

## Creating Value from Intellectual Assets

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### Introduction

Intellectual assets have become strategic factors for value creation by firms. The expansion of the services sector, globalisation, deregulation, and the emergence of new information technologies have brought to the fore the issue of how knowledge is created, disseminated, retained and used to obtain economic returns. This has led to a structural change, from traditional scale-based manufacturing, which mainly relies on tangible assets, to new innovation-oriented activities which rely largely on research and development, patents, software, human resources and new organisational structures – collectively referred to as intellectual assets.

These factors have transformed the value creation process, making it necessary to update measurement methods and conceptual models of investment, capital, and its return. This is true at both the economy-wide level and at the firm level, as intellectual assets are rarely reflected in official measures of economic performance such as gross domestic product (GDP), and most of them are not accounted for as investments in financial statements. When one dollar is spent in buying a piece of equipment and another dollar goes to learn how to use it or to pay the patent license that enables its use, only the first dollar is accounted for as investment.

Today, firms often spend as much on intellectual assets as on tangible ones, so there is an increasing need to measure their contribution to OECD economies. The current bias towards tangible assets in measuring investment may lead to inefficient policy making, misallocation of resources by managers and increased cost of capital for investors. However, considering intellectual assets as investments rather than as expenses is fraught with measurement and valuation problems.

This *Policy Brief* looks at how better understanding and improved disclosure of investments in intellectual assets, as well as diffusion of best practices, would benefit managers, investors and policy makers. ■

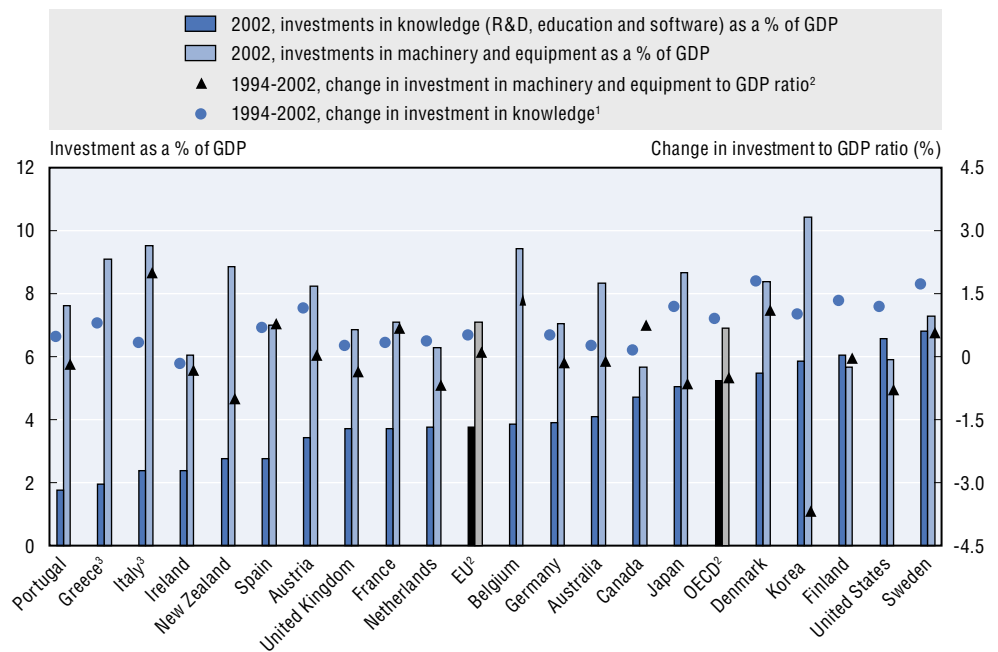
**How do intellectual assets drive growth?**

Expenditure on intellectual assets in the OECD area has grown faster than expenditure on machinery and equipment in recent years. In 2002, total expenditure in research and development (R&D), software and higher education was larger than investment in machinery and equipment in the United States and Finland, and grew at a faster rate between 1994 and 2002 in most OECD countries (Figure 1).

As spending on intellectual assets increases, so does their economic impact. A large number of studies show that intellectual assets make a substantial contribution to economic growth:

- Human capital has a significant impact on business and economic performance. When workers' characteristics such as educational levels, skills and experience, age and gender distribution are taken into account, the change in the composition of labour is shown to play an important role in productivity growth.
- Studies typically suggest that R&D spending is associated with an increase in productivity, with estimated gross rates of return (including both net return to capital and depreciation) ranging from 10 to 20%. Social returns (spillovers to firms not involved in the research effort) can be considerably higher.

**Figure 1.**  
**INVESTMENT IN KNOWLEDGE AND INVESTMENT IN MACHINERY AND EQUIPMENT, 1994-2002**



1. 1994-2001 for Greece and Italy. 1995-2002 for Korea. EU figure excludes Belgium, Greece and Italy. OECD figure excludes Belgium, Greece, Italy and New Zealand.  
2. Excludes Greece and Italy.  
3. 2001 data.

Source: OECD (2005), *Science, Technology and Industry Scoreboard*, OECD, Paris.

- The knowledge developed by R&D is increasingly protected by patents. Patent filings grew by 94% in the United States and by 76% in Europe between 1992 and 2002, with ICT, one of the most R&D-intensive sectors, driving the lion's share of the growth. The impact of patents also differs substantially across sectors and largely depends on their use, which can include obtaining freedom of action, commercialising own inventions, licensing them to third parties, entering into cross-licensing agreements and attracting external finance.
- Investments in software have also contributed much to business performance and economic growth in recent years. In Denmark, France, the Netherlands, Sweden and the United States, investment in software accounted for one-third of the total contribution of ICT capital to GDP growth between 1995 and 2003.

Added to the difficulty in drawing the line between expenditure and investment is the fact that intellectual assets are not always separately identifiable. Instead, they tend to be complementary and can overlap significantly, so they are difficult to measure and their impact is difficult to isolate. In many cases the border between different categories is blurred. For example, the bulk of R&D expenditures go towards wages for highly-skilled labour. This results in training and the development of skills. Patents are frequently the result of R&D and are a legal device for securing the ideas emanating from human capital. Similarly, the development of software represents a large portion of R&D spending, especially in services. But software and organisational structure are frequently the codification of human expertise and know-how. These interactions and complementarities need to be taken into account or the resulting picture may be incomplete and lead to an inaccurate view of the overall contribution of intellectual assets to economic performance. ■

### A new perception of investment?

The growing importance of intellectual assets and their intertwined nature pose new challenges for official statistics such as the national accounts. With the adoption of the System of National Accounts, 1993 (1993 SNA), countries' measures of fixed capital formation have been expanded to include expenditure on software, thereby leading to an increase in measured GDP. In the current update of the 1993 SNA, it has been proposed to treat R&D expenditure as investment rather than an intermediate input. While these changes represent improvements in the system of national accounts, making it better suited to tracking knowledge-based economies, a number of practical measurement issues remain. These include determining the depreciation rate of R&D, developing an appropriate price index, measuring international trade in intellectual property between affiliated enterprises and the question of whether other investments in intellectual assets should be included. Some critics argue that R&D expenditures are only part of the total amount spent by businesses to improve their technological capabilities and bring innovations to market.

Using a variety of official and non-official sources of information, a recent study has found that, had it been included in the official figures, business investment in intellectual assets would have been about 10% to 11% of GDP

in the United States by the late 1990s, roughly the same share as tangible investments. Intellectual assets are also found to contribute as much to labour productivity growth as investment in tangibles for the period 1995-2003 (Box 1). ■

### How to realise their full potential?

The ability to create economic value from intellectual assets is highly contingent on the management capabilities of individual firms and the implementation of appropriate business strategies. Work on the impact of R&D, patents, human capital and software shows not only that the average return on investment in intellectual assets can be large, but also that the value of many intellectual assets is highly skewed. A small number of patents, for example, account for most of the value of firms' patent portfolios. Many R&D projects do not result in a successful new product or service, but the returns on successful projects can more than compensate. The role of management is to direct investment to areas of higher expected returns and develop processes that ensure that those returns are realised. In general, there are many poorly managed firms; well-managed firms excel in productivity, profitability and sales growth.

Management practices are also important for improving returns on investments in knowledge. Leading firms have increased the efficiency of their R&D processes by linking internal R&D activities more closely to their business strategy and relying on external sources to gain access to complementary knowledge and round out technology portfolios. Managers now use new intellectual property management techniques. These aim to realise value from patented inventions through licensing and sale, to transfer

#### Box 1.

#### REVEALING INTANGIBLE CAPITAL AS A KEY DRIVER OF GROWTH

In an attempt to fill the gap of official statistics measuring investment at the country level, economists at the US Federal Reserve Board have estimated that annual investment in intellectual assets by US businesses in the late 1990s was about USD 800 billion, roughly the same they invested in tangible assets. According to their calculations, US nominal GDP would be about 10% higher in the late 1990s if such investments were taken into account. For this analysis, the authors construct an extended measure of GDP for the United States, including not only tangible capital spending but also intangible spending intended to increase output in the future, such as expenditures on computerised information (mainly computer software); innovative property (scientific and non-scientific R&D); and economic competencies (brand equity and firm-specific resources). Non-traditional types of intangible capital such as non-scientific R&D, brand equity and firm-specific resources together account for almost 60% of intangible capital deepening since 1995. Computer software is the only category that is currently capitalized in the US national accounts (since 1999). Scientific R&D will likely be capitalized in the coming years too, but there is no plan at the moment to include other intangible capital categories in US national accounts.

Using this extended measure of GDP, the authors analyse the contribution of different components to labour productivity growth and find that investment in intangibles contributed as much to labour productivity growth as investment in tangibles during the period 1995-2003, with computerised information (mainly software) and

low-value patents to venture capital enterprises and to link patents better with innovation by incorporating them into improved products and services. Such techniques are particularly important in competitive industries where innovative products rapidly become commodities through follow-on innovation and imitation.

A key element of intellectual asset management is retaining the assets developed or acquired by a firm. Many intellectual assets are far more mobile than fixed capital. For example, workers can leave one firm for another while knowledge diffuses through various channels, including published papers, reverse engineering of inventions and conversation. As intellectual assets become a more important source of value creation, firms need to manage and retain their assets. To retain human resources, they use non-competition and confidentiality agreements in employment contracts, stock options and attractive benefits. Intellectual property rights like patents, copyrights and trademarks are used along with secrecy to protect knowledge. Licences allow patent holders to share patented inventions or other intellectual property in a controlled manner and receive revenue (e.g. royalties) or other benefits (e.g. access to another firm’s knowledge). ■

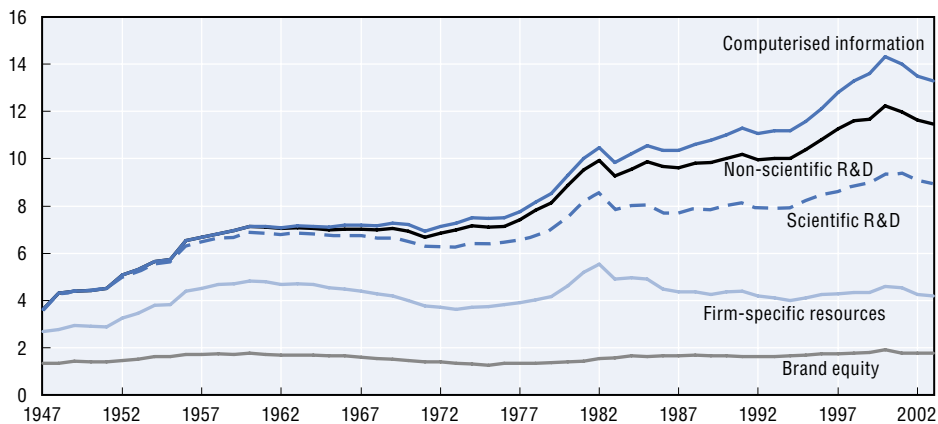
**How to diffuse best practices?**

Because company management is such a key factor for realising value from intellectual assets, governments are limited in their ability to influence the value creation processes directly. While a number of policy instruments such as tax incentives can be used to encourage investment in particular intellectual assets, fewer options exist for influencing business management practices. However, OECD work has found that some policies can encourage innovation

**Box 1. (cont.)**

firm-specific resources (worker training and strategic planning and reorganization costs) contributing the most among the intangibles considered. The growth rate of labour productivity was also higher with intangibles, changing our perceptions of growth, cyclical variations and savings versus consumption – in short, economic performance.

**Figure.**  
**ESTIMATED INTANGIBLE INVESTMENTS IN THE UNITED STATES, 1947-2003**  
 Per cent of business output



Source: Corrado, C., Hulten, C., and D. Sichel (2006), “The Contribution of Intangible Investments to US Economic Growth: A Sources-of-growth Analysis”, NBER Working Paper 11948.

and entrepreneurship. Policies to encourage the diffusion of best practices already pioneered by advanced firms are a necessary part of the strategy.

Several studies indicate that diffusion of good management depends significantly on the strength of competition and the ability of firms to enter and exit a market. One way to diffuse best practices is to provide financial markets with sufficient and relevant non-financial information about intellectual assets, thereby improving the exercise of ownership rights and tightening the financial discipline of management and boards, with positive economic consequences. The management, measurement and reporting of intellectual assets is intimately linked with key corporate governance issues such as board monitoring of senior management and oversight of strategy, reporting tools and accountability to shareholders, as well as internal control and risk management.

Intellectual assets are not generally recognised in a firm's financial accounts. The only intangible assets recognised in financial statements are purchased intellectual property, such as patents and trademarks, and acquired items such as goodwill. This excludes for instance R&D expenses. Although a number of efforts have been made to propose accounting standards that take account of a wider range of intangibles, it is difficult to establish and verify monetary values for such assets, which are often risky and have highly uncertain rates of depreciation. The relative lack of recognition of intangibles in accounting, coupled with their growing importance in the value creation process, means that financial statements have lost some of their value for shareholders. If other information does not fill the void, there could be a misallocation of resources in capital markets. ■

### How can companies report intellectual assets?

Intense market pressures are already encouraging more companies to improve their reporting practices, although companies differ widely in this respect. Some companies are experimenting with non-financial reporting of intellectual assets, but on an unsystematic basis and with great discrepancies between companies, sectors and countries. Evidence suggests that additional public disclosure would enhance capital market efficiency and that stock market valuations are influenced by the extent and type of information on intellectual assets that is publicly disclosed. The experience of the dot com bubble is a powerful reminder of difficulties in valuing firms, evaluating business models and identifying the drivers of value. A firm's ownership structure provides a means for improving disclosure and transparency.

For non-listed companies, acquiring information on intellectual assets and firm strategy may be relatively straightforward as there is often a strong correspondence between management and ownership. When ownership is more diffuse and includes venture funds, for example, the need for information is best handled by private contractual arrangements if the legal framework allows parties sufficient flexibility.

For listed companies, which account for the bulk of intellectual assets in OECD economies, the situation is far more complex and involves accounting and disclosure standards and practices (both financial and non-financial) together

with procedures and requirements for disclosing company strategy and business models. Many of the standards and procedures covering strategy and business models are voluntary, and are often developed by the private sector. ■

### What role for governments?

Although creating innovations and value through the efficient use of intellectual assets is primarily the role of company management and their boards, public policy is nevertheless important. The OECD Growth Project, which analysed the factors fuelling differences in growth performance in OECD economies, stressed that: "... something new is taking place in the structure of OECD economies... and this transformation might account for the high growth recorded in several OECD countries. Policies that engage ICT, human capital, innovation and entrepreneurship in the growth process, alongside fundamental policies to control inflation and instil competition while controlling public finances are likely to bear the most fruit over the longer term."

Given that expenditures on intellectual assets have generally been increasing, their inclusion in measures of the economy can alter perceptions of economic performance. Governments should explore options to improve information on intellectual assets reflected in the national accounts (*e.g.* experimenting with satellite accounts for specific assets). This would provide a clearer picture of economic growth and thus aid policies designed to stimulate growth.

As innovation becomes more collaborative within and across firms and as the pace of innovation accelerates, policies need to strike a proper balance between private and public goals. In particular, policy makers need to ensure that firms have the tools to retain and make the best out of their intellectual assets, without undermining competition. At the same time, they need to promote the mobility of human resources and the diffusion of knowledge. Policies related to intellectual property rights, technology markets and employment protection law may need to be re-evaluated to ensure a suitable balance.

The upgrading and updating of adults' knowledge and skills is skewed toward highly qualified workers, giving them an edge over poorly qualified workers with respect to earnings, employability and the likelihood of participating in further learning opportunities. Governments will have to ensure adequate learning opportunities for who do not receive them through work.

Competition in financial markets already encourages companies to improve their reporting and managerial practices on intellectual assets. However, best practices have not been widely disseminated across companies and jurisdictions. Governments need to encourage the diffusion of best practices, already pioneered by advanced firms. Given the wide range of intellectual assets held by firms in different industries, and the comparatively early stage of development of reporting frameworks, the approach to improved disclosure should remain principles-based. ■

### For further information

More information about this *Policy Brief* and the OECD project on intellectual assets and value creation can be obtained from Marcos Bonturi, e-mail: [marcos.bonturi@oecd.org](mailto:marcos.bonturi@oecd.org), tel.: +33 1 45 24 19 59, or see: [www.oecd.org/sti/ipr/iavc](http://www.oecd.org/sti/ipr/iavc).



### For further reading

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