8th Meeting of the Advisory Expert Group on National Accounts,
29-31 May 2013, Luxembourg

Agenda item: 11
Topic: Research and development

Introduction

Eurostat published a report on the treatment and measurement of R&D. The report contains calculations of the impact of R&D-capitalisation on GDP, based on data for two years. Figures are calculated for the total economy and by institutional sector. The OECD is processing the questionnaire on service lives and country methods for the measurement of R&D. The documentation will be made available for publication on the SNA and OECD-websites. The ISWGNA agreed that no further conceptual work is needed in the short term

Guidance on documentation provided

A note on research and development is attached

Main issues to be discussed

This item is for information.

1. Recommendations from the Eurostat Task Force

The following recommendations were agreed by the Task Force on R&D:

a) ***full consistency between the data in the agreed compulsory R&D tables and the national accounts should be ensured in the course of the capitalisation of R&D services;***

The Task Force agreed a compulsory set of tables that should be used as bridge between data sources and National Accounts (see Annex to this report). In particular Table 1 and Table 2 concern the calculation of output of R&D. Table 1 may be filled in for sectors for which sufficient information from sources other than Frascati surveys is available (that could most probably be the case for S13, but maybe also for other sectors). In the other cases Table 2, which is based on Frascati surveys data, should be used. The Task Force made a recommendation that full consistency between the data in the agreed compulsory R&D tables and the national accounts should be ensured in the course of the capitalisation of R&D services.

b) ***until the R&D stocks are available, the consumption of the R&D assets used in the production of R&D services does not have to be taken into account in the estimates of the R&D output (as a part of the consumption of fixed capital);***

The calculation of the consumption of fixed capital in the production of R&D services (R&D output) by means of the PIM method requires estimation of the use of all fixed assets, including existing R&D assets used to produce new R&D. As the stocks of R&D assets are not yet available in most of the countries, the Task Force recommended that for the moment the consumption of the R&D assets used in the production of the R&D services may not be taken into account.

c) ***the input method is recommended in the calculation of R&D in volume terms****;*

In view of difficulties in identifying the output unit in R&D and as no unit value indices exist, the Task Force recommended to use the input method for the volume measures of R&D.

d) ***geometric depreciation function is recommended as a reference method in the calculation of CFC of R&D; however, countries that have developed alternative methods may continue to use them;***

The Task Force recommended that countries should use the geometric depreciation function as a reference in the calculation of consumption of fixed capital of R&D assets. However, countries that developed alternative methods may continue to use them.

e) ***the R&D services subcontracted by one R&D institutional unit to another R&D institutional unit should be recorded as intermediate consumption. However, the possibility of recording the output of R&D institutional unit net of subcontracted R&D or on a gross basis would be left open to countries that encounter problems in obtaining data needed to adjust the Frascati intramural expenditures on R&D to gross recording;***

Already the previous R&D Task Force encouraged the Member States to record the R&D services subcontracted by one R&D company to another R&D company as intermediate consumption. However, the possibility of recording the output of R&D companies net of subcontracted R&D was left open to countries that encounter problems in obtaining data needed to adjust the Frascati intramural expenditures on R&D to gross recording.

f) ***all expenditures by government on Intellectual Property Products (IPPs), including freely available R&D, should be recorded as GFCF, if they satisfy the requirement that IPPs is intended for use in the production of more than one year;***

While filling in the questionnaires some countries excluded a part of the freely available R&D from investment. The justification of such a treatment was intensively discussed. Finally the Task

Force was reminded of the pragmatic decision of the ESA 95 review group to capitalise all freely available R&D which is intended for use in the production of more than one year.

g) ***the net operating surplus of market producers of R&D (as reference to return to capital) is derived as mark-up including unsuccessful R&D. The method to obtain the mark-up may be calculated as industry specific or as a single mark-up for all industries: To ensure stability of the mark-up time series, an average or a weighted moving average of several years should be used;***

Ideally, the averaging technique should be consistent with the parameters used in the calculation of CFC. In practice, however, there could be problems regarding the availability of long time series and thus a simple average of a limited time-span should also be allowed.

h) ***Service Life estimates used in the calculations of R&D should be based on dedicated surveys or other relevant research information, including information of other countries with comparable market/industry characteristics. In case, where such information is not available, a single average Service Life of 10 years should be retained. It is also recommended that the above mentioned Service Life estimates should be investigated regularly, e.g. every 10 years.***

A majority of countries have neither detailed nor reliable information on service life for each component of R&D. The proposed single average of service life of 10 year is a practical solution for those countries that have no information on service life of R&D assets. There is no intention to prevent countries from using more specific information resulting from their research efforts.

The complete report of the Eurostat Task Force is presented in Annex 1.

2. Synthesis of the results of the OECD survey on Intellectual Property Products

This synthesis below on the methodology and the measurement of R&D has been derived from the OECD-paper "Synthesis of the results of the survey on Intellectual Property Products". The full document is available on OLIS in its original format (**STD/CSTAT/WPNA(2012)9**).

Background

The Handbook on Deriving Capital Measures of Intellectual Property Products (OECD, 2010) provides detailed background and guidance for the collection and measurement of Intellectual Property Products. At the OECD Working Party on National Accounts on 24 - 28 October 2011, however, it was discussed that there was a need for sharing greater detail on service lives, depreciation rates and national practices related to Intellectual Property Products (IPPs). The sharing of methodology and measurement practices between OECD-countries in this relatively new area may indeed be helpful in the implementation of the 2008 System of National Accounts (SNA).

For the above reasons, the OECD recently developed and launched a questionnaire on IPPs. The purpose of the questionnaire was to arrive at improved metadata on issues related to country best practice, the availability of data sources, improving understanding measurement of capital stocks and update the current progress related to the implementation of SNA 2008 for specific aspects. Topics covered included Research and Development; Mineral exploration and evaluation; Software and databases; Entertainment, literary and artistic originals; and Other intellectual property products.

This note summarises the key issues related to R&D, as raised by the 23 OECD countries who responded to the questionnaire.

Expected impact:

There is a wide range of the estimated impact of capitalisation of Research and Development (R&D) on GDP, although there was some uncertainty on the magnitude with some countries noting it would be minimal. Estimates range from 0.5% to 3.5% of GDP with an average of around 1.7% of GDP. Four countries have not yet fully analysed the estimated impact. 5. Data sources: A large majority of countries have not needed to use any new surveys, although a few countries have captured the new requirements by

revising existing surveys. The main data sources used are specific research and development surveys: e.g. GERD (gross domestic expenditure by government), BERD (gross domestic expenditure by business), and specific surveys for private non-profit bodies. Other data sources include: a) administrative data, e.g. universities and grant information, bank records; b) international trade in services; c) additional surveys, e.g. on structural business statistics, earnings statistics, monthly labour force estimates; d) taxes and subsidies data; e) operating surplus and consumption of fixed capital; f) corporate goods price indices. Where data is not available on a regular annual basis, some countries use a supplementary survey for the years in between by using aggregated estimates from other survey data, administrative data such as tax deductions, or extrapolating for the missing years. One country noted that there was limited coverage for business sector expenditures on social science research.

Methods:

All countries implement, or intend to follow, the methods in both the conclusions of the Eurostat R&D task forces and the OECD manual. For some countries there are still specific outstanding issues. Examples included: a) source limitations making it difficult to collect information about external funds to post graduate students; b) no information about trade margins, or taxes and subsidies on products and changes in inventories; c) for some countries all expenditures on R&D have been considered as providing a benefit; d) for one country lags are not used, e.g. R&D is registered as an investment in the same period as the production costs occur so there are no changes in inventories; and e) for one country R&D purchases by R&D industries are capitalized in the R&D production account with the primary reason being that there is a lack of information to distinguish single from repeated use and that there is an expectation that single use is small. Where Frascati source data does not exist, some countries use the historical survey data and tax data to estimate the missing part of R&D activities, and/or transform it to the definitions according to the Frascati Manual. This can include adjustment for missing size classes and exhaustiveness.

Double counting:

Nearly all countries take account, or use approaches to minimise, any double counting. Some countries noted that information on this issue was not easily available, but for other countries it was not identified as a significant issue. Different approaches used to estimate double counting included: a) use of information about the number of employees in the software industry, e.g. ratio of software developers to all researchers, comparison of employment data with data on persons employed in R&D at the level of the reporting unit to identify any double counting, or unit record matching; b) the addition of questions, or use of aggregation checks, in the surveys; c) using a historical ratio, or deducting a proportion, e.g. 10% or 50% of user-produced software; d) focus on double counting in particular industries where the issue of double counting is known to be significant, e.g. elements of R&D in oil exploration; e) use of survey information on product fields where all expenditures reported by respondents as software is excluded.

Sector and industry:

Nearly all countries break down data by institutional sector, although slightly less break down the data by industry. For both sector and industry this is done primarily by the use of the underlying source information, or the allocation of individual units to the different sectors which are subsequently aggregated. Some countries referred to the use of the bridge table approach noted in OECD (2010). Some countries have not yet decided on methods for the sectorial breakdown of private R&D.

Historical data:

For years where estimates do not exist the most common approach is the use of modelling. However, there are a small number of countries who have not decided what approach to use. For some countries, there is additional detail available at a microeconomic level for recent years, but only macroeconomic data for earlier or intermediate years which means for those earlier periods a set of simplifying assumptions, or models, will be used to derive back data. Other approaches included: a) the use of backcasting with a suitably chosen end point, e.g. applying average growth rate of R&D expenditures to historic data; b) use of interpolation or extrapolation based on relative or declining proportions; d) use of

a benchmark value and then indicators such as wages and intermediate consumption to construct estimates earlier than the benchmark; and e) use of classification adjustments to align earlier data to earlier collected data.

Capital stock and depreciation:

All countries will, or plan to, use the Perpetual Inventory Method (PIM) to calculate capital stock and depreciation. The majority of countries use a geometric depreciation function. Mortality functions used included: delayed linear, log normal, Weibull and a double declining rate. Service lives differ across countries; see table 1 for a summary. These can differ based on the type and industry of R&D. For example, 13 years (basic research), 11 years (applied research), 9 years (experimental development), and for specific industries: 7 years (computer programming), 9 years (electronics), and estimates of 15, 20 and 60 years (chemical and pharmaceutical products). Finland and Israel (see Israel, 2008) have calculated detailed service lives for a wide range of industries, ranging from 7 – 10 years, and 5 – 60 years respectively. The Netherlands' approach used data on patent values and amortization. For all countries, overall service lives used for aggregate R&D were: 4.6 years, 6.2 years, 7 years, 8 years, 10 years, and 12 years. Where service life information was not available, assumptions were based on other countries, or the recommendation by the recent Eurostat taskforce on R&D which notes that "… where such information is not available, a single average service life of 10 years should be retained".

Some countries continuing research to derive estimates are Germany, Sweden and the United Kingdom.

Other issues:

Issues raised included: a) an inconsistency between the Balance of Payments and International Position Manual (BPM6) on the one hand and the 2008 SNA on the other hand in the treatment of R&D, where BPM6 incorporates trade in patents in commercial services under R&D services and includes a much broader definition of patented entities than what is defined as R&D fixed assets in the SNA; b) for some countries, a need for clarification of the treatment of R&D by multinational corporations, e.g. is the R&D produced by them mostly exports or domestic investments?; c) integrating into calculations the treatment of consumption of fixed capital used for the production of new R&D results, as it can have an accelerating impact on R&D outputs; d) how to ensure consistency between different data sources, e.g. R&D surveys and structural business surveys; e) choice and sensitivity of the deflation method; and f) how to calculate the cost of capital in the R&D output as it could be sensitive to the choice of calculation.

Table 1

Summary table on methodology for estimating capital stock and depreciation of R&D, based on country responses to an OECD survey in 2012

Country	Method	Service life	Depreciation function	Mortality function
Austria	PIM	13 years (basic research) 11 years (applied research) 9 years (experimental development)	Geometric	Delayed linear
Belgium	PIM	10 years*	Geometric	Double-declining
Canada	PIM	6.2 years	Geometric	
Czech Republic	PIM	8 years	Linear	Log-normal
Denmark	PIM		Geometric	
Finland	PIM	Detailed information available by industry: range of 7 – 10 years.	Geometric	
Germany	PIM	Survey in progress, alternative is 10 years*	Linear	
Ireland	PIM	Work in progress		
Israel	PIM	Detailed information by industry available from a pilot study**	Linear	Truncated normal
Italy	PIM	10 years*	Geometric	Double-declining
The Netherlands	PIM	12 years (exc. Chemical and electronics) 15 years (chemical) 9 years (electronics)	Winfrey	Weibull
New Zealand	PIM			
Norway	PIM	10 years*		
Portugal	PIM	10 years*	Linear	Delayed linear
Slovak Republic	PIM	Various		
Slovenia	PIM	10 years*	Geometric	Double-declining
Sweden	PIM	10 years*, additional work in progress	Geometric	
United Kingdom	PIM	4.6 years, additional work in progress	Geometric	Weibull

* Recommendation from a Eurostat task force: "In case, where such information is not available, a single average Service Life of 10 years should be retained"

** http://www.unece.org/fileadmin/DAM/stats/documents/ece/ces/ge.20/2008/sp.3.e.pdf

3. Eurostat Manual on Research and Development

The new System of National Accounts (2008 SNA) and the new European System of Accounts (ESA 2010) recognise that Research and Development expenditure should be recorded as capital formation.

Developing National Accounts R&D estimates is a difficult area and continued work is needed to continue improvement in the quality of the R&D estimates. In order to prepare the implementation of the capitalisation of Research and Development in national accounts, Eurostat set up two Task Forces which prepared the templates of supplementary tables of R&D; worked on the identification of the main difficulties for completing these supplementary tables as well as conducting reliability tests on the data. A number of EU-countries have constructed satellite accounts showing R&D as capital formation.

In its meeting on 7 November 2012, the European Directors of Macroeconomic Statistics (DMES) were invited to express their opinion on the capitalisation of Research and Development in National Accounts. The DMES recommended the implementation of the principle of capitalization and asked Eurostat to follow-up on the issues mentioned in its discussion. This relates amongst others to the production of a manual on Research and Development.

Work on the first draft of the manual is under way. The structure is as follows:

1. Purpose of the manual

2. Introduction

3. A step by step guide to the production of estimates of R&D as capital formation.

    a. This is the key section of the manual. It sets out the sources and methods to generate reliable and consistent estimates of creation and use of R&D products in the economy.

    b. It describes how the surveys supporting the Frascati Manual can be adapted to ensure good estimates of R&D according to national accounts concepts.

    c. It sets out how annual and quarterly estimates can be produced.

    d. It describes how volume estimates can be derived.

Interim stages

4. Many Member States will not have all the data sources set out in section 3, and this section describes how acceptable approximations can be made so that estimates of sufficient reliability can be produced, pending introduction of the data sources specified in section 3.

5. There will also be description of production methods which are not sufficient to form the basis of reliable and consistent estimates of the capitalisation of R&D. Such methods may be used given the lack of alternatives, but it will be of the highest priority to replace these by the methods described in sections 3 and 4 of this manual.

6. Special issues

    a. Multinationals – the treatment of these is not straightforward, especially with regard to the creation and use of R&D within the same enterprise but across national boundaries products. It is likely that the measurement of cross-border imputed payments for multinational R&D products will not be captured.

b. Other sources – Information on patents, tax relief and tax credit systems, and other administrative records have the potential to play an important part in the checking of the survey based estimates of R&D.
c. Payments for the use of R&D products. Headings in current use such as licence fees, royalties, franchise payments etc. can confuse between payments for non-produced assets such as marketing and brand names, and produced assets as the result of research and development.
d. Back series – this will unavoidably require the use of proxy information to create back series which will not be of the same quality as estimates based upon sources and methods designed and introduced to generate reliable estimates in the future. Nevertheless, proposals will be made for suitable proxies as long time series are necessary for the running of Perpetual Inventory Models to enable stock levels and depreciation estimates to be made for R&D capital assets.

Annex 1

EUROPEAN COMMISSION
EUROSTAT

Directorate C: National Accounts, Prices and Key Indicators

FINAL REPORT

SECOND TASK FORCE ON THE CAPITALISATION OF RESEARCH AND DEVELOPMENT IN NATIONAL ACCOUNTS

Introduction

1. The share of goods in GDP has been steadily declining in favour of services in the European Union Member States and other developed countries. Both inputs into production process and outputs of production have become more "intangible". In many cases most of the value of these intangible products is to intellectual endeavour they embody – a feature that calls for their treatment as investment. However, research and development (R&D) services have not been so far included in gross fixed capital formation in ESA95. Instead, they are treated as intermediate consumption. Given the fact that R&D has many characteristics of investment, its capitalisation has become one of the major topics of the revision of the System of National Accounts and the upcoming revision of the ESA95. As a result of the work of the Canberra II Group on the Measurement of Non-financial Assets in particular, it was proposed to include R&D expenditure as gross fixed capital formation in the core national accounts. Hence, the latest System of National Accounts (SNA2008) explicitly recognises that expenditure on research and development should be recorded as capital formation.

2. Before achieving the aim of capitalisation of R&D, the quality of the data must first be tested in the satellite accounts. A high level of reliability of data and its international comparability have to be ensured. A statistical basis for the development of harmonised European R&D satellite accounts exists, 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 the 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.

3. However, data currently collected are insufficient for the comprehensive preparation of R&D satellite accounts. The fair application of European legislation therefore means that the required estimates must be harmonised, clearly identified and discussed between the Member States. In this context the main objective of the first Eurostat Task Force on R&D was to prepare templates for supplementary tables of R&D with the long-term aim of enabling the capitalisation of R&D.

4. The second Task Force made use of the outcome of the first Task Force, completed two rounds of the templates for supplementary tables of R&D and by doing so the Task Force tested the reliability of the R&D data. The reliability tests and the identification of the main difficulties encountered in completing the supplementary tables was the main objective of this Task Force. The second objective of the Task Force was the promotion of exchange of experience with regard to the capitalisation of R&D between the participants.

5. The Task Force met 3 times in 2011 and 2012. In the preparation to the meetings, the EU Member States and the EFTA countries were requested to complete the R&D questionnaire containing the R&D capitalisation templates. Furthermore, the countries were encouraged to provide comments on their preliminary experience with regard to the capitalisation of R&D services. In the course of the work carried out by the Task Force difficult issues, such as the treatment of the freely available R&D services and the issue of service life of R&D assets, were thoroughly discussed.

Recommendations of the second Task Force on the capitalisation of R&D in National Accounts

6. The following recommendations were agreed by the Task Force on R&D:

i) ***full consistency between the data in the agreed compulsory R&D tables and the national accounts should be ensured in the course of the capitalisation of R&D services;***

The Task Force agreed a compulsory set of tables that should be used as bridge between data sources and National Accounts (see Annex to this report). In particular Table 1 and Table 2 concern the calculation of output of R&D. Table 1 may be filled in for sectors for which sufficient information from sources other than Frascati surveys is available (that could most probably be the case for S13, but maybe also for other sectors). In the other cases Table 2, which is based on Frascati surveys data, should be used. The Task Force made a recommendation that full consistency between the data in the agreed compulsory R&D tables and the national accounts should be ensured in the course of the capitalisation of R&D services.

j) ***until the R&D stocks are available, the consumption of the R&D assets used in the production of R&D services does not have to be taken into account in the estimates of the R&D output (as a part of the consumption of fixed capital);***

The calculation of the consumption of fixed capital in the production of R&D services (R&D output) by means of the PIM method requires estimation of the use of all fixed assets, including existing R&D assets used to produce new R&D. As the stocks of R&D assets are not yet available in most of the countries, the Task Force recommended that for the moment the consumption of the R&D assets used in the production of the R&D services may not be taken into account.

k)***the input method is recommended in the calculation of R&D in volume terms****;*

In view of difficulties in identifying the output unit in R&D and as no unit value indices exist, the Task Force recommended to use the input method for the volume measures of R&D.

l) ***geometric depreciation function is recommended as a reference method in the calculation of CFC of R&D; however, countries that have developed alternative methods may continue to use them;***

The Task Force recommended that countries should use the geometric depreciation function as a reference in the calculation of consumption of fixed capital of R&D assets. However, countries that developed alternative methods may continue to use them.

m) ***the R&D services subcontracted by one R&D institutional unit to another R&D institutional unit should be recorded as intermediate consumption. However, the possibility of recording the output of R&D institutional unit net of subcontracted R&D or on a gross basis would be left open to countries that encounter problems in obtaining data needed to adjust the Frascati intramural expenditures on R&D to gross recording;***

Already the previous R&D Task Force encouraged the Member States to record the R&D services subcontracted by one R&D company to another R&D company as intermediate consumption. However, the possibility of recording the output of R&D companies net of

subcontracted R&D was left open to countries that encounter problems in obtaining data needed to adjust the Frascati intramural expenditures on R&D to gross recording.

n)***all expenditures by government on Intellectual Property Products (IPPs), including freely available R&D, should be recorded as GFCF, if they satisfy the requirement that IPPs is intended for use in the production of more than one year;***

While filling in the questionnaires some countries excluded a part of the freely available R&D from investment. The justification of such a treatment was intensively discussed. Finally the Task Force was reminded of the pragmatic decision of the ESA 95 review group to capitalise all freely available R&D which is intended for use in the production of more than one year.

o)***the net operating surplus of market producers of R&D (as reference to return to capital) is derived as mark-up including unsuccessful R&D. The method to obtain the mark-up may be calculated as industry specific or as a single mark-up for all industries: To ensure stability of the mark-up time series, an average or a weighted moving average of several years should be used;***

Ideally, the averaging technique should be consistent with the parameters used in the calculation of CFC. In practice, however, there could be problems regarding the availability of long time series and thus a simple average of a limited time-span should also be allowed.

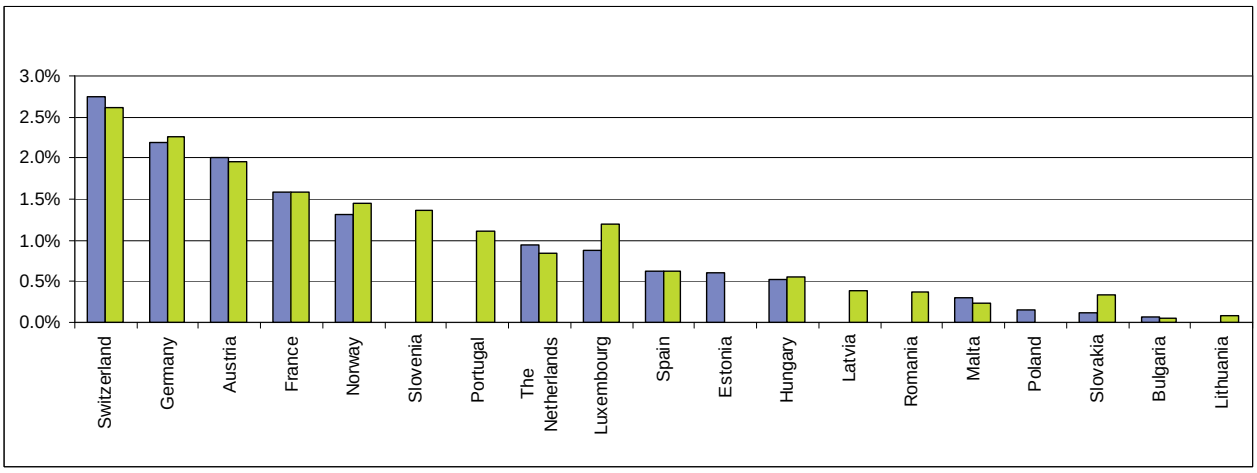
p)***Service Life estimates used in the calculations of R&D should be based on dedicated surveys or other relevant research information, including information of other countries with comparable market/industry characteristics. In case, where such information is not available, a single average Service Life of 10 years should be retained. It is also recommended that the above mentioned Service Life estimates should be investigated regularly, e.g. every 10 years.***

A majority of countries have neither detailed nor reliable information on service life for each component of R&D. The proposed single average of service life of 10 year is a practical solution for those countries that have no information on service life of R&D assets. There is no intention to prevent countries from using more specific information resulting from their research efforts.

Impact of the R&D capitalisation - Reliability of the results

7. The main objective of the Task Force was to test the reliability of the R&D data. The results showing the impact of capitalisation of R&D on GDP using the statistical information provided in the questionnaires in 2011 and in 2012 are best illustrated by **Chart 1** below.

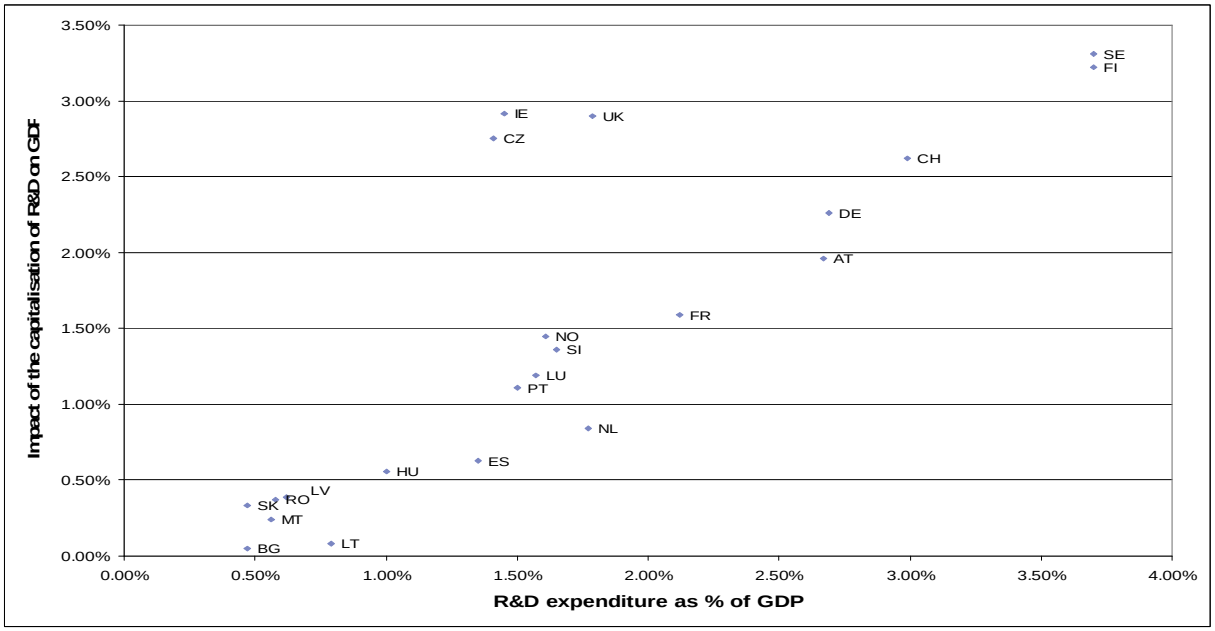
Chart 1: Impact of R&D capitalisation on GDP – in per cent of GDP – Preliminary results



Source: Results of the questionnaire on capitalisation of R&D in 2011(blue) and in 2012 (green)

8. The Task Force also analysed the correlation between GERD expenditure and impact of R&D capitalisation on GDP. The results are plotted in **Chart 2** below.

Chart 2: Correlation between GERD expenditure and impact of R&D capitalisation on GDP – Preliminary results



Source: Results of the questionnaire on capitalisation of R&D of 2012, and GERD database.

9. Chart 1 visualizes the progress of the Member States while calculating R&D figures. Several countries were able to fill in the questionnaire twice and the number of reporting countries increased significantly with the second exercise. Furthermore, the chart shows that the estimates on the impact of R&D capitalisation for those countries delivering two data sets are considerably stable.

10. Chart 2 shows a strong positive correlation for all countries between GERD expenditure and impact of R&D capitalisation on GDP. Some countries stated that their R&D data are still subject to further improvements (e.g. methodological, expanding coverage of survey currently in operation) and that their data are expected to be more comparable with the other countries' results.

11. The joint analysis of Chart 1 and Chart 2 shows that the widespread results presented in Chart 1 are in line with the information provided by Chart 2. Low GERD expenditure leads to a low impact of the capitalisation of R&D expenditure on GDP and vice versa.

12. A self-assessment of the countries with respect to the plausibility of results and to the coherence across the different approaches was provided by the R&D questionnaires. The self-assessment is in line with the positive results given in Chart 1 and Chart 2. The vast majority of countries classified the results of their calculations as plausible and coherent.

Final Conclusions

13. The Task Force on R&D completed its work according to its mandate: 1) to analyse the results of the supplementary tables on the capitalisation of R&D sent by the Member States, in particular the reliability of the data and the main difficulties encountered in completing them; 2) to promote the exchange of experience with regard to the capitalisation of R&D between the countries.

14. The Task Force had identified the main practical problems in compiling R&D estimates and put forward solutions, as presented in part 2, that will help to further improve the reliability and comparability of the R&D estimates.

15. Developing National Accounts R&D estimates is a difficult area and continued work is needed to keep on improving the quality the R&D estimates. In order to foster this, Eurostat will produce a dedicated compilation guide and will organise training on R&D for R&D compilers.

16. Taking into account its discussions and recommendations, the Task Force on R&D saw no major obstacles against implementing the capitalisation of R&D in National Accounts. One member expressed the view that it is too early to make this decision.

Annex to the Final Report - Templates of tables presenting the impact of reclassification of R&D on the value added by industries and on Gross Domestic Product

Table 1

OUTPUT OF R&D
Year:

		S11	S12	S13	S14	S15	TOTAL
1	Intermediate consumption						
2	Compensation of employees						
3	Other taxes on production						
4	Other subsidies on production						
5	Gross operating surplus						
6	Adjustment for exhaustiveness						
7	Other adjustments						
8	TOTAL = OUTPUT						

Table 2

OUTPUT OF R&D

Year :

		S11		S12		S13		S14		S15		TOTAL	
		+	-	+	-	+	-	+	-	+	-	+	-
1	Frascati Manual Intramural expenditures on R&D												
2	Subtract payments for licences to use intellectual products (principally R&D assets, such as patents) that should be recorded as GFCF												
3	Subtract expenditure on own-account production of software												
4	Add payments to postgraduate students not included in FM data												
5	Subtract capital expenditures												
6	Add other taxes on production not included in FM data												
7	Subtract other subsidies on production												
8	Add extramural purchases of R&D that should be recorded as intermediate consumption. Applies only to R&D industry												
9	Sub-Total (1 to 8): current expenditures												
10	Add estimate of consumption of fixed capital plus a return to capital (for non market producers only consumption of fixed capital):												
11	- Option 1: As percentage of current expenditures (line 9) or compensation of employees												
12	- Option 2: As cost of capital services measured with a PIM												
13	Adjustment for exhaustiveness												
14	Other adjustments												
15	Balance : Output of R&D												

Table 3

GFCF OF R&D

Year:

		S11		S12		S13		S14		S15		TOTAL	
		-	+	-	+	-	+	-	+	-	+	-	+
1	R&D output												
2	Add Imports of R&D												
3	Add trade margins												
4	Add taxes on products												
5	Subtract subsidies on products												
6	Subtract extramural purchases of R&D that should be recorded as intermediate consumption. Applies only to R&D industry												
7	Subtract Acquisitions of R&D not expected to provide a benefit												
8	Subtract changes in inventories of finished R&D												
9	Subtract Exports of R&D												
10	Add Net purchases of R&D between domestic sectors												
11	Sub-Total												
12	Balance: Total GFCF of R&D												
13	Add/subtract capital transfers of R&D assets between sectors in capital account												

Table 4

R&D ASSETS AND CONSUMPTION OF FIXED CAPITAL

Year:

		R&D assets	CFC
1	S11		
2	S12		
3	S13		
4	S14		
5	S15		
6	TOTAL		

Table 5

IMPACT OF RECLASSIFICATION OF R&D ON THE VALUE ADDED BY INDUSTRIES
Year:

		Market producers of R&D (by NACE)	Non-market producers of R&D (by NACE)	TOTAL
1	Output before R&D capitalisation			
2	Changes in output because of own account production of R&D			
3	Changes in output because of government consumption of fixed capital of R&D			
4	Output after R&D capitalisation			
5	Intermediate consumption before R&D capitalisation			
6	Changes in intermediate consumption because of capitalisation of R&D purchases previously included in IC			
7	Intermediate consumption after R&D capitalisation			
8	Value added before R&D capitalisation			
9	Changes in value added			
10	Value added after R&D capitalisation			

Table 6

IMPACT OF RECLASSIFICATION OF R&D ON THE GROSS DOMESTIC PRODUCT
Year:

	Before R&D capitalisation	After R&D capitalisation
FROM THE OUTPUT		
Output (basic prices)		
Intermediate consumption (excl. deductible VAT) (-)		
Value added (gross, basic prices)		
Taxes less subsidies on products		
Taxes on products		
Subsidies on products (-)		
Difference imputed and paid VAT		
Domestic product (gross, market prices)		
FROM THE GENERATION OF INCOME		
Compensation of employees		
Wages and salaries		
Employers' social contributions		
Taxes on production and imports less subsidies		
Taxes on production and imports		
Subsidies (-)		
Operating surplus/mixed income (gross)		
Consumption of fixed capital		
Operating surplus/mixed income (net)		
Domestic product (gross, market prices)		
FROM THE FINAL EXPENDITURE		
Final consumption expenditure		
Fixed capital formation (gross)		
Changes in inventories		
Acquisitions less disposals of valuables		
Exports of goods and services		
Imports of goods and services (-)		
Domestic product (gross, market prices)		

List of participants of the Eurostat Task Force

Belgium	Bernadette BOUDRY, Cedric LUPPENS
Bulgaria	Margarita TZVETKOVA
Czech Republic	Jaroslav ZBRANEK, Jaroslav SIXTA
Denmark	Christian GYSTING
Germany	Eric OLTMANNS, Walter ADLER
Estonia	Mari PARNAMAE, Robert MÜÜRSEPP
Ireland	Kieran CULHANE
Greece	Maria KATSIKAVELI
Spain	Elena MORALES OLABARRIA
France	Michel BRAIBANT, Marie HASSAN
Italy	Antonio REGANO, Massimiliano IOMMI
Cyprus	Damianos DAMIANOU
Latvia	Inese MEDNE
Lithuania	Jurate SINKUNIENE
Luxembourg	John HAAS, Jill THINNES
Hungary	Ferenc LASZLO DIENES
Malta	Dorota ZAMMIT
Netherlands	Murat TANRISEVEN, Joy-Sie CHEUNG
Norway	Steinar TODSEN, Knut SØRENSEN
Austria	Josef FALKINGER
Poland	Magdalena MOJSIEWICZ, Marcin PLOCIENNIK, Alicja TRUSZYNSKA, Dominik ROZKRUT
Portugal	Maria JOAO DAVID
Romania	Maria GIURGEAN
Slovenia	Jure LASNIBAT
Slovak Republic	Alena ILLITOVA, Frantisek BERNADIC
Finland	Taru SANDSTRÖM, Ville HALTIA
Sweden	Jonas ZEED
Switzerland	Pierre SOLLBERGER
United Kingdom	Walter MKANDAWIRE, Daniel KIER, Mavis ANAGBOSO
OECD	Julian DUPONT, Nadim AHMAD, Craig McLAREN
Eurostat	Gallo GUEYE, Francis MALHERBE, Jens GRUETZ, Leonidas