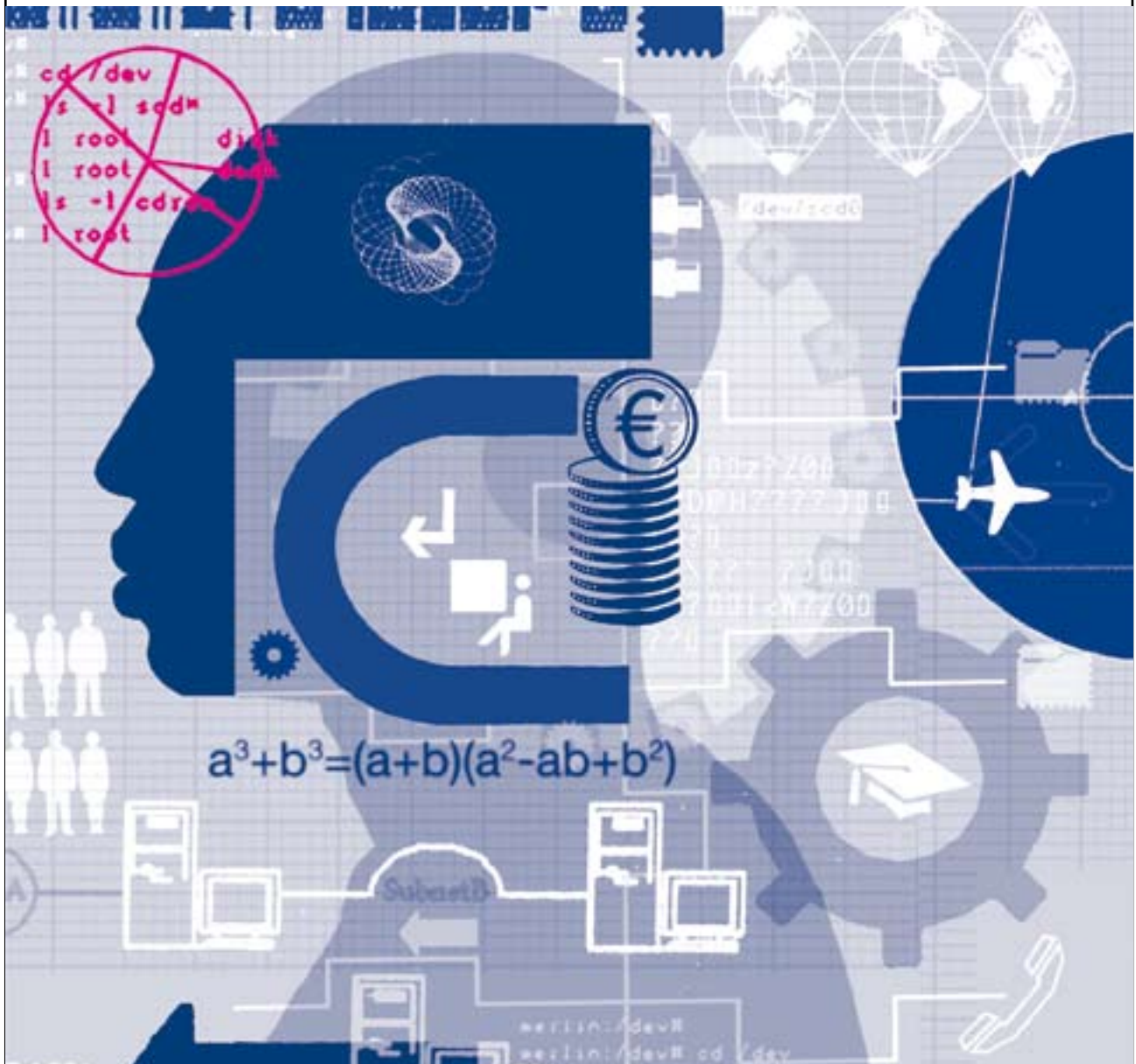


What You Get Is Not What You See: Intangible Assets and the Knowledge Economy



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1. Introduction

The 'old' economy was primarily based on tangible assets, such as equipment and materials for goods. It was characterised by a manufacturing process adding value to raw materials, which was realised shortly thereafter. A set of accounting conventions were developed to support this modus operandi, used by firms both as business management tools and for engaging with investors, and by government to form a national picture of the economy.

From physical assets to people and processes – value creation in the knowledge economy

But in the 'knowledge' economy, value creation does not just rest on machines and buildings. Increasingly, value is also based on intangible assets – the quality of people and processes. These investments are not substitutes – firms that invest substantially in new technology are also likely to invest heavily in intangibles – but increasingly the balance of investment across business has switched towards the latter.

Realisation of value may be many years after it is created, and bear no relation to the initial level of investment. 'Old' economy accounting practices are therefore failing to measure and account for these new value adding processes, by treating spending on those assets as intermediate consumption. Consequently, firms operating within the knowledge economy have fewer useful business management tools and government has less reliable macro information, leading to an incomplete and sometimes even distorted picture of the economy. Indeed, economic performance is increasingly difficult to measure – a good example for this is the conundrum of productivity slowdown.

What are intangibles...

The debate around the impact of intangibles is not new. However, the measurement of assets and how they impact on productivity is still very much in its infancy. The first difficulty encountered is that there is no agreed definition of what is encompassed. The term intangible asset is used to cover a wide range of ideas and concepts, some more easily understood and measured than others. Whereas tangible assets refer to equipment and buildings, physical things that you can touch, intangible assets refer to those things that are of value to a company and its future performance but that cannot be physically touched. For example, the term has been used to refer to intellectual property, patents, human capital management, brand reputation, processes for knowledge transfer, skill utilisation, retention tactics and investment in innovation.

The OECD concludes that most definitions of intangible assets contain three core elements:

- i. they are sources of probable future economic profits;
- ii. they lack physical substance; and
- iii. to some extent, they can be retained and traded by a firm.¹

Moreover, the OECD highlights that the potential for confusion is amplified by the difficulty in untangling intangible assets from the managerial capabilities required to elicit the value from the assets. For example, processes that allow for knowledge transfer could potentially be classified as an asset or a capability, suggesting that they might be measured in different ways or even accorded rather different degrees of importance.

A recent paper by Australian academics Hunter, Webster and Hyatt shows just how wide-ranging such definitions can be:

'[All] forms of capital not embodied in matter, that is, all assets that do not have a tangible form. While it includes enterprise level intellectual capital and registered intellectual capital, it also embraces access to distribution networks and markets, systems to optimise the rate of innovation and structures and procedures that improve workplace and enterprise efficiency. As a subset, intellectual capital refers to the stored knowledge and cognitive abilities of the workforce. This includes investment in both the skills and knowledge of a firm's workforce and the invention and development of new products and processes².

...and why do they matter?

With our traditional ways of understanding value creation and accounting for assets no longer sufficient, this paper explores our understanding of intangibles in the knowledge economy by discussing the following areas:

- Why do government, companies and investors need to understand the role that intangibles play in productivity?
- How has measurement been approached to date?
- What challenges lie ahead?

¹ OECD (2006) Creating Value from Intellectual Assets

² L.C. Hunter, E. Webster and A Wyatt Measuring Intangible Investment., Melbourne Institute Working Paper No 15/05, October 2005

We argue that organisations and policy-makers need to work together to learn how intangibles impact on business and the economy. This is vital not only for a government designing policies to underpin the UK's economic success but also for companies wanting to sustain their competitiveness in a global market. In the growing knowledge based economy, where the way organisations use knowledge is the key to unlocking value, conventional information about the levels of investment can fail to capture the real value of a business.

Of course, we are not suggesting that conventional measures should be abandoned – far from it; all of the standard measures remain important. But the knowledge economy is sufficiently different for it to demand new measurement tools – both qualitative and quantitative – and new arrangements for corporate reporting. To do anything less will limit our opportunity to reap the huge promise of a decisive shift to a knowledge intensive economy. Most importantly perhaps, we can only design good policy and companies can only make good investment decisions if we have a much clearer understanding of the relationship between intangibles, value creation and productivity.

2. Why do government need to understand intangibles?

Across the OECD economies have been restructuring towards knowledge-based economic activity, shifting from the reliance on investment in machines and bricks and mortar to a much more central focus on investment in knowledge assets. These include R&D and IT software and even more importantly design, development and innovation, brand equity, and human and organisational capital. As we will further outline below, the way the economy creates value and generates growth has changed, and new economic theories attempting to explain long-term economic growth have emerged. At the heart of this are intangibles, which is why it is so important for government to understand how they interact with the traditional factors of production.

A changing economy

The OECD and the EU have developed definitions of technology and knowledge based industries³ that show that in 2002 these industries generated over 40 per cent of national income according to the OECD and by 2005 provided 48 per cent of total employment⁴. However, the shift to competitive advantage based on the exploitation of knowledge is by no means confined to these industries but can be found across all sectors of the economy.

Of course, all economies have always been partly based on the exploitation of knowledge so the phrase knowledge economy describes a 'soft discontinuity' rather than a sharp break from the past. However what has made the current transformation distinctive from the past are four closely related developments:

- the evolution of mass consumer markets of increasing sophistication and diversity: affluent consumers increasingly place value on the logo or brand of a product – its image, if you like, is what determines the value of the product rather than the raw material used – think expensive trainers or jeans;
- the introduction of very powerful and cheap general purpose information and communication technologies;
- the spread of higher education beyond a small elite, providing an unprecedented increase in both well-qualified labour and well-educated and demanding consumers;
- the opening up of global markets, supported by the new technologies, leading to the development of global brands and fragmented production systems.

³ High to medium tech manufacturing, business, financial, telecommunication and high tech services and education and health

⁴ See Brinkley, I. *Defining the knowledge economy*, The Work Foundation, 2006

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Under this model, the big driver of the knowledge economy has been rising demand for knowledge-based goods and services – from consumers, from business, and through collective consumption of health and education services. Technology primarily acts as a supply side enabler, although it can also influence the demand side. Globalisation has accelerated both the demand and supply sides.

The UK is well placed by international standards

This transformation of the economy is not limited simply to a shift of more economic activity into services. As a recent report showed, the UK is the only major OECD economy to have specialised in knowledge service based trade over the past decade⁵. Such exports account for nearly a quarter of all exports from the UK in 2004 compared with about 15 per cent for the US and less than 10 per cent for Germany, France, and Japan. The UK has emerged as a world leader – in 2005 the surplus on trade in knowledge based services was worth 3.3 per cent of GDP in the UK compared with 0.5 per cent for the US, balance for Germany and France, and deficits for Italy and Japan. Today, the UK is trading more in ideas, knowledge and exploitation of the science, technology and education base than ever before. Put another way, firms have proved highly successful in being able to translate their investment in intangible knowledge assets into services that are highly competitive in world markets.

The manufacturing sector has also transformed itself. In response to competition from low wage manufacturing some OECD economies have moved towards high tech manufacturing, but none have matched the shift in the UK. High tech manufacturing now provides a higher share of manufacturing exports from the UK than Germany, France or Italy and is roughly comparable with the US and Japan.

Moreover, much of the UK's success in knowledge service exports originates with manufacturing companies. A recent report for the DTI found that between 1997 and 2003 about a third of business service exports came from manufacturing companies⁶. The authors conclude that:

'the propensity to import and export services appears to be higher in manufacturing than services. Trade in producer services may therefore be even more important for manufacturing than services.'

⁵ Brinkley, I. *Trade in Ideas and Knowledge*, Work Foundation June 2007. Knowledge service exports include business, financial and high tech services, telecommunications, royalties and licence fees, cultural services, and spending by foreign students and visitors on health and education services

⁶ Hijzen, Pisu and Upward A Portrait of Trade in Services, Report to the DTI, June 2006

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The latter is part of a wider shift affecting manufacturing across the OECD where manufacturing firms are becoming more like service companies and service companies more like manufacturing⁷. One UK research study has described this as 'service encapsulation' where '*manufactured goods are not offered to consumers in their own right but rather in terms of their wider service attributes*'⁸.

A further indicator is that the share of 'knowledge workers' defined by the top three occupational categories within high to medium tech manufacturing will shortly exceed the share of production workers. Part of the shift must be because production worker jobs are more vulnerable to technological displacement, but the change is also consistent with service related activities becoming more important as part of the manufacturing process.

Manufacturing for some represents the solid certainty of investment in tangibles such as machines and buildings, things with real value, rather than the ephemeral intangible investment associated with services. The upshot of these changes is that new business models and the emergence of new sources of comparative advantage in world markets mean that successful modern manufacturing depends as much as services on being able to exploit intangible investments.

This transformation of the economic structure of advanced OECD economies has made it increasingly difficult for policy makers to understand exactly how modern economies work. This problem was recognised by the OECD a decade ago.

*'In general, our understanding of what is happening in the knowledge-based economy is constrained by the extent and quality of the available knowledge-related indicators. Traditional national accounts frameworks are not offering convincing explanations of trends in economic growth, productivity and employment. Development of indicators of the knowledge-based economy must start with improvements to more traditional input indicators of R&D expenditures and research personnel. Better indicators are also needed of knowledge stocks and flows, particularly relating to the diffusion of information technologies, in both manufacturing and service sectors; social and private rates of return to knowledge investments to better gauge the impact of technology on productivity and growth; the functioning of knowledge networks and national innovation systems; and the development and skilling of human capital.'*⁹

⁷ The Changing Nature of manufacturing in OECD Economies, OECD STI Working Paper 2006/9

⁸ Howells, J, *Innovation, Consumption, and Knowledge*, CRIC Discussion Paper No 62. August 2003

⁹ OECD (1996) *The knowledge-Based Economy*, Paris

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In the late 1990s some commentators thought an entirely new paradigm was emerging that could defy the economic cycle with almost unlimited productivity growth and ever rising stock markets. Policy makers proved more cautious and the dot-com crash injected a greater note of realism into the public debate. A more measured assessment by Professor Sushil Wadhvani published in 2000 argued however that some of the developments associated with the knowledge economy had improved the potential long run trade-off between growth and inflation, but that it would be many years before these improvements showed up in the productivity figures.

Our understanding of the relationship between intangibles and growth, investment and productivity has improved somewhat over the past decade. For example, we report below some of the first attempts to construct estimates of investment in intangible assets that might one day be incorporated into national accounts. But in the absence of agreed definitions and measures, in many respects policy makers and companies are still struggling to make sense of the limited statistical information on the one hand and the plethora of non-standardised indicators and benchmarks produced by academic studies and business consultants on the other.

A failure to invest in knowledge

The changed economic reality also provided the backdrop for the Lisbon Summit in 2000 where an agreement was reached to make the EU ‘the most competitive and dynamic knowledge-driven economy by 2010’¹⁰. Investment in intellectual assets was seen as part of the strategic policy response for Europe to move up the increasingly global value chain. However, few of the key indicators related to the knowledge economy or indeed investment in knowledge assets, so it was never very clear how the EU would know how it had achieved its wider ambitions.

A key focus has been R&D and innovation as a driver of economic growth – consistent with the strictures of new growth theory. Indeed, in their mid-term review of the Lisbon Strategy, the expert group chaired by Wim Kok highlighted the importance of Europe’s drive to become a knowledge based economy and its capacity to diffuse knowledge across the economy. One of the key recommendations from the Aho report which was formulated by an expert group appointed by the European Commission was to create a ‘pact for research and innovation’¹¹. It also recommended the creation of innovation-friendly markets in which businesses can launch new products and services. However,

¹⁰ Lisbon Agenda, 2000

¹¹ Aho report, 2005

the EU has made little progress towards the R&D target laid down by Lisbon and given the EU's industrial structure there appears little prospect it will do so within the foreseeable future.

Whatever the strengths and weaknesses of the policy framework, there has been a significant expansion in knowledge industries in Europe, in terms of numbers and activity levels. Indeed we estimate that knowledge based industries account for roughly similar shares of employment as in the US and have been growing at comparable rates over the past decade. However, this has not been matched by faster economic growth and higher productivity. Productivity growth has fallen in many EU states rather than accelerated, in contrast to the US¹². The latest EU Commission assessment says this *'reflects an underperformance in the creation, diffusion, and utilisation of new knowledge over recent years'*.

Even though the EU policy framework contains all the right objectives and draws on the most relevant economic insights, reality continues to fall short of ambition. To this extent the Commission's diagnosis must be right. Europe's weakness is best explained by the failure to invest in knowledge. The OECD defines investment in knowledge as investment in R&D, higher education and ICT. In 2003 high investment economies (North America, OECD Asia and Japan) invested between 4 and 5 per cent of GDP compared with 2 to 3 per cent for the middle investment economies (Northern Europe and Australia) and 1 to 2 per cent in the low investment economies of Southern Europe). Moreover, over the period 1995 to 2003 the high investment economies pulled away from the rest. Investment went up by between 1 and 2 per cent of GDP in the high investment economies but changed little in most other economies.

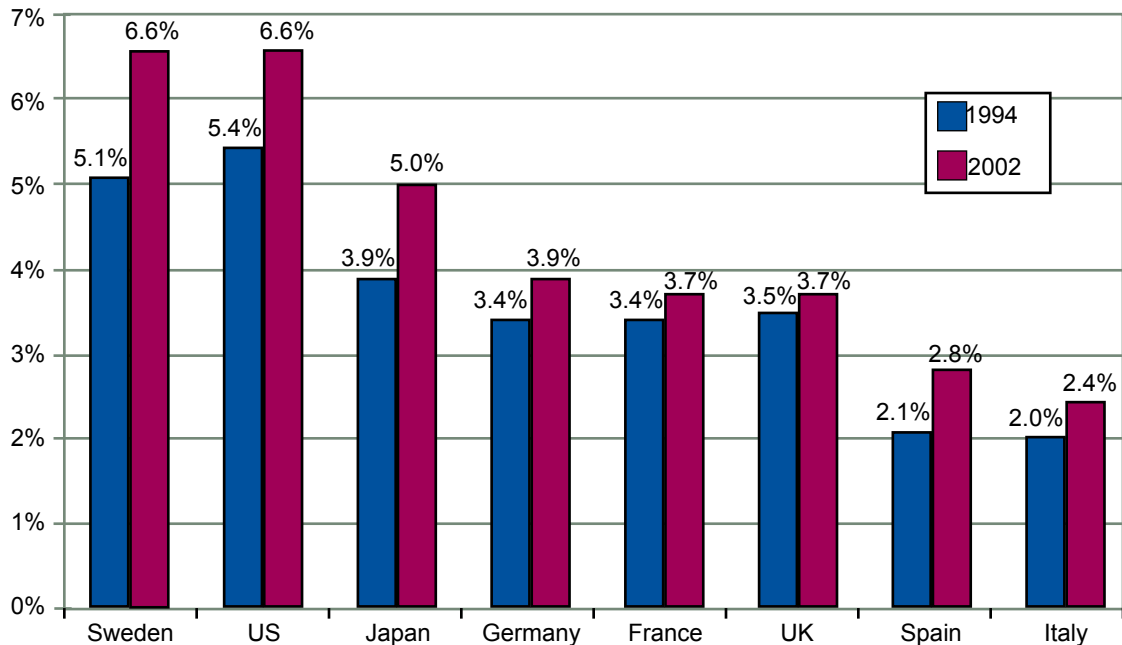
According to the EU Commission, investment in R&D and higher education (one proxy for human capital) explains 75 per cent of long run US productivity growth between 1950 and 2003¹³. However, the EU Commission definition of knowledge investment is limited to R&D and tertiary education (especially science and engineering graduates). Yet as we have seen from the definitions we have outlined, investment in the knowledge economy takes place in a wide range of intangible assets. The EU definition also simply measures inputs and therefore tells us very little about how effectively these investments are being utilised which is especially crucial when it comes to human capital.

¹² Brinkley, I. *The Knowledge Economy in Europe*. London, The Work Foundation

¹³ EU Commission 2004

Figure 1: National investment in some knowledge based assets

OECD definitions of investment in knowledge: total investment in R&D, ICT and higher education as share of GDP



Source: OECD Science and Technology Indicators, 2006

As mentioned above, if governments want to design the right policies they need to have a good understanding of how those factors interact in order to be able to measure the impact of their policies.

Accounting for intangibles

Much of the attention given to intangibles has been in terms of stock market valuations. In particular whether firms which invest in intangibles such as R&D are undervalued by stock markets who either do not fully understand such investments or are so fixated on short term gains that they discriminate against firms that make such investments with long term pay-offs (although in principle the same disincentives would apply to firms making tangible investments).

Much less common have been 'big picture' measures that put a value on intangible assets as a share of GDP. An Australian study¹⁴ carried out in 1999 attempted to estimate intangible investment over time based on two indirect measures using stock market records and changes in employment composition.

¹⁴ Webster, E. *The Growth of Enterprise Intangible Investment*, Melbourne Institute No 9/1999.

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The first subtracted the value of company assets as recorded in balance sheets from the whole market value of the company and attributed the result to intangible assets. This measure suggests a long run upward trend between 1947 and 1998, with investment in intangible assets increasing faster than investment in tangible assets. In the 1950s intangible assets were worth around 1.5 times the book value of total capital, but by the 1990s this had increased to between 2.5 and 3 times. However, the measure broke down in the 1970s when the Australian stock market was severely undervalued.

The second method reclassified employment from the Australian Census of Employment to include those who:

- directly produce intangible assets (teachers, trainers, sales and marketing workers, management consultants, R&D staff, financial advisors, and those involved in the collection, retrieval and dissemination of information and knowledge such as social scientists, statisticians and actuaries and librarians); and,
- indirectly produce intangible assets by contributing towards the goodwill, marketing and process efficiency of the enterprise or establishment. These include managing supervisors, natural scientists, social professionals, technicians, and nurses.

The employment estimates suggest that the share of the Australian workforce directly employed in the production of intangible capital increased from 17 per cent of the workforce in 1971 to 31 per cent in 1996. There was however little change in the share of people thought to be indirectly contributing to intangible investment through 'learning by doing' who constituted about 16 per cent of the Australian workforce.

We have undertaken our own analysis of the UK Labour Force Survey using similar occupational classifications to the Australian study. This showed that, according to the Australian classifications, in 2006 about 28 per cent of the UK workforce were directly employed in producing knowledge based assets, with another 19 per cent indirectly involved. This is roughly comparable with the Australian estimates, but that study is ten years old and we can expect the share in Australia to be somewhat higher today.

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Moreover, the share is significantly lower than some of the more common measures of 'knowledge workers' such as the top three occupational groups. Job titles and occupational groups are poor proxy measures for investment in knowledge or numbers of knowledge workers. However, to date there is no better definition of what knowledge work entails. As part of the knowledge economy programme, we are undertaking a major survey of employees to construct a more robust definition of knowledge work and knowledge workers.

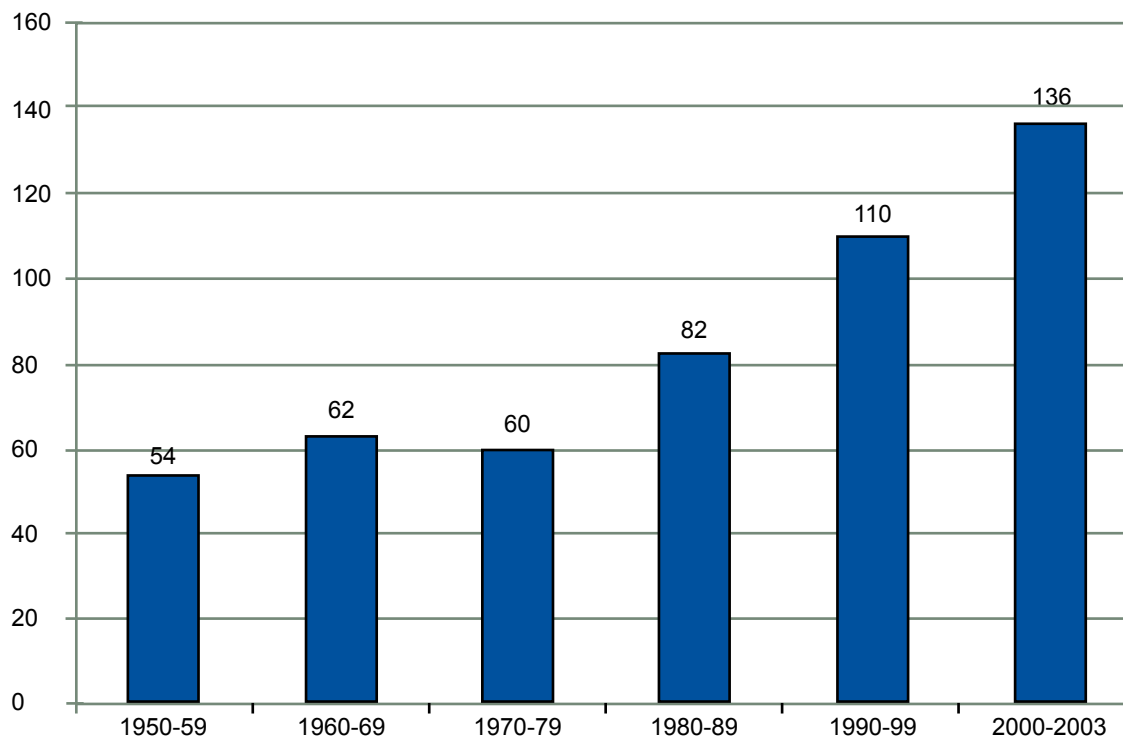
More recently, economists at the US Federal Reserve have undertaken what they believe to be a systematic measurement of intangible assets, prompted in part by their puzzlement at the lack of responsiveness of US business investment as measured by the national accounts to the long US economic boom¹⁵. The main findings are as follows:

- Business investment in intangibles started to accelerate from the 1980s onwards, exceeding investment in tangibles by 36 per cent by the early 2000s (see chart below);
- Business investment share in GDP is significantly higher than previously thought;
- Investments in intangibles are significantly more important to productivity growth than spending on physical assets and R&D (although they do not explain the acceleration in US growth over the past decade) – which we might take to be a modest vindication of the accuracy of new growth theory.

The findings come with significant caveats, not least because the authors have had to rely on what they admit are rough and ready proxies for investment in intangibles such as brand equity and managerial competencies. We explore the implications of these limitations in more detail below. Moreover, the numbers can be presented in different ways and the story that emerges is not always clear. For example, one interpretation of the research is that much of the acceleration in intangible investment resulted from increasing investment in R&D and ICT software. But this phenomenon is already well documented and we might readily conclude that the 'new' intangibles identified by the study have played a less important role. On the other hand, the authors point out that investment in physical assets and R&D can account for only about 10 per cent of US productivity growth over the past decade, so other factors must be important too. But even if this is right, the Federal reserve's researchers caution against concluding that the other 90 per cent is best explained by investment in intangibles.

¹⁵ *Intangible Investment and Economic Growth*, Corrado, Hulten, Daniel Sichel; Federal Reserve Bank Working Paper 2006/24, April

Figure 2: US business investment in intangibles as a ration of tangible investment
(tangible investment = 100)



Source: Corrado et al, 2006

Despite these self-evident limitations, it is reasonable to conclude that investment in intangibles plays an increasingly important role in modern knowledge based economies.

The US and UK compared

Marrano and Haskel¹⁶ have attempted to replicate the work of Corrado, Hulten and Sichel (CHS) in the US to estimate the level of national investment in intangibles, providing the first estimations of intangible investments in the UK. Their estimates put spending on intangibles at 10% of GDP or roughly comparable to US levels.

In attempting to place a monetary figure on intangible investments Marrano and Haskel (following CHS) made various approximations. Their methodology split intangible investment into three categories: 'computerised information (software, computerised databases); innovative property (scientific R&D, non-scientific R&D) and economic competencies (brand equity, firm-specific human capital and organisational capital)'.

¹⁶ Marrano, M.G., Haskel, J. (2006). How Much Does the UK Invest in Intangible Assets? London: Department of Economics, Queen Mary University

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Compared with the US, UK firms invest much less in R&D, but the gap is narrower in what is termed non-scientific R&D (design, process and product innovation) and investment in IT software is about the same. The gap in brand equity is entirely accounted for by investment in advertising because UK firms invest more, proportionately, in market research. This may simply reflect differences in market size.

The differences in investment in organisational capital are intriguing: UK firms appear to invest more in their workforce but less in terms of managerial time. Both may be subject to measurement problems. However, the higher investment by US firms in managerial organisational capital is consistent with UK research that suggests that US managers get more benefit from ICT investments than their UK or European counterparts and that this in turn helps explain faster US productivity growth over the past decade. One reason why this might be so is simply that US companies devote more managerial effort to getting new technology to deliver improvements in performance and productivity – a finding reinforced by a recent study by McKinsey and the London School of Economics¹⁷.

Marrano, Haskel and Wallis have looked at the consequences for a range of macroeconomic variables, including productivity, when taking into account intangibles. They argue that the impact of investment in intangibles is hidden by measurement problems. Their findings suggest that a different picture of the economy all together emerges when spending on intangible assets is treated as investment and is thus included in the GDP¹⁸. The authors use growth accounting to explore the slowdown in UK productivity from 1995 to 2000 (compared to a speed up of productivity in the US) and by including intangibles in their accounting exercise they discover a different picture: indeed, the mid-1990s slowdown was a ‘statistical illusion’¹⁹ caused by not accounting for investment in intangibles.

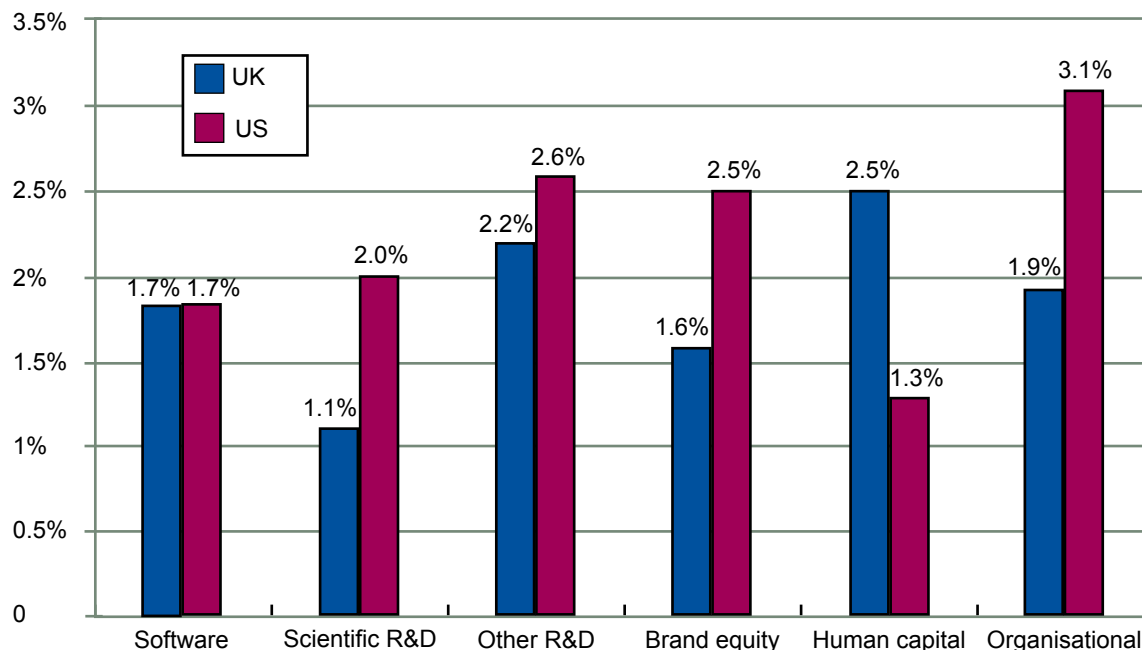
Marrano and Haskel used a variety of sources of publicly available data to estimate levels of investment in intangible assets. Official statistics for scientific R&D and investment in IT software were already available. Others such as employer related training were possible to estimate. However, other measures are more difficult. For example, measuring brand equity was proxied by ‘strategic’ advertising spend. Although attempts were made to discount advertising on vacancies, assumptions had to be made that the

¹⁷ Bloom et al, *Management Practice and Productivity: Why They Matter*, CEP/McKinsey (2007)

¹⁸ Marrano, Haskel and Wallis, ‘What happened to the Knowledge Economy?’ ICT, Intangible Investment and Britain’s Productivity Record Revisited’, Working Paper No.603, Queen Mary, University of London, June 2007

¹⁹ *ibid*, page 17

Figure 3: Business investment in intangibles in 2004 % of GDP



Source: Marrano and Haskell, OMC WP November 2006

Note: Other R&D includes copyright and licence fees; mineral exploitation; new products in financial industry, new designs in architecture and engineering; R&D in social sciences; brand equity in long term advertising, market research; human capital is firm provided training; organisational capital measured by spending on management consultancy and executive time spent on organisational tasks.

remaining amount of spend was entirely 'strategic' in that it had an impact beyond one year. Perhaps more concerning is that investment in managerial competence is proxied by the expenditure of the management consultancy industry and an assumed 20% of the cost of executives. The authors recognised the limitations of their method and admitted that they were somewhat thwarted by the lack of suitable publicly available data.

The impact of investment in intangibles

PRISM, a project launched by the European Commission in 2000, collected and analysed data to examine the socio-economic issues related to the growing influence of intangibles. In their final report in 2003 the authors concluded that:

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‘a gradual shift has been taking place for many years within our economy, within the drivers of growth and productivity. No longer is it sufficient to trace the investment into physical capital and the hours worked by labourers to track change. Factors which have up to now been hidden from us, mis-classified, or lumped together as “residuals” have gradually emerged as some of the most important factors in our economy. Growth is not the result of one single policy or input factor’²⁰.

Furthermore, the PRISM report makes clear that the System of National Accounts (SNA) is poorly aligned to measure today’s economic realities, presenting a distorted picture of the economy and how it works by either misclassifying or not recording intangible outputs such as knowledge and skills, scientific and technological originals or the activities leading to their production. The role of technological progress, the main long-term driver of economic growth, cannot be measured appropriately when those activities leading to technological advances are not recorded as doing so²¹. The project’s High Level expert group on intangibles propose that the SNA should introduce in future two additional asset classes – *technology assets and human capital assets*, this would, they argue, paint an entirely different and more accurate picture of the economy²²

Knowledge as an economic good and a factor of production

‘New’ or ‘Endogenous’ growth theory sees technological change as an additional factor of production and this insight makes intangibles vital. Much of this thinking dates from the early 1990s and is an attempt to give a better account of how economies succeed and offer a compelling answer to the question: where does growth come from?²³

Perhaps the central insight here is that knowledge and ideas are, like capital, an economic good: there is a cost to producing them, they can be used in production and they have a price (the cost of a patent for example). But they differentiate themselves from other economic goods by being both, ‘non-rival’ and ‘partially excludable’. The term ‘non-rival’ describes a good that can be copied or shared and used by many people at the same time – a book, a piece of software, the design of a micro-processor, the chemical formula for a new drug – and ‘partially excludable’ means a good that can be protected by intellectual property rights – so some people don’t have access to it. The idea of knowledge being ‘non-rival’ is critical in explaining why knowledge is the only production

²⁰ PRISM report 2003, page 23

²¹ Ibid, page 24

²² Ibid, page 26

²³ For an accessible account see Warsh, Knowledge and the Wealth of Nations, Norton (2006)

factor which is not subject to diminishing returns – there is no diminishing productivity – it can be used over and over again by every worker and can never be exhausted.

Building on this work, the economist Paul Romer developed a model where technological change arises because of ‘intentional actions taken by people who respond to market changes’²⁴. This means that in contrast to the previous growth models, technological change stems from inside the model, it’s endogenous.

Endogenous growth theory is important in the context of this paper because it demonstrates that policy measures can have an impact on the long-run growth rate of an economy. Government subsidies for private R&D, for example, can increase the growth rate by increasing the incentive for firms to innovate. Policy debates focusing on issues such as the effects of government procurement, the scope of protection for intellectual property rights, the links between private firms and universities or the mechanism for the selection of research areas are thus heavily influenced by new growth models:

‘Ultimately, this will put us in position to offer policy-makers something more insightful than the standard neoclassical prescription-more saving and more schooling (...) We will be able to address the most important policy questions about growth: In a developing country like the Philippines, what are the best institutional arrangements for gaining access to the knowledge that already exists in the rest of the world? In a country like the United States, what are the best institutional arrangements for encouraging the production and use of new knowledge?’²⁵

Secondly, considering the shift from manufacturing based industries to service based industries, the real value of many businesses is now located in their ability to manage their knowledge assets effectively. Knowledge, an intangible asset is now seen as an additional factor of production, meaning that intangible assets join the traditional factors of production – labour and capital.

This not only requires some measurement of all those elements mentioned above leading to technological progress, but it is also necessary to find out how those elements interact

²⁴ Paul M. Romer, ‘Endogenous Technological Change’ in The Journal of Political Economy, Vol. 98, No. 5, Part 2: The Problem of Development: A Conference of the Institute for the Study of Free Enterprise Systems (Oct.,1990), pp. S71-S102

²⁵ Romer, P. The Origins of Endogenous Growth, The Journal of Economic Perspectives, Vol. 8, No. 1. (Winter, 1994),pp.21-21

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and how to best invest in them. Investing in knowledge production by investing in R&D, for example, is not enough as an organisation's sustainable growth also depends critically on the ability of a business to recruit, retain and motivate employees so that they are contributing to the production of knowledge and the process of innovation. In addition to that, as seen above, much of the value of an organisation may lie in the tacit knowledge of the employees acquired through 'learning by doing'. This insight generated by the endogenous growth theory has led to the increasing attention paid to human capital management. Reporting to investors on the management of those knowledge based factors of production has therefore also become more important.

Simply expressed, new growth theory has sought to shed new light on the importance of ideas in economic life. In the words of one commentator, it tries to explain the importance of

...trade secrets, formulas, trademarks, algorithms, mechanisms, patents, scientific laws, designs, maps, recipes, procedures, business methods, copyrights, bootleg copies; collectively, that is, the economics of knowledge.²⁶

The level of investment in intangibles

Crucially, a record of the level of investment (even acknowledging the limitations of approximations) still gives us insufficient understanding of what is happening in the knowledge economy. The figures still rely on recording the past and do not give us any insight into the future returns on that investment. While the studies so far offer a useful first step, we do not yet know as much as we need to about how intangibles work in order to develop a comprehensive picture. Most importantly perhaps, the relationship between intangible assets and value is much more complex than predicting the value that might be created by an investment in tangible assets. Moreover, the diversity of intangibles means that the process of causation (through which investment creates value) will vary from one asset to another. The data is good enough to show that there has been an increase in spending on intangibles, but the story is by no means clear enough to allow for sophisticated judgments about the design of public policy, accounting frameworks or the processes through which investors value intangibles.

If those macro-variables and economic performance are different from what they seem, it is difficult for government to tailor the right policies. If governments want to understand

²⁶ Warsh David, *Knowledge and the Wealth of Nations: a Story of Economic Discovery*

what is really happening in the economy, particularly the relationship between intangibles and growth, then they have no alternative but to develop a new set of measures. Most importantly perhaps, it becomes much more difficult to develop effective policies in the absence of accurate data. Yet despite the compelling nature of the argument, progress has been relatively slow and those measures that do exist are somewhat partial, suffer from methodological weaknesses and are offered rather cautiously. A clear recommendation for policy makers is that these efforts must be intensified.

3. Why do companies and investors need to understand intangibles?

Companies

We have seen that there are clear drivers for governments to require national accounts to measure and track intangible assets. For companies it is important that policy makers understand the drivers behind their decisions to invest in intangible assets so that appropriate policies can be implemented. There are also clear performance driven needs for companies to want to understand their own intangible assets to enable them to work towards sustainable high performance and make the right investment decisions. Companies also need to be able to communicate the true value of all their assets to investors. The problem here is that they still need to rely on traditional accounting for all of this.

The European Commission's High Level Expert Group argues in its PRISM 2003 report that intangibles challenge the existing accounting system because

'their value for an organisation is not only linked to transactions but also, and more importantly, to the imaginative exploitation of the core activities of innovation, production and distribution, leveraged by networks'²⁷.

They argue that the problem with the current model is that it is 'deeply rooted in the notion that sustainable growth and performance lie in the accumulation of fixed assets such as property, plant and equipment'²⁸. Investment in knowledge-building activities such as training and R&D is treated as a cost – despite being the primary source of wealth creation in the modern economy.

Business management and intangibles

Many of the internal drivers for understanding and measuring intangibles are not new to organisations and most organisations have developed their own language and literature – for example, performance management and human capital management. However management is no longer simply about managing employees who produce the products or services. Of course, some firms depend on knowledge more than others²⁹. But the management of people becomes particularly important if value is mostly to be found in intangibles, since innovation will depend on the organisation's ability to recruit and retain the best people. The rather rhetorical observation that 'people are a company's

²⁷ The PRISM report 2003, Research Findings and policy recommendations, Clark Eustace, Editor, European Commission, Information Society Technologies Programme

²⁸ PRISM report 2003, page 27

²⁹ Mason, R.O., Apte, U.M. (2005). Using Knowledge to Transform Enterprises in Transforming Enterprise: The Economic and Social Implications of Information Technology. Cambridge, Mass: MIT Press

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most valuable asset' has often been ignored in practice, but in a knowledge economy it becomes an unavoidable statement of fact³⁰.

Work by Brynjolfsson and Hitt ³¹ has highlighted the strong relationship between investment in computers and investment in organisational capital, suggesting the ratio in monetary terms might be as high as 10 to 1 in those firms who are most successful in realising the benefits of investing in new technologies. Work by the same authors also suggests that productivity gains attributable to investment in computers were much stronger in the longer term (between five and ten years) than in the short term. The authors attribute the delay to making the necessary but more extensive and expensive organisational capital investments.

This study confirms the earlier findings of the relative importance of investment in intangibles. But it also emphasises the strong complementarities between the two forms of investment. It would be a mistake to think that investment in intangibles is always, or indeed usually, undertaken as an alternative to investment in tangibles.

There are both internal and external factors driving the focus on intangibles. Internally organisations need to be able to monitor and control their performance. Most importantly, they want to focus on those sources of value that lead to sustained profitability. In today's economy this means that companies need to understand how intangibles impact on productivity and future value, which is a process that demands more than conventional systems of measurement can deliver. The external drivers are equally clear – companies want investors to understand these processes too and want to present information that guarantees an appropriate valuation of the company by the capital markets.

There is obviously a continuum on which organisations can place themselves, reflecting the extent to which their value lies in tangible or intangible assets. For example, the value of a management consultancy lies in both its brand and in the skills, knowledge and innovative capacity of its staff. Measuring only tangible assets is an inadequate benchmark for both understanding current performance and predicting future returns. A natural conclusion is that a company offering knowledge intensive services would be better advised to focus on such matters as:

³⁰ See Coats (2005). *Healthy Workplaces*, London: The Work Foundation

³¹ Brynjolfsson and Hitt, *Beyond computation: information technology, organisational transformation and business performance*, Journal of Economic Perspectives, Journal of Economic Perspectives 2003

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- The 'brand building' impact that flows from the successful completion of projects.
- The capability to win new contracts.
- The arrangements for effective knowledge management so that the lessons of experience are codified and generalised.

Using benchmarks of this kind will also allow the company to manage risk more effectively, recognising that the brand, reputation and people are the resources that need to be nurtured.

Investment and consumption at the firm level

Economic theory suggests that firms make the optimal choice between current consumption and investment in order to maximise future revenues. In principle, therefore, all spending that forgoes current consumption in order to maximise future consumption should be treated as investment. However, the standard rules of accountancy developed in the 19th century only classify investment in 'tangibles' or 'bricks and mortars' spending as investment.

Perhaps the biggest problem lies in the definition of an 'asset', which according to the standard accountancy model must include the following three elements;

- economic resources controlled by an entity
- cost at time of acquisition
- can be objectively measured.

In other words, the definition makes it difficult to incorporate the importance of those intangibles whose costs cannot be objectively measured – assuming of course that something intangible can be captured by the notion of 'economic resources controlled by an entity'; brand reputation or the tacit knowledge of employees, both of which contribute to value, would seem to be beyond the scope of this definition.

Only half the picture

Relying on conventional methods of measurement can give us a distorted picture simply because they record historic spending. For example, the value of a patent reflects little more than the fact that it exists; little or no account is taken of the potential to generate revenue from licensing or through the sale of new goods and services; similarly, spend on advertising does not account for brand reputation which can affect the likelihood that a new product or service will be brought successfully to market.

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There are other problems in accounting for investment in intangibles because:

- Such investments may not be verifiable from market transactions – the costs may be internal to the firm.
- By definition ‘intangibles’ are often ‘invisible’ making it difficult to use conventional stock-taking techniques.
- ‘Investment’ demands a demonstrable effect on asset creation beyond the current accounting year – but intangibles may not be amenable to the application of that principle, since the ‘value’ of the assets created may be beyond the reach of measures appropriate to ‘tangible’ or bricks-and-mortar investment.
- Some intangibles (like a merger or acquisition) can appear on balance sheets whereas others (brand development, workforce skills, and capacities for innovation) may not.

Intangibles and value creation: an unreliable relationship?

Perhaps reliability is the largest problem in fitting intangibles into a standard accounting framework, principally because the relationship between intangible assets and value is not straightforward or linear. For example, in the conventional framework an organisation can invest in capital equipment, make a well-judged prediction about the impact on output and offer a reasonable assessment of likely sales. In other words, the relationship between capital investment and value is easily understood. But when it comes to intangibles the relationship is more complex – investing in the brand or in learning and development of staff ought to produce value, but how does one measure that value once it has been created? How can we make a judgement about the relationship between investment in training, building the innovative capabilities of employees and improvements in productivity? These causal relationships, if indeed they are causal, are poorly understood and difficult to measure. We might also note that the skills and (tacit or codified) knowledge of staff both fall outside the definition of an ‘asset’ that we discussed above. The costs of training can be easily accommodated in annual accounts, but the knowledge created by training can only be the property of the employees (unless it is otherwise protected by the intellectual property regime) because the employer lacks any ownership of the thoughts in the workers’ minds.

Not surprisingly, managers are having to use incomplete information to make judgments about the returns to investment in intangibles – and whether there has been any economic benefit at all. We might think that accurate internal reporting leads to

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transparent audited accounts allowing investors to assess the competence of the senior management of the organisation. In principle this must be right, but it offers a rather over-optimistic assessment of the rationality of management thinking.

Most importantly, perhaps, management investment decisions are rarely based on cold-blooded calculation and:

*'[M]ay be based on more or less acts of faith – or guided by rules of thumb – or through managers being sufficiently persuasive in managerial politics to win approvals for their plans.'*³²

A similar conclusion was reached in a paper produced for the ESRC's Business Knowledge Programme by Chris Hendry and James Brown³³:

Many companies try to identify, measure, and manage those intangible assets they consider important for long-term value creation. However, the cause-effect relationship is not easy to establish. More often than not, it is senior management perceptions that determine strategic direction, not proven relationships between intangible assets and business performance.

Better reporting on intangibles

Attempts have been made to improve reporting mechanisms. The subsequently dropped Operating and Financial Review (OFR) proposed by the Company Law Review was one instrument which attempted to allow for the better reporting of intangibles. The purpose of the OFR was to give investors and other stakeholders a 'fair view of the business', based on the disclosure of all 'material' information³⁴. The 'business review' that has replaced the OFR imposes rather less rigorous requirements on corporations, although there is still an opportunity to give a proper account of knowledge assets in presenting information to the capital markets.

The same might be said for the fate of the recommendations made by the Kingsmill review of human capital management (HCM), sponsored by the DTI³⁵. This review was linked to the OFR. It was deliberately designed to get companies to report

³² Hunter, Webster and Wyatt Measuring Intangible Investment, Melbourne Institute Working Paper No 15/05, October 2005

³³ Brown and James, EBK Working Paper 2005

³⁴ A small working group was established by the DTI, which developed a sophisticated definition of 'materiality'. All this was lost when the OFR was abandoned

³⁵ Department for Trade and Industry, 'Accounting for People' Report of the Task Force on Human Capital Management' October 2003

comprehensively on their management of human capital and think more creatively about how effectively HCM added value to the business.

One of Kingsmill's key recommendations was that a group of experts, drawn from all stakeholder interests, should advise on how to incorporate information on human capital management as part of the mandatory requirements of the OFR. Kingsmill recommended that smaller companies, partnerships, charities and other organisations that were not required to file company reports and accountants should also be advised on how to report such information. This second element highlights the crucial importance intangible assets play in the economy and all organisations, not simply large corporations.

Another solution has been to develop indicators for managers to use at company level – some of these instruments have been endorsed by governments (principally in the Nordic countries) and others are proprietary products promoted by consultants. None of them could be described as all encompassing. Amongst the most widely cited models are the Skandia Navigator³⁶, the Intangible Asset Monitor³⁷ and the Balanced Score Card³⁸.

The perils of measurement

Organisations must ensure that their attempts at measurement do not in themselves bias or interfere with their assets and capabilities. Measurement of social phenomena is a challenge and can result in distortions if, for example, people try to alter their behaviour to ensure a particular outcome, or the process of measurement undermines trust in the organisation.

The danger, for example, with a focus on internal performance is not only that the measurement systems used for intangible assets create distortions as they are based on those for tangible assets but that measurement becomes the goal in itself rather than the means to understand what the level of performance is or how intangibles impact on performance. Internal performance management often creates targets and follows the principles of 'what gets measured gets done'. When rewards are linked to the performance measurement system, the culture of measurement, particularly those involving subjective measurements, can result in manipulation of the system in order to 'look good' on performance reviews. Not only does the 'true' picture become distorted but the incentives for high performance can prevent innovation and knowledge sharing in

³⁶ Edvinsson and Malone (1997)

³⁷ Sveiby (1997)

³⁸ Kaplan and Norton (1992)

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order for individuals and teams to 'outperform' their colleagues based on the performance measures³⁹. Measuring the wrong things or in the wrong way can lead to manipulation of performance figures – providing both the company and investors with an inaccurate and potentially misleading picture.

Sveiby, a leading academic and practitioner in intangible assets, argues that there are long-term internal benefits to an organisation of a concentration on measuring intangibles in order to learn. He posits that 'First; the learning purpose offers a good way around the manipulation issue. If the purpose is learning, not control nor reward, the employees and managers can relax. Second, a learning purpose allows more creativity in the design of metrics, a more process-oriented bottom-up approach and less of top-down commands'⁴⁰. By trying to account for intangible assets in the same way we account for tangible assets, Sveiby posits we will miss the elements that make intangibles different from tangibles.

Investors

The OECD argues that financial statements have lost some of their value for shareholders because the management of intangibles is rarely captured accurately in annual reports⁴¹. This creates a problem because the share price may not reflect the real value of the company.

Looking beyond the book value

In order to evaluate the value of a company, analysts do not merely rely on the book value. The most comprehensive appraisal technique is a cash flow-based methodology called 'discounted cash flow valuation' (DCF). This model is used to determine a company's current value according to its estimated future cash flows: in practice this means forecasted free cash flows are discounted to a present value using the company's weighted average costs of capital. The DCF model is focused on long-term investment and gives investors a good picture of the key drivers of shareholder value: expected growth in operating earnings and expected duration of growth. The time value of money is then accounted for by adjusting expected future returns to today's monetary values using a discount rate, with the discount rate also accounting for risk and for expected rates of inflation. Even though the method recognises market conditions, likely performance and

³⁹ Sveiby, K. (2004). When measuring fails – try learning! *International Journal of Intellectual Capital*, 1,(3), 370-376

⁴⁰ Sveiby, K., Armstrong, C. (2004). Learn to Measure to Learn! Opening key note address to IC congress. Helsinki 2 Sept 2004

⁴¹ OECD (2006) *Creating Value from Intellectual Assets*

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potential, it largely fails to account for intangibles as it is mainly based on physical capital and its depreciation rates.

According to the findings of the PRISM report, banks and other capital providers are indeed concerned with evaluation of intangibles – goodwill, patents and leases – currently disclosed in company reports. Intangibles have in fact been incorporated in credit risk analysis for some time, albeit intuitively and subjectively without a common language or measurement framework⁴².

In other words, we can be confident in saying that orthodox accounting frameworks accurately describe assets and liabilities as conventionally conceived, but fail to embrace the ‘algorithms, mechanisms, patents, scientific laws, maps, recipes, procedures, business methods⁴³’ that we described earlier as important factors of production. Intangible assets enter companies’ books only very randomly and unsystematically, if at all, which makes it almost impossible to compare them and draw any conclusion on how they impact on the company’s future performance, which might lead to misjudgement and subsequent misallocation of capital. The need for better reporting and accounting frameworks to encourage growth and competitiveness is therefore compelling.

The importance of intellectual property

However, just because traditional accounting does not consider intangibles, it does not mean that investors disregard them completely. Especially when it comes to intellectual property (IP) a company’s strategy is judged by investors and analysts as very important for market position and competitive advantage. For example, a survey of investors in 2001 found:

‘There are two reasons to turn down a business: 1) the management team 2) that you don’t think they can exploit the IP they have’ (Venture Capitalist)⁴⁴

Indeed, the survey revealed that 90% of the respondents considered a company’s intellectual property an important factor in their investment assessment. However, 70% of respondents were also convinced that the market lacked reliable tools to value intellectual property effectively meaning that they had to rely on subjective assessments for their investment decisions⁴⁵.

⁴² PRISM report 2003, page 7

⁴³ See David Warsh in *Knowledge and the Wealth Of Nations: A Story of Economic Discovery*, p.xvii

⁴⁴ Howrey (2001). A Survey of Investor Attitudes on IP Protection, page 12 (www.howrey.com/docs/UK_IP_Survey0102.pdf)

⁴⁵ Ibid

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This amply demonstrates that it would be wrong to assume that investors focus on the mere book value of a company to judge its value and performance, but it equally shows that they are in the dark when it comes to robust valuations of intangibles.

The merits of valuing intangible assets

Indeed, according to a recent Deutsche Bank report, both investors and lenders could gain substantially from systematic valuation of intangible assets: 'Investors could optimize their portfolios and increase their returns through more realistic company evaluations and credit suppliers in turn could lend their money according to terms better adapted to the actual risk. This would not only mean boosting their average yield per loan, a better pricing strategy would allow them to capture a greater market share in high growth, knowledge-intensive markets as they value intangible assets better than their competitors'⁴⁶.

The same study also suggests that a more systematic valuation of intangible assets by investors should lead to more growth for the economy as a whole. Capital could be allocated more efficiently, acting as a driver for innovation by giving knowledge-intensive companies better access to credit and capital. Furthermore, improved information on intangible assets would render capital markets less volatile because investors' would be making judgments based on trustworthy data. Better corporate reporting on intangibles could also reduce inequalities between wholesale and retail investors. At present only wholesale business investors with established business models are more familiar with the evaluation of intangibles through non-monetary information, largely because consultants communicate intensively with the management of a company and carry out first hand analysis⁴⁷.

Non-financial reporting and the investment process

At UK and international level a broader consensus is starting to emerge when it comes to non-financial business reporting and intangibles, even if this is mostly connected to corporate governance or the fight against short-termism.

The International Corporate Governance Network's Non-Financial Business Reporting Committee, composed of investors, companies and academics, is aiming to publish an 'Initial Framework for Non-Financial Business Reporting' in 2007, which will study the link between non-financial issues and value creation. The committee argues that the

⁴⁶ See Jan Hofmann, 'Value intangibles! Intangible capital can and must be valued – owners and valuers alike will benefit' Deutsche Bank Research, 19 October, 2005

⁴⁷ *ibid*

'marketplace needs a legitimate, credible and competent adjudicatory institution for non-financial measurement and reporting for the long-term.'⁴⁸ It wants to address the 'value question, which can in part be expressed as the gap between more traditional financial accounting measures of value, such as book value on the one hand and market capitalization on the other' exploring what drives value and how non-financial information can enhance the assessment of such value and inform the investment process⁴⁹. They acknowledge that traditional accounting 'misses or mis-values intangible assets' arguing that traditional accounting may 'value the same intangible assets differently if purchased or internally developed' and most importantly that it 'does not take full account of the interdependency of assets on each other when determining their value'⁵⁰.

Improving institutional investment

The Myners report commissioned by the Treasury in March 2000 is part of the Government's programme of reform to improve the efficiency of the 'investment chain' linking savers and companies. Paul Myners the author of the report conducted a review of institutional investment in the UK and concluded that there were a number of areas where change would result in improved investment decision-making. He recommended that pension fund trustees voluntarily adopt, on a 'comply or explain' basis, a series of principles codifying best practice for investment decision-making⁵¹. The aim of the report was, however, more to address the short-termism of the institutional investment rather than reporting on intangibles.

Are investors short-sighted?

We have already observed that capital markets may undervalue firms that either invest in intangibles or whose value principally lies in intangibles. In part this is a subset of a wider argument about the short-termism of capital markets in liberal market economies⁵². It is true, for example, as some have suggested, that too many investors are focused on short-term gains, with pension fund managers in particular keeping a weather eye on their quarterly performance to avoid the awful possibility that they may lose their mandate to manage a fund. Of course, this argument is equally applicable to both the 'old' and the knowledge economy, although the problem is more acute with intangibles in the knowledge economy since they are rarely adequately captured by conventional measures of capital stock. Perhaps the best conclusion is that the understanding of intangibles will only become widespread once investors realise that in today's economy, for many

⁴⁸ International Corporate Governance Network, NFBF Progress Report, page 4 July 2006

⁴⁹ *ibid* page 1 July 2006

⁵⁰ *Ibid*, page 3

⁵¹ HM Treasury, Myners principles for institutional investment decision-making: review of progress

⁵² See Hutton, *The State We're In* (1995) and Hall and Soskice, *Varieties of Capitalism* (2001)

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businesses intangibles are the source of value creation. Investor pressure will encourage better corporate reporting, with even the most recalcitrant organisations realising that it matters how they account for their management of intangibles. But in the absence of genuine investor pressure we might say that the appreciation of the importance of intangibles will be patchy at best. Whatever we may think about short-termism there can be little doubt that a change in investor culture is required.

Nonetheless, the last decade has witnessed a serious effort to develop an accounting framework for intangibles. But in the absence of agreed definitions and measures, in many respects policy makers and companies are still struggling to make sense of the limited statistical information on the one hand and the plethora of non-standardised indicators and benchmarks produced by academic studies and business consultants on the other.

Four broad clusters of factors emerge from all these benchmarks:

- **human capital:** the skills, knowledge and experience of employees;
- **organisational or structural capital:** structures, procedures and business routines;
- **relational\market capital:** relationships with suppliers, customers, partners, brand equity;
- **innovation and R&D:** intellectual property, patents, trademarks, design titles, copyright.

Non monetary- frameworks of measurement

However, many of these factors do not easily lend themselves to financial measures, and are to be measured by a mass of non-financial indicators. Hunter et al are highly critical of these non-financial measures:

If our object is to measure investment and analyse value creation, these indicators are a superfluous step for they clearly neither reflect inputs into the intangible investment process or outputs. If they do not enable us to either know the quantum of returns to a given expenditure on resources or to comprehend why we achieved a certain profit result in a given period, then the cost of collecting them can hardly be justified. (p21).

Yet, we have seen that intangibles are the key to the productivity conundrum so we need to find a way of measuring them. Before we understand the relationship between intangibles, value creation and realisation sufficiently to quantify it, a non-monetary framework may provide a way forward. Guidelines produced by MERITUM, a project funded by the European Union: 'has sought to provide a standard non-monetary framework for organisations to record and report intangibles'⁵³. The aim of the guidelines is to provide a common framework for the identification, measurement and control of intangibles as well as proposing criteria for the disclosure of information on the intangible determinants of the firm's value. The purpose is to assist companies in the development of their ability to identify, measure and control intangibles, in order to increase the efficiency of their management and to improve their financial performance. They also attempt to provide useful guidance for firms willing to disclose information on the intangible determinants of their value creation capability, in order to help the providers of capital to efficiently estimate the future payoffs and the risks associated with their investment opportunities. Their aim was to produce a set of guidelines that are accepted across Europe to encourage companies to produce comparable reports to start to address the gap in understanding that is essential to fill in order to set accurate policies for a sustainable economy. The MERITUM report argued that the current:

'erroneous measurement of knowledge, due to rapidly outdated industrial management models and financial reporting practices, may lead to an inefficient allocation of material, financial and human resources, not only by firms but also by their suppliers of goods, services and capitals'⁵⁴.

Clearly, with so many reasons for needing to understand intangible assets and processes, it is unlikely that there can ever be one form of measurement that will provide the answers to all. For organisations, perhaps more so than government, the core to intangible assets is knowledge and as knowledge is fundamentally different in make-up to tangible assets, a fundamentally different form of measurement will be required. Furthermore, no one tool is likely to be appropriate for all intangibles; tools suitable for measuring learning are likely to be different from tools that try and capture brand value, innovative capacity or the potential of the intellectual property rights held by the organisation. Indeed, some of the measures may be more qualitative than quantitative – an outcome implicitly envisaged by the recommendations of both the Myners and Kingsmill reviews. In other words, the aim is to ensure that investors receive information that enables them to answer the questions:

⁵³ See Meritum Guidelines: managing and reporting intangibles, Final report, EC, 2001

⁵⁴ MERITUM Guidelines – Full report

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- What makes the organisation tick?
- How does it build its internal capabilities?
- How does this affect the potential for sustained profitability and business growth in the future?

In other words, companies, investors and government must work out why they want to measure, what they want to measure and how they want to measure. This is work in progress today but moving beyond existing frameworks is essential if all stakeholders are to have an understanding of the dynamics of the knowledge economy.

4. Conclusions

'...we are running today's knowledge-based economies with the tools inherited from a 19th century manufacturing era. Knowledge is now a fundamental component of our value-delivery systems, but our understanding of how to measure that knowledge and value is, at best, immature'⁵⁵

In the UK's knowledge-based economy the invisible factors of production – computerised information, innovative property and firm competencies – contribute increasingly to corporate and national performance. This shift to 'intangibles' is underpinned by modern economic growth theory which acknowledges the vital role that technological progress and knowledge play in generating long-term growth. This shift is not, however, reflected in the measurement and valuation of economic activity at company and national level. This means that whilst we are benefiting from the consequential growth that has accompanied the change to the knowledge economy, we are not yet adequately equipping ourselves to make it sustainable.

Economies have always been partly based on the exploitation of knowledge, but the key difference now is the rising demand from consumers for knowledge based services, with technology and globalisation as key drivers. The UK is well placed by international standards; we are the only OECD country to have specialised in knowledge based services over the last decade, trading in ideas, knowledge and the exploitation of science, technology and education. Our economy is no longer centred around tangible assets such as machines and buildings, all companies are having to exploit intangible assets too. Manufacturing firms (across the OECD countries) are becoming more like service companies and vice versa.

However, despite our success in specialising in knowledge based services, measures of productivity suggest this has not been matched by faster economic growth and higher productivity. Productivity growth, according to current measures, has fallen across many EU states. It appears that a failure to invest in knowledge may be the best explanation. However, this does not provide us with the full picture. The figures on investment in intangibles across the EU are limited to the OECD definition of investment in R&D, ICT and higher education. Intangibles cover a wide range of assets and crucially the relationship between investment and outcome is not easily predictable. We need to re-examine the relationship and measurement of investment and outcome to help us

⁵⁵ PRISM report 2003 page 41

address questions such as why productivity does not appear to have risen even though highly productive knowledge intensive industries have increased.

Conventional information about investments is no longer sufficient. Intangibles assets by definition are very different from physical assets. In many cases value creation and realisation are no longer in the same period. With intangible assets, it is difficult to link R&D, brand development or investment in human capital to specific performance outcomes, even if there is some evidence of a causal relationship.

The implication of the transformation of the UK's economy and the increasing importance of intangibles would be that the measurement of intangibles is heavily reflected in the valuation of companies and their business strategies, that investors undertake a thorough analysis of intangible assets in order to decide whether they should make an investment or not. This however, is not the case, intangibles enter company reports and financial balance sheets only sporadically.

As orthodox measurement frameworks do not capture intangible assets, they are left out of the equation. This means that company reports and financial balance sheets are unable to give investors adequate information about the value of the company and future profits. The consequence might be a mis-allocation of capital, to the detriment of those knowledge-based companies driving the UK's economic success.

The same is true for the national accounts. Policy-makers are provided with half of the picture and little information about how to best invest in the new drivers of the economy, how they interact with traditional factors of production and their real impact on labour productivity. This is why the work commissioned by the government and undertaken by Jonathan Haskell and his colleagues in collaboration with the National Offices of Statistics is very useful and should be implemented.

Firms may be naturally reluctant to share the necessary information about their intangible assets and may feel that disclosure would lead to a loss of competitive advantage. Voluntary codes, as we have seen with the OFR, can be easily abandoned and moreover the fewer companies who take part, the more likely it is that those taking part lose some competitive advantage.

Despite all the efforts of firms to retain knowledge, knowledge is essentially a public good because knowledge leaks – it is very difficult for a firm to retain knowledge just for their own advantage for any length of time. The role of governments should thus be to strike the right balance in promoting the diffusion of knowledge but also to protect existing knowledge to allow companies to use it for their, and ultimately the economy's benefit. We need a reporting framework fit for the knowledge economy. It is only by recognising the shift in the economy and by actively supporting investment in these new drivers that governments can promote future prosperity. Better information is a necessary condition for effective public policy.

Areas for future research

This paper has touched only on the surface of the debate. Its purpose was establish how the economy has changed, how the importance of intangibles has risen and what the implications of this are, by gathering existing material on challenges and solutions. The following describes potential areas of further research which we will focus on in the next stage of The Work Foundation's knowledge economy programme:

We intend to further explore the attitudes and views of firms and markets on intangibles, particularly focusing on investors and to what extent and how they take intangibles into account when valuing firms:

- What are the implications for capital allocation?
- How, if at all, do firms communicate information to investors about their intangibles assets?
- What information do investors think would help them to make more informed judgements?

Further insight in the views of firms would also be useful:

- Do firms whose market value is strongly based on intangibles think more disclosure of those assets in their balance sheets would help or hinder their competitiveness and access to capital?
- Do some forms of intangible assets have a bigger input on how stock markets value the firm than other forms of intangible assets?

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