

THE INTANGIBLE ECONOMY IMPACT AND POLICY ISSUES

Report of the European High Level Expert
Group on the Intangible Economy

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Preface

This report sets out the initial findings of the European High Level Expert Group (HLEG) on the Intangible Economy, which was set up in response to a request by the European Commission Directorate General for Enterprise. Its conclusions and recommendations represent the first milestone in a study programme launched in January 2000, and present new evidence on the influence of business intangibles on corporate performance and productivity, together with an assessment of the implications for companies, financial markets, public institutions and regulators.

The report was prepared by the HLEG secretariat with assistance from the expert group whose members are listed in Appendix 1. Special thanks go to Andrew Wyckoff and his colleagues on the OECD Growth Project for providing econometric and productivity research statistics; and to McKinsey & Co. for access to the firm's country economic surveys and the wealth of data provided by their Global Institute in Washington, D.C. We are indebted to Ellen Pedersen and her colleagues in the European Commission Directorate General for Enterprise for their assistance throughout the project. Thanks are also due to the faculty staffs of IMD, KTH, CUBS and the University of Ferrara for hosting the HLEG sessions. The HLEG was supported by funding from the European Commission Directorate General for Enterprise.

The report starts with an executive summary and the remainder is structured in four parts. Part I discusses the economic transformations currently at work and the essential responses for European companies to remain in the premier competitiveness league. Part II explores and presents fresh evidence on the links between intangible investment and economic performance. The implications for official statistical and accounting systems are reviewed in part III, by reference to national accounts and economic indicators, capital markets and internal management accounting practice. Part IV concludes with a rationale and priorities for policy orientation.

A. EXECUTIVE SUMMARY

Overview

The 21st century business landscape is often characterised as 'old economy' plus the internet. As a metaphor this has the appeal of simplicity, but is misleading. Today, the pursuit of competitive advantage requires a radical shift of mindset away from our old-world business models and practices. The clarity of 20th century markets was based on a system of fixed boundaries, with one-to-one trading relationships, linear value-chains and balance sheet accounting concepts. The economy today operates without fixed boundaries, and this has far-reaching implications for companies, financial markets, public institutions and regulators.

At the corporate level, the search for new modes of competitiveness has opened the way for visionary entrepreneurs to exploit intangible investment in previously unforeseen ways. Intangibles such as R&D and proprietary know-how, intellectual property, workforce skills, world-class supply networks and brands are now *the* key drivers of wealth production, while physical and financial assets are increasingly regarded as commodities. In this respect, ICT continues to play an indispensable material role, both as an infrastructure and carrier that migrates concepts, processes and practices across all sectors. The latest generation of web-based technologies is transforming the structure and behaviour of global markets as well as their core activities of innovation, production and distribution. This has led to a wholesale desegregation of the value-delivery systems in many sectors of the economy, and is bringing about profound changes in company performance thresholds.

While the origins of this trend can be traced far into the past, the level and scope of intangible investment in the leading economies has reached a critical mass that some observers now believe is challenging the orthodoxy of classical economics and accounting. In terms of a cogent explanation that has predictive power, the clearest pointers are coming from the United States, where for many years non-inflationary growth has consistently confounded analysts' expectations. Increasingly, economists and business thought leaders are coming round to the view that we are in a transitional economy where value-creation stems chiefly from innovation capability. These innovations are made possible by the new information and communications technologies and collateral investment in other areas that impact directly on firm-level competitiveness.

Meanwhile, the various interest groups are struggling to adapt their analytical models, standards and regulatory policies to reflect the economics of intangibles. The overriding problem is how to isolate the new performance drivers – the portfolio of assets, quasi-assets, commodities and competencies we need to measure. Although much of the hype in the dot.com debate evaporated during the course of the study, a residual concern for investors and other stakeholders - not only in 'new economy' sectors, but in mature industries struggling to stabilise their value chains – is how to differentiate durable modes of profitable business activity from what, in the long run, will prove to be evanescent, irrelevant, or just plain snake oil.

Findings and Conclusions

The HLEG's specific findings and conclusions are that:

(1) In the past few years we have heard a great deal of rhetoric about a new economic paradigm. On balance, however, the evidence does not fully support this claim. While the global economies are undoubtedly experiencing as rapid an era of change as at any time in history, the economic fundamentals remain in place. The 'new' economy is less about irreversible discontinuities than a shift of mindset relating to building and extracting value - in both the tangible and intangible worlds. The disconnect, as this paper will demonstrate, lies in our economic and business measurement systems, which are tracking - with ever increasing efficiency - a smaller and smaller proportion of the real economy.

(2) Far from being new topics, knowledge and intangibles have been important throughout history. The difference is that, today, a firm's intangible assets are often *the* key element in its competitiveness. Increasingly, the capacity to combine external and internal sources of knowledge to exploit commercial opportunities has become a distinctive competency. Firms possess many different types of knowledge, which may be codified or tacit - codified knowledge can be bought, sold, stocked and valued, tacit cannot.

(3) A number of transformations are at work in the modern economy. The primary drivers centre on the rapid pace of improvements in computer power and connectivity, and 'global contestability' - the speed with which leading-edge practices migrate around the world. Their impact is not limited to service industries and internet enterprises. Many traditional sectors are also profoundly affected. The effects can be seen most clearly in terms of their impact on three broad industry groups:

- Traditional non-service industries, especially those experiencing fundamental shifts in their value chains.
- New growth companies (in all sectors), led by the early adopters in their search for new modes of competitive advantage.
- Service industries, including the public support framework and government services.

(4) The impact of knowledge and intangibles will be greater for old-established companies that are built on traditional technologies than for dot.coms and other 'new economy' enterprises. Faced with increasing globalisation, Europe's mature industries are struggling to get to grips with the exhaustion of the old mass-production model at the same time as being forced to respond to demands for mass customisation by consumers whose commoditised demand is essentially satisfied. Most dot.coms will sooner or later be absorbed by more traditional businesses, or disappear

(5) In common with parallel studies at the Brookings Institution and the OECD, the HLEG sessions were confronted with a wide range of unresolved conceptual ambiguities, measurement and data problems. Some of these will prove intractable and new business models will need to evolve before new theories can be postulated. Others will be resolved as the existing analytical tools and data improve. In this respect an important breakthrough has been reported recently at the OECD, whose research has identified, albeit on a tentative basis, a number of business intangibles that correlate positively with GDP or productivity growth.

(6) The present statistical and accounting frameworks are in urgent need of updating. New explanatory models and metrics are needed to enable us to understand the workings of the modern economy, especially the intangible goods and 'content' sectors that are currently hidden from public view. At the firm level, a new generation of analytical tools is needed to enable company boards, shareholders and investors to judge management performance and differentiate good, bad and delinquent corporate stewardship.

(7) The European IPR framework also needs to be reconstituted in the light of the growing importance of intangibles for EU competition policy. IPR related to services and intangible commodities will increasingly drive future competition policy as well as the policies that underpin the 6th Framework Programme. Our present IPR conventions are based on outdated asset-class boundaries and value models. A new, flexible IPR framework is required that reflects the changing dynamics of today's market access and protection needs, and is supported by an efficient pan-European administration system.

(8) At present, European-oriented research into intangibles amounts to too little, too late. Different groups are working in the same area, but are not communicating effectively. In this connection, the absence of a supra-national body with a mandate to champion and co-ordinate the emerging solutions is a matter of serious concern. A structured, interdisciplinary research programme must now be a top economic priority for the Commission, and this will require public support at the community level. In the first instance the agenda should focus on the spread of enlightened best practice rather than attempting to construct prematurely new theories.

(9) In the long run, the new economic order will bring about major global changes in culture, process, infrastructure and measurement. Regulation has to adjust to best international practice, and the European Commission needs to take action early to ensure that it is positioned to play its right and proper part in these developments.

Key Policy Implications

An early conclusion of the High-Level Expert Group was that there is no simple pan-European policy prescription for the intangible economy. Rather, a mutually-reinforcing set of community and national policy initiatives is required. In this connection:

(1) The first priority is to undertake a critical reassessment of the Commission's existing policy framework in relation to the needs of a dynamic economy that is increasingly dominated by trade in intangible goods and services. Central to this will be the interconnection between the different components of the policy set viewed from an IPR and competition perspective.

(2) Given that we are in a transitional economy with little in the way of navigational tools or data to rely on, regulators should proceed with caution. Prescriptive regulatory action is still some way off. In the mid-term, EU and national policies should aim to foster a business and political climate that encourages entrepreneurial opportunism, innovation and rapid technology diffusion.

(3) Complementary policy initiatives will be required to encourage and accelerate market-led restructuring of European industry in line with international best practice.

Accordingly, the HLEG recommends the following broad policy agenda for adoption by the European Commission and national governments:

- Fostering an entrepreneurial business and political culture, including market-led restructuring of 'old economy' sectors.
- Public support for a pan-European research initiative, including establishing a supra-national body to co-ordinate community and national policy initiatives.
- Modernisation of government services - g-commerce and e-government.
- Better integration of public-private networks, especially in R&D.
- A fundamental reconstitution of community competition and IPR policies.

B. DISCUSSION OF FINDINGS

"We are competing in a 21st century economy. Our institutions are still working under frameworks and mindsets that derive from the 19th century. This imbalance is growing by the day, and needs to be addressed quickly."

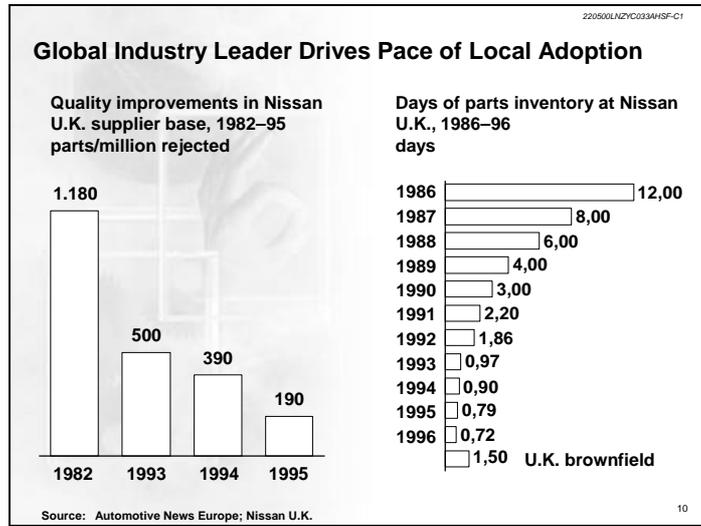
1. Throughout the meetings of the High-Level Expert Group and our parallel interviews and group discussions, this was *the* one recurring theme. It was a leitmotif we had half-suspected at the outset, but we had not realised how deeply it was held by the opinion formers we met in the course of the study. Many of the experts who participated from around Europe and gave so generously of their time were motivated by the knowledge that the group was EC sponsored, precisely in the expectation of being able to influence public policy, whether at the Community, national or another level. This role of the Community as an influencer is as powerful as its legislative role. In a context where increasing institutional imbalance exists, we believe that the Community needs to move quickly and with urgency.

I - THE CORPORATE PERSPECTIVE

2. A central part of our brief was to explore the changing business landscape and, in so doing, to attempt to provide fresh insights into such questions as:

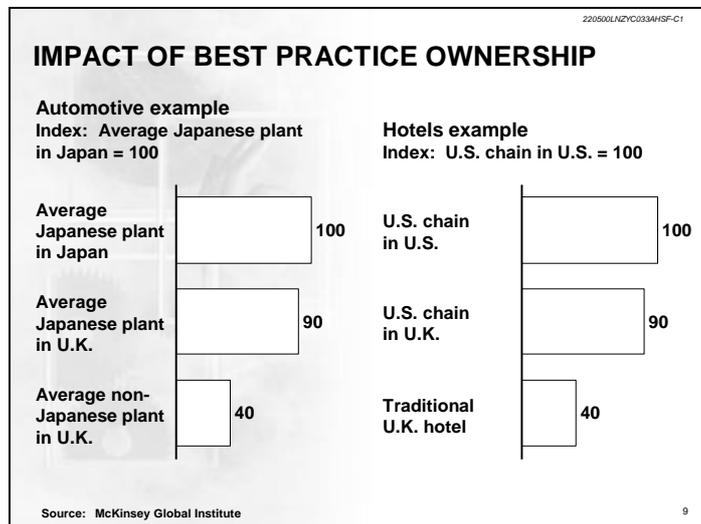
- *What are the fundamental forces at work in the modern economy? What is the impact on economy structure and performance - what is new and durable and how does it differ from what we had before?*
- *What is happening to the corporate value 'system'? What transformations are influencing our innovation and productive systems, and value chains? To what the extent is there a shift from scale-driven strategies towards exploiting economies of scope, especially at the market interface?*
- *What sectors are most affected & how? What steps can and should be taken to revitalise old sectors?*
- *What are the measurement gaps that may need attention?*
- *What regulatory constraints frustrate corporate executives?*
- *What do companies, investors, and society at large need from government and what policy actions should the HLEG promote a) in the immediate short-term, and b) as longer-term strategic initiatives?*

Exhibit 1. Migration of Global Best Practice - I.
(Impact of Nissan on UK supply base)



Source: McKinsey

Exhibit 2. Migration of Global Best Practice - II.
(Case Studies: Automotive and Hotels Industries)



Source: McKinsey

Drivers of Competitive Advantage

3. In classical business theory, major shifts are driven by discontinuities or rapid changes in market expectations. In this context, the primary drivers of economic change today are seen as:

- Rapid improvements in computer power and connectivity.
- Global contestability¹ of business intangibles (the rapid speed with which leading-edge practices migrate around the world).

4. The net effect of these and other firm-level changes has served to create a wholesale disaggregation of the 'old world' value delivery systems over the past 25 years. Adding to this, the rising proportion of intangibles in investment and the growth of outsourcing and relocation as value management tools are having a profound effect on the managerial mindset and the norms of entrepreneurial behaviour and competitiveness. At the firm level, changes in the architecture, pace and connectivity of the value chain have redefined the core business activities of innovation, operations and management of the customer interface. These aspects of the changing corporate perspective were explored in some depth by the HLEG, and are now discussed in the following section.

Innovation²

5. Innovation is a critical driver of business performance and this has been recognised intuitively for some years, but the processes and causal linkages involved are complex and have been slow to yield to analytical methods. Since the 1960s, our understanding of the processes that drive innovation performance has matured and opened up considerably as the concepts have moved away from their factory and laboratory origins. As a result, the contingent links between investment, value-creation and bottom-line performance have grown and expanded along a number of axes:³

- Although companies now deploy a variety of business models to extract value from new technology, it is generally accepted that technology-intensive companies fall into two classes - technology generators and technology users. The first group is characterised by the pharmaceutical, fine chemicals, electronics and process industries. Their R&D and

¹ *Global contestability is based on the notion that best practice migrates rapidly to multinational companies everywhere. The prime agents are leading edge companies establishing operations abroad and M&A, but there is also a 'halo' effect on local companies as suppliers link in via electronically-enabled supply chains. Global contestability also drives equality of productivity in locally-produced, locally-consumed services. In this respect, ownership changes through cross-border mergers and acquisitions are important - the pace of adoption in the local economy increases dramatically in the presence of a global industry leader (Exhibits 1 and 2). For a fuller description of global contestability, see Bryan, Fraser, Oppenheim and Rall, 1999.*

² *For a more comprehensive analysis of the corporate innovation 'system' see the report of the R&D sub-group of the Brookings Intangibles Task Force (www.brook.edu/intangibles).*

³ *Private-sector R&D spend in the industrial economies has exhibited broadly consistent growth characteristics since the 1960s. According to Lev (1999a), total annual R&D expenditures in the U.S. increased from \$26 billion in 1970 to \$206 billion in 1997, representing an average yearly growth rate of 8%, while investment in plant and equipment over the same period increased annually by 6.8% on average. Collateral intangible investments in other areas that impact directly on firm-level innovation - IT and information systems, supply chain responsiveness, brands and workforce skills - exhibit broadly comparable growth rates. Corporate intangible investment in the U.S. economy is now running on a par with tangible investment in plant and equipment, at a GDP intensity approximately twice that of Europe and Japan.*

engineering functions are engaged mainly in generating distinctive technical know-how and prototypes on which to build future products and services. These enterprises leverage technology in a fundamentally different way to service organisations - such as banks, airlines, media and entertainment companies - which use technology as a basis for operating and distributing other value-added services.

- Technology-intensive competition tends to suck technology in - its infrastructure is a prerequisite to being a global winner. In-sourcing of new technology and R&D capabilities has led to the growth of company incubator funds that operate as in-house venture capital boutiques to make strategic investments in potential technology suppliers, usually SMEs. The use of technology search agents is now also common practice, as is outsourcing of routine activities in areas such as technology proving and prototype testing.
- Technology-intensive companies have reconfigured their R&D activities to achieve a closer fit with the core business strategy and alignment with operational and service units, such as design, engineering and marketing.
- There has also been a marked shift from innovative 'R' to incremental 'D' and soft investment aimed at organisational effectiveness and continuous process improvement (kaizen).
- As a result, corporate R&D budgets now encompass a range of complex innovation processes. An essential, material, part of the total innovation spend lies outside the traditional R&D domain, in areas such as quality control, skills renewal, training and ICT systems, or in managing the market franchise, alliances, etc.⁴ Adding to this, most technology-intensive industries, including service industries, are now networked globally in a labyrinth of strategic technology partnerships, alliances and technology licensing agreements.⁵
- Science parks have been building bridges between research and business for some time, and there is now well-established evidence that science parks,⁶ where innovative people can meet and have ready access to other support skills (the spill-over effect), enable member companies to grow faster than working by themselves.

⁴ *PIMS research shows the existence of a statistically significant correlation between R&D to new-product conversion and specific factors of 'non-price' competition such as R&D intensity, patent citations, market share, time-to-market and quality reputation.*

⁵ *Narula and Hagedoorn, MERIT, 1997.*

⁶ *For example Kista, Cambridge and Sophia Antipolis.*

6. Managing innovation presents a particular challenge for technology multinationals.⁷ They have also had to learn to master the balance between creating and exploiting legacies.

The classic innovation model starts from:

- Basic research (university-based)
- Development (company-based)
- Applied research (overlapping)

7. This model may well still apply for incremental development of commodity technologies, but new-product innovation in hi-tech sectors now depends critically on other factors - such as speed of response, interdisciplinary teamwork and networking with supply chain partners. The old model is also poorly suited to new areas of knowledge, where experimentation, prototyping and vision come into play. The consensus was that this should not be left to the academics, who were seen as too narrowly focused and unable to cope with the time pressures created by shrinking business decision cycles. At a recent Stanford meeting "all the most creative ideas came from industry, not academics". On several occasions the expert hearings highlighted the contrast between the flexibility of multidisciplinary research institutes and the conventional university ethos. In terms of future policy orientation, a key challenge for the EU research community is how to encourage inter-disciplinary cultures and networks that foster an open exchange of new ideas between academic institutions and companies at all levels.

8. The HLEG is anxious to see the 6th Framework Programme provide a focus for building centres of excellence above the national level and a great deal more on the movement of people, especially technologists. This should be part of the European Research Area agenda.

Electronic Supply Networks

9. Since the 1960s significant changes have also taken place in the core production and distribution functions, driven by an increasing technological sophistication of products and processes and the growth of digitally-enabled supply chains.⁸ The availability of low-cost distributed ICT has shifted the boundaries between tacit and codified knowledge resulting in massive amounts of ICT and collateral spend being directed towards the codification of proprietary know-how and processes. ICT acts as a codifier, which migrates processes and tools

⁷ *The discussion led by Bernt Ericson of L.M. Ericsson (KTH, 26 May 2000) focused on the example of the Swedish technology multinational, L.M. Ericsson, which is creating cells that can act like small independent companies which can develop ideas that may not be immediately attractive or aligned with core strategy or the established organisational hierarchy. Innovation always involves leading-edge customers and projects. Ericsson is more interested in attracting leading-edge customers in new market segments to help generate new business ideas than slow-moving national telephone companies. The new development cycle, as demonstrated in Silicon Valley, is:*

- *Find a customer*
- *Sell them a solution*
- *Then go home and develop it*

Five years ago the cells were 'skunkworks'. Two years ago they appeared on the organisation chart. Today they report direct to the CEO. Staff in the cells can be rewarded with equity, but this can create great stress in the rest of the organisation. The cells have their own 'CEOs' but are not legally separate entities.

⁸ *This section is based on the CUBS discussion of 13 July 2000, which was led by John Barber (UK Department of Trade and Industry).*

across all sectors. Even genetic engineering is based on the decoding, manipulation and eventual reprogramming of the information codes of living matter.⁹ By this means, intangible assets, mainly in the form of knowledge, reputation, relationships and people, can be codified and converted into leverageable intellectual capital.

10. Until the 1980s, firms in sectors such as mechanical and electrical engineering depended mainly on the skills of their designers, draftsmen, production engineers and craftsmen for their technology. Now leading edge firms in these sectors depend on computer-aided design and manufacture (CAD/ CAM) and knowledge of a range of advanced technologies including electronics, advanced materials and software. The various stages of the production and distribution process, along with the interfaces between organisations in the supply-chain, are now codified and managed electronically rather than via blueprints and engineering drawings. As a result, traditional craft and production engineering skills have been replaced by computer design skills, and the ability to integrate successfully the various elements of computer-controlled work and information flows within and across company boundaries is now a key competence in many industries.

11. Led by the media, software, business and information services sectors, many industries that exhibit high growth rates have radically different value-generating processes to the old-world norms. Not only do their supply and value chains operate very differently, but there are fundamental differences in the way the economists' 'production function' works in these industries. This has led to a migration of productive effort (and jobs) away from the traditional production activities - upstream into R&D and downstream into distribution and new forms of market access. The new barriers here are pre- and post-manufacturing, since there is no manufacturing phase in the conventional sense. The current accounting regulations in most countries require both R&D and market development costs to be expensed - ie. written off as they occur - and neither shows up explicitly as value-creating in company accounts or government statistics. Although the industries affected are mainly found in the new growth sectors, the effect is also felt in more traditional sectors which are seeing fundamental shifts in their supply chains.

12. The challenge for these industries is less a question of managing scale, but rather how to capitalise on the commercial opportunities when the winner appears - the so-called 'serendipity' factor. This implies business models geared to economies of scope rather than scale, and the new rules of the game are being forged by organisations such as the media giants, who are adept at spinning out ancillary products - videotapes, CDs, computer games, toys, clothing, licenses and franchises - from their hit movies. The research agenda should be geared to gaining a much better understanding of these business models, and driving home the lessons learned to a wider private and public sector audience.

13. According to IMD, "business practice is light years ahead of business theory - it is more enlightening to read publications such as Fortune or the FT than the Harvard Business Review". In their view the existing academic and consultancy models cannot begin to explain the workings of the post-industrial economy, and the accounting/ SNA system is still locked in the 19th century. In this respect, the high ground has been lost - it is now open. Classic management ideas have been rendered obsolete and a new generation of business models is needed. This presents a key problem for regulators - "until we can see what we are dealing with, there's nothing for them to regulate".

14. ***Pan-European Intangibles Research.*** In terms of policy research and analysis, the business schools need to be brought centre-stage and encouraged to play a more pivotal role, but to be effective will require an institutional mindset shift away from accumulating conventional

⁹ See Manuel Castells, 1996

teaching materials in favour of forward-looking interdisciplinary research and advancing the knowledge base. A key conclusion of the HLEG in this regard was that:

- The subject needs to be opened up, structured and made more orderly and disciplined.
- Much more co-ordination is needed at an EU level and a top priority must go to appointing or establishing a lead institution to provide political leadership and act as a clearing house for the different interest groups. The absence of a supra-national body of substance with a mandate to champion and co-ordinate the emerging solutions across the interest groups was viewed as a matter of concern. Different groups are working in the same area, but not communicating well and the pace of development is being stalled by a fragmentation of effort. Public support and funding will be essential. Left to the corporate, professional and academic communities alone, there is likely to be very little appetite for pro bono initiatives.
- It is essential to involve companies of all sizes in research, experimentation and trials. There is both a practical and a policy need to develop new concepts, a lexicon and metrics, and this needs to be done on a pan-European basis.
- It is essential to adopt an interdisciplinary approach - ie. researchers with different experiences and cultural backgrounds, based around a specific core of ideas. A minimum initial project funding of 2-3 years is required to achieve critical mass.

15. ***The Management Development Perspective.*** From a management training and executive development perspective, a special challenge is how to manage the full spectrum of intangible competencies. The old firm was tangible and its competencies were embedded in the structure. Company executives now have to manage large areas of competency that are both intangible and outside the company. This is a rich and fertile policy target, since a very wide range of EU policies are affected by the need to foster more effective private-public networks of excellence.

16. A development with potentially far reaching consequences is the recent co-operation between the global consultancy majors and the leading European business schools.¹⁰ According to IMD¹¹ "there is now great emphasis on exposing very senior European executives to the reinvention of how business is going to be done" and the benefits of 'total immersion' visits to

¹⁰ For example, the link-up between IESE (Barcelona), Reykjavik University and McKinsey for the International Executive Education seminar "Who's Afraid of the New Economy" in October 2000.

¹¹ A wide-ranging discussion on how corporate culture impacts performance was led by Bill Fischer and Andy Boynton at the IMD session. IDEO, for example, is a Silicon Valley company that started as a product design ideas factory, but its people are now being hired as consultants to change company structures and culture. IDEO has moved from being an ideas factory to a culture factory. Its strong culture and leadership style are achieved through intuitive shared perceptions and beliefs that simplify communication rather than via fixed rules and codes of behaviour. The culture is 'fail early and fail often' and they have two key principles.

- The individual is at the core
- The organisation is there to release flair and passion but not via conventional structures or rigid policy frameworks.

Silicon Valley is hungry and ambitious for new ideas. But its best companies also have the ability to execute flawlessly. IMD believes that these new company ideas are transferable back to old economy firms. Another example is Generics of Cambridge, UK. Case-studies are urgently needed to explore the common success factors.

Silicon Valley, Ireland, Northern Italy, etc.¹² A related problem is that of increasing dependence on the competency of top managers, as this is not necessarily a renewable resource. This also needs to be part of the research agenda.

17. Demand network management.¹³ The major economies are experiencing multiple waves - in effect a continuous re-engineering - of their value chains and delivery systems. In the past, the locus was centred on the manufacturing and process industries, but now it is spreading rapidly to virtually all service sectors, from airlines to banking and insurance - the exception is government services where the penetration is still very low. Traditional value chain concepts are fast breaking down. Business strategy today is less and less about inter-firm competition. The 'magic dust' is now in inter-chain competition and mass customisation.¹⁴ The concept of the value-chain is giving way to global value networks, such that it is the knowledge capital of the network as a whole that enables it to combine external and internal sources of knowledge intangibles to exploit commercial opportunities. In this connection successful companies generally find that:

- First-mover advantage is paramount. Companies must constantly adapt to new forms of competing, including competing against your own product base (obsolete your products before the competitors do it).
- Competition and friction between players in the same chain destroys value. For this reason competitive bidding ('auctions') should be avoided since it pushes firms into a non-virtuous cost reduction spiral that inhibits long term competence development (the audit profession is a good example). Also, the confrontational approach to supply chains by purchasers is detrimental in the long term (e.g. the after-effect of Lopez at Volkswagen). Where co-operation is counter-culture, often it is easier to start new companies (or semi-autonomous cells as in Ericsson) than tackle the problem head on.
- A strategy for outsourcing is essential, to include 'lock-on' and value-sharing along the chain. Lock-on is vital - both ways - to both input and output partners. Outsourcing parts of the demand chain is not at all like outsourcing the company cafeteria. Investment and value-extraction invariably occur at different points in the chain, and the latter is not obvious in terms of when and where it will emerge. Investments made by one operator at one point in time are often realised later by someone else along the chain, or in someone else's chain.
- The key ratio is value to cost, but there has been over-focus on cost in the past. The issue here is to pick players in the chain who add value, not just reduce costs, and then build long-term, mutually-profitable relationships. According to IMD "if you're in a commodity business you deserve it - the same goes for commodity suppliers". Similarly, suppliers should be encouraged to provide more than commodities. Firms should be

¹². When British Telecom executives visited Oracle they were amazed at the lack of long debate and lack of effort on consensus building. Speed of execution had become a key strategic dimension.

¹³ Based on the IMD discussion of 27 March 2000 led by Tom Vollmann.

¹⁴ See Victor and Boynton "Invented Here. Maximising Your Organization's Internal Growth and Profitability". The emphasis is now on chain management and delivery systems geared to providing a unique solution to each individual customer's demands - the exact opposite of Henry Ford's marketing mantra. Market segmentation and mass customisation are the same thing (except that mass customisation implies finer granularity), and the key is in the infrastructure that supports it.

When we use the term 'mass customisation' we are exploring a phenomenon that was considered a paradox until very recently. Mass production required a stock of homogeneous goods to exploit economies of scale, whereas customisation implies the capacity to satisfy each individual's needs uniquely. Coupling the two was considered impossible with the previous models of industrial production.

prepared to eliminate players who under-perform, or find new roles for them. This also goes for customers (as confirmed in the Ericsson case).

- In demand chain management, the real payback is in cross-company flows. The information management function needs to focus on co-ordinating these flows. One of the beauties of e-processes is that when well designed they are eminently scaleable. Part of the design specification should be the ability to cope with a 400% demand growth.
- Intelligent use of e-commerce should aim at increasing value throughout the chain, rather than just grafting on e-business arbitrarily (Exhibit 3). The graft will usually only lead to a poorly thought out business concept being executed quickly. The issue is less one of attacking the value-to-cost ratio than differentiating the market offer from your competitors'.
- There is an increasing need for cost-benefit models of the whole demand chain.

Exhibit 3. Impact of E-Commerce on the Supply Chain.

(Key levers of e-Business along the supply chain)



Source: McKinsey

18. The experts were unanimous in the belief that “the rules of the game are changing - the winning companies are rewriting the rules”. The hearings have shown repeatedly that this is not limited to new start ups and dot.coms. Traditional businesses are heavily impacted as they engage in a relentless search for new ways of sustaining their market power in the old markets and rapid dominance of the new. It is important to emphasise that there is no ‘quick fix’, and especially not by using IT to ‘solve’ problems. Technology solutions alone will fail.

Exhibit 4. Impact of Searching Efficiencies - I.

(Profile of interaction activities for different jobs and industries)

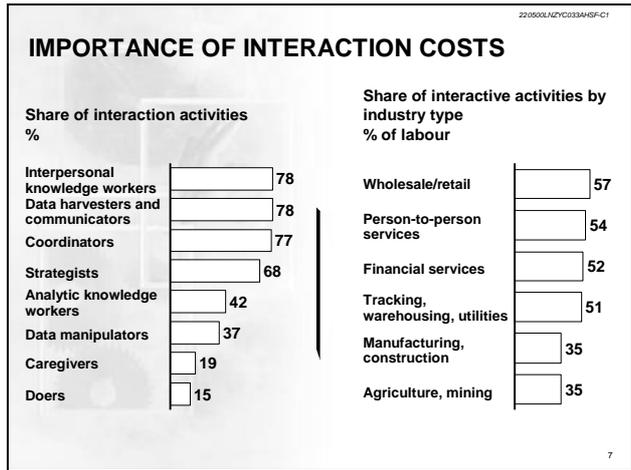


Exhibit 5. Impact of Searching Efficiencies - II.
(Case study: wholesale banking)

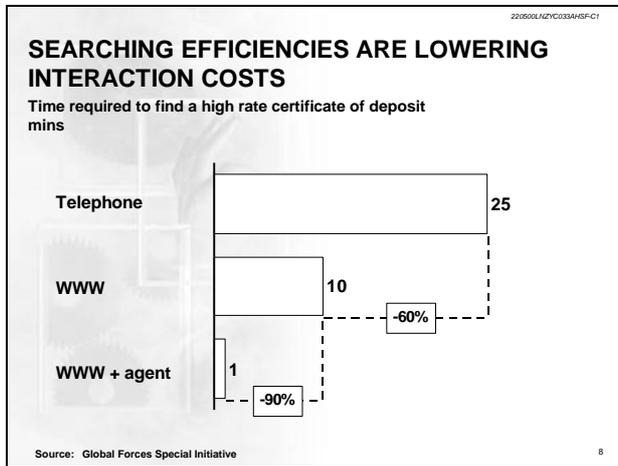
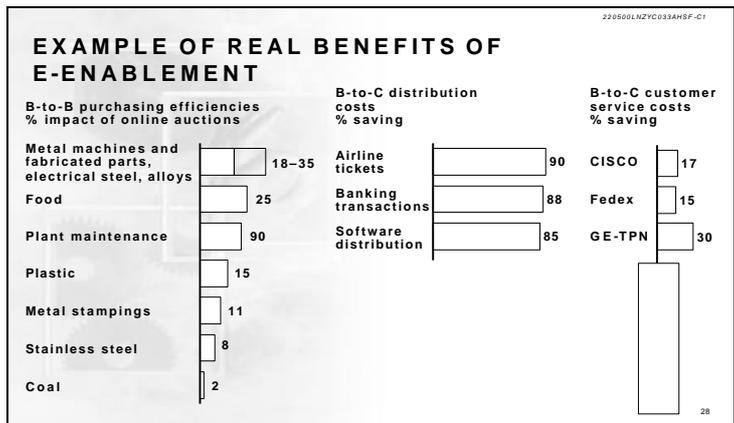


Exhibit 6. Examples of E-Enablement.



Source: McKinsey(Exhibits 4, 5 and 6)

Technology spend must always be linked to strategic, value-based goals. There are many examples of technology-enabled radical change – for example Dell changing the rules in the PC market by going direct over the internet (it did not have an existing retailer base to alienate). Amazon changed the rules for retailing books and, as the home-loop bandwidth increases, software downloading will create discontinuities that will change the structure of the film, music and publishing industries for ever. According to IMD:

- "At the micro level we're in a period of upheaval and it's pointless trying to track it, map it, or organise for it - it's changing too fast."
- This in turn creates macro issues for governments – particularly in dealing with social exclusion, and the need for a more responsive, technologically-enabled public support framework.
- In a regulatory context, "less is more" at this stage of the game.

19. **E-business.** E-business is not new. Proprietary electronic supply-chain networks and digitalised trade are a long-established feature of industries such as aerospace, pharmaceuticals, oil and automotive, and latterly this has extended to sectors such as textiles, footwear, clothing and ethical drugs. However, in the late 1990s it received a massive impetus in the form of ubiquitous, low-cost connectivity through the arrival of the Internet, which opened up the prospect of B-to-C commerce spanning a broad customer interface. While the impact will be felt to a greater or lesser extent across all areas of business, in hindsight its most durable legacy will almost certainly be seen in terms of the shock effect on the reach and speed of electronic supply networks. The new market structure and practices that emerge will be very different from those of the 1990s, especially in the financial sector.

20. Studies of the working practices of a wide variety of workers¹⁵ (white and blue-collar) have shown that 'searching efficiencies' resulting from a combination of accelerating web penetration and the use intelligent agents (software) are dramatically reducing interaction costs and time (Exhibits 4 and 5).

21. The real benefits of E-enablement will be felt in areas such as B-to-B purchasing efficiencies, B-to-C distribution costs and B-to-C customer service costs, where in some cases e-commerce will also have a disfunctional impact. As shown in Exhibit 6, significant savings are projected across a wide range of industries.

22. For some industries this represents an order of magnitude fall in interaction time and costs, which will create a structural dynamic leading to a) greater specialisation, b) accelerated growth in the specialisations, and c) opportunities for new entrants and agents - ie. new forms of intermediation.

Customer Relationship Management

23. E-commerce and its derivatives will also create a very wide space at the customer interface and huge, winner-takes-all value will migrate to those who can exploit economies of scope rather than traditional scale factors. In addition, new 'ecosystems' will emerge at the customer interface, although the necessary technology and standards are still some way off. In this connection, there is still considerable scope for strong European brands to achieve yet greater leverage.

24. **Positioning of Internet and dot.com companies.** A recurring concern of the expert group was that policy analysts must avoid an excessive emphasis on high technology and the Internet

¹⁵ Based on the presentation "New Economy vs Old Industries: A Global Perspective", Stockholm, 26 May 2000, led by Simon Fidler (McKinsey & Co.).

at the expense of understanding and tracking the needs of the more traditional sectors. A balanced approach is needed, giving proper weight to traditional sectors and drawing on all relevant policy analysis, since the policy impact of the intangible economy goes far beyond the conventional vertical policy domains of trade and industry, education and employment, etc. The HLEG was cautious from the outset about over-emphasising dot.coms and by the summer the virtual bandwagon was over as investors moved sharply against the B-to-Cs. Although an important group, it is doubtful if their start-up business models will be sustainable after the first round of funding runs out and most B-to-C dot.coms are now running into serious problems with logistics. They will mostly be absorbed into larger firms in the next few years, or disappear.

25. In summary, there is a much greater interdependence and dynamic communication today among workers, firms, their customers and suppliers. For 'old economy' industries producing tangible products and services, the key drivers of value lie in continuous innovation linked to the search for new scale advantages and geographical arbitrage. Much of this will be achieved through relocation and outsourcing. The rapid expansion of business-to-business commerce seen in the U.S. is now spreading to Europe and Asia. The economic effects of the internet will be felt mainly in searching efficiencies and, as a result, value-creation and the operational infrastructures that support it are being organised in very different ways from the traditional mass production model. This will have a dramatic impact on GDP, growth, price inflation and equity markets and, according to Goldman Sachs¹⁶, the shock effect should boost long-run GDP by some 5% in the major industrialised countries over the next 10 years. In this connection, considerable scope exists for extending commercial B-to-B and B-to-C practice to government services. We consider this to be a major untapped driver of economic growth that, given the weight of public-sector services in the EU economies, could give a further much-needed boost to GDP performance thresholds.

26. ***Internationally-Comparable EU Data.*** As the HLEG discussions developed, the full extent of the problem of data sourcing for European comparisons became abundantly clear. The United States in particular has a much richer base of aggregate and company data available for public analysis, mainly but not only as a result of the U.S. Securities and Exchange Commission (SEC) filings system. We believe the role that this has played in encouraging econometric and other analytical studies of the intangibles phenomenon cannot be overstated. The group was unanimous in the view that closing the information gap must be a high policy priority for the remainder of this Commission's term. The group is also strongly of the view that company reporting needs to focus on making more explicit a lot of value that is currently implicit. This applies particularly to new start-ups, for example in the area of internet service providers or mobile phones. Currently there is an over-reliance on image and branding. Without a reputation, they rely on that of others. Big hitters are appointed as bankers, top legal firms as advisers, leading accounting firms as auditors, and retired chief executives as chairmen. They are selling a promise of new services to manage networks, and there is both a practical and a policy need to develop a lexicon and metrics, and this needs to be done on a pan-European basis.

¹⁶ Goldman Sachs, 2000.

Entrepreneurial Capital

27. *Entrepreneurial Skills and Immigration.* There is well-established evidence that immigrants add significantly to diversity and are more prone to be entrepreneurial. There is also evidence that the recent U.S. boom in the ICT sector - especially software, where human capital is the key input - has been substantially fuelled and sustained by tapping into the international labour market. For some years U.S. immigration policy has set out to attract skilled workers - especially qualified scientists and computer technologists - and its universities and major corporations have been active in recruiting skills from overseas. Recent research¹⁷ has shown that nearly a third of Silicon Valley's 1990 workforce was made up of immigrants, two thirds of whom were from Asia, mainly China or India, while Indian nationals account for some 45% of the 115,000 professional work visas granted in the U.S. each year.¹⁸ A quarter of Microsoft's employees were born outside America. There is also growing evidence that the buoyant UK economy has attracted large numbers of immigrants since the mid-1990s.^{19 20}

28. In terms of entrepreneurial achievement, the correlation is even more remarkable. Exhibit 7 shows that between 1995 and 1998, almost 30% of Silicon Valley's technology companies were started by Chinese or Indian engineers. A similar situation exists in Australia. There the net inflow of scientists and engineers for the period 1987-1999 was 55,000, 50 percent of whom were engineers and 30% computer professionals. According to the OECD this equates to the graduate output of engineers and scientists of five to six Australian universities.

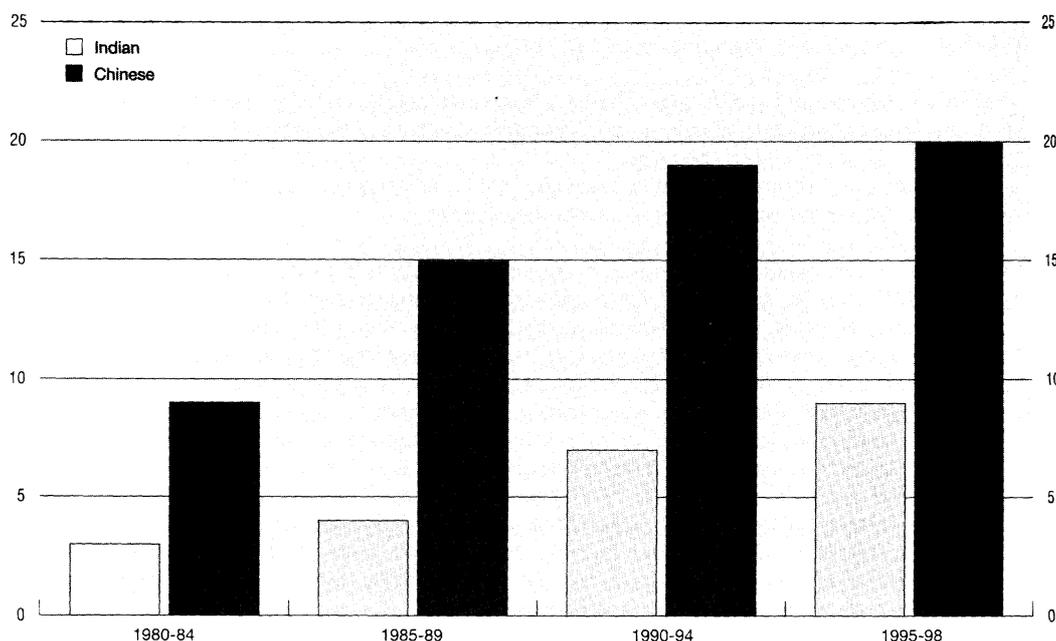
¹⁷ Saxenian, 1999, as reported in OECD, 2000.

¹⁸ Dhume, 2000.

¹⁹ Sunday Times, August 27, 2000.

²⁰ In a recent development, the Silicon Valley IndUS entrepreneurs' group (whose membership includes Asian software professionals who have created businesses to the value of \$75bn since 1992) is about to set up its first 'chapter' outside its core North American and Indian markets, located in the UK (FT, September 13, 2000, p9).

Exhibit 7. Silicon Valley start-ups by ethnic origin (%).



Source: OECD 2000, based on Saxenian (1999)

29. One feature of the entrepreneurial success of skilled immigrants is that socially they often remain outsiders for a generation or more, and are less constrained by negative social attitudes to work ethics, ambition and conspicuous consumption. This is prevalent in Europe, but less so in countries such as the U.S. and Australia, where society is generally more open. There, the entrepreneurial goal is less to build a company in the founder's image than to put Ferraris in the car park.

30. While demographic statistics alone might raise significant grounds for concern that the community will run into skills shortages as its working population ages, this is not the end of the story. Most leading firms have made significant strides in codifying their proprietary designs, formulae, know-how and processes and this should materially reduce the impact of the skills gap. It has already enabled many industries to bridge the gap by outsourcing or relocating facilities abroad while still retaining control over the key value-generating segments in the supply chain - ie. those where they have competitive advantage. The economic sectors affected cover the full spectrum, from manufacturing and process industries to software, media, information and professional services.

31. Nevertheless, many experts believe we are facing a shortfall of trained technologists and ICT skills in Europe over the next decade, and that this could have a damping effect on productivity and GDP growth. The residual impact on community policies will be felt in several ways. First, governments need to look again at the education supply-chain and consider ways of promoting public-private sector partnerships aimed at increasing the output of numerate graduates, technologists and skilled ICT workers. Second, governments need to foster the development of infrastructures for vocational re-skilling in the light of the rapid pace of technology obsolescence. Third, governments need to develop immigration policies to enable them to bridge short-term skills gaps.

32. A related impact area is community IPR policy, which is discussed more fully at paragraphs 84 and 108 below. In the present context (of private-public partnerships), a policy response will be required in respect of the spread of U.S. patenting of 'business methods' (following the 1998 State Street Bank opinion) and the recent U.S. proposal to set up a specialised Federal trial court to speed up IPR litigation.²¹

33. Most European economies have had to rely on immigration to meet the need for new professional and artisan skills at some stage in the past. History is rich in examples where domestic markets failed to meet the changing demand for skilled workers, especially in times of rapid technological change. The corollary - brain drains - especially of technologists, tends to have a negative influence on the donor country's economic performance and prospects, while uncontrolled migration of unskilled workers often places a heavy welfare burden on recipient countries.

II - ASSESSING THE ECONOMIC IMPACT

34. Probably the most enigmatic challenge presented by the modern economy is that faced by macroeconomists, statisticians and accountants. Since the 1950s, economic theorists have offered a succession of views as to why the macroeconomic indicators have for many years failed to reflect the cumulative investment in technological, management, logistical, educational and other improvements aimed at raising efficiency. As a result, we have seen a succession of new growth theories, each claiming unique insights into the reasons for the explanatory failure of the classical model to cope with the technological revolution that began in America after World War II. A key question - which has fuelled a heated 40-year economic debate - is the failure of the massive expansion of intangible investment to show up explicitly in productivity performance statistics.²² The debate was heightened recently when, after several decades of unexplained productivity slowdown in the global economies, the U.S. trend exhibited a sharp reversal.

35. In the 25 years up to 1995, U.S. productivity growth remained stagnant at around one percent per year. But in the last five years, output per hour has gradually accelerated. Discounting cyclical perturbations in the quarterly figures, the most reliable measures of productivity suggest that the underlying trend rate is now almost 4 per cent per year. In macroeconomic circles this is now widely attributed to the startling upturn in the growth figures reported by the U.S. hi-tech industries, while their equally remarkable productivity performance is held to be a major factor in the U.S. productivity turnaround. According to the Economist, between 1995 and 1998 the ICT sector, despite accounting for only about 8% of America's GDP, contributed, on average, 35% of the country's economic growth²³. At the same time, productivity growth in the computer manufacturing sector improved at a staggering rate of 42% a year between the fourth quarter of 1995 and Q1 1999.

36. In its most recent announcements however²⁴, the U.S. Federal Reserve has cautioned that this extraordinary period of acceleration in productivity growth and of sustainable overall

²¹ See Brookings, 2000b, section VI.

²² A detailed treatment of the wealth of theoretical and experimental work that has shaped a heated academic debate on this topic since the 1950s is beyond the scope of this report. A good general introduction can be found in OECD 2000(d), Chapter 2, while OECD 2000(a) offers a more rigorous analytical survey of the chronology and mathematics of the various growth theories. The latter contains a comprehensive bibliography, with references to the seminal work of researchers such as David, Griliches, Jorgensen, Solow and Triplett.

²³ The Economist: "The New Economy - Work in Progress", 24 July 1999.

economic growth will come to an end sooner or later, as the returns to new investments eventually diminish. Nevertheless, many expert commentators believe that the US phenomenon will migrate to Europe over the next decade. Whatever the reality, it is clear that in the absence of a better understanding of what influenced the recent past, predicting the future will be tough for public policy analysts and decision-makers.

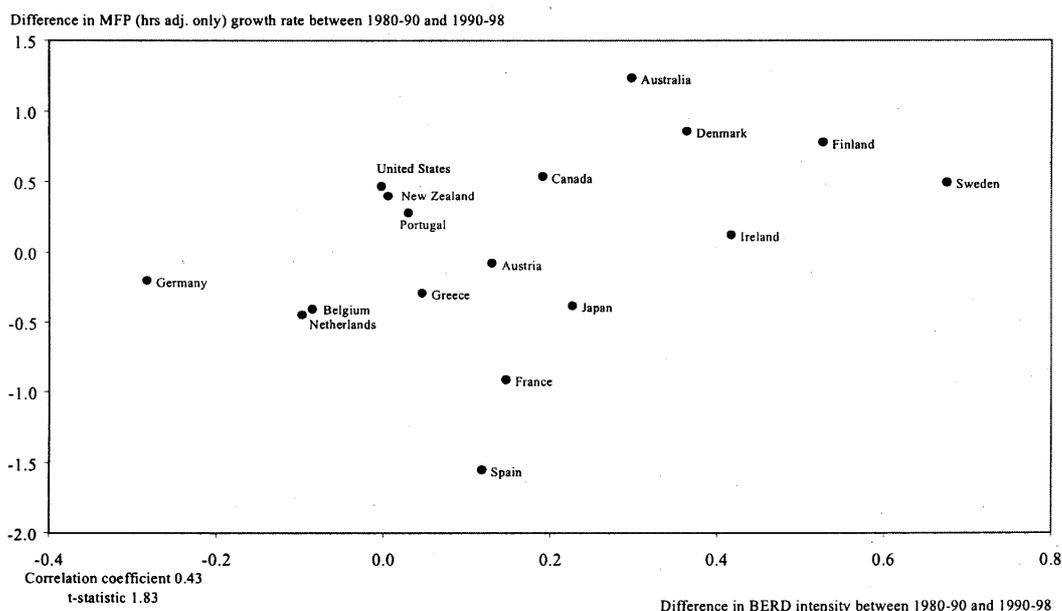
37. That we are living in a transitional economy and need to move quickly to modernise our concepts was a central recurring theme shared by all HLEG experts. The main problem is that, as yet, no unifying theory or experimental model exists to provide a satisfactory explanation of the workings of the modern economy. Nor is there a cogent explanation for the recent disparities in the GDP and productivity trends exhibited by the leading economies. In these circumstances, we have little alternative but to step back and let the scientific due process run its course, as each new theory compromises and displaces its predecessors. At the same time, the absence of an *a priori* economic or business model reinforces the need for public support and funding of initiatives to foster inter-disciplinary research and experimentation among the interest groups.

Links Between Intangible Investment and Economic Performance

38. Nonetheless, recent research in the U.S. and Europe shows encouraging signs of progress, especially the preliminary econometric work carried out under the auspices of the OECD Growth Project. This has demonstrated a more-or-less robust correlation between intangible investment, GDP and productivity growth. According to the OECD²⁵, the following intangibles have been shown to correlate positively with GDP and/ or productivity growth:

39. **Business-funded R&D investment.** A strong positive relationship has been shown to exist between the intensity of R&D expenditure and economic performance as measured by productivity gains. On this basis, Exhibit 8 shows a clear, positive correlation between changes in the intensity of R&D expenditure and the productivity growth indicators for 17 OECD countries over the period 1980-98.²⁶

Exhibit 8. Drivers of Productivity Growth - I.
(Productivity Growth vs BERD, 1980-98)



Source: R&D data are from the OECD MSTI database.

expanded to cover activities such as those that are essential to the development process, but currently excluded.

40. The correlation holds good for three indicators of R&D expenditure.

- Business Enterprise Expenditure on R&D (BERD)
- Gross Expenditure on R&D (GERD)
- The ratio of BERD to GERD

Although there are indications that overall R&D spend (public and private) acts as a driver of productivity growth, the correlation is strongest when business-funded R&D (BERD) is used as the dependent variable. Evidence from other studies also suggests that basic research has higher returns than applied R&D (Griliches, 1986) and that process R&D has higher returns than product R&D. There is also some evidence to suggest that the role of R&D differs according to the size of the economy. In large countries, R&D operates mainly by increasing the rate of innovation, while in smaller countries, it serves primarily to facilitate technology transfer from abroad.

41. *ICT spend geared to improving firm dynamics.* Since the dawn of the computer era the digital technologies have provided a major locus of growth and innovation, particularly in the United States, which is rapidly consolidating its position as the global technology leader of the digital industries. The digital revolution has also transformed working practices in the office and factory, and their supply chains. But, paradoxically, so far there has been little sign anywhere of the expected payoff to productivity for the users of ICT, especially in the service sectors which absorb the lion's share of the ICT industries' output.²⁷

42. The importance of ICT as a driver of business performance has been recognised for some years now, but the processes involved are complex and do not yield readily to analytical methods. In recent years an alternative view of ICT has emerged²⁸ which suggests caution in inferring superior performance based on any single measure. The failure of economic and business researchers to demonstrate a statistically-significant, direct relationship between ICT expenditure and company performance is almost certainly because the route from input to output - from ICT to innovation and growth - is contingent on more complex factors that act as enablers. According to this view, the returns to ICT investment are geared more to the receptiveness of the entrepreneurial culture than to the technology itself. If it is to provide not only a competitive impetus, but the flexibility to exploit new as yet unforeseen business opportunities, a collateral spend of several times the technology cost itself is required to change mindsets, organisational flows and work practices sufficiently to bring about real improvements in performance thresholds.

43. While the U.S. lead in technology provision is huge, it provides relatively few jobs in the supply sectors. The greater economic benefit comes from the deployment of technology across users. ICT spend tends to increase output while simultaneously reducing market prices – the main beneficiaries are therefore consumers. This is good news for consumers, but bad news for CEOs judging internal returns to ICT vs other investments. Too many executives and politicians only have a shallow insight into the real issues surrounding the impact of ICT investment. A key policy question is how to drive the message home to the wider audience.

²⁷ A detailed treatment of the theoretical and experimental work on the 'productivity paradox' since Robert Solow's 1987 call to arms "you can see computers everywhere except in the productivity statistics", is beyond the remit of this report. OECD 2000(d) offers a comprehensive treatment of the theoretical and statistical problems, together with comprehensive references to the on-going work of researchers such as Brynjolfsson, Hitt, Yang and Strassmann.

²⁸ See Brynjolfsson and Hitt's MIT Sloan papers (1992-2000).

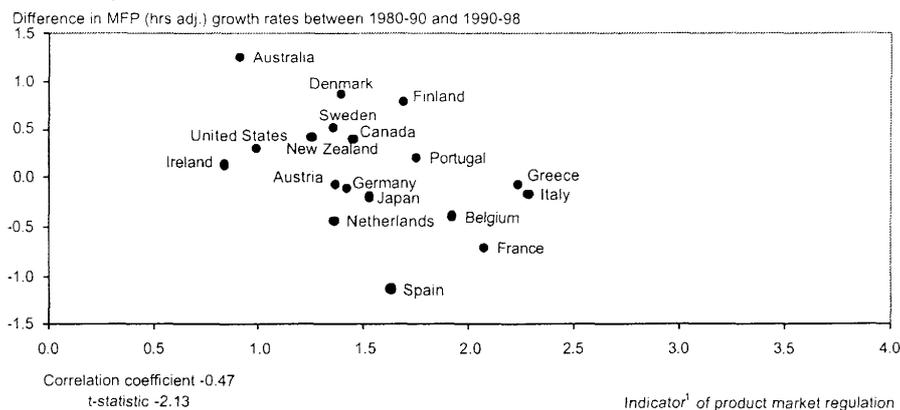
44. Although the impact of ICT on the modern economy is undoubtedly considerably stronger and deeper than is revealed by the official statistics, there is no clear link as yet between ICT investment and GDP, productivity or profit growth. The single exception is the U.S. ICT supply industry which has achieved a remarkable - but as yet unexplained - turnaround in productivity growth since 1995. Although, or perhaps because, the exponential growth trajectories of ICT interconnectivity and price-to-performance still show no sign of saturating, the problems associated with correlating ICT investment with user industry performance have so far proven intractable. The unresolved issues go well beyond the measurement domain as massive ambiguities still persist in the conceptual framework for non-physical assets.

45. Liberalisation of product markets. Recent research has shown that public policy related to the legal institutional framework for business influences innovation, turnover growth and the diffusion of innovation. In particular, making markets more 'contestable' and increasing competition can be expected to accelerate GDP and productivity growth.²⁹ This aspect is explored in some detail in the McKinsey country reports for Sweden and the UK, while OECD research³⁰ shows the existence of a statistically-significant link between overall product market regulation and multi-factor productivity (MFP) growth during the 1990s (Exhibit 9a).

Exhibit 9. Drivers of Productivity Growth - II.

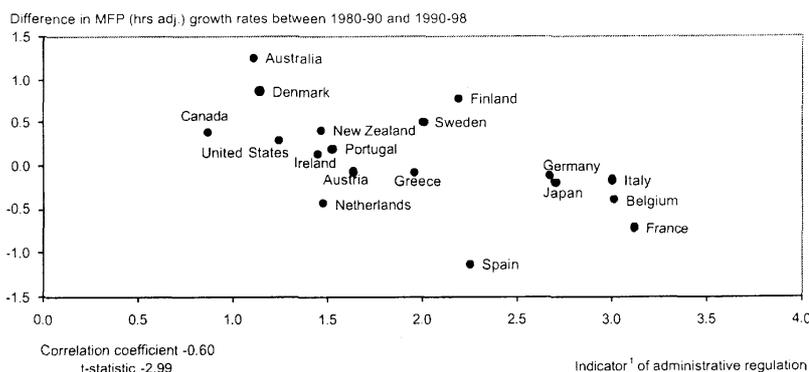
A. Liberalisation of Product Markets

(Bivariate correlations of MFP with policy indicators)



46. **Relaxing administrative legislation.** Administrative burdens are another aspect of product market regulation that inhibits technology adoption and constrains technology diffusion. Exhibit 9b shows the correlation between a leading indicator of administrative legislation and productivity growth during the 1990s. This reinforces the view that countries with strict regulations and slow-moving, bureaucratic public institutions were generally associated with low productivity growth in the 1990s.³¹

B. Relaxing Administrative Regulations



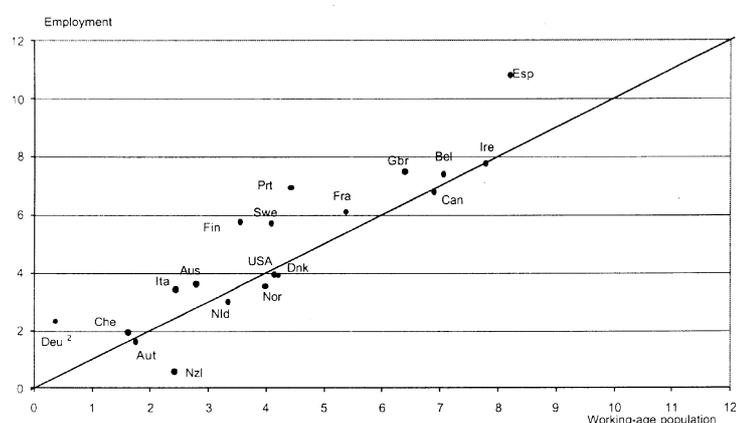
example, "Sweden's onomy" (1998).

of the National Bank 1ay 2000.

47. Raising workforce educational levels. Another important insight into the drivers of growth and productivity can be obtained by comparing the educational attainment of workers in active employment with that of the working-age population overall (Exhibit 10). The analysis covers nineteen OECD countries for the period 1989-96, and shows a clear trend towards skill-based employment growth. Not surprisingly, it also indicates that employment prospects for workers with upper-secondary education compare favourably with the working age population at large. According to McKinsey, over the next 10 years 50 percent of all jobs will become redundant or change beyond recognition, which means that, from a policy perspective, labour flexibility and lifelong learning must continue to be top priorities. The pace of change will be greatest in the service industries.

Exhibit 10. Drivers of Productivity Growth - III.
(Bivariate correlations of MFP with policy indicators)

C. Rising Educational Levels



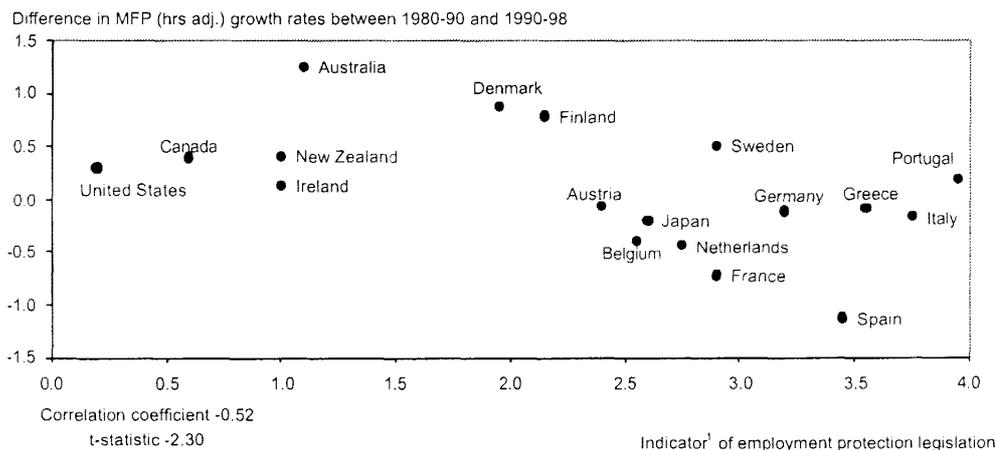
1 Higher education levels refer to ISCED codes 5, 6 and 7.
2 1991-96
Source: Calculations based on data from OECD, *Education at a Glance*, various issues

Source: OECD 2000

48. Relaxing employment protection legislation. Labour market regulation also plays a role in influencing GDP and productivity growth. Exhibit 11 shows a significant negative correlation between employment protection legislation and MFP growth for selected OECD countries during the 1990s. In countries with strict employment protection regulations, firms adopt more cautious recruitment policies and this, ultimately, has an adverse affect on their propensity to invest, diversify and take risks. Mergers and take-overs are also influenced by employment legislation, for example in the freedom to divest activities that no longer fit strategically with the core business. The policy lesson is that as a rule we should allow employment to flow towards the demand sectors. History tells us that personal services are the natural receptacle for displaced labour, albeit backstopped by appropriate social security policies.

Exhibit 11. Drivers of Productivity Growth - IV.
(Bivariate correlations of MFP with policy indicators)

D. Relaxing Employment Protection Legislation



Source: OECD 2000

Corporate Governance

49. A highly sensitive policy area in relation to the relaxation of employment legislation is that of corporate governance. Market economies need strong systems of corporate governance in order to minimise the risk of market shocks escalating into economic instability. The corporate governance framework operates in a mutually-reinforcing way at a number of levels, ranging from the governance of self-regulating markets and their intermediaries - banks, investment institutions, financial analysts and other professionals with a direct interest - to the legal and ethical behaviour of individual companies.

50. As leading companies assume a greater role in the affairs of national economies and local communities, their activities are being scrutinised by a wider constituency of stakeholders and other observers with a commercial or societal interest. In addition, as European companies widen their shareholder base by seeking equity funds on both domestic and international capital markets, they encounter an increasingly demanding investment community. Those investors - and the analysts who advise them - expect company reports to provide credible explanations and signals to future business performance. Although national laws in Europe usually prescribe a minimum basic level of financial and narrative reporting, listed companies in many countries now go much further than this, and recognise the benefits of expanded voluntary disclosure.

51. In this context, two recently-published U.S. studies of corporate ethics³² would suggest there is significant room for improvement in the ethical standards of corporate America, albeit with some grounds for optimism as firms recognise the problem and put it on the formal management agenda. A recent ERC Business Ethics Survey indicated ethical misconduct cutting across a broad range of risk areas - from deceptive sales and environmental practices to abusive or intimidating behaviour towards employees, and even falsifying data and internal records. The results are summarised in Exhibit 12. In a similar national survey of 3,075 U.S. workers, the accountant KPMG found that while the risk of ethical compliance taking a back seat under pressure from operational priorities - ie. meeting budgets, schedules or sales projections - is always present, companies are increasingly taking a longer term view, especially in northern Europe. In view of the policy implications, more research is needed at an EU level into this aspect of corporate governance where, to our knowledge, little authoritative policy analysis work has been done.

³² See *National Business Ethics Survey (2000)*, Ethics Resource Center, Washington D.C. and the parallel survey of business ethics by accountants KPMG.

Exhibit 12. Ethics of Corporate America

Types of misconduct observed by employees

Lying to employees and the public	26%
Withholding key information from employees and the public.....	25%
Abusive or intimidating behaviour towards employees	24%
Misreporting time worked	21%
Discrimination	17%
Sexual harassment	13%
Stealing, theft or related fraud	12%
Breaking environmental or safety laws or regulations.....	12%
Falsifying records and reports	12%
Abusing drugs or alcohol on the job	10%
Giving or accepting bribes or kickbacks	5%

Source: National Business Ethics Survey (2000), ERC, Washington, D.C.

Exhibit 12 summarises the results of a survey of U.S. corporate ethics carried out by the Washington based Ethics Resource Center. The study findings are based on a survey of 1500 private and public sector workers between November 1999 and February 2000.

Twenty-six percent of the workers polled claimed that their employers lied to customers, vendors, employees or the public; about one-quarter said employees were treated abusively; 12 percent said they had observed theft; and 12 percent claimed to have been party to infringing environmental or safety laws. More encouragingly, only 13 percent said they felt undue pressure to compromise ethical standards, down from 29 percent in 1994. and the highest levels of misconduct were found to occur in periods of intense stress, for example during corporate mergers, acquisitions and restructurings, when chains of command are disrupted and established business patterns are left in disarray.

Comparison with a 1994 survey also showed that:

- (i) 79% of companies laid down formal ethics standards in 2000, up from 60%.
- (ii) 55% of companies provided formal ethics training for employees, up from 33%.

III - MEASUREMENT AND REPORTING ISSUES

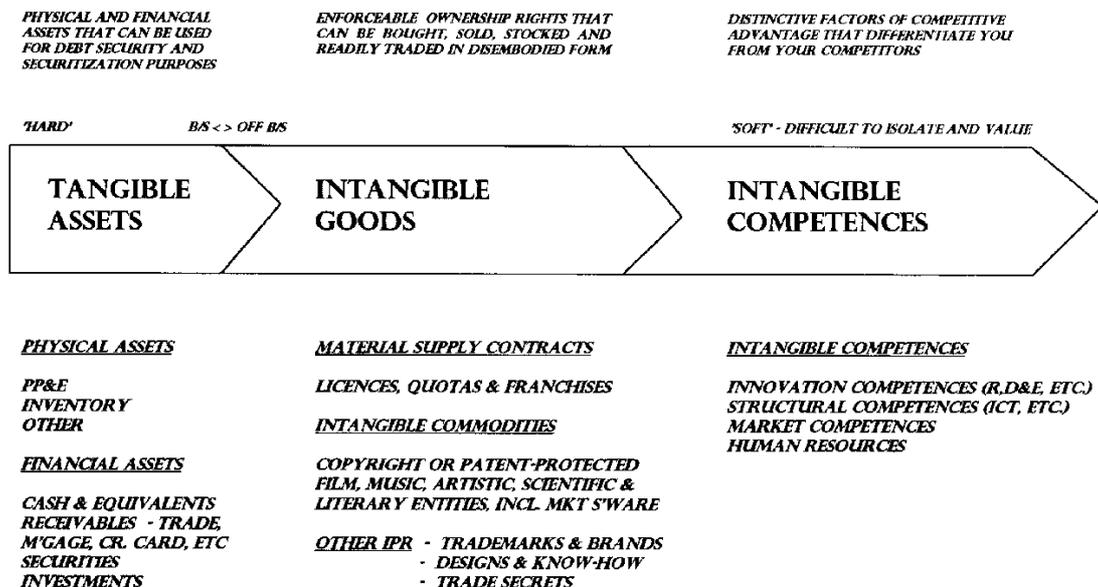
52. A common basic goal of all interest groups is to answer the question "what drives value-creation and superior economic performance in the 'weightless' knowledge economy". This, in turn, revolves around our being able to visualise and isolate the performance drivers - namely the portfolio of assets, quasi-assets, commodities and competencies we need to measure.

A Taxonomy for Intangibles

53. For most enterprises the concept of an 'asset' has shifted significantly in recent years. Whereas competitive advantage was traditionally based on factors such as the exploitation of unique technology, manufacturing or scale advantages, today's leading companies deploy an array of IPR and other factors of 'non-price competition' in the bundle of goods and services that constitute their market offer. A key conceptual problem is how to leverage and extract value from these non-physical assets. Recent developments in the capital markets are enlightening in that they provide us with new ways of realising value from them. In both Europe and the United States, leading investment banks now recognise and actively encourage corporate CFOs and treasurers to use intangible assets as collateral for debt security purposes. As a result, the use of IP assets in inter-company trading, intra-company sale and leaseback, and ABS deals has led to a growing list of intangibles that can be isolated from the physical and financial fabric of the enterprise.

54. In all fields of empirical investigation it is useful to have a working model as an aid to understanding and provide a common reference point and language. In this connection, a useful schema was developed at the City University Business School, London in the course of research with the international financial community into the use of IPR as debt security.³³ Exhibit 13 shows the essential link between tangible assets and intangibles, and illustrates the principal constituents of the corporate asset base of most leading companies today.

Exhibit 13. The New Corporate Asset Base.
(The essential link between tangible assets and intangibles)



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55. The first group - *intangible goods* - is made up of two main sub-classes, *intangible commodities* and *intellectual property*. Intangible commodities are essentially rights in contract (including publishing and reproduction rights), commercial databases and other marketable

³³ See Eustace, 2000.

software with associated long-term royalty annuities. A common characteristic is that they can be bought, sold, stocked, leased and otherwise traded - generally with very low due diligence costs. Intellectual property, on the other hand, includes those assets whose essential characteristics are derived from the legal system, eg. patents, copyrights, registered designs, trade secrets and proprietary technology. In this case the cost and time of legal searches can be significant, and rises dramatically in situations where multiple legal jurisdictions are involved.

56. Although notoriously difficult to separate from the organisational fabric of the enterprise, the second group - *intangible competencies* - are valued by successful companies as vitally important in differentiating their market offer from those of their competitors.³⁴ Although the assets involved are generally bundled together and interdependent to such an extent that they are difficult (but not impossible) to isolate and value, they are now widely deployed as key factors of 'non-price competition'.³⁵

57. **Defining intangibles.** In view of the cognitive uncertainties, the HLEG took a deliberate decision to minimise the time spent in attempting to elaborate a 'proprietary' definition of intangibles. The group was mindful that despite the work that has been done in this area, notably by the OECD, IASC and their associated academic networks, consensus is still elusive and massive ambiguities still persist in the conceptual framework for non-physical assets. One reason for this is that the boundaries, constituents and definitions of the set <intangibles> vary according to the perspectives of the different interest groups - for example whether we are dealing with accounting concepts, or measures of national income and wealth, or how to manage and extract value from key business investments and assets.

58. Some interest groups - notably the accounting standards bodies - necessarily limit their definition of intangibles to those factors over which legal rights have been assigned, such as patents, marks and copyrights. We took the view that control is more important than ownership and that any definition should encompass factors such as competencies, skills and know-how, networks and business relationships, as well as external factors arising from the legal, administrative and regulatory environment. The locus of interest has also been expanded through the use of scorecards³⁶ for intellectual capital reporting by corporate innovators in this field, such as Skandia, Celemi and Ramboll. As a working definition, the HLEG took intangibles to be:

<< non-material factors that contribute to enterprise performance in the production of goods or the provision of services, or that are expected to generate future economic benefits to the entities or individuals that control their deployment >>

59. The conceptual framework is far from mature however, and the approach needed at this stage is essentially pragmatic and experimental, and will be undermined by the adoption of fixed, deterministic definitions or an attempt to construct prematurely new theories. One member observed that he would like to see 1000 new collaborative experimental measurement and reporting initiatives as an end-product of the HLEG exercise.

³⁴ After Porter, Hamel & Prahalad, and Vollmann.

³⁵ Valuation tools for these intellectual assets are now beginning to appear. For example, customer and subscription lists, in-process R&D and brands are now capable of assessment and independent valuation. However, it is important to recognise that many such assets are in fact complex collective attributes, consisting of hierarchies of sub-assets, each with different value characteristics. A brand, for example, is a compound asset that contains many value components, each of which has to be individually assessed and valued. Typically, these include copyright, design, sub-brands and marks, as well as accumulated R&D, promotional and advertising investment.

³⁶ After Kaplan and Norton, 1996.

Tracking Intangibles

60. Even when we can visualise them, their intrinsic characteristics make intangibles difficult to track. Because we cannot see them, touch them or weigh them, we cannot measure them directly and have to rely on proxy or indirect measures of their impact. In both macro and business economics, their existence is revealed indirectly by incremental economic performance that is not accounted for by the conventional key indicators.

61. In macroeconomics, productivity increases - output increases not attributable to increases in input of labour or capital - are normally considered to be due to 'technological progress'. The latter can be '*disembodied*' - due to a more efficient use of existing equipment - or '*embodied*' - implying the replacement of existing equipment by more efficient machinery.

62. In business economics, the existence of intangibles shows up chiefly in the form of turnover and profit growth that is not explained through the use of labour and capital inputs under current accounting conventions. Intangibles such as exploitation rights, unique intellectual assets and brands may ensure above-average profit margins and/ or faster-than-average growth, or simply leave a part of the economic performance 'unexplained' by the input of tangible capital and labour.

63. In valuation, more subtle factors come into play involving judgement and expert opinion (this also applies to tangibles such as property in illiquid markets). A classic assumption in accounting is that value is contextual, and hence the value of an asset, commodity or service depends on when, where, and between whom the transaction takes place. Consequently, the value of a drug formulation, patent, software, or music copyright depends critically on its exploitation potential which, in turn, is a function of enabling factors internal and external to the host enterprise.

Key Measurement Issues

64. In addressing the measurement problem, the HLEG focused on three broad levels of disclosure:

- Official statistical reporting and macroeconomic indicators.
- Capital market behaviour and investor risks.
- Deficiencies in internal management information.

65. ***Official Statistical Reporting and Macroeconomic Indicators.***³⁷ For over two hundred years, economists and statisticians have been constrained by an economic model based on the myth of a strict dichotomy between goods and services, the origins of which go back to the work of the pioneering economists Adam Smith, John Stuart Mill and Jean-Baptiste Say. Adam Smith held that only material goods add to the stock of a nation's capital, and characterised services as "vanishing in the instant they are performed". Others held the view that services really were productive, as has been recognised intuitively by many companies for a long time. But the processes involved are complex and have not yielded readily to analytical methods. As a result their productivity and value-added mechanisms are notoriously difficult to measure. Over the past decade there have been a number of attempts to devise a new taxonomy for the economy that is theoretically meaningful and useful for empirical analysis, but these have been severely constrained by a lack of broadly accepted definitions.

³⁷ Based on the discussion of 13 July 2000 led by Peter Hill.

66. In a 1997 paper to the Canadian Statistical Society, Peter Hill proposes a third class of economic activity (in addition to goods and services), based on entities he terms 'immaterial goods'. He defines these as non-physical entities that can be separated from a firm's organisational fabric - generally in the form of intellectual property (patents, licences, trademarks, etc.) as distinct from those which are interwoven, often in complex and subtle ways, with the enterprise's physical and financial asset base. Such goods can be bought, sold, stocked, licensed and otherwise traded in the same manner as physical goods:

- They consist mainly, possibly exclusively, of immaterial products in the form of information and scientific, literary, artistic or entertainment creations that are generally recorded and stored on media such as paper, film, tape or disk;
- They have all the essential economic characteristics of goods - often highly durable goods - and, as such, have nothing in common with services, although physical goods and services may be deployed as carriers and distribution agencies, often in electronic form.
- They are generally sub-classes of IPR, which offers the advantage of an established framework of definitions that is recognised internationally.
- Under current accounting and SNA conventions, they are not reflected in the stock of material wealth until a transfer of ownership takes place.
- They represent the primary stocks of the intangible economy, and should be disclosed as such.

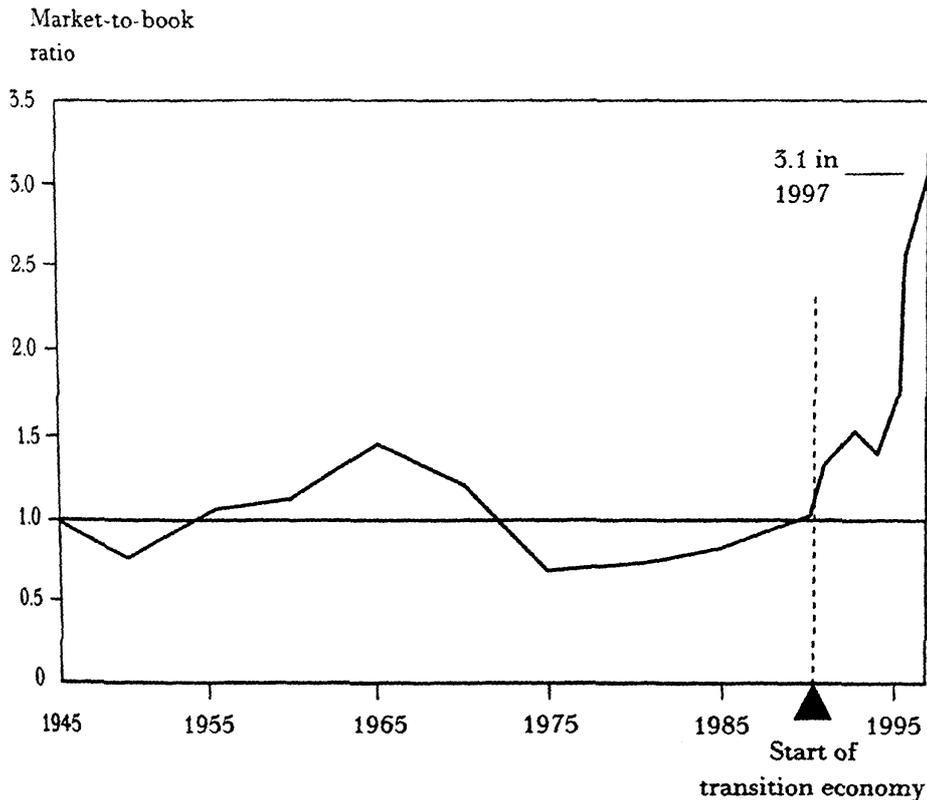
67. The contrast between the rigour and precision that underpins most economic modelling and the lack of precision in some of the underlying concepts and measures used is nowhere more marked than in the boundary between goods, services and intangibles. Classification is not keeping pace with changing reality because the current industrial classifications scatter intangibles all over services. To characterise intangible goods and commodities as services was seen as pernicious since it distorts the way we perceive phenomena and undermines the transparency of the economic reporting process. As a rule the distinction between intangibles and services is as great as the distinction between tangible and intangible goods.

68. There was a broad consensus in support of the view that the existing conceptual SNA framework can and should be reformulated - firstly to map the structural shift in the economic asset base of companies and societies and, secondly, to enable economists, statisticians and financial managers to track the performance of the new wealth drivers. In the past, there has been an over-focus on manufacturing and process industries, and a solid body of statistics now exists on the core activities of these sectors. A new 'chart of accounts' is required, which reflects a shift of emphasis towards collecting more structured information on services and intangible goods, in both old and new economy sectors. A third issue is that classification has not kept pace with changing reality. Ways need to be found of making Eurostat more responsive to today's pace of change - changes to the official statistical model can take 10-15 years to implement, which is unacceptable.

69. **Capital Markets and Investor Risk.** The unprecedented bull market run in stock prices over the last decade has yielded probably the most overworked single indicator of the intangible economy. The growing influence of intangibles is held by many observers to be a major factor in the exceptionally large market-to-book ratios currently seen in the U.S. and other stock markets. It also provides the most explicit evidence for the assertion that our economic and accounting systems have failed to keep pace with economic reality.

70. Over the forty-five year period from 1945-90, book values and market values for all U.S. companies were roughly equal and the market-to-book ratio fluctuated in a range around 1.0. This means that over this time period the market capitalisation of U.S. companies was roughly the same as the value of their tangible assets. During the 1990s the average market-to-book ratio increased sharply and, according to McKinsey³⁸, is now greater than 3 (Exhibit 14), while for technology and software stocks (excluding the dot.coms, which break all the rules), it can go as high as 50 or more.

Exhibit 14. Trend in Ratio of Market Capitalisation to Book Value.
(All U.S. listed equities, 1945-97)



Source: McKinsey

71. Some academic theorists and analysts believe that the high stock values seen in today's equity markets are attributable principally if not entirely to the substantial build-up of hidden intangible capital that is not reported in company returns, or elsewhere in government statistics. However, the contention that the gap is attributable entirely to unbooked 'intellectual capital' is now largely discredited as too simplistic and that the influence of other factors, such as rising returns to book equity and a fall in the cost of equity³⁹ must be taken into account. In this connection, two seminal research findings are attributable to Baruch Lev. In the first⁴⁰ he shows

³⁸ Conceptually similar but methodologically different approaches by different researchers have produced ratios in the range 1.8 to 6 at the end of the 1990s. Lev (2000) for example calculates the ratio as the firm's market value of equity to the net book value of its assets and finds that for the S&P500 this has risen from a little over 1 in the late 1970s to over 6 at the end of the 1990s, whereas Hall (1999) uses the ratio of the market value of debt plus equity to the reproduction cost of plant and equipment, and finds that for all firms this rose from 0.8 in the mid 1970s to 1.8 by the late 1990s. This again underscores the urgent need for consistency in definitions and starting conditions.

³⁹ See Bryan, Fraser et al, 1999, pp 98-104.

that the gap is systematic, being smallest (or even negative) for low-tech, commodity sectors and highest for hi-tech corporations with high levels of investment in R&D, ICT and human capital, or those with a strong reputational image (brands). A second, practical breakthrough came with his knowledge index⁴¹, by which stock market values are discounted by reference to normalised earnings and returns on the physical and financial capital employed. Although not an absolute measure, the resulting estimate of intangible capital takes account of cyclical factors and 'irrational exuberance', and provides a useful tool for inter-company comparison purposes.

72. An industry diagnostic developed by McKinsey throws a different light on what the market-to-book relationship tells us about a firm's competitive positioning relative to others in its industry sector, and how this moves over time. The diagnostic technique goes under the name "strategic control mapping"⁴², and provides a useful picture of the relationship between the size and performance perspectives of market capitalisation. Sectoral studies have shown that as a rule an inverse relationship exists between the performance and size metrics for most industries. Exhibit 15 shows a strategic control map of the global financial services industry.

Data sources (Exhibits 15 and 16): Compustat; Global Vantage; Bloomberg.

* *Market Value calculated by reference to price of common stock on March 31, 1998.*

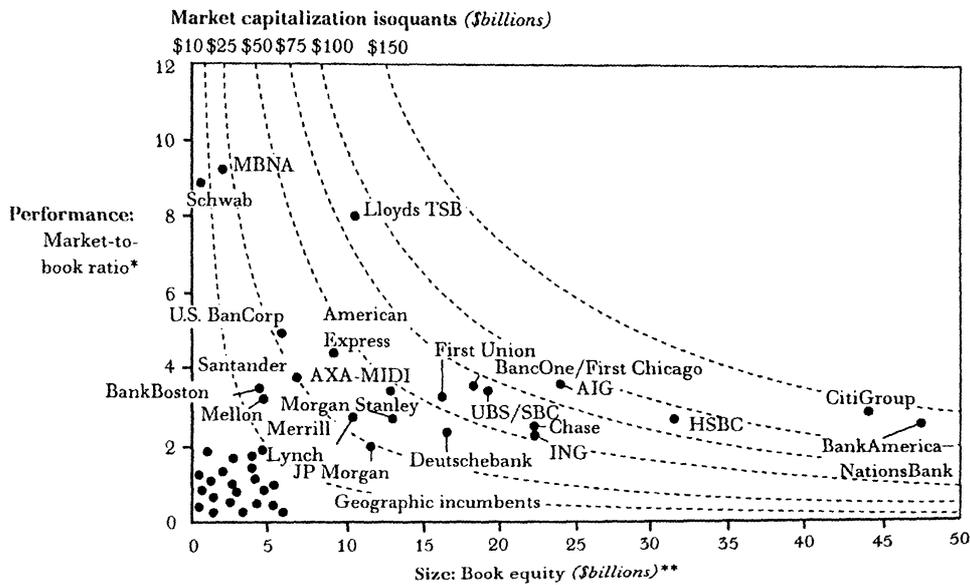
** *Shareholders' equity as of March 31, 1998, or most recent previous reporting date.*

⁴⁰ *Lev, 1996a and Figure 13.*

⁴¹ *Lev, 1999.*

⁴² *A full description of the diagnostic is contained in Bryan, Fraser et al (1999), from which the Financial Services example was taken. For further reference, sample maps for the IT, Telecoms and Automotive industries are included as Appendix II.*

Exhibit 15. Strategic Map of the Global Financial Services Industry.
(Simplified to show a sample of the major global players)

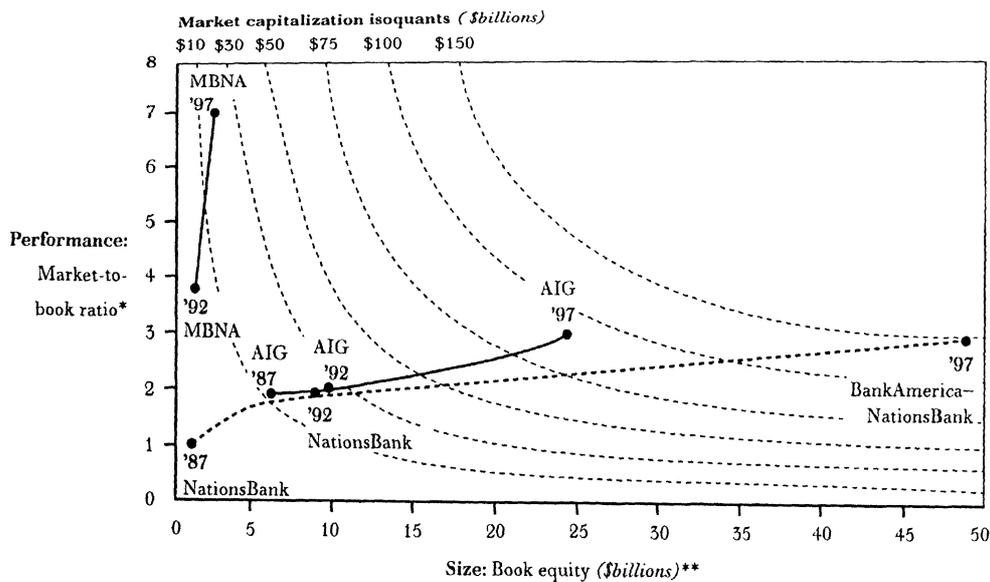


Source: McKinsey

It plots book value as a proxy for size and market-to-book ratio as a proxy for performance. Mapping all the players in a given industry on the strategic control map gives a snapshot of their competitive positioning.

73. A further dimension is obtained by looking at the trajectories of the market and book figures over time (Exhibit 16). This plots the course of a sample of financial services firms between 1992 and 1997.

Exhibit 16. Strategic Trajectory of Key Industry Players.
(Global Financial Services Industry, 1987-97)



Source: McKinsey

74. **The Banking Perspective.**⁴³ Twenty years ago the conventions and practices of banks operating in the corporate debt market focused on the borrower as a '*gone concern*'. The risk model was geared heavily to asset break-up values in a default scenario, and most lenders ignored intangibles. However, the financial analysts have had to adapt to changing market conditions, and today's risk management and credit scoring models are geared increasingly to the value of the business as a '*going concern*'. As a result, lending institutions place greater emphasis on the prospective cashflows and look increasingly to a forward assessment of prospective risk, rather than historical performance alone. A critical issue today in risk assessment is how to assess the quality of intangibles, especially management.⁴⁴

75. Notwithstanding these developments, most of the concepts in risk assessment are derived from the manufacturing era (paralleling the SNA and financial reporting models) although increasing importance is placed on future cashflows as a predictor of processes going forward and, in valuation, as a proxy due to the inability to value many intangibles precisely. However, cashflow is a poor leading indicator of the future value of hidden intangibles, especially when there is a change of management. Lending institutions also use a range of statistical and scorecard-type measures to monitor risk for their business customers, but a new generation of business models and risk management tools is needed to cope with the increasing volatility and uncertainty of going concern values that are now commonplace, especially in service industries. As a first step, three aspects of the intangibles problem need to be addressed urgently, and tackled on an inter-disciplinary basis with the other interest groups – common definitions, consistent accounting practices and clarity of ownership.

76. **The Accounting Perspective.**⁴⁵ The old financial information model is not broken. It remains relevant but needs revision in certain important areas. The technical agendas of the leading accountancy standards bodies give a high priority to the provision of forward-looking information and reorientation of the reporting model away from its historical emphasis on inputs (costs) towards indicators of output and *outcomes* (values).

77. A key issue for professional accountants is how to reconstitute the financial reporting model to reflect 'fair values' and not just historical costs. The existing cost-based model is essentially backward-looking and deterministic whereas value as a concept is forward-looking and contextual. The value of a company is a function of risk, return and growth. In the future there will be three key value components – 'momentum', 'latent' and 'contingent'.

78. This raises a second important issue. The main explanation of corporate valuations seen in today's equity markets is *growth prospects* and the accounting profession does not subscribe to the simplistic view that the market-to-book differential is explained by intangibles alone.

79. Capital markets have been dramatically affected by the systematic reduction in inflation levels, plus the massive influx in pension capital. Historic accounts can only explain the momentum value going forward from the past. The latent component is within a company's own capability to bring about e.g. brand expansion as when Mars moved into ice cream. Deterministic information is only partially helpful – approaches such as scenario analysis may be more useful. It is the contingent component that causes the most difficulty. If there is a market with three competitors and one goes bankrupt, we would expect the value of the other

⁴³ Based on a presentation on 13 July 2000 by David Jukes and John Atherton (Barclays plc).

⁴⁴ In bank lending decisions this is probably the most significant intangible - the strength of the management team, which is very difficult to measure objectively. Good management will improve on average capability, while bad management will quickly undermine even a sound company.

⁴⁵ Based on the 13 July 2000 discussion led by Ian Coleman and Ian Wright (PwC).

two to rise. But markets are rife with interconnectivity, so this component is inherently not knowable. Concern was expressed as to whether European companies are adopting appropriate approaches to technology investments of uncertainty. In both pharmaceuticals and in venture capital there is willingness to take a staged approach to investments and to stop investing when the risks are too great, but elsewhere, particularly in Europe, there may be cultural barriers to the toleration of ambiguity.

80. A third issue for the accounting profession is how to promote transparency of financial information so that investors can access a richer scope and depth of information (quantitative and narrative) that they can trust, on demand. Today's reporting model is not flexible enough to meet the needs of investors as they construct their own individual analytical views of the enterprise. The Internet is putting a huge amount of data at the disposal of investors and this will drive the new financial reporting model. However in the USA where, as often happens, intensive market activity has triggered off a regulatory debate, the problems of consistency of web-site information with SEC filings and attestation of data and intelligence put out by information agencies such as Bloomberg and Standard & Poor⁴⁶, are fast becoming a major concern for the authorities.

81. The accounting profession is putting its global weight behind the current array of Internet-based reporting initiatives. The web of today (slow, inaccurate, lacking focus) will be replaced by the web of the future, and XML (eXtensible Mark-up Language) will supersede HTML. XML allows customised 'dialects' to suit the needs of specific business communities (by codifying and supporting the terminology, practices and knowledge classification systems of particular professional or business groups) and hence promote standardised access to information. As discussed in Section I, the potential for savings through business-to-business e-commerce are very considerable, ranging from 5-15% (oil, gas and communications) to 30-40% (electronics) and 90% (airline, banking and software distribution). Under the XML umbrella, a number of sectoral initiatives are in progress. These are generally led from the USA, and include:

- FPML Financial Products Mark-up Language (led by a consortium of PwC, JP Morgan and 20 international banks).
- ACCORD Insurance Contracts
- RETS Real Estate Transactions
- XBRL eXtensible Business Reporting Language

82. In financial statements, the AICPA and more than 30 partners have developed XBRL in order to enable comprehensive interchange of, and transparent access to, financial data including over the internet. XBRL involves a set of tags, derived from a detailed taxonomy of financial reporting. This will permit the evolution of specialist browsers and search engines, and the use of style sheets to enable familiar formats to be reconstructed. Four of the challenges in XBRL are:

⁴⁶ *The Sunday Times, London, 3 September 2000.*

- a) Overcoming resistance to more open, symmetrical disclosure.⁴⁷
- b) Extending to non-financial and qualitative data whilst retaining relevance and reliability.
- c) Standards. Current developments on the accounting and reporting front will reinforce the need for a strong, well-informed Community regulatory infrastructure that can inspire both the confidence of the national professional bodies and the respect of other regulators around the world. Also, as the accounting standards issues unfold, a fundamental reappraisal of the future role and positioning of the existing EC accounting directives will be required. This will serve to heighten the on-going policy debate over the proper balance between a rule-based approach, as adopted by the U.S., and one based on broad principles and compliance guidelines as followed in most European countries, notably the UK. The result is very different behavioural patterns. Arguably, principles encourage compliance whereas regulations encourage avoidance and deception.

83. **Internal Management Information.** Dramatic weaknesses in the company management systems were laid out very clearly by U.S. academics such as Thomas Johnson and Robert Kaplan as far back as 1987.⁴⁸ Notwithstanding the pioneering efforts of companies such as Skandia, Dow and Celemi in the management of intellectual capital, little real progress has been made towards resolving the management accounting problem. The key requirement for managers is less a question of valuation than measuring returns to non-physical investment. A new generation of analytical tools is urgently needed to enable company boards, shareholders and investors to judge management performance in relation to the stewardship (control) and effective management (exploitation) of their key intangibles, and differentiate leading and lagging companies in this respect. The greatest need is in enterprises operating in the new growth sectors that are struggling to come to terms with the new value models.

Intellectual Property Rights and Competition Policy⁴⁹

84. A closely related concern for enterprises with high levels of intangibles lies in the failure of the existing IPR systems to keep pace with the shifts in the corporate asset base and evolving business practices. This generated a wide-ranging debate, the consensus of which was that the subject is so fundamental and crucial to the EU policy set that an in-depth rethink of IPR theory and practice is required as a matter of urgency. Although this was seen as outside the scope of its current remit, the group's preliminary view was that:

- (i) In Europe and elsewhere, our existing IPR concepts and conventions are still rooted in an old-world, linear, laboratory-to-market model. The traditional view of IPR was based on fixed definitions, boundaries and rights of exploitation or access that were generally embodied in a product, process or service. The old concepts involving fixed boundaries are no longer appropriate - as in corporate lending, new forms of covenant, including dynamic covenants, are now required.
- (ii) Today, there is a need to shift the focus of IPR policy away from its legal origins and towards the economic domain. IPR is used increasingly as a distinctive lever of competitive advantage. In addition firms buy, sell and otherwise trade IPR (an

⁴⁷ Baruch Lev (2000) offers the following highly perceptive insight: "The traditional business model of an introverted, somewhat secretive enterprise, interacting with outsiders mainly through exchanges of property rights (sales, purchases, financial investments) is reasonably well accounted for by traditional, transaction-based accounting. Such an inward-oriented business model is rapidly giving way to an open, extroverted model, where important relationships with customers, suppliers and even competitors are not fully characterized by property right exchanges".

⁴⁸ See Johnson & Kaplan in "The Rise and Fall of Management Accounting".

⁴⁹ Based on the 13 July 2000 discussion led by Larry Cohen (McDermott Will & Emery) and the plenary session in Ferrara on 30 September 2000.

intangible commodity) that is surplus to requirements, independent of the underlying goods and services in their market offer. Its use as collateral for corporate loans and ABS bonds is also growing, and the tradable patent is a phenomenon whose time has come.

- (iii) The growing use of IPR for market control purposes, and in technology licensing deals aimed at raising entry barriers, is changing the market structure and the rules of the game in many sectors.⁵⁰ This is a central issue for future competition policy.
- (iv) IPR content now tends to follow value in the supply network. This reinforces the need to develop new forms of covenant, including dynamic covenants.
- (v) The R&D policies underpinning the 6th Framework Programme will need to give attention to clarifying the relationship between individual rights (IPR) and the need for improved dynamics of circulation of pre-competitive ideas.

85. From a policy perspective, the HLEG also concluded that IPR will increasingly play a pivotal role in interconnecting the different components of the policy set. In future, the axis of industrial policy, as well as its key policy levers, will revolve around the interface between competition policy and the 6th Framework Programme. IPR will be central to both domains. Looking ahead, the key issue for competition policy is the right to enter and take part in the game. Competition policy in the 21st century will be less concerned about ex-post intervention than creating a dynamic policy framework that maintains open rights of access while encouraging European suppliers to achieve market control over their domestic markets as a first step towards international markets.

86. An additional specific area of concern was that of the existing IPR arrangements related to quasi-IP assets. A grey area that will become increasingly problematic for IPR lawyers and courts is the establishment of rights over quasi-assets such as competencies which lie beyond the formal IPR domain. Even in IPR there are:

- Clear boundaries - eg. patents, trademarks, registered design, unregistered design, copyright.
- Unclear boundaries - eg. know-how (where is it possible to sell a package of know-how?). When written, this is copyright, but the boundaries are very unclear. Also device trademarks have a copyright element.
- Regulatory rights - eg. those produced by regulation, such as planning permission, which is certainly an intangible asset, and may be a form of IPR.

87. With regard to regulatory rights, there was also some concern over the lack of clarity in the present EC competition rules as to whether and under what circumstances there is commercial value in government-issued quotas and licenses - eg. airport landing rights, broadcast and performing rights, agricultural quotas etc. The consensus was that there are major issues here that need to be resolved. Government-allocated rights such as broadcast and cellular licenses exhibit rapid early-stage growth and clearly do have real value as companies invest shareholder funds to build market share in immature markets. They cannot be taken away as they are accrued rights, so the issue is what can be done with them. Again, clear competition policy guidelines are needed as a matter of urgency.

⁵⁰ For a comprehensive account of the role of technology licensing in competition strategy, see Rivette and Kline, 2000.

European standards

88. Even though some of the early thinking and conceptualisation - particularly in the area of human capital - originated in Europe, much of the dynamic and practical implementation in recent years has been oriented towards North America. To date, the European policy debate has been predominantly analytical and reflective, and invariably negative in its orientation. Where policy action is proposed, it has usually been geared to strategies involving intervention, regulatory deepening and protectionism rather than pragmatic initiatives aimed at stimulating and freeing up the natural forces of competitive renewal. The cumulative result is that the U.S. is now way ahead and the EU must urgently identify ways of fighting back - to formulate the necessary regulatory and financial policy targets and manage them through. A lot has to be done to modernise our concepts and develop new policies quickly.

89. We do not believe a 'fortress Europe' approach will in itself create standards which can be imposed globally. The key is to ensure active and well-informed European participation in global standards initiatives. This is a key factor that determines whether national suppliers maintain market control over their domestic markets as a first step towards global domination. In two important areas - GSM and smart-card technology the EU has demonstrated a track record in establishing common standards. At present, one of the most potent vehicles for the development of the underlying infrastructure for new value chains is the XML protocol. Unlike HTML, XML is predicted to lead to a new generation of communications products, which support the terminology, practices and knowledge classification systems of particular professional or business groups. Some of the current XML initiatives are European led, but the majority have U.S. origins, and this is a matter for policy attention at the EU level.

90. Although the task of tracking developments in e-commerce generally is probably moving too fast for conventional research and observatory methods, we believe that global infrastructures built on XML could have a profound effect on the conduct of world trade, and on both old and new value chains. It is therefore of the utmost importance that close attention is given to tracking such infrastructures, not least to evaluate the extent of European contribution to such initiatives.

IV - ISSUES FOR PUBLIC POLICY ORIENTATION

Key Policy Questions

91. Not surprisingly, one of the main conclusions of the HLEG was that there is no comprehensive pan-European policy prescription for the intangible economy, rather that a broad nexus of mutually-reinforcing policy initiatives is required. In certain areas these may conflict with the established policy hierarchies of the CEC institutions and member governments, which are themselves a legacy of a 19th century manufacturing era. Our specific conclusions in this respect are discussed at paragraph 108 below. In the short-term, we believe that the EU policy response should be structured around the following policy imperatives.

1. Fostering an entrepreneurial business culture.

92. *Raising awareness of knowledge and intangibles.* One of the main obstacles to the growth of an entrepreneurial economy in Europe is that too many executives, politicians and bureaucrats have only shallow insights into the drivers and transformations at work in the modern economy and the new business models that are emerging. This report contains a rich mine of concepts, rationale and information about what is driving the modern economy. It also presents case material on the use of intangible investment to sensitise the reader to think about new ways of realising hidden value and competitive advantage. The concept of the intangible economy has barely begun to excite or stimulate business and government decision-makers and these ideas need exposure to a much wider audience.

93. Europe has some exceptional success stories of companies that have 'seen the light' and adopted an intangibles mindset and managerial culture, and this only highlights its slow rate of infusion in the business mainstream. There is a great deal of apathy, if not actual hostility as, like any innovative approach, it challenges and threatens to de-skill or destabilise those with perfected expertise in the old order. Apathy and hostility to the intangibles mindset are deep-rooted. There is a stark contrast between business executives and public officials who almost intuitively grasp the significance of intangibles, and those who remain very comfortable with the deterministic approach that was a strong characteristic of the command and control era. This is compounded by evidence that certain managerial personality types excel at managing tangibles, whereas others respond more readily to a more flexible mindset. Our initial view was that dissemination and awareness campaigns would be sufficient to catalyse change. We are now much less optimistic and believe that a more challenging approach is urgently needed, not least because of the very long lead times to turn around key measurement systems.

94. It is essential that we create a 'fair share' of global innovations and encourage leadership in the take-up of new technology by European firms. Here a major challenge lies with the universities and research institutes, who are not accustomed to viewing the knowledge they create as an economic good. This also holds true for public authorities, particularly the executive agencies who, as a rule, do not have coherent policies regarding IPR ownership.

95. *Speeding up the restructuring of the 'old economy'.* A recurring concern of the HLEG was the contrast between the demands of today's global markets and business practices and the renewal capabilities of much of Europe's established industrial base. This is compounded by the failure of many of Europe's institutions to cope with the pace and complexity of change. The HLEG uses the collective term 'institutions' to encompass essentially two groups.

- Government and public sector
- Professions and professional groups

96. Our conventions of public and professional governance were created in their present form during the 19th century. Both were forged out of a dramatic trade expansion which, in turn, led to an era of professional assimilation, training and standard-setting. Just as the *laissez-faire* social policies of nineteenth century European governments had to adjust to the demands of complex non-agrarian economies - as well as to the social aspirations of an increasingly educated and mobile population - so a strong parallel exists today.

97. Notwithstanding 150 years of institutional reform and strengthening, these institutions remain remarkably faithful to their 19th century origins. Business and social economics in the 21st century is now preoccupied with much higher levels of global competition than existed two centuries ago, and the need for an international perspective by the European institutions is now paramount. Speed of response is arguably now *the* prime factor of competitive advantage, but frustration and barriers are increasingly found in these institutions which are profoundly fragmented in practice and (more worryingly), in outlook. Innovation is often the result of hybrid thinking - a synergy of ideas from people with different training, perspectives and insights. An innovative organisation is not sympathetic to rigid boundaries. Yet such boundaries are commonplace in Europe and supported by a massive, growing weight of national and international law. The policy aim here is less one of evangelising or 'selling' the intangibles mindset as an end-product in itself than to challenge the old economy mindset, developed over a millenium and refined almost to perfection over the past two centuries.

98. *Encouraging low-friction deployment of labour.* To the extent that labour market regulation has been shown to have a direct influence on GDP and productivity growth, EU employment and immigration policies will need to address the issue of low-friction redeployment of displaced labour. In this context the second and third world economies are now major players in global supply networks, and this opens up endless new opportunities for arbitrage - not least in the labour markets where low-cost economies such as India and others in the Pacific rim compete not only on clerical labour and assembly lines, but computer-based work demanding high skill and qualification levels. In countries with strict employment protection laws, firms will invariably adopt more cautious recruitment policies, and this has an adverse affect on their propensity to invest, diversify and take risks. M&A decisions are also influenced by employment legislation - for example in the freedom to divest non-core business activities. Employment policy should be oriented towards encouraging employment flow towards the demand sectors and appropriate imaginative immigration initiatives for gap-filling. Fine-grained policy analysis and benchmarking data will be required for this to be effective.

2. Research into the management of intangible assets, including strategic benchmarking of intangibles.

99. *A pan-European research initiative.* Throughout the report we present strong evidence of the scale and seriousness of the conceptual, information and data problems and their impact for macroeconomic analysis, markets and corporate management. In this connection the gap between the EU and North America, not only in terms of economic performance, but also the quantity and quality of the research base, is substantial and grows by the day. An orchestrated policy initiative aimed at closing this gap must be a top priority for policy makers. A major pan-European research effort is required, backed by public support above the national level.

100. The first priority is to appoint an appropriate public institution to give political and technical leadership and provide an infrastructure. Initially, its role should focus on co-ordinating pan-European research and acting as a clearing house and communications centre for the main interest groups. The research agenda should be interdisciplinary, and involve academics, professionals and private-sector firms of all sizes, sectors and cultures. Initially it should be grounded in propagating best practice rather than aiming at the theoretical or abstract knowledge domain. The choice of a lead institution should clearly reflect this emphasis.

101. *Strategic benchmarking of intangibles.* In sections I and II we set out a range of evidence in support of the contention that intangibles impact directly on the performance of firms and economies. In all of these areas, compared to the U.S. the European business framework is markedly less conducive to the creation, rapid growth and survival of entrepreneurial enterprise. In almost all areas that impact on the attractiveness of Europe as a place to do business, the U.S. environment (which was considered by the HLEG experts to be a leading benchmark of best practice) is at least 100% more attractive than the community, and in some critical areas this rises to 5-600 percent⁵¹, for example:⁵²

- New MBA graduates (400%)
- Company start-up costs (200%)
- Company start-up time (600%)
- Patents and patent citations (60%)
- Patenting costs & time (500%)
- Availability of *early-stage* venture capital (500%)
- Marginal tax wedge (60%)
- Exit realisation after taxes (100%)

102. Overall there is a need for much greater intellectual and organisational coherence in the Commission's benchmarking initiatives. The immediate priority is to begin the process of defining a core set of strategic performance indicators and get a pilot initiative underway quickly.⁵³

103. However, the HLEG would argue that the real challenge for Europe is more subtle. The key question is not just how to repeat the American experience in stimulating profitable business growth, but how to exploit and develop the distinctive competencies and capabilities offered by Europe's diversity. Much of this diversity originates in demography and welfare experiences, which we now have to reconstitute and adapt intelligently to a new technology environment.

3. Modernisation of government services.

104. There was broad consensus among HLEG experts on the need a) to infuse modern entrepreneurial thinking into the political and bureaucratic process, and b) for a more responsive, technologically-enabled public support framework. The policy agenda here will revolve around how to modernise and bring a wide range of public service enterprises into line with entrepreneurial business practice and thinking, for example in areas such as service ethos, pace and responsiveness, and the use of enabling technologies. We must also find ways of promoting the 'kaizen' (continuous improvement) mindset in public institutions.

⁵¹ Source: various, including UNICE 'Fostering Entrepreneurship in Europe', 1999; press commentary; FT editorials.

⁵² Other metrics include new company formation and growth rates, equity market size and liquidity, bankruptcy releases, business school endowments (chairs) and research performance, flexible labour contracts, and ITC and Internet traffic statistics.

⁵³ Any community initiative should co-ordinate with the U.S. pilot initiative proposed by the Brookings Institution (see Appendix III and Brookings, 2000b). This will take the form of a 3-4 year private-public programme of research and data modelling trials, and the establishment of a new Center for the Study of Business, Technology and Innovation in Washington, D.C. Given the U.S. dominance of almost all the existing performance indicators, the goal here is less to benchmark than establish a core set of performance indicators, aimed chiefly but not exclusively at firms operating in 'new economy' sectors. The main focus is to a) capture a richer base of cost data on intangible investments, b) develop a coherent framework of value indicators relating to the outcomes of those intangible investments, and c) begin to develop a new generation of business models.

105. A major pan-European 'g-commerce' initiative is needed - in effect a fundamental rethink of the government-to-business and government-to-citizen-client interface. The overriding priority should be given to the funding of pensions, which is a hybrid service with far-reaching public-private implications for the core community countries.⁵⁴ Beyond the pension domain, the spectrum of public services affected is seemingly endless - from social services, healthcare and public procurement to tax, customs & excise, franchises, quotas, commercial licenses, grants & subventions, census, statistics & information services, planning consents, personal licenses, education, museums & galleries, etc, etc. A 'g-commerce' initiative on this scale would generate a massive demand-side stimulus to the EU economies which would materially reinforce that predicted by some experts⁵⁵ for private sector e-business in the coming decade.

106. *Completion of a single market in services.* Consistent with a shift of policy focus from physical goods to intangible goods and services, the European community must take on the challenge of improving the quantity and quality of its service industries. Traditionally, services fall into one of four groups: (i) public (ii) private (regulated) (iii) private (monopoly controlled), and (iv) local. The next framework programme must ramp up the pressure on eliminating the barriers to an effective single market in all four service categories.

⁵⁴ According to OECD demographic data, 25% of the population of almost all European countries was aged 65 or more in 1990. In 2010, this will be 33% and by 2030 half the population will be of retirement age. This means that we need both a reform of the public pension system (see for instance ERT report, 2000), and to plan and prepare for the deeper societal changes that will be needed because of this trend. A related concern is how to maintain prosperity in the ageing society (OECD, 1998). Governments may well have to reduce direct assistance and health care to a such wide part of population. Equally, the progressive liberalisation of the services sector can generate new services for individuals and families that become the basis of new products, services and industries.

An example is the Italian firm CUP 2000 s.r.l., which was founded in 1990 as a spin-off from the municipality and health authority of Bologna. Originally established as a call centre for booking specialty services in the Bologna hospitals, CUP 2000 is now a public company employing 300 people and offering a variety of telematics-based services focused on older people.

⁵⁵ Goldman Sachs, 2000.

4. The need for better integration of public-private networks, especially in R&D.

107. Better integration of private-public research networks is essential to the diffusion of new knowledge into the hands of entrepreneurs who can exploit it. The key concerns here are not new and relate to long-acknowledged inefficiencies in public-to-private knowledge transfer. The policy imperatives are:

- The need to promote rapid dispersion of innovation and knowledge. First-mover advantage is paramount today more than ever and we must make knowledge faster transferable. A key objective is how to get improved ideas to those who can apply them.
- Recognition that the 'new' economy sectors are characterised by a thinner distinction between pre-competitive research and near-market product and process development. Also, that new communications networks are lowering the barriers to entry to the global supply networks. We need an IPR environment that allows regulators to achieve a dynamic balance between knowledge diffusion and private rent-seeking. A new system of competition indicators will be needed to monitor this.
- Recognition that publicly-funded R&D needs re-orientating towards 'smart' individuals and companies linked to networks to produce results, rather than propping up sclerotic organisations and R&D 'brands' that are past their prime. Co-funding and other arrangements involving venture capitalists (not only traditional VCs, but also the corporate incubators) should be encouraged as a check on commercial viability.
- Setting explicit policy targets to encourage the adoption of technology.

The Wider Policy Perspective

108. While this report examines a broad range of interrelated policy issues, the study also identified a number of important emerging policy questions that cannot be resolved by the group at this level. In parallel with the foregoing, the HLEG recommends that the Commission undertakes a fundamental review of its existing policy framework, with particular emphasis on the interconnection between the different components of the policy set. In this respect, the following were singled out for special attention.

109. **Market and competition policy.** Competition today has shifted from inter-firm competition to inter-chain competition and the scope for innovation, operations and market-supply is global. Market access is crucial - it is the right of entry to play in the game. Competition policy is no longer a matter of monopoly regulation by reference to balance sheet and market share criteria. IPR considerations apart, the knowledge economy is creating an ambiguous situation that cuts across all policy domains. People have the right to use a growing tide of public information and the critical capacity is the ability to choose. This means that the real barriers to market entry are increasingly moving upstream and are rooted in educational limitations and negative cultural attitudes. In recognition of this, our historic policy structures - competition, research, education, trade & industry - need to be replaced by a more integrated vision, and a new paradigm is required to guide our market access and control policies.

110. A related competition policy issue is the performance gap vis-à-vis the USA in respect of the circulation of ideas. Patents and trademarks are strongly connected with the old manufacturing model and need to be reconstituted to reflect their growing importance as economic goods and their extension into the business process and knowledge protection domains where patents are very difficult to establish and protect. IPR policy in the new economy is not just an evolution of the old, but needs to reflect the fundamental changes that

are taking place at the interface between pre-competitive and competitive research. The risk is to reduce the circulation of ideas.

111. Europe is weak in this area and ways must be found of making pre-competitive research diffuse more freely into the corporate sector. There is an urgent need to increase circulation relative to the USA. Today, in software or biotech or consultancy, the real cost is to produce the prototype. The cost of reproducing the prototype - copying software, cloning a biotech culture or re-equipping consulting professionals is small, often zero. In the modern economy the real access rights are not protected by IPR legislation and, in value terms, the key competitive assets now lie in know-how and control over market access channels.

112. **Corporate governance.** Concerns were raised in several HLEG sessions about the need for accelerated reform of Europe's systems of corporate governance. In this respect, the dissonances in the self-governing arrangements that underpin the capital markets, financial services sector and the liberal professions drew special mention. Some concerns focused on the fragmentation of market information systems, which were considered to be increasingly out of step with the need for more symmetrical disclosure of value-relevant information to an expanded stakeholder community. Others focused on the prospects for a supra-national monitoring authority for financial markets (which was seen as ultimately inevitable). The overriding concern however, was the shifting balance of governance vs self-interest (which Adam Smith raised as long ago as 1770), and that rampant entrepreneurialism will undermine the fabric of social governance. This also raises fundamental questions about what public goods would best support the new economic order. For the public policy community, a clear understanding of the factors influencing this balance is crucial, since national governments must maintain their privatisation momentum in order to make the public system more dynamic.

C. CONCLUSION

113. The HLEG members listed in Appendix I endorse this report and its proposals as representing a clear communication for the purpose intended, with sensible policy tracking. The views expressed are those of the authors and do not necessarily represent the views and perspectives of each individual member, especially where the report takes into account external opinion. There were no specific abstentions. However, it should be appreciated that the findings and conclusions do not necessarily represent the views and perspectives of each individual member, especially where the report takes into account external opinion, although there were no specific abstentions.

114. As outlined in the previous section, there are many policy-related ideas that are touched on but not developed fully in the report, particularly in the areas of education, employment and competition policy. Also, certain of the policy conclusions outlined are necessarily preliminary and need to be explored in greater depth. The group has given some thought to how these matters can be communicated. The signatories to this report believe that a higher-level, inter-governmental document is required aimed at senior public and private sector policy makers. It should take account of relevant existing Commission and national government communications, such as the recent report of the Science and Technology Policy Council of Finland.⁵⁶ This sets out explicitly to lay down an infrastructure for continuing economic success, and creates a policy structure that takes a long-term perspective and provides for effective management of the implementation process.

115. In our expert soundings, the growing disconnect between our established economic concepts and business models and today's rapidly-changing economic reality was readily and universally acknowledged. At a personal level, interest is invariably high, but the professional appetite and commitment of policy makers to embrace change were found to be disappointingly low. In this respect, the responses most often encountered were:

- a) Apathy, lack of interest.
- b) Active resistance to change.
- c) White papers and communications that embrace the rhetoric, but fail to address what is really needed to implement change.

116. If the recommendations set out in this report are not to be implemented, we would strongly prefer it to be as a result of the second response. In other words, we would prefer a conscious decision to remain locked in to a 19th century institutional mindset, not least because this would constitute a conscious decision to opt out of the global competitiveness race. We would be disappointed with response a), especially if it reflected a lack of clear communication on our part and thus an inability to wake readers from their apathy. But what we fear most is response (c) - adoption of the rhetoric, but no real action. This is the easy option (hence our fear it might prevail), but it is dangerous because it gives the illusion of action without addressing the substance of the problem.

117. In summary, the report calls for a sustained initiative aimed at a wide-range of interrelated institutional reforms, which will require championing and support at the highest political levels if they are to have any chance of success. A lot has to be done to modernise our concepts and develop new policies quickly. The overriding priority for the European Commission and its institutions is to take the political high ground in laying down clear policy

⁵⁶ *Report of the Science and Technology Policy Council of Finland "Review 2000: The Challenge of Knowledge and Know-How"* at www.minedu.fi/minedu/research/organisation/Review_2000.html

concepts and formulating the necessary pan-European policy targets and managing them through.

118. A major challenge lies ahead and we fully recognise that implementation will be hard and victories slow to materialise. History tells us that to change attitudes and mindsets in the absence of a major crisis or the threat of an imminent meltdown is one of the most difficult and challenging tasks for the public policy agenda. But we believe that is precisely what is required if a key economic challenge for this generation is not to become a crisis for the next.

Clark G. Eustace, Chairman
Clive W. Holtham, Vice-Chairman

20 October 2000

Appendices

Appendix I

HLEG MEMBERSHIP

Chair

Clark G. Eustace Honorary Fellow, City University Business School, London, and Chmn., R&D Policy Task Force, Brookings Institution, Washington, D.C. A former Senior Partner with Price Waterhouse Europe.

Vice Chair

Clive W. Holtham Bull Information Systems Professor of Information Management, City University Business School, London.

Members :

Patrizio Bianchi President, Comitato Scientifico Nomisma, and Dean of Faculty of Economics, University of Ferrara, Italy.

Laurence J. Cohen Senior IPR Partner, McDermott, Will & Emery, London.

Leif Edvinsson Director, UNIC and former Vice President, Intellectual Capital, Skandia, visiting Professor in Knowledge Economics, University of Lund, and advisor to Swedish Cabinet on digital economics. Founder, Swedish Association of Service Industries, Stockholm, Sweden.

Reinhold Enqvist Managing Director, Nordic Industrial Fund, Oslo, Norway.

Simon Fidler Partner, McKinsey & Co., London.

Baruch Lev Philip Bardes Professor of Accounting and Finance, Stern School of Business, New York University, USA, and Director of the US Intangibles Research Programme at the Ross Institute, New York.

Kurt P. Ramin Commercial Director, International Accounting Standards Committee (IASC), London, and a Senior Partner with PricewaterhouseCoopers, New York.

Thomas E. Vollmann Head of Manufacturing Industries Programme, IMD, Lausanne, Switzerland.

Stefano Zambon Associate Professor of Business Economics, University of Ferrara, Italy.

INVITED SPEAKERS & PARTICIPANTS

IMD, Lausanne - 26/27 March 2000

Andrew Boynton	Professor of Business Strategy, IMD, Lausanne, Switzerland
William A. Fischer	Professor of Business Strategy, IMD, Lausanne, Switzerland
Donald A. Marchand	Head of Information Management and Strategy, IMD, Lausanne, Switzerland.

Royal Institute of Technology (KTH), Stockholm - 25/26 May 2000

Bengt Braun	President & CEO, Bonnier Group, Sweden
Nils Enlund	Professor of Media, Technology & Graphic Arts, KTH Stockholm
Bernt Ericson	Direktör, LM Ericsson, Sweden
Leif Lundberg	Professor, KTH Stockholm
Bertil Nyberg	Direktör, Kista Science Park AB, Sweden
Pernilla Röjdmärk	CEO, Cell Network Stockholm AB, Sweden
Roger Wallis	Visiting Professor of Multimedia, KTH Stockholm
Lennart Wiklund	Senior Vice President, Bonnier Group, Sweden

City University Business School, London - 12/13 July 2000

John Atherton	Barclays Bank PLC, UK
John Barber	Director of Technology, Economics, Statistics and Evaluation, DTI London
Laurence J. Cohen	Senior Partner, Intellectual Property, McDermott Will & Emery, London
Ian Coleman	Senior Partner, Shareholder Value Group, PricewaterhouseCoopers
Peter Hill	Former Head of Economic Statistics and National Accounts, OECD, Paris
David Jukes	Director, Barclays Bank PLC, UK
Meziane Lasfer	Professor of Accounting & Finance, CUBS, London
Ian Wright	Senior Technical Partner, PricewaterhouseCoopers

University of Ferrara - 29/30 September 2000

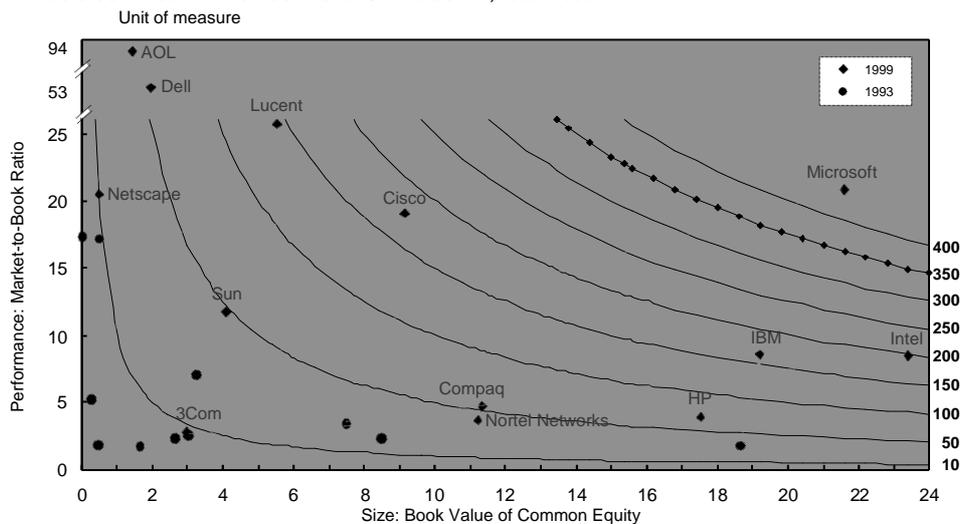
Stefano Azzolari	KPMG Audit, Italy
Paolo Bigotto	Senior Consultant, Summit, Milan
Carla Fiori	Operations Manager, CUP 2000 s.r.l.
Giovanni Maria De Marco	Head of Human Resource Unit, Eridania S.p.A.
Carolina Matarazzi	Head of Business Development, Italian Space Agency (ASI)
Tommaso De Vitis	IPO Analysis Unit, Consob

STRATEGIC INDUSTRY MAPS

Exhibit 17. Strategic Map of the Global IT Industry.
(Simplified to show a few of the industry's largest participants)

Annotation

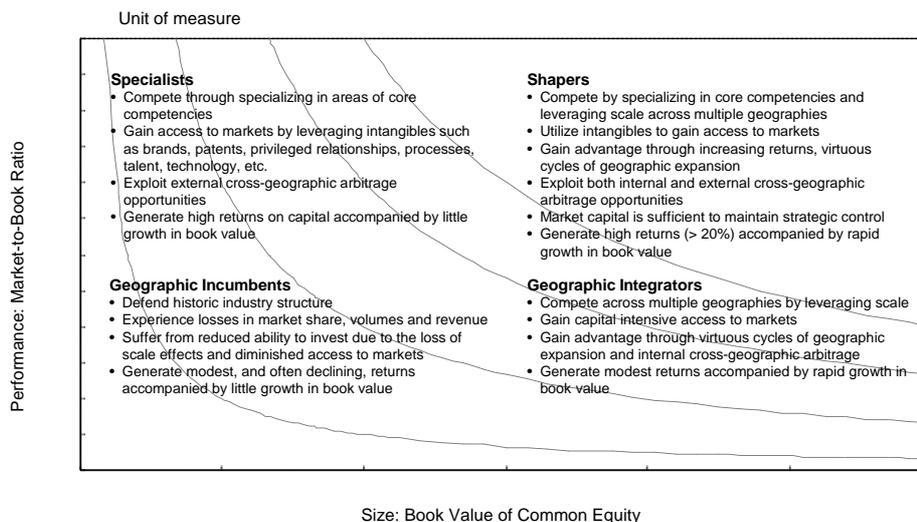
STRATEGIC CONTROL MAP FOR COMPUTER / IT INDUSTRY, 1993 - 1999*



* Market value as of March 1999 and Dec 31, 1993; book value is as of 1993 fiscal year end and most recent available from Sep 30, 1998 to Jan 31, 1999

Annotation

STRATEGIC CONTROL MAP - COMPANY SEGMENTATION



* Footnote
 Source: Sources
 Source: GNEP Analysis

Exhibit 18. Strategic Map of the Global Automotive Industry.

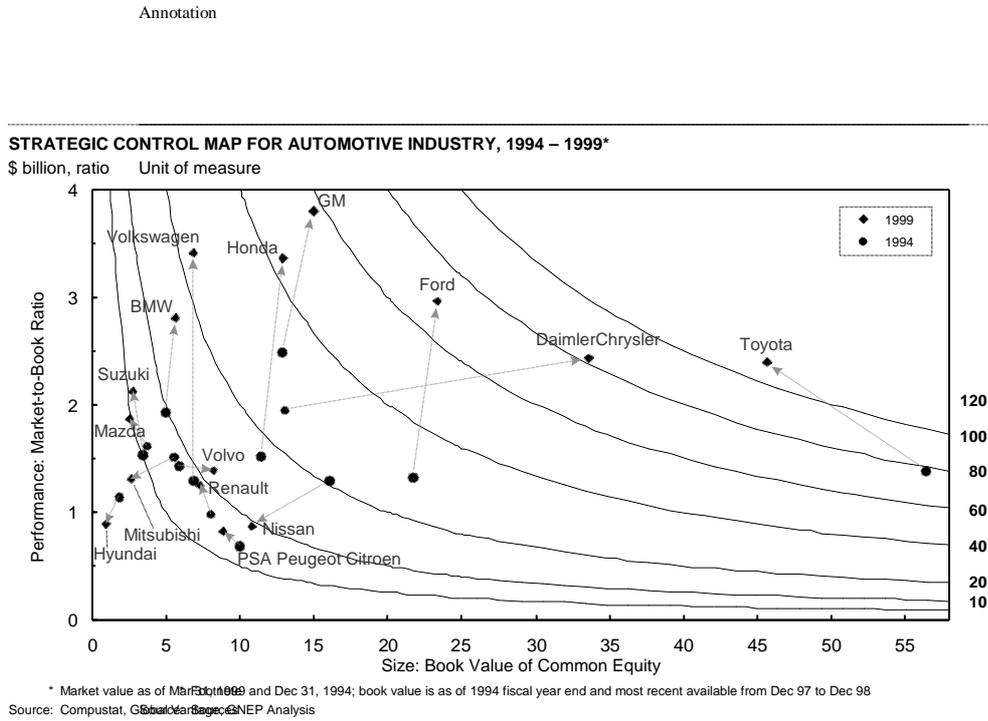
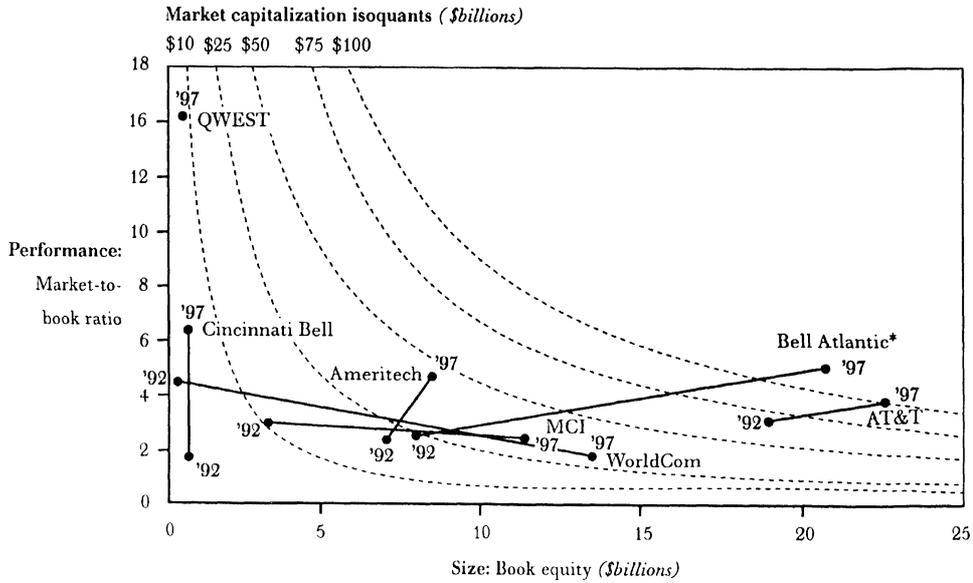


Exhibit 19. Strategic Map of the U.S. Telecom. Services Industry



Appendix III

EXTRACT FROM REPORT OF THE TASK FORCE ON THE INTANGIBLE ECONOMY AT THE BROOKINGS INSTITUTION, WASHINGTON, D. C. (Draft Release 3, September 13, 2000).

The task force has concluded that there is a strong positive role that should be played by the federal government in solving this particular public goods problem. Uncoordinated and isolated efforts within the private marketplace will not achieve the necessary outcomes as swiftly or as well if the public sector fails to provide financial support, and coordinate the efforts of private sector players.

In particular, we believe government should play an active role in:

1. Facilitating the convening of all interested stakeholders;
2. Helping to finance the research necessary to monitor and evaluate experimentation in measurement and disclosure; and
3. Fostering the promotion of voluntary guidelines that would increase the availability of comparable and verifiable information about business investments in R&D, in structural or organizational capital, and in human capital.

In particular, we propose the creation of a new, federally-funded Center for the Study of Business, Technology, and Innovation. The Center would be a government and private-sector collaboration, drawing on expertise from the Bureau of Economic Analysis at the Department of Commerce, the Center for Economic Studies at the Bureau of Census, the Bureau of Labor Statistics, the National Science Foundation, private sector organizations such as the Conference Board, (some leading organization representing the high-tech community?), the American Institute of Certified Public Accountants (AICPA) or other representatives of the accounting profession, and corporate thought leaders.

At least initially, the Center should perhaps be housed at the Bureau of Economic Analysis (which is already in the business of assembling data on the national accounts) or at the Center for Economic Studies (which already has a massive collection of business data, collected at the plant level, and an established reputation in the business community for handling business data with confidentiality). The goal of research undertaken at the Center should be the development of a more comprehensive set of macroeconomic and microeconomic performance indicators that can do a better job of tracking developments in the New Economy and providing useful industry-level information to individual firms for benchmarking purposes.

The longer-term goal is to help establish standards for expanded reporting by publicly-traded business firms and improved flow of information to investors who are making capital allocation decisions. Hence, the Financial Accounting Standards Board (FASB) and the Securities and Exchange Commission (SEC) should closely monitor the work of the Center and the research that comes out of it so that, as reliable, auditable or verifiable performance indicators are developed, these agencies should consider whether such indicators should be included in the disclosures required for publicly-traded companies and, if so how, and in what form. (In the meantime, publicly-traded firms should be given greater latitude and regulatory protection for increased voluntary disclosures. See Sect. B below.)

1. A pilot project. As a first step toward the creation of such a center, Congress should provide funding for, and the BEA, the BLS, the Bureau of Census, and the National Science Foundation should jointly sponsor or otherwise support a pilot study that would enlist the

voluntary cooperation of perhaps 100 to 150 private-sector firms in at least a dozen different sectors of the economy, over a three to four year period. This initial study would do three things:

a. *Capture a richer base of cost data on intangible investments.* Researchers would develop a template to be used by participating firms in collecting and reporting information about corporate investments that are directed at building distinctive intangible assets over time. The information structure should be capable of delineating the key asset-building outlays that currently flow through the traditional reporting system as periodic expenses. These might include, for example, breakouts of expenditures on basic research; new product development; on-going product and process improvement; the costs associated with quality assurance programs and/or service functions; training systems; the development and installation of information technology systems; advertising or brand development; market alliances; distribution networks; the enhancement and renewal of workforce skills; and salaries, bonuses, and incentive compensation systems.

Participating firms would work with the researchers to develop the data collection templates and to modify them as appropriate. Participating firms might also be given modest grants to help defray the costs of developing the information capture systems within their firms and to report back about just how costly those systems turn out to be, both to install and to operate. Participating firms should also receive feedback from the project that would allow them to compare and rank their performance with other participating firms (while still maintaining the confidentiality of the individual firm-level information).

b. *Develop a coherent framework of value indicators.* It is widely understood that, with intangibles perhaps even more than with tangible assets, the value created by an expenditure on developing the intangible may bear little relation to the cost. So in addition to capturing more cost information, the pilot project should develop a template for tracking the intermediate outcomes of prior investments in intangibles. The kind of information collected might include number of patents or copyrights; patent licensing revenues; citation counts (as indicators of how influential the patents or copyrights proved to be) ; income from new products (i.e., those introduced within the last three years); royalty flows (in and out); information on insourced and outsourced services; product life-cycle and time-to-market information; growth and expansion of market share; and human resource management systems. Participating firms should also provide detailed traditional financial data at the line of business level. Again, participating firms should work with researchers to advise them about indicators that they believe to be relevant to performance in their industry or sector.

c. *Begin to develop a new generation of business models.* During the first few years of the project, while the initial rounds of data are being collected, researchers, again working with participating firms, should develop and begin testing models to describe the relationships among the various input measures and outcomes measures, and to link the primary inputs to intermediate inputs and, ultimately, to financial performance and other measures of total value creation.

An example of the kind of reform needed is an improvement in the standard protocols used to collect R&D information. Since the mid-1960s, R&D accounting policies set by FASB and IASC, as well as the survey work of the BEA, NSF and Census Bureau, have been based on the so-called "Frascati manual" developed by the Organization for Economic Cooperation and Development (OECD). Although these protocols have been updated several times (the most recent was the fifth edition in 1994, and a current revision is underway for release in 2002), they are widely perceived as having failed to keep pace with the changing scope and nature of R&D. Few organizations now use the Frascati manual internally for their day-to-day operations.

The Frascati definitions are generally based on a laboratory model of R&D and do not relate well to the profile of expenditures on R&D related activities by most business firms today. The narrow, science-based definitions need to be adapted, for example, to make finer distinctions among innovation activities relating to basic research, near-market development, process re-engineering, and training and distribution, as well as to take account of the very different practices that have grown up in different industrial sectors, especially the service industries. As more data are collected, the new models being developed and tested as part of this pilot project should be continuously refined.

2. Scholarly publishing. Although the underlying data collected in the pilot project would have to remain confidential, researchers who work on the pilot project should be encouraged to publish reports on a variety of aspects of the project, from the development of the data collection templates to the development and testing of the models. These reports and papers should be submitted to scholarly journals for publication so they can be critiqued and evaluated by non-participating scholarly researchers. We would also urge that scholars who are given access to the data in the pilot project for their research be prohibited from exploiting the data for commercial purposes.

3. Monitoring what other companies and other countries are doing. One of the other major roles that should be played by the Center in its early years is to collect information about and monitor efforts by private sector companies (both in the U.S. and abroad) and by other countries to experiment with new business reporting systems. Some companies are already providing expanded (although somewhat ad hoc) information on social and environmental practices, for example, or on recruiting, training and employee development programs, or on incentive compensation programs intended to retain and motivate key people.

Some companies are publishing addenda to their annual reports, intellectual capital accounts, or reports to society. These documents contain not only narrative accounts that explain how the organizations define and meet their ethical responsibilities to employees, suppliers, customers, owners, communities, and governments but also metrics that help to hold the organizations to a standard of performance over time. A number of projects are also under way in Europe to develop better reporting models for intangiblesⁱ. The Center should open channels of communication and information exchange with the other international and private sector organizations that are experimenting with expanded business reporting models.

ⁱ The Danish Ministry of Business has issued a series of reports detailing an initiative to develop a framework for reporting on intellectual capital. See "Intellectual Capital Accounts: Reporting and Managing Intellectual Capital," Danish Trade and Industry Development Council, May, 1997. The Organization for Economic Cooperation and Development (OECD) together with the Ministries of Economic Affairs and Education, Culture and Science of Netherlands, sponsored an international symposium on "Measuring and Reporting Intellectual Capital" in June of 1999. The Meritum Project (Measuring Intangibles to Understand and Improve Innovation) and will send a final report to the European Commission in May, 2001. The Global Reporting Initiative, a project of the Coalition for Environmentally Responsible Economies (CERES) is developing guidelines for companies to use in reporting on the sustainability of their environmental policies. See "Sustainability Reporting Guidelines: Exposure Draft for Public Comment and Pilot Testing," CERES, 1999. See also "Sooner, Sharper, Simpler: A Lean Vision of an Inclusive Annual Report," a publication of Centre for Tomorrow's Company, in London. See also "Report on Communications," report on a project of the Swedish Public Relations Association to develop better information about the growing role of intangibles in the economy

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