

Redis News

1 □ 1996

Bi-annual

FOREWORD

Globalisation - A new challenge for R&D and Innovation Statistics

The globalisation of markets as well as of enterprises is one of the striking current developments of economies all around the world. This evolution is of specific relevance for R&D and innovation. To take an example, a multinational enterprise with its headquarters in an EU Member State might run an R&D centre in the USA performing all R&D of this enterprise, and the R&D results might be used for the production of innovative goods somewhere in the Third World. From the point of view of traditional, nationally oriented R&D and innovation statistics neither R&D nor innovation activities would be attributed to the EU Member State, but to the USA (R&D) and to the Third World country (innovations). Although this approach is formally correct it gives a distorted picture of the reality because, for example, such innovations could not have been performed in the Third World country without the R&D efforts in the USA and the capital of the mother enterprise in the EU.

R&D and innovation statistics are influenced by this development. Besides some general statistical problems such as the choice of the statistical unit and that of interpreting national data, globalisation might require additional R&D and innovation indicators to measure the links between different (national) units of multinational enterprises. Examples are indicators on R&D performance in one country undertaken on behalf

of mother enterprises located in other countries or technology flows within the multinational enterprise across (national) borders. Eurostat started first activities in the (general) field of globalisation (see for example "The Globalisation Newsletter") and will contribute to the emerging international discussion on the measurement of globalisation in the field of R&D and innovation.

Photis Nanopoulos
 Director - Directorate D
 Eurostat

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Editorial

This (slightly late) edition of Redis News reviews the activities on the project in the second half of 1995. As the contents of the following pages will show, progress was made on various activities of the project as they relate both to developing methodology and data collection and processing.

The focus section in this edition takes a close look at R&D funding on defence in the European Union. It is based on information contained in the Eurostat database on R&D. The analysis shows the current trends in defence R&D expenditures.

As in the previous year, contacts with both the national experts and users of our data continue to be strengthened. A meeting of the group of users of R&D statistics was held in October while a working party meeting was held in November. This year's meeting of national experts was the largest ever, with representatives from about 25 countries.

It is an integral part of our mission to continue serving you to the best of our ability. This newsletter is a mere summary of some of our activities. If you will like some more information, or if you have questions or comments on any of the issues mentioned in it, please do not hesitate to contact us. To ensure that you receive future issues of REDIS News, please notify us of any changes to your address.

Abbreviations and Acronyms used

CIS	Community Innovation Survey
COFOG	Classification of Functions of Government
DG	General Directorate (of the European Commission)
DOSES	Development of Statistical Expert Systems
DOSIS	Development of Statistical Information Systems
ECE	United Nations Economic Commission for Europe
EEA	European Economic Area
EPO	European Patent Office
EU	European Union
FTE	Full Time Equivalent
HC	Head count
HRST	Human Resources in Science & Technology
IPC	International Patent Classification
NACE	General Industrial Classification of Economic Activities within the EC
NESTI	National Experts on Science and Technology Indicators
NUTS	Nomenclature of Territorial Units for Statistics
OECD	Organisation for Economic Cooperation and Development
REDIS	R&D and Innovation Statistics
TACIS	Technical Assistance for the Commonwealth of Independent States
UNSTAT	United Nations Statistical Office

REDIS News is one of a series of three newsletters prepared by Unit D3 of Eurostat. The others are **Research in Official Statistics** (on DOSIS) and **The Panelists** (on Enterprise Panels Statistics).

Please note that the opinions expressed are those of the authors alone. Neither the European Commission nor any person acting on its behalf is responsible for the use which might be made of the information contained in this newsletter.

R&D AND INNOVATION STATISTICS IN EUROSTAT

Achievements and Results in the Second Half of 1995

Community Innovation Survey (CIS)

The database is ready.....

The Community Innovation Survey database is now ready for analysis. Data is available for the twelve pre-1995 EU Member States and for Norway. Innovation data from Iceland will soon be transmitted to Eurostat.

After the transfer of the data from the Member States, a substantial amount of work has been done to clean and harmonize all the data as far as possible. The work consisted mainly of checking and correcting for logical inconsistencies. Estimations were carried out for item non-response. The different methods used depend whether the variables are quantitative, ordinal or nominal. For some Member States, weighting factors were not available and therefore had to be calculated so as to make extrapolations possible. To check whether non-responding enterprises have the same characteristics as the responding enterprises, non-response analysis was carried out in some countries. In Denmark and Germany this non-response analysis was taken into account for the calculation of the weighting factors.

Before submitting the data to selected contractors of EIMS-DG XIII, the data was micro-aggregated so as to maintain confidentiality of the individual enterprises. Some of the economic and policy analysis of these contractors are devoted to :

- Technology transfer, information flows and collaboration
- Innovation objectives and barriers in European Industries
- Innovation outputs in European Industry
- Patterns of innovation input, innovative costs and intangible inputs
- Comparative analysis of innovation attitudes of innovation in Europe.

Pilot actions for future activities.....

In connection with the preparation of the next

round of the CIS, pilot actions have been undertaken by Centraal Bureau voor de Statistiek (Innovation in the service sector), Statistics Finland (Measurement of innovation expenditure in the manufacturing industry) and Zentrum für Europäische Wirtschaftsforschung and SV Wissenschaftsstatistik (Case studies in Germany - Service and Manufacturing sector).

First Innovation Conference.....

In Eurostat, preparatory work on methodology and publication of results on the harmonized innovation survey is under way. Also, the European Commission is organizing an international conference for 20 and 21 May 1996, where the main analytical and statistical results of the Community Innovation Survey will be presented and other related issues discussed. More information on this conference can be found on page 10 of this newsletter.

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Human Resources in Science and Technology (HRST)

Canberra Manual now available.....

The final version of the "Canberra Manual", the manual on the measurement of human resources devoted to Science and Technology, is available now. This manual is the first joint manual of the OECD secretariat and Eurostat in the field of R&D and innovation statistics. It is published in the Frascati family of methodological manuals of the OECD secretariat. According to the agreement between both institutions, any requests for (further) copies should be sent to the OECD secretariat.

Basic HRST stock indicators.....

Based on the methodology of the Canberra Manual, Eurostat developed basic indicators for the measurement of HRST stocks. After the revision of the first draft which has been presented

to the last meeting of the NESTI (= National Experts on S&T Indicators) group of the OECD, a document on basic HRST stock indicators is available now at Eurostat. A summary of this paper has been presented to the 4th international conference on S&T indicators in October 1995. Based on this document, a questionnaire has been developed and sent to all EEA Member States (except Liechtenstein) to collect basic data on HRST stocks for the first time. A parallel action has been launched by the OECD secretariat for the remaining OECD Member States. The first data collection exercise in the field of HRST is again a joint action of the OECD secretariat and Eurostat.

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Regional R&D and Innovation indicators

Regional Manual approved.....

The draft manual on the Regional Dimension of R&D and Innovation Statistics has been reworked several times and submitted to the Member States as well as to the users inside the Commission for comments and ideas. A final version has now been prepared and was presented at the Joint EEA Working Party Meeting on R&D and Innovation Statistics in November for approval. The document is intended to serve all parties involved in the Member States as well as international and supranational institutions as a guideline for compiling and processing regional data in the field of R&D and innovation statistics.

Co-operation with the European Patent Office - new regional data on patent applications

Concordance tables translating the national postcode system into the NUTS have been developed for most of the Member States (except for Denmark, Ireland, Luxembourg, and Finland). Extractions from the EPO databases have been done relating to the number of European patent applications broken down by region (NUTS level 3) and IPC (subsection level). Data for Denmark, Ireland and Luxembourg are provided on a national level only. All data are provided on yearly terms covering the period 1989 - 1994. The results will be included in the REGIO database. The co-operation with EPO will be continued.

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Nowcasting R&D and Innovation Indicators

Availability of estimates.....

Nowcasting R&D and innovation indicators was a topic at the last NESTI group meeting in Paris, April of this year. Eurostat and the OECD secretariat submitted a common paper. The co-operation in this field was continued in launching a joint "mini-questionnaire" sent to the EU and OECD Member States. Based on the consensus that nowcasts are best prepared by national experts, and that inter- or supranational institutions should only engage if such national estimates are not available the Member States were asked to provide information about the general availability (month and year) and quality (final or provisional/estimate) of their data regarding the main S&T indicators. The large part of the EU Member States has already returned this survey. A first analysis of the results was presented to the Joint EEA Working Party Meeting on R&D and Innovation Statistics in November.

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Government R&D appropriations

First actions started.....

Past investigations of national methods and concepts for the collection of government R&D budget data showed considerable differences which endanger their comparability. An inventory was started to get more detailed information. Based on the national reports, first methodological recommendations for a better harmonization were discussed at the Working Party meeting in November. The comments of the national delegates will be used for an update of the methodological recommendations and the summaries of the national reports.

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Other Activities

International cooperation.....

..... with China

A visit of a Chinese delegation from the State Science and Technology Commission gave Eurostat the opportunity to exchange information and experiences in the field of R&D and Innovation statistics with this important Asian country. During the visit, the Chinese delegation expressed a great

interest in future cooperation with Eurostat. Discussion were mainly focused on

- Human Resources in Science and Technology
- Regional R&D and Innovation statistics
- Community Innovation Survey

..... with Russia

Last September, a meeting was held between Eurostat and the Center for Science Research and Statistics (CSRS) in order to discuss the interim report on the activities achieved under the TACIS programme in the field of R&D and Innovation statistics. Questionnaires have been designed in taking into account international recommendations and two pilot surveys are planned in the field of statistics on government R&D funding and on innovation, before the end of 1995

Two weeks later, a full week programme was organised by Eurostat and the OPOCE (Office for Official Publications of the European Communities) for another group of the CSRS, mainly to discuss the following points:

- Eurostat's experience in sample survey and in statistical analysis of survey data ;
- Software applications for sample surveys ;
- Eurostat databases and publication facilities ;
- Protection of confidential data, legal environment for statistical confidentiality ,
- Printing facilities and dissemination of Eurostat publications.

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Statistical Information System on R&D and Innovation Activities funded by the European Commission

Slow but steady progress.....

The objective of this sub-project is to set up a statistical information system on R&D and Innovation activities funded by the European Commission. The information that exists at present in this area is spread between different DGs. Thus if one wants to have a full picture on R&D and innovation activities funded by the Commission, it is fairly difficult.

The project was pushed ahead by several requests from a number of services of the European Commission, the European Parliament, the general users, etc. Several actions were undertaken:

- a contact group made up of all services of the Commission dealing with this area was set up,
- a document on modelling the system has been produced. The developed methodological framework distinguishes several sections of the process:
 - section 1. programming
 - section 2. participants
 - section 3. selection
 - section 4. different forms of support
 - section 5. results
 - section 6. impacts

For all these sections a complete set of variables has to be developed, taking into consideration the international recommendations.

The decision was to focus first on section 4 which deals with the different forms of EC support to R&D and innovation: shared cost actions, concerted actions, demonstration support, etc.

After an internal discussion with all services of the Commission involved in this project, a list of variables and breakdowns related to different kinds of Commission's support to RDT&I activities was developed as being desirable.

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REDIS Database and Publications

REDIS Annual publication

The latest edition of the publication "**Research and Development : Annual statistics 1995**" is now available. Retaining the superfluous format of the 1994 edition, this publication contains the principal indicators of the REDIS database. From the period starting 1984 to 1994 figures for Government R&D appropriations are available for Norway and 14 European Union Member States (Luxembourg not being included). For 1985 up to 1993 the total data are available for R&D personnel broken down by

regions and by sectors (the Business Enterprise sector, Government sector and Higher Education sector). The data is available in full time equivalent as well as in head count. The publication also contains for the same period, R&D expenditure data broken down by regions and by sectors. Please note that the regional data are also available in the database REGIO.

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Research and Development Annual statistics 1995

One volume in three languages - English, French and German; Published - 1995

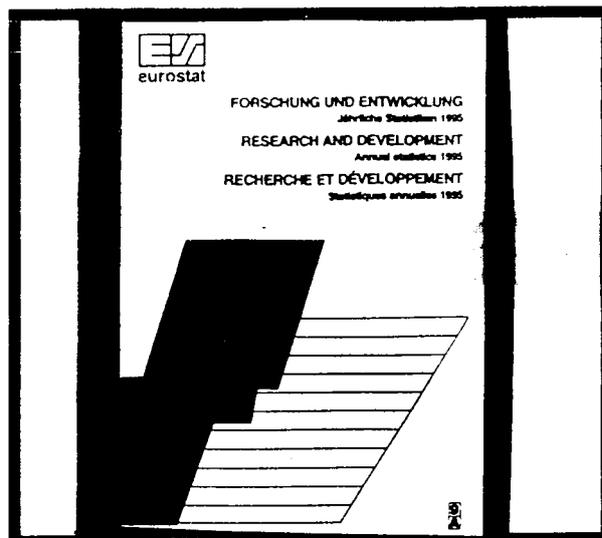
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Interim report to the Council

All current activities of Eurostat in the field of R&D and innovation statistics are based on a Council Decision "establishing a multiannual programme for the development of Community statistics on R&D and innovation", approved in early 1994. One Article of this Decision requires an interim report on the implementation of the programme to be submitted end of 1995 by the Commission. The draft of this report was discussed by various groups in November and December before transmitted as a Commission report to the Council. After the approval by the Commission, the interim report can be made available in all eleven languages.

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Government R&D appropriations

The latest figures on Government Budget Appropriations on Research and Development

(GBAORD) show a decline in funding. In the EUR-12 Member States GBAORD declined by about ECU 0.75 billion to ECU 49.5 billion in 1994 (estimations). Correcting for inflation, the decline was about 5%. The 3 new Member States are estimated to contribute about ECU 4 billion to the total and the European Commission about ECU 2 billion.

The composition of GBAORD broken down according to socio-economic objectives does not change very much over time. The main categories remain "General University Funds" with more than a quarter of the funding (in Austria and Greece these figures are 65% and 45% respectively), "Defence" with almost 20% and "Industrial Production and Technology" with over 10%. The Commission's appropriations differ fundamentally from this average. Its efforts focus on "Industrial Production and Technology" (40%) and "Energy" (20%).

Plans for the coming months

The dominating project in the coming months for the REDIS team of Eurostat will be the statistical annex to the "Second European Report on S&T Indicators" to be published by the Commission at the end of 1996. In contrast to its first edition, the sole responsibility for the statistical annex of the second edition will be with Eurostat. Important inputs to this annex will come from other projects for which the following actions are planned in the next months:

- in the field of innovation statistics: construction of a database with aggregated results of the CIS, preparation of two publications on results and methodology of the CIS, participation in the revision of the Oslo manual, preparation of the first innovation conference;
- in the field of data on Government R&D appropriations: development of methodological recommendations for better harmonised data;
- in the field of HRST: evaluation and, to some extent, harmonisation of incoming stock data,

development of basic indicators for selected HRST flows (eg. flows from the education systems, immigrants and emigrants);
- in the field of regional indicators: analysis of the results of feasibility studies aiming at developing supplementary indicators.

All other projects like the project on indicators for the R&D and innovation programmes funded by the Commission will be continued. Substantial progress is expected in the preparation of a legal framework for future harmonised R&D and innovation surveys in the European Union.

Organization

There have been some changes to the REDIS team since the last edition of the newsletter was published. Ms. Pierra Calcinaghi who managed the database left the team for Eurostat Data Shop in Brussels in May 1995. Mr. Mikael Akerblom and Mr. Per Nymand-Andersen who both worked on the CIS project left for Statistics Finland, Helsinki and European Monetary Institute, Frankfurt respectively. Ms. Daniela Schackis who worked on the HRST project has moved to another unit of Eurostat in Luxembourg.

There are a number of new members in the team. Mr. Maurits Pino (a new *A-official*) has joined the management of the team while the secretariat has been strengthened by Ms. Anne-Marie Pratiffi. Mr. George Paterson takes over the HRST project while Mr. Martin Schaaper joined the team to support the DGXII's project on European Report on Science and Technology Indicators (REIST).



Focus.....

.....On Defence: R&D efforts for defence purposes

Large Discrepancies Between Member States

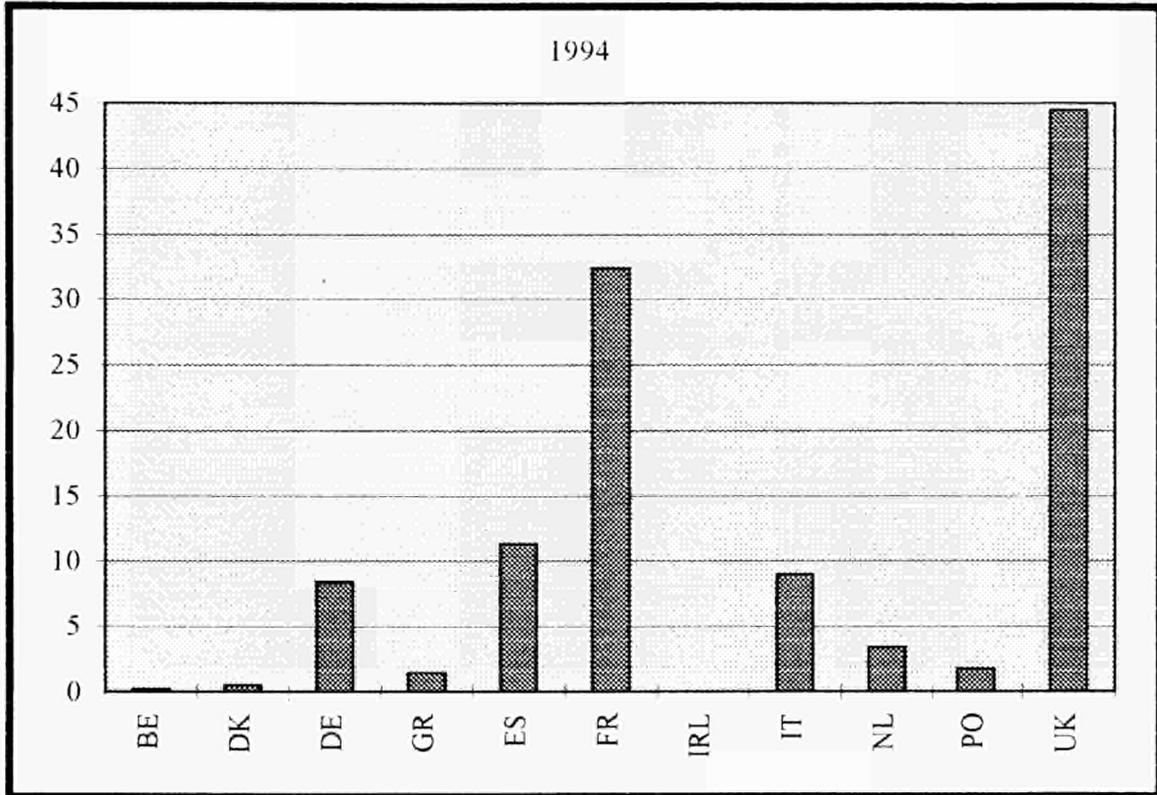
After the collapse of the Soviet Union, most European Union Member States cut their defence budgets substantially. One would expect to see a similar decrease in importance of defence oriented Research and Development efforts. This, however, does not seem to be the case.

R&D appropriations vary considerably: taking the latest available data, the 1994 provisional figures, they are from almost 45% in the UK and over 30% in France,

about 10% in Germany, Spain and Italy, 3% in Greece, the Netherlands and Portugal, to less than 1% in Denmark and Belgium and nothing in Ireland (see figure 1). The differences are even more pronounced when analysing total amounts (see figure 2) because of the tendency of larger Member States to allocate higher percentages to defence.

Among the new Member States, Sweden allocates approximately 20% of its R&D budget to defence. In Finland and Austria the amounts are very low. These three countries will be left out of the rest of the analysis for lack of long term figures. There is no data available for Luxembourg.

Fig. 1: Percentage of Government R&D appropriations devoted to defence



Contrary to expectations based on the overall trend in defence budgets, R&D defence budgets did not all decline in recent years. In Italy and Portugal defence oriented research as a percentage of total went up. In most Member States percentages were more or less stable. Only in Germany and Spain a substantial drop was recorded: as a percentage it went down from over 10% of total R&D appropriations in 1991 to under 9% in 1994 and from almost 13% to somewhat over 11% respectively.

A long term analysis of Germany, France and the United Kingdom gives a somewhat different picture (see figure 3). In France there was a steep rise in nominal defence R&D appropriations from 1980 to 1990 that has turned into a decline. The German

appropriations rose slowly during the eighties and then declined. This decline was noted earlier in the analysis of defence as a percentage of total R&D appropriations. The UK amount varied from year to year. There does not seem to be a marked change of policy in the early nineties.

The collapse of the Soviet Union in 1991 led to large reductions in defence budgets. Compared to the size of these cuts, defence R&D seems to be largely unaffected. In some Member States budgets go up, in some they go down. However, these observations do not justify further conclusions concerning defence policy. More data would be needed for such conclusions.

Fig. 2: Government R&D appropriations devoted to defence
(Current prices and exchange rates, Million ECU)

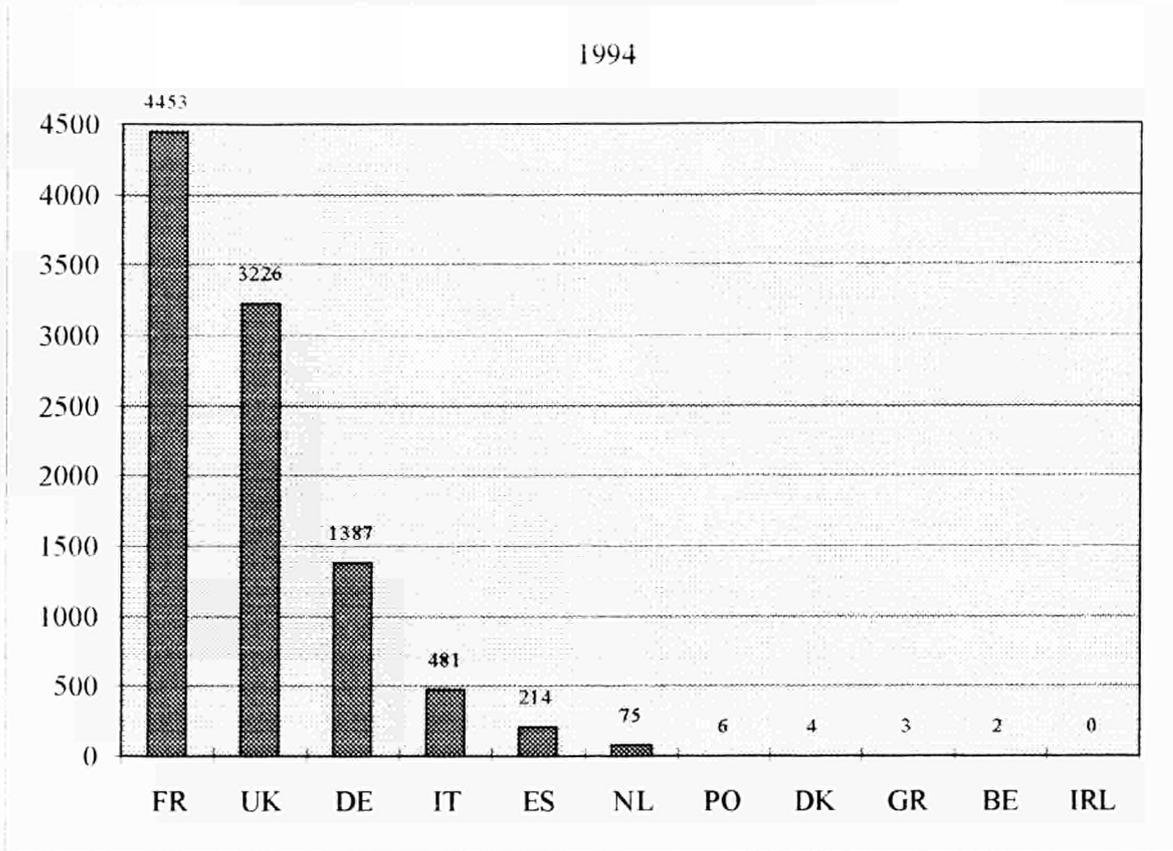
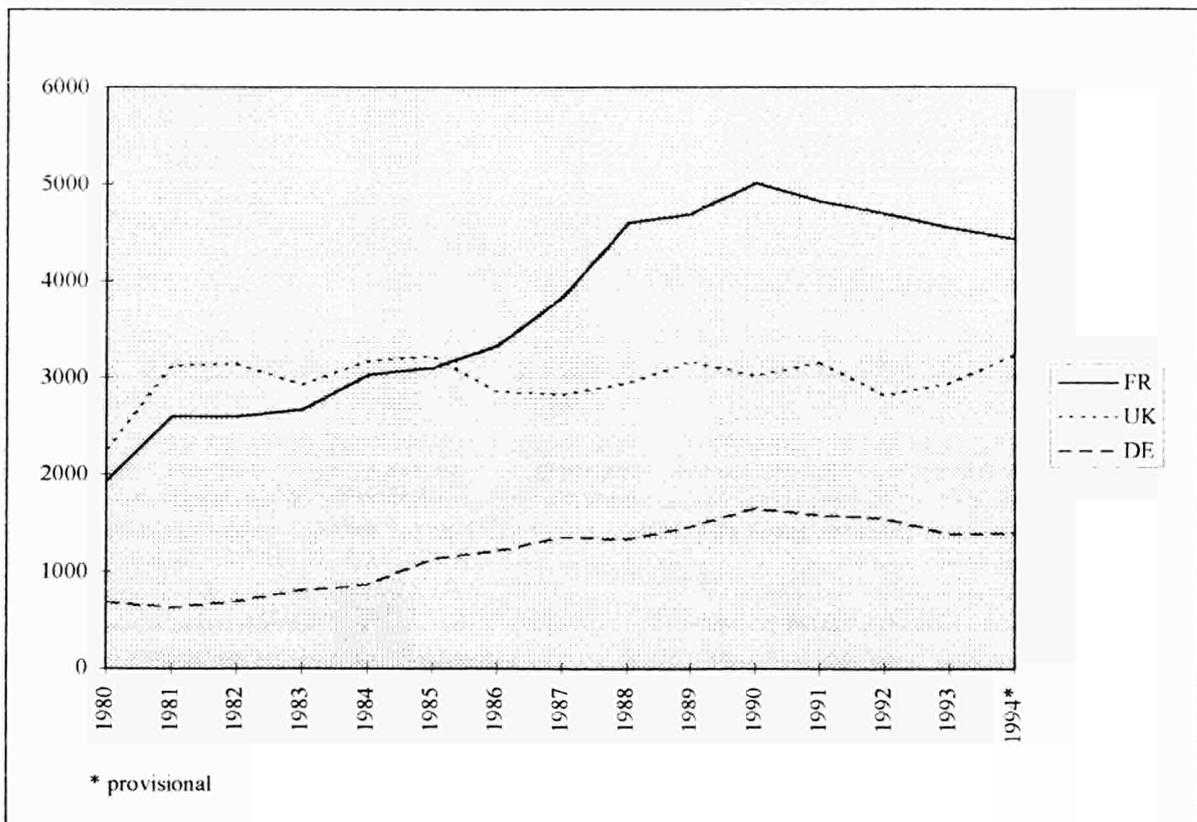


Fig. 3: Development over time of R&D defence budgets
(Million ECU (current prices) of government R&D appropriations for defence in Germany, France and the United Kingdom)



**International conference on
Innovation Measurement & Policies
Luxembourg 20 - 21 May 1996**

Introduction:

The Community Innovation Survey (CIS) is a new action of the Commission (under the European Innovation Monitoring System of the Innovation Programme in collaboration with Eurostat), in trying to define and measure innovation in a comparable and comprehensive way throughout the Union. Over 40 000 enterprises have participated in this experiment in measuring innovation processes in manufacturing and services in most Member States. The Commission has launched twelve large scale projects to exploit the information in order to provide a global picture of the innovative performance of European enterprises.

The conference will deal with the development and use of innovation indicators, their relevance to innovation promotion and policy, and reciprocally, the need of new indicators to support sustainable policy developments in this area. The objective is to build on the lessons of experience and move towards improved tools and policies.

Participants:

It is aimed at policy makers, academics, consultants and managers concerned with the different aspects of innovation. It will be held over two days and will involve plenary and parallel sessions. Simultaneous interpretations will be made into English, French, German from any of these languages and from Danish, Dutch, Italian, Greek, Portuguese or Spanish.

A participation fee of 175 Ecu will be charged per participant.

Main topics of interest:

Broad themes of general interest will include:

- The innovative landscape in Europe
- The innovativeness of different sectors
- Innovation and employment
- The measurement of intellectual capital
- Implications for innovation policy

More specialised themes will include:

- Technology Transfer and Collaboration
- Corporate Innovative Behaviour
- The importance of intangible assets in innovation
- Barrier to Innovation
- Measurement and innovation policy
- Pitfalls in measuring innovative activities inside enterprises

Scientific Committee:

The following persons will be invited to be members of the Scientific Committee:

Chairman: Prof. Bangt Lundvall

Members:

- Prof. Patrick Cohendet (BETA, Strasbourg)
- Prof. Giorgio Sirilli (CNR, Rome)
- Hans Van Leuven (EPO, Munich)
- Prof. Victor Simoes (CISEP, Lisbon)
- Prof. Luc Soete (MERIT, Maastricht)
- Prof. Fujio Niwa (NISTP, Japan)
- Ms. Genevieve Muzart (OECD, Paris)
- Dr. Giulio Cesare Grata (CEC DGXIII)
- Dr. Jennifer Sue Bond (NSF, USA)
- Dr. Photis Nanopoulos (Eurostat, Luxembourg)

General information:

The conference will be held in the European Centre, Kirchberg Plateau, Luxembourg. Simultaneous interpretations will be made into English, French and German from any of these languages and from Italian, Spanish, Greek, Portuguese, Danish or Dutch.

If you are considering participating in this conference, and will like to receive more information, please complete the form below and return it to the conference secretariat.

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