow organisations to benefit most from the investments that they make in their workforces.

The methodology measures 69 different human capital items within an organisation. These items are grouped into five human capital "indices," with three to six underlying subgroups (referred to as "factor" groups) included in each index category, for a total of 20 subgroups. Definitions of these indices follow.

29 The Pfau and Kay study also reported that a group of human resource practices that they generally label "Prudent Use of Resources" is associated with a decrease in market value. Some have incorrectly interpreted this finding to mean that there is a negative relationship between market value and training and development expenditures. The name of the category is highly misleading, however, as only two of the six specific elements in the category are in any way related to training and development, and neither captures more than an extremely small slice of any firm's overall investment in training.

Table 2. Definitions of Human Capital Indices and Their Associated Factors

Index	Definition	Factors Included
Leadership Practices	Managers' and leaders' communication, performance feedback, supervisory skills, demonstration of key organizational values, efforts and ability to instill confidence.	Communication - Managers Communication – Executives Inclusiveness – Managers Inclusiveness – Executives Supervisory Skills Executive Skills Systems
Employee Engagement	The organization's capacity to engage, retain, and optimize the value of its employees hinges on how well jobs are designed, how employees' time is used, and the commitment that is shown to employees.	Job Design Commitment to Employees Time Systems
Knowledge Accessibility	The extent of the organization's "collaborativeness" and its capacity for making knowledge and ideas widely available to employees.	Availability Collaboration & Teamwork Information Sharing Systems
Workforce Optimization	The organization's success in optimizing the performance of its workforce by establishing essential processes for getting work done, providing good working conditions, establishing accountability, and making good hiring choices.	Processes Conditions Accountability Hiring Decisions Systems
Learning Capacity	The organization's overall ability to learn, innovate, and continually improve.	Innovation Training Development Value & Support Learning Systems

The standardised nature of the elements makes it possible to examine the common human capital drivers *across* organisations. The methodology has also been used multiple times in some organisations, thereby enabling us to analyze the true drivers of *improvement* (as opposed to potentially spurious correlates of performance). Finally, it is possible to measure these drivers at a highly "disaggregated" level within any organisation. This makes it possible to analyse the drivers of productivity and key outcomes even *within* a given organisation, using the natural variation in human capital practices and outcomes that occurs across comparable units (*e.g.*, bank branches, sales offices, or schools) within any given organisation.

The process of deploying the methodology's full set of items across a range of organisations has itself revealed some valuable lessons regarding the measurement of human capital management within an organisation.

a. By posing factual statements and asking employees to evaluate the extent to which these statements do or do not apply to their work environment, we have found that employee surveys can be used to capture human capital metrics and information that predict future business results.

b. An advantage of employee surveys is that they can quickly and inexpensively be used to generate highly disaggregated measures of the variations in the quality (or "maturity") of human capital management both within and across organisations.

c. These measures of variations in human capital management can then be used to systematically identify opportunities for reducing undesirable variation – essentially introducing six sigma techniques into the domain of human capital management.

Analysing the proposed human capital measurement methodology

We conducted three different analyses to examine the consistency of the relationships across organisations: an analysis of the internal consistency of the factor subgroups, an analysis of how the factor groups relate to one another, and an analysis of the consistency with which specific items were found to predict key results across multiple types of organisations.

Checking internal consistency

In order to examine the validity of the conceptual factor subgroups that were developed for this framework, we conducted a statistical analysis of the internal consistency of the items in each factor subgroup. The core of this analysis was the calculation of a statistic called *Cronbach's alpha*, a measure of internal consistency that is based on the average inter-item correlation among elements in the same group (in this case, within the same factor group). The results from this analysis strongly suggest that, with few exceptions, the factor subgroups included in the analysis have substantial internal consistency and are indeed related elements.

Interestingly, the lowest levels of internal consistency were observed for those organisations with the lowest observed levels of human capital maturity. This finding is consistent with a "six sigma" perspective on human capital management; organisations that have low maturity in this regard have not yet learned to be consistent in their human capital management practices.

Factor analysis: seeking a smaller set of underlying factors

The second quantitative exercise used *factor analysis* to examine the relationships across the 20 different factor subgroups delineated above. Factor analysis attempts to identify *underlying* (unobserved) variables, referred to as "factors," that explain relationships among a set of observed variables. It is frequently used as a method of "data reduction" to identify a small number of variables that can explain a substantial percentage of the variation among a much larger set of intercorrelated variables. Although there are many different specific methods that can be used to conduct a factor analysis, the goal is the same regardless of technique: identify a simple structure of factors that explain the full set of observed variables within a data set. The substantive meaning and interpretation of any factor that emerges is determined by examining the correlations ("loadings") of the observed variables with the newly emergent factor.

The factor analysis was designed to shed additional light on whether the human capital framework described above is a meaningful way to observe and measure (and ultimately manage) human capital elements within organisations. In particular, by examining whether the multiple subgroups above can be condensed into a smaller set of underlying factors, we can determine whether there are certain subgroups that reliably co-vary, indicating that they are each essentially measuring some components of the same single phenomenon.

One clear underlying factor emerged from the cross-organisational analysis (indeed, it was present in all organisations included in the analysis): a factor that includes all three subgroups related to

organisational *executives* (Executive Communication, Executive Inclusiveness, and Executive Leadership). These three subgroups reliably loaded onto a single underlying factor in all analyses.

There were no other clear patterns across organisations in the factor analysis, although there were a small number of additional relationships that were observed in multiple organisations. For example, the "time" subgroup emerged in factors along with a variety of other subgroups, including "conditions," "knowledge availability," and "accountability." This result suggests that "time" elements (workload allows employees to do their jobs right, make thoughtful decisions, and achieve an appropriate balance between work and home) are not always independent human capital inputs, but should perhaps also be seen as something of an intermediate outcome, related to other human capital characteristics of an organisation, such as its working conditions, easy availability of necessary information, and employee accountability.

The only other pattern that emerged in a substantial percentage of the organisation was a relationship of "knowledge availability" in an empirical factor with "conditions" and/or "training." All three of these subgroups are related to the availability and accessibility of components (information, materials/equipment, and training) that are necessary for an employee to work effectively. In some organisations, there thus appears to be a correlation in the availability of multiple categories of components, while in other organisations, the availability of these items tends to vary independently.

The factor analysis results, combined with the Cronbach's alpha results, indicate that the proposed framework and methodology is indeed appropriate for measuring, and evaluating human capital capability within a broad range of organisations—both in the U.S. and around the globe. The factor subgroups are internally consistent, while, with one major exception (executive leadership items), they are also usually independent, measuring distinct elements of an organisation's human capital capacity.

Human capital, work organisation and value creation

There is substantial research evidence that the components that were incorporated into the described human capital methodology are associated with variations in organisational outcomes – both financial and other key results (*i.e.*, those items that are most closely associated with outcomes in previous research represent the core of the items that comprise the methodology being examined). Now that the same methodology has been implemented in multiple organisations, one key question emerges: assuming that the human capital items[30] continue to be associated with organisational outcomes, are the relationships fairly similar across organisations, or are there different relationships within different organisations?

Unfortunately, a consistent analysis across multiple types of organisations is made more difficult by a number of administrative or technical issues: different types of outcomes across organisations, a small number of units of analysis in some organisations (since outcomes are typically measured at the level of location, branch, or business unit), and imperfect timing of the available data (*e.g.*, to examine the impact of human capital on outcomes, it would be ideal to have human capital data for one point in time, and then outcomes data for a period that immediately follows the human capital information).[31] Such issues can be addressed in the future as more organisations use the methodology and as time elapses, allowing additional sets of outcomes data to be analysed. For purposes of the current analysis, however, none of the outcomes

[30] Analysis of relationships with outcomes was done at the level of the individual human capital item (*i.e.*, one of the 69 items in the core questionnaire) because it is at that most specific level that any findings are most precise (as well as most useful and actionable for organisations using this framework). More general findings (*e.g.*, at the factor subgroup level) are discussed in the following section.

[31] Since the current version of this methodology has only been in use for approximately one year prior to this paper, "properly-timed" outcomes data are typically not yet available from all of the organisations that have used the methodology.

data examined occurred subsequent to the date of the human capital data gathering, but were often contemporaneous in nature.[32] By using common statistical methods (in particular, correlation analysis), we were able to generate statistics with some limited comparability, after taking into account the fact that the outcomes being examined were often significantly different across organisations.

Financial outcomes

There were three organisations that both deployed the full human capital methodology and were able to provide key organisational outcomes for a sufficient number of organisational subunits to make correlation analysis feasible. Two were multi-national manufacturing firms (one large; one medium size) and the third was a public school district in the United States. They each identified and provided different outcomes that they used as key indicators of their organisational success:

a. one manufacturing firm selected a financial index consisting of multiple measures of profit, all calculated on a per employee basis,

b. the other manufacturing firm identified an internally-generated index of efficiency and success by sales office,

c. the public school district selected a standardised achievement test used by schools nationwide.

In each case, we analysed the relationship between the 69 individual human capital items and its selected measures of success. In all three cases, we found a significant and positive relationship with the outcomes measures for a large number of human capital items, and no statistically significant negative relationships. Naturally, because the nature of the outcomes measures, as well as the number and nature of the units being examined, varied so dramatically across organisations, the magnitudes of the correlation coefficients and the number of correlations that were statistically significant also varied substantially.[33]

The strength of these findings in the three organisations provides additional suggestive evidence supporting the research findings cited previously: this core group of human capital items does contain numerous indicators that are associated with organisational outcomes, across multiple types of organisations.

Equally interesting, however, is the pattern of correlations across organisations. Table 3 provides the actual correlations (all are statistically significant) for the 10 items with the highest correlation coefficients in each organisation, sorted by the five main index categories within the framework. (For purposes of enhancing data anonymity, the organisations were randomly assigned the names "Organisation A," "Organisation B," and "Organisation C.") Twenty-five of the 69 items was in the top 10 items for at least one of the organisations. Only 5 of the 69 items, however were in the top 10 for two of the three organisations, and none was in the top 10 for all three organisations. A number of the top 10 items in one organisation were ranked 60th or higher in one of the other organisations.

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32 Based on other analysis, we believe that this means that the analysis that follows is a quite conservative one in that the results will become stronger and more significant as subsequent outcomes data become available.

33 The percentage of the 69 items that were significantly and positively correlated with the selected outcomes measures ranged from 33 percent to 100 percent across the three organisations. As noted above, none of the 69 items was significantly and negatively correlated with the outcome measures in any organisation.

Table 3. Top 10 Human Capital Items Correlated with Key Organisational Outcomes, Selected for Each of 3 Individual Organisations (2 manufacturing, 1 public school district)

	Organisation A		Organisation B		Organisation C	
Human capital item	**correlation**	**rank**	**correlation**	**rank**	**correlation**	**rank**
LEADERSHIP PRACTICES						
Question #1	0.57	5				
Question #2			0.21	8		
Question #3	0.56	8				
Question #4					0.37	7
Question #5	0.55	10	0.33	1		
Question #6	0.56	7				
Question #7	0.59	3	0.22	6		
Question #8			0.26	3		
EMPLOYEE ENGAGEMENT						
Question #9	0.63	1				
Question #10			0.27	2	0.43	4
Question #11			0.21	9		
Question #12	0.56	6			0.37	8
Question #13					0.49	1
Question #14					0.42	5
KNOWLEDGE ACCESSIBILITY						
Question #15					0.35	10
Question #16			0.22	7		
Question #17			0.21	10	0.47	2
Question #18					0.41	6
Question #19			0.25	5		
WORKFORCE OPTIMISATION						
Question #20	0.60	2				
Question #21	0.58	4				
Question #22	0.56	9				
LEARNING CAPACITY						
Question #23			0.26	4		
Question #24					0.45	3
Question #25					0.35	9

This is a remarkable finding. It confirms that the core list of 69 items does indeed contain a wide variety of human capital elements that are statistically associated with key organisational outcomes, but that the exact list of items that are most closely related to key outcomes in any given organisation bears little relation to the list of most important items in other organisations, even (in the case of the two manufacturing firms) within the same industry. It points to the complexity of measuring and managing human capital within organisations: there is no handy list of a small number of items that can be targeted in a quick effort to address an organisation's human capital deficiencies. Rather, a wide range of items, across multiple categories of human capital, must first be examined in order to identify those that are most closely related to the outcomes that the organisation is seeking. Only then can an organisation know where its human capital improvement efforts might most usefully be targeted.

Employee satisfaction/commitment outcomes

Additional evidence on the above point is provided by a look at a different set of organisations, all within the same industry, this time examining which human capital factors are associated with the exact *same* outcome (in this case, an intermediate outcome, rather than a key business result) across each of the organisations. Among the organisations that have also implemented this human capital methodology are four major financial institutions located in the United Kingdom and United States.[34] For these organisations, we examined the relationship (at the level of the individual employee respondent) between their human capital items and an index score measuring employee satisfaction and commitment (also captured through the standard employee questionnaire and thus, identically measured across the organisations).[35]

The relationship being examined was between employees' *current* assessments of human capital in the organisation and their *current* satisfaction and commitment to the organisation. The ten human capital items with the highest correlations with the employee outcomes had average correlations (across the four organisations) that ranged from 0.52 to 0.69. Five of these items are in the Leadership Practices index group; two are in Employee Engagement, and three are in Learning Capacity. (The other two index groups—Knowledge Accessibility and Workforce Optimisation—had no items in the top 10 items.)

Interestingly, with the exception of a small number of the items, there is a wide range in the relative importance of even the top 10 items across organisations. Indeed, 6 of the top 10 items ranked 23rd or higher in importance (relative to employee satisfaction/ commitment) in at least one of the four organisations included in the analysis. And numerous factors not included in the overall top 10 ranked among the top 10 items in each individual organisation.

Overall, these results point quite consistently to the same conclusion as emerged from the cross-organisational analysis of items associated with key organisation-level outcomes: there is a significant variation across organisations in which human capital items are important. Not surprisingly, when correlations with an identical set of outcomes (in this case, measures of employee satisfaction/commitment) are examined, the associated human capital indicators are somewhat more consistent than when the outcomes vary. But substantial variation in the human capital indicators exists even when analysing these identically-measured outcomes.

Substantive findings and interpretation: importance of leadership practices

This analysis, combined with additional extensive analysis within each individual organisation regarding the determinants of organisational results, points quite clearly to the primary importance of items in the leadership practices category in shaping outcomes and results.

This finding may help to explain the relative lack of effort seen in many organisations regarding the measurement, management, and improvement of human capital factors. It suggests that the leadership practices noted above often may represent a "binding constraint." In other words, the absence of these leadership practices in many organisations (it is quite common to see relatively low maturity scores in most leadership practice categories in many organisations that have implemented this measurement

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34 These organisations were not included among those analysed in the previous section regarding organisational outcomes because their available outcomes data were not complete and thus unavailable for correlation analysis.

35 The outcome examined in this analysis was an index comprised of responses to two employee outcomes questions: general satisfaction with the employee's job, and willingness to extend effort over and beyond that which was required for the organisation.

methodology) is a key factor that may be limiting both the use of, and the return to, employee skill-building. Its effect can be seen on both formal (captured in "learning capacity" measures) and informal (captured in "knowledge accessibility" measures) methods of developing employees' skills.

This has led us to the following conclusions about the importance of leadership skills:

a. The leadership skills that are necessary to optimise the return on investments in employee training are in short supply (especially given the evidence above that points to the complexity of such endeavours).

b. This shortage, at least in part, explains why organisations tend to under-invest in employee training.

c. Due to their effects on these other human capital factors, investments in leadership skills that would lead to improved human capital management may yield a very high return for organisations that have a deficiency in this regard.

It also seems likely that in many setting (*e.g.*, low density of employers within a specific industry, as noted in Section II of this paper), a "coordination problem" exists that merits public policy attention. If superior skills for managing human capital and superior human capital must simultaneously exist in order for one to benefit from the other, then it is possible that neither will be invested in (especially when the investments must be made by different economic entities—firms and individuals). Under these circumstances, a low-skill/low-wage/low-training equilibrium may be the outcome of rational choices may be all parties. The alternative—a high-skill/high-wage/high-training may never occur without public interventions designed to improve the human capital management skills.

V. IMPLICATIONS FOR PUBLIC AND PRIVATE POLICIES AND PRACTICES

The ongoing evolution of the "human capital era" requires a shift and expansion of policies that individuals, organisations, and nations must pursue if they are to prosper in this era. This shift will require that an increased priority be assigned to human capital strategies, both at a corporate and public policy level.

Public policies related to human capital have typically focused primarily at the level of the individual. While the creation and augmentation of individuals' skills is of vital importance, those organisations and nations that will be successful over the long term must have an even broader focus, seeking to foster superior human capital management – of all forms – at the organisational level. Those organisations and nations that pursue a *laissez-faire* strategy in this regard will almost certainly lag behind those that don't. For example, new information efforts be made to improve organisations' understanding of which human capital strategies have been shown to be effective and beneficial in the long-run, and which (like downsizing) have not.

The "low-road" to profitability, in which employees are viewed primarily as disposable costs, on which firms pursue a low-cost, low-margin strategy, becomes a less viable path to long-term success. Except for producers in the lowest wage nations, it is a sustainable strategy only for those in sectors that are impervious to foreign trade. Hence, a coherent set of "human capital strategies" that encourages firms

to pursue the "high road" to profitability needs to be implemented. On the high road, competitive advantage depends on superior human capital management; it creates and depends on a "virtuous cycle" of high wages, high skills, and innovation.

There are three categories of policies that governments should implement to encourage employers to pursue this high road to profitability:

a. *Improving the education and skill levels of individuals:* The need for this type of intervention is already widely accepted within most developed nations, which typically have a wide array of programs and policies for advancing educational attainment and promoting skill development. These programs range from public provision of education for children to subsidisation of education and skill development for working age adults. The level of funding for the latter is, however, often perceived as inadequate. The evidence presented in the earlier sections of this paper strongly suggests that fostering ongoing education and training—especially for those adults with low levels of educational attainment—will continue to grow in importance, as will the need for funding of public programs that underwrite adult learning.

a. *Improving human capital management by promoting managerial capacity:* The preceding discussion suggests that managerial capability with regard to human capital management is likely to be a constraint that impedes some (perhaps many) employers from pursuing the high road. Hence, while improving the education and skill levels of front-line workers may be a necessary condition for higher wages/profits, it may not be a sufficient condition. Consequently, public policy may need to underwrite the development of those managerial skills that are necessary for achieving superior human capital management. While this is a less traditional form of public policy intervention than that which is outlined above in #1, it is not entirely without precedent. For example, publicly-sponsored industry cooperatives that focus on improving managerial competence within an industry (such as manufacturing) are an example a vehicle that governments can and have used. Moving forward, however, it is likely that these types of programs will need to be expanded, with additional emphasis being placed on superior human capital management.

b. *Addressing information deficiencies in financial markets:* Both economic logic and empirical evidence indicates that financial markets are contributing to an underinvestment in workplace education and training. By failing to distinguish these investments from "costs," analysts under-estimate short-run earnings, which in turn, causes them to under-value firms that are making unusually large investments in workplace training. This under-valuation, in turn, is likely to result in a chronic tendency to under-invest in training among publicly traded firms. This situation could be remedied by requiring publicly traded firms to report their spending levels on training.

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