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NEW TECHNOLOGY BASED FIRMS

EIMS Policy Workshop

by

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PUBLIC SUPPORT FOR NEW TECHNOLOGY BASED FIRMS

EIMS Policy Workshop

Foreword

The design, implementation and evaluation of policies promoting innovation and technology transfer have undergone a series of changes. In the 1970s policy was to a large extent an ad-hoc and judgmental process. However, during the 1980s policy changes have been more informed and professional in outlook.

In order to continue this development, SPRINT/EIMS has launched a series of state-of-the-art reviews in the field of innovation and technology transfer support. These so called "policy workshops" are mainly directed to public sector scheme managers and the aim is to discuss recent developments in innovation policy, to exchange experience of best practice, to assess existing as well as future Community action in these fields and to discuss options for concerted actions.

One of SPRINT objectives is to help improve the effectiveness of national and regional innovation policies and to tune Community and Member State actions. As such these workshops provide important inputs as well as providing an opportunity to exchange information among scheme managers in the Member States.

This report summarises the proceedings from the first workshop in the series titled, *Public measures supporting new technology based firms.* Lately policies throughout Europe have been directed to new technology based firms(NTBF), based on the belief in their superior innovating potential and positive employment effects. The conference aimed at identifying policies directed to new technology based firms in Member countries and discuss their rationale, implementation and effectiveness. Over 30 European schemes have been identified and are described in the proceedings. This information, we think, is quite unique since it provides an up-to-date picture of the various efforts in Member States.

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GERMANY:	(federal programmes) Business Investment for New Based Firms, BJTU Pilot scheme for New Technology Based Firms: TOU Foundation of NTBFs and incubator- and technology centres, in the new Länder (TOU-NBL)
	(regional programmes)
Baden-Würtemberg	Promotion of technology oriented start ups
Berlin	Promotion by Innovationfund
GREECE:	PAVE (PAVE A, PAVE B) Law 1892/90 on modernisation and development Venture capital companies
SPAIN:	Joint Research Projects Development Projects Plan Tecnológico - Valencia
FRANCE:	ANVAR, Support for creation of innovative enterprises
IRELAND:	Enterprise Development Programme
ITALY:	Law 317
NETHERLANDS:	Guarantee-scheme for Venture Capital Companies, PPM Technical Development Credit, TOK Business-Oriented Technology Promotion, PBTS
PORTUGAL	n.a.
UK:	Small firms Merit Award for Research and Technology, SMART Support for Products under Research, SPUR

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SUMMARY OF PRESENTATIONS AND DEBATE

SPRINT/EIMS POLICY EXCHANGE WORKSHOP 1: PUBLIC MEASURES TO SUPPORT NEW TECHNOLOGY BASED FIRMS
Luxembourg 18-19 March 1993

SUMMARY AND CONCLUSION

The SPRINT/EIMS workshop on public policies to support New Technology Based Firms was one of the first in a series of workshops aimed at the exchange of experience between the Member States on innovation related public policies.

SETTING THE SCENE

The first session set out to describe what New Technology Based Firms (NTBFs) are and which government actions could support them. The papers that introduced the debate are included in this report and hence will not be discussed here.

Summarizing it was argued that SMEs play an increasingly important role in the technological key sectors. The number of companies and employees is growing fast. The nominal value added of SMEs in some sectors is growing even faster than value added by large companies. SMEs, compared to large firms, also have become the provider of the largest proportion of innovations. This justifies why public administrations should be interested in this group of firms. Defined in a broad sense, including all firms who exploit new technologies, their number is estimated at a few thousand in the Community. In a more narrow sense, including only those NTBFs that develop new technologies, their number may be a few hundred.

In the past two decennia, public policy instruments to support NTBFs have been developed in all EC countries. The inventory of these instruments, also included in this report, shows a great variety. This diversity would probably support the idea that there is not one single and simple 'best practice' to support NTBFs.

In the EC one can identify two basic types of instruments. First, the most dominant form of support, *direct financial aid* (grants, loans participation or tax

reduction), either given directly to enterprises for support, or indirectly via intermediaries. Second, *indirect financial aid* to reduce the risk of financial institutions. In many countries however, support for NTBFs is integrated in schemes to aid SMEs in general.The overview of the policy actions in Europe which fall in each category is given in one of the papers which follow this summary of the workshop.

In the discussion which followed the presentations the question was raised how one could justify actions to support NTBFs given the fact that numerically NTBFs are not very significant. Some of the arguments mentioned to support this form of intervention were their flexibility (first to market), their capability to provide R&D more cost effectively in comparison with large companies, their contribution to development of human capital and improving the dynamics of markets, and finally industrial policy arguments of supporting key sectors.

The presentations which followed during the first day of the workshop were illustrations of different types of schemes in the Member States.

INDIRECT SCHEMES

The first two schemes presented, - the Dutch PPM scheme and the German BJTU pilot scheme are indirect policies, designed to reduce the risk of the financial institutions which invest in NTBFs. The long-term goal is to create a mature venture capital market which is less risk averse towards the NTBFs.

The PPM programme which provides guarantees for risk capital suppliers is the most specific instrument addressing the financial needs of NTBFs. This scheme, established in 1981, is aimed at stimulating private venture capital firms to provide equity investment in SMEs. Essence of the programme is that the Dutch government guarantees a recovery of 50% of eventual losses of investors. It has allowed in a period of 12 years to establish a stable group of approximately 100 VCCs.

At the federal level in Germany we can find the BJTU pilot programme, which supports NTBFs indirectly by providing better investment capital conditions. The programme has two lines of action. The 'refinancing model', carried out by the Kreditanstalt für Wiederaufbau, makes loans available to investment companies, with up to 90% release from liability. The 'co-investment model' allows the government (BMFT through the Technologie Beteiligungsgesellschaft) to place a dormant holding in a NTBF to which another investor must be committed with at least the same amount.

The subsequent discussion concentrated on the relation between government and the private capital market. The question was asked if the private venture market was made even more risk averse by government financed safety nets. In the view of most participants this did not seem the case. Moreover the German and the Dutch experience showed that it created a financial infrastructure for NTBFs which did not exist before. However participants also stressed that investment risk for venture capitalists must remain in place to allow investment decisions based on objective risk assessments. The aim of a scheme should be to make the risk acceptable. In order to limit the failure rate of the schemes it was argued that good selection criteria were essential. Both Dutch and German representatives agreed that the selection should be made at 'two-arms' length of government, assuming that the financial institutions themselves are best suited to make the selection.

It was further suggested that it is important for governments to remove the structural impediments for venture capital investments, for instance in taxation rules. At European Community level this means a further harmonisation of regulation on capital markets. Policy schemes operators should not forget that management quality should be the most important selection criteria to support NTBFs. Finally it was argued that the main bottleneck at the moment seems to be the availability of risk capital in many countries.

THE DIRECT AND SPECIFIC SCHEMES

Two examples of instruments that directly support the firms were presented during this session: the SMART and SPUR schemes in the UK and the Spanish CDTI-loan scheme. These schemes are strictly financial support instruments, they do not offer any other support services.

The Small Firms Merit Awards for Research and Technology (SMART) programme is a national competition established in 1986 which provides non repayable grants for NTBFs. It provides up to 150 grants per year for feasibility studies (stage I) and 75 grants to continue with the development of pre-production prototypes (stage II). The Support for Products under Research (SPUR) programme started in 1991 and is aimed at encouraging SMEs to increase R&D expenditure and to develop new products and processes.

The CDTI loan scheme for research collaboration projects, aims at more mature firms, not specifically in the seed and start-up stage. This makes the idea of providing management-support less obvious. In Spain this type of government funding is essential to firms because there are hardly any other sources of finance

for technology based projects. Unlike the UK there is no venture capital market.

During the debate it was said that one should not forget that the 'labelling effect' also plays an important role in this type of schemes. Access to additional financing is made much easier, for firms that receive this type of grant or loan. This is certainly not the case for all types of grants.

Furthermore it was suggested that loans which are refundable only in case of success of the project might put a premium on failure. The Spanish representative argued that the fact that firms in Spain depend on CDTI for most of their finance, reduces this danger.

THE DIRECT INTEGRATED APPROACH.

One of the characteristics of the direct integrated approach is that direct financial support of an NTBF is supplemented with assistance for management, network connections, marketing advice and so on. This is based on the conviction that the combination of a sound financial base and good management are prerequisites for growth. In most participants experience, technical entrepreneurs are not necessarily good businessmen. The two examples of the integrated approach were ANVAR from France and IDA from Ireland. Both organisations are concerned with support for firms in general, mainly SMEs. Nevertheless in both cases NTBFs constitute a significant part of the subsidised firms.

The ANVAR programme is a national programme managed through 24 regional offices which implement the scheme. ANVARs main target are SMEs in all sectors of industry. Innovation assistance is given to projects of technological nature, via advances of up to 40% of the cost of the innovation programme, in the form of interest free loans. These loans are repayable in four instalments, depending on the failure or success of the project. The assistance is offered for the complete innovation trajectory, from feasibility studies to commercialisation of the project. In addition to the financial support it also provides innovation support services and consultancies.

The Enterprise Development Programme managed by he Industrial Development Authority of Ireland (IDA) is also an integrated approach to SMEs. Important aspect of this programme is to build up management teams in firms and subsequently help them establish a network of strategic research partners, key customers and financial experts. It is less explicitly focused on NTBFs. However NTBFs constitute about one third of the IDA projects. This programme includes mainly direct forms of financial aid and management support. There is a wide

range of support services which include interesting features such as key customer introduction.

Both schemes are examples of a 'hands-on' approach, operating as financier, dealing with the selection of projects themselves and in the Irish case acting as shareholder. Personal contact and therefore proximity of the agency to their clients is important in this hands-on approach. During the discussion it was noticed that a drawback of this approach is the danger of "falling in love" with an NTBF. Clear exit criteria, and regular evaluation of the progress of their projects, are therefore needed by IDA and ANVAR.

Some participants argued that although integrated programmes had advantages, they were not applicable in all countries.

THE FISCAL APPROACH.

There are only a reduced number of tax related schemes available in the EC. Two examples illustrated this approach: the federal Belgian fiscal scheme 'Innovation Company' (abandoned in 1990) and the Italian law 317 (not yet fully implemented).

The 'Innovation Company' law is a scheme which exempted new technology based firms from taxation. To apply for the scheme companies had to be identified as innovating companies and once they were notified they were allowed tax reduction, either on profits or on income tax. The scheme, although seen as successful, was phased out in 1990 due to budgetary constraints.

The Italian 'Law 317' is a very comprehensive law which includes up to eight different types of support for SMEs. Some of them operate through the mechanism of tax reduction. However it has had some start up problems with oversubscription in the grants part of the scheme. The scheme also has some relatively novel mechanisms to increase expediency. Through a system of self-certification, the time to award the credit is reduced to 15 days so the scheme can handle many applications.

During the debate it was argued that innovation related tax reduction schemes can be identified in many countries, however they vary greatly in their design and implementation. A major advantage of the tax related schemes was seen in the fact that the dissemination of information on the schemes themselves is facilitated by the use of existing channels like accountants and lawyers. Drawbacks are the insufficient feedback from the recipients and poor possibility to target the

schemes.

It was further argued that double taxation of the investments constituted a problem in some member states. Harmonisation of tax rules was seen as an important task for the Commission.

AN INTERMEZZO: THE CHANGES IN US POLICY

During the dinner session the participants had the opportunity to listen to and discuss with Mr Bradshaw, a former coordinator of science and technology issues during the Clinton campaign. He presented the main lines of the new US administration.
Under the banner of 'Technology for America's Economic Growth', the Clinton administration aims to redirect US technology policy. This means a shift of emphasis from the large defense related research projects to more civilian and industry-led research and development, at the same time recognising the importance of basic science for technological development. New emphasis will be placed on the importance of education and training as means to improve American skills and upgrading of the infrastructure both to enhance technological capability. Commenting on the near future, Mr. Bradshaw argued that, given the pressures on the new team, there is the danger that they will concentrate on revitalising the American firms at the expense of openness towards its trade partners. This could counteract years of effort to open up the US, EC and Japanese economies to each other. This will need on all sides a period of very careful negotiation which takes into consideration the US policy making pressures of an incoming administration.

ISSUES OF DESIGN, MANAGEMENT AND EVALUATION.

During the morning session of the second day of the workshop several issues of design, management and evaluation of policy instruments were discussed and briefly introduced by different speakers.

On the question how to *cope with failure* it was argued that the definition of failure must be clearly recorded in the scheme from the beginning. One can use a narrow definition of failure,(eg. bankruptcy) or a broader one where the firm survives but doesn't live up to the expectations of a NTBF. Working with the narrow definition, scheme managers might end up supporting the 'living dead' just to avoid failure.
Comparing the experiences of the different support schemes presented, the failure rates differ considerably, partly caused by different definitions of failure.

On the topic of *defining the target group* it was argued that it clearly depended on the objectives of the programme, ranging from regional development to creating a venture capital market. No general recommendations could be given on that.

Another issue which has to be considered more explicitly before setting up these type of schemes is why member states should emphasise so much on high technology firms as producers of new technologies? In the view of some of the participants dissemination of technologies is equally and possibly more important. Furthermore, public policy should strongly aim at maintaining the market share of the more competitive European high-tech sectors, usually in the hands of large companies.

On the question of why and how to evaluate schemes it was argued that the evaluation of a scheme should be held against its policy objectives. By several participants it was stressed that the success of separate projects does not mean that the scheme as a whole is successful. If the objective of a scheme is an intended change in attitude within the target group, this will be hard to evaluate.

COMMUNITY ACTION AND SUPPORT SCHEMES

This session gave an overview of Community schemes to promote NTBFs. The schemes either involve financial intermediaries, innovation support services or firms. During this session several individual Community schemes were presented: the EC Seed Capital Scheme, the Venture Consort and Eurotech Capital Scheme and finally the SPRINT - NTBF support measures, in particular the Technology Performance Financing scheme.
Although the participants stressed the importance of the European schemes they also observed some difficulties for potential applicants due to the great diversity of actions.
Another point of debate was the regional disparity in the creation of NTBFs and in the provision of seed capital. In spite of numerous Community programmes the situation has not changed: the UK has still the strongest seed-capital market and Spain /Portugal the weakest. In many participants' view this meant that each region needed a different approach and the regions lagging behind need a more 'hands-on' policy.

POLICY PERSPECTIVES

The last session of the workshop started with a 'Tour de Table' on the future

perspectives of the different programmes and actions in member states. In several countries recent or forthcoming changes of governments make future developments more difficult to define.

In the UK it was mentioned that the government was preparing a major revision of its S&T policy. A White Paper on the issue was due to be published in May 1993. DTI had just started reviewing their objectives and schemes. This process will also be completed in May. SMART and SPUR are due to run until 1994 and are both due for evaluation later this year. UK representatives could hence not give a very detailed picture of the lines to the future.

In Scotland a package of new policies will be launched in May, aimed at the creation of new firms, including NTBFs. This will include financing, management training and support for networking of new firms. Starting entrepreneurs in Scotland have poor networks and have to rely on formal linkages rather than informal ones. Therefore Scottish Enterprise will probably initiate a forum where new entrepreneurs can have informal contacts with experienced entrepreneurs or venture capitalists to discuss business plans.

French representatives argued that the future priorities for ANVAR, based on the principle of shared investment risks, are to be found along three lines. The first priority is to improve the services of ANVAR to firms in general. The second is to help NTBFs to a capable management. A third development aims at mobilising capital either by transforming conditional loans back into their own funds or developing guarantee mechanisms.

The representative for the Netherlands distinguished two events likely to affect science and technology policy. The first is a white paper on technology policy due in April, the second will be the elections next year. Dutch representatives expect a considerable increase of funds for R&D policy in the next year. The Netherlands has had the lowest level of funding to industry in the EC in the recent years. In relation to NTBFs more emphasis might be placed on networking, co-makership, clustering and collaboration with R&D organisations. Another initiative under discussion, is a scheme to support feasibility studies, - both technical and economic - for R&D based start-up companies.

German participants argued that the experimental BJTU-programme is due to run until end of 1994. It is likely to be extended. The most important issue will be which organisation will be assigned the management of the scheme once it is established more permanently.

The TOU scheme in the new German Länder is due to run until 1995 and it will

be extended after that year. In the third phase of the programme the aim is to improve the capital base of NTBFs, by transforming the loan guarantee into equity capital. Under discussion are a collaboration scheme for SMEs and R&D organisations and a tax reduction scheme for R&D expenses. It was argued that the use of regional funds to support NTBFs in the new Länder would be a welcome addition, and any ideas from the Commission to make this possible would be appreciated.

German participants suggested that the Commission act as coordinator of national efforts to support NTBFs. A follow-up of this workshop could be one instrument of coordination. It was also proposed that the EC role in fiscal harmonisation regarding risk capital should be strengthened.

The Danish representative argued that a new government under social-democratic leadership has recently been installed and new lines in industrial policy can be expected, unemployment being the main policy issue. Schemes that exist from the former government - a series of small initiatives towards entrepreneurs - will probably proceed. There is however no indication of specific activities towards NTBFs in the future. Support for SMEs will be brought forward in the form of a guarantee scheme for loans with private banks. Furthermore the funding of the industrial and technological development agency will be doubled.

Italian policy in this field will continue although due to budgetary constrains one could expect a progressive reduction in funds. At the moment the department of industry is preparing the annual report on Law 317. The report will discuss the problems arising from the choice between grants and tax reduction given to applicants. Another problem raised is the system of self-certification, checked by the banks. Most banks cannot make the technical evaluation if funded projects involve high-technology innovations.

In Ireland participants expected some new initiatives on support to NTBFs. The role of the state taking equities in NTBFs will be gradually replaced by a role of 'silent partner'. A new initiative, the Enterprise Preparation Programme, intends to bring together a small groups of highly motivated potential entrepreneurs with financial intermediaries and investors to prepare the start-up of new firms. A new guideline is also to fund firms with repayable grants.

Greek policy is strongly dominated by the issues of privatisation and deregulation. This applies to R&D policy as well. New initiatives in Greece originate from the EC, in particular from the Delors II package. In a programme financed by DG XVI and DG V for technology transfer and innovation, still under discussion, the specific needs of Greece will be addressed. The schemes are not particularly

focused on NTBFs, at most on spin-offs from universities and foreign companies.

Belgian participants dit not expect at the federal level any new initiative or the revival of fiscal measures regarding NTBFs. In the three regions the only new policy initiative is the 'Brustart' fund in the Brussels region, which has only started and will probably have a SMART like formula. In the Flanders region job creation is the main policy objective and possibly NTBFs oriented policies will derive from that objective.

Finally, to illustrate some of the initiatives being developed in the autonomous regions of Spain one participant described an ambitious plan of the Valencia region, containing direct grants for competitive and pre-competitive research and agreements with universities, technological institutes and firms. In a few months the regional government is going to set up a seed capital fund and a specific programme for NTBFs to obtain managerial expertise and financial support for feasibility studies if done by consultants.
Trying to identify common tendencies in policy developments in *MEMBER STATES* one can summarize them as follows:

- Efforts to support SMEs will most likely increase in almost every country. Only a few countries concentrate on NTBFs as a specific and thus different category of enterprises(Germany, UK, NL). In most countries support for NTBFs is part of more general SME schemes;
- Management support is seen as an essential addition to financial support programmes. Most countries will include or stress such actions in their schemes;
- Another addition to support schemes will be actions to improve access to relevant networks, such as research networks and collaboration partners;
- As policy level the regional level is growing in importance. The examples of Scotland, Valencia and Belgium illustrated this point;
- There is an increasing interest in member states for new financial instruments, particularly for schemes such as the 'loan guarantee fund'.

At the *REGIONAL LEVEL* discussants argued that regions have more difficulties in designing their own policies due to the fact that they are on the one hand under pressure of the regional issues and on the other hand constrained by national and EC regulation. Their room of manoeuvre depends on their autonomy from the central government. The problem with NTBF schemes is that these are aimed at long-term results, whereas issues in the regions often need short term effects, for instance in terms of employment. An advantage of policy at the regional level is that there is a closer relation to the infrastructure and firms and policies can be better fine tuned to local needs and characteristics.

At the *NATIONAL LEVEL* discussants argued that one should keep in mind the balance between the weight of NTBFs and the problems that face the whole economy, unemployment being the most urgent one. One should not forget the large amount of traditional companies which are not innovative enough. Focusing on NTBFs at national level should not be considered as the 'magic bullet' to solve all problems. Large high technology based companies are still the main force in creating and diffusing technology in most countries.

On the prospects for *COMMUNITY* action discussants argued that the Community faced several constraints. Politically the Community acts according to the subsidiarity principle, hence any direct action on its part is not likely unless required by member states. A second (temporary) constraint is the recession which has hit Europe. This has meant that in terms of budget, the increases proposed in the Delors II package, were not approved. Last but not least the conflicting need for diversity and cohesion strongly effected the result of policy actions.

Three possible courses of action appear to be open to the European Commission level. The EC could:

- contribute to the *analysis* of the phenomenon of NTBFs, the national and EC schemes, in such a way that it helps to place the issue on the economic and political agenda. Decision makers in the Member States and the EC should be convinced of the importance of the issue.
- contribute to the *exchange of experience* between the countries and the regions. Particularly the regional perspective deserves a further reflection in this exchange.
- serve as a platform for launching *joint experimental* policies, the risk shared by the countries.

There is in addition a list of domains to be involved in which the Commission could play an active role in the future:

- fiscal transparency and harmonisation for risk capital throughout the Community needs to be taken aboard;
- the problem of flight of risk capital should be tackled on the Community level;
- the Commission should improve coordination of EC policies, harmonisation of their objectives and intensify the discussion on the levels of aid allowed in the Member States for SMEs and NTBFs. The objectives of regional policy, cohesion, competitiveness and of reinforcing the R&D infrastructure, should not contradict each other.

Closing the workshop the chairman said that from the point of view of the Commission this first exchange of experience had been intense and in his view successful. The active and open contribution of the participants had been essential for the success of the workshop. He hoped other workshops would be able to continue this very fruitful exchange of experiences between member states and the EC.

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STB-TNO, April 1993

SETTING THE SCENE

THIRD PARTY EQUITY SUPPORT FOR NEW TECHNOLOGY BASED FIRMS IN THE UK AND CONTINENTAL EUROPE

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A. INTRODUCTION

The purpose of this paper is to introduce the subject of venture capital, equity finance and its particular role in the creation and support of new and developing businesses. A number of practitioner and policy issues are raised concerning the objectives and operation of New Technology Based Firms (NTBFs) and their relationship with early stage, venture capital funds in the UK and continental Europe. Where appropriate, observations are illustrated or referenced with industry statistics and research findings from studies undertaken by Warwick and other researchers.

B. INDUSTRY STATISTICS AND TRENDS

Technology is defined throughout this paper as including the following sectors: communications, computer related, other electronic related, biotechnology and medical/health related. Data on these categories are segregated in all three data sets produced by the UK, European and US venture capital industries.

Time series figures on the importance of technology investment as a specific focus of venture capital activity in the UK show a clear downward trend over the 1980s, particularly when measured by the total value of investments made each year. The UK and European figures (which include the UK) show a similar trend albeit that the European figures indicate a rather higher importance for technology in total investment. These figures are in marked contrast to the US where venture capital activity has been largely defined within a technology focus (see Roberts 1991 and Bygrave & Timmons 1992). UK interest in the potential of technology investment in the early 1980s was to result in a subsequently very high failure rate

of supported technology entrepreneurs (Murray 1991). The considerable risks of backing novel technologies and commercially inexperienced technology entrepreneurs was to result in a large number of venture capital firms deciding to abandon a presence in this market. Technology investment was left to a small number of specialist investors with staff able to appreciate the complex technical and market characteristics (Murray & Lott 1992). At the same time as venture capital firms were abandoning technology investment, the UK's MBO market was starting to accelerate. MBOs appeared to offer more substantial and less risky returns than earlier stage, technology investments. Thus, venture capitalists substituted funds into this potentially attractive area, starting a pattern of investment which remains to the present day. European funds developed later than in the UK. They were thus able to see the problems of technology investment experienced in the UK. In consequence, the majority of emerging European venture capital industries followed a UK rather than a US model devoting the majority of investment activity and interest to later stage, development capital activity.

Table 1 Percentage Number and Value of Technology Investments in the UK, Europe and the US by Venture Capital Firms

Year	1984	1985	1986	1987	1988	1989	1990	1991
UK:								
Total No. UK Comp. Financed	350	517	600	1174	1326	1302	1221	1196
Technology-% No. Tot. Invest.	36.3	30.9	26.5	25.6	21.4	23.7	23.6	20.8
Total Value Invest.(£ mill)	140	278	384	934	1298	1420	1106	989
Technology -% Value Total Investments	33.3	26.4	17.8	15.7	8.9	12.4	12.9	13.1
EUROPE:								
Total No. Investments	n.a.	n.a.	n.a.	n.a.	5078	5439	5362	6907
Technology-% No. Tot. Invest	n.a.	n.a.	n.a.	n.a.	32.0	30.4	29.0	25.5
Total Value Investments (ECU million)	n.a.	n.a.	n.a.	n.a.	3452	4271	4126	4632
Technology -% Value Total Investments	n.a.	n.a.	n.a.	n.a.	20.7	20.4	19.7	16.1
USA:								
Total Value Investments ($ million)	2760	2670	3242	3977	3847	3395	1922	1358
Technology -% Value Total Investments	82.0	77.0	70.9	63.5	60.5	67.4	72.8	80.0

Source: BVCA and EVCA Annual Statistics 1984-91, NVCA Annual Reports 1990 &1991

However, the growth of MBO and MBI activity to a predominant position in the UK and the second most popular investment activity in Europe confounds an understanding of the changing trends in technology investment. In both the UK,

particularly, but also in Europe several funds were established specifically to invest in MBO/MBI activity. These dedicated funds were not available for earlier stage investment nor technology start-ups. Thus, aggregate figures that include the substantial volume of investment into the venture capital industry to finance one particular product serve to reduce artificially the importance of technology investment. In order to correct for this influence, Table 2 adjusts the figures of table 1 to remove MBO/MBI finance activity on the assumption that technology investment is not a real substitute for these bespoke funds.

Table 2 'Adjusted' Percentage Numbers and Value of Technology Investments (ie. Excluding MBOs/MBIs in the UK and Europe and LBOs/Acquisitions in the US) by Venture Capitalist Firms

Year	1984	1985	1986	1987	1988	1989	1990	1991
UK:								
Technology- % No. Total Investments	42.3	37.6	33.9	31.4	24.4	31.8	32.7	27.4
Technology- % Value Tot. Invest.	42.0	41.5	32.5	34.9	20.5	32.0	30.2	29.2
EUROPE:								
Technology- % No. Total Investments	n.a.	n.a.	n.a.	n.a.	38.9	38.1	36.6	31.4
Technology- % Value Tot. Invest.	n.a.	n.a.	37.7	35.9	33.7	37.0	31.2	24.6
USA:								
Technology- % No. Total Investments	n.a.	n.a.	79.3	75.8	75.9	77.3	81.3	80.0
Technology- % Value Total Investment	n.a.	n.a.	87.0	79.5	85.5	85.2	85.1	82.9

Source: BVCA and EVCA Annual Statistics 1984-91, NVCA Annual Reports 1990 &1991

Table 2 shows that there is still an overall decline in the level of technology investment by venture capital firms in both the UK and Europe. However, the decline is less precipitant than the unadjusted figures in table 1 would suggest. In the UK, technology investment is still nearly a third of total non-MBO/MBI investment in comparison to approximately one quarter of total European investment by value. That the percentage number of investments is higher than the equivalent value statistics in Europe suggests that technology investments are, overall, of lesser value than the average venture capital investment. This is likely to be an indication that technology investors are biased towards early stage investment. This is logical because a technology investor necessarily has to invest early in the technology process. Once a novel technology is shown to have a realisable benefit, the discounted cash value of the NTBF is too high for the venture capitalist to compete with commercial purchasers. Again, the statistics in table 2 show the predominant technology focus of US venture capital investors and its relative stability over a six year period.

Figures presented in table 3 describe the relative importance of early stage investment, ie. seed capital, start-up and early stage development finance. NTBF financing can be seen as a subset of this activity. The figures indicate the problems faced by young entrepreneurs seeking external equity in the UK and Europe. The majority of venture capital firms have become increasingly disillusioned with the difficulties of investing in start-up and early stage enterprises. While these investors admire the spirit of enterprise of these business owners, performance statistics indicate that it is an extremely difficult area for the venture capital firms to gain a sufficient return on their investments commensuate with the considerable risks of early stage activities. Chief executives from twenty leading UK venture capital firms were unanimous in their view of the importance of this early stage activity (Murray 1991). They just preferred that these investments were undertaken by organisations other than their own.

Table 3 'Adjusted' Percentage Value of Start-Up and Other Early Stage Investment in the UK, Europe and the US (ie. Excluding MBOs/MBIs in the UK and Europe and LBOs/Acquisitions in the US) by Venture Capital Firms

Year	1986	1987	1988	1989	1990	1991
UK:						
% Investment in S-U &OE-S	40.9	28.5	23.0	38.9	24.4	13.0
EUROPE:						
% Seed & Start-Ups only*	23.3	19.7	20.4	17.9	13.4	10.5
US:						
% Investment in S-U &OE-S	43.0	36.0	38.5	35.9	33.6	32.5

*EVCA figures do not segregate expansion finance into early or later stage investmentSource: BVCA and EVCA Annual Statistics 1984-91, NVCA Annual Reports 1990 &1991

If start-up and early stage activity is considered unattractive to the majority of UK and European venture capital firms, seed stage activity becomes 'beyond the pale'. Seed capital may be defined as 'equity investment in the earliest conceptual or ideas stage of a new product, process or service in order to test the fundamental feasibility of a proposal'. It is an activity that is characterised more by its absence than its existence in UK and European venture capital activity. With negligible exception, commercial seed capital activity is conducted by a small cadre of technology investors with a fierce commitment to the critical importance of this activity to the future economic welfare of an advanced, industrial country. Seed capital investors are the 'radical fundamentalists' of the venture capital industry. They are fiercely critical of what they believe is the development capitalists' aversion to risk and to technology investment at large. Similar opprobrium is levelled at, in their view, the limited governmental efforts to support NTBFs. It is this general disinclination by commercial investors to support seed capital which has encouraged a number of state and EC initiatives to encourage at least some minimum level of seed capital activity. the most commonly cited examples are the PPM scheme in Holland, the BJTU scheme in Germany and the Community wide European Seed Capital Fund scheme.

Table 4 Seed capital Investment as a Percentage of Total Annual Investment in the UK, Europe and the US

	1986	1987	1988	1989	1990	1991
UK:						
Annual Investment £000s	1700	1900	1113	4072	3045	428
% Value Tot. Investment	0.2	0.2	0.1	0.2	0.2	0.04
No. Investments			13	30	42	18
% Total Investments			0.6	1.3	2.1	0.8
EUROPE:						
Annual Investment ECU000s	10576	23307	9238	38686	30782	45942
% Value Tot. Investment	0.5	0.8	0.3	0.9	0.7	1.0
No. Investments			77	117	139	255
% Total Investments			1.5	2.1	2.6	3.7
US:						
Annual Investments $ million	101	87	114	138	60	56
% Value Total Investments	3.1	2.2	3.0	4.1	3.1	4.1

Table 4 shows the rather erratic nature of seed capital activity in the UK and Europe. The British Venture Capital Association does not bother to segregate this category of investment in its annual statistics given its tiny size in relation to other investment categories. The European statistics show an encouraging trend albeit from a low starting figure. However, EVCA figures, particularly in the early years, are best seen as approximates given the difficulty of collecting accurate, pan-European statistics. Again, the US is distinctive in the existence of a relatively robust seed capital activity.

C. CLARIFICATIONS, DEFINITIONS AND OBSERVATIONS

1) New Technology Based Firms (NTBFs)

The term, NTBFs, is widely used by both policy makers and academics. However, the immediate question arises whether one is talking about firms embracing *new technologies* or *new firms* which have a technology focus, or indeed both categories. Clearly, a number of appropriate policy instruments regarding each category are likely to be quite different. The policy debates around the role of the financial support mechanisms for NTBFs largely assume that one is talking about new or young firms whose activities embrace a significant technology component. Within this category, those start-up firms which are attempting to develop and exploit leading edge technologies and their commercial applications are likely to be a relatively small subset. This subset is most likely to be of interest to speculative equity investors because of the potential for exceptional economic rewards in the event of success. However, policy makers and particularly regional development agencies outside established centres of excellence are likely to have a more eclectic definition of what constitutes acceptable, technology based firms. To define the focus of interest purely at the level of leading-edge technology would dramatically reduce the potential population of target firms.

It is difficult to segregate what is meant by the degree of technological innovativeness. The term 'high technology' is itself a rather vague concept. Definitions by the OECD (1992) and Butchart (1987) refer to the level of R&D expenditure as a percentage of the firm's sales. Butchart also include a variable for the percentage of 'knowledge workers' as apposed to other types of employee within the enterprise. However, the authors of these definitions acknowledge the difficulties of operationalising their definitions in any precise manner.

As an illustration of the scale of NTBFs entering an economy, the 1990 Value Added Tax statistics for the UK 1990 are used. A qualification is immediately necessary as new or small firms under an annual sales threshold of £27,500 in 1990 did not need to register for VAT.

Table 5 Technology and High Technology Births of New Companies in the UK 1990 Based on VAT Returns

Sector: Production, Technology Related	**Estimated Births**	
Chemicals/ man made Fibres	463	
Mech. Engineering	3349	
Office Machinery	197	
Electrical/Electronic Eng.	1436	
Instrument Eng.	356	
Total		5801
Percentage of All 1990 Births		2.5%
Sector: Production, High Technology Related	**Estimated Births**	
Organic Chemicals	19	
Synthetic Plastics etc.	81	
Pharmaceuticals	50	
EDP Equipment	179	
Electrical Control Systems	146	
Total		475
Percentage of All 1990 Births		0.2
Sector: Services, High Technology Related	**Estimated Births**	
R&D Services	298	
Research Chemists etc.	124	
Computer Services	6785	
Total		7878
Percentage of All 1990 Births		3.4%

* Allocation of appropriate Standard Industrial Classification categories into technology or high technology were made by the author.

Source: Murray & Francis for DGXIII, 1992

Thus, figures from the UK would suggest that the population of firms of primary interest to technology investors and policy makers is less than one percent (< 1000 firms) of total births per annum if software and other computer services are excluded. The small size of this population raises significant problems of identification and access.

2) The Importance of NTBFs

Given the small numbers of NTBF firms entering the economy each year, the question is raised as to why these firms should be of special important and interest. The response is invariably couched in the potential of these firms regarding:

(high quality) employment
value-added
innovation
creating tomorrow's corporate successes
symbiosis between large and small firms

Eurostat figures were compiled in an attempt to illustrate the potential of NTBFs. In the statistics below SMEs (< 500 employees) in high technology industries are used as a surrogate for NTBFs.

Table 6 Percentage Changes in SMEs and Large Firms for Four High-Technology Sectors in UK Germany, France & Italy, 1981-89[1,2,3]

	No. Enterprises	Value-Added	No. Employees
Pharmaceuticals (NACE 257)			
SMEs	-4	62	-3
LFs	22	122	18
Off. Mach. &DP (NACE 33)			
SMEs	152	273	100
LFs	26	138	24
Electrical (NACE 34)			
SMEs	54	142	36
LFs	6	84	-0.1
Aerospace (NACE 364)			
SMEs	25	80	25
LFs	-1	48	-11

1 Value-added figures for UK are 19882 3-digit breakdown not available in 1981

3 Aerospace figures do not include Germany

Source: Eurostat (figures presented by the author at a European Commission (DGXIII) workshop on the Financing of NTBFs, Luxembourg, March 1993)

It is noteworthy that only in the pharmaceuticals sector (an industry with very high barriers to entry) are the statistics in Table 2 more favourable to large firms (> 500 employees) than small & medium enterprises. The data indicate that over the 1980s, the changing relative contribution of small and large firms within the high technology sectors. Smaller firms appear to be of increasing importance. However, the data do not show the relative sizes of the small and large firms sectors. This disguises the continued economic dominance of the larger companies within each sector.

Evidence of the increasing relative innovativeness of SMEs compared to larger firms has been indicated by Rothwell and Dodgson in their review of research findings presented to the European Commission's Industrial Research and Development Advisory Committee in 1989. Studies of this nature usually use patent applications or an equivalent. However, it is dangerous to make categorical judgements regarding the nature of efficiency of innovation by firm size without extended discussion and clarification. None the less, it can be stated with considerable confidence that NTBFs are an important source of both product and process innovations within Europe.

The absence in Europe of those spectacularly successful, venture financed NTBFs which have become the icons of US technology history (eg. DEC, Apple, Genentech etc.) is frequently bemoaned. However, Michael Porter in his *The Competitive Advantage of Nations* cites the critical importance for future competitive success of an enabling infrastructure, world class suppliers and remorselessly demanding buyers. These conditions include an important role for technologically informed and successful firms of all sizes. While the equivalent creation of European technology exemplars is important, it is the development of a heterogeneous mix of successful and growing, technology based firms which is constantly added to and renewed which is the more critical goal of policy.

3) The 'Equity Gap' and Capital Market Failure

The existence of an equity gap, ie. the limited and insufficient provision of equity finance in small tranches (< £250,000) to new and young firms, has been debated regularly since the Macmillan Report in the UK in 1931. Small firms' associations and interest groups are virtually unanimous in their belief that the available capital markets discriminate against the needs of new and young firms for small, third party equity investments (see, for example, *Finance for Growth*, the report of the Smaller Firms Council of the Confederation of British Industry, 1993). Murray in his 1992 study of UK venture capitalists (Murray 1994 forthcoming) could only identify sixteen, specialist, early stage equity providers from among the ranks of the UK venture capital industry. The twelve firms

which were interviewed had funds under management of £ 76.3 million, or less than 1% of total UK venture capital funds under management (both committed and uninvested) in 1992/93 of approximately £9 billion (BVCA 1992).

Table 7 Venture Capital Firms' Expected Minimum IRR by Investment Stage: Technology and Non-Technology Investments

Investment Stage:	Non-Technology Mean IRR%	Stnd Dev. %	N	Technology Mean IRR%	Stnd. Dev. %	N
Seed	55.0	20.31	9	57.1	16.95	14
Start-Up	49.5	11.64	22	52.4	11.07	23
Expansion	36.3	6.91	28	39.1	8.14	31
MBO/MBI	32.7	4.55	22	35.5	4.80	22

Source: Murray & Lott 1992

KPMG Peat Marwick in a 1992 study for the UK's Department of Trade & Industry isolated 128 sources of equity funds of under £250,000. However, in reality, the majority of these sources are of marginal importance and do not represent a sustained source of new equity to small businesses. Murray & Lott 1992 also found that when venture capital firms in the UK are prepared to invest in technology based firms, they typically impose significantly higher prices their equity participation. This situation is broadly similar to that found in the rest of Europe.

That an equity gap exists is not in question. A rather more pertinent question noted by Storey (1994 forthcoming) is whether or not the gap signifies the existence of *market failure* in the capital markets serving small firms. The existence of market failure would require evidence that, if venture capitalists were in receipt of full information on the early stage investments which were available to them, then the supply of capital would increase and the level of finance charges would decline. Conversely, if venture capitalists were acting in concert to curtail the provision of equity and to raise the price at which the existing capital was supplied, this would also be an example of market failure.

An alternative explanation is that the scarce provision of early stage venture capital is a consequence of the limited number of attractive deals that are presented to the investors. Dixon 1991 and Bannock 1991 both allude to the fact that UK venture capitalists believe that there is a paucity of attractive deals available to them. Given that, on average, venture capitalist invest in

approximately five percent of the deals which they are offered, this would suggest that the great majority of deals are unattractive to a commercial investor. (The acceptance figure for European seed capitalists in the ESCF Scheme survey by Murray & Francis 1992 was also 5%). In this argument, the high cost of capital at which early stage venture capitalists are prepared to invest in those firms which they consider have commercial potential, is a rational consequence of the substantial risks incurred in making such investments. Sahlman 1990 shows that, in the US between 1969-85 only about one in fifteen of the venture capital industry's investments showed a return of more than ten times the original investment. One third of all investments resulted in total absolute losses. Given that Sahlman was looking at the entire industry and early stage is popularly viewed as being the most risky stage of investment (Murray 1991), these statistics are likely to under-estimate the risks associated with early stage investment.

This alternative view of early stage investment would suggest that the problem is not that the capital markets are inefficient but, to the contrary, are correctly pricing the high risks of such investment. Therefore, the issue becomes not one of the supply of capital but, rather, the supply of sufficiently attractive investments. In this scenario, the additional provision of state owned funds would not drive down the cost of capital but would merely replace commercial funds at the margin. Commercial investors would leave public funds to make unattractive investments while they concentrated on more attractive, (primarily later stage) investment opportunities. The performance problems associated with public provision of early stage investments in Europe and the very selective nature of the few successful early stage commercial investors would lend circumstantial evidence to this second proposition.

4) New or Replacement Capital

The term 'venture capital industry' tends to imply a homogenous provision of services. Yet, in reality, the term embraces two very different sets of investment activities. Bygrave & Timmons (1992) have termed the two sets of activities as *classic venture capital*, ie. the provision of capital to new and or young businesses, and *merchant capital*, ie. the later stage financing activities involved in development capital and leveraged buy-outs. Murray (1992) uses the terms *new capital* and *replacement capital* to make the same distinction. Early stage investors are providing additional capital which is necessary for the formation or development of the business. In later stage deals, the venture capitalist is essentially providing a source of replacement capital to assist the change in ownership of the assets of an existing business. The means by which the two types of proposal can be appraised are very different. Respondents to Murray's 1991 survey of CEOs of leading UK venture capital firms bemoaned the fact that

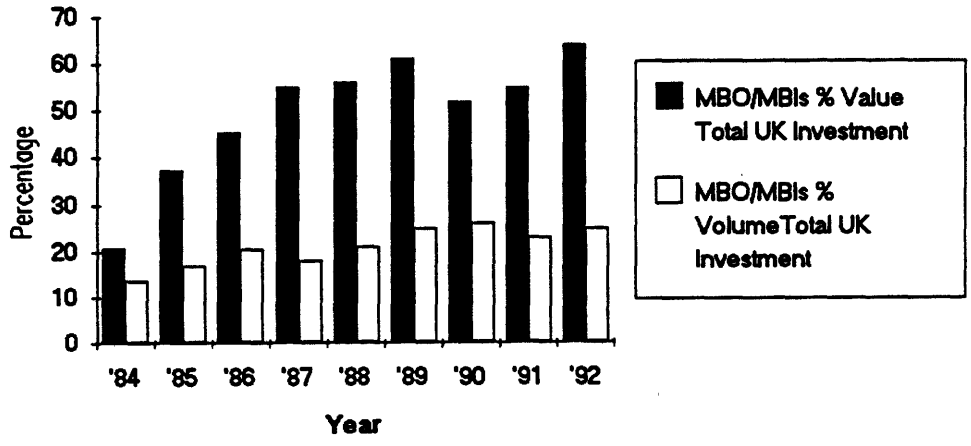
the industry had moved away from classic or new equity (start-ups and technology investments were specifically mentioned) to the more attractive opportunities of replacement capital, particularly management buy-outs and buy-ins.

Table 8 Percentage Numbers and Value of Technology Investments by UK Venture Capitalists 1984-91

Year	1984	1985	1986	1987	1988	1989	1990	1991
Total No. UK Companies Financed	350	517	600	1174	1326	1302	1221	1196
Technology-% No. Total Investments	36.3	30.9	26.5	25.6	21.4	23.7	23.6	20.8
Total Value UK Investments (£m)	140	278	384	934	1298	1420	1106	989
Technology -% Value Total Investments	33.3	26.4	17.8	15.7	8.9	12.4	12.9	13.1

Source: BVCA Reports on Investment Activity 1984-1991

Fig. 1 MBO/MBI Investments by Number and Value as a Percentage of Total UK Venture Capital Investment 1984-92



Source: BVCA Annual Statistics 1984-92

v) Early Stage or Seed Capital

Throughout this paper, the term early stage capital has been used in preference to seed capital. Early stage capital is a rubric which encompasses seed capital, start-up and subsequent rounds of new equity in the post start-up, growth phase. The difference is not immaterial. Of the twelve firms in Murray 1992 UK seed capital survey, nine organisations operated with 'closed end' funds. Six of these funds were £5 million or less with the smallest fund having £0.5 million to invest. Murray & Francis 1992 survey of the European Seed Capital Fund Scheme showed that the average fund size of the EC supported seed capital organisations was ECU 1.7 million. These authors suggested that funds of this size are not commercially sustainable in the longer term.

Table 9 Minimum Viable Size of a Commercial Seed Capital Fund

Estimated Minimum Size of a of a Commercial Seed/ Start-Up Fund	Frequency (n=10)	Average Existing Size of Seed/ Start-Up Funds making Estimate
£5 million or less	5	£2.3 million range £1.1-5.0 m.
£>5-20 million	5	£11.6 range £1.62[1]-21 m.
No Estimate Given	2	

[1] This figure was an outlier with the other four fund sizes averaging £15.8 million, range £11.5-21 million.

Source: Murray 1994 (forthcoming)

In each of these cases, the funds could only be described as seed capital. However, their inability to provide the additional resources needed by successfully growing (or problematic) investees within their portfolio meant that, in Murray's terms, the investee companies faced a *second* equity gap after the resources of their initial backer were exhausted (Murray 1994 forthcoming). Ironically, the more successful a seed capital investment, the more rapidly the resources of the seed capital provider become inadequate given the limited size of the funds under management and the ceiling on finance which may be allocated to a single portfolio investment. Thus, a successful investee company can pose a major problem to the seed capital investor which has to seek further rounds of follow-on

finance. The original investor, without access to additional resources, invariably faces the situation of a major dilution of its equity stake in its most successful business ventures at the stage of follow-on financing.

Small seed funds get locked in a 'vicious circle'. The intensity of the relationship between the fund and its investee companies limits the size of a manageable portfolio. This limited scale of operation reduces the size of funds which can be handled at the seed stage. This in turn limits the amount of fee income which can be earned on the funds under management. The limited income constrains the number of staff and assistance which can be employed in supporting the portfolio. The resource constraints limit the size of the portfolio...thus, the circle is complete thereby locking the small fund into a size trap. In addition to the disproportionate fixed costs of a small seed capital fund (a cost which the ESCF Scheme specifically addresses), the limited portfolio size prevents the use of diversification to reduce non-systematic or non-market risk. In consequence, small seed capital funds are likely to be inherently more risky that larger, early stage funds with portfolios of twenty or more investee firms.

In their review of the first three years of the European Seed Capital Fund (ESCF) Scheme, Murray & Francis reserved their greatest concern for the viability of the smaller funds which did not have additional, secured avenues of financial support. In particular, the operating costs of the seed capital funds were disproportionate to the size of the funds under management. It is a recognition of these economic 'iron laws' which have obliged a number of seed capital funds to attempt to increase significantly the size of their funds under management by further fund raising. Calculations conducted by Dr. Robert Hook of Prelude Technology Investments in Cambridge, England with the author suggest that a minimum, early stage fund size is around £20 million if the fund is also to engage in further rounds of follow-on finance (Hook 1993). However, the time to exit of a typical seed capital investment is typically 7-10 years (Bannock 1991). Few seed capital funds started in the UK in the 1980s have yet a sufficient track record with which to impress new institutional investors. Regardless of their ability to raise new funds, a number of seed capital investors have changed their names eschewing the term seed capital. They believe that the term, seed capital, is too closely associated with uneconomic and excessively small funds which are unlikely to become commercially viable.

6) The Relationship Between Early Stage Funds and Development Capitalists

It can be hypothesised that there could exist the opportunity for a *complementarity* between early stage venture capitalists and later stage, development capitalists which will, in theory at least, allow for reciprocal and mutually advantageous co-

operation. Later stage venture capitalists reject the vast majority of all investee applicants. A number of these applicants may well have potentially attractive proposals but be at too early a stage for the involvement of a development capitalist. These latter investors typically prefer making equity investments of £0.5 million upwards to management teams with an assessable track record. In addition, most development capitalists are not organised to provide the intensive 'hands-on' support, and often elementary business advice, required by the inexperienced technology entrepreneur (Gorman and Sahlman 1989).

Thus, there would appear to be the potential for a 'symbiotic relationship'. Early stage investors could nurture new and young companies (some of which would be redirected to the early stage investor by the development capitalist) up until the stage where the investee company needs financing beyond the resources of the original equity investors. At this stage, the early stage investor would either syndicate with, or sell its interest outright to, one or a number of development capitalists. These latter investors would take the company through successive rounds of further finance until the company was ready for a market listing or trade sale.

Table 10 Problems with future Fund Raising for Seed Capitalists

Rating of Problem of Raising Future Finance	Frequency (n = 11)
1 (no problem)	3
2	0
3	2
4	5
5 (major problem)	1

Source Murray: 1994

Such a putative relationship would, at least in theory, be to the advantage of the early stage investor by allowing the firm to realise its investments in an orderly manner or to continue as a minority shareholder in the subsequent development of the investee firms. The development capitalist would have preferential access to early stage, deal flow. It would also be in receipt of greater information on the new and now operational investment than if it had invested 'cold' in a previously unknown company. The relationship could therefore also serve to reduce the critical problem of information asymmetries as a cause of market failure.

Thus, early and later stage development capitalists could each appear to benefit from a relationship characterised both by redirected/exchanged deal flow and joint investment. The existence of a reciprocal relationship would, it is argued, be seen most clearly at the time when an early stage venture capitalist sought to realise his investment either outright through a sale, or partially by inviting a new investor(s) to share, through syndication, a major part of the future financing burden.

Table 11 Proposed Sources of Follow-On Finance for UK Seed Capitalists

Proposed Sources of Additional Funds for Follow-On Investment	Weighted Ranking	Frequency (n=12)
Venture (Development) Capitalists	1st	10
Corporate Investors	=2nd	5
In-House Finance	=2nd	5
Private Investors	4th	3
Banks (loans)	5th	1

Source: Murray 1994

The twelve, early stage, UK venture capitalists were approached to explore empirically their experience of attracting further finance for their portfolio companies from development capitalists (Murray 1994). Eight organisations in the study expressed a view that they would experience clear difficulties in attracting follow-on finance. While venture capitalists were the first choice for seeking additional funds, in practice, respondents believed that they would most likely exit from their investments via trade sales rather than continuing the investment in syndication with development capitalists.

Table 12 Planned Exit Route for UK Seed Capitalists

Planned/Actual Exit Route	Weighted Ranking	Number (n=12)
Trade Sale	1st	11
Buy Back	2nd	5
Initial Public Offering	3rd	4
Sale to Dev. Capitalist	4th	3

Source: Murray 1994

The seed capitalist managers overwhelmingly articulated a view that there was a substantial imbalance of power in dealing with later stage venture capitalists which worked to their disadvantage. In a parallel series of discussions with development capitalists, they evinced little enthusiasm in dealing with seed capitalists. The majority of development capitalists had severe reservations as to the commercial experience and professionalism of the majority of seed capital fund managers, particularly regarding public sector supported activity, which was also reflected in their general disinterest in the investee companies of the early stage investors.

7) 'Hands-On'/'Hands-Off' Investee Support Relationships

Without exception, venture capitalist investors in seed capital and other early stage, technology based enterprises employ a hands-on style of management regarding their investees. These investors believe that they have no discretion in this matter. Frequently, technology entrepreneurs create businesses based on their previous experience in universities, governmental and commercial laboratories and other centres of advanced technology. It is highly unlikely, for all but a minority of exceptional technology entrepreneurs, that their technical competencies are matched with an equal level of skills and experience in creating and managing a new enterprise. Accordingly, in the absence of an appropriate and credible public support structure for NTBFs, the venture capitalist has to assume the role of nurturing the new firms and supporting the technical capabilities of the entrepreneurial owner/managers with equivalent commercial skills. Gorman & Sahlman (1989) indicated that the average venture capitalist in the US spent some 80 hours per year in direct contact with each of his or her investee companies. A further 30 hours of contact was maintained by telephone. In the case of the seed capital companies in the ESCF survey, the average amount of time spent with each investee businesses was 200 hours per annum (range 60 to 540 hours).

Given the importance ascribed to maintaining an intense, supportive environment between the investor and the entrepreneurial firm, it is surprising that there has been very little empirical work to determine the effectiveness of this assumption. This is likely to be in part due to the methodological difficulties of constructing a research framework which would adequately test the effectiveness of a hands-on relationship. MacMillan et al (1989) and Fredriksen et al (1990) have attempted this exercise in the US and Sweden, respectively. In each case, the researchers could not establish robust evidence to show that the involvement of the venture capitalist firm materially improved the relative performance of the investee companies receiving a hands-on style of supervision and support.

The absence of unequivocal evidence in favour of a hands-on mode of intervention may be, in part, a consequence of the effectiveness of the advice provided by the

investors. In the ESCF study, forty entrepreneurs (53% of all firms which had received equity from ESCF supported funds, were asked to rate the quality and relevance of advice which they received from all parties. Three channels of advice were isolated: i) provided by the seed capitalist staff, ii) recommended by the seed capitalist staff and iii) sought out by the investee firm independent of the venture capitalist.

Table 13 The usefulness of Advice/ Assistance Provided to ESCF Scheme Investees

Area of advice: NTBFs Rating of Providers of Advice/Assistance (5-very important, 1-no importance)

	Provided by S. Capitalist	Arranged by S. Capitalist	Unconnected with S. Capitalist
Business strategy	3.82	4.45	3.88
Marketing	3.51	4.05	4.01
Finance	4.81	4.36	3.76
Accounting	4.06	3.34	4.21
Technology	3.01	4.03	3.91
Production	1.01	0	2.52
Personnel	3.05	2.33	3.56
Recruitment	4.03	3.02	3.36
Overall averages	3.9	3.8	3.8
Overall totals	54	28	61

Source: Murray & Francis 1992

It is noteworthy that the seed capitalists only scored the highest relative rating in the area of finance. In the functional disciplines required by the fledgling business, other parties than the seed capitalist were deemed as being able to provide more relevant information and advice. A not dissimilar reaction was found among a sample of five NTBFs in the former East Germany currently receiving financial and advisory support from the federal state under the TOU Scheme investigated by Warwick and the ISI Fraunhofer Institut in 1993 (Crossfield & Lange 1993). The technology entrepreneurs indicated their misgivings at the relevance of the marketing/strategy advice they received from the support infrastructure employed to service these new companies.

This problem centres around the availability of advice of appropriate specificity to the needs of the new entrepreneurs. That new entrepreneur needs to understand the foundations of a marketing philosophy is not questioned.

However, to enter and succeed in a competitive market place for sophisticated technology products and services requires, above all, a comprehensive understanding of the nature of the target market and familiarity with the discipline of industrial marketing techniques. Thus, the entrepreneurs have a requirement for marketing advice of a highly specific nature. This requirement works against the provision of general or non specific advice by organisations with a wide, SME support remit. There is an argument that the entrepreneur him or herself may have a better understanding as to where that advice can be sourced than the investor.

A number of seed capital firms have focused their investment choices to specific industries, technologies and sectors in an attempt to reduce the uncertainties of inadequate industry knowledge (Murray & Lott 1992). However, there is a delicate trade-off between a tight investment focus and the opportunity for adequate deal flow. In the former case of high specificity, the level of investor's knowledge is high but the volume of deals presented to the firm may be insufficient to maintain necessary activity and/or rigorous selection criteria. In the alternative case, if the focus is relaxed, the potential deal volume is less likely to be a problem but the spread of investment areas is likely to be beyond the experiences or competencies of the investor team which is undertaking the appraisals.

It is in the context of investors' uncertainty or unfamiliarity with specific technology processes or markets, that the role of a corporate investor from the industry in question may be raised. Corporate venturing, whereby potential industry users either invest directly or via a specialist venture capital firm, is more common in the US than in Europe. Corporate exemplars, such as Xerox, 3M, IBM, Apple etc., are more evident by their absence than their involvement. With few exceptions, corporate venturing remains a disappointing success in Europe. While there are signs of increasing corporate venturing in both the US and Europe since 1990 (Mast 1991, McNally 1993), the involvement of very large industrial interests with the fledgling NTBFs is not without difficulties. Oakey (1993) raises the question as to the motives of the larger company. He uses the term 'predatory networking' to describe the phenomenon where small but promising firms may have their ideas captured or stifled by an inappropriate relationship with an immensely larger, corporate partner.

However, the corporates do represent a set of opportunities to the NTBFs, albeit with attendant risks. Particularly, they are likely to be users of the new technological products or services developed by the NTBFs. As potential customers they are also aware of the nature, characteristics and dynamics of the specific technology market. They, therefore, may also have a greater ability to

appreciate the full market potential of a new innovation than the technology entrepreneur. That corporates have a future and increasing role to play in technology venturing is not the question. What is less clear is how these different parties can organise to generate reciprocal benefit at acceptable costs to both parties. In the absence of clear guidelines and experience, NTBFs are advised to 'eat with a long spoon'.

8) Exits from Venture Backed Enterprises

Venture capitalists are essentially transient financial partners to the supported enterprise. With the exception of a few organisations, primarily development capitalists who structure the economics of a deal primarily on the 'running yield' rather than the capital gain at termination, the majority of investors wish to establish a clear horizon to their involvement in the client firm. Development capitalists prefer to operate on a 3-5 year time span from investment to exit. Seed capital, start-up and other early stage investors, while possibly preferring a shorter period of investment, are normally committed up to ten years before being able to realise their stake in a young company (Bannock 1991).

The term 'exit' is used to describe the point at which the venture capitalist ceases to have a financial interest in the investee company. The primary means of exit or realisation are via i) a trade sale, frequently to a larger business in the same sector as the investee company; ii) the flotation of the company on the main or secondary stock market; iii) or the sale of the enterprise back to its owner managers. (In reality, it is unlikely that the investor can sell the entirety of its shares in an enterprise immediately on flotation because of stock market limitations.). In addition, the venture capitalist may sell its equity in part or full to another investor who will fund the needs of the growing company through the next or several stages of development. Finally, the failure and liquidation of an unsuccessful investee company is also a form of exit. For the NTBF investor, flotation or trade sale are the two most common means most likely to produce an attractive return on the firm's investment.

The relative immaturity and small deal volume of European stock markets when compared to their US counterparts has been a serious limitation on the opportunity to exit via a listing. Even in the UK, which has had the most developed secondary markets in Europe, the 1990s have seen the demise of the Third Market and the announcement that the Unlisted Securities Market, which was established in 1981, will cease trading in 1996. The venture capital industry (both the British and European Venture Capital Associations) has reacted strongly to this announcement by the Stock Market and is currently exploring the feasibility of retaining some form of market for small firm stocks either on a UK or Europe

wide basis. The reason that the USM has been marked for closure has been the very limited volume of trading in this market since the stock market shock of 'Black Monday' and the subsequent move of the UK into recession. In adverse economic conditions, the price of illiquid, small firm stocks is particularly discounted.
As an indication of the relative minor importance of the stock markets to development capital deals, only 181 MBOs have floated in the period 1982-92 out of a total number of MBOs created in that period of 3,755 in the UK. In the period 1985-92, the number of MBO and private MBI flotations was 169 compared to 356 trade sales (Centre for Management Buy-Out Research, University of Nottingham 1993).

Adverse economic conditions since 1989 in the UK have caused the build up of a number of venture backed companies which, given an attractive market for corporate control, would have been exited by their investors. It needs to be remembered that, for a deal structured on a specific time to exit, the venture capital investor pays a considerable penalty for any delay in the realisation of its investment returns. Annualised Internal Rates of Return are highly sensitive to a delay in the planned receipt of realisation returns. Increasing confidence in equity markets in the period since 1992 in the UK has resulted in a flush of venture backed investments being realised through a full stock market listing. In the period from the 1st July 1992 to the 30 th June 1993, 75 companies (excluding investment trusts and reverse take-overs) were floated. Thirty six (48%) of these companies were venture backed. Nineteen of the companies were MBOs or MBIs and five were NTBFs.

Table 14 Flotation (Full Listing) of UK Companies July '92 to June '93

	1992 Q3	1992 Q4	1993 Q1	1993 Q2
NTBFs	1	2	1	2
MBOs/MBIs	5	5	1	8
All Venture Backed Companies	7	9	4	16
All Companies12	14	11	38	

Source: BVCA 1993

Bygrave and Timmons and other American researchers have noted the erratic nature of the stock markets interest in NTBF stocks. There are irregular occasions of 'hot markets' when the investors' appetite for fashionable technologies (eg. Winchester disc manufacturers and, more recently, bio-genetics

companies) has resulted in very substantial gains to those venture firms with investee companies ready for a flotation. Bygrave and Timmons have referred to these extreme actions of stock market investors as a 'feeding frenzy'. It is likely that the projected demise of the USM in the UK by 1996 and the continued immaturity of continental European markets will each serve to increase the importance of US stock markets as a potential source of exits for those successful NTBFs with products and/or services of international market attractiveness. Ineffective local stock markets will also increase the continued importance of trade sales in the venturing process.

9) The Potential 'Multiplier Effect' of Official Support - the Example of the European Commission's European Seed Capital Fund Pilot Scheme

Both European and UK figures are consistent in showing the negligible resources available from market sources in the provision of early stage, third party equity. The concern of the European Commission (DGXXIII, Enterprise Policy and DGXVI, Regional Policy) as to the effects of capital scarcity on the formation levels of NTBFs lead to the creation of the ESCF pilot scheme in October 1988. In summary, DGXXIII was prepared to pay up to 50% of the first five year's operating costs of the new funds as an interest free loan for two approved funds in each member state. For those funds operating in selected assisted areas, DGXVI in addition would include an interest free loan to cover a maximum of 25% of the capital needed to a ceiling of ECU 250,000 in order to assist the formation of the seed capital fund . This capital loan was to be administered through the local Business Innovation Centre which would become a limited partner in the fund with other investors. The pilot scheme was to cover a maximum of twenty four funds for initially a period of no longer than five years.

Murray and Francis were invited to review the progress of the first three years of the scheme in the spring of 1992. The researchers, reflecting the caveat of Standeven (1993), were adamant in describing their subsequent survey of all twenty one, operating seed capital funds, which were assisted financially by the scheme, as a 'review' not an evaluation. The researchers also interviewed, by postal questionnaire, 40 of the 76 extant businesses in which the supported funds had invested by March 1992. The overwhelming majority of the investee companies had a direct technology focus.

By the beginning of 1992, the twenty-one supported funds had raised a total of over ECU 35 million, an average of ECU 1.7 million per fund (range ECU 0.5 to 7 million). The fund managers were asked to estimate what funds they would have been able to raise without the support of the EC scheme. The 'additionality

effect' of the EC's involvement was a significant 100% increase in funds made available from both public and private sources of investment. The effect of the ESCF scheme is even more dramatic if the funds are segregated into strictly commercial funds and those regionally based funds which also embraced a significant, economic development focus. It is these latter funds which are most likely to be avoided by strictly commercial, institutional investors.

Table 15 Effect of the Imprimatur of the EC in Assisting the Fund Raising Efforts of Seed Capital Funds Supported by the ESCF Scheme

Type of Seed Capital Fund:	N	Estimated Funds without ESCF Scheme ECU million	Actual Funds Raised in ESCF Scheme ECU million	% Difference
Strictly Commercial7	14.7	18.73	27.4	
inc. Regional Development Goals	14	2.8	16.284	482.0
All Funds	21	17.5	35.0	100

Source: Murray 1993

The substantial influence of the European Commission's support in helping regional funds to raise over ECU 16 million is impressive. However, the extreme sensitivity of these funds to official support is also a possible indication of their inherent weakness as commercially viable businesses. However, the seed capitalists were successful in attracting a wide range of sources of institutional funding from both the public and private sectors in order to launch the new funds.

Table 16 Types of Investor in the ESCF Seed Funds

Investor type:	% total funds
Financial institutions	37.02
Banks	22.05
Government agencies	14.81
Venture capitalists	13.06
Individuals	5.81
Chambers of commerce	3.46
Churches	1.72
BICs	0.41
Universities	0.24

Source: Murray & Francis 1992

This additionality effect was not restricted to the funds alone. The NTBFs which the funds supported also gained from the involvement of the EC in the scheme. 84% of the investee managers responding to the postal questionnaire acknowledged the involvement of the EC supported seed capital funds had raised their own credibility with additional sources of finance.

Table 17 Finance Provided by Seed Capitalists to Investees

	Totals	Average/Investee	n
Equity	4,453,600	111,340	40
Debt	164,800	4,120	40
Other	967,600	24,190	40
		Total/Investee = ECU 139,650	

Source: Murray & Francis 1992

The investee firms appeared to have been relatively successful in attracting additional funds without long and fruitless searches. On average, investees had approached 2.2 institutions before gaining finance. 70% of the respondents (ie. 28 NTBFs) said that their seed capitalist could provide them with as much funding as they needed.

In addition to the funds directly supplied by the Seed Capitalist, they were also responsible in giving additional assistance to investees in raising ECU 2,550,00 (average/Investee ECU 65, 397) from other sources of finance. Thus, the entrepreneurs appeared to be extremely well resourced when compared to the generality of NTBF start-ups where the predominant funding is commonly a reliance on their own assets. Moore (1992) in a survey of 89 NTBFs in the UK found that 44% of the sample relied 'overwhelmingly on self-finance' at start-up. In a follow-on survey by Moore of 42 NTBFs, the four most important sources of finance at start-up were: founders' savings 49%, venture capital 10%, money from government agencies 9%, and bank loans 7%. Moore notes the much smaller, initial role of banks in financing new NTBFs compared with small firms generally, a similar finding to Roberts (1991) in the US.

Table 18 Non-Seed Capital Sources of Finance Available to the ESCF Investees

Source:	Totals			Average/ Investee		N=40*
(ECUs)	Equity	Debt	Other Funds	Equity	Debt	OtherFunds
Entrepreneur	2,954,200	390,000		75,749	9,750	
Family	637,800	49,000		16,354	1,225	
Banks		3,097,900			77,448	
Grants			1,068,600			27,400
Others	4,288,000	539,300	982,300	109,949	13,438	25,187
Total	7,880,000	4,076,200	2,050,900	202,052	101,861	52,587

* While 40 investee replied in total, a number of averages had to be calculated on smaller number where appropriate.

Source: Murray & Francis 1992

It can be seen that one outcome of the ESCF Scheme in its first three years has been to increase the multiplier effect of the EC base funding to the scheme which, as of 1st January 1993, has cost the European Commission ECU 4.8 million in direct support costs (European Commission, DGXXIII 1993).

The Leverage Effect: on average, the investees had raised:

Equity	ECU	202,052
Loans	ECU	101,861
Grants & Others	ECU	52,587
Total	**ECU**	**356,500**

This was *in addition* to the Seed Capital funding of ECU 139,650 (n=40). Therefore, the existence of the seed capital funding contributed to a leverage effect of approximately two and a half times. However, this is at the level of the fund/investee. If the original funds of the European Commission of ECU 4.8 million are compared to the total funds realised in early 1992 by the 76 investees (excluding the ECU 103,078 per investee provided by the entrepreneur and family) of ECU 18.9 million, the leverage effect, to that date, becomes approximately four times. The same calculation between EC costs and the total finances raised by the twenty-one funds of ECU 36.2 million gives a multiplier of seven and a half times.

These figures are encouraging but need to be taken in context. Critically, the level of funds invested gives no indication of the commercial out-turn or performance of the investments made. The scheme appears to have been successful in raising additional monies for seed capital activity in Europe. The ability to raise further funds, particularly, from the original investors will be largely conditional on the performance of the funds to date. Given the noted 7-10 year gestation period of a typical seed capital investment, the funds will have to generate additional sources of finance before the majority of any successful investments show a return to the fund.

This extended period before an investment can be seen as a success or failure is a problem when the objectives of the scheme are reviewed. Essentially, the logic of the pilot scheme was to encourage the supply of seed capital to young European firms. Interestingly, while NTBFs were not mentioned in the initial documentation of the scheme, the funds have almost universally committed their finances to NTBFs. In order to act as a 'pump-priming exercise' it is critical that commercial institutions and investors can be shown attractive returns from early stage investment. It is not likely that such information will be in existence before the pilot programme reaches its planned termination, or review, in 1994/5.

10) The Challenge of Seed Capital as a Regional Development Instrument - the Problem of Incompatible Goals

Sixteen of the twenty-one seed capital funds reviewed by Murray & Francis had a specific regional development remit. Exclusively commercial funds in the scheme were, and remain, a minority. The addition of a developmental objective to a seed capital fund adds a further level of complexity and challenge. This is reflected in the decision of DGXVI to give an additional level of loans to support these regional funds. In the opinion of Murray (1993), who subsequently revised the original research database on the ESCF scheme report to separate the characteristics of the regional and commercial funds, the addition of a developmental objective on the regional funds further weakens their ability to pursue and achieve commercial, investment goals. The differences between the commercial and regional funds was highly significant and the comparison was almost universally to the detriment of the regional funds.

The regional funds were smaller; took longer to raise their finances; were supported less by commercial rather than governmental investors; and, reflecting their smaller size, had significantly higher operating costs as a percentage of total funds under management. In addition, the performance evaluation systems of the regional funds were often rudimentary. Commercial funds were more likely to require a minimum return on capital before agreeing to invest in a project. These

minima were also higher for commercial funds reflecting their greater discrimination of projects. When commercial funds did invest, they allocated nearly four times as much per investee than the regional funds. However, to their advantage, regional funds like commercial funds invested in enterprises at the earliest stages of their development and dedicated the majority of their finances to medium and high technology, new firms. None the less, management of regional funds spent, on average, half the amount of time allocated by commercial funds both to assessing projects pre-deal and, subsequently supporting their investee companies post-deal. The support ability of regional funds, despite the existence of Business Innovation Centres, also remains in question. 60% of the investees supported by regional funds sought technical advice unassociated with the regional fund or BIC. The regional fund managers acknowledged that their inability to provide appropriate technical advice to their investees was the single biggest weakness of their advisory services. Perhaps most critical of all, assuming the level of costs of the regional funds and their investment patterns to date continue, Murray calculated that the average regional fund is likely to run out of money and/or face a major funding crisis in approximately four year's time.

Table 19 Finances Raised by Regional and Commercial ESCF Funds

ECUs:	Regional Funds	Commercial Funds
Average Fund Size	1,345,385	2,341,250
Max. Funds Raised	2,575,000	7,000,000
Min. Funds Raised	500,000	750,000

These pessimistic conclusions raise the issue of whether or not commercial and regional development goals are compatible for a small, seed capital fund. The regional funds also face problems of the number and quality of supply of attractive investments in their regions. A substantial and continuing, quality deal flow is a necessary precondition for the economic success of a seed capital fund. It is no co-incidence that the largest concentration of seed capital activity in the US is centred around international centres of economic and, particularly, technologically innovative activity. Thus, seed capital firms tend to be concentrated in Palo Alto and other areas of California's 'Silicon Valley' or Boston's 'Route 128' conurbation. Both these areas share a similarly high incidence of internationally recognised universities, major technology companies and their research laboratories, and a tradition of spin-off, high technology firms. This pattern of economic geography immediately raises important policy issues for policy makers with a remit to support socio-economic development in less favoured regions within the European Community.

Table 20 Sources of investments for Commercial and Regional ESCF Funds

Source:	Investment in Regional Funds (ECUs)	% Total Investment	Investment in Commercial Funds (ECUs)	% Total Investment
Banks	1,569,000	12.3	3,063,040	16.4
State Banks	2,500,000	13.3		
BICs	132,000	1.0		
Chambers of Commerce	120,000	0.9	1,000,000	5.3
Churches	556,000	4.4		
Financial Institutions	2,775,000	21.7	8,751960	46.7
Government Agencies	2,886,650	22.6		
Regional Gov. Agencies	805,600	6.3	750,000	4.0
Private Companies	402,000	3.1		
Venture Capitalists	2,748,650	21.5	1480,000	7.9
Universities	77,250	0.6		
Individuals	693,000	5.4	1,185,000	6.3
Total Funds Raised	**12,765,150**		**18,730,000**	

Source: Murray 1993

A number of crude calculations can be made in order to start to address the minimum location needs for a new seed capital fund. The following assumptions are made. A 'closed end' fund starts with ECU 10 million. This, as already noted, is likely to not be the optimum size for a seed capital fund but it is arguably a practicable fund goal. Within its ten year investment life, the fund makes 50 initial investments of average size of 100,000 ECU. 20% of the portfolio (10 investees) fail losing all the fund's investment. Of the remaining 40 investments, 25 firms are categorised as "living dead". These 25 firms neither make or lose the fund money over time but they do tie up 2.5 million ECU of the total fund. Of the now remaining 15 investments, the fund decides to put further finance of 250,000 ECU into the ten most promising investees. From the fund's remaining 2.5 million Ecu, operating costs of 160,000 ECU per year will absorb all but 0.9 million ECU of the total fund over its life. This last figure can be seen as a sum for contingencies. In all probability, the fund will have to consider further rounds of finance by year 4 or 5 in order to survive beyond its ten year

life but this is ignored in the example.

Taking an industry average, it is assumed that the fund accepts 5% of all applicants for its funds. Thus, it needs a deal flow of 100 firms per year. These applicants will primarily come at the recommendation of intermediaries (accountants, notaries, banks, BICs etc.). The intermediaries will also act as a filter and the assumption is made that they consider half the firms they see as appropriate for seed capital finance. (This assumes that the intermediaries are able to make informed decisions regarding the appropriateness and role of seed capital. Work by Murray et al (1993) on UK intermediaries in the MBO market indicates a very variable level of intermediary knowledge. It is unlikely that their information on seed capital is greater or more informed.) Thus, the indirect deal flow to the intermediaries needs to be 200 firms per year. However, not all NTBFs will be interested or prepared to accept the disciplines of an external, equity investor. None the less, the sources of alternative external finance are highly limited. Thus, it is assumed that 75% of potential investee companies would accept seed capital funds if offered to them. This takes the derived deal flow to 267 firms per year.

NTBFs form a relatively small percentage of all new firms started in any one year. It is assumed that technology-based firms represent 5% of the population of all new firm starts. (As noted in table 5, this figure is approximately correct for UK data from VAT returns). Thus, the total number of firm starts within the area of operation of the seed capital fund needs to be 5,333 per year, assuming the distribution of NTBFs is geographically homogeneous (a heroic assumption).

The geographic area of operation appropriate for a seed capital fund will depend on the amount and the nature of economic activity within its sphere of influence. Catchment areas can be smaller for seed capital funds based in areas of high levels of technological and innovation excellence. For funds based in predominantly rural areas or regions characterised by declining heavy industries, the catchment area will necessarily be larger. It is difficult to generalise on this issue and hence the need for empirical research data. The above calculations are an initial attempt to look at the process of determining where, and over what area, a fund should be located. Other factors will be important, including the existence of a well developed, or develop-able, network relationship with key intermediary, support organisations as well as suppliers and customers.

This paper is not the vehicle to develop these arguments further. However, the author suggests that the placement of both commercial and economic goals on a seed capital fund is to put the fund managers in a very difficult situation. If economic goals are not realised then it is improbable that the continued support

from commercial investors will be realised. In order to meet commercial goals, the imposition of investment constraints to encourage support for local firms, sometimes despite questions regarding their commercial viability, has little commercial logic. Yet the majority of regional funds are constrained to invest within their region. This circle cannot be squared without relaxing either the developmental or commercial goals. It may be more sensible to recognise the economic limitations on regional funds and to expect a return on funds employed of a lesser order than that which would be imposed on a strictly commercial fund. In effect, a 'social discount' on the cost of capital would be applied to reflect the wider social benefits perceived from the existence and operation of such a fund. However, such a compromise would have to accept the consequence that the state or other public bodies would become the primary investors in such an investment activity. Commercial institutions would only participate in such funds for philanthropic or socially motivated reasons. Such largesse is likely to be relatively modest and irregular.

11) Some Final Observations on the Future

This paper has attempted to give a brief review of the European situation as it affects early stage and seed capital investment. The following statements are the author's subjective opinions as to how the European venture capital industries might develop over the next three to five years:

i. ***Seed capital and early stage investment will continue to by a minority activity undertaken by less than thirty professional venture capital firms in the UK***

The high risks of early stage investment, particularly related to the financing of new technologies and young companies will prove to be an unpalatable activity for all but the most dedicated, specialist organisations. However, those funds which do invest in technology related investments will become larger and more technologically specialist in nature. They will invariable forge greater overseas links particularly with the US, and to a lesser extent continental Europe.

ii. ***The majority of UK venture capitalists will continue to invest in development capital but in an increasingly concentrated and competitive market.***

The majority of UK venture capitalists will continue to be later stage, development or replacement capital funds. However, the level of competitive rivalry in this market will increase thereby forcing out a number of less successful players. The inability of less successful funds to attract additional institutional finance will be the single biggest cause of firms leaving the industry. These exits will accelerate over the next five years as a number of poorly performing firms

face a 'funds famine'. The greater competition in the development capital market will encourage a number of venture capitalists to revisit technology focused funds. These will likely be the larger firms which may create a number of smaller dedicated technology funds. By definition, these funds will be obliged to invest at an earlier stage than the other funds in the venture capital firms' portfolios.

iii. ***Government will be obliged to recognise that the traditional venture capital industry does not cater for the specific and legitimate needs of NTBFs and their investors***

The continuing importance of NTBFs for the future of developed economies will remain a cogent argument for special treatment for young technology based companies. Government will be challenged to make specific arrangements whereby technology entrepreneurs and their investors are incentivised to continue to accept the significant risks and extended pay-back periods of investment in this area. State supported NTBF investment programmes will continue in a number of European states despite equivocal performance results in the medium term. There will be a tendency to increasingly use commercial investors as the vehicle for technology investments in preference to the staff of state owned organisations. However, in less economically advantaged regions, the schemes employed will continue to be primarily state engendered and supported given the low attraction of such activity to commercial (ie. private) investment organisations. European Commission involvement in innovation will continue to have an important influence. US federal government initiatives to support NTBFs will also be an influence on European policy makers.

iv. *The planned demise of the USM market in the UK and the rudimentary secondary markets in continental Europe will encourage the flotation of European high technology new firms on the US market*

The continued availability of stock market exit routes is a primary concern to investors in NTBFs. The periodic attraction of US markets will require European venture capitalists to ensure that a conduit is maintained for the sale of attractive technology based firms from their portfolios. If the planned demise of the UK's Unlisted Securities Market occurs, this will encourage greater attention on US flotations. Stock market flotations will not necessarily be a substitute for trade sales but, rather, will increase, or maintain, the alternative exit channels open to the investors and thereby the opportunity to maximise realisation prices.

v. ***Corporate venturing will increase in Europe but from a low base of activity***

Corporate venturing will continue to be an practice most actively pursued by US organisations and their European subsidiaries. However, an increasing number of Japanese and European firms will emulate US activity with the introduction of venture funds managed both internally or by specialist venture capital firms. In the absence of easily emulated models, a variety of relationships will be tested as firms learn the pros and cons of creating productive relationships with technology entrepreneurs and their fledgling companies. The imperative to maintain innovatory impetus by corporates in increasingly global, technology based industries will encourage large firms to take a long term view on such experiments.

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SETTING THE SCENE

SURVEY OF PUBLIC MEASURES SUPPORTING NEW TECHNOLOGY BASED FIRMS IN THE EUROPEAN COMMUNITY

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SURVEY OF PUBLIC MEASURES SUPPORTING NEW TECHNOLOGY BASED FIRMS IN THE EUROPEAN COMMUNITY

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STB-TNO, April 1993

The purpose of this introductory note is to provide some basic elements to understand the need for and the form of public support for New Technology Based Firms (NBTF's) in the European Community. It will describe first very briefly why do members states support these firms. In other words what is the implicit or explicit policy rationale of these actions. Second, it will set out the types of policy actions directly addressing the needs of NTBFs. Thirdly it will summarise the findings of a survey of schemes available in the European Community to support NTBFs prepared for the workshop and included in the report.

Why do Member States support NTBFs?

Most policy documents which aim at supporting New Technology Based Firms (NTBFs) argue that those companies play an important role in spearheading technical advance and hence can contribute positively to the competitiveness of the regional or national industrial fabric. Much of the early evidence of the role which NTBFs played in the emergence of new, high -technology sectors such as semiconductors and bio-technology was based on the United States experience (Rothwell and Zegveld,1982,1984; Kaplinsky, 1982).

The growing belief during the 1970's in small firm's greater than average capacity for innovation, employment creation and industrial renewal spurred the emergence of an increasing number of schemes to support R&D of small and medium sized firms (Braunling,1982). Most of the schemes had the form of tax relief, loan guarantees or grants which financed the start-up phase of SMF's. More targeted policy actions concentrated on the cost of the whole or part of the R&D activity.

During the 1980's the attention of policy makers and policy analysts started to shift towards a particular sub-set of SMF's: those small and new enterprises which were technology based. Several studies attempted to show the importance of this particular group of SMF's. Based on a study for the European Commission's Industrial Research and Development Advisory Committee (IRDAC), Rothwell and Dodgson (1989) summarise some of the findings of these studies as follows:

- There are indications that the share of innovations which are developed by SMF's (employment between 1-499) has increased rapidly. In the UK these SMF's would have almost doubled their share of significant British innovations from 22% in 1965-69 to 38% in 1980-83. See Fig.

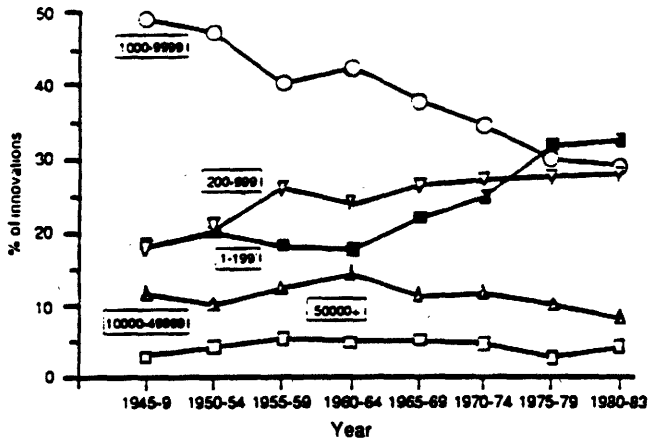


Figure 1. Trends in the size distribution of innovating firms 1945-83
Note: Unit employment in boxes.
Source: SPRU innovation databank.

Results of studies relating specifically to NTBFs show an explosive increase in the number of firms and give some impression on the number and importance in terms of employment for the UK and the FRG. See Tables 1 and 2.

Table 1. NTBFs in Europe - 1950-1975

	UK	FRG
Number in existence:	200	100
(considered only manufacturing – probably an understatement)		
Total employment:	15,000	12,000
Total annual sales (1985):	£200 million (50% from four companies	£180 million (60% from one company - Nixdorf
Export ratio:	30%	–
Sectors: mainly electrical and electronic		

Source: A D Little (1977)

Table 2. NTBFs in Europe: 1970-1985

	UK	FRG
Number in existence:	7,000	3,000
Start-up rate:	'Explosive' since the mid-1970s. Most are 'very young' – post 1979	Mid 1970s: 40-60 per annum. 1983: 125
Employment (1985) sectors	About 120,000 electronics; computer hardware and software; instruments; (recently) biotechnology	About 120,000 electronics and telecoms, 50%, computer hardware and software, 17% scientific instruments, 16%
Strong geographical clustering effects in both countries.		

Source: Segal, Quince, Wicksteed and ISI (1986).

Kulicke and Krupp (1987) arrive to similar conclusions: "*The rate of formation of NTBFs in the FRG seems to be on the rise. This trend began in the late 1970s. The annual founding rate in 1983 appeared to be twice that of 1973; today it may be up to three times as large, possibly 500 annually.*" However the authors also sound a note of warning: " *This cannot yet be attributed to specific NTBF promotion schemes, but only, if at all, to earlier promotional activities designed generally for small and medium sized firms.*"

Having sketched very briefly the possible importance of NTBFs still does not explain completely why public authorities have selected this particular group of companies as an object of public action. Two reasons are usually presented.

First, there is the implicit or explicit assumption that some of those companies might end up by growing into large firms which open a new technological trajectory.It is argued that new technical advances can be developed more easily in NTBFs, because their responsiveness to new demands is greater than that of large firms. This is said to result from the shorter decision path between the different functions within the firm. Much of the evidence is based on the US experience of development and growth of start-ups which today form the back-bone of the US semiconductor and biotech industry.

One should keep in mind however that not every NTBF is a winner.As our survey of schemes shows, failure rates for companies supported can be as high as 35%. Moreover of those companies which survive only a very reduced number can be defined to be high performers on the long run. A German study by Kulike (1987) which followed 2000 SMEs over a ten year period comes to the conclusion that NTBFs grow fast in the start-up phase of the firm leveling out to average growthrates in their industrial sector after a period of 1 to 7 years. On the whole the contribution to employment is relatively small on the national scale. Nevertheless some regions with a high clustering of these type of firms might benefit significantly due to the effect they have on the regional/ local economy.

There is however a second reason to propose actions of support of NTBFs by public authorities. As Kulicke and Krupp(1987) argue, large and small firms live in a complementary symbiosis. In other words they constitute together the industrial fabric of a country. Large firms take most of the initial steps as far as mayor or basic innovations go, including massive market penetration and diffusion. Small firms either use these innovations in order to feed their own innovations in niche markets, or through supply relations with large firms contribute to increased competitiveness. Due to their position in the 'national system of innovation' NTBFs appear as an interesting group of small firms to support if the public authority intends to promote the competitiveness of the economic system.

Whatever the reasoning used to justify public support for NTBFs the scope of the action will by necessity be limited. As Rothwell and Zegveld (1985) argue, some sectors where R&D requirements are very large and capital costs very high, will see little contribution from small firms (pharmaceuticals). High entry barriers make it almost impossible for them to participate. Industries where mass production

process innovation is the prime mover for competitiveness are also unlikely to see many contributions from small firms, except in small localised innovations.

Policy instruments used to support NTBFs

As argued the growing belief during the 1970's in small firm's greater than average capacity for innovation, employment creation and industrial renewal spurred the emergence of an increasing number of schemes to support R&D of small and medium sized firms. During the 1980's the attention of policy makers and policy analysts started to shift towards a particular sub-set of SMEs: those small and new enterprises which were technology based. Several countries of the EC started to device schemes for a particular sub-set of small firms: the NTBFs. In 1983 the FRG launched its '*Pilot scheme for the Promotion of NTBFs*' (TOU). In France ANVAR has been involved in the provision of 'seed money' since 1982 through different programmes which later merged into the ASI-CE (*Aide aux Services de l' Innovation en vue de la Creation d'Enterprises*). The UK introduced in 1986 the *SMART* scheme which provides funds to encourage innovative firms. In 1981 the Netherlands introduced the *PPM* Guarantee program for private venture-capital companies. etc.

The inventory of policy instruments which EC member states use to support NTBFs in the 80s and up to now show an increasing degree of sophistication. Many of them are geared to aid NTBFs on one or more problems which they encounter in different phases of their development. From different studies one can identify roughly the following factors which might affect the development of NBTFs :

* A group of **financial problems**. The factor which most studies identify as an important constrain to the development of NTBFs are of financial nature. More or less detailed surveys of the difficulties which NTBFs find in most Member States all indicate that availability and cost of finance is perceived as the most important constrain.(for example SBRC,Cambridge 1992). Not surprisingly public authority intervention tends to concentrate on these aspects. Two main type of constrains have been identified which in turn give rise to two different forms of action by governments:
  One type of problems refers to the functioning of the financial markets and their relative aversion to risk. Since by definition NTBFs tend to be difficult to assess according to traditional economic criteria they also have difficulties of access to traditional financial markets.
  The second set of problems refer to the fact that NTBFs have a very costly first phase of development (R&D, pilot project), which make them much more vulnerable if financial resources are not readily available.

* Another group of factors affecting the development of NTBFs are related to the **management capabilities** of High-Technology firm founders. Entrepreneurial and marketing skills tend to be less developed in this particular group of firms

* Another set of factors is the availability of risk accepting **markets**. The existence of markets for innovative products and processes is considered crucial for the rate of formation as well as for the longer term viability of NTBFs. The market might be a group of consumers which takes up innovations easily. It can also be other large firms which are supplied by NTBFs or institutional consumers such as the public and private health and educational sector, or the public administration itself.

* Last but not least some studies mention the **access to state-of-the-art technology** as another factor which might affect the formation and survival of NTBFs. Clearly governments can play an important role by establishing centres of R&D with easy access by private companies.

This list of factors affecting the creation and development of NTBFs is not intended to be exhaustive. Nevertheless it gives an impression of the possible range and forms of public authority support to NTBFs.

Instruments available to public authorities to support NTBFs

Based on an extensive typology prepared by the OECD one can identify several forms of action by public authorities to financially support firms. (See insert in annex) This typology gives an overview of **potential** instruments. However, not all of them are applied in the EC or have an effect on the development of NTBFs. Based on this overview of potential instruments we defined three basically different forms of support to NTBFs.

The forms of **indirect financial aid** which can include actions to reduce the risk which intermediaries such as banks, venture capitalists, development corporations might have when dealing with NTBFs. Usually these instruments take the form of guarantees or equity participation. Governments might also increase the attractiveness of the financing NTBFs by changing the fiscal treatment of risk capital. Within the same group of indirect forms of support to NTBFs we can find measures which affect the market and demand for innovative products (procurement, trade guarantees, etc)

Support for NTBFs might also take the form of **direct financial aid** to enterprises to develop a particular activity (R&D, prototyping, machinery and equipment etc). They take the form of grants, loans, equity participation or reduce the tax burden of NTBFs.

In addition to the financial forms of support one can also identify those which have no quantifiable form: **management/marketing support, technological support** etc.

Finally several of the policy instruments can be **integrated** in one scheme.

Policy instruments used by EC Member States to support NTBFs

In producing a compilation of policy instruments used by EC Member State to support NTBFs one can identify many of the above described policy instrument. However most of them have a wider scope and apply either to all enterprises (for example direct financial aid to stimulate R&D) or are directed at the wider group of SMEs. In the overview presented in the next pages we used the rather pragmatic criteria of selection: When a particular country had policy instruments explicitly addressing NTBFs we only described those instruments. For countries which had no specific policy of support of NTBFs we included those schemes which indirectly also addressed them. This might give a somewhat distorted picture, but at least we hoped it would not leave out actions which in practice might be stimulating the development of NTBFs.

Our review included 25 to 30 schemes. Not all of them are included in the following tables and inventory forms, either because the necessary information dit not reach us in time or because their small size would make the overview less clear. In some cases we included in this selection some regional programmes either because they were the main programmes in very decentralised countries or because of their size.

Based on this overview one can make the following general comments on the nature of the support to NTBFs in the EC:

The most dominant form of support in Europe is clearly the direct financial aid in its many forms. One can identify only four schemes in two countries which operate indirectly by attempting to reduce the risk to capital providers for NTBFs: The Business Investment Capital for NTBFs scheme (BJTU) and the Pilot Scheme to Stimulate NTBFs(TOU) in Germany; the Guarantee Scheme for Venture Capital companies (Garantieregeling PPM) in The Netherlands; Law 317, article 4 in Italy.
In the review we did not find any tax mechanisms which explicitly address the issue of making investments in venture capital more attractive. This might be an area worth looking at. The new US Administration is exploring several proposals which make long term finance of SMEs more attractive.

Within the indirect forms of aid we did not identify any actions directed at stimulating markets and the demand for innovative products specifically targeted at NTBFs.

The majority of European schemes addressing the needs of NTBFs, or more generally SMEs, have the form of direct financial aid. One of the main reasons could be the fact that it allows a much more targeted approach than the indirect policies. The target can be a certain type of companies, operating in specified sectors of the economy and aiming at the development of specific technologies. The most widely used type of instrument is the grant, followed by loans. In both these instruments we find a great variety of modalities: non-refundable and refundable grants and loans in case of success, some of the grants might have the form of an award, different coverage of costs supported, different percentages of support, different forms and levels of reduction of interest rates, etc. However all of them have to conform to European regulation on competition.

	Name of Scheme	Indirect financial aid			Direct financial aid				management support	integrated schemes	Comments
		risk capital	tax risk cp.	market/exp.	Grants	Loans	Equity	Tax red			
B	Brustart					O >	O >		O >		regional scheme
	Take off Fund GIMV						O >		O >		regional scheme
	Expansion supp. for SMEs				X			X			Flemish support SMEs
	Innovation Company							O >			phased out
DK	Scholarship scheme				O >				X		scholarship 2 years
	Scout scheme								X		search for spin -offs
	Product idea supp. scheme								X		business plan devel.
	Establishment scheme								X		counseling to entrepreneurs
	Professional board								X		prof. management
	Dev. of new product ideas				X						personnel/equip./consultancy
D	BJTU- Busn inv. cap. for NTBFs	X									stimulation of venture capital
	TOU- NTBF scheme (WG)	O >			O >				O >		pilot to stimulate NTBFs,83-88
	TOU (New Lander)	O >			O >				O >		idem new Lander
	Ba Wu: NTBF start ups				X	X					for R&D and investment
	Berlin: Promotion Innovation Fund				O >	O >	O >				Baden Wu. NTBF support progr.
GR	Law 1892/90 on modern. & dev				X						grant on investm. % dif. p/region
	Law 1755/88 Vent. Cap. Co.	X									Subsidy for VCCs
	Law 558/85 PAVE				X						Support for R&D
SP	Development Projects					X					soft loans for R&D expenditure
	Joint Research Projects					X					soft loans for joint research
	Plan Tecnologico Valencia				X						regional programme
F	ANVAR-Aide creat. d'ent. innov.				O >	O >			O >		National + regional integr. scheme

	Name of Scheme	Indirect financial aid			Direct financial aid				management	integrated	Comments
		risk capital	tax risk cp.	market/exp.	Grants	Loans	Equity	Tax red	support	schemes	
IR	Enterprise Devel. Program				O>	O>	O>		O>		SME/ NTBFs support
I	Law 317	O>			O>			O>			Diff. forms of innov. support
NL	PPM- Guarant. for Vent. Cap.	X									Guarantee scheme for V.C.
	TOK- Tech.. Dev. Credits					X					Refund. loans for R&D
	PBTS- Bus.Orient.Tech.Promot.				X						Grants for R&D selec. R&D
P											
UK	SMART				X						Grant award for form. NTBFs
	SPUR				X						Increase R&D in NTBFs

SYMBOLS

X — **Specific schemes**

Integrated schemes

O> — **Type of aid integrated scheme**

Equity participation is used in only three, mainly integrated schemes and thus in combination with other forms of support.

Management and technical support schemes are usually part of an integrated scheme where financial aid is combined with management support and some sort of "hands on" assistance on the part of the scheme managers. To a certain extend scheme managers are providing through this form of aid the support which NTBFs get through venture capitalists where the latter exist.

Integrated schemes can be found in several countries. In some of them, for example Italy, France and Ireland they are the main if not the only policy instrument. Moreover many of these schemes are not exclusively directed at NTBFs, but cover all types of SMEs.

From the review per country one thing becomes clear: every country has its own way of dealing with the problem of supporting NTBFs. The differences would seem to be bigger than the similarities between them. The differences are partly the result of the specific forms of development of the national system of innovation (type of economic structure, infrastructure supporting it) and the policies which have been employed to support it. However Member States have been incorporating new policy instruments and adapting them to the national policy context.

Based on the available information one can summarize the forms of support for NTBFs per country as follows:

Given the increasing decentralization of government in **Belgium** support for enterprises is also progressively shifting to the regional level. It is unlikely that any new schemes will be initiated at the federal level. The three regions (Flanders, Wallonia and Brussels) have been setting up support schemes in recent years. One of the schemes, the Flanders based "Take off Fund" started its operations in 1989. The main strategic issue here will be the creation of employment. The Brussels based scheme "Brustart" started its operations in 1993. At federal level innovative companies had the Innovation Company scheme. This scheme was discussed during the workshop as being an example of a tax related scheme. To apply for the scheme companies had to be identified as innovating companies and once they had they were allowed tax reduction, either on profits or on income tax. The scheme, although seen as successful was phased out in 1990 due to budgetary constrains.

Denmark has a complex set of interrelated schemes which include the schemes for searching and stimulating spin-offs at research centres and universities, a scholarship scheme, management support schemes and a grant scheme which supports the development of new product ideas. It is still not very clear which strategy the new Danish government will follow. However Danish participants to the workshop expressed their belief that the labour effects of actions aimed at creating new firms will be more important than in the past. It is also likely that the government develops a guarantee scheme for financial institutions to stimulate the development of NTBFs.

Germany with its decentralised/ federalised form of government presents a great variety of policy instruments at different levels. Of the european countries it would seem to have the most complex set of schemes covering almost all forms of support. At the federal level Germany has the BJTU pilot programme which supports NTBFs indirectly through providing better investment capital conditions. This programme which was discussed during the workshop is due to renewal in 1994. According to the German participants it is likely to be continued. From the experience with the pilot programme the issue is not so much about how to promote but who will do it. In the new Lander the integrated TOU programme covers a great variety of direct and indirect actions by providing risk capital, grants and management support to NTBFS.This programme will be continued after 1995. The credit guarantee might be transformed into an equity participation to improve the capital base of firms. It is likely that a cooperation programme designed to bring together research and development is implemented. At the Lander level one might find in addition sometimes two or three initiatives which support NTBFs and SMEs on different aspects of their develop. Most of them include some form of direct financial aid and/or management support.

Greece has no programmes specifically aimed at NTBFs. However it has three schemes to stimulate the innovative capacity of firms and thus also NTBFs. The Programme for the Advancement of Industrial Research and Innovation (PAVE) is aimed all types of productive enterprises (including SMEs).It is a grant programme which supports personnel, consultant and running costs of small equipment.The Law 1892/90 on modernisation and development subsidizes high-tech investments through grants, combined with loans. Finally Greece has developed a scheme to promote risk capital. The Venture Capital Company scheme creates a regulatory environment for the operation of V.C.C. by providing public subsidies to these companies.

Spain, as several other European countries, has two different and rather independent levels of government action: the central government and the Comunidades Autónomas. At central government level one can identify two schemes which although not specifically directed at SMEs or NTBFs are nevertheless applicable to them. The Joint Research Projects is aimed at improving the collaboration between companies, research centres and universities. It provides free interest loans for R&D expenditure and investment. The Development Projects Programme provides soft loans which are not refundable in case of failure for R&D expenditure and investment. Both schemes are implemented by CDTI. The venture capital market in Spain is considered to be relatively weak. At the level of the Comunidades Autónomas there are many different initiatives with a similar nature. Some of them are explicitly aimed at SME's. In the survey we included as an example only one: the Plan Tecnológico of the Comunidad Valenciana which support through grants the R&D expenditure of SMEs including personnel, equipment and the acquisition of licences.

France has one of the biggest nationally and regionally integrated programmes. The ANVAR programme "Aide a la creation d'etreprises innovantes" is a national programme managed through 24 regional offices which implement the scheme. ANVARs main target are SMEs in all sectors of industry. Innovation assistance is given to projects of technological nature, via advances of up to 40% of the cost of the innovation programme, in the form of interest -free loans. These loans are repayable in four instalments, depending on the failure or success of the project. The assistance is offered for the complete innovation trajectory, from feasibility studies to commercialisation of the project. In addition to the financial support it also provides innovation support services and consultancies. ANVAR has identified the insufficient knowledge of the market by SMEs as one of the main sources of failure. Two thirds of the failures are due to commercial reasons. In the future it intends to strengthen this capability. Moreover ANVAR intends to strengthen the risk capital provision through the implementation of some mechanisms of guarantee.

A similar, but given the size of the country , somewhat smaller integrated programme can be found in **Ireland**. The IDA "Enterprise Development Programme" is less explicitly focused on NTBFs. However some of the requirements such as the one that firms should operate in markets for internationally traded goods and export services should produce a certain bias towards this type of firms. NTBFs constitute about one third of the IDA projects. Although initially this programme was explicitly focused on NTBFs this focus was abandoned in 1985. Since that period IDA has concentrated more on the strategic characteristics of the business. The main aim of the programme is to create employment. This programme includes mainly direct forms of financial aid and management support. There is a wide range of support services which include interesting features such as key customer introduction.

Italy does not have an explicit system of support for NTBFs. However the Italian Parliament recently approved a new comprehensive law, Law 317, which puts together eight different forms of support for SMEs and simplified the procedure of access to that support (a procedure of self-certification with control a posteriori). Some of these forms of support are clearly directed at small firms with a high technological content. As an integrated scheme it covers indirect aid to stimulate risk participation in the capital of SMEs and various forms of direct financial aid (in tax credits or grants) for different purposes (R&D expenses, innovative investments, counselling). This scheme has encountered two problems in its first year of implementation. The first one refers to the type of aid which is preferred. Most enterprises have opted for the form of grant, oversubscribing it in a very short period of time. The second problem has arisen through the implementation of EC regulation on support for SMEs which will require to change some aspects of the law.

The Netherlands has three schemes which address either explicitly or implicitly NTBFs. The PPM programme which supplies guarantees for risk capital providers is the most specific instrument addressing the financial needs of NTBFs. This scheme, established in 1981, is aimed at stimulating private venture capital firms to provide equity investment in SMEs. Essence of the programme is that the Dutch government guarantees a recovery of 50% of eventual losses of investors. It has allowed to establish in a period of 12 years a stable group of approximately 100 VCCs. Although the PPM scheme is supposed to end in 1995, it is likely to be continued. In addition and similarly to schemes in other countries firms can apply for Technical development credits (TOK) and for grants to develop selected technologies (PBTS). Dutch participants to the workshop suggested that the government might further promote NTBFs through support to clustering and networking of firms. It is likely that after the significant reduction in the support to SMEs due to the phasing out of the WIR subsidies in 1991 the government might again increase its support through other means.

The **UK**, has two national programmes for NTBFs. Both of them are grant based programmes. The Small Firms Merit Awards for Research and Technology (SMART) programme is a national competition established in 1986 which provides non repayable grants for NTBFs. It provides up to 150 grants per year for feasibility studies (stage I) and 75 grants to continue with the development of pre-production prototypes (stage II).The grants are also meant to be a signal of quality of the projects to individuals and financial institutions. The Support for Products under Research (SPUR) programme was started in 1991 and is aimed at encouraging SMEs to increase R&D expenditure and to develop new products and processes. SPUR is a grant programme which covers 30% of the costs of the project. In addition to these national programmes most regions in the UK have their own programmes to support SMEs and NTBFs. Most of those programmes provide not only direct forms of aid (grants, loans) but also technical and managerial support. Moreover the entities responsible for the implementation of the national schemes are usually the regional agencies (Scottish Office, Welsh Office).

Summary of the main characteristics of the schemes

The following tables present a summary of the main characteristics of each of the schemes included in the survey. For further details on each of the schemes see the survey forms included in this report. The summary of some of the main results and the size of the schemes are organized according to the type of scheme and should allow a better cross comparison of the different schemes supporting NTBFs in Europe.

The indirect schemes

The survey identified three indirect schemes which are aimed at strengthening the availability of risk capital (see table). There are a few other, usually integrated schemes such as the Italian Law 317, which also have some form of stimulation to develop the risk capital

market. The Dutch PPM scheme is the oldest of the three. Through its operation it has been able to create a substantial risk capital market. VCCs making use of this scheme have taken a participation in 100 to 120 firms per year. Cumulatively the decade of operation has meant a participation of VCCs in nearly 800 firms. The German BJTU scheme is more recent (1989). In 1991 it provided risk finance for nearly 100 firms. Cumulatively the scheme is involved in 42 operations through refinancing and 144 operations through coinvestment. On the Greek scheme we have very little information.
The budgetary information on both, the Dutch and the German scheme is very difficult to compare since one scheme operates through guarantees (PPM) and he other mainly through refinancing and coinvestment.

Table 4: Indirect Schemes

	Scheme	Operation	Number of Firms	Failure r.	Budget
D	BJTU	1989 / 1994	from 89 to 92: refinance 42 coinvest. 144	6 % of firms have failed	Total 300 Mln DM = 154 MECU of which already invested: 50 Mln DM (26 MECU) reinvestmentment 30 Mln DM (15 MECU) cofinance
Gr	Law 1755/ 88	1988			One VCC created
N L	PPM	1981	from 81 to 91: cumulative: 776 firms approx= 100 to 120 firms p/y	35% firms have failed	Reimbursements due to failure of participation: 1983 to 91 = fl 89,6 Mln (41 MECU) in 1991 = fl 20,6 Mln (9 MECU)

The direct financial schemes

They constitute the majority of schemes in the EC. Only few are explicitly aimed at NTBFs. The SMART programme being the most explicitly directed at NTBFs. Most other programmes include NTBFs but do not exclude others. Some programmes tend to privilege SMEs and certain technologies. Given the difference in coverage and the fact that some of them are repayable loans in case of success (TOK), soft loans (the Spanish programmes) or grants (most of the rest) one can not compare the size of the support directly.

Table 5: Direct Financial Schemes

	Scheme	Operation since/ to	Number of Firms	Failure r.	Budget
B	Innovation Compa-nies	1984/1990	260 applicants 75 firms selected	n.a.	budget n.a. (tax reduction scheme)
D k	New prod. ideas Prog.	1990	in 1992: 105 grants	n.a.	90-92: 13.8 MECU 1992: 7.3 MECU
N L	TOK	1954	from 88 to 92: 355 grants. 60 to 90 per/year		Budget fixed annually New loans: approx fl 130 Mln/y (60 MECU) loan only repayable on success: 40% payback
N L	PBTS	1987	600-800 requests per year		expenditure per year approx Fl 100 Mln (46 MECU)
U K	SMART	1986	In 1991 awarded: stage 1: 180 grnt. stage 2: 105 grnt.		budget: 86 to 91: 34 Mln (43 MECU) 92: 12,5 Mln (16 MECU)
U K	SPUR	1991	in 1992: 148 firms		budget 1991-1993 : 32 Mln (42 MECU)
S P	Developm. Projects	1978	between 78-88: 838 loans 88-92: 905 loans		loans: between 1978-90: 390 MECU 1992: 82 MECU
S P	Joint Research	1987	between 88-92: 552 loans		loans: between 1987-92: 196 MECU 1992: 31 MECU
G r	PAVE	1985	between 88-92: 430 grants 100 to 150 p/y		budget: approx 500 Mln dr per year (2 MECU)

Integrated Programmes

In the survey we identified six national programmes which have this integrated character and operate a great variety of schemes in a single framework. Again, most of them do not focus exclusively on NTBFs. The French ANVAR programme 'Aide à la création d'enterprises innovantes' is possibly the biggest one with an annual budget of nearly 45 MECU. The German TOU programme today only applies to the New Länder. The Italian law 317 programme is only in operation since 1992.

Integrated programmes will be found in most regions in Europe. Only a few of these have been included in the survey, and mainly as examples. The following table does not include them.

Table 6: Integrated Programmes

	Scheme	Operation since/ to	Number of Firms	Failure r.	Budget
B	Brustart	1993	n.a.		Fund has just started
B	Take-off Fund	1989	90-92: 10 equity partic. 2 conv. oblig		n.a.
D	TOU	1983-1988	stage1 258 stage2 373 stage3 97	13 to 25%	Budget over the lifetime of the scheme: 210Mln DM (108 MECU) median exp: 24 Mln DM (12 MECU)
D	TOU New Lander	1991-1994			similar in structure to the above
F	Aide a la creation... ANVAR	1983	between 88-91: 3965 firms approx 1000 p/y	20 %	Budget total expenditure 380 MECU 1992: 45 MECU
Ir	EDP-IDA	1978	between 91-92: 37 projects approx: 700 jobs	average SMEs	Budget per annum 2,4 Mln Ir Pounds (3 MECU)
It	Law 317	1992	in 1992: 8800 grants		annual budget: 500 Billn Lira (26 MECU)

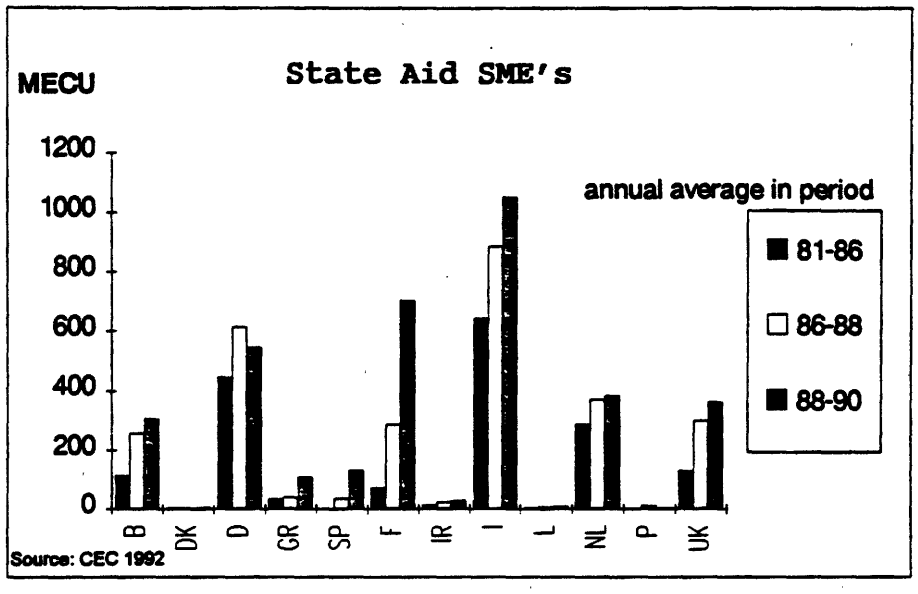
A comparison of levels of support by Member States

Based on the information produced by the survey it is not possible to give any impression on the volume of aid member states spend on supporting NTBFs. The reasons are many: in some cases the information was simply not available. The schemes are of a very different nature (for example grants, soft loan of different types, equity participation) and hence the aid intensity is not comparable. The schemes in some cases cover all sorts of industries and technologies and in others only NTBFs.

To overcome this limitations of the survey we can however use some proxies which give us an impression on the intensity of aid to SMEs in the different Member States. Using the "Third Survey on State Aid in the European Community in the Manufacturing and certain other Sectors" (CEC, 1992) one can compare in a systematic and weighted form the volume of aid spend by Member States on supporting SMEs. The information collected by the European Commission to prepare this report is based on the official information provided by Member States under Articles 92 and 93 of the EEC Treaty. As the report explains in its annexes the intensity of aid is calculated by weighting the different forms of aid. It is not a simple addition of the volumes spend by each Member State for a particular purpose.

The intensity of State aid for SMEs in the period 1981 to 1990 developed in absolute terms as follows:

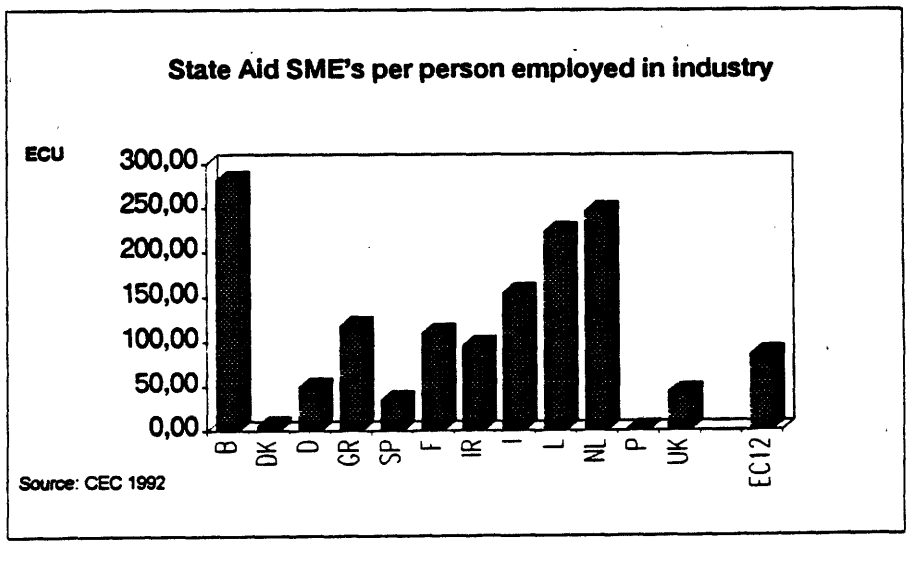
Table 7



Given the size of the different Member States it is not surprising that Germany, France and Italy spend the most on support to SMEs. What is more surprising is the relatively low level of support in the UK, although it almost doubled in the same period. On the whole the intensity of aid to SMEs has increased over the decade indicating the importance this issue has in the different member states. The increase is the most impressive in France.

Since the total value of aid makes it very difficult to compare bigger with smaller countries we calculated the intensity of aid to SMEs per person employed in industry in the period 1988 to 1990. The result is very different.

Table 8



The intensity of aid to SMEs is the highest in the three Benelux countries. In some cases almost double the average spend by the EC. However this picture has changed radically in the beginning of the 90s. Belgium has reduced the level of aid substantially (between other measures aimed at reducing the deficit see the phasing out of the Innovation Company Scheme). The Netherlands has phased out two schemes (WIR and INSTIR) which had been increasingly aimed at SMEs. The result might, as Dutch and Belgian representatives argued during the workshop that the two countries might actually be spending much less than other EC countries today.
Of the big countries Italy seems to be spending most on aid to SMEs not only in absolute but also in relative terms.

Two countries seem to be spending very little on supporting SMEs. In the case of Portugal it might be due to the fact that it is only recently gearing up to this type of actions. In the Danish case it is more remarkable since Denmark has some of the most successful SMEs. One of the explanations might be that much of the support for SMEs takes place through intermediaries (for example the national research infrastructure) and thus is not considered as a form of aid in the sense of Articles 92 and 93 of the EEC Treaty.

Summarizing one could argue that although there were significant differences in the level of support between the member states in the 80s, the process of economic convergence is equalising the conditions. However this says very little about the effectiveness of the aid instruments. The workshop concentrated mainly on exchanging experiences to improve effectiveness of the forms of support to NTBFs. The results of this debate is summarized in the report of the workshop.

ANNEX

A.-DIRECT FINANCIAL AID

1.-Act directly on enterprises to support:

* -R&D activities-General
  -Specific technological areas
* -Building prototypes
* -New premises
* -New machinery
* -Management support
* -Technical capabilities
* -Intellectual property

Types of instruments.

Subsidies:-non refundable -refundable in case of success

Loans: -with low rate of interest -with extended duration -non-refundable in case of failure

Equity participation (with different limits and degree of participation)

Guarantees

2.-Indirect financial aid through intermediaries

*** a.-*Actions to reduce the risk of financial institutions.* The risk might need to cover long term investments in premises, machinery or equipment, or more short term expenditure for intangible assets, current expenditure, working capital.

-private (banks,investors, venture capitalists, leasing companies)

-public or semi-public (development corporations)

** b.-*Actions on the market and demand for innovative products*

-On the national market

-on government and institutional market (procurement)

-on the private market (trade finance guarantees,factoring)

-on export (through export credits, trade guarantees, foreign currency loans, factoring)

B. FISCAL MEASURES.

1. Direct actions on the tax burden of NTBFs:

* -expenditure on R&D -current expenditure or capital expenditure
* -expenditure on patents and licences
* -expenditure on machinery and premises
* -expenditure on technical and managerial support

2. Actions on the environment of NTBFs:

* -fiscal treatment of SMEs and NTBFs

** -fiscal treatment of risk capital

-fiscal treatment of non-profit R&D institutions

-fiscal treatment of equipment which incorporates new technologies

The policy instruments and mechanisms which governments might use to support the above actions might be very varied and depend to a great extend on the composition of the general tax regime. It includes mechanisms such as reduction in tax rates, the taxable base, the method of fiscal depreciation, tax credits, etc.

SURVEY OF POLICY INSTRUMENTS

CONTENTS

BELGIUM

COUNTRY Belgium, region Brussels

Name of Scheme: Brustart

I. DESCRIPTION OF SCHEME

I.a. General information

Type:

Reference to legal basis: (white paper, act, public document)

The government of the Brussels Region assigned to the S.R.I.B. the mission to create Brustart as part of its policy to develop and encourage Brussels's economy. Brustart was formally set up on 21-12-'92.

In operation since:	*Life of the Scheme:*	*Previous Schemes:*
1993	unlimited	none

Stated goals of the scheme:

Allow small and medium-sized companies to have access to venture capital. Brustart provides financing to start ups companies or to growing new companies. Brustart is allowed to either take minority stakes in the capital or to lend money at market rates. Loans are granted without guarantees if needed; reimbursement can be deferred for a period of up to two years. Brustart's stake is to be bought back by the manager at a later stage as decided in the contract.
Brustart's interventions are granted for an average period of 7 years. Brustart was also set up with a view to support management of these new firms.

The program is ecpected to support 100 firms in four years.

Have the goals been changed during the implementation of the scheme: (describe changes through evaluation and learning process)
no

Relation with other programmes: (is this scheme part of a programme or initiative)
none

Geographical coverage: (national, regional)
The Brussel Region (19 burroughs)

Entity responsible for the budget:
GIMB

Entity responsible for implementation:
GIMB

Name of Scheme: Brustart, Belgium

I.b. Target group

What is the target group:
Newly set up companies or entrepreneurs willing to launch a new product or service (with some growth potential); Experienced companies willing to commercialize a new product or service; and researchers who want to ensure that their product or service meets market needs,and need the fund to realise a market study and to draft a business plan before launching the product.

Specific requirements for participation in this scheme:

-Size (turnover, employees)	no
-sectors, branches	no
-technology	no
-age/investment stage	5 years old maximum
-specific problems	capital has to be positive
-geographical aspects	company has to be located in Brussels
-others	

Other selection criteria:
none

Other promoted activities: (examples: consultancy in definition of product, securing intellectual property rights, business plans, management training, etc.)
none

Name of Scheme Brustart, Belgium

I.c. Organization and Implementation

What is supported?
Type of activities supported:
No specific activities are excluded

Maximum / minimum amounts per project or action and/ or reimbursement:

500.000 - 7.500.000 Bfr.

Type of support:

- Financial support (in capital or loans) for an average period of 5 years.
- If needed aiding management in the running of his company.
- If needed, sharing of required consultancy costs.

Organization and structure: (describe briefly how the scheme works, the actors involved, how they reach the target group).

Director: Eddy van Gelder
Coordinator:Serge van Hamme
Financial analysts: Françoise Macq and Barbara Roose

Information (phone calls, letters, thick files...) is received by any member of this team of four people and thereafter cases are assigned to either coordinator or any of the financial analysts. They first review the project and get to meet the managers. They then ask to produce so called receivability notes, which are then submitted to Brustarts Board. These notes present briefly the company and the project, and allow a first selection to take place. Once and if receivability is granted, the analysis procedure starts, whereby a file (containing all sorts of legal documents as well as market information) is constituted. More interviews are done in order to determine the management-capacities of the entrepreneur, in depth financial analysis is carried out, as well as a market study.

Total cost over the lifetime of the scheme	***Expenditure per year***
n.a.	n.a.

Other budgetary information
none

II. RESULTS
III. EVALUATION OF RESULTS not yet available.

COUNTRY Belgium, Region Flanders

Name of Scheme: Take-off Fund GIMV (Regional Investmentcompany for Flanders)

I. DESCRIPTION OF SCHEME

I.a. General information

Type: (do not fill in)		
Reference to legal basis: (white paper, act, public document)		
In operation since: 1989	***Life of the Scheme:***	***Previous Schemes:***
Stated goals of the scheme: Take-off fund: Offer start-up finance for growth or product-diversification Seed-capital fund: Finance seed-phase of innovative projects /new firms, to test feasibility leading to possibilities for start-up finance.		
Have the goals been changed during the implementation of the scheme: (describe changes through evaluation and learning process)		
Relation with other programmes: (is this scheme part of a programme or initiative) Seed-capital fund was sponsored by EC fund? The Seed Capital Fund for the Kempen, an affiliate of the Take-off fund, received EC Funds for its start up.		
Geographical coverage: (national, regional) preference: Flanders		
Entity responsible for the budget: GIMV ***Entity responsible for implementation:*** GIMV		

Name of Scheme: Take-off Fund

I.b. Target group

What is the target group:

- Management-teams wanting to commercialise innovative products and services, also for making a business plan;
- Researchers wanting to commercialise a product or prototype,
- Study-consortia, preceding the establishment of a firm, which depends on wether feasibility-study or product-development proves viability of the product for commercialization.

Take-of fund: Firms that started less than 3 years ago (not real-estate, or small shops)
Seed-capital fund for the Kempen: Companies established not more than 2 years ago, with the intention to commercialise innovative products and services.

Specific requirements for participation in this scheme:

-Size (turnover, employees)
-sectors, branches
-technology
-age/investment stage - age: seed-capital
-specific problems
-geographical aspects - preference: Flanders;
for the seed-capital fund for the kempen:
Kempenregion
-others

Other selection criteria:

Other promoted activities: (examples: consultancy in definition of product, securing intellectual property rights, business plans, management training, etc.)

Name of Scheme Take-off fund

I.c. Organization and Implementation

What is supported? ***Type of activities supported:*** ***Maximum / minimum amounts per project or action and/ or reimbursement:*** In general small amounts, but in some specific start-ups also substantial amounts (e.g. investments in health care)
Type of support: (describe the type of support to NTBF's .Example: financial support provided directly or indirectly through investment companies. It might take the form of early stage seed equity funding , soft loans, grants or guarantees. Assistance in definition of product, securing intellectual property rights, business plans, management training, etc.) - early stage seed equity funding - management assistance
Organization and structure: (describe briefly how the scheme works, the actors involved, how they reach the target group). - GIMV's network - own contacts - requests from researchers, businessmen etc.

Total cost over the lifetime of the scheme	***Expenditure per year***
Other budgetary information	

Name of Scheme: Take-off Fund

II. RESULTS

Number of firms involved		*Observations*
1988		One portfolio company of the Seed capital fund for the Kempen has already been sold.
1989		
1990	*	
1991		

1990	4	3 equity participations	(9.000.000) Bfr.
		1 convertible obligation	(2.000.000) Bfr.
1991	4	3 equity participation	(4.000.000 - 70.000.000) Bfr.
		1 convertible obligations	(2.000.000) Bfr.
1992	4	equity participations	(3.210.000 - 29.000.000) Bfr.

III. EVALUATION OF RESULTS

Evaluator:

Brief summary of results of the evaluation such as failure rate, economic effects, etc:

Take off fund is to young to draw major conclusions yet.
The importance of management as selection criterium
Strong follow-up efforts necessary.

COUNTRY Belgium

Name of Scheme: Innovative companies

I. DESCRIPTION OF SCHEME

I.a. General information

Type: (do not fill in)		
Reference to legal basis: (white paper, act, public document) "Recovery" Law of July 31, 1984		
In operation since: 1984	***Life of the Scheme:*** The law was abolished in 1990, ahead of time	***Previous Schemes:***
Stated goals of the scheme: Confer fiscal advantages to stock holders, employees and the company itself in the case of the creation of small innovative companies (i.e. exploiting themselves a proprietary new technology) which were considered as the major guarantee for permanent industrial activities in Belgium.		
Have the goals been changed during the implementation of the scheme: (describe changes through evaluation and learning process) NO		
Relation with other programmes: (is this scheme part of a programme or initiative) In the same period of the "RECOVERY" law, the Belgian Government created also the scheme of the "EMPLOYMENT ZONES" and of the "COORDINATION CENTRES". All three formulas aim at the growth of stable economical activities and employment in Belgium.		
Geographical coverage: (national, regional) Belgium		
Entity responsible for the budget: / (Fiscal exemptions) ***Entity responsible for implementation:*** Ministry of Finance		

Name of Scheme: Innovative companies

I.b. Target group

What is the target group:

Newly created, small, innovative and technologically and industrially autonomous companies.
Private capital investors: individuals, venture capital companies
personnel of the innovative companies

Specific requirements for participation in this scheme:

-Size (turnover, employees)	max. 99 employees
-sectors, branches	all
-technology	must be new high-technology processes
-age/investment stage	created between 1984 - 1993
-specific problems	
-geographical aspects	national coverage: all activities undertaken in Belgium; only sales and service activities allowed abroad.
-others	the firm should be dedicated solely to the exploitation and commercialization of the innovative processes, and should be autonomous in all development stages

Other selection criteria:

New applications are needed for every new process the company exploits
The innovative company can not receive tax reduction if it benefits from other support schemes: no cumulation of support
The evaluation of the technology (new, innovative and autonomous) had to lead to a unanimous positive advice from a panel of experts from 3 ministries:
for Economic Affairs (IRSIA-IWONL), Science Policy and SME. The final descision was made by the Minister of Finance.

Other promoted activities: (examples: consultancy in definition of product, securing intellectual property rights, business plans, management training, etc.)

Name of Scheme Innovative companies

I.c. Organization and Implementation

What is supported? ***Type of activities supported:*** starting new technological innovative firms investing in such firms ***Maximum / minimum amounts per project or action and/ or reimbursement:***
Type of support: Fiscal exemptions: - on firm-income for a 10-years period, in the first 13 years of the firms existence, max 13% of invested capital - on value added for firms founded not more than three years ago. - on ROI - for private investors 50% income tax reduction - for employees of the innovative company 100% income tax reduction
Organization and structure: (describe briefly how the scheme works, the actors involved, how they reach the target group). After initial sensibilisation ('84) the scheme was auto catalytic. A small committee, with representatives from the 4 ministries involved, assessed the granting of the statute to the companies which applied for it.

Total cost over the lifetime of the scheme	***Expenditure per year***
Not available (fiscal)	
Other budgetary information	

Name of Scheme: Innovative companies

II. RESULTS

Number of firms involved	*Observations*
1988 : 37 *1989* : 29 *1990* : 9 (abolished) *1991* : -	In total: ± 260 applicants over the years 84-90

III. EVALUATION OF RESULTS

Evaluator:

Brief summary of results of the evaluation such as failure rate, economic effects, etc:

POSITIVE : The scheme was a successful 'focal point' for venture capitalists, for 'entrepreneurs' within big companies, for fostering innovation in general

NEGATIVE : Various dichotomies: size limitation vs employment; autonomy vs corporate strategy; innovative technology during 10 years vs diversification

COUNTRY Belgium, Flemisch Government

Name of Scheme: Support to SME for expansion

I. DESCRIPTION OF SCHEME

I.a. General information

Type:		
Reference to legal basis: (white paper, act, public document) Law 04 08 78		
In operation since: aug. 1990	***Life of the Scheme:***	***Previous Schemes:***
Stated goals of the scheme: Give stimuli to regional SME- among others especially - for investments leading to increase of employment - extra support for strategically important firms e.g. high-tec - extra support for establishment of new firms by young entrepreneurs		
Have the goals been changed during the implementation of the scheme: (describe changes through evaluation and learning process)		
Relation with other programmes: (is this scheme part of a programme or initiative)		
Geographical coverage: Flanders region		
aEntity responsible for the budget: Krediet voor de nijverheid (Creditbank for the small-self employed) ***Entity responsible for implementation:***		

Name of Scheme: expansion support to SME

I.b. Target group

What is the target group:

- Young entrepreneurs < 35 year who want to start their own business
- Established SME - who want to invest for expansion
  - or start production of high-tec products or use high-tec proces

Specific requirements for participation in this scheme:

	for established firms:
-Size (turnover, employees)	40 employees max. for trading companies,
-sectors, branches	50 " for other firms
-technology	turnover max. 300 mln Bfr/year
-age/investment stage	
-specific problems	For high-tec firm: strategic importance if the
-geographical aspects	process or product is rare in Flanders region.
-others	

If one of these required measures is exeeded, the firm falls under the law concerning expansion of large firms.

Other selection criteria:

For start support:
entrepreneurs must be under 35 years of age,
not have started a firm before,
be owner/director of the firm
and hold majority of shares for at least 5 years to come.

Other promoted activities: (examples: consultancy in definition of product, securing intellectual property rights, business plans, management training, etc.)

fiscal exemptions

Name of Scheme expansion support to SME

I.c. Organization and Implementation

What is supported? Investments in ***Type of activities supported:*** - fixed assets: land, buildings - capital goods: machinery - immaterial goods: patents, market reorganization ecology researches. ***Maximum / minimum amounts per project or action and/ or reimbursement:*** percentage of investment for new high-tec entrepreneurs 3% (min 800.000) for strategic important firms 3-6% (min. 3.000.000)
Type of support: Investments may be financed with own or external money Investment ‹ 50% with own finance, will be supported via rent-support: 3 payments/year Investment › 50% own finance - rent support for the externally financed part + premium paid directly to firm
Organization and structure: (describe briefly how the scheme works, the actors involved, how they reach the target group). Firms apply at Krediet aan de nijverheid.

Total cost over the lifetime of the scheme	***Expenditure per year***
Other budgetary information	

Name of Scheme: expansion support to SME

II. RESULTS

Number of firms involved *1988* *1989* *1990* *1991*	*Observations*
Other measurements of results (per year)	
Bottlenecks	

III. EVALUATION OF RESULTS

Evaluator: *Brief summary of results of the evaluation such as failure rate, economic effects, etc:*

DENMARK

COUNTRY Denmark

Name of Scheme: The Scholarship Scheme

I. DESCRIPTION OF SCHEME

I.a. General information

Type:		
Reference to legal basis: (white paper, act, public document) Part of coordinated support programme for entrepreneurs and small businesses under the Ministry of Industry, represented by the National Agency for Industry and Trade.		
In operation since: 1982	***Life of the Scheme:*** Still in operation	***Previous Schemes:***
Stated goals of the scheme: To promote the establishment of new Danish production companies with a high content of technology or know-how.		
Have the goals been changed during the implementation of the scheme: (describe changes through evaluation and learning process) No		
Relation with other programmes: (is this scheme part of a programme or initiative) It is an independent programme, but works closely together with the start-up scheme and the Grants Scheme for working up high-potential product ideas.		
Geographical coverage: National		
Entity responsible for the budget: DTI/Danish Innovation Centre ***Entity responsible for implementation:*** DTI/Danish Innovation Centre		

Name of Scheme: The Scholarship Scheme, Denmark

I.b. Target group

What is the target group: Private individuals with particulary promising product ideas who wish to start their own production business.
Specific requirements for participation in this scheme: ***-Size (turnover, employees)*** ***-sectors, branches*** ***-technology*** High technology or high level of know-how. ***-age/investment stage*** ***-specific problems*** ***-geographical aspects*** ***-others***
Other selection criteria:
Other promoted activities: (examples: consultancy in definition of product, securing intellectual property rights, business plans, management training, etc.) Yes, comprising all the examples mentioned.

Name of Scheme The scholarship Scheme, Denmark

I.c. Organization and Implementation

What is supported?
Type of activities supported:

The scholarship covers subsistence for a maximum of 2 years, plus counselling from the scheme administration. In this period the scholar should document and establish the basis for setting up a new business.

Maximum / minimum amounts per project or action and/ or reimbursement:

Maximum support: 1 Mln DKK, minimum: 175.000 DKK

Type of support:

Apart from the direct financial support to subsistence (the scholarship), up to 50.000 DKK is granted to cover expenses for external technical, commercial, legal or property right counselling.

Organization and structure: (describe briefly how the scheme works, the actors involved, how they reach the target group).

In cooperation between the applicant and the secretariat the latter sets up an application to be presented before a grants committee under the National Agency for Industry and Trade. Through close contact and quarterly reports the secretariat monitors the scholar's development of the project.

Total cost over the lifetime of the scheme	*Expenditure per year*
25,5 mill. DKK	Budget 1993: 6 mill. DKK

Other budgetary information

Name of Scheme: Scholarschip scheme, Denmark

II. RESULTS

Number of firms involved	*Observations*
1988 7 *1989* 9 *1990* 6 *1991* 9	
Other measurements of results (per year) The total employment created, including subsuppliers, is 280 in 1991 (38 surviving companies out of 62). Average employment rate after 1-2 years: 5.3 after 7-8 years: 12.3	In average, 55% of the turnover in exporting scholarschip businesses comes from export.
Bottlenecks Additional equity capital financing.	

III. EVALUATION OF RESULTS

Evaluator: *Brief summary of results of the evaluation such as failure rate, economic effects, etc:*

COUNTRY Denmark

Name of Scheme: The scout scheme

I. DESCRIPTION OF SCHEME

I.a. General information Looking up of product ideas in research centres

Type:		
Reference to legal basis: (white paper, act, public document) Act of business development		
In operation since: About 1980	***Life of the Scheme:*** ongoing	***Previous Schemes:***
Stated goals of the scheme: To promote development of product ideas emerging as spin off from research work.		
Have the goals been changed during the implementation of the scheme: (describe changes through evaluation and learning process) No		
Relation with other programmes: (is this scheme part of a programme or initiative) Part of entrepreneur including inventor programme		
Geographical coverage: (national, regional) National		
Entity responsible for the budget: The National Agency of Trade and Industry ***Entity responsible for implementation:*** Danish Technology Institute		

Name of Scheme: The scout scheme, Denmark

I.b. Target group

What is the target group: Researchers and research centres
Specific requirements for participation in this scheme: ***-Size (turnover, employees)*** ***-sectors, branches*** ***-technology*** ***-age/investment stage*** ***-specific problems*** ***-geographical aspects*** ***-others***
Other selection criteria:
Other promoted activities: (examples: consultancy in definition of product, securing intellectual property rights, business plans, management training, etc.) - examination of novelty - securing intellectual property rights - assistance to licencing negotiations

Name of Scheme The scout scheme, Denmark

I.c. Organization and Implementation

What is supported?
Type of activities supported:

See: other promoted activities

Maximum / minimum amounts per project or action and/ or reimbursement:

No limitation

Type of support:

Management and technical
See: other promoted activities

Organization and structure: (describe briefly how the scheme works, the actors involved, how they reach the target group).

Consultants visit the research centres, searching for product ideas.

Total cost over the lifetime of the scheme	***Expenditure per year***
200.000 ECU pr. year	

Other budgetary information

Name of Scheme: The scout scheme, Denmark

II. RESULTS

Number of firms involved	*Observations*
1988 *1989* About 7% of the ideas *1990* are licenced to *1991* enterprises	
Other measurements of results (per year)	
Bottlenecks	

III. EVALUATION OF RESULTS

Evaluator:

Brief summary of results of the evaluation such as failure rate, economic effects, etc:

Not available.

COUNTRY DENMARK

Name of Scheme: The Product Ideas Support Scheme

I. DESCRIPTION OF SCHEME

I.a. General information

Type:		
Reference to legal basis: (white paper, act, public document) Part of coordinated support programme for entrepreneurs and small businesses under the Ministry of Industry/the National Agency for Industry and Trade		
In operation since: 1982	***Life of the Scheme:*** Still in operation	***Previous Schemes:*** PROFEO, start 1972
Stated goals of the scheme: To improve product renewal and competitiveness of Danisch industry through licensing of product ideas from Danish private individuals to industry.		
Have the goals been changed during the implementation of the scheme: (describe changes through evaluation and learning process) No		
Relation with other programmes: (is this scheme part of a programme or initiative) The scheme works as the natural extension of the Technology Scout Scheme, the aim of which is to identify commercially applicable scientific research at Danish universities.		
Geographical coverage: national		
Entity responsible for the budget: DTI/Danish Innovation Centre ***Entity responsible for implementation:*** DTI/Danish Innovation Centre		

Name of Scheme: The Product Ideas Support Scheme, Denmark

I.b. Target group

What is the target group: Source target group. Danish private inventors. End target group: Danish companies
Specific requirements for participation in this scheme: ***-Size (turnover, employees)*** ***-sectors, branches*** ***-technology*** ***-age/investment stage*** ***-specific problems*** - Documentation by the inventor of his rights ***-geographical aspects*** to the product idea. ***-others***
Other selection criteria:
Other promoted activities: (examples: consultancy in definition of product, securing intellectual property rights, business plans, management training, etc.)

Name of Scheme The Product Ideas Support Scheme, Denmark

I.c. Organization and Implementation

What is supported?
Type of activities supported:

Technical documentation,
preliminary market surveys,
setting up and filing of patent application,
legal assistance in setting up draft contract,
contract negotiation.

Maximum / minimum amounts per project or action and/ or reimbursement:

Maximum: 300,000 DKK
Minimum: 10,000 DKK

Type of support:

The scheme covers cost in connection with external consultancy, advisory assistance from DIC test, materials and prototype development. In case of failure, i.e. no licence contract being made, the state bares the whole risk. In case of success, the inventor repays what has been spent on his project through DIC, on behalf of the scheme, deducting the amount from his license fee.

Organization and structure: (describe briefly how the scheme works, the actors involved, how they reach the target group).

The DIC administers all activities and payments under the scheme, in cooperation with the inventor and based on an agreed action plan. Informal applications for support are handled every two weeks in a committee of DIC-staff members and a representative from the National Agency for Industry and Trade.

Total cost over the lifetime of the scheme	*Expenditure per year*
approx. 30 mill DKK	1992 : 6.3 mill DKK

Other budgetary information

Name of Scheme: The Product Ideas Support Scheme, Denmark

II. RESULTS

Number of firms involved	*Observations*
1988 100 *1989* 115 *1990* 97 *1991* 140	
Other measurements of results (per year)	
Bottlenecks	

III. EVALUATION OF RESULTS

Evaluator: *Brief summary of results of the evaluation such as failure rate, economic effects, etc:* The scheme is being evaluated at present.

COUNTRY DENMARK

Name of Scheme: The establishment scheme

I. DESCRIPTION OF SCHEME

I.a. General information Counselling to entrepreneurs at reduced rates

Type:		
Reference to legal basis: (white paper, act, public document) Act of business development		
In operation since: about 1980	***Life of the Scheme:*** ongoing	***Previous Schemes:***
Stated goals of the scheme: Counselling to entrepreneurs at reduced rates To ensure a better start for new, small firms		
Have the goals been changed during the implementation of the scheme: (describe changes through evaluation and learning process) No		
Relation with other programmes: (is this scheme part of a programme or initiative) Part of the entrepreneur and inventor programme		
Geographical coverage: National		
Entity responsible for the budget: The national Agency of Industry and Trade ***Entity responsible for implementation:*** Danish Technological Institute		

Name of Scheme: The establishment scheme, Denmark

I.b. Target group

What is the target group: New starters and companies not more than three years old.
Specific requirements for participation in this scheme: ***-Size (turnover, employees)*** ***-sectors, branches*** - manufacturing companies ***-technology*** - and technology and knowledge based one service ***-specific problems*** enterprises. ***-age/investment stage*** ***-geographical aspects*** ***-others*** - Development oriented companies
Other selection criteria:
Other promoted activities: (examples: consultancy in definition of product, securing intellectual property rights, business plans, management training, etc.)

I.c. Organization and Implementation

What is supported? ***Type of activities supported:*** Consultancy services ***Maximum / minimum amounts per project or action and/ or reimbursement:*** No limitation
Type of support:
Organization and structure: (describe briefly how the scheme works, the actors involved, how they reach the target group).

Total cost over the lifetime of the scheme	***Expenditure per year***
Other budgetary information	

Name of Scheme: The establishment scheme, Denmark

II. RESULTS

Number of firms involved	*Observations*
1988 ca. 450 *1989* ca. 500 *1990* ca. 400 *1991* ca. 600	
Other measurements of results (per year)	
Bottlenecks	

III. EVALUATION OF RESULTS

Evaluator: *Brief summary of results of the evaluation such as failure rate, economic effects, etc:* n.a.

COUNTRY Denmark

Name of Scheme: Initiative on Professional Boards

I. DESCRIPTION OF SCHEME

I.a. General information Promote the use of professional boards in small firms

Type:		
Reference to legal basis: (white paper, act, public document) Act on business development		
In operation since: 1993	***Life of the Scheme:*** two years	***Previous Schemes:***
Stated goals of the scheme: Promote the use of professional boards in small firms		
Have the goals been changed during the implementation of the scheme: (describe changes through evaluation and learning process)		
Relation with other programmes: (is this scheme part of a programme or initiative) Part of entrepreneurs and inventors program		
Geographical coverage: (national, regional) National		
Entity responsible for the budget: The agency of Industry and Trade ***Entity responsible for implementation:*** The Agency of Industry and Trade		

Name of Scheme: Initiative on Professional Boards, Denmark

I.b. Target group

What is the target group: Small enterprises
Specific requirements for participation in this scheme: ***-Size (turnover, employees)*** ***-sectors, branches*** ***-technology*** ***-age/investment stage*** ***-specific problems*** ***-geographical aspects*** No limitation ***-others***
Other selection criteria:
Other promoted activities: (examples: consultancy in definition of product, securing intellectual property rights, business plans, management training, etc.)

Name of Scheme Initiative on Professional Boards, Denmark

I.c. Organization and Implementation

What is supported? ***Type of activities supported:*** See type of support ***Maximum / minimum amounts per project or action and/ or reimbursement:***
Type of support: Promotive campaigns, directed at companies and potential boards members Education of intermediares supporting activities: Information materials Database on professional board members.
Organization and structure: (describe briefly how the scheme works, the actors involved, how they reach the target group). The scheme has not yet started

Total cost over the lifetime of the scheme	***Expenditure per year***
700.000 ECU	350.000 ECU
Other budgetary information	

II. RESULTS No results, for scheme has not yet started.

no further pages.

COUNTRY Denmark

Name of Scheme: Development of new product ideas

I. DESCRIPTION OF SCHEME

I.a. General information

Type: (do not fill in)		
Reference to legal basis: (white paper, act, public document) Law of Industry and Trade development		
In operation since: beginning 1990	***Life of the Scheme:*** no limit	***Previous Schemes:*** no
Stated goals of the scheme: The aim of providing grants for entrepreneurs and small companies is, to ensure that more new companies are set up and that these new entrepreneurs are particularly creative and have strong growth potential. These measures will not only benefit Denmark exports and employment situation in the longer term, but should also be seen as an important contribution towards the rejuvenation of Danish industry.		
Have the goals been changed during the implementation of the scheme: (describe changes through evaluation and learning process) no		
Relation with other programmes: (is this scheme part of a programme or initiative) Yes: -entrepreneurs and new production: an offer to entrepreneurs and people with new product ideas, - advise on small-business establishment, - co-funding in the establishment phase, - co-funding of new, promising product-ideas.		
Geographical coverage: (national, regional) Denmark, (Greenland and Faroe Islands not included)		
Entity responsible for the budget: The National Agency of Industry and Trade ***Entity responsible for implementation:*** The National Agency of Industry and Trade		

Name of Scheme: Development of new product ideas, Denmark

I.b. Target group

What is the target group:

Entrepreneurs and small companies

Specific requirements for participation in this scheme:

-Size (turnover, employees)	Less than 50 employees
-sectors, branches	Combination of: special technologies, specialist
-technology	knowledge and promising marketing prospectives.
-age/investment stage	Maximum 3 years of age.
-specific problems	
-geographical aspects	

Other selection criteria:

Applicants must be able to demonstrate that:
- The product-idea has an exiting technical and commercial potential,
- The grant will enable the applicant to manage the project in terms of the technical, financial and commercial framework,
- Any technical or commercial grants are of a nature which makes a grant imperative if the entrepreneur is to be able to see the project through.
- A substantial proportion of future revenue earning from the product must be attributable to exports.

Other promoted activities: (examples: consultancy in definition of product, securing intellectual property rights, business plans, management training, etc.)

The project development must be described as a project to qualify for consideration. Information must be submitted specifying which stage the idea currently is in, the type of activities the applicant intends to undertake and what the aims are. Applicants must submit a schedule in respect of the above work as well as a budget which relates to the implementation schedule in such a way as to make early deviation easily detectable. Applicants must submit a business-plan.

Name of Scheme Development of new product ideas, Denmark

I.c. Organization and Implementation

What is supported?
Type of activities supported:

Applications are invited with respect to actual costs, connected with the project, such as the entrepreneurs salary, staff salaries, consultancy fees, materials, special equipment. However, funding will not normally be available for capital investments.

Applications are invited in respect of the preliminary stage of a development project. This would cover essential activities relating to the documentation phase which will help the company reach a stage from where it is able to seek funding form the private capital market. Thus the grant might cover a period from conception to, if necessary , up to the product preparation phase.

Maximum / minimum amounts per project or action and/ or reimbursement:

Minimum normal	10.000	ECU	
Maximum normal	67.000	ECU	
Maximum exceptional	200.000	ECU	(1ECU = 7,5 DKK)

Type of support:

Grants, normally up to 50% of project costs.
With projects where the grants are over 67.000 ECU , and the results are exploited commercially, the subsidy (over 67.000 ECU) shall be repaid in the form of royalty on the sales.

Organization and structure: (describe briefly how the scheme works, the actors involved, how they reach the target group).

Total cost over the lifetime of the scheme	***Expenditure per year***
90-92: 13.800 Mln. ECU	1990 2.1 Mln. ECU 1991 4,4 Mln. 1992 7,3 1993 3,2 approx. (budget)

Other budgetary information

Running costs approx. 105.000 ECU per year.

Name of Scheme: Development of new product ideas, Denmark

II. RESULTS

Number of firms involved		*Observations*
applications	/ grants (entrepreneurs or small companies)	
1990 107	/ 58	
1991 153	/ 58	
1992 189	/ 105	
1993		

Other measurements of results (per year)

Distribution of grants with respect to firm size:

number of employees	applications / grants
0 - 3	62,8% / 67,5%
4 - 6	13,8% / 13,6%
7 - 9	5,6% / 5,3%
0 - 49	16,6% / 13,0%
>49	1,1% / 0,6%

Bottlenecks

Lack of money, especially in 1993.

III. EVALUATION OF RESULTS

Evaluator: An external evaluator will be used.

Brief summary of results of the evaluation such as failure rate, economic effects, etc:

An evaluation has not been done yet, because only 98 projects have ended so far.

GERMANY

COUNTRY GERMANY

Name of Scheme: Pilot scheme " Business Investment Capital for New Technology - Based Firms" (BJTU)

I. DESCRIPTION OF SCHEME

I.a. General information

Type:		
Reference to legal basis: Richtlinie		
In operation since: 1989	***Life of the Scheme:*** 5 years	***Previous Schemes:*** Pilot scheme "support of New Technology Based Firms" (TOU).
Stated goals of the scheme: - To encourage Venture- and Business Investment companies to early investments (seed-, start up) - To enable learning processes with investors, for the best practice of acquisition assessment and management assistance of NTBFs - To find out, whether there is a level of necessary public involvement in the venture capital market to ensure an adequate supply of capital for early stage investments		
Have the goals been changed during the implementation of the scheme: (describe changes through evaluation and learning process)		
Relation with other programmes: (is this scheme part of a programme or initiative)		
Geographical coverage: (national, regional) National		
Entity responsible for the budget: BMFT ***Entity responsible for implementation:*** Kreditanstalt für Wiederaufbau (KfW), Frankfurt Deutsche Ausgleichsbank, Bonn (DtAB)		

Name of Scheme: BJTU Germany

I.b. Target group

What is the target group:

Investments companies, private investors etc.,
which invest in a NTBF not more than 3 years of age

Specific requirements for participation in this scheme:

-Size (turnover, employees)	
-sectors, branches	
-technology	New and/or innovative technology
-age/investment stage	Seed + start up stage of NTBF
-specific problems	R&D and market introduction
-geographical aspects	
-others	

Other selection criteria:

- Background of the founder/team: professional orientation in the same industry; market orientation; capabilities to manage a fast growing NTBF.
- Market potential for the innovative products: special advantage in technological competition; market potential to growth and to achieve a stable market position; strategies to overcome market barriers; potential to create a competitive portfolio of products and services.
- Financial status: role of the participation (fresh money to finance R&D and market entry/penetration expenditures vs. removal of current financial gaps); realistic planning of the expected financial requirements; financial reserves for unexpected expenditures.

Other promoted activities: (examples: consultancy in definition of product, securing intellectual property rights, business plans, management training, etc.)

Name of Scheme BJTU Germany

I.c. Organization and Implementation

What is supported?
Type of activities supported:

Maximum / minimum amounts per project or action and/ or reimbursement:

KfW-model: - refinancing of an investment in a NTBF up to 1 Million DM
- 90% release from liability

tbg-model: - dormant holding up to 1 Million DM

→ NTBF can get: - 1 Mln. DM via Kfw (investment by 1 company)
- 2 Mln. DM via tbg-model

Type of support:

See appendix

structure: (describe briefly how the scheme works, the actors involved, how they reach the target group).

BJTU is carried out in two models: The Co-investment, and the Refinancing-model. The Refinancing model is carried out by the Kreditanstalt fur Wiederaufbau KfW, which makes loans available for investment companies, with up to 90% release from liability, which serves the refinancing of investments to the NTBFs.

The other is carried out by the tbg, a subsidiary of the DtAB, which will enter into dormant holdings with NTBFs, to which at least an other investor must equally be committed, with an investment of at least the same amount (cooperative investor).

Total cost over the lifetime of the scheme	***Expenditure per year***
150 Mln. invested in each scheme, adds up to a sum af 300 Mln. Dm.	50 Mln. have been invested by Kfw 30 Mln. by the tbg-model (1989 - 1992/9)
Other budgetary information	

Name of Scheme: BJTU Germany

II. RESULTS

Number of firms involved (cumulative)	***Observations***
	Refinance, coinvestmentmodel
1988	
1989	4 4
1990	21 20
1991	39 60
1992-9	42 144
(see appendix 2)	
Other measurements of results (per year)	
Bottlenecks	

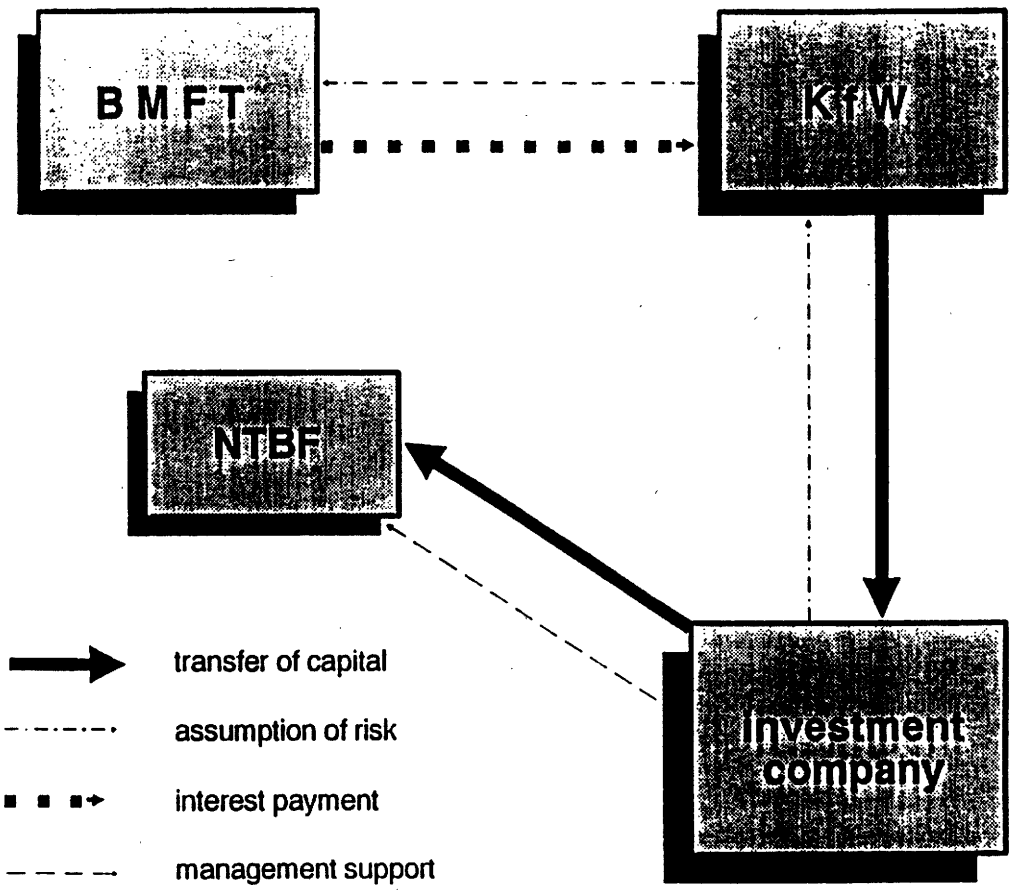
III. EVALUATION OF RESULTS

Evaluator:

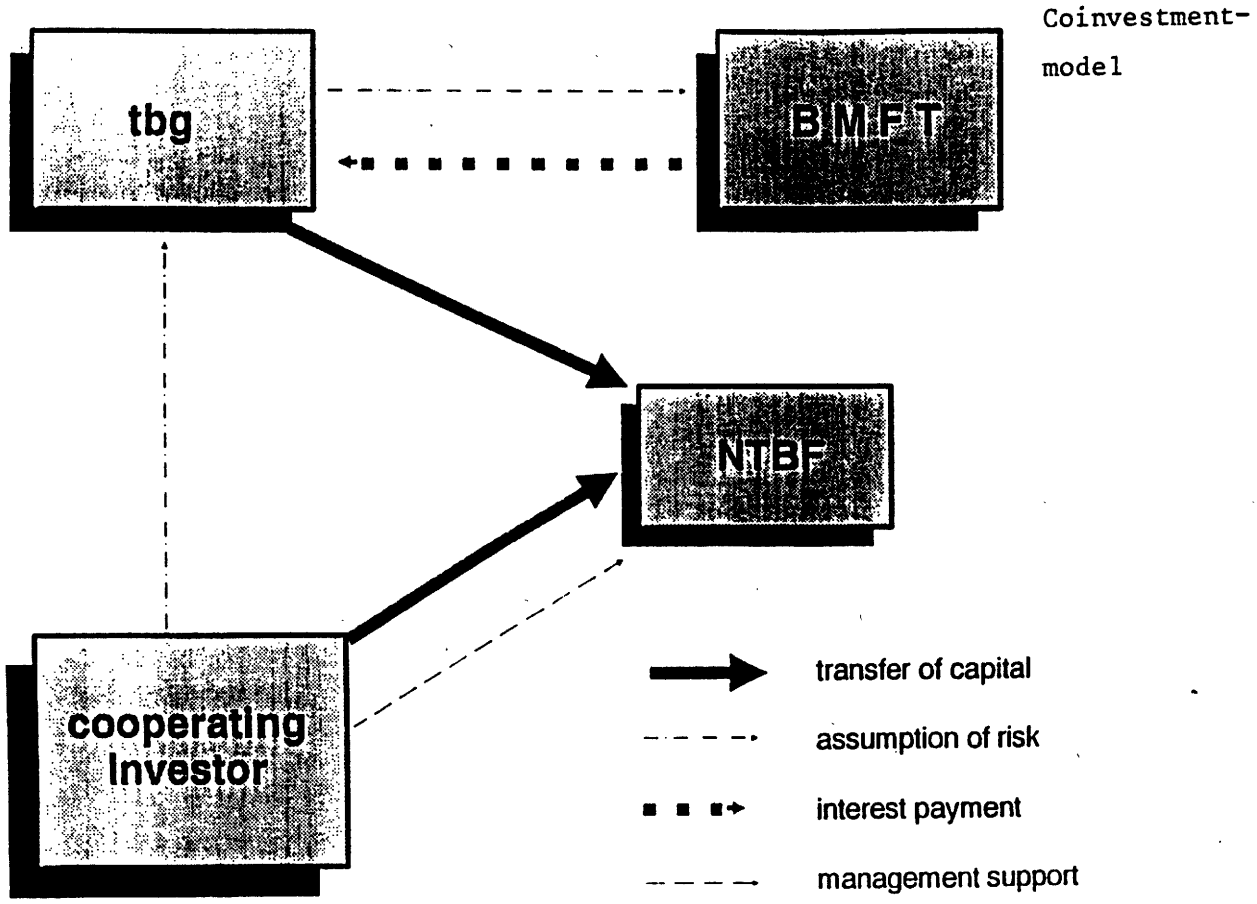
Brief summary of results of the evaluation such as failure rate, economic effects, etc:

12 NTBFs have failed.

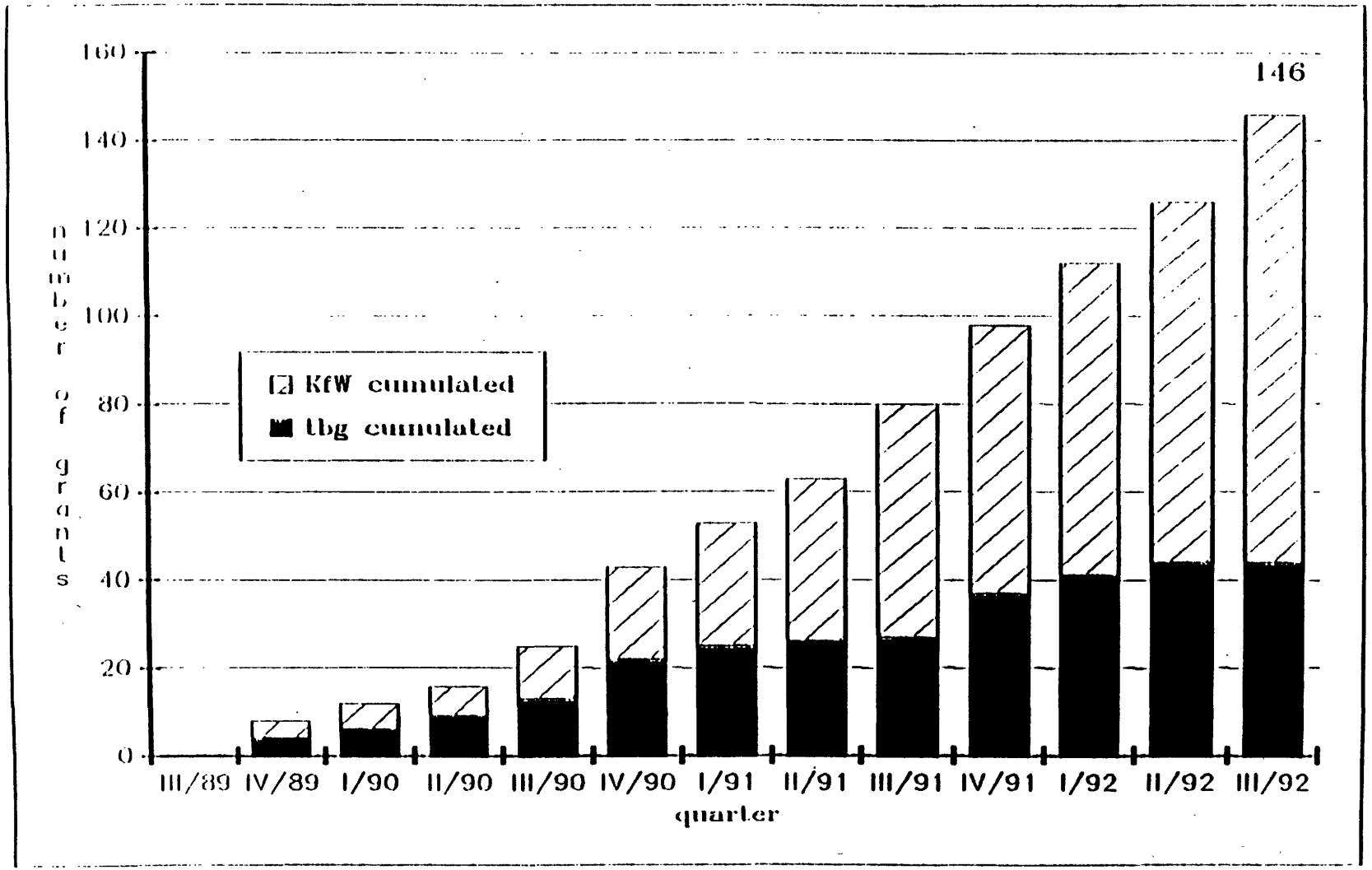
Reinvestment-model



Coinvestment-model



Development of the grants in both models (cumulated)



Criteria for investment selection

Background of the founder/founder team:

- o professional experience in the same industry
- o market orientation
- o capabilities to manage a fast growthing NTBF (e.g. to negotiate and cooperate with different types of partners, to motivate the employees)

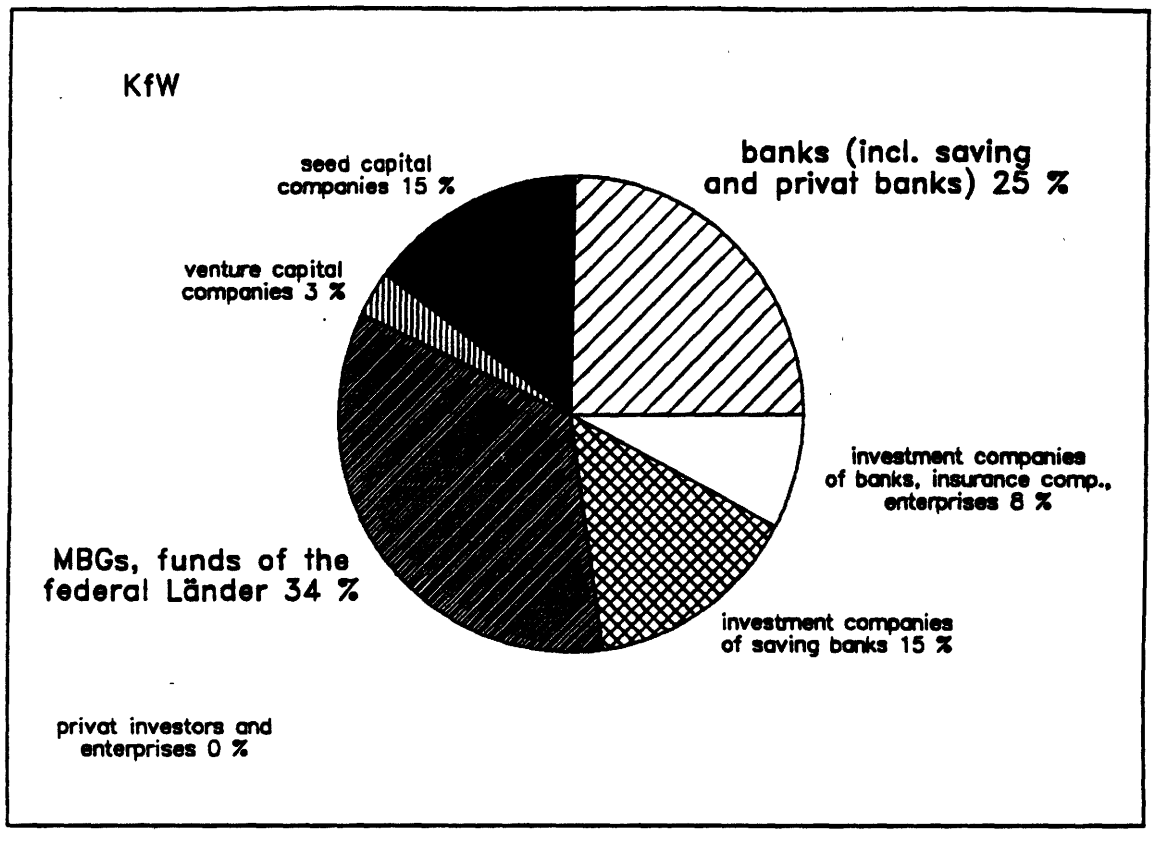
Market potential for the innovative products:

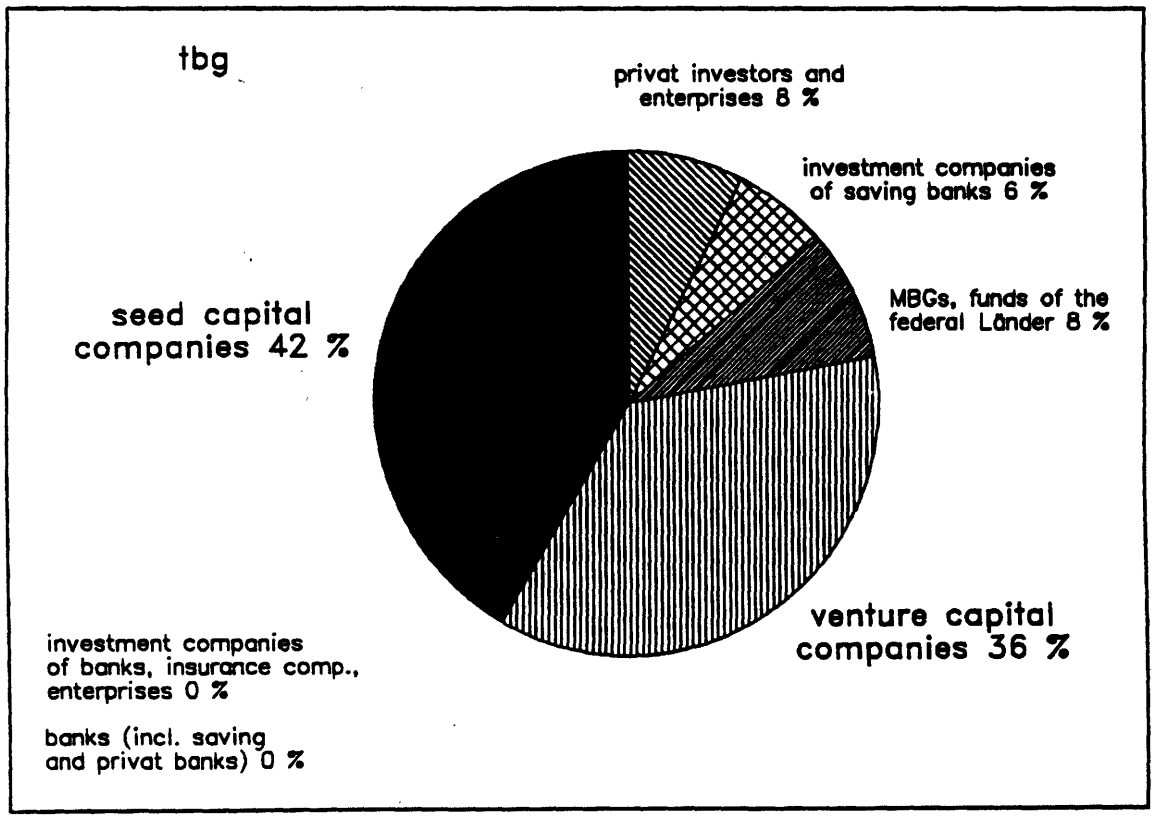
- o special advantages in technological competition
- o market potential to growth and to achieve a stable market position
- o strategies to overcome market barriers
- o potential to create a competitive portfolio of products and services

Financial status of the NTBF:

- o role of the participation: fresh money to finance R&D and market entry/penetration expenditures vs. removal of current financial gaps
- o realistic planning of the expected financial requirements
- o financial reserves for unexpected expenditures

Grants by different types of investment companies in both models (concerning the amount of investments)





COUNTRY Germany

Name of Scheme: Pilot scheme for New Technology-Based Firms: TOU (Technologie-Orientierte Unternehmensgründungen)

I. DESCRIPTION OF SCHEME

I.a. General information

Type: (do not fill in)

Reference to legal basis: (white paper, act, public document)

Richtlinie

In operation since:	*Life of the Scheme:*	*Previous Schemes:*
beginning 4/83	end 31-12-88	Promotion of the Deutsche Wagnis Finanzierungs-gesellschaft (Support of German venture-capital firms)

Stated goals of the scheme: TOU is a 'learning program'. Aims are: To find out:

- How to achieve a climate favourable to foundation and innovation of NTBF,
- problems and demands of NTBFs in their first stages of development,
- qualified consultancy and assistance services for NTBFs,
- financial aid to improve the start up and growth for NTBFs,
- how can risk capital be stimulated to finance NTBFs,

» what are suitable instruments / measures to promote NTBFs.

- Stimulation of starting of NTBFs and supporting founders of NTBFs,
- improvement of conditions of start-up and growth for NTBFs,
- stimulation of consulting activities; risk capital market, technology transfer,
- improvement of environmental conditions for NTBFs.

Have the goals been changed during the implementation of the scheme: --

Relation with other programmes: (is this scheme part of a programme or initiative)

Geographical coverage: National scheme.

6 regions, Berlin, Hamburg, Ruhrgebiet, Saarland, Karlsruhe/Pfalzheim, Ost-Bayern.
15 technology centres
National: Biotechnology-, micro-electronics and Risk capital variant

Entity responsible for the budget:

Federal Ministry for R&D (BMFT)

Entity responsible for implementation:

8 Technology consultancy agencies (Technologieberatungsstellen tbs)

Name of Scheme: TOU Germany

I.b. Target group

What is the target group:

NTBFs that started less than 3 years ago.

Specific requirements for participation in this scheme:

-Size (turnover, employees)	less than 10 employees
-sectors, branches	
-technology	
-age/investment stage	company not more than 3 years old, seed + start-up stage
-specific problems	
-geographical aspects	region of the 8 tbs (6 regions)
-others	located in one of the 15 technology-centres
	national: - biotechnology / micro-electronics - commitment of a risk-capital company.

Other selection criteria:

- innovative products, processes or services, based on new or advanced technology, or improved new product based on new technology.
- viability
- 50% share of the starter,
  25% share of the starter with technological know-how.

Other promoted activities: (examples: consultancy in definition of product, securing intellectual property rights, business plans, management training, etc.)

see type of support

Name of Scheme TOU Germany

I.c. Organization and Implementation

What is supported?
Type of activities supported:

Maximum / minimum amounts per project or action and/ or reimbursement:

Stage I: Financial support for contracts with experts who help to develop a business plan
(up to Dm. 60.000)

Stage II: Non-reimbursble grants for finance of the development costs,
(to a maximum of 750.000; 75% of max. 1 Mln Dm. R&D costs)

Stage III: Guarantees for bank loans to finance the cost of the production facilities and introduction on the market.
(maximum 80% of up to 1 Mln. Dm)

Type of support:

Organization and structure: (describe briefly how the scheme works, the actors involved, how they reach the target group).

The pilote scheme was carried out via 5 regionally active technological consultancy agencies, two techn. oriented management agencies, 15 selected technology and incubator centres and via investment companies.
The consultancy agencies were responsible for selection and consulting of the NTBFs that were promoted.

Total cost over the lifetime of the scheme

210.157 000 DM

Expenditure per year

1983	598	x 1000 DM
84	9.571	
85	25.553	
86	39.841	
87	43.401	
88	37.970	
89	37.979	
90	27.120	
91	10.890	
92	8.640	

Other budgetary information

Name of Scheme: TOU Germany

II. RESULTS

Number of firms involved	*Observations*
(Cumulative over period 1983 - 1988) **overview dated 31-12-1991** Stage I 258 firms; 106 only this stage. stage II 373 stage III 97 (14 of which not in stage II)	Stage I 7,6 mln. DM involved stage II 240,2 Mln. DM subsidies (319) 5,3 Mln. DM guarantees (54) stage III 90,9 Mln. DM
Other measurements of results (per year) Relevenace of various ways to enter the scheme, in % participating NTBFs. see appendix.	
Bottlenecks	

III. EVALUATION OF RESULTS

Evaluator:

Brief summary of results of the evaluation such as failure rate, economic effects, etc:

failure rates (by the end of)	'87	88	89	90	91
number of firms with completed development phase	113	163	243	281	317
of which: succesfull	87%	83%	81%	77%	74%
change of activitites or base-line existence	8%	8%	8%	12%	12%
stopped	5%	9%	11%	11%	14%

COUNTRY Germany

Name of Scheme: Foundation of NTBF's and incubator- and technology centres, in the new Länder (TOU-NBL.) PILOTE SCHEME

I. DESCRIPTION OF SCHEME

I.a. General information

Type: (do not fill in)

Reference to legal basis: (white paper, act, public document)

Richtlinie

In operation since:	*Life of the Scheme:*	*Previous Schemes:*
1991	1994	

Stated goals of the scheme:

- promotion of NTBF's
- development of an efficient structure (environmental) supporting NTBF's
- stimulation of regional technology centres
- development and testing of different activities for the promoting of NTBF's in the specific situation of the new Länder
- stimulation of 'learning-effects' of the different actors.

Have the goals been changed during the implementation of the scheme: (describe changes through evaluation and learning process)

Relation with other programmes: (is this scheme part of a programme or initiative)

Geographical coverage: (national, regional)

New Länder

Entity responsible for the budget:

Bundes Ministerium für Industrie (Federal Ministry for Industry)

Entity responsible for implementation:

VDI/VDE Technologiezentrum Berlin (Technology centre Berlin)

The pilot scheme is also carries out by the VDI/VDE. Cf. TOU

Other information on the scheme CF TOU-scheme Germany
no more pages

COUNTRY Baden-Würtemberg Germany

Name of Scheme: Promotion of technology oriented start ups

I. DESCRIPTION OF SCHEME

I.a. General information

Type: Regional program by Bundesland Baden-Würtemberg		
Reference to legal basis: Guideline from Ministry of Industry, Trade, and Technology, for the adjudgement of prizes for the development of new products and processes. according to the Innovation-support program. + Guideline from Ministry for ITT for restructuring of firms. Regulation of the Mittelständische Beteiligungsgesellschaft (MBG BAWÜ) and the Burgschaftsbank Baden-Würtemberg		
In operation since:	***Life of the Scheme:***	***Previous Schemes:***
Stated goals of the scheme: - increasing the numbers of companies that use new technologies - stimulation of start-ups of NTBF's - creation of qualified jobs		
Have the goals been changed during the implementation of the scheme **(changes through evaluation and learning process)**		
Relation with other programmes: (is this scheme part of a programme or initiative)		
Geographical coverage: (national, regional) Baden-Würtemberg		
Entity responsible for the budget: ***Entity responsible for implementation:*** Ministry of Industry, Trade and Technology Ba-WÜ.		

Name of Scheme: Promotion of technology oriented start-ups, BA-WÜ, Germany

I.b. Target group

What is the target group: Starters of companies, which use new technologies
Specific requirements for participation in this scheme: ***-Size (turnover, employees)*** ***-sectors, branches*** ***-technology*** ***-age/investment stage*** - new start-up ***-specific problems*** - investment in - acquisition of a company to introduce new technologies ***-geographical aspects*** ***-others*** - consolidation of the company within 5 years.
Other selection criteria:
Other promoted activities: (examples: consultancy in definition of product, securing intellectual property rights, business plans, management training, etc.)

I.c. Organization and Implementation

What is supported? ***Type of activities supported:*** ***Maximum / minimum amounts per project or action and/ or reimbursement:*** - loans up to 1 Mln. Dm. by Landeskreditbank - investmentcapital up to 300.000 Dm. by MBG bank - guarantees for loans
Type of support: (to NTBF) - grants for development of new products/processes (according to the innovation stimulation program) up to 50% of R&D costs - loans up to 15% of the investments-costs concerned with the use of new technologies, according to the promotion of new technologies scheme.
Organization and structure: (describe briefly how the scheme works, the actors involved, how they reach the target group).

COUNTRY State of Berlin, Germany

Name of Scheme: Promotion by Innovationfund

I. DESCRIPTION OF SCHEME

I.a. General information Berlin/FRG

Type: (do not fill in)
Reference to legal basis: (white paper, act, public document) § 264 st6B, § 2,4 Subventionsgesetz § 1 Landessubventionsgesetz

In operation since:	***Life of the Scheme:***	***Previous Schemes:***
15 - 7 - 1991		

Stated goals of the scheme:

- strenghten ability of innovation in Berlin's SMEs
- help carry risk by risk capital

Geographical coverage: (national, regional)

Berlin

Entity responsible for the budget:

Berliner Industriebank AG

Entity responsible for implementation:

I.b. Target group

What is the target group:

SME's & NTBF's

Specific requirements for participation in this scheme:

-Size (turnover, employees)	< 50 MLn. DM/year turnover
-sectors, branches	
-technology	new technology
-age/investment stage	
-specific problems	
-geographical aspects	
-others	

Other selection criteria:

Eventually no promotion if Federal promotion available

Other promoted activities: (examples: consultancy in definition of product, securing intellectual property rights, business plans, management training, etc.)

Eventually advice

Name of Scheme: Promotion by Innovationfund

I.c. Organization and Implementation

What is supported?
Type of activities supported:

all

Maximum / minimum amounts per project or action and/ or reimbursement:

Type of support:

Investment, loan, subsidy (evtl. backpayable) or combination of these.

GREECE

COUNTRY Greece

Name of Scheme: PAVE (PAVE A, PAVE B)

I. DESCRIPTION OF SCHEME Programme for the advancement of Industrial Research (and Innovation)

I.a. General information

Type:		
Reference to legal basis: (white paper, act, public document) Presidential Decree 558/85 modified and complemented by P.D. 434/88		
In operation since: 1985/88	***Life of the Scheme:*** on going	***Previous Schemes:***
Stated goals of the scheme: Increase the share of business enterprises in the national R&D effort Improve liquidities in firms spending money for R&D, and encourage them to exploit new knowledge or assimilate imported knowledge		
Have the goals been changed during the implementation of the scheme: (describe changes through evaluation and learning process) The scheme started in 1985 and focussed on industrial R&D promotion. In 1988-89 a segment on innovation (prototype construction and testing, marketing studies) was added.		
Relation with other programmes: (is this scheme part of a programme or initiative) Since 1992 it is part of the operational programme for research and technology, funded under the Common Support Framework (DG XVI)		
Geographical coverage: National		
Entity responsible for the budget: General Secretariat for Research & Technology ***Entity responsible for implementation:*** idem		

Name of Scheme: PAVE (PAVE A, PAVE B)

I.b. Target group

What is the target group: Productive entreprises (private or public)
Specific requirements for participation in this scheme: ***-Size (turnover, employees)*** ***-sectors, branches*** ***-technology*** ***-age/investment stage*** ***-specific problems*** ***-geographical aspects*** ***-others***
Other selection criteria: Serious working team Viable company Quality of the project Cost/utility (rough ratio)
Other promoted activities: (examples: consultancy in definition of product, securing intellectual property rights, business plans, management training, etc.) Entreprises may sub-contract their project (or part of it) to a public researcch centre or to a university laboratory.

Name of Scheme PAVE

I.c. Organization and Implementation

What is supported?
Type of activities supported:

Personnel employed in the project, running costs
small equipment, subcontracting to universities or consultants

Maximum / minimum amounts per project or action and/ or reimbursement:

Formally none
In practice the public contribution does not exceed 40 million drachmae. The average contribution is 10 to 15 million drachmae.

Type of support:

Subsidy given in 2 parts (at the beginning and at the middle of the 2-year project). A letter of guarantee from a bank is given by the company to the Ministry at the beginning of the project. The guarantee is equivalent to 20% of the public contribution. Is returned to the company after finishing the project.

Organization and structure: (describe briefly how the scheme works, the actors involved, how they reach the target group).

Call for proposals - evaluation of proposals through expert committees - approval by Minsterial decision - funding - monitoring (weak) - acception of deliverables.

Total cost over the lifetime of the scheme	***Expenditure per year***
approx. 3500 million dr.	approx. 500 million dr.

Other budgetary information

Name of Scheme: PAVE

II. RESULTS

Number of firms involved	*Observations*
1988 80 *1989* 100 *1990* 100 *1992* 150	
Other measurements of results (per year) A specific ex-post evaluation study is under implementation by an external consultant	
Bottlenecks The evaluation - approval procedure last more than 12 months	

III. EVALUATION OF RESULTS

Evaluator: *Brief summary of results of the evaluation such as failure rate, economic effects, etc:*

COUNTRY Greece

Name of Scheme: Law 1892/90 on modernisation and development

I. DESCRIPTION OF SCHEME

I.a. General information

Type:		
Reference to legal basis: (white paper, act, public document) Act 1892/90		
In operation since: 1990	***Life of the Scheme:*** 2 years	***Previous Schemes:*** L.1262/82, L.1360/83
Stated goals of the scheme: Promote the investment in Greece, and regional development		
Have the goals been changed during the implementation of the scheme: (describe changes through evaluation and learning process) All the beginning emphasis was given to direct subsidies and to the creation of new jobs (1982). Later, effectiveness/efficiency of the investment became more important than new jobs. Since 1990 only hi-tech investments are subsidezed, the other are given tax incentives.		
Relation with other programmes: (is this scheme part of a programme or initiative) Subsidies are supported through the Common Support Framework for Greece.		
Geographical coverage: National		
Entity responsible for the budget: Ministry of National Economy ***Entity responsible for implementation:***		

Name of Scheme: Law 1892/90

I.b. Target group

What is the target group: Potential investors, productive firms undergoing modernisation
Specific requirements for participation in this scheme: to qualify for subsidy as hitec ***-Size (turnover, employees)*** ***-sectors, branches*** ***-technology*** products and services produced ***-age/investment stage*** ***-specific problems*** ***-geographical aspects*** only hi-tec producing firms qualify for subsidies in Athens, Thessaloniki ***-others***
Other selection criteria: Three groups of criteria are used to qualify as hitec: - age of the product or service in the international market - international organisation of the company to support hitec (R&D department, personnel) - marketing etc. capabilities of the firm
Other promoted activities: (examples: consultancy in definition of product, securing intellectual property rights, business plans, management training, etc.) Most investors use private consultants for drafting the application forms

Name of Scheme Law 1892/90

I.c. Organization and Implementation

What is supported?
Type of activities supported:

Construction of facilities, equipment acquisition and start up

Maximum / minimum amounts per project or action and/ or reimbursement:

The percentage of grant, varies according to the region: Athens and Thessaloniki < 30% of the total cost. In remote regions, it may theoretically go up to 65%. In practice does not exceed 50%. Minimum own participation varies between 40% and 15%.

Type of support:

Grant, a percentage of the investment, provided by the Ministry. The grant is combined to bank loans and own financial participation.

Organization and structure: (describe briefly how the scheme works, the actors involved, how they reach the target group).

The Minister of National Economy and an Advisory Committee decide on major investments. Smaller investments are 'admitted' by the regional services of the Ministry or by the EOMMEX (small & medium Entreprises and Handcrafts). In order to be admitted as hitec in the scheme, the application is evaluated by a committee of experts (mainly university professors) of the Gen. secretariat for Research and Technology

Total cost over the lifetime of the scheme	***Expenditure per year***
only for the hitec approvals for further consideration 73 billion Dr (1983-1992) includes loans, subsidies and own participation of the investor	7,3 bill. dr. min 1,6 (1985) max 14,8 (1989)
Other budgetary information	

Name of Scheme: Law 1892/90

II. RESULTS

Number of firms involved	*Observations*
	financial means involved (volume of the investment)
1988 42	
1989 33	
1990 18	1988 14
1991 7	1989 15
1992 36	1990 11
	1991 2,3
	1992 8,5 billion drachmae
Other measurements of results (per year)	

Bottlenecks

Long last evaluation procedure. Evaluators are university professors with little or no business experience (in 'hitec' investments)
No managerial or other assistance is provided to investors - monitoring is very poor. Public funding comes late, for small new investors.

III. EVALUATION OF RESULTS

Evaluator:

Brief summary of results of the evaluation such as failure rate, economic effects, etc:

No formal evaluation is made up to date.
An estimation of the participation of hitec on the total budget allocations (approvals of subsidies) for the period 1983-1987 (spring) has shown that hitec receives less than 1% of the approvals.

COUNTRY Greece

Name of Scheme: Venture capital companies

I. DESCRIPTION OF SCHEME

I.a. General information

Type:		
Reference to legal basis: (white paper, act, public document) Law 1775/1988		
In operation since: 1988	***Life of the Scheme:*** 4 years	***Previous Schemes:***
Stated goals of the scheme: Create a regulatory environment for the operation of venture capital companies. Provide for public subsidies to these companies.		
Have the goals been changed during the implementation of the scheme: (describe changes through evaluation and learning process)		
Relation with other programmes: (is this scheme part of a programme or initiative) Law 1262/82 modified by law 1892/90.		
Geographical coverage: National		
Entity responsible for the budget: Min. of National Economy ***Entity responsible for implementation:*** " " "		

Name of Scheme: Venture Capital Companies

I.b. Target group

What is the target group: at 1st level: V.C. companies at end: entreprises investing in high technology and innovation
Specific requirements for participation in this scheme: ***-Size (turnover, employees)*** for V.C. companies: total stock 500 million drachmae (1ECU = 265 dr. approx.) ***-sectors, branches*** ***-technology*** high tech firms: small/new ***-age/investment stage*** ***-specific problems*** ***-geographical aspects*** ***-others***
Other selection criteria: For the proposed investment: hitec products or services, appropriate organisation of the firm (R&D personnel, R&D support services, marketing services).
Other promoted activities: (examples: consultancy in definition of product, securing intellectual property rights, business plans, management training, etc.) Every V.C. company is free to organise the support to companies "subsidised"

Name of Scheme Venture Capital Companies

I.c. Organization and Implementation

What is supported? ***Type of activities supported:*** Provision of Venture capital for participation in the stock capital or loans to hi-tec or "innovative" firms ***Maximum / minimum amounts per project or action and/ or reimbursement:*** The V.C. company is allowed to participate in hitec firms for a max. of 20% of its stock capital by firms. (If the stock capital is 500 million drs the max. participations is 5).
Type of support: The Min. of National Economy subsidises 30% of the participation of V.C. companies in NTBFs (or the corresponding in loans)
Organization and structure: (describe briefly how the scheme works, the actors involved, how they reach the target group). Decision by the Ministry of National Economy for the subsidy to the V.C. company. The General Secretariat for Research and Technology evaluates the investment to be supported, and gives its opinion to the Ministry of National Economy

Total cost over the lifetime of the scheme	***Expenditure per year***
Other budgetary information	

Name of Scheme: Venture Capital Companies

II. RESULTS

Number of firms involved *1988* *1989* *1990* *1991*	*Observations*
Other measurements of results (per year)	
Bottlenecks The scheme is considered as too "bureaucratic" by venture capitalists. Two or three V.C. companies have been created since 1988, with no reference to the L.1775/88. Only one has applied for subsidies of the Law. The 2 new ventures supported are not in hitec areas.	

III. EVALUATION OF RESULTS

Evaluator: *Brief summary of results of the evaluation such as failure rate, economic effects, etc:*

SPAIN

COUNTRY Spain

Name of Scheme: Joint Research Projects

I. DESCRIPTION OF SCHEME

I.a. General information

Type:		
Reference to legal basis: (white paper, act, public document) Spanish Law for the Fostering and Coordination of Technical and Scientific Development		
In operation since: 1978	***Life of the Scheme:*** No limit	***Previous Schemes:***
Stated goals of the scheme: To improve joint research between Spanish companies and Spanish universities and Public Research Centers.		
Have the goals been changed during the implementation of the scheme: (describe changes through evaluation and learning process) Also private research centers have been elegible for these projects.		
Relation with other programmes: (is this scheme part of a programme or initiative) Related to the National Plan of Research and Development		
Geographical coverage: National		
Entity responsible for the budget: General Secretariat for National Plan of Research and Development ***Entity responsible for implementation:*** CDTI		

Name of Scheme: Joint Research Projects

I.b. Target group

What is the target group:

Companies established in Spain who want to do research in a technology still far from the marktet ,
and subcontracting R&D facilities.

Specific requirements for participation in this scheme:

-Size (turnover, employees)
-sectors, branches
-technology Must be of scientific interest and promise good
-age/investment stage future performance in the market
-specific problems
-geographical aspects
-others

Other selection criteria:

- Better technical performance that the State of the Art
- Good market possibilities
- Financial soundness of the company
- Capable management team to reach success
- Good scientific level of the research team

Other promoted activities: (examples: consultancy in definition of product, securing intellectual property rights, business plans, management training, etc.)

Property rights are secured through a new type of scheme called Technology Promotion Projects

Name of Scheme Joint Research Projects

I.c. Organization and Implementation

What is supported?
Type of activities supported: R&D expenditures and Investments

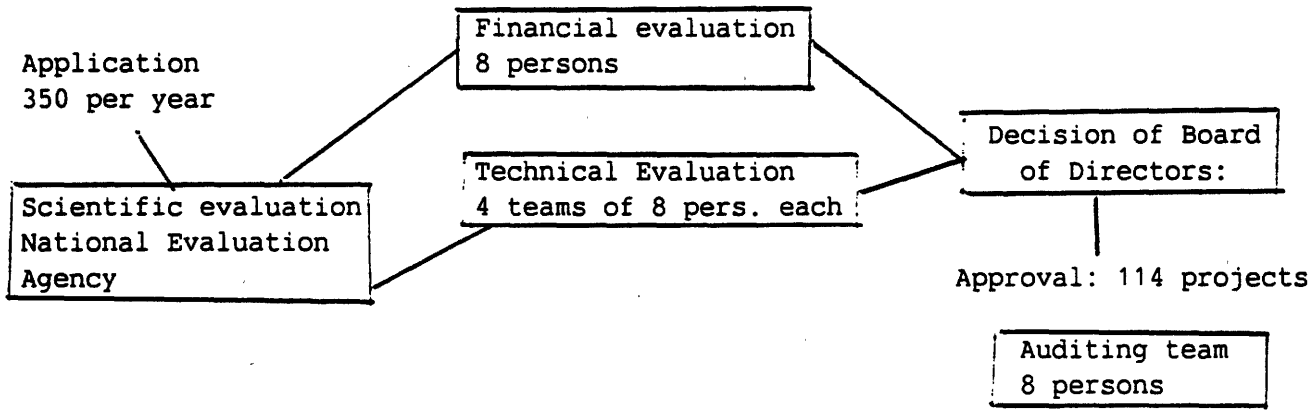
Maximum / minimum amounts per project or action and/ or reimbursement:

No maximum or minimum fixed
Average budget per project: 0,83 MECUS (million ECUS)
Loan of CDTI: 0, 36 MECUS (43% of total budget)

Type of support:

- Interest free loans
- No guarantees required
- Technical risk shared with the company (in case of technical failure, CDTI would receive only the proportional amount lent, of the sold project assets.

Organization and structure: (describe briefly how the scheme works, the actors involved, how they reach the target group).



Total cost over the lifetime of the scheme	***Expenditure per year*** (1992 data)
Total loans (1987-1992): 112 MECUS Total loans commited by CDTI period (87/920: 202, 8 MECUS	Expenditure: 31,6 MECUS Committed: 31,6 MECUS

Other budgetary information

Name of Scheme: Joint Research Projects

II. RESULTS

Number of projects: Loans			*Observations* total amounts in R&D and Investements in Spain:
1988	76	34,4	1988 68
1989	124	41,4	1989 91,1
1990	129	47,2	1990 111,3
1991	114	41,7	1991 100,8
1992	109	31,6	1992 81,3 MECUS
		MECUS	
Other measurements of results (per year)			
Bottlenecks			

III. EVALUATION OF RESULTS

Evaluator: It is early to evaluate because a standard project last about 5 years

Brief summary of results of the evaluation such as failure rate, economic effects, etc:

COUNTRY Spain

Name of Scheme: Development projects

I. DESCRIPTION OF SCHEME

I.a. General information

Type:		
Reference to legal basis: (white paper, act, public document) Spanish Law for the Fostering and Coordination of Technical and Scientific Development		
In operation since: 1978	***Life of the Scheme:*** No limit	***Previous Schemes:***
Stated goals of the scheme: To improve the number and quality of the technologies developed by companies established in Spain.		
Have the goals been changed during the implementation of the scheme: (describe changes through evaluation and learning process) We have changed the target technology sectors as the general conditions of the industry have changed. Technology rights protection is being promoted more actively.		
Relation with other programmes: (is this scheme part of a programme or initiative) This scheme is under the initiative of the Spanish Ministry of Industry, Commerce and Tourism, called PATI (Working Plan on Technology and Industry)		
Geographical coverage: National		
Entity responsible for the budget: CDTI ***Entity responsible for implementation:*** CDTI		

Name of Scheme: Developments projects

I.b. Target group

What is the target group:

Companies established in Spain and with R&D facilities in this country.

Specific requirements for participation in this scheme:

-Size (turnover, employees)	
-sectors, branches	
-technology	Must be new in Spain
-age/investment stage	Investment must be done after aproval
-specific problems	
-geographical aspects	
-others	

Other selection criteria:

- Better technical performance that the State of the Art
- Good market possibilities
- Financial soundness of the company
- Capable mangement team to reach success

Other promoted activities: (examples: consultancy in definition of product, securing intellectual property rights, business plans, management training, etc.)

Property rights are secured through a new type of scheme called Technology Promotion Projects

Name of Scheme Development projects

I.c. Organization and Implementation

What is supported?
Type of activities supported:

R&D expenditures and Investments

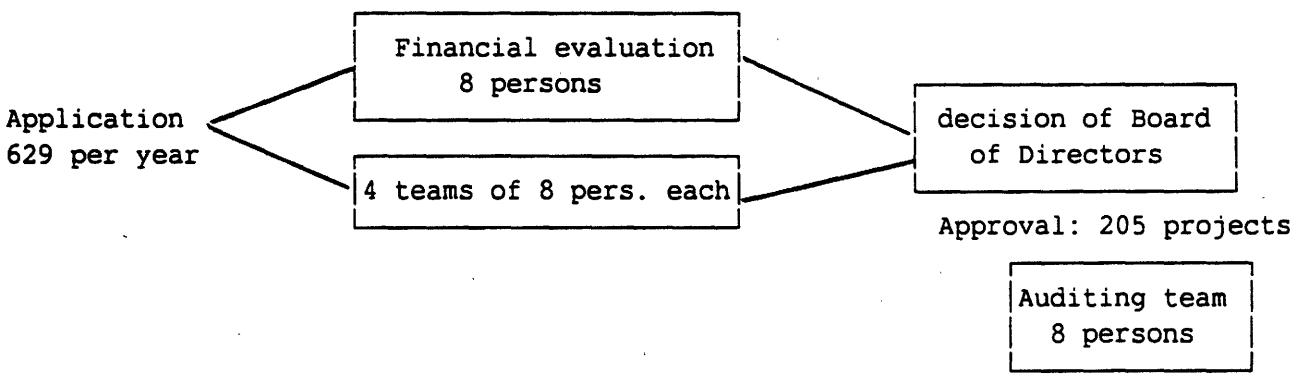
Maximum / minimum amounts per project or action and/ or reimbursement:

No maximum or minimum fixed
Average budget per project: 1,08 MECUS
Loan of CDTI: 0,4 MECUS (37% of total budget)

Type of support:

- Soft loans: half the zero-risk rate of Spanish market
- No guarantees required
- Technical risk shared with the company (in case of technical failure, CDTI would receive only the proportional amount lent, of the sold project assets.

Organization and structure: (describe briefly how the scheme works, the actors involved, how they reach the target group).



Total cost over the lifetime of the scheme

Total loans (1978-1992): 426 MECUS
Total loans commited by CDTI
period (78/92): 649,9 MECUS

Expenditure per year

Expenditure: 58,4 MECUS
Committed: 82,1 MECUS

Other budgetary information

Total investment in projects (1978-1992): 1.741 MECUS

Name of Scheme: Development projects

II. RESULTS

Number of projects:		*Loans*	*Investment*
1978/83	176	31,8	58,7
1984/88	662	196	744,5
1988	140	68,3	193
1989	160	73,29	227,2
1990	178	79,7	226,4
1991	205	86,8	235,5
1992	222	82,1	248,6
		MECUS	**MECUS**

Observations Total amount of the firms's investments	
1978-83	58,7
1984-88	744,5
1988	193
1989	227,2
1990	226,4
1991	235,5
1992	248,6

Other measurements of results (per year)

Bottlenecks

III. EVALUATION OF RESULTS

Evaluator: Annual reports of CDTI (evaluation until 1991)

Brief summary of results of the evaluation such as failure rate, economic effects, etc:

- Failure rate: Real failure rate: 1,1%
  Estimated failure rate: 12,3%

- Total investment in R&D (companies + CDTI)

  34,556 MPtas in 1992 = 248,6 MECUS ,
  7,6% of the total investment in R&D in Spain

COUNTRY Spain

Name of Scheme: PLAN TECNOLOGICO - VALENCIA

I. DESCRIPTION OF SCHEME

I.a. General information

Type:		
Reference to legal basis: (white paper, act, public document) Resolution of local government		
In operation since: 1/1/93	***Life of the Scheme:*** 31/12/97	***Previous Schemes:*** Several R&D support Programmes
Stated goals of the scheme: Increase capacity of firms to incorporate: -existing technologies -development of new technologies -new products and processes		
Have the goals been changed during the implementation of the scheme: (describe changes through evaluation and learning process) Earlier programmes concentrated on firms which already did R&D. The Plan Tecnologico covers all type of firms.		
Relation with other programmes: (is this scheme part of a programme or initiative)		
Geographical coverage: Comunidad Valenciana		
Entity responsible for the budget: Consejeria de Industria, Comercio y Turismo de la Generalidad Valenciana through IMPIVA (Instituto de la Pequena y Mediana Industria Valenciana) ***Entity responsible for implementation:*** IMPIVA		

Name of Scheme: PLAN TECNOLOGICO

I.b. Target group

What is the target group: SMEs of the Comunidad Valenciana
Specific requirements for participation in this scheme: ***-Size (turnover, employees)*** 250 ***-sectors, branches*** all ***-technology*** all but special attention to emerging technologies ***-age/investment stage*** ***-specific problems*** ***-geographical aspects*** Comunidad Valenciana ***-others***
Other selection criteria: Previous experience with R&D; innovating characteristics of the project, effect on the industrial environment of the region.
Other promoted activities: (examples: consultancy in definition of product, securing intellectual property rights, business plans, management training, etc.) Support and advice in product design; intellectual property rights and patents; management support and training of R&D personnel.

Name of Scheme

I.c. Organization and Implementation

What is supported?
Type of activities supported: acquisition of R&D equipment, contracting technical personnel, external technical advice, acquisition of licences and patents, collaboration with research institutions and Universities.

Maximum / minimum amounts per project or action and/ or reimbursement:
Programmed basic research: up to 50% of investment
Programmed applied research: up to 25% of investment
In addition: another 10% if the firm is an SME
another 10% if the project is linked to an European project

Type of support:
Grants as described above

Organization and structure: (describe briefly how the scheme works, the actors involved, how they reach the target group).
Step 1: IMPIVA makes a technical assessment of the project and a proposal to the Permanent Committee of the Plan.
Step 2: The Permanent Committee of the Plan approves or rejects the project and proposes a level of support to IMPIVA.

Total cost over the lifetime of the scheme	***Expenditure per year***
4.000 Million Pesetas for 4 years	1.000 Million Pesetas per year

Other budgetary information

Name of Scheme: PLAN TECNOLOGICO

II. RESULTS

Number of firms involved	*Observations*
1988 150 firms in the period 1988-1991 *1989* *1990* *1991*	The aims achieved are the strengthening of 150 firm which incorporate R&D systematically and the strengthening of the relation between firms and Universities
Other measurements of results (per year) - 20 firms launched new products. - creation of new activities and sectors	
Bottlenecks Problems related to the financing of firms. The banking system is reluctant to support long term projects and charges high interest rates	

III. EVALUATION OF RESULTS

Evaluator:

Brief summary of results of the evaluation such as failure rate, economic effects, etc:
- 8 companies had to close their activities due to financial problems
- 10% of the firms did not finish the R&D project
- Increased investment in the region
- Employment in the group of firms has slightly increased.

FRANCE

COUNTRY France

Name of Scheme: Aide à la création d'entreprises innovantes

I. DESCRIPTION OF SCHEME

I.a. General information

Type: (do not fill in)		
Reference to legal basis: (white paper, act, public document) Decree July 13, 1979		
In operation since: 1983	***Life of the Scheme:*** 10 years	***Previous Schemes:***
Stated goals of the scheme: Assistance to creation of new innovative businesses particularly technology - based firms: - by funding preparation phase (business plan) - by funding product of process innovation		
Have the goals been changed during the implementation of the scheme: (describe changes through evaluation and learning process) No		
Relation with other programmes: (is this scheme part of a programme or initiative) The scheme is part of Programme for Promotion and Support of INNOVATION and TECHNOLOGY in Industry. With a financial tool : "Aide à l'Innovation"		
Geographical coverage: (national, regional) National		
Entity responsible for the budget: ANVAR ***Entity responsible for implementation:*** ANVAR		

Name of Scheme: Aide à la création d'entreprises innovantes

I.b. Target group

What is the target group: Technology - based firms aged ‹ 3 or individual's project
Specific requirements for participation in this scheme: ***-Size (turnover, employees)*** no size requirements   ***-sectors, branches*** all   ***-technology*** all   ***-age/investment stage*** 0 - 3 years old   ***-specific problems*** none   ***-geographical aspects*** none   ***-others*** none
Other selection criteria:
Other promoted activities: (examples: consultancy in definition of product, securing intellectual property rights, business plans, management training, etc.)   * innovation support services: All consultancy needed for the development of new innovative firms: - market studies   - value analysis   - intellectual property rights   - management of technology   - design   - partner search   - feasibility studies   - information on technology   - business plan   * technology transfer   * R&D support

Name of Scheme Aide à la création d'entreprises innovantes

I.c. Organization and Implementation

What is supported? Business preparation phase and technical development of product or process ***Type of activities supported:*** - consultancy - R and D ***Maximum / minimum amounts per project or action and/ or reimbursement:*** Variable amount of financial support as required by the project: business plan : 300 KFF (50.000 ECUS) - grant and/or R and D : > 300 KFF (50.000 ECUS) - conditional loan
Type of support: Financial support provided directly to the individual or the firms - it is a grant for innovation support services - a conditional loan for R and D phase activity in a 'sharing risk' partnership - no equity funding provided
Organization and structure: (describe briefly how the scheme works, the actors involved, how they reach the target group). ANVAR is organised with 24 regional offices which are implementing the scheme - Assistance to the NTBF is directly provided by the ANVAR regional offices (review of the project, decision of financial support, follow-up)

Total cost over the lifetime of the scheme 380 MECUS	***Expenditure per year*** 1992: 45 MECUS (294,4 MFF)
Other budgetary information 21% of the ANVAR budget allocation	

Name of Scheme: Aide à la création d'entreprises innovantes

II. RESULTS

Number of firms involved	*Observations*
1988 1036 *1989* 956 *1990* 1008 *1991* 965	ANVAR invests more, per year, in less than three years old firms, than the French venture capital
Other measurements of results (per year)	

Bottlenecks

- Lack of seed capital / 2nd roundtable stage insufficient
- Under estimation of commercialization difficulties
- Misappreciation of market (over estimation)
- No clear decision by firms about what market they wish to serve

III. EVALUATION OF RESULTS

Evaluator: ANVAR and INSEE

Brief summary of results of the evaluation such as failure rate, economic effects, etc:

- 20% of new technology-based firms disappeared during the first five years compared to 44% of industrial start-up
- 20% are successful
- 32% of the NTBF have employed after 5 years, more than 20 people
- Most failures of firm's innovation projects are at the commercial stage Market is, most of the time, misappreciated
- Partnership and strategic alliances have been used by those who are growing rapidly

IRELAND

COUNTRY Ireland

Name of Scheme: Enterprise Development Programme

I. DESCRIPTION OF SCHEME

I.a. General information

Type:		
Reference to legal basis: (white paper, act, public document)		
In operation since: 1978	***Life of the Scheme:*** Open	***Previous Schemes:***
Stated goals of the scheme: Provide encouragement and assistance to (high-calibre) managers, academics and professionals to establish entrepreurial businesses. NB. This scheme is available to all types of enterprise, not just technology-based initiatives. There is no exclusively targetted scheme for NTBFs in Ireland.		
Have the goals been changed during the implementation of the scheme: (describe changes through evaluation and learning process)		
Relation with other programmes: (is this scheme part of a programme or initiative) - Higher Education Industry Co-operation Scheme (administered by EOLAS, the National Technology Agency) - Enterprises Preparation Programme (run jointly with IMI, the Irish Management Institute) - Business Innovation Centres and Business Innovation Fund		
Geographical coverage: (national, regional) National		
Entity responsible for the budget: Industrial Development Authority of Ireland (IDA) ***Entity responsible for implementation:*** IDA		

Name of Scheme: Enterprise Development Programme

I.b. Target group

What is the target group:

Mid career managers, academics and professionals wishing to set up own businesses.

Specific requirements for participation in this scheme:

-Size (turnover, employees)	- projects must be able to achieve significant scale in SME-context (sales of £1 Mln. or employment 20 persons or investment of £500K within three years.
-sector, branches	
-technology	
-age/investment stage	- operate in markets for iternationally traded goods and export services
-specific problems	
-geographical aspects	
-others	

Other selection criteria:

Other companies may be supported under the programme if they promise significant contributions to the development of an industry sector. All projects must be commercially viable.

Other promoted activities: (examples: consultancy in definition of product, securing intellectual property rights, business plans, management training, etc.)

EDP offers mentoring and a range of commercial information and analysis in addition to grants, subsidies, equity participation and loan guarantees.

Name of Scheme Enterprise Development Programme

I.c. Organization and Implementation

What is supported?
Type of activities supported:

- Pre-project expenditures (Feasibility Studies, Product Development Costs,

- Planning costs (50%) and
- Project costs (as set out below)

Maximum / minimum amounts per project or action and/ or reimbursement:

Up to 50% of project cost
Up to 65% of financial exposure

Type of support:

At project identification and preparation stage, promotors are eligible for:
- participation in Enterprise Preparation Programme seminar (6-day seminar where experienced entrepreneurs provide opportunity to discuss the practical issues an entrepreneur has to face.)
- Appointment of an experienced business-person to act as mentor
- Personal IDA project officer for advise, contacts, administration of financial inputs.
- 50% grant for costs of feasibility studies, product-development programmes.

As soon as bankable busineses proposal is prepared, IDA offers:
- Capital grants/rent subsidies, (max 45% of costs of fixed assets and/or rent,
- Employment grants up to £9000 per employee (ew job created)
- Management Development Grants up to 50% additional costs
- Convertible, redeemable, preference shares typically convertible into 10% ordinary shares of the promoting company
- Loan guarantees typically 50% of borrowing requirement of project
- Interest subsidies on loans/overdraft to bring interest costs down to 4% per year.

An IDA officer remains at disposal throughout project implementation and post start-up.

Organization and structure: (describe briefly how the scheme works, the actors involved, how they reach the target group).

- potential candidates for support are invited through a targeted marketing programme, to participate in the entreprise preparation Programme seminar.
- The EDP programme is promoted nationally by a dedicated unit of IDA.
- Financial resources are disbursed by IDA directly to client.
- Information, analysis is provided by IDA staff and an extensive network of external mentors and consultants.

Name of Scheme Enterprise Development Programme

I.c. Organization and Implementation

Total cost over the lifetime of the scheme	*Expenditure per year* currently £2,4 IR per annum
Other budgetary information	

II. RESULTS

Number of firms involved			*Observations*
	No. Projects	Assoc, Investment	Anticipated Employment
1988			
1989			
1990			448
1991	15	7	254
1992	22	11	
Other measurements of results (per year) › 350 managers supported by EDP since 1978			

Bottlenecks

- Shortage of managers willing to promote projects
- Severe lack of seed capital

III. EVALUATION OF RESULTS

Evaluator:

Brief summary of results of the evaluation such as failure rate, economic effects, etc:

- EDP stimulates a good proportion of high calibre/high growth projects,
- Historical failure rates in line with small business average

ITALY

COUNTRY Italy

Name of Scheme: Law 317

I. DESCRIPTION OF SCHEME

I.a. General information

Type:		
Reference to legal basis: (white paper, act, public document) Parliament act, law 317 of october 1991		
In operation since: april 1992	***Life of the Scheme:*** 11 months	***Previous Schemes:*** law 399 of 1987
Stated goals of the scheme: Supporting innovation and development of small firms.		
Have the goals been changed during the implementation of the scheme: (describe changes through evaluation and learning process) no.		
Relation with other programmes: (is this scheme part of a programme or initiative) The scheme is composed of several programmes covering different aspects of innovation support for SME's.		
Geographical coverage: (national, regional) National		
Entity responsible for the budget: Ministry of Industry and Commerce ***Entity responsible for implementation:*** Ministry of Industry and Commerce.		

Name of Scheme: Law 317 october 5, 1991

I.b. Target group

What is the target group:

SME's, industrial, craft and partly commercial sectors, both new and existing.

Specific requirements for participation in this scheme:

*-Size (turnover, employees)**	- small = up to 100 employees,
-sectors, branches	medium = up to 200 employees
-technology	- certain particular sectors have some extra benefits;
-age/investment stage	Higher aid intensity for firms operative in objectives 1 and 2 areas
-specific problems	
-geographical aspects	
-others	

* -in manufacturing sector: autonomous firms < 250 employees and < 25 Bln Lire fixed assets
-in service sector: operating in the field of infrastructure, industrial plants, computer & data processing, < 75 employees and < 7,5 Bln lire fixed assets
-craft sector: < 20 employees, manufacturers, and included in law 443 of 1985.

Other selection criteria:

New SME's created in one of the sectors listed by the interministerial committee for industrial policy, have 'particular' benefits under article 8.

Other promoted activities: (mezzogiorno region between brackets)

A: Research and Innovation

1) aquisition of advanced technology industrial machinery /art. 5 : tax credit, or direct contribution
2) research expenditures /art. 8

B: Counselling

3) consultancy /art. 7 : 50% (75%) subsidy, or tax credit
4) Innovation consortia /art. 17
   consortium of > 5 SME's : 30% subsidy on annual costs
5) Mixed consortium companies /art. 27
   private company and public organizations who support SME's : subsidy 50% annual expense

C: Finance and Credit

6) Participation in SME's capital /art. 2 : subsidy 50% annual increase of holding
7) aid for mutual guarantee consortia /art. 29 + 30
8) aid for participation loans /art 35

Only art. 5 has been implemented so far.

Name of Scheme Law 317 october 5, 1991

I.c. Organization and Implementation

What is supported?
Type of activities supported:

see other promoted activities
Maximum / minimum amounts per project or action and/ or reimbursement:

up to 100 employees: 25% of expenses (37,5% Obj. 1 and 2)
up to 200 employees: 20% of expenses (30% Obj. 1 and 2)

Type of support:

- firms have a choice between grants and tax credits for aquisition of advanced technology machinery.
- All other schemes within the law only grant tax credits.

Organization and structure: (describe briefly how the scheme works, the actors involved, how they reach the target group).

- The scheme is based on a form where SME's 'self-certificate' the posession of the requirements stated by the law.
- After the aid is granted by Ministry of Industry, firms have to submit documentation, proving that they were in fact eligible for the benefits. This control is carried out by the banks.

Total cost over the lifetime of the scheme	***Expenditure per year***
1,500 billion lire (1991-1993)	500 billion lire

Other budgetary information

The available money is devided as follows:
-60% to central\northern Italy
-40% for mezzo giorno regions

Name of Scheme: Law 317, october 5, 1991

II. RESULTS

Number of firms involved *1991* *1992* 8800	*Observations*
Other measurements of results (per year)	
Bottlenecks To many requests for grants (under articles) while more money is available for tax credit.	

III. EVALUATION OF RESULTS

Evaluator: ministry of Industry (report to parliament)

Brief summary of results of the evaluation such as failure rate, economic effects, etc:

The procedure based on self-certification has the advantage of being very rapid (15/20 days), but often the following control carried out by banks shows that about 15% of granted benefits have to be returned because the firms were not eligible.

NETHERLANDS

COUNTRY Netherlands

Name of Scheme: Garantieregeling PPM (Guarantee-program for private venture-capital companies)

I. DESCRIPTION OF SCHEME

I.a. General information

Type:

Reference to legal basis: (white paper, act, public document)

Letter from Ministries for Economic Affairs and Finance, to Parliament;
dated 16-9-1980
TK nr. 16.403

In operation since:	*Life of the Scheme:*	*Previous Schemes:*
1981	ends in 1995	no

Stated goals of the scheme:

- To stimulate private venture capital firms to invest in small and medium sized businesses, via equity investments, or covertible subordinated loans.
- Create conditions for the development of a mature venture-capital market.

Have the goals been changed during the implementation of the scheme: (describe changes through evaluation and learning process)

After the evaluation in 1990, focus shifted onto market segment for small SME's of the venture-capital market (i.e. smaller SME's). Requirements regarding the size of the SME in which VC companies could participate under the PPM-program shifted from ≤ 500 to ≤ 100 employees, for a concern from ≤1000 to ≤ 200 employees.

Relation with other programmes: (is this scheme part of a programme or initiative)

Initially: PPM's for investments < fl 4 Mln.
MIP (57% state) for investments > fl 4 Mln.
MIP merged in 1991 with APM into Alpinvest (30% state)

(MIP, Maatschappij voor Industriële Projecten,
Venture Company for Industrial Projects)

Geographical coverage: national

Entity responsible for the budget: Ministry for Economic Affairs (since 1992)

Entity responsible for implementation: Dutch National Bank

Name of Scheme: PPM-program

I.b. Target group

What is the target group: SME's, through private venture capital companies, investment companies.

Specific requirements for participation in this scheme:

-Size (turnover, employees) - SME ≤ 100 employees (concern ≤ 200 employes),
- max. investment per SME under guarantee fl 2,5 Mln,

-sectors, branches
-technology
-age/investment stage
-specific problems
-geographical aspects
-others

Other selection criteria:

The Dutch National Bank decides wether an investment company will be accepted as participant. Criteria:
- Max. 20% of investment company's portfolio in one single SME,
- of the company portfolio, at least:
  40% in the 3d,
  50% in the 4th, and
  60% in the 5th bookyear have to be invested in projects under the PPM programme.
- Fund must be > 1 Mln. Fl,
- Investment fund reliant on money from private sector

Other promoted activities: (examples: consultancy in definition of product, securing intellectual property rights, business plans, management training, etc.)

Name of Scheme PPM-program

I.c. Organization and Implementation

What is supported?
Type of activities supported:

Investments in SME's by private venture capital companies.

Maximum / minimum amounts per project or action and/or reimbursement:

Half of the loss on an investment will be reimbursed.
Guarantee effective: 50% during years 1-5, then declining by 10% per annum.
(Since 1988, no reimbursement will be paid within the first year after acquisition of a participation.)

Max. guarantee/annum is fl 50 Mln, which allows fl 100 Mln. investments under this scheme.
Maximum guarantee per firm is f 2,5 mln (was 4 mln before '91)

Type of support:

Financial support provided directly to investment companies.

Reducing risks for venture-capital companies to invest in SME's, in the form of equity funding or convertible soft loans. By sharing half of eventual losses in investments with the state, venture-capitalists will be more willing to invest in SME's, so problems for SME's to aquire seed- and start-up capital will be reduced.

Organization and structure: (describe briefly how the scheme works, the actors involved, how they reach the target group).

Venture capital companies apply at the Dutch National Bank to be accepted as participant in the PPM-program. Individual investments need be recongized by the DNB to make the guarantee effective.

Total cost over the lifetime of the scheme	***Expenditure per year*** (reimbursements)
'83-'92 119,2 Mln fl.	'87 5,0 Mln '88 12,1 Mln '89 23,3 Mln '90 22,3 Mln '91 20,6 Mln. '92 29,6 Mln.

Other budgetary information

in '88 a guarantee ceiling was introduced of fl 75 Mln/year
in '91 the ceiling was lowered to fl 50 Mln/year

Name of Scheme: PPM-program

II. RESULTS

Number of firms involved

	VCcy's	SME's	cumul.
1988	90	125	479
1989	99	109	588
1990	98	113	701
1991	104	75	776
1992	99	153	828

Observations

invested sum	p.annum	cumulative
1986	86,9	200,9
1987	167,7	349,7
1988	109,2	478
1989	109,8	587,8
1990/9	93,7	681,5

Mean investment 1 mln Dfl.

Other measurements of results

Distribution of height of invested sums (cumulated)

invested sum per firm:	number of firms	invested sum cum.
0 - 0,2 fl Mln.	140+ 42	13,8+ 0,6
0,2 - 0,5	213+ 26	57,9+ 8,6
0,5 - 1,0	134+ 23	92,7+ 15,8
1,0 - 2,0	94+ 27	133,5+ 35,1
2,0 - 4,0	120+ 35	383,6+ 94,8
	153	154,9

Data from evaluation 1989, results for 1992 added.

Distribution of height of invested sums, (cumulative, x fl mln.) over new and established firms: (mid 1990)

	number	invested	mean
established:	418	456,6	1,09
new firms	257	224,9	0,88
total	675	681,5	1,01

Bottlenecks

- Few investment opportunities with acceptable risk-return profile,
- entrepreneurial management support
- exits.

Name of Scheme: PPM-program

III. EVALUATION OF RESULTS

Evaluator: Ministry of Finance, Financing Directorate (1990)

Brief summary of results of the evaluation such as failure rate, economic effects, etc:

Distribution over new/established firms (mid 1990) of State expenses (losses) on participations accepted under the PPM-measure. (x fl mln.)

	invested sum by VC companies	experienced loss by State	
established firms	456,6	35,9	7,9%
new firms	224,9	23,8	10,6%
Total	681,5	59,7	8,8%

Distribution of reimbursements regarding height of invested sum: (x fl mln.)

invested sum per firm	participations under PPM-program	reimbursed	state loss %
0 - 0,2	13,8	0,9	6,5 %
0,2 - 0,5	57,9	5,2	9,0
0,5 - 1,0	92,7	6,6	7,1
1,0 - 2,0	133,5	13,3	10,0
2,0 - 4,0	383,6	33,7	8,8

In general the PPM-program is considered to have been effective with regard to the stated goals.

About 1/3 of all participations accepted under the PPM-program, lead to losses. There is little difference between small or bigger participations with regard to this.
About 34% of the loss occurs due to failure of the participations. Acquisitions that are sold at a loss are resposible for the other 66% reimbursements.

COUNTRY Netherlands

Name of Scheme: Technical Development Credit (TOK)

I. DESCRIPTION OF SCHEME

I.a. General information

Type: (do not fill in)		
Reference to legal basis: (white paper, act, public document) Regeling TOK 1991. Start 31 juli nr. 146, 1991 Start 20 aug. nr. 160, 1991		
In operation since: 1954	***Life of the Scheme:*** not restricted	***Previous Schemes:***
Stated goals of the scheme: Stimulate firms to undertake risk-bearing research and development projects.		
Have the goals been changed during the implementation of the scheme: (describe changes through evaluation and learning process) No important changes		
Relation with other programmes: (is this scheme part of a programme or initiative) TOK is one of the main technology policy programmes of the Netherlands. Others are: PBTS : Eureka (international cooperation) : collective research : IOP (institutions research)		
Geographical coverage: (national, regional) national		
Entity responsible for the budget: Ministry for Economic Affairs ***Entity responsible for implementation:*** SENTER		

Name of Scheme: Technical Development Credit (TOK), Netherlands

I.b. Target group

What is the target group:

All companies in the Netherlands below 20.000 employees.

Specific requirements for participation in this scheme:

-Size (turnover, employees)	No
-sectors, branches	No
-technology	No
-age/investment stage	No
-specific problems	
-geographical aspects	Located in the Netherlands
-others	

Other selection criteria:

A development project for a technical new product/process or service, with more than average technical and financial risks.

Other promoted activities: (beside financial support, e.g. consultancy in definition of product, securing intellectual property rights, business plans, management training, etc.)

* financial support from the scheme plus mediation for financial support from other banks, investment companies
* project-connected consultancy on property rights, project-approach, management, expertise from outside cooperation with other companies/institutes

Name of Scheme Technical Development Credit (TOK), Netherlands

I.c. Organization and Implementation

What is supported?
Type of activities supported:

development costs

Maximum / minimum amounts per project or action and/ or reimbursement:

maximum 40% of project-costs

Type of support:

Interest-bearing credit directly to firm
1. - financial support is 40% of project costs
   - loan, without securities, off balance
   - interest rate is 8%, added to the loan in the development fase
   - pay-back is based on sales after development fase

2. - consultancy › project related only

Organization and structure: (describe briefly how the scheme works, the actors involved, how they reach the target group).

- yearly fixed budget, 50 to 100 projects a year
- programme is published
- Senter is the executive organisation:
  ›10 professional project advisers, external advisory board
- two third of budget goes to comp. ‹ 500

Total cost over the lifetime of the scheme	***Expenditure per year***
2500 mln gld. Pay back ca 40%	new loans ± 130 mln gld.

Other budgetary information

Name of Scheme: Technical Development Credit (TOK), Netherlands

II. RESULTS

Number of firms involved	*Observations*
1988 requests 120, granted 68 *1989* 144 75 *1990* 94 *1991* 62 1992 56	Machine and fine mechanical and electronic ind. are important sectors. Companies up to 20 employees: important participation > 40%
Other measurements of results (per year)	
Bottlenecks In small companies: 1) management and finance 2) information/networks	

III. EVALUATION OF RESULTS

Evaluator: *Brief summary of results of the evaluation such as failure rate, economic effects, etc:*

COUNTRY Netherlands

Name of Scheme: Business Oriented Technology Promotion Programme (PBTS)

I. DESCRIPTION OF SCHEME

I.a. General information

Type: (do not fill in)

Reference to legal basis: (white paper, act, public document)

PBTS Regeling (start 1988, nr. 42, start 1991, nr. 49)

In operation since:	*Life of the Scheme:*	*Previous Schemes:*
1987	not restricted	-

Stated goals of the scheme:

Stimulate firms to do research and development in certain areas of technology
Every year the specific areas are reconsidered for which subsidies will be available

Have the goals been changed during the implementation of the scheme: (describe changes through evaluation and learning process)

No important changes

Relation with other programmes: (is this scheme part of a programme or initiative)

PBTS is an instrument in the National Technology Programs. PBTS, aimed at enterprises, together with Innovation Oriented Research Programmes (IOP's) for universities, are designed to stimulate knowledge development.

Geographical coverage:

national

Entity responsible for the budget:

Ministry for Economic Affairs

Entity responsible for implementation:

SENTER

Name of Scheme: Technology Promotion Programme (PBTS), Netherlands

I.b. Target group

What is the target group: Dutch enterprises
Specific requirements for participation in this scheme: ***-Size (turnover, employees)*** ***-sectors, branches*** ***-technology*** * biotechnology, information-technology, new materials technology, environmental technology. ***-age/investment stage*** ***-specific problems*** ***-geographical aspects*** ***-others***
Other selection criteria: research projects feasibility projects demonstration projects
Other promoted activities: (examples: consultancy in definition of product, securing intellectual property rights, business plans, management training, etc.) Knowledge diffusion and cooperation of enterprises with less than 250 employees

Name of Scheme Technology Promotion Programme (PBTS), Netherlands

I.c. **Organization and Implementation**

What is supported?	Feasibility-studies
Type of activities supported:	Research-projects (not for information technology) Demonstration-projects (not for environment. technology)

Maximum / minimum amounts per project or action and/ or reimbursement:

subsidy up to 37,5% of project-costs, to a maximum of

-for feasibility-studies	Dfl. 250.000 (or 500.00 for concerted projects)
-research projects	20% of research-budget
-demonstration-projects	Dfl. 500.000 (or 1.000.000 for concerted actions)

Type of support:

Subsidy, direct to the firm or consortium undertaking the project.
Financial support is 37,5% of project costs, such as salaries of direct personnel, material costs, investment costs, patents costs, travel costs and out of pocket costs for third parties, included an additional amount of 40% of the personnel costs for indirect activities.

Organization and structure: (describe briefly how the scheme works, the actors involved, how they reach the target group).

Yearly fixed budgets per technology theme
Programme is published yearly
Senter acts as executor
Advisory Board judges project quality and degree of innovation

Total cost over the lifetime of the scheme	***Expenditure per year***
$0,6.10^3$ mln gld	100 mln gld

Other budgetary information

Name of Scheme: Technology Promotion Programme (PBTS), Netherlands

II. RESULTS

Number of firms involved		*Observations*
	Requests	
1988	800	
1989	600	
1990	600	
1991	750	
Other measurements of results (per year)		
Bottlenecks For small enterprises: the formulation of a good project plan.		

III. EVALUATION OF RESULTS

Evaluator: *Brief summary of results of the evaluation such as failure rate, economic effects, etc:*

UNITED KINGDOM

COUNTRY United Kingdom

Name of Scheme: Small firms Merit Awards for Research and Technology (SMART)

I. DESCRIPTION OF SCHEME

I.a. General information

Type:		
Reference to legal basis: (white paper, act, public document) Science & Technology Act 1965		
In operation since: 1986	***Life of the Scheme:*** until 1994	***Previous Schemes:*** Previous SMART progr. 1986, 1988, 1989-'91
Stated goals of the scheme: 1) To stimulate small businesses to develop and market new science and technology based products 2) To encourage and facilitate the formation of viable and durable NTBFs 3) To contribute to a climate which encourages investment in highly innovative technologies by individuals and financial institutions 4) To attract private backing to meritorious but high risk projects which other wise would have remained dormant.		
Have the goals been changed during the implementation of the scheme: (describe changes through evaluation and learning process) No, but after '88 evalutation the maximum size of firms was reduced from 199 to 49, the number of awards was raised from 140 to 180, to reinstate '86 values of the rewards, maximum awards were raised from 37,5 and 50 £k to 45 and 60 £k for stage I and II respectively.		
Relation with other programmes: (is this scheme part of a programme or initiative) No, but links to other SME services provided by DTI to SME's		
Geographical coverage: national		
Entity responsible for the budget: Department of Trade and Industry (DTI) ***Entity responsible for implementation:*** DTI (England); Scottish office (Scotland); Welsh office (Wales); Dept. of Economic Development (N. Ireland)		

Name of Scheme: SMART UK

I.b. Target group

What is the target group: New, and early stage Technology Based New Firms
Specific requirements for participation in this scheme: ***-Size (turnover, employees)*** less than 50 employees ***-sectors, branches*** less than £ 10 Million turnover per year ***-technology*** * ***-age/investment stage*** ***-specific problems*** ***-geographical aspects*** UK citizens, or foreign nationals' intending to ***-others*** start a new business the in UK they win SMART I Smart II applicants must have received SMART I award to be eligible.
Other selection criteria: - Business Plan (feasibility of turning the project into a success) - Additional Accounts (if in existence over 12 months) - Evidence of rights to intellectual property - Quality and novely of the product - The need for SMART support to continu (additionality) - Qualification and experience of the people involved - Significance of the project and its potential commercial benefit to the UK
Other promoted activities: (examples: consultancy in definition of product, securing intellectual property rights, business plans, management training, etc.)

* Particularly welcomed technologies:
Manufacturing technologies (particularly computer-aided)
Materials technologies
Information Technology
Biotechnology
Environmental technology
Communications
Instrumentation and control
New Testing methods
Separation techniques
Tribology, wear and corrosion

Projects for the modernisation of traditional industry (e.g. textiles) are also welcome

Name of Scheme SMART UK

I.c. Organization and Implementation

What is supported? Type of activities supported:

Stage I: feasibility studies (limited to 150 individuals/small firms)

Stage II: development of pre-production prototypes (limited to 75 out of the 150 stage I-winners)

Maximum / minimum amounts per project or action and/ or reimbursement

75% of project costs (max. £45.000) in stage I
50% of project costs (max. £60.000) in stage II

Maximum per applicant from SMART I + II + further applications:
= 45 + 60 + 35 = £140.000

Payment in advance 1\3 of the award.
Projects are expected to be completed within 12 months.

Type of support: Non-repayable grant

Organization and structure:

1) National competition, promoted/advertised nationally
2) Regional (DTI offices)/territorial appraisal of entries.
   Allocation of 75% of the awards.
3) National allocation of the 25% reserve awards

Total cost over the lifetime of the scheme	***Expenditure per year***
SMART I + II £34 Mln. by end of 1991 £42 Mln. from 1992 for 3 years (projected)	£12 Mln. in 1991 £12.5 Mln. in 1992
Other budgetary information	

Name of Scheme: SMART UK

II. RESULTS

Number of firms involved

	STAGE I	STAGE II
1988	140	-
1989	150	80
1990	180	84
1991	180	105

Observations

The SMART scheme has become increasingly well known among technical entepreneurs and financial advisers (eg. banks).
Some observers have argued that the inability to obtain a SMART grant (which is budget constrained) is seen adversely by other potential financial sponsors of a NTBF.

Bottlenecks

Other measuresments of results

Stage I applications and awards per size of company

	1988			1989			1990		
size	appl.	awards	(% %)	appl.	awards	(% %)	appl.	awards	(% %)
1	356	29	38 21	272	26	33 17	614	44	43 24
2-5	289	44	31 31	309	53	38 35	431	57	31 32
6-24	194	42	21 30	184	51	22 35	307	66	22 37
25-49	57	22	6 16	61	20	7 13	63	13	4 7
50-99	22	1	3 1		--				
100+	12	2	1 2						

Number of stage I winners, offered less than maximum award:

1986	6	(30%)
1988	41	(29%)
1989	33	(22%)
1990	33	(18%)

In general 50% of stage I winners have also gained stage II award.

Name of Scheme: SMART UK

III. EVALUATION OF RESULTS

Evaluator: DTI Assessment Unit 1990 (assessment paper no. 13 1991)
Evaluation of results of 1986 and 1988 competition.

- Main conclusion: scheme should continue. Goals 1-3 have been achieved. Attitudes of financial institutes to investments in NTBFs have not changed (i.e. risk/rewards generally seen as unattractive at NTBF level.)
- High additionality: many projects could only proceed with SMART support. Additionality is stronger with stage I than with stage II winners.
- About 10% of 1988 winners established a firm as result of winning the award.
- Overall contribution to profits will outweigh the costs of the SMART scheme (i.e. good value for money)
- Award-winners were judged to have highly innovative projects.
- Advance payment was much appreciated by firms, mainly used to purchase equipment or hire (research) manpower.
- Successive and multiple applications were allowed, but evidence of displacement was found in companies , especially where stage I awards had been won in succesive rounds of Smart. Resources were being overstretched by trying to complete one project while getting another one of the ground in the same time.

Failure rates of 1986 winners (pilot competition, 20 awards)
8 firms ceased or are still seeking additional finance.
(2 of those won stage I + stage II award)
8 firms are in the stage of developing, pre-market introduction
(6 of them won stage I + stage II award)
4 are selling (3 won both stage I and stage II award).

About 1\4 of 1986 and 1988 winners changed their technical objectives.

Evaluation of scheme administration:
- Differences appeared in the way DTI regions appraised applications in the 1988 competition. In some regions the chance to win award is better then in others.
- Suggestion rises that regions tend to use SMART as a support scheme instead of a competition award, with a tendency to assist incremental development.
- Regional officers are not happy with 25% of awards being allocated by national managers. Evaluation team advised to continue central judgement of a reserve of 20% of the awards. Allocation of awards to a region should reflect that region's share of awards given in the previous year, including the reserve.

COUNTRY United Kingdom

Name of Scheme: Support for Products under Research (SPUR)

I. DESCRIPTION OF SCHEME

I.a. General information

Type:		
Reference to legal basis: (white paper, act, public document) Science & Technology Act 1965		
In operation since: 1991	***Life of the Scheme:*** until 1994	***Previous Schemes:*** -
Stated goals of the scheme: To encourage a larger number of smaller firms to increase R&D expenditure and to develop new products and processes to benefit the UK economy		
Have the goals been changed during the implementation of the scheme: (describe changes through evaluation and learning process) Not available; new scheme		
Relation with other programmes: (is this scheme part of a programme or initiative) Designed as an additional grant to SMART awards for SMEs, rather than new firms		
Geographical coverage: (national, regional) national (UK) excludes N. Ireland		
Entity responsible for the budget: Department for Trade and Industry (DTI) ***Entity responsible for implementation:*** DTI, Scottish office, Welsh office		

Name of Scheme: SPUR UK

I.b. Target group

What is the target group: Small and medium sized enterprises: 1e up to 500 employees
Specific requirements for participation in this scheme: ***-Size (turnover, employees)*** - Introduction of new technology into a sector - " a significant technological advance for the industry or sector nationally" ***-sectors, branches*** ***-technology*** ***-age/investment stage*** - Project should be for a minimum of 6 months and a maximum of 3 years duration. ***-specific problems*** ***-geographical aspects*** - Project could not proceed without financial tance provided by SPUR. ***-others***
Other selection criteria: Annual Accounts (x 2 years) Business Plan
Other promoted activities: (examples: consultancy in definition of product, securing intellectual property rights, business plans, management training, etc.)

Name of Scheme SPUR UK

I.c. Organization and Implementation

What is supported?
Type of activities supported:

Maximum / minimum amounts per project or action and/ or reimbursement:

30% of costs (max. grant £ 150.000)

Type of support:

Non-repayable grant.
Grant is paid directly to successful applicants in arrears (i.e. retrospectively)

Organization and structure: (describe briefly how the scheme works, the actors involved, how they reach the target group).

1) National scheme
2) Local/Regional Promotion & Advertising
3) Local Appraisal
4) National Allocation of Funds

Total cost over the lifetime of the scheme	***Expenditure per year***
£ 32 Mln. over 3 years 1991-1993	1991 - £ 270.000 1992 - £ 5 Mln. (estimated)

Other budgetary information

Name of Scheme: SPUR UK

II. RESULTS

Number of firms involved	*Observations*
1988 - *1989* - *1990* - *1991* - 1992 - 148	
Other measurements of results (per year)	
Bottlenecks	

III. EVALUATION OF RESULTS

Evaluator:

Brief summary of results of the evaluation such as failure rate, economic effects, etc:

Too early in scheme to evaluate.

ANNEX

B
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COMMISSION
OF THE EUROPEAN
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Directorate-General XIII
Information Technologies and Industries, and Telecommunications

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SPRINT/EIMS POLICY EXCHANGE WORKSHOP N° 1 ON PUBLIC MEASURES SUPPORTING NEW TECHNOLOGY BASED FIRMS

Programme

March 18

Chairman : A. Strub

9.30 h	Welcome and Introduction	A. Strub DG XIII-D
9.45 h	**Session I : Setting the Scene**	
	(1) The nature and relevance of NTBFs : their position and economic relevance in Europe	G. Murray Warwick Univ./UK
	(2) Public policies to support NTBFs in Europe : an overview of basic approaches and types of schemes	G. Fahrenkrog TNO-STB/NL
	(3) Comments	G. Bräunling DG XIII-D
11.00 h	**Coffee Break**	
11.30 h	**Session II : Indirect Schemes**	
	(4) A guarantee scheme : The Garantieregeling PPM	A.G.M. Bastiaans MEA/NL
	(5) An equity participation scheme : The BJTU scheme	H.P. Lorenzen BMFT/D
	(6) Comments	W. Stevens EVCA
13.00 h	**Lunch**	

Chairman : D. Janssens

14.30 h	**Session III : Direct and Specific Schemes**		
	(7)	The UK Grant schemes : SMART/SPUR	B. Parsons DTI/UK
	(8)	The Spanish loan scheme	L. Pozo CDTI/E
	(9)	Comments	P. Cordsen DTI/DK
15.45	**Session IV : Direct Integrated Approach**		
	(10)	ANVAR : the national integrated approach to NTBFs	J.C. Porée ANVAR/F
	(11)	The development perspective : the Entreprise Development Programme in Ireland	S. O'Reagain IDA/IRL
	(12)	Comments	G. Fahrenkrog TNO-STB/NL
17.00 h	**Session V : Fiscal Approach**		
	(13)	The Innovation company-law in Belgium	W. Degriek IRSIA/B
	(14)	The Italian Tax Scheme	A. Cagli M.O.I./I
	(15)	Comments :	Ph. Pellé DG XV/B/1
18.00 h	**Closure of the Session**		
18.30 h	**Dinner (Salon Vert)**		
	Invited speaker :		
	(16)	Forming a US technology policy : congressional and administrative interaction	R. Bradshaw Science and Technology Policy Advisor for the Clinton Presidential Campaign

March 19

Chairman : G. Bräunling

9.00 h	**Session VI : Issues of Design, Management and Evaluation of NTBF Support Schemes : Problems and Perspectives**		
	(17)	How is the target group defined ? What are effective means of programme marketing ? Introduction :	B.J.M. Giesen SENTER/NL
	(18)	How to cope with the failures of NTBFs ? Introduction :	G. Murray Warwick Univ./UK
	(19)	What are the positive and negative effects of governmental support ? Introduction :	R. Chabbal MRE/F
	(20)	How best do public and private resources cooperate in support programmes Introduction :	R. Bachelier BMFT/D
	(21)	Why and how to evaluate schemes ? Introduction :	R. Kerr DIC/IRL
11.00 h	**Coffee break**		
11.30 h	**Session VII : Community Action and Support Schemes**		
	(22)	Overview on current Community support schemes in favour in NTBF	R. Miège DG XIII-D
	(23)	The EC Seed Capital Scheme	M. Richards DG XXIII and J. Marteau DG XVI
	(24)	Venture Consort and Eurotech Capital	C. Lambert DG XVIII/1
	(25)	The BRITE/EURAM feasibility Awards	I. Saragossi DG XII/C/3
	(26)	SPRINT NTBF support measures	D. Janssens DG XIII/D/4
	(27)	Comments :	D. Deniozos M.I.E.T./GR
13.00 h	**Lunch**		

Chairman : R. Miège

14.30 h **Session VIII : Policy Perspectives :**

Tour de Table :

Future developments of
Member States Support for NTBF

General Discussion :

Trends in Policy developments at Community,
National and regional level

Introductory Statements :

(28)	Community perspectives	A. Strub
(29)	Perspectives of Member States	R. Chabbal
(30)	Regional perspectives	J.M. Ivanez

16.15 h **Concluding remarks**

16.30 h **End of Workshop**

* * *

Participants : Representatives from the Commission and from the Member States responsible for policy development, programme management, and programme monitoring and evaluation for NTBF support schemes.

Participation by invitation.

Translation : Simultaneous translation from English, French, German, Italian and Spanish into English, French and German.

Documents : All participations will receive the results of a survey on programmes to support new technology based firms in the Member States, prepared by TNO.

Venue :

1) Workshop
Commission of the European Communities
Jean Monnet Building
L-2920 Luxembourg
Room M5

2) Dinner
Jean Monnet Building
Salon Vert

* * *

EIMS

EUROPEAN INNOVATION MONITORING SYSTEM

EIMS' broad aims are to collect and disseminate information on innovation and technology transfer, and to organise a permanent and interactive system for producing and using this knowledge.

More precisely, EIMS aims at:

- Monitoring of innovation and diffusion in Europe and evaluation of support measures
- Strengthening of the exchange of experience between the member states and the Commission in the field of innovation policy and technology transfer
- Providing all interested parties with information, analysis and research on the factors shaping, promoting and inhibiting innovation at the company level across Europe
- Reflecting the increasing need for reliable information as a foundation for formulating innovation policies in the phase of the major changes in the innovation environment and especially the characteristics and different types of innovation within SMEs.

EIMS activities are organised in the six main areas:

1. Evaluation
2. Innovation in firms
3. Innovation and technology transfer supporting infrastructures
4. Regional aspects of innovation (capabilities, infrastructures and strategies)
5. Innovation financing
6. Innovation policy.

Further EIMS publications

1. **An integrated Approach to European Innovation and Technology Diffusion Policy: a Maastricht Memorandum, L. Soete and A. Arundel, 1993**

2. **The Community Innovation Survey: Status and Perspectives, 1994**

3. **Innovation Activities and Industrial Structure: Industry and R&D in a Comparative Context, T. Sandven and K. Smith, 1993**

4. **Investment, Innovation and Competitiveness: Sectoral Performance within the Triad, A. Wyckoff, 1993**

5. **Patterns of Innovation in Italian Industry, G. Sirilli, R. Evanglista, M. Pianta, 1993**

6. **Innovation Structures and Performance in Nordic Manufacturing Industry, A. Kristensen, 1993**

7. **Public Measures Supporting New Technology Based Firms: Proceedings of the SPRINT/EIMS Policy Workshop, P. Boekholt, and G. Fahrenkrog, 1994**

8. **Policies to Support Tacit Knowledge Transfer. Proceeding of the SPRINT/EIMS Policy Workshop, Luxembourg 25-26 May1993, G. Fahrenkrog, P. Boekholt, J. Howells, V. Mangematin, and G. Schütte.**

9. **Surveys of Regional Innovation? A Feasibility Study for Europe, N. Alderman and M. Wood, 1994**

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