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**SEMINAR ON MEASURING CAPITAL: BEYOND THE TRADITIONAL MEASURES  
SESSION II**

Capitalisation of research and development expenditure:  
points of view and experiences in the European Union<sup>1</sup>

Submitted by Eurostat

**INTRODUCTION**

1. Research and development has been one of the major topics of the revision of the United Nations System of National Accounts. As a result of the work of the Canberra II Group in particular, it was proposed to include research and development expenditure as gross fixed capital formation. This innovation in relation to the current system would have a substantial impact on national accounts, since, according to the estimates of Danish national accountants, for example, capitalisation of research and development expenditure would lead to an increase of around 3% in gross domestic product. Initially, this proposed change in the United Nations 1993 System of National Accounts (SNA 1993) was opposed by many European countries for essentially practical reasons, but also for theoretical reasons. A compromise has finally been found, however. It has been acknowledged that R&D expenditure has the characteristics of investment and that the long-term aim must be to record this expenditure as fixed capital formation in the core national accounts. However, the quality of the data must first be tested in a

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<sup>1</sup> This paper has been prepared at the invitation of the secretariat.

satellite account, so as to ensure a high level of reliability, before achieving the long-term aim of capitalisation.

2. R&D is treated in the current system as intermediate consumption, i.e. as current expenditure benefiting production for the current period only. This of course runs counter to the very nature of R&D, the aim of which is to improve production for future periods. The current treatment is justified in the SNA 1993 Manual by considerations of an essentially practical nature: other activities such as staff training and market research also allow benefits to be gained in the longer term. In order to be able to classify R&D as investment expenditure, there would have to be precise criteria for distinguishing it from the other activities. In addition, it would have to be possible to identify and classify the assets produced, value them in an economically meaningful way and establish their rate of depreciation over time.

3. The experts of the Canberra II Group and of the AEG felt that considerable progress had been achieved as regards knowledge of R&D activities, with the result that most countries were now able to overcome those difficulties that led them to oppose the move to treat R&D expenditure as fixed capital formation. It is true that their decision was also influenced by the desire to give greater weight to an activity that has an ever increasing importance in modern economies. There was also considerable pressure from economists to move towards capitalisation of R&D expenditure. Indeed, without knowing what services are generated by the knowledge capital accumulated through R&D, it is impossible to measure the impact of R&D on growth and thus lay the foundations of policies in this area on objective bases.

## **I. EUROPEAN POINTS OF VIEW**

4. The experts' optimism is shared by few European national accountants. The European position was expressed officially at the meeting of the Statistical Programme Committee of the Member States of the European Union and put forward as part of the SNA review. The majority of the European national accountants consider that the obstacles to the capitalisation of R&D expenditure presented in the current SNA are not yet solved in their countries. Moreover, they have raised new objections of a more conceptual nature. For example, the Danish national accountants point out that, in the revised SNA, production costs will have to include capital services and therefore, in particular, capital services generated by the current stocks of knowledge accumulated through R&D, since new research is generally based on the results of previous research. So, even if it were possible to measure these stocks and related capital services accurately, would it really be possible to attribute some or all of these costs to new research on an objective basis in order for this research to be taken into account in valuing the related production? It is difficult to deny the relevance of such a remark even if it is still possible to play down its importance.

5. Let us now return to the various obstacles mentioned by the SNA, so that we can determine to what extent they can be considered to have been overcome by the European countries. The first difficulty, the need to be able to distinguish R&D from other activities such as training or market research, still exists in the different countries, even if the situation varies from one country to the next. Suffice to say that this problem already exists in the current system, the main difference being that confusion between two activities (e.g. research and training) does not have

any impact on GDP in the current system, whereas it would have in a system where R&D expenditure was considered to be an investment.

6. The second obstacle is the difficulty in identifying and classifying the assets produced. This is a new problem that does not exist in the current system and only the experience of the countries will really be able to respond to it. It should be noted, however, that, if we can conceive that R&D products protected by patents will be sufficiently well known for correct identification and classification, we can also predict that there will be huge problems in identifying and classifying R&D products not covered by patents. If this is not the case, at the very least, we can say that it is actually an additional difficulty, since, here again, if an identification error has only minor consequences in the current system, it would have a major impact in a system where R&D were capitalised. Valuing assets resulting from research depends largely on the characteristics of the assets themselves, such as their expected life; consequently, a classification error has an impact on how assets are valued.

7. The third problem concerns the need to be able to value the assets produced by research in a relevant way. In this area, ideally we would apply the general principles of the SNA and value the assets produced at market prices. However, it is difficult to adopt this approach in practice, as the price of these assets is only available on an exceptional basis. Although this may be the case when these assets are protected by a patent with regularly tracked prices, such favourable situations are rare in practice. Consequently, the only possible valuation methods are more often than not those involving a perpetual inventory, whereby the stocks of capital are built up again from entries made up by the fixed gross capital formation, disposals and revaluations. It is clear that such valuations are particularly difficult, largely on account of the wide range of research products, which are never standardised products.

8. These valuation difficulties can be grouped together in several categories. The first, already mentioned, relates to the difficulty in identifying and classifying the product. The second concerns the need to value correctly the gross fixed capital formation for the different types of research expenditure, taking account of all the imputations necessary, e.g. capital services of the stock of current knowledge. The third is connected to the difficulty in estimating, on an objective basis, the mortality tables and expected lives of the R&D products. This last point is particularly important, as it is difficult to imagine being able to have effective measures to establish this information other than on a totally exceptional basis. In practice, it will only be possible to estimate mortality and expected lives on the basis of hypotheses or, at best, expert opinions. Indeed, the estimation of the level of knowledge capital accumulated will depend largely on these hypotheses. A fourth difficulty lies in the availability of long series, which are vital for implementing the perpetual inventory methods. A fifth problem concerns the need for deflators to apply the perpetual inventory method to R&D expenditure, when it is virtually impossible to obtain price indices of R&D services owing to the fact that they are not standardised.

9. All of these problems persist in most if not all of the countries and we must therefore support the countries that are concerned about the difficulties of implementing rules on the capitalisation of R&D expenditure. At the same time, Eurostat cannot ignore the arguments of economists and policy-makers who wish to have reliable data on an area that has such strategic importance for the future of European economies. Eurostat has therefore decided to support a compromise solution that will allow experience to be built up before achieving the long-term

objective of capitalisation. Accordingly, R&D will not be capitalised in the core national accounts but will first be presented in satellite accounts.

10. Such a compromise solution may appear to provide little satisfaction to some people, given that it puts off the final decision, but, in the absence of any kind of consensus, it was difficult to settle on either option. In fact, what we have here is a problem that is all too familiar to national accountants. We are faced with a phenomenon that clearly needs to be measured, but the measurement methods actually available are not sufficient to measure it accurately and, in all likelihood, never will be. As a result, a valuation can only be made on the basis of hypotheses, which by their very nature are debatable, and thus with little accuracy, difficult to measure in any case. We are therefore faced with the following question: would it be better to make a very rough estimate than no estimate at all, knowing that, in the case of the latter, we often return to estimating at a zero value when it is certain that this is not true? If we use a very rough estimate, do we not run the risk of misleading users, since, even if forewarned, they will have no other choice but to use the estimates proposed by the national accountants? On the other hand, if we reject this estimate, are we not damaging the macroeconomic quality of the accounts? It is only with experience that we will be able to decide on more objective criteria. In any event, the methods and estimates must be comparable at European level and this is a major constraint that will have to be respected by the R&D satellite accounts.

## **II. THE DEVELOPMENT OF SATELLITE ACCOUNTS**

11. The development of R&D satellite accounts represents a major aim and a major challenge at European level. This project will enable Member States to prepare estimates that will be integrated in their core national accounts, but only when a high level of reliability has been achieved.

12. According to the information currently available, only two countries of the European Union, namely the Netherlands and Denmark, are currently developing R&D satellite accounts. This situation may appear to be worrying in the light of the introduction of the compromise reached for the SNA update, but it may actually represent an opportunity. First, the other Member States will be able to take advantage of the experience gained by these two countries and, second, it will certainly be easier to develop common methods for all of the Member States, since the vast majority of them will not be bound by any existing method, which means that it will be possible to achieve a satisfactory level of results comparability more quickly.

13. It will be possible to provide a solid statistical basis for the development of harmonised European R&D satellite accounts, since, under Commission Regulation (EC) No 753/2004 of 22 April 2004, all European Union countries must gather statistical information in the field of research and development. The Regulation lays down that Member States must obtain the necessary data using a combination of different sources, such as sample surveys, administrative data sources or other data sources. The emphasis is placed on comparability at international level, since the Regulation clearly specifies that the statistical areas it covers are based on harmonised concepts and definitions set out in the latest versions of the Frascati and Canberra manuals. The

Member States must transmit their data in a standardised format to Eurostat, which is responsible for checking the quality of the data.

14. Eurostat is deeply committed to promoting the development of R&D satellite accounts in the European Union. To this end, it will hold talks with the various national statistical institutes to determine what the satellite accounts should be. Eurostat plans to set up a task force on this subject in which all volunteer countries will be able to participate. This will be a long and complex undertaking, since the data currently collected are insufficient for the comprehensive preparation of R&D satellite accounts. In particular, at present, there are no reliable data on the expected life of the results of R&D studies and, thus, without information on these expected lives, perpetual inventory methods cannot be used to evaluate the accumulated knowledge capital. A collective decision will therefore have to be made on which hypotheses are acceptable and on what form should be taken by the base needed to extend data collection to other data.

15. The possible development of new Community provisions requires major testing in advance and an impact study focusing on the consequences of the new rules on national accounts, the reliability of estimates and the additional resources that may be needed by the national statistical institutes to implement the new requirements. In this area, it is important to remember the specificity of the European Union. Whereas for most other countries national accounts are primarily an instrument of economic analysis to be used by decision-makers and are therefore mainly of a technical nature, in the EU they are one of the bases of the common policies of the Community and have a legally binding nature for the Member States. This specificity is not without consequences for the development of national accounts. Indeed, Community legal acts must be able to be applied in all Member States in the same way and must therefore be founded on indisputable objective bases.

16. The fair application of European law therefore means that the estimates required must be clearly identified and discussed and validated jointly by all Member States. An incorrect estimate in one country may have repercussions for the other countries, particularly in financial terms, e.g. the estimate of gross national income is used to distribute the fourth own resource between Member States. The counterpart to this fairness is the need to find a consensus.

17. With regard to the development of R&D satellite accounts, Eurostat will emphasise this collective approach, as it believes that it is the only approach capable of ensuring that the Community provisions are applied fairly, and that comparing experiences leads to a better understanding of the phenomena and therefore to the possibility of providing a better basis for the estimates needed to compile national accounts.

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