LABOUR/MANAGEMENT PROGRAMME

FINANCING INNOVATION

Report on a meeting of management experts held under the OECD Labour/Management Programme

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FINANCING INNOVATION

Report on a meeting of management experts
held under the OECD Labour/Management Programme

(Paris, 26 June 1996)

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FOREWORD

Under the OECD Labour/Management Programme for 1996, a meeting of management experts on "Financing Innovation" was held in Paris on 26 June 1996. The meeting was prepared in collaboration with the Business and Industry Advisory Committee to the OECD (BIAC).

Below is an overall report of the discussions of the meeting of experts, prepared by Dr. Colin Mason, who was designated as General Rapporteur for this activity.

THE OPINIONS EXPRESSED AND ARGUMENTS EMPLOYED IN THIS REPORT ARE THE RESPONSIBILITY OF THE AUTHOR AND DO NOT NECESSARILY REPRESENT THOSE OF THE OECD.
1. INTRODUCTION

It is widely agreed that the translation of R&D results into commercial products – the innovation process – is imperative if businesses are to meet new competitive challenges and if countries are to achieve economic growth and create new sources of employment. Indeed, globalisation leaves companies and countries with little choice other than to continually innovative if they are to effectively compete. Certainly, technology is by no means the only source of innovation, and "high tech" firms are not the only ones which create jobs. In particular, the role of service industries in innovation should not be overlooked. Nevertheless, other forms of innovation generally have some form of technology in them. The availability of finance is a key factor in the innovation process.

The context for this meeting was the concern that changes to the way in which the public and private sectors have traditionally shared innovation-related risks in OECD countries is threatening the innovation process. On the one hand, reductions in public sector funding are forcing public laboratories and universities to become more commercial and short-term in their research orientation (e.g. as a result of pressures to achieve commercial viability) and attempts to control public expenditure affect the ability and willingness of private sector businesses to invest in R&D in those industries where government is the dominant customer, for example in the medical industry. On the other hand, the innovation strategies of the private sector are changing. The R&D function is now under increasing financial discipline, subject to capital budgeting, and is scrutinised for shareholder returns maximisation. The decentralisation of business units has also affected the innovation process because of the shorter term perspective of such units and a reduction in their degree of collaboration with central R&D laboratories. Moreover, it is argued that reductions in corporate R&D expenditure associated with the strategy of focusing on core business activities may lead to the loss of sources of new technology in the future.

In considering the case for government intervention it is necessary to distinguish between the upstream and downstream stages of the innovation process. The majority view accepts that government has a legitimate role in financing fundamental research. Typically this is undertaken in public sector scientific institutions such as universities. However, while this process might be effective in producing technology, lack of links with industry may limit the commercial possibilities. Thus, there is also a case for providing government funding for private sector firms to undertake fundamental research. Such pre-competitive research is best undertaken on a collaborative basis as the technology may have different uses in different companies. The danger is that the technology stays on the shelf and never reaches the market. Indeed, there is an argument that the lack of innovation is not so much a result of the shortage of investment in R&D but rather because of the inability to turn R&D into commercial products. There may well be a role for government to address this problem; however, the solution may lie in mechanisms which link researchers to the market rather than in initiatives which provide financial support for innovation.

The case for government intervention in the downstream stages of the innovation process is not one that is universally accepted. Direct government funding of the downstream process is widely seen as being inappropriate. For example, schemes which involve government funding of private sector R&D and
innovation were criticised because of the distorting effect on private sector behaviour, encouraging them to modify their business strategy to fit government schemes. There is also the moral hazard problem: the private sector will submit their high risk projects for public funding. Thus, the question which the meeting spent most of its time considering was as follows: what can governments do to stimulate the private financing of innovation?

Conceptually, there are at least three functions of government which can achieve this objective:

- Establishing the framework conditions for innovation. One example under this heading is the protection of intellectual property rights which attempt to bring private returns closer to the social returns of innovation;

- Influencing financing costs. This takes a variety of forms, including macro-economic management to reduce interest rates, minimising restrictions and regulations which affect financial markets (e.g. placement rules) as well as direct and indirect financial support. However, it is important to emphasise that government can take actions which do not involve spending public money to reduce the financing costs of business;

- Stimulating demand for innovations through their own purchasing.

In fact, the discussion focused on just two main issues. The first issue, reviewed in section 2, concerns the financing of small and medium-sized firms (SMEs). A prominent item under this heading concerns what governments can do to stimulate venture capital investments in innovative businesses at their start-up and early stages of development. The second issue, discussed in section 3, was based largely on the experience of the biotechnology and pharmaceutical industries concerning the influence of government on the innovation process arising from its support for research, patent protection, pre-market approval and price controls, and reflected the fact that a number of the participants were from the health care sector. The discussion also briefly touched on a range of other issues which are noted in section 4.

2. FINANCING OF TECHNOLOGY-BASED SMALL AND MEDIUM-SIZED ENTERPRISES (SMEs)

Small and medium-sized enterprises (SMEs) are widely regarded as playing a key role in the innovation process, and at a time when large companies are downsizing their significance is even greater. However, it is appropriate to insert the caveat that by no means all technology-based SMEs involve a high level of science or have large financing requirements and some firms may generate sufficient funds through internal sources. Nevertheless, it is often the case that technology-based firms use up the personal financial resources of the entrepreneur in developing the product and require external financing in order to launch it on the market. Moreover, there is a clear consensus that the more science-based the company the greater the difficulties encountered in raising finance from external providers which, in turn, hinders their ability to innovate.

The nature of the innovation process -- its high risks and long-term nature -- makes it inappropriate to be financed through commercial bank funding which is based on regular repayments of principal plus interest over a fixed time-period. Moreover, banks rely on the availability of collateral to determine project viability rather than undertaking a formal technological assessment. However, IPR and patents are not regarded as acceptable collateral. Furthermore, banks generally lack the capability to assess the risks of technology projects.
2.1 Venture Capital

Many technology-based SMEs are therefore likely to require venture capital if they are to successfully innovate. However, there is considerable variation between countries both in the availability of venture capital and also in the degree to which the venture capital industry supports both start-ups and early stage investments and also technology-based sectors. Whereas venture capital investments in the United States are highly concentrated in early stage investments in technology sectors this is less so in most other OECD countries. Moreover, the fixed costs for venture capitalists in assessing investment opportunities mitigates against small investments. The high costs involved in making small investments makes it difficult to run a seed/start-up technology fund on standard industry management cost ratios. Indeed, there is a world-wide upward trend in venture capital deal sizes, resulting in a growing mismatch between the amounts of investment sought by firms and size of investments that venture capital funds are willing to make.

This situation highlights the important role of "business angels" -- private individuals, usually with an entrepreneurial or senior management background, who, either alone or as part of an informal syndicate, invest a proportion of their own wealth in unquoted SMEs. Evidence from a number of OECD countries indicates that the informal venture capital market is considerably more important than the institutional venture capital industry as a source of equity finance for companies seeking seed, start-up and early stage finance. The importance of business angels arises not just because their investments fill the gaps left by institutional venture capital funds but also on account of the management skills which they contribute as a result of their involvement in the companies in which they invest. By contributing in this way business angels fill gaps in the management expertise of SMEs. Moreover, there is the potential for venture capital funds to reduce their appraisal and monitoring costs by co-investing alongside business angels. However, there is a concern that because the overriding investment criterion of business angels is to invest in industries and markets that they understand, only a small proportion of investors are capable of dealing with high-end technology opportunities.

The problem is therefore not as simple as one of a lack of supply. Indeed, institutional suppliers of finance claim that there is no shortage of finance available for "good" projects, while most business angels report that they are unable to find sufficient investment opportunities that fit their investment criteria. Thus, there is also a problem of a mismatch between supply and demand. While this is partly associated with the -- arguably unrealistic -- investment requirements of providers of finance, there is also a separate demand-side influence. Specifically, there is a lack of investment readiness amongst many of the SMEs which seek equity finance from venture capital funds and business angels. What is meant by this term is that firms have not done enough to meet the requirements of the potential investor, for example, in terms of understanding the implications of raising finance from an outside investor or in the provision of information for the investor's due diligence process.

Large enterprises represent a further potential source of venture capital for SMEs. Motivated largely by a desire for access to the entrepreneurial R&D culture of small firms and more generally by the need for a window on new technologies, large firms may take minority equity stakes in small businesses. This development is particularly common at the present time in the biotechnology industry in the USA, with large pharmaceutical companies taking equity stakes in small, often start-up, biotechnology firms. However, there is little evidence that this process is found more widely across other sectors and in other countries. Indeed, the meeting heard that large French companies have encountered major problems in managing their seed investments in small companies and have now stopped making such investments.

Ways in which governments can foster venture capital activity have been considered in previous OECD papers and meetings. The key factor is the creation of appropriate framework conditions. Central to this is the creation of secondary markets to improve the liquidity of venture capital investments (and to enable
companies to raise further finance, although in practice this role is less significant). However, whereas the National Association of Securities Dealers Automated Quotation (NASDAQ) in the United States has been extremely effective in meeting these objectives, second tier markets in Europe have been unsuccessful. One of the reasons is that they have under the same control as the main markets in each country. In the past stock market managements have been more interested in promoting the main list, which encourages successful companies on the second-tier list to graduate to the main market. This has been detrimental to the prestige of the second-tier market. However, there has been renewed interest in launching stock markets targeted at listing small and medium-sized companies, with new markets launched in the UK, Alternative Investment Market (AIM), France (Nouveau Marché), Germany (Neuer Market) and Belgium. The new markets in Belgium, France and Germany have launched EURO.NM (Société du Nouveau Marché) which seeks to establish linkages between markets to create joint trading and data dissemination networks, to harmonise admission criteria and to offer intermediaries cross-membership. The development of the European Association of Securities Dealers Automated Quotation (EASDAQ), an independent pan-European market, is another initiative that is intended to overcome the difficulty that smaller and medium-sized firms encounter in obtaining a listing. The development of venture capital activity is also affected by national fiscal and legal environments: e.g. tax transparency, capital gains tax rates, taxation and regulation of stock options, the patent system (including an effective enforcement system for patent protection), controls on what kinds of organisations can invest in venture capital funds (notably pension funds and insurance companies). Governments can also take more interventionist measures to promote venture capital activity with initiatives to improve the returns to investors (e.g. tax incentives, guarantee schemes, subsidising the appraisal and monitoring costs). But, of course, even if these measures are successful in producing an increase in venture capital activity it does not automatically follow that this will be channelled to early stage businesses in technology sectors.

Tax incentives for investors to stimulate venture capital activity are particularly problematic in this respect. Tax incentives are of two kinds: (i) up-front incentives which provide the investor with a tax break when the money is invested, and (ii) tax breaks on the sale of the investment (e.g. capital gains tax relief). However, it is difficult to structure tax breaks to ensure that they are well-targeted. An alternative approach, thought by some commentators to be more effective, is the United States’ Small Business Investment Companies (SBIC) scheme in which venture capital investment is leveraged by additional funds supplied by government at a low interest rate.

Governments may also become directly involved in the supply of venture capital through the establishment of public sector venture capital funds. Indeed, these types of schemes are multiplying in OECD countries. However, many commentators question whether this is an effective or appropriate use of tax payers’ money. It has been suggested that public sector seed and start-up funds lack the skills and expertise to “add value” to their investments. There is also concern that public sector funds might drive down returns below levels necessary to attract and retain private sector venture capital companies in the market. However, one possible justification for this form of public sector intervention involving the creation of a fund which invests in young technology-based businesses is its demonstration role, showing the venture capital industry that there are fundable opportunities. The impact of public sector venture capital funds is an area where further research might usefully be conducted.

Governments can also intervene to improve the flow of information between business angels and entrepreneurs seeking finance by underwriting the operating costs of business angel networks which “introduce” investors and entrepreneurs to one another. Evidence from a number of countries indicates that such a mechanism enables the informal venture capital market to operate more efficiently and can also encourage more potential angels to become active investors.
2.2 Tax Incentives for R&D

Another way in which governments address the financing needs of technology-based companies is to provide finance either directly or indirectly via tax concessions and tax credits. One of the problems with such schemes is in defining what constitutes R&D spending. Experience in a number of countries indicates that such schemes are particularly important for new companies, and especially university spin-off companies. Tax concessions are of little benefit to start-up companies because the company first needs to generate revenues before it can take advantage of the relief. Thus, refundable tax credits is a more appropriate way in which to assist start-up companies. Canadian experience of tax credit schemes for small companies indicates that a further requirement is efficient processing of applications. The Canadian tax authorities give a pre-judgement of eligibility in favour of companies, hires scientists to discuss with companies their eligibility and promises a six month processing time for claims.

2.3 Cash Grants for SMEs

Tax-based incentives are complex to administer and inappropriate for start-ups. For these reasons cash grants are favoured by some commentators because of their ease of administration. A variant of the cash grant scheme is the competitive award. For example, the UK SMART scheme is structured on a competitive basis, with firms applying for a limited number of awards. Stage I awards are for initial feasibility studies and stage II awards are to develop the technology to prototype stage. One of the interesting by-products for award winners is the "signal" that the favourable external assessment of their technology gives to financial institutions. SMART award winners report finding it much easier to raise external finance after having won an award.

2.4 Mutualisation of Risk

While much of the debate about the financing of technology-based firms is concerned with venture capital it is important not to overlook the needs of such firms for debt finance. One of the problems encountered by small firms is that they often lack the ability to provide guarantees (e.g. security) that providers of debt finance require. A number of countries address this problem through loan guarantee schemes in which government assumes a proportion of the risk of the lender in making unsecured loans. Another approach is through the mutualisation of risk which is a long-established form of financing for certain purposes (e.g. exports) in some countries. However, the meeting was sceptical about the appropriateness of this form of financing for technology-based SMEs. First, it raises the cost of capital as the cost includes an insurance premium. Second, adverse selection is likely to be very pronounced. Third, the targeting of such schemes at technology-based firms is difficult.

2.5 SMEs and Growth

There is widespread concern amongst policy-makers in many OECD countries that too few small firms achieve significant growth, expanding to 500 employees and beyond. One commentator described the prevailing situation, with companies starting small, staying small and then dying, as a "bonsai economy". However, economists do not see this as a problem and suggest that one size distribution of firms is not preferable over another. Moreover, the firm size distribution of particular industries changes over time as the industry develops and matures. For example, mergers between the major firms in the pharmaceutical industry at the present time is resulting in a change to its size distribution with the emergence of a small number of giant firms. The contrary argument, which is supported by considerable research evidence in the USA and UK, is that the small minority of small firms which do achieve growth contribute to the majority of the jobs that are created by the SME sector as a whole; hence generating more fast-growth SMEs would have a significant impact on job creation.
Many of the constraints on growth are internal to the companies themselves. Four problems can be identified:

- The owner-managers of many small companies do not want to grow, especially if it means selling equity to outside investors, and hence giving up “control”. Thus, they do not respond to incentives designed to assist growth;

- Such companies are often not sufficiently profitable to grow through their own internal resources;

- In family-owned businesses the process of inheritance can result in the loss of equity from the business;

- There is often a lack of appropriate management skills in such companies. The skills required to start a company are very different to those required to grow a company.

The greatest external constraint for many firms which do seek to grow is the lack of finance. Frequently the response is to sell out to large companies. Indeed, this is likely to be a major reason for the relative absence of medium-sized companies in many countries. Such companies therefore exist, but are subsidiaries and divisions of large companies rather than independent entities. Moreover, there is considerable evidence to suggest that companies which are acquired by large firms from their entrepreneurial owners often lose their dynamism over time.

Thus, the availability of venture capital is also essential for companies seeking to grow. Specialist forms of venture capital activity which enable the transfer of ownership and control to management specialists (management buy-ins) can be particularly important in overcoming some of the internal constraints on growth.

3. THE ROLE OF GOVERNMENT IN THE INNOVATION PROCESS

The second major theme of the meeting was to highlight the crucial role of government in the innovation process. Much of the discussion around this theme was related to the health care sector (including the pharmaceutical and biotechnology industries).

- research support: many innovations are based on publicly-funded research. For example, in the case of the pharmaceutical industry, 56% of new drugs in the USA relied on underlying academic research, a higher proportion than in other sectors;

- patent protection: The long payback periods on R&D expenditure makes the period of market exclusivity secured through patents a key risk factor for companies in deciding to develop a new product. Patents are particularly important in industries with high innovation costs but low imitation costs to enable firms which have invested in R&D to gain a return on this investment. For this reason patents are more important in the pharmaceutical industry than in semi-conductors or electronics. Patents also play a key role in the biotechnology sector.
industry, with the first wave of biotech firms (e.g. Genentech, Chiron, Amgen) all relying on
a strong patent base to develop proprietary platform technologies. Patents are considered
essential by biotechnology firms for securing the funding for expensive and time-consuming
clinical testing which is necessary to gain regulatory approval. There is considerable
evidence to demonstrate that the nature of national patent laws are a major influence on
R&D activity in the pharmaceutical industry;

• **pre-market approval**: the market risk that is common to all forms of innovation is
  compounded in the health care sector by the fact that Government regulates market entry.
  Virtually all countries require pre-market evaluation of the safety and efficacy of new drugs
  before they can be marketed. There is a consensus that this is a proper and desirable function
  of government. But at the same time there is concern that unnecessary regulation
  ("regulatory creep") increases the costs of drug discovery and development by raising R&D
  costs and increasing development times. Indeed, much of the research that is undertaken by
drug companies is to meet regulatory approval. In the United States R&D costs for
pharmaceutical industry are rising exponentially, the regulatory approval time is increasing
and only a small and declining proportion of products get approval;\(^ {12}\)

• **price controls**: companies may be expected to price their products in a way which recoups
  their investment in R&D. But in the health care industry government is the dominant, or
  only, customer for innovative products. Moreover, a high priority for governments in all
OECD countries is the containment of health care costs, particularly those associated with
the cost of drugs. Cost containment strategies as applied to pharmaceuticals includes price
controls, profit controls and budgetary caps and dispensing controls. This means that the
pharmaceutical and medical instrument industries assume all of the development, marketing
and financing risks but without knowing the size of the market or the price.

One of the features of the pharmaceutical industry, according to research in the USA, is that firms rely on
a small number of "blockbuster" drugs for a disproportionate amount of their profits. For many firms,
therefore, the profits from just one successful product may have to compensate for the development costs
of compounds that never found a market, as well as for marginal products that fail to earn back their
allocated share of capital and expenses. In addition, the uncertainties associated with approval, the size of
market and price makes it difficult for firms to obtain external finance. Thus, established pharmaceutical
companies must rely on internally generated finance, using the cash-flow from their existing products to
finance their R&D activities. In other words, the profits from today's drugs are paying for the research to
develop the drugs of tomorrow. However, government efforts to contain drug costs through price controls
target these blockbuster products. By having a disproportionate impact on industry cash flow government
price controls have a detrimental impact on the ability of firms to risk additional funds for R&D. Other
forms of government cost-containment also has stiling effects on innovation in the pharmaceutical
industry. For example, the effect of introduction of a limited list of seven product categories targeted for
reimbursement elimination in the United Kingdom in 1985 has been that no significant new products have
been introduced.

The paradox is that governments need firms to generate innovations in order to reduce the costs of
providing health care. However, if the cost controls on suppliers are too draconian then this will stifle
innovation and ultimately lead to the bankruptcy of health care systems.

It is also important to note that drugs are only one element in the health care continuum. There are many
eamples of situations in which drug budgets have been subject to capping, resulting in increased costs
elsewhere in the system (e.g. hospital costs, physician costs).\(^ {13}\)
In summary, governments can stifle private sector innovation as a result of their influence on market entry, the volume of demand, costs and price, all of which provides further sources of uncertainty in the innovation process and so discourage investment.

Suggestions for ways in which this high level of uncertainty can be reduced includes the following:

- creating a single evaluation and approval procedure for the United States and EU. However, this requires individual countries to give up their power and responsibility for setting standards which they are unlikely to be willing to do;
- speeding up evaluation procedures;
- establishing a fair and transparent system for pricing;
- sharing of innovation risk; e.g. through consortia.

4. OTHER ISSUES

Four other topics were briefly discussed:

- converting R&D activity into marketable products;
- licensing and the circulation of technological information;
- inter-firm networks;
- shareholder attitudes to investment in new products.

(i) Much of the technological knowledge that large firms generate through their R&D activities is peripheral to their core business activities and may therefore be under-used. This tendency is increasing as firms rationalise to focus on their core businesses. Important issues therefore concern how to encourage large firms to codify and market non-core technology and how to encourage employees to spin-out of these large companies to start new companies based on these unused research ideas.

(ii) Licensing is the main way in which technological know-how can be traded between firms. However, there is concern that the market for technology does not operate efficiently, particularly in Europe. The proportion of firms involved in the licensing of technology is much lower in Europe than in the USA, and there are fewer intermediaries (e.g. technology brokers) to ensure the efficient circulation of information. It was suggested that this situation can be attributed to deficiencies in the system for licensing technology in Europe.

In view of the apparent lack of authoritative information on issues associated with the circulation of technological information, the market for IPR and licensing trends the OECD should consider undertaking some research on this topic.

(iii) Companies -- especially SMEs -- can benefit from being part of a network of linked firms. Such arrangements enable the transfer of know-how between firms. The United States example of Sematech was cited as an illustration of a successful collaborative research programme. However, it was further observed that Sematech was formed, with government support, because the semi-conductor industry was in crisis, implying that firms may be only be willing to collaborate when they feel threatened. Nevertheless, Sematech continues to exist despite the ending of government financial support.

A further effect of collaboration may be a reduction in the aggregate amount of research activity being undertaken. This may arise because collaboration enables companies to identify and eliminate research activity which overlaps with similar activity elsewhere. Looked at another way, it is suggested that
collaboration may result in more effective research; because the research is more effective it can be accomplished with fewer inputs.

This whole area of research collaboration was another issue where it was felt that understanding was hampered by a lack of information.

(iv) The crucial issue of shareholder attitudes to investment in new product R&D was noted in passing. However, it was disappointing that there was not more consideration given to issues associated with the investment decision-making process of firms. A fundamental question is whether, and in what ways, the financial system gives incentives to firms to invest in R&D.

The key source of finance for investment is retained profits. However, there are well-documented differences between countries both in the proportion of profits paid out in dividends and also in the ability of firms to cut their dividends in periods of financial difficulty. Clearly, the ability of firms to invest is linked to the proportion of their profits that they retain. A number of factors have been proposed to explain such variations, including the nature of external shareholders, the concentration of ownership and the level of take-over activity. A further influence on the investment behaviour of firms is the rates of return which companies require from their investment projects. Here again there is evidence of international differences. In addition, firms may be discouraged from investing in R&D because of difficulties in evaluating its returns. Arguably, such difficulties may result in the potential returns being under-estimated. Changes in management accounting practices and the development of new financial methods (e.g. option pricing theory) may therefore have a significant influence on the innovation process by enabling firms to evaluate investment in research, development and design more effectively at an early stage and to indicate to investors how such investments can increase shareholder value. These are issues which deserve much greater attention.

5. CONCLUSION

Although the meeting provided only a selective discussion of the issues associated with the financing of innovation on account of the small number of participants and their narrow range of backgrounds and countries, a number of general themes did emerge:

The scale of government activity in OECD countries means that governments have an enormous influence on the innovation process. This is seen in its most extreme form in the health care sector.

Governments can stimulate the innovation process without direct financial involvement.

Governments should only intervene directly with financial assistance when there is clear market failure. Their objective should be to stimulate activity and they should withdraw assistance as soon as possible.

It is difficult to separate the financing of innovation from other aspects of the innovation process.

It would appear that there are areas of information deficiency concerning a number of aspects of the innovation process which it might be appropriate for the OECD to address by means of research. These include the following: the market for informal venture capital in OECD countries other than the United Kingdom, USA and Canada; corporate venture capital investment activity; evaluating the impact of public sector venture capital funds; trends in licensing and research collaboration; the impact of management accounting practices on investment in research, development and design.
A very interesting demonstration of the importance of innovation in business success is provided by the contrast in the fortunes of Amstrad and Psion, two British electronics companies. Amstrad's approach was based on accurately understanding consumers' needs, specifying products to meet them (initially in consumer electronics and then in personal computers), contracting for low-cost production in east Asia, then marketing and selling them in western Europe. The company was hugely successful in the 1980s. However, this strategy was flawed. It worked best at the moment when previously expensive, high-end technology suddenly became suitable for the mass market. But its commitment to mass-market scale required a level of inventory that proved damaging when any particular product failed to sell. It was also vulnerable to competition -- from the mass-market retailers through which Amstrad reached its customers, its product suppliers and from premium-brand manufacturers cutting costs to eliminate Amstrad's pricing edge. Crucially, it also relied on a string of technologies ready to make the transition to the mass market. Shorter product life cycles have left little scope for Amstrad to take to new products to mass market. The initial innovator now plays that role. In contrast, Psion, which makes electronic personal organisers, is a technology-based company with a premium-priced product, substantial margins and a high degree of vertical integration. The Financial Times editorial, upon which this account is taken, observes that the broader lesson "is that exploiting cheap Asian production costs is not, by itself, a long-term strategy for a western manufacturing company. Control of technology and innovation is essential, too." (Financial Times, 26 June 1996, p.13).

A good example is Federal Express. This company is in the postal services business which is clearly not a "high tech" sector. It was established on the basis of an organisational innovation -- the delivery of time-sensitive packages. However, the ability to deliver this service depended on prior technological innovations which enabled the location of packages to be continually tracked.

One example of a company which has adopted a more rigorous approach to the allocation of investment to R&D is Pilkington, the glass manufacturers reported in the Financial Times, 21 May 1996, p. 16. The chief executive notes that the proportion of blue sky research has fallen from 60% to less than 20% as a result of the changes that have been introduced. Another is General Electric of the United States. In the 1990s the company's central laboratories have seen a change in their funding because of the concern that some researchers had become rather remote from commercial realities and the need to get value for money. Previously, 75% of its funding came from group HQ, with most of the rest from United States government programmes. Now, to ensure that the central laboratories give priority to the needs of the operating divisions they receive only 25% of their budget from the group, leaving GE's operating units to make up the difference. GE has also determined how the central laboratories will spend their budget: 15% on improving current products; 35% on developing successor; 35% on next generation products and 15% on blue-sky ideas (Financial Times, 23 July, 1996, p.14).

This is clearly a much narrower focus than had been intended. However, it reflects the range of expertise and interests of the participants who attended the meeting.

It is important to recognise that the United States offers a much more favourable environment for venture capital investments in technology-based sectors on account of its large technology base, large domestic market and the importance of start-up ventures (usually spin-outs from established firms) in commercialising technological opportunities. Thus, it may be unrealistic for other countries to assume that they should have an equivalent level of venture capital activity to that of the USA.

Evidence on the significance and role of business angels is based on studies in the USA, Canada, UK, Sweden, Finland and The Netherlands. There is also anecdotal evidence on the existence of business angels in several other countries (e.g. Australia, Denmark). However, in view of the geographically
limited nature of this evidence it would be particularly valuable for the OECD to initiate a cross-national study of the size and characteristics of the informal venture capital market (including such key economies as France, Germany, Italy and Japan where information is lacking).


8 For example, two-thirds of business angels registered with the Australia’s Chamber’s business angels network in Sydney, Australia are looking to make their first investment.

9 The Meeting of Management Experts on “ Financing Innovation” was followed the next day (27 June, 1996) by a Meeting of Management Experts on “ Financing Innovation in Health Care (Including Biotechnology)”. A number of participants attended both meetings and many of the discussion points came up at both meetings. This section draws upon the relevant discussion at both meetings.


11 Grabowski, op.cit.

12 In the United States, 3 of every 4 new compounds are abandoned or rejected early on in the approval process: of those which get to the final Phase-III stage of clinical trials, one-third will fail to receive a final authorisation for sale (Grabowski, op.cit.)

13 Grabowski, op.cit.
ANNEX - LIST OF PARTICIPANTS

MANAGEMENT EXPERTS

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ACCI Representative  
AUSTRALIA

Mr. Christian Dambrine  
Chairman of the Meeting  
President  
ANRT  
FRANCE

Mr. Alain Sommer  
Directeur Administratif et Financier  
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