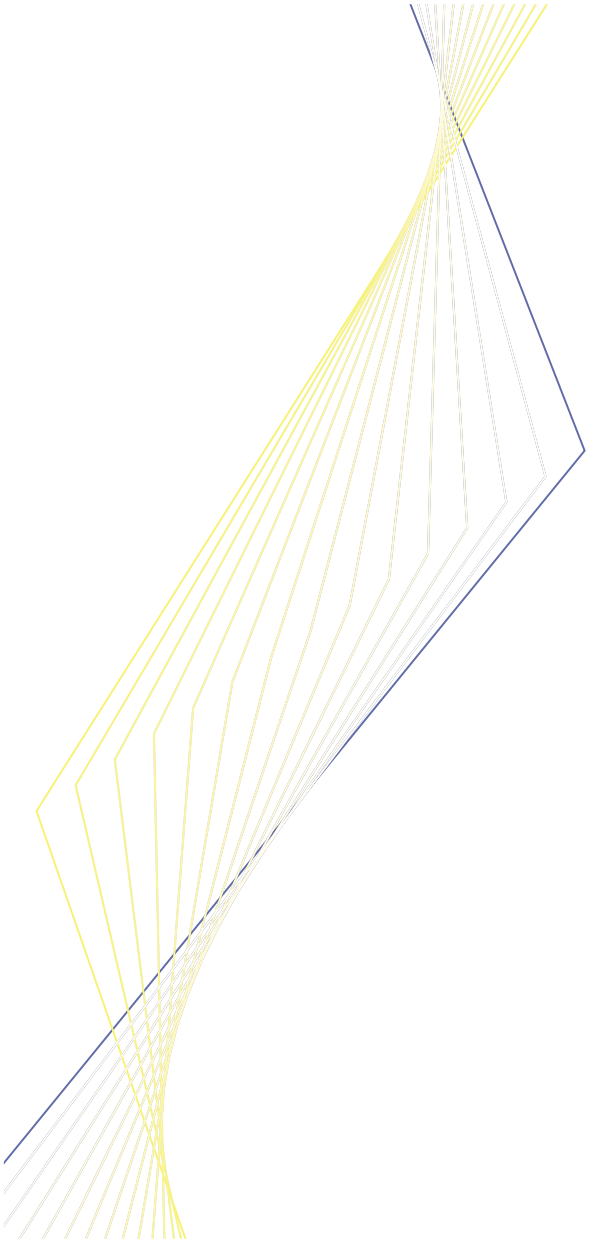
EUROPEAN CENTRAL BANK

PORTFOLIO INVESTMENT INCOME

TASK FORCE REPORT

August 2003



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Address	**Kaiserstrasse 29**
	D-60311 Frankfurt am Main
	Germany
Postal address	**Postfach 16 03 19**
	D-60066 Frankfurt am Main
	Germany
Telephone	**+49 69 1344 0**
Internet	**http://www.ecb.int**
Fax	**+49 69 1344 6000**
Telex	**411 144 ecb d**

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Executive summary

I. Introduction

Summary of the mandate

The Task Force on Portfolio Investment Income (TF-PII) was set up by the Working Group on Balance of Payments and External Reserves Statistics (WG-BP&ER) to follow up the work of the Task Force on Portfolio Investment Collection Systems (TF-PICS). The TF-PII was mandated to investigate the need for and the characteristics of harmonised approaches to the compilation of portfolio investment income for the euro area balance of payments (b.o.p.), as the TF-PICS was not able to carry out such an analysis in time to incorporate the conclusions into its final report.

The TF-PII mandate observed that the income recorded in the current account of the euro area b.o.p. is of poor quality at present. The context of improvements in portfolio investment collection systems stemming from the TF-PICS triggered an appropriate opportunity to undertake a thorough review of the present income compilation methods as well.

The TF-PII was empirically rather than conceptually organised. This was an essential prerequisite for the orderly working of the Task Force, given the ongoing conceptual debate as to which general approach (debtor or creditor) should be followed. This debate has continued throughout the life of the TF-PII within the IMF, SOEC, OECD and the UN, and was not yet over at the date the TF-PII completed its work.

Review of output requirements

According to its mandate, the TF-PII was required to identify the features that the final product should fulfil in terms of output requirements.

The current quarterly output requirements for portfolio investment income are as follows:

- Compilation of all income on a full accruals basis;
- Compilation of income aggregates by instrument;
- Compilation of income aggregates by resident sector;
- For credits, compilation currently following an intra/extra-euro area split and, in 2004, following the step 3 geographical breakdown;
- For debits, compilation on a (national) non-resident basis only.

These output criteria required a review of the data collection models (DCMs) for portfolio investment stock and flow data to be carried out in order to meet the requirement for portfolio investment income of a high level of quality.

Quality criteria

The quality criteria considered by the TF-PII are those that have been developed by the WG-BP&ER and approved by the STC for monitoring the dimension of quality in the compilation of b.o.p. and i.i.p. statistics.[1] In addition, some specific quality measures that could be applied to income were also included.

1 See reference document "ST/STC/BP/QUALIMP3.DOC", approved by the STC in April 2001.

II. Current national practices and consequences for the euro area aggregates

At present, the collection systems for portfolio investment income within EU countries are based on three broad methodologies (see table in Appendix 1): (i) income data collected from reporters, which can take two forms, namely surveys (three countries) and settlements (seven countries); (ii) income calculated at the level of individual securities by the b.o.p. compiler using security-by-security information (two countries); and (iii) income estimated by the b.o.p. compiler following an aggregate approach, applying benchmark yields to outstanding stocks aggregated by categories of securities, e.g. by type of instrument, sector and country of the issuer, issue currency, etc. (three countries)

In terms of the most common problems, one widespread concern identified by compilers in their current systems is the non-application of the accruals principle. Another source of inconsistencies is the fact that Member States employ different methods to accrue income (debtor/acquisition/creditor), and mostly apply dissimilar methods to credits and debits as well.

Concerning the calculation / collection / estimation of income on an aggregate or on a security-by-security basis, the picture is again not uniform. Some countries compile this information s-b-s for at least part of the total income reported. Other countries apply the so-called mixed approach, i.e. establishing categories of securities out of s-b-s portfolio investment stocks and applying benchmark yields to these aggregates in order to estimate income. The remaining countries estimate or collect income on an aggregate basis.

There seems to be an obvious correlation between the choice of methodology (aggregate/s-b-s) and whether the debtor or creditor approach is followed. Countries estimating income on an aggregate basis normally follow the creditor approach, while countries calculating income s-b-s normally follow the debtor approach. Indeed, even countries applying a different methodology to different instruments normally follow this pattern (i.e. s-b-s in combination with the debtor approach, and aggregated plus the creditor approach). For example, in quite a number of cases, the calculation of income s-b-s is only used for domestic government bonds, following the debtor approach.

The availability of a fully operational CSDB plays a crucial role in the future plans of most countries as regards changes in their systems.

III. Plausibility Exercise on Portfolio Investment Income

The TF-PII performed an econometric analysis of income data supplied by Task Force members (and the Banque Nationale de Belgique) covering the entire EU/ euro area. The aim of the study was to test the plausibility of portfolio investment income figures both at the national and at the euro area aggregate level. Data at the national level were further broken down by three types of instruments: Equities, Bonds & Notes and Money Market Instruments. A second strand of analysis was to regress overall portfolio investment credits over assets and debits over liabilities ratios on the characteristics of individual countries' stylised compilation methodologies, the business cycle and country-specific indicators. The purpose was to analyse whether the use of different compilation methods introduces systematic biases into the portfolio investment income figures which, in turn, could lead to asymmetries in national data contributions to the euro area aggregate.

The most interesting finding was that, although we observe plausible net ratios at the step 1 euro area aggregate level, the variation of ratios at the national level broken down by

instruments gives rise to significant concern. This is especially the case for Equities and Money Market Instruments. It seems that the plausible step I euro area aggregate simply results from netting of positive and negative asymmetries in the two years analysed. Given the enormous degree of inconsistency in ratios, irrespective of the economic theory applied, we should at least observe some convergence in fixed interest and short-term securities over the period. Instead, we find strong evidence that large asymmetries in portfolio investment income recording exist within the euro area.

This finding is further supported by analysing the impact of using different compilation methodologies. Here, for all stylised characteristics of compilation methodologies, we find a significant and systematic influence in the results on assets and/or liabilities with both the Bonds & Notes and MMI class of securities. Given the heterogeneity in calculation methods applied in the euro area countries, a strong argument can be made for further harmonisation in this field.

In essence, the objective findings highlight the same issues encountered in Chapter II and confirm what we already knew intuitively. The findings were corroborated by this somewhat innovative analysis, which quantified the effect that a number of asymmetries (such as the application of the accruals principle, aggregate versus s-b-s compilation, debtor versus creditor-based compilation etc.) may exert on the euro area aggregates. Overall, while this chapter does not recommend one approach over another, it highlights the consequences for the euro and EU aggregates entailed by the lack of harmonisation.

IV. Selected Issues on the statistical reporting of portfolio investment income

Application of the accruals principle

In revisiting current practices for income compilation, it was evident that one of the most significant problems at present is the inability of some countries to follow the accruals principle. Only six EU countries currently compile interest income on a full accruals basis, while three countries apply it only to a limited range of financial instruments. Two more countries record accrued interest without any offsetting entry in the financial account. Finally, the remaining four countries do not currently compile interest income on an accruals basis. It is worth noting, however, that some Member States have made firm plans to address this problem.

In the specific case of the euro area, the inconsistent application of this principle causes significant distortions in the compilation of the euro area aggregates. More specifically, the influence of this factor in the volume of monthly errors and omissions in the euro area b.o.p. may deserve further attention. The TF-PII carried out a quantification of this potential gap on the basis of some empirical investigations.

Based on its investigations, the TF-PII considers this issue to represent the most substantial problem for the compilation of income statistics at the present time.

Debtor/creditor: magnitude of the differences and possible way out

The work of the TF-PII took place in the context of an international debate as to whether the interest rate to be used in the calculation of accruals should be the one prevailing at the time of issuance (the so-called debtor or issuer approach), or whether it should be the one at the time of compiling accrued interest (the so-called creditor or market approach).

In reviewing current practices, the TF-PII acknowledged that countries which calculate

income on an s-b-s basis generally follow the debtor approach, while countries estimating income by means of an aggregate methodology mainly follow the creditor approach.

The TF-PII was mandated to assess the magnitude of the difference in the calculation of accrued interest following both approaches. To this aim, a number of empirical exercises were conducted, from which some conclusions can be drawn. The main conclusion was that the magnitude of the difference was indeed relevant, and can be expected to be most pronounced in times of rapid changes in interest rates. For this reason, the TF-PII recommends that, within a country's b.o.p. compilation system, the same approach should be applied to the calculation/estimation of income on both assets and liabilities in order to eliminate inconsistencies between income credits and debits. To reduce asymmetries, a consistent approach should also be adopted across all b.o.p. compiling countries.

To ensure that calculations are made in a consistent way across all EU (euro area) countries, it is recommended that, whichever approach is adopted, estimations/calculations of income should be made, as far as possible, by the b.o.p. compiler and not by reporting agents.

The lack of appropriate information has repeatedly justified the impossibility of promoting a single approach across all EU/euro area countries for portfolio investment income compilation. It might therefore be relevant to note that, if the CSDB can provide monthly information on market yields for individual securities in the future, it will be possible for countries with an s-b-s system to move to a creditor approach. Similarly, the CSDB could also be used to derive aggregate nominal yields for groupings of securities, thus also permitting countries with aggregate systems to move to the debtor approach.[2]

Calculation of income security-by-security versus estimation on an aggregate basis

The TF-PII was of the opinion that the calculation of income on an s-b-s basis offers precise results, provided that all the necessary information is available at a sufficient level of quality. This approach is considered to be the most practical way to substantially reduce asymmetries among countries.

Nevertheless, different circumstances (mainly associated with cost considerations, availability of appropriate information, internal compilation processes and checking procedures, available resources, etc.) could lead b.o.p. compilers to adopt a more simplified approach, such as the aggregate one.

The estimation of income on an aggregate basis consists of multiplying stocks by benchmark yields for a given set of breakdowns (e.g. currency, maturities, country of the issuer). For this approach to produce acceptable results, monthly stocks (or quarterly/annual stocks plus cumulated monthly flows with the corresponding price and exchange rate adjustments) must be available to the compiler. These aggregate stocks could also be built up from s-b-s information applying the so-called mixed approach.

The aggregate approach could represent a practical solution for countries that currently collect income on a settlements basis, but are seeking to evolve towards estimating income on an accruals basis.

The existence of centralised information (e.g. through the CSDB) would be an additional key factor in reducing asymmetries further, regardless of the approach followed. Any asymmetries potentially introduced by MSs adopting different aggregate solutions should be reduced by using the CSDB as the sole source of information for benchmark yields

2 *In practice, however, the need to have access to portfolio investment stocks based on nominal values could constitute an additional difficulty for this approach.*

(given a minimum standard of breakdowns, which ensures suitable income figures).

With the aim of harmonising statistical practices amongst countries, aggregate calculations should be carried out at a minimum level of detail at the very least. The TF-PII is of the opinion that aggregate estimations should be performed (and stocks should be available for this purpose) with a breakdown of assets and liabilities by original maturity, currency of issue and issuer sector (for liabilities and intra-euro area assets) as a minimum.

Income on CIIs

The ECB's "EU b.o.p./i.i.p statistical methods" recommends that all income received by a CII as a result of investments made is to be attributed to the holders of the units over the period under review. This recommended treatment is currently somewhat asymmetric, since it is more difficult to apply it to income credits (i.e. involving non-resident CIIs) than to income debits (i.e. involving domestic CIIs). Assuming that stocks of investments in CIIs abroad will be available to Member States at the same frequency as that at which income needs to be calculated, Member States should theoretically obtain or estimate the asset allocation strategy of the non-resident CIIs.

As this is virtually impossible on practical grounds, a unique set of estimation procedures has been developed in Chapter IV of the final report. The TF-PII recommends that all countries should apply these estimation methods in order to reduce potential asymmetries. Concerning taxes, the figures should be adjusted and appropriate offsetting entries recorded under the current transfer item. To this end, the TF-PII recommends the exchange of information on taxation among euro area compilers.

An optimal element of the estimation procedure is that an agreed rate of return for either overall CII investment in the euro area or for each class of investment by CIIs, i.e. Bond Funds, Equity Funds and Money Market Funds, will be agreed, set centrally and made available in the CSDB. Until this information can be made available through the CSDB, however, some temporary solutions could be considered as outlined in the main report.

Practical difficulties in the collection of income on zero coupon bonds

The mandate of the TF-PII included a specific point for investigation concerning practical difficulties in the collection of income on zero coupon bonds. Furthermore, the lack of information on accrued income on zero coupon bonds and deep-discounted notes was one of the most significant problems reported by a number of countries in the introductory meeting of the TF-PII, especially by those countries collecting income data from settlements.

The main finding of the TF-PII is that the problems associated with the recording of income for zero coupon bonds crucially depend on which general approach for the compilation of income is followed: collection, calculation or estimation. Only in the first of these, and where income is collected through settlements, are these problems relevant. This method has already been deemed inappropriate for the compilation of accrued income.

The standard approach used for calculating income, for example at the level of individual securities, is to use the linear or cumulative method. Although both methods potentially offer acceptable results, the cumulative method seems conceptually more robust. However, it is more difficult to apply compared with the simplicity and ease of application of the linear method.

Alternatively, when the compiler estimates income, these problems are less important, as no instrument-specific method is necessary for zero coupon bonds. The standard method, i.e. applying yields to outstanding stocks, can be

used, following the same estimation method as for any other type of debt security.

Income on shares

The TF-PII recommends that, for practical reasons, dividends should be recorded in the period when they are paid rather than when they are declared payable. Likewise, and as a practical solution to avoid asymmetries, it is acceptable to record dividends from both operating profits and from capital gains under investment income, following the advice of the BOP Book.

At present, most countries do not record stock dividends. Nevertheless, the TF-PII empirically checked that stock dividends were not substantial in any country[3] and, therefore, potential asymmetries due to non-recording cannot be deemed sizeable. Additionally, most countries record dividends net of taxes at present. The TF-PII recommends that an imputation should be made reflecting the amount of the corresponding tax (both the income on shares and the current transfers items should be corrected). The full report provides some information on taxation applicable within the EU countries.

V. Approaches to the compilation of Income

Three approaches to the compilation of PI income are explored here, namely, collection, estimation and calculation. Calculation is where the compiler calculates PI income at the individual security level; estimation refers to when benchmark yields are applied to aggregates of PI stocks at the instrument, currency, sector or country level, or to the entire aggregate; and collection refers to when income figures are directly collected from reporters either through surveys or via settlements channelled through domestic banks. These three methods of compilation are assessed in the context of the three channels for approaching the reporting population identified in the TF-PICS's final report, i.e. indirect reporting through settlements, direct reporting through surveys and indirect reporting from custodians.

The chapter, therefore, considers various combinations of these methods of collection/calculation/estimation and alternative channels of reporting, and whether they can easily be used to compile income on an accruals basis. It also considers whether this income can be recorded on a debtor or a creditor basis. The context was the requirement that any combination should in theory meet the output, timeliness and quality requirements set out in the Introduction and in ECB Guideline ECB/2000/4.

Collection of income – summary findings

Collecting income via settlements is not suitable for the compilation of accrued portfolio investment income. Collection of income on an accruals basis is only possible in a direct reporting system (i.e. through surveys). In this case it must be determined whether accounting and statistical methodologies and concepts coincide. Additionally, surveys normally only collect income information on a debtor/acquisition basis. The potential for asymmetries between assets/credits and liabilities/debits should be borne in mind.

Estimation of income – summary findings

The estimation of income requires stock statistics on Portfolio Investment to be available either on an s-b-s basis or an aggregate one. The compiler then estimates income by applying benchmark yields to these stocks.

Estimation of income from stock positions in Portfolio Investment is possible for two of the

3 Portugal could prove an exception in 2001.

three channels for addressing the reporting population (Channels B & C). It has no application in the case of settlement systems where no stock information is collected. However, some supplementary data to current output requirements (such as currency) is required to perform these estimations with the necessary degree of accuracy. While income on a creditor basis can be readily estimated, there are difficulties associated with the compilation on a debtor basis which centre on the availability of historic benchmark yields and nominal stocks. Where s-b-s data are used to compile the stock aggregates, the required additional breakdowns are available and a higher degree of accuracy is possible (the "mixed approach").

Calculation of income - summary findings

By the term calculation we mean when the compiler operates an s-b-s data collection system for portfolio investment and when individual yields are applied at a security level to calculate portfolio investment income. If the compiler has the full population of relevant securities in his collection system as well as individual yield data for all securities, it follows that this exercise is more correctly termed calculation, as opposed to estimation.

Not all respondents in specific countries may be in a position to supply s-b-s portfolio investment information. Nevertheless, calculation of income offers the greatest flexibility, as the detailed security data collected from compilers allows income to be compiled at a high level of accuracy. However, if income is compiled on a creditor basis, an absolute prerequisite is an operational CSDB that can provide the necessary market information on yields etc., allowing income to be calculated. The calculation method is possible in the case of Channel B (Direct reporting) and Channel C (Indirect reporting). It has no application in the case of settlement systems where stock data are not collected. All the necessary data regarding issuer of the security, sector, currency maturity are available allowing additional detailed analysis. Compiler costs are deemed higher than in the case of aggregate estimations

Main conclusions

Following the recent questionnaire on Recording of income on an accruals basis completed by all European Union members, there are a number of issues that need to be addressed in order for the euro area and the EU to produce income on an accruals basis without the presence of significant asymmetries.

As Member States can choose to compile income in any of the variety of approaches outlined above, the natural consequence is that a consistent measure of accrued income on either a creditor or debtor basis will be difficult to achieve. A particular compilation method therefore needs to be found that can accommodate as many of the various approaches as possible, while at the same time delivering a consistent measure.

From this analysis, we can conclude the following: (i) settlement systems cannot be directly used to estimate accrued income; (ii) direct reporting systems (i.e. surveys) can only collect income from reporters on a debtor (acquisition) basis; and (iii) estimating/ calculating income on a debtor basis requires either an s-b-s system with individual yield calculations, or the application of benchmark nominal yields to aggregate estimated nominal stocks.

VI. Estimation of income on an aggregate basis

The aggregate approach to income estimation can range from the minimum breakdown of stocks and yields required to meet the ECB breakdown of investment income, to more sophisticated models using stock and yield information broken down into the factors that determine the income earned on a particular security (currency, risk, maturity etc.). Taken to the extreme, this becomes an s-b-s approach.

The main advantage of the aggregate approach is that it is less costly both in terms of compiler and respondent resources in comparison with s-b-s compilation.

Currently, the results obtained under an aggregate system are consistent with the creditor approach. Of course, when the CSDB is operational, it will be possible to calculate benchmark indices based on nominal or market interest rates for a given set of breakdowns. This would enable income to be derived following either a creditor or debtor approach. Until then, however, aggregate systems are generally designed to produce results under the creditor approach.

Nevertheless, even with a fully operational CSDB, the application of the debtor approach under an aggregate system requires an additional step, namely the conversion of market stocks into nominal stocks[4]. This further step could cause additional errors, thereby amplifying the deviation of using an aggregate instead of an s-b-s approach, and would decrease the level of precision achieved.

In relation to minimum breakdowns for stocks and yields, the TF-PII is of the opinion that aggregate estimations should be performed (and that stocks should be available for this purpose) with a breakdown of assets and liabilities by original maturity, currency of issue and issuer sector (for liabilities and intra euro area assets), as a minimum.

VII. Conclusions and recommendations

Conclusions and recommendations for individual items

The TF-PII recommends that:

- All countries should adopt the accruals principle as soon as possible, and in a co-ordinated manner. The TF-PII considers this issue to be the most substantial problem in the compilation of income statistics at the present time.

- The pivotal role of the CSDB should be recognised, as it is crucial for the consistent calculation and compilation of income on an accruals basis.

- In general, the compiler should aim to estimate or calculate rather than purely collect income data, especially when income is collected from settlement systems.

- To improve the quality of portfolio income, the availability of both more frequent and more detailed stocks is crucial. Therefore, the production of s-b-s portfolio investment stocks at a certain periodicity, containing detailed categories of instrument detail (which should be available in the securities database), would allow detailed calculations or assist in the use of the mixed approach with the creation of benchmark yields.

- Within a country's b.o.p. compilation system, the same approach (debtor/acquisition/creditor) should apply to the calculation/estimation of income on both assets and liabilities, in order to eliminate

4 The most common output that compilers will find for portfolio investment stocks is probably based on a market valuation, which is the international standard. If so, conversion into nominal valued stocks is required. If countries are already compiling nominal valued stocks for debt securities, then they could directly apply nominal benchmark yields to nominal stocks.

inconsistencies between income credits and debits. To reduce asymmetries, a consistent approach should also be adopted across all b.o.p. compiling countries.

– It is recommended that all countries should apply similar estimation methods in relation to income from CIIs abroad (see the specific estimation methods proposed in the report).

– The TF-PII recommends that, for practical reasons, dividends should be recorded in the period when they are paid rather than when they are declared payable.

Conclusions and recommendations for specific features of data collection models

The TF-PII investigated different solutions for portfolio investment income compilation that were capable of meeting two requirements: (i) to be compatible with acceptable DCMs in the field of portfolio investment; and (ii) to guarantee consistent and high quality income statistics. Following this line of reasoning, the TF-PII selected a number of dimensions, which may be combined to define individual income compilation models.

When considering a ranking for these models, in relation to the debtor and the creditor approaches the mandate of the TF-PII explicitly stated that the ability to adapt to any future change in standards (from one principle to another) should be deemed a highly positive feature in any technique proposed by the TF-PII. In the course of its investigations, the TF-PII came to the conclusion that not all models deemed "acceptable" in the TF-PICS cascade could provide information according to both the creditor and the debtor approaches (at least until the CSDB becomes fully operational). Models without this capacity should therefore be given a lower ranking.

For this reason, the solutions provided by the TF-PII deviate from the cascade and are presented in a tree type structure (see Appendix 2), starting from a single grouping encompassing models compatible with both the debtor and the creditor approaches, and then branching out into two different sections comprising models that are only compatible with one of the two approaches.

However, this tree type structure should be interpreted as the medium to long-term minimum acceptable solution for income compilation. Combinations above the line provide a range of possible alternatives that Member States could move towards in the future. Below the line, a number of solutions have also been identified which could be considered as acceptable alternatives during a transitional or interim period. The duration of this period is yet to be defined by other fora.

Following the above conclusion on the advantages of collecting s-b-s portfolio investment stocks, the tree structure implicitly addresses this common feature. Additionally, the TF-PII encourages the collection of quarterly s-b-s stocks. This recommendation basically depends on a favourable outcome of the national feasibility studies on s-b-s reporting currently in progress. Should these studies conclude that s-b-s reporting is not feasible, the aggregate model under 7b (see Appendix 2) presented as transitional should be considered as acceptable (to the extent that it should meet the data requirements in terms of breakdowns set out in Chapter 6 of the report).

Moreover, the tree structure should be interpreted in the framework of the so-called "matrix approach" (i.e. different solutions may be applied to different sub-populations/ economic sectors). The main aim of this approach is to reach a high level of coverage, i.e. to apply the best possible method to the major market players (which may refer to different economic sectors in different Member States) and thus to cover the bulk of the market. For some economic sectors below a certain threshold of portfolio income/ investment, the temporarily acceptable models (e.g. aggregate solutions or direct collection of income figures) could still produce results of

acceptable quality after the interim period to be defined by the STC and the WG-BP&ER.

Pending issues

The following issues were not tackled by the TF-PII, as it was assumed they were not integrated into its mandate:

- Define a deadline for all countries to accept the recommendation to start applying the accruals principle.

- Decide on the approach to be followed (debtor or creditor), and ensure that all countries stick to such a decision once the CSDB is operational. The possibility of estimating accruals using the debtor approach and aggregated stocks should be studied when the CSDB is operational. The WG-BP&ER and the STC could consider different decisions that are on the one hand applicable to the present situation and, on the other, to a future scenario featuring an operational CSDB.

- Set out an implementation calendar comprising deadlines in order to successively undertake the following two steps: (i) firstly, to implement at least one of the solutions considered to be "temporarily" acceptable; (ii) subsequently, to implement at least one of the solutions considered to be acceptable.

Appendix I

Table II.1

Summary of current practices and future plans[1)]

Country	Main source	Application of accruals	Aggregated/ s-b-s	Debtor/ creditor	Future plans
AT	Calculated by compiler	Yes (Monthly)	s-b-s	Debtor	• Owing to the abolition of the settlement system, future sources for coupon payments are still under consideration.
BE	Estimated by compiler	Partially[2)]	Aggregated	Creditor	-
DE	Collected from reporters	No[3)]	Aggregated	Payments	• An ISIN code has been introduced this year for PI transactions; however, no decision on its possible use for calculating income has been taken yet.
DK	Collected from reporters[4)]	No[4)]	Aggregated[4)]	Payments[4)]	• A system based on s-b-s is under construction.
ES	Collected from reporters[5)]	No[5)]	s-b-s	Payments[5)]	• The new PI system will permit monthly calculation of accrued interest s-b-s once the CSDB is available.
FI	Collected from reporters	Yes (Monthly)	Aggregated	Debits: debtor Credits: acquisition	• A new system for income on CIIs is being developed. • A securities database for money & banking statistics is under construction. This could be used for b.o.p. purposes in the future.
FR	Collected from reporters	No[3)]	s-b-s	Payments	• A new system is being developed (but not before 2004) based on i.i.p. stocks and average yields (following the creditor approach). S-b-s will only be possible if and when the CSDB is fully operational.
GR	Collected from reporters	No	Aggregated	Payments	• As soon as PI stocks are available on a monthly basis (expected in the near future), a new system could provide the accrued interest s-b-s.
IE	Collected from reporters	Yes (Monthly)	Aggregated	Debits: debtor Credits: debtor/ acquisition	• Increase quality checking with benchmark yields and monthlysurveys of MFI income.
IT	Calculated by compiler	Yes (Monthly)	s-b-s[6)]	Debtor	• Changes only foreseen to the extent that the conclusions of the TF-PII are available and the CSDB is fully operative.
LU	Estimated by compiler	Partially[7)]	Aggregated	Creditor	• Improvement of geographical breakdown as of 2003. • The possibility of recording offsetting entries in the financial account for income accrued on mutual funds is being studied.

1) This table is presented for illustrative purposes and therefore necessarily implies a certain degree of simplification concerning current practices.
2) No financial account entry, neither to offset accrued income, nor at the time the coupon is finally paid.
3) A correction is applied to the recording of purchases and sales of securities, estimating and recording the accrued coupon paid by the acquirers as income rather than including it in the financial account.
4) Except premium/discount of debt securities registered at the Danish Securities Centre, calculated by the compiler s-b-s and on an accruals basis, following the debtor approach.
5) Except for government bonds and notes, where the accrued interest is calculated s-b-s, following the debtor approach.
6) Except for MFIs' liabilities, for which s-b-s stocks are not available.
7) No financial account entry, neither to offset accrued income, nor at the time the coupon is finally paid.

Table II.1 (cont'd)

Summary of current practices and future plans

Country	Main source	Application of accruals	Aggregated/ s-b-s	Debtor/ creditor	Future plans
NL	Collected from reporters	No[8)]	Aggregated	Payments	• A new direct reporting system with monthly accruals following the debtor approach, either calculated by the compiler if information is reported s-b-s, or collected on an aggregate basis from reporters.
PT	Estimated by	Yes (Monthly)	Mixed[9)]	Creditor	• The PT securities database can be used to obtain information on coupon payments (currently obtained from the settlement system). • Calculations can be improved by differentiating among sectors.
SE	Mostly collected from reporters	Partially[10)]	Mixed[10)]	Debtor/ acquisition/ payments	• The settlement system is to be abolished in 2003. • For those parts affected, an alternative system is under construction.
UK	Estimated by compiler/ collected from reporters[11)]	Yes (Quarterly)	Aggregated	Debits: debtor Credits: acquisition/ creditor	• A joint ONS/Bank of England feasibility study of a monthly s-b-s reporting system is currently running.

8) For income on Dutch bonds, payments are smoothed out across a period of 12 months (instead of being entirely recorded when the coupon is paid).

9) Aggregated calculations based originally on s-b-s PI stocks.

10) For some prominent resident holders of foreign securities (credits) and resident issuers of bonds/MMIs denominated in foreign currency (debits), income is reported directly on an aggregate basis (acquisition and debtor). For income debits on domestic bonds/MMIs denominated in domestic currency, the compiler calculates income s-b-s (debtor). The rest is collected through settlements (aggregated).

11) Income data are collected from MFIs and some investment trusts.

Appendix 2

Table VII.2
Tree structure of data collection models

		DEBTOR[1]	CREDITOR
Ideal	1	Calculation by compiler [s-b-s][2] PI stocks: M collected [s-b-s]	
Good	2	Calculation by compiler [s-b-s][2] PI stocks: Q collected, M derived [s-b-s][3]	
	3	Estimation by compiler [mixed[4]][5] PI stocks: M collected [s-b-s]	
Acceptable	4	Estimation by compiler [mixed][5] PI stocks: Q collected [s-b-s], M derived [s-b-s][3]	
	5	Estimation by compiler [aggr.][3] PI stocks: Q collected [s-b-s], M derived [aggr.][6), 3]	
	6	Calculation/Estimation by compiler [s-b-s][3), 5] PI stocks: Y collected [s-b-s], M derived [s-b-s][3]	
Transitional	7a	Collection from reporters [surveys][7] PI stocks: M or Q collected [aggr.]	7b: Estimation by compiler [aggr.][5), 6] PI stocks: M or Q collected [aggr.][3]
Not acceptable	8	Collection from reporters [settlements] PI stocks: irrelevant	

1) The application of the debtor approach requires the availability of portfolio investment stocks at nominal values. International standards require flows and stocks at market values, which could be a problem for models (3) to (6) at present.

2) S-b-s calculations following the creditor approach will only be feasible in the future, assuming market yield information for individual securities is supplied monthly by the CSDB.

3) By accumulating monthly b.o.p. flows to less frequent stocks, with the relevant price and exchange rate adjustments. This approximation may produce results of inferior quality in the debtor approach compared with the creditor approach, since monthly b.o.p. transactions are valued at market prices rather than at nominal values. Some adjustments would therefore be necessary.

4) Aggregate income estimations applied to categories of securities established from s-b-s portfolio investment stocks..

5) To be considered acceptable, aggregate estimations should meet at least the minimum features required in Chapter VI, i.e. they should be performed (and stocks should be available for this purpose) with a breakdown of assets and liabilities by original maturity (short term/long term), issuer sector (for liabilities and intra-euro area assets) and currency of issue as a minimum.

6) Aggregate income estimations following the debtor approach require (i) the availability of benchmark yields based on nominal interest rates; and (ii) monthly nominal stocks to be estimated on the basis of marked-to-market aggregate stocks (quarterly stocks s-b-s + aggregate monthly flows), which should be converted from market into nominal values. The CSDB should provide the necessary yields and ratios to permit such estimations in the future.

7) This model is only compatible with the debtor approach for liabilities/debits; for assets/credits, it is more closely aligned to the acquisition approach.

I. Introduction

Summary of the mandate

1. The Task Force on Portfolio Investment Income (TF-PII) was set up by the Working Group on Balance of Payments and External Reserves Statistics (WG-BP&ER) to follow up the work of the Task Force on Portfolio Investment Collection Systems (TF-PICS). The TF-PII was mandated to conduct similar investigations regarding the need for and the characteristics of harmonised approaches to the compilation of portfolio investment (PI) income for the euro area balance of payments (b.o.p.), as the TF-PICS was not able to carry out such an analysis in time to incorporate the conclusions into its final report.

2. The TF-PII mandate observed that the income recorded in the current account of the euro area b.o.p. has been of poor quality. The context of improvements in portfolio investment collection systems stemming from the TF-PICS triggered an appropriate opportunity to undertake a thorough review of the present income compilation methods as well.

3. The TF-PII was empirically rather than conceptually oriented. This was an essential prerequisite for the orderly working of the Task Force, given the ongoing conceptual debate as to which general approach (debtor or creditor) should be followed. This debate has continued throughout the life of the TF-PII within the IMF, SOEC, OECD and the UN, and was not yet over at the date the TF-PII completed its work.

4. Specifically, the TF-PII mandate covered the investigation and assessment of different approaches to the compilation of income, including a qualitative merits and costs analysis. The core mandate specified the following:

- To identify the features that the final product should fulfil in terms of output requirements and quality criteria, i.e. high quality euro area aggregates;

- To identify, in the context of the output and quality requirements, a limited number of techniques which would deliver the necessary portfolio investment income aggregates;

- To subject these techniques to empirical analysis and rank them in accordance with how they meet the requirement of ensuring consistency between portfolio investment stocks and income flows, and of delivering a symmetric solution for income debits and credits that is consistent with the acceptable solutions of the TF-PICS;

- To balance and accommodate the following items:

  – Prerequisites for the calculation of income

  – Methods for the collection of data on coupon payments/receipts

  – The feasibility of the recommended approaches

  – Interest rates to be applied for accruals calculation.

5. In addition, a number of specific topics were included in the mandate to be technically investigated by the Task Force. They included the following:

(i) Income on collective investment institutions (CIIs)

(ii) Income on shares

(iii) Practical difficulties in the collection of income on zero coupon bonds

(iv) Financial flows which should not be considered as income (e.g. interest rate swaps, fees paid on securities lending/gold loans and deposits, etc.).

6. Practically all these topics that the TF-PII was mandated to investigate are covered in this report. However, the TF-PII was unable to undertake an exhaustive analysis of b.o.p. flows not to be considered as income due to time constraints. In any case, the TF-PII is of the

opinion that such an investigation could be deemed more methodological and, as such, could perhaps be carried out by the WG-BP&ER at a later stage.

Structure of the report

7. Chapters II – VI cover the investigations carried out by the Task Force. Chapter II reviews current national practices in the light of the numerous heterogeneous approaches to compiling portfolio investment income currently applied by the EU and euro area Member States. Additionally, the consequences for the quality of the supranational aggregates resulting from this divergence between Member States are considered. The chapter concludes with a summary of the main contributing factors to asymmetries, together with an assessment of the benefits that would emerge from a more harmonised approach to compilation.

8. The basis of Chapter III is an econometric analysis of the data supplied by Task Force members (and the Banque Nationale de Belgique). In essence, the objective findings were not particularly different from those of Chapter II (i.e. identifying gaps in current compilation systems), and confirm what had already been intuitively known. These findings were corroborated by a somewhat innovative analysis, which quantified the effect that a number of asymmetries (such as the application of the accruals principle, aggregate versus security-by-security (s-b-s) compilation, debtor versus creditor-based compilation, etc.) may exert on the euro area aggregates. The technical details of this analysis are presented in an annex. Overall, this chapter does not recommend one approach over another, but rather highlights the consequences of the lack of harmonisation for the euro and EU aggregates.

9. Chapter IV analyses selected issues regarding the statistical reporting of portfolio investment income. Issues analysed include (i) the consequences of non-application of the accruals principle; (ii) empirical evidence on the differences between the creditor and debtor approaches to the compilation of PI income; (iii) empirical evidence on aggregated compared with security-by-security recording; (iv) further empirical work on the comparison between debtor-based s-b-s reporting and creditor-based aggregate reporting, expanding on the previous point; (v) treatment of income on collective investment institutions; (vi) income on zero coupon bonds; and (vii) income on shares. Each section has a series of conclusions which ultimately feed into the overall conclusions and recommendations of the Task Force as outlined in Chapter VII.

10. Chapter V explores the three approaches to the compilation of PI income, namely collection, estimation and *calculation*. Calculation is where the compiler calculates the PI income at the individual security level; *estimation* refers to when benchmark yields are applied to aggregates of PI stocks at the instrument, currency, sector or country level, or to the entire aggregate; while *collection* refers to when income figures are directly collected from reporters either via surveys or via settlements channelled through domestic banks. These three compilation approaches are assessed in the context of the three channels for approaching the reporting population identified in the final report of the TF-PICS: indirect reporting through settlements, direct reporting through surveys, and indirect reporting from custodians.

11. The estimation of income on an aggregate basis is extensively treated in Chapter VI. A number of important issues are discussed, including the difficulties that arise when applying the debtor approach to the estimation of PI income on aggregated securities (the creditor approach is a more straightforward option when estimating income from the aggregates). In addition, the details on portfolio stocks that assist in the estimation of income, such as currency, original/residual maturity, country of issue etc., are discussed. A minimum set of breakdowns is proposed to enable income of an acceptable quality to be estimated from the aggregates.

12. The TF-PII's conclusions and recommendations are outlined in Chapter VII.

Review of output requirements

13. According to its mandate, the TF-PII was required to identify the features that the final product should fulfil in terms of output requirements.

14. The current quarterly output requirements for portfolio investment income are as follows:

- Compilation of all income on a full accruals basis;
- Compilation of income aggregates by instrument;
- Compilation of income aggregates by resident sector;
- For credits, compilation currently with an intra/extra-euro area split and, in 2004, with the step 3 geographical breakdown;
- For debits, compilation on a (national) non-resident basis only.

15. The issue as to whether income should be compiled on a debtor or a creditor basis remains open for the time being. At the very least, our analysis suggests that whatever approach is followed should be applied consistently for debits and credits and across countries without exception until this issue is finalised in other fora, i.e. the ECB, SOEC, IMF, etc.

16. These output criteria triggered a review of the data collection models (DCMs) for portfolio investment stock and flow data in order to meet the requirement for portfolio investment income of a high quality level. Accordingly, the tree structure outlined in Chapter VII presents some more forward-looking DCMs considered acceptable for long-term implementation, as well as some transitional DCMs that are considered acceptable for the short to medium term.

Quality criteria

17. The WG-BP&ER and the STC defined some quality criteria with a view to guiding the way how information should be collected, estimated, calculated, processed and transformed into aggregated statistics. These criteria, which are designed to monitor the dimension of quality in the compilation of b.o.p. and i.i.p. statistics, are at the heart of the TF-PII's proposals.[1]

18. These quality requirements are set out in Annex 1 and cover the following issues :

– Timeliness and accuracy

– Stability and accuracy

– Stability and integrity.

19. However, there are some specific quality measures that could be applied to income:

– The consistency between stocks/flows and income, namely, rates of returns for both assets and liabilities could be checked against market interest rates and yields. Such tests could be included as a quality measure.

– The monthly/quarterly measures of interest income for bonds and notes and money market instruments should exhibit a relatively smooth transition from month to month or quarter to quarter when the accruals concept is applied. The profile of the time series could be examined as another quality test.

– Yield tests measuring, for example, the implicit rate of return when portfolio investment income flows are confronted with portfolio investment stocks represent another appropriate quality check.

1 See reference document 'ST/STC/BP/QUALIMP3.DOC', approved by the STC in April 2001.

II. Current national practices and consequences for the euro area aggregates

Features of present compilation systems and prospects for change[1]

20. At present, the compilation systems for portfolio investment income within EU countries are based on three broad methodologies (see Table II.1 for further details on individual countries' methodologies):

(i) Directly collected from reporters (nine countries). This can take two forms:

  (a) collecting income from reporters' accounting statements (three countries), i.e. following accruals accounting and most often conforming to the debtor approach for liabilities (debits) and to the acquisition approach for assets (credits); or

  (b) collecting coupon payments only (most often from settlements), without applying the accruals principle (seven countries[2]).[3]

(ii) Calculated by the b.o.p. compiler from security-by-security information. Income is calculated as the product of each individual yield times the outstanding stock of foreign securities holdings by residents (for credits) or stock of domestic securities holdings by non-residents (for debits) (two countries; three more countries apply it partially). The selection of these two elements can theoretically follow either the debtor or the creditor approach. According to the debtor approach, calculations are based on the nominal yield (which includes both the explicit coupon at issuance and the issue premium/discount) as well as the nominal value of the outstanding stocks. According to the creditor approach, calculations are based on the market yield of each individual security and the outstanding marked-to-market stocks. At present, all countries calculating this information security-by-security follow the debtor approach for practical reasons.

(iii) Estimated by the b.o.p. compiler through an aggregate approach, i.e. applying benchmark yields to outstanding stocks aggregated by categories of securities, for example by type of instrument, sector and country of the issuer, issue currency, etc. (four countries). In theory, both the debtor and the creditor approach can be followed; however, in practice, countries have considerable difficulty in accessing nominal values for stocks and yields on an aggregate basis. For this reason, at present all countries estimating income on an aggregate basis follow the creditor approach.

Limitations of each approach

21. Among the most significant problems identified by compilers in their current systems, non-application of the accruals principle is a widespread concern. Six countries currently compile income on an accruals basis, while five more countries only do this partially (i.e. either without an offsetting entry in the financial account, or only to a limited range of financial instruments). The remaining four countries do not currently record income on an accruals basis.

22. One difficulty mentioned by several countries in achieving a full application of accruals is the absence of (reliable) information on coupon payments. Apart from settlement systems, few alternatives to this

1 Mostly based on the presentations made by TF-PII members describing their current systems during the introductory meeting (April 2002). Some further details have been extracted from the ECB's 'B.o.p. Book' ('EU balance of payments/international investment position statistical methods', November 2001 release) and the replies to the questionnaire on accruals recording circulated to the WG-BP&ER in October 2000.

2 SE should be allocated to both groups, depending on the financial instrument concerned.

3 Some countries apply a correction to the recording of purchases and sales of securities, estimating and recording the accrued coupon paid by the acquirers as income rather than in the financial account. Although once the coupon is finally paid the net income results might be correct, this adjustment may temporarily create serious distortions since, apart from an incorrect allocation of income flows through time, it overstates gross income flows (i.e. credits and debits).

Table II.1

Summary of current practices and future plans[1)]

Country	Main source	Application of accruals	Aggregated/ s-b-s	Debtor/ creditor	Future plans
AT	Calculated by compiler	Yes (Monthly)	s-b-s	Debtor	• Owing to the abolition of the settlement system, future sources for coupon payments are still under consideration.
BE	Estimated by compiler	Partially[2)]	Aggregated	Creditor	-
DE	Collected from reporters	No[3)]	Aggregated	Payments	• An ISIN code has been introduced this year for PI transactions; however, no decision on its possible use for calculating income has been taken yet.
DK	Collected from reporters[8]	No[4)]	Aggregated[8]	Payments[8]	• A system based on s-b-s is under construction.
ES	Collected from reporters[9]	No[5)]	s-b-s	Payments[9]	• The new PI system will permit monthly calculation of accrued interest s-b-s once the CSDB is available.
FI	Collected from reporters	Yes (Monthly)	Aggregated	Debits: debtor Credits: acquisition	• A new system for income on CIIs is being developed. • A securities database for money & banking statistics is under construction. This could be used for b.o.p. purposes in the future.
FR	Collected from reporters	No[3)]	s-b-s	Payments	• A new system is being developed (but not before 2004) based on i.i.p. stocks and average yields (following the creditor approach). S-b-s will only be possible if and when the CSDB is fully operational.
GR	Collected from reporters	No	Aggregated	Payments	• As soon as PI stocks are available on a monthly basis (expected in the near future), a new system could provide the accrued interest s-b-s.
IE	Collected from reporters	Yes (Monthly)	Aggregated	Debits: debtor Credits: debtor/ acquisition	• Increase quality checking with benchmark yields and monthlysurveys of MFI income.
IT	Calculated by compiler	Yes (Monthly)	s-b-s[6)]	Debtor	• Changes only foreseen to the extent that the conclusions of the TF-PII are available and the CSDB is fully operative.
LU	Estimated by compiler	Partially[7)]	Aggregated	Creditor	• Improvement of geographical breakdown as of 2003. • The possibility of recording offsetting entries in the financial account for income accrued on mutual funds is being studied.

1) This table is presented for illustrative purposes and therefore necessarily implies a certain degree of simplification concerning current practices.
2) No financial account entry, neither to offset accrued income, nor at the time the coupon is finally paid.
3) A correction is applied to the recording of purchases and sales of securities, estimating and recording the accrued coupon paid by the acquirers as income rather than including it in the financial account.
4) Except premium/discount of debt securities registered at the Danish Securities Centre, calculated by the compiler s-b-s and on an accruals basis, following the debtor approach.
5) Except for government bonds and notes, where the accrued interest is calculated s-b-s, following the debtor approach.
6) Except for MFIs' liabilities, for which s-b-s stocks are not available.
7) No financial account entry, neither to offset accrued income, nor at the time the coupon is finally paid.

Table II.1 (cont'd)

Summary of current practices and future plans

Country	Main source	Application of accruals	Aggregated/ s-b-s	Debtor/ creditor	Future plans
NL	Collected from reporters	No[8]	Aggregated	Payments	• A new direct reporting system with monthly accruals following the debtor approach, either calculated by the compiler if information is reported s-b-s, or collected on an aggregate basis from reporters.
PT	Estimated by	Yes (Monthly)	Mixed[9]	Creditor	• The PT securities database can be used to obtain information on coupon payments (currently obtained from the settlement system). • Calculations can be improved by differentiating among sectors.
SE	Mostly collected from reporters	Partially[10]	Mixed[10]	Debtor/ acquisition/ payments	• The settlement system is to be abolished in 2003. • For those parts affected, an alternative system is under construction.
UK	Estimated by compiler/ collected from reporters[11]	Yes (Quarterly)	Aggregated	Debits: debtor Credits: acquisition/ creditor	• A joint ONS/Bank of England feasibility study of a monthly s-b-s reporting system is currently running.

8) For income on Dutch bonds, payments are smoothed out across a period of 12 months (instead of being entirely recorded when the coupon is paid).
9) Aggregated calculations based originally on s-b-s PI stocks.
10) For some prominent resident holders of foreign securities (credits) and resident issuers of bonds/MMIs denominated in foreign currency (debits), income is reported directly on an aggregate basis (acquisition and debtor). For income debits on domestic bonds/MMIs denominated in domestic currency, the compiler calculates income s-b-s (debtor). The rest is collected through settlements (aggregated).
11) Income data are collected from MFIs and some investment trusts.

information source are under consideration. The lack of timely information on stocks with a sufficient level of detail is an additional problem.

23. One further source of inconsistencies is that Member States employ different methods to accrue income (debtor/acquisition/creditor). Apart from the three countries that purely collect income data via settlements, there are eight countries that follow the debtor approach for at least part of their total PI income. Four countries apply the creditor approach (one only partially), while three countries receive income figures directly from the holders of securities, following the acquisition approach. In short, four countries apply different criteria for the valuation of income credits (acquisition or creditor) and debits (debtor) respectively. Finally, four countries do not apply accruals recording at all.

24. Concerning the calculation/collection/ estimation of income on an aggregate or on a security-by-security basis, the picture also varies. Six countries compile this information s-b-s for at least part of the total income reported. Two more countries apply the so-called mixed approach, i.e. by establishing categories of securities out of s-b-s portfolio investment stocks, so as to estimate income through an aggregate procedure. The remaining seven countries estimate or collect income on an aggregate basis (for the time being at least; some countries will shortly introduce changes though. See Table II.1).

25. There seems to be an obvious correlation between the choice of methodology (aggregate/s-b-s) and whether the debtor or creditor approach is followed. Countries *estimating* income on an aggregate basis normally employ the creditor approach, while countries *calculating* income s-b-s normally use

the debtor approach. Indeed, even countries applying a different methodology to different instruments normally follow this pattern (i.e. s-b-s in combination with the debtor approach or aggregated plus the creditor approach). For example, in many cases the calculation of income s-b-s is only used for domestic government bonds following the debtor approach.

26. Finally, the availability of a fully operational CSDB plays a crucial role in the future plans of most countries, affecting foreseeable changes to the systems and influencing decisions that might eventually need to be taken.

Most common problems: questionnaire on the accruals principle

27. In the introductory meeting of the TF-PII, the members were asked to give a detailed analysis of their current Portfolio Investment Income Compilation Systems, including the most substantial shortcomings of their respective systems and what prospects for change exist. Additional information was gathered from a questionnaire prepared jointly by the ECB's Balance of Payments and External Reserves Division (BP&ERD) and the Banque de France. This accruals questionnaire aimed at gathering information on current practices regarding the collection of accrued interest within the euro area.[4]

28. This section summarises the most substantial problems in the compilation of portfolio investment income, as identified by the two above-mentioned initiatives. Whereas some problems reported are connected to specific features of particular systems, other problems are shared by a large number of countries running dissimilar systems. The various shortcomings currently affecting the quality of the final product can be divided into two groups: (i) problems related to the underlying data compilation; and (ii) problems related to the actual calculation of income on an accruals basis.

(i) Problems related to data compilation

- **Insufficient coverage of specific instruments:** a recurrent topic is the lack of satisfactory information on collective investment institutions (CII)/mutual funds, whose coverage is deemed insufficient by a number of countries (FI, ES, LU). Some other countries also report difficulties in collecting data on money market instruments (ES and NL).

- **Identification of holders:** problems in correctly identifying the holders of securities lead to an **inaccurate geographical split of income debits**, i.e. of coupon payments from resident issuers to non-resident holders.[5] A widespread practice which affects the quality of the geographical breakdown is the use of the first known counterpart of payments (AT, ES, FI, FR, IT and SE). However, in the accruals questionnaire, most countries confirmed that they face serious difficulties in the geographical allocation of interest accrued on domestic securities, more specifically in identifying the ultimate non-resident holder of domestic securities. In actual fact, most countries may only identify the first non-resident acquiring domestic securities, while further transmissions between non-residents cannot be captured by national b.o.p. collection systems. A related point is the correct attribution of CII-related income to individual holders with an accurate instrument and geographical breakdown, as mentioned by AT and LU.

- A related problem, although deemed less important by most countries, is the unavailability of an **accurate geographical split for income credits** in terms of the

4 *The final version of the questionnaire was circulated to the members of the WGBP&ER in October 2000. Thirteen EU countries returned the completed questionnaire (all bar GR and LU). Switzerland also replied.*

5 *This is the 'classical' problem of identifying non-resident end-investors in securities issued by residents, which has been already discussed at length in the TF-PICS report. The problem particularly arises owing either to the existence of long intermediary chains in the execution of transactions, or to the use of specific financial channels such as bearer paper, nominee accounts, etc.*

country of the non-resident issuer of securities held by resident investors.[6]

- **Security-by-security databases:** some countries that use s-b-s databases stress the need for very resource-intensive quality management in order to obtain satisfactory results.

- **Data compilation via surveys:** for the time being, the compilation of income via surveys only allows the calculation of accrued interest on an aggregate basis, i.e. most often as directly reported by respondents. FI highlights the difficulty of designing a representative sample; IE mentions possible misclassifications of items by reporting agents; while UK highlights that using the residual approach to derive stocks of liabilities risks magnifying errors (as discussed in the final report of the TF-PICS).

- **Income compilation via settlement systems:** although they are still widely used for the collection of income information, settlement systems exhibit a number of inconvenient features which can lead to biased information. In the accruals questionnaire, a number of countries (LU, FR, PT) mentioned the use of netting and clearing techniques in settlement systems as well as so-called exemption thresholds[7] as introducing a bias in the reported income. Additionally, some countries (NL, LU, GR, SE) pointed out that the use of the ITRS system does not allow the application of the accruals principle without additional information.

(ii) Problems related to the calculation of accrued interest

- **Non-application of the accruals principle:** the most striking shortcoming of current systems is that a number of countries[8] do not calculate income on an accruals basis, but instead merely report cash payments when they occur. The principal reason for this practice is the lack of detailed and relevant information needed to perform accruals accounting (i.e. timely and frequent stocks and yields).

- **Calculation accrued interest for specific securities:** countries using s-b-s databases generally report difficulties in calculating exact accruals for non-straight debt instruments, such as index-linked bonds, convertible bonds or floating rate notes. The most common way forward in such cases is to calculate accrued interest on such instruments in a simplified manner, usually by treating them as straight instruments.

- **Asymmetries in the compilation of income credits and debits:** a considerable number of countries report an inconsistent application of the accruals principle in the sense that accruals are only recorded for a subset of instruments. Furthermore, as the overall situation is quite heterogeneous at the national level, a significant number of countries apply asymmetric treatments to credits and debits:

  a) Credits (interest accrued on resident holdings of foreign securities, i.e. on assets):
     – Debtor: two countries
     – Acquisition: three countries
     – Creditor: four countries
     – Non-application of the accruals principle: six countries.

  b) Debits (interest accrued on non-resident holdings of domestic securities, i.e. on liabilities)
     – Debtor: eight countries

6 For example, ES reports this problem for matador bonds and bonds issued in the Euromarket. Additionally, FI reports that reporting agents have had difficulties in implementing an exact euro area/non-euro area split owing to the possible ambiguity of the security identifiers (ISIN code).

7 Transactions below the threshold do not need to be reported by MFIs.

8 As reported in the introductory section of this chapter, only six countries currently compile income on an accruals basis, while five more countries purely do this partially (i.e. either without making an offsetting entry in the financial account, or only to a limited range of financial instruments). The remaining four countries do not currently record income on an accruals basis.

– Creditor: three countries
– Non-application of the accruals principle: four countries.

Summing up, only five countries apply consistent methods for collecting both credits and debits (the 'creditor approach' in three cases, and the 'debtor approach' in two). Four countries apply dissimilar methods to collect credits and debits (acquisition/creditor and debtor, respectively), whereas six more countries do not apply the accruals principle for the collection of credits (interest on foreign securities).

29. All of these problems contribute to an inconsistent recording of identical intra-euro area transactions in the compiler countries of issuers and investors. Such inconsistencies imply distorted figures at the euro area level. From a euro area perspective, this problem is considerable, given the wide variety of methods applied for recording these figures.

30. The compilation of the euro area aggregate reflects the consequences of two different types of inconsistencies:

(i) *Dissimilar practices among Member States* imply that, at the time the aggregate is compiled, *intra-euro area positions do not cancel each other out*. This situation is especially harmful owing to the particular *compilation method for income on portfolio investment* in the euro area b.o.p.

(ii) In addition, *asymmetries* in the treatment of credits and debits within individual countries actually have an automatic distorting effect on the compilation of the income aggregate.

Problems linked to the compilation of euro area aggregates

31. The compilation of portfolio investment income for the euro area aggregates presents similar problems to those linked to portfolio investment statistics. Indeed, a similar calculation method is applied for the compilation of portfolio investment and portfolio investment income flows in the euro area b.o.p.

32. Interest payments to non-resident holders are frequently channelled through third parties. In such cases, the securities' issuer is only aware of its first known counterpart's location. However, this first-shot geographical breakdown does not usually provide a reliable picture of the final destination of the funds. Indeed, euro area investors may receive coupon payments from euro area issuers through clearing institutions located outside the euro area.

33. Conversely, final investors are normally aware of the residence of the securities' issuer and, thus, of the origin of the coupon payments, even if they are received from third countries. Therefore, euro area resident investors could (correctly) exclude such credits within the (extra) contribution to the euro area aggregates. As a consequence, substantial asymmetries would arise between the information provided by debtors and creditors. Should such distortions not be corrected, the euro area b.o.p. would be incorrect and the current account deficit would be distorted.

34. For this reason, extra-euro area debits in portfolio investment income are calculated as the difference between total national debits and intra-euro area credits (i.e. credits received by euro area investors from issuers resident in other euro area countries). Resulting from this approach, bilateral asymmetries among Member States with respect to the assessment of intra-euro area portfolio investment income credits and debits automatically produce incorrect extra-euro area aggregates. Additionally, errors in the geographical allocation intra/extra of income credits would result in distorted gross figures (i.e. the split between euro area income credits and debits), even if the net overall picture were not to change.

35. Needless to say, in addition to the problems derived from compiling aggregates, the quality problems of national b.o.p. collection systems in the compilation of income are also directly transferred to the supranational aggregates, as the contributions to the aggregate are built up on the basis of the national statistics.

36. As in the case of portfolio investment statistics, the ECB already acknowledges quite a number of recurrent factors causing asymmetries and resulting in inaccuracies at the time of compiling monthly income flows in the euro area b.o.p. Some of these factors have already been listed in the TF-PICS report and are also relevant for the compilation of income, as in an erroneous geographical split of income credits into 'intra/extra', for example (i.e. misidentifying the residency of the securities' issuer).

37. However, the compilation of portfolio investment income presents specific problems which are the origin of asymmetries and errors in the compilation of euro area aggregates. These problems are normally related to the different collection/calculation/ estimation methods employed in euro area Member States. Any bilateral asymmetries in the compilation of income may produce significant differences in the outcome reported by countries. This could be due to the different compilation methods presented in the first section of this chapter (see Table II.1).

In summary, the following factors may be signalled as the main contributors to asymmetries among euro area countries:

(i) the compilation method, i.e. differences between countries where the b.o.p. compiler calculates or estimates income versus countries where income is directly collected from reporters;

(ii) the level of detail, i.e. countries calculating income s-b-s versus countries estimating income and following an aggregate approach;

(iii) the application/non-application of the accruals principle, i.e. applied to all, none or only part of portfolio investment instruments, at different frequencies, etc.;

(iv) the application of accruals on the basis of dissimilar principles, i.e. debtor/ acquisition/creditor.

Potential benefits of harmonising collection systems in the field of portfolio investment income

38. This subsection conceptually explores the areas in which further harmonisation could improve the overall picture for the collection of portfolio investment income statistics.

39. In this respect, most aspects tackled in the final report of the TF-PICS are also relevant for the compilation of income. For instance, any measures aimed at improving the quality of national statistics should also result in more accurate supranational aggregates. Following this line of reasoning, those fields which are essential for their contribution to the euro area aggregates should receive the highest priority in the compilation of national statistics. An appropriate example is the geographical breakdown of portfolio investment credits. An accurate split between intra and extra-income credits is a necessary precondition to diminish mistakes in the split between euro area income credits and debits.

40. On the other hand, assuming all asymmetries among Member States in the compilation of income directly produce errors in the assessment of the euro area aggregates, a goal of the TF-PII should be to identify best practices and to promote their widespread use. In those cases in which a single method could not be prescribed, the identification of a limited number of acceptable practices should aim at diminishing the risk of a dissimilar outcome as far as possible.

41. In addition to reducing the risk of asymmetries owing to the existence of different compilation methods, further input

harmonisation would also help achieve greater quality both in national and in euro area statistics by promoting aspects which are beneficial to several quality dimensions, such as stability, transparency and accuracy. [21]

42. Among the positive factors designed to improve the accuracy of income statistics, the following could be considered:

1. Exactness, e.g. in the split of income flows between direct, portfolio and other investments; the breakdown of income credits according to the residence of the securities issuer, etc.

2. Completeness, thereby avoiding asymmetries caused by incomplete coverage of respondents or financial instruments.

3. Application of a unique approach (debtor/acquisition/creditor) for income compilation.

4. Application of the accruals principle at the same frequency by all Member States.

5. Establishment of minimum breakdowns (which ensure income figures of acceptable quality) for portfolio investment stocks and yields, enabling them to carry out aggregate estimations.

6. Widespread use of common information on securities and yields will be provided by the Centralised Securities Data Base (CSDB).

43. The fourth point mentioned above also impacts another dimension of quality, namely stability, since the construction of the aggregate necessarily implies the integration of Member States' revisions. Dissimilar timetables when applying the accruals principle implies more frequent revisions to the published data. Additionally, more robust calculation/collection/estimation methods should also help in reducing both the likelihood of revisions and their magnitude.

44. Finally, harmonising methodologies as far as this is practical may reduce the common difficulties raised earlier in the chapter. As was the case for portfolio investment statistics, finding a joint approach for the compilation of income would increase the comparability of the national contributions and improve their use for the calculation of supranational aggregates. By reducing the number of different compilation methods applied by Member States, communication with the final users of euro area statistics should become more straightforward, thus enhancing transparency vis-à-vis counterparts outside the statistical world.

21 See Chapter 2 of the TF-PICS final report.

III. Plausibility exercise on portfolio investment income

Introduction

45. The aim of this analysis is to check the plausibility of the calculation of portfolio investment income figures at the national level as well as at the level of euro area aggregates. The analysis is motivated by the risk that national portfolio investment income figures, although seemingly plausible, may not reflect a complete absence of asymmetries owing to dissimilar compilation/estimation methods and, thus, may not produce proper aggregates.

46. The analysis in sections 1 – 4 is based on the unit-free ratios of portfolio investment credits (debits) over the year-average portfolio investment stocks of assets (liabilities). For a given year t, the definition of these ratios for country i calculated on a yearly basis is:

$$credits\ ratio_{it} = \frac{2\ credits_{it}}{(assets_{it} + assets_{it-1})}$$

$$debits\ ratio_{it} = \frac{2\ debits_{it}}{(liabilities_{it} + liabilities_{it-1})} \quad \forall i \in I$$

In the above, *credits/debits* are whole year b.o.p. income flows, as recorded in the current account, while *assets/liabilities* are year--end portfolio investment positions, as recorded in country i's international investment position. ***I*** is the set of countries participating in this exercise, i.e. the euro area countries as well as the three pre-ins.

47. The ratios are calculated at various levels of aggregation. In section 1 we analyse a step 1 euro area aggregate calculated on the basis of the data contributions by Task Force members, and compare it with the corresponding step 1 euro area aggregate, as published in the ECB's Monthly Bulletin. The aim is to check the plausibility of the ratios constructed from the data provided by the Task Force, and is based upon the formula:

$$aggregate_t = \frac{2\sum_i (Credits_{it} - Debits_{it})}{\sum_i [(Assets_{it} - Liabilities_{it}) + (Assets_{it-1} - Liabilities_{it-1})]} \quad \forall i \in I$$

Here *I* is the set of the 12 euro area countries. Another purpose is to check the validity of national contributions as sent in by the Task Force members.

48. The advantage of using these ratios is that they are independent of exchange rate changes over time. A weakness in analysing portfolio investment income compilation systems is that they implicitly assume that both stocks and income flows are produced by comparable compilation systems[1] as understood by the TF-PICS report. However, if we accept that – in principle – all compilation systems yield unbiased estimates of the 'true' figures, then this should not pose a major problem for this analysis.

49. In section 1 we analyse national ratios using graphs and descriptive analysis at the national level per year for

– Portfolio investment credits over assets (figure 1)

– Portfolio investment debits over liabilities (figure 2).

50. This type of analysis is pursued further in section 2, where national portfolio investment income ratios are analysed via an instrument breakdown which distinguishes between *Equities, Bonds & Notes* and *Money Market Instruments.*

51. In section 3 we further explore which explanatory variables (in terms of the specific methodology applied by Member States) may lie behind the existence of systematic biases in the income results obtained. To this end, we identify the marginal effects of specific income calculation methods on the observed ratios by regressing the overall portfolio investment credits (debits) over assets (liabilities) ratio on the stylised characteristics of the country-specific income calculation systems. Some further details on the methodology applied in this exercise are provided in Annex 2 of this report. Section 4 concludes.

1 *Otherwise, unreasonable ratios might (partly) be the result of the difference in the calculation methods applied to stocks and flows.*

Ratios of the step 1 euro area aggregate

52. The aim behind constructing a euro area aggregate based on national contributions is to check whether national figures are plausible in the sense that they succeed in producing a euro area aggregate of an adequate level of quality. Given the weaknesses of the available data (lack of intra/extra-euro area geographical split), this analysis is limited in the sense that it can only focus on net positions.

53. As a first step, the data contributions sent by Task Force members are checked for consistency with the ECB Monthly Bulletin aggregates published in the July 2002 release. Subsequently, these aggregates (i.e. the one based on the Task Force members' contributions as well as the one published in the ECB's Monthly Bulletin) are checked to see whether they produce reasonable net credits over net assets ratios.

54. For portfolio investment stocks, it was not possible to approximate a step 1 euro area aggregate based on i.i.p. data submitted by the Task Force members with the exception of 1998 (for stocks only), 1999 and 2000. The reason for this is the lack of data contributions from some Task Force members for the years before 1998 and/or after 2000.

55. Table 1 shows the step 1 euro area net assets and net credits based upon the data contributions by the Task Force members and the kind contribution from the Belgium National Central Bank. A detailed investigation revealed that the difference between the series arises from two factors:

(i) Member States have updated their data, whereas the stock data shown in the Monthly Bulletin are too old (the Monthly Bulletin data were being updated at the time this report was drafted);

(ii) The most substantial remaining differences were explained by the non-inclusion of special purpose entities (SPEs) (in either flows or stocks) in the contribution to this exercise provided by NL.

56. Once revisions reported by the Task Force members are incorporated into the data analysed, and taking into account the fact that SPE-related data are not included in the Task Force data, we end up with very similar figures compared with those published in the ECB's July 2002 Monthly Bulletin. Table 2 shows the major revisions to i.i.p. data reported, as well as the 'corrected' net portfolio investment stock position.

57. Taking into account this information, and given the fact that both aggregates show the same overall ratios of net returns, the plausibility of the data provided by the Task Force members was confirmed, thus forming a sound data basis for the subsequent analysis.

Portfolio investment ratios

58. In this section we analyse the overall portfolio investment credits over assets and debits over liabilities as gross ratios by country. Figure 1 shows the yearly income credits over the yearly average PI assets' stocks, and the yearly income debits over the yearly average PI liabilities.

Table 1

Step 1 euro area aggregates for PI income

	Task Force contributions			ECB Monthly Bulletin July 2002		
Year	1998	1999	2000	1998	1999	2000
Net assets	-571.6	-585.5	-447.6	-747.3	-756.4	-659.9
Net credits		-29.4	-23.6		-38.8	-34.9
Net ratio		0.05	0.05		0.05	0.05

Table 2

Revisions reported by the Task Force members

Year	1999	2000
NL	-207.6	-252.7
FR	30.4	41.1
ES	5.2	-3.2
PT	1.6	1.5
FI	-0.3	0.1
AT	-0.2	1.5
BLEU		-0.6
Non-revised TF Step 1 position	-756.4	-659.9

59. Both figures show a rather homogeneous development in most countries between (on average) 2 to 8% for *credits over assets* and 4 to 6% for *debits over liabilities* (excluding GR). For debits over liabilities, GR shows implausible values below 1%.

Analysis of portfolio investment income ratios by instrument

60. Having detected mostly plausible values at the overall PI level, this section examines an instrument breakdown of these figures at the national level.[2] This breakdown was made possible thanks to the co-operation of the Task Force members, who sent in portfolio investment data broken down by[3] the instrument types *Equities, Bonds & Notes* and *Money Market Instruments.*

Portfolio investment – equities

61. The graphs for *credits over assets* (Figure 3) and *debits over liabilities* (Figure 4) show an important degree of heterogeneity with a tendency for convergence except for the

2 *As the calculation of the resident transactor's sector is different for assets and liabilities, we cannot make this analysis at the euro area level, as here we have to take net figures. Such an analysis would only be possible with step-2 data contributions, including a euro area/non-euro area breakdown, and additional details for portfolio investment intra-euro area assets by sector of the euro area issuer.*

3 *A sectoral breakdown (according to the items Monetary Authorities, General Government, Banks and Other Sectors) was*
- *not possible at all for DE, FR, IE*
- *only partially possible for ES*
- *only possible in the last few years of the 1990s for AT, PT, FI*
- *for DK, a breakdown between Bonds & Notes and MMI was not possible, and DK is therefore not included in figure 7 and 8,*
- *only partially and only for the last few years for GR.*
- *For SE, the exercise would have been possible in principle except for the equities sectors, where only combined sectoral numbers are available.*

Figure 1

Portfolio investment yearly credits over year-average assets

(Average Yield)

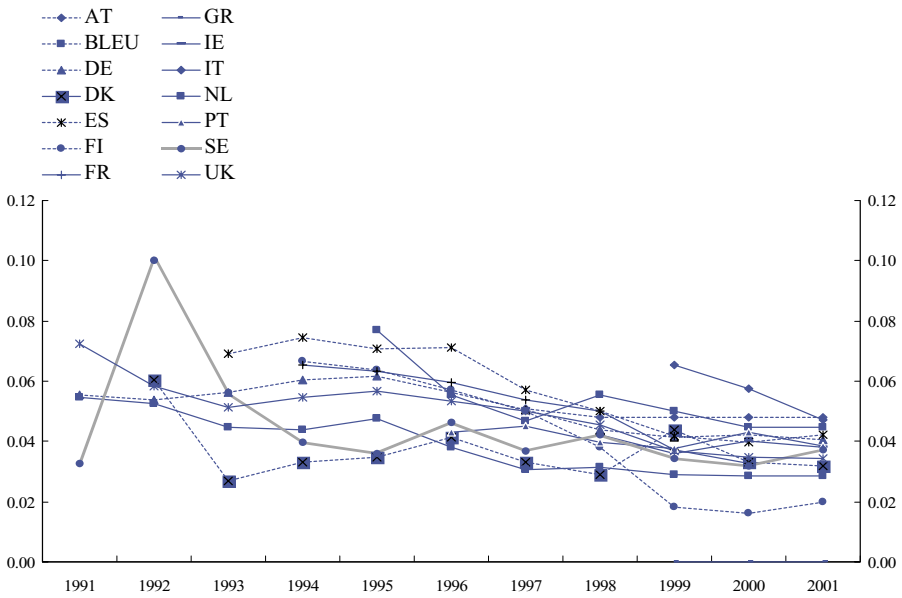
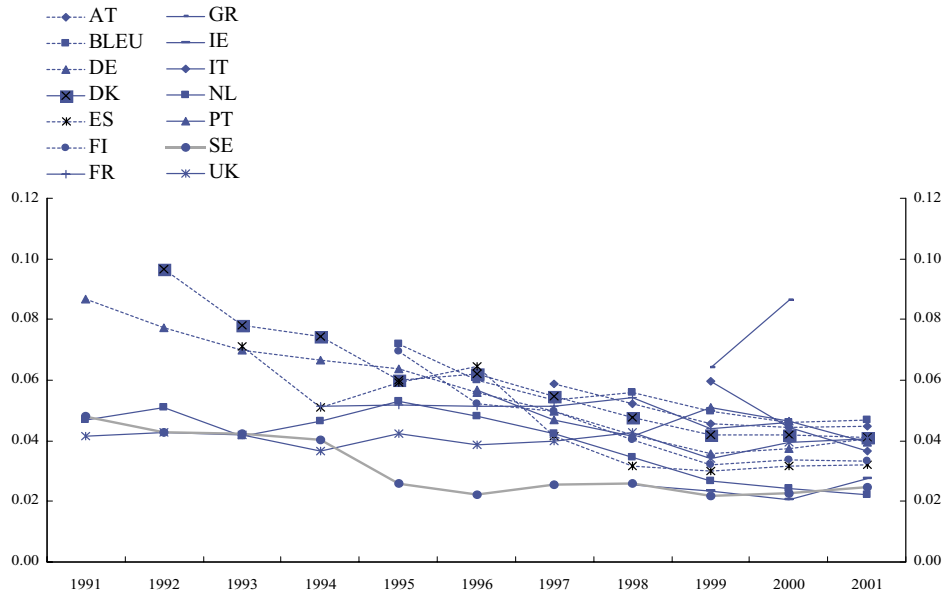


Figure 2

Portfolio investment yearly debits over year-average liabilities

(Average Yield)



liabilities' side of IT, which exhibits increasing two-digit levels.[4] The average ratios are between 0.1 to 4% for *credits over assets*, and 1 to 5% for *debits over liabilities* (excluding IT and GR). As mentioned, IT shows implausibly high figures on the liabilities side, while GR reports implausibly low ones (below 1%).

Portfolio investment – Bonds & Notes

62. Compared with equities, the *credits over assets* ratios analysed for Bonds & Notes (Figure 5) look rather homogeneous[5], ranging from 3 to 9% (excluding SE). SE also starts with very high ratios, but from 1995 onwards, ratios reported are in line with the ones from other countries.

63. On the liabilities side (Figure 6), both SE and IE exhibit unusual patterns in their ratios. Data for GR are very low, a feature we have already observed with the equity instrument. The other countries show homogenous ratios between 5 and 9%.

64. Contrary to a visual impression, the degree of heterogeneity is not very different for both Bonds & Notes series, with a standard deviation of 0.2 for credits over assets, and of 0.1 for debits over liabilities.

Portfolio investment – Money Market Instruments

65. The most troubling figures come from Money Market Instruments (MMI). Here, the ratios analysed are highly heterogeneous, exceeding significantly those of equities.[6] On the assets side, the heterogeneity in the *credits over assets* ratios (Figure 7) is very pronounced. GR shows exceedingly high ratios (586.9 and 153.1%) which are excluded from

4 *At the time of writing of this report, the income on equity for IT was calculated on a cash basis. Before 1999 the income on equity was reported jointly with other portfolio investment components. However, since 1999 the precision of the existing split may be questionable due to misreporting – notably on the liabilities side.*

5 *In principle, the Bonds & Notes and MMI income flows are not separable in DK. However, for the years 1999-2002, it is possible to separate the stock data in B&S and MMI. As stock data shows that the B&S items are much larger than the MMI item, it was deemed appropriate to show the combined B&S/MMI flows under the B&S item.*

6 *A caveat in the analysis of the MMI sector of instruments which has to be born in mind: in the case of MMIs for some countries, taking the average of year-end stocks may represent a doubtful approximation of the 'true' year-average stocks. In such cases, this is due to significant monthly stocks with an often-existing decline at the end of the year.*

the graph. Without GR, the average volatility is 3%, about 1.5 to 3 times the volatility detected in other classes of instruments.

66. On the liabilities' side (Figure 8), the debits over liabilities ratios are less heterogeneous, with an average volatility of 2% (this time including GR). However, it is again very difficult to speak of a homogeneous picture at this stage.

Figure 3

Portfolio investment – Equity: yearly credits over year-average assets

(Average Yield)

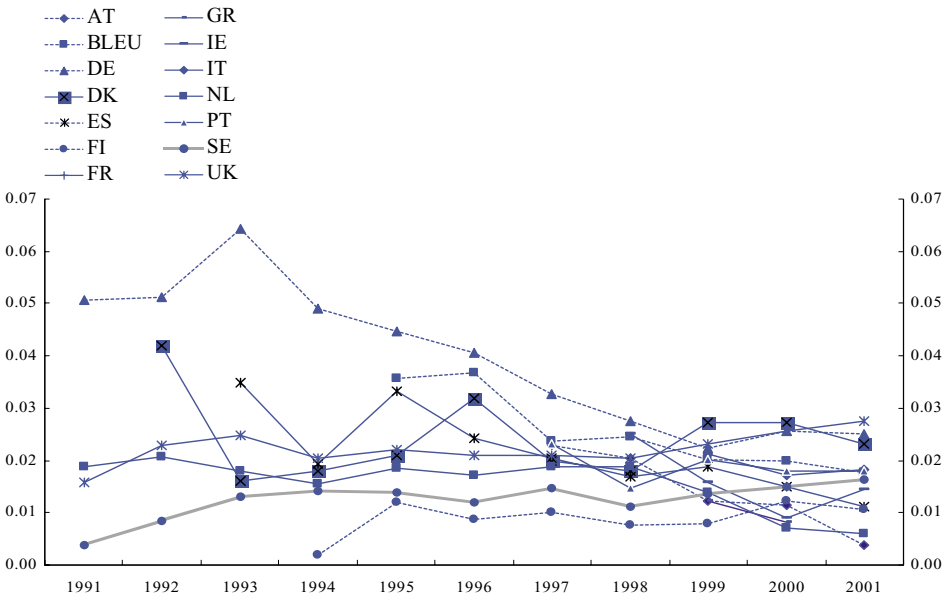


Figure 4

Portfolio investment – Equity: debits over average liabilities

(Average Yield)

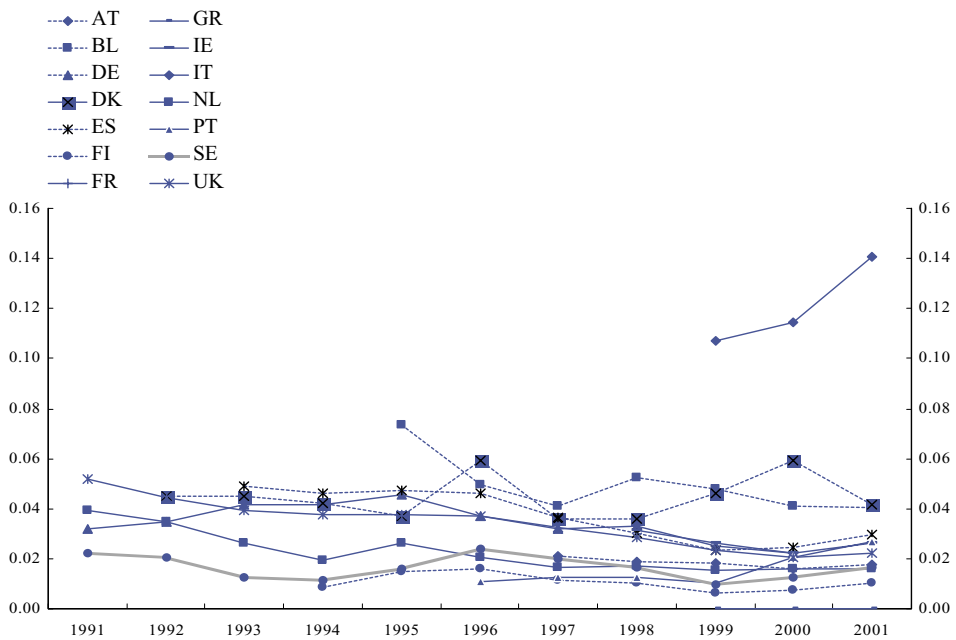


Figure 5

Portfolio Investment – Bonds and notes: credits over average assets

(Average Yield)

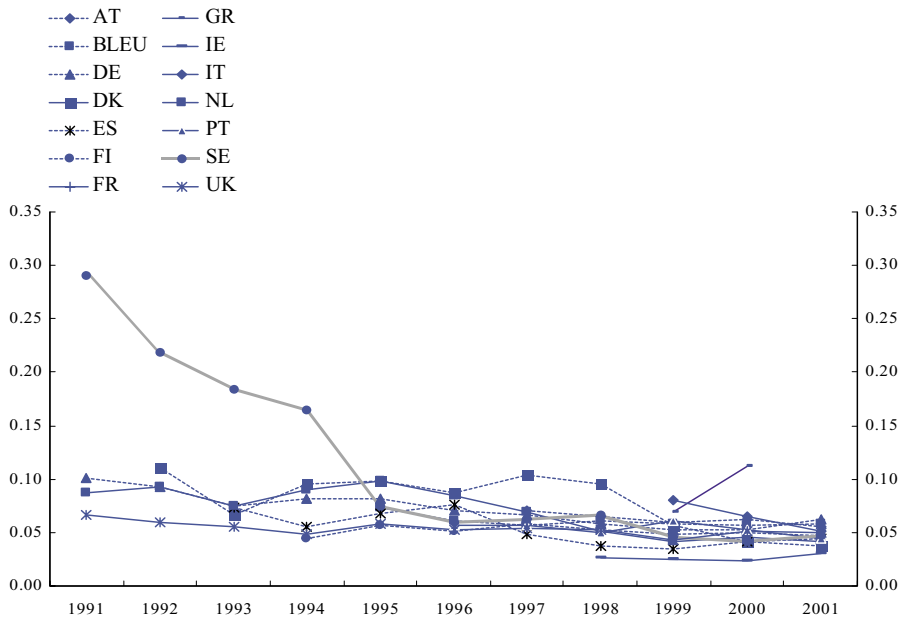


Figure 6

Portfolio Investment – Bonds and notes: debits over average liabilities

(Average Yield)

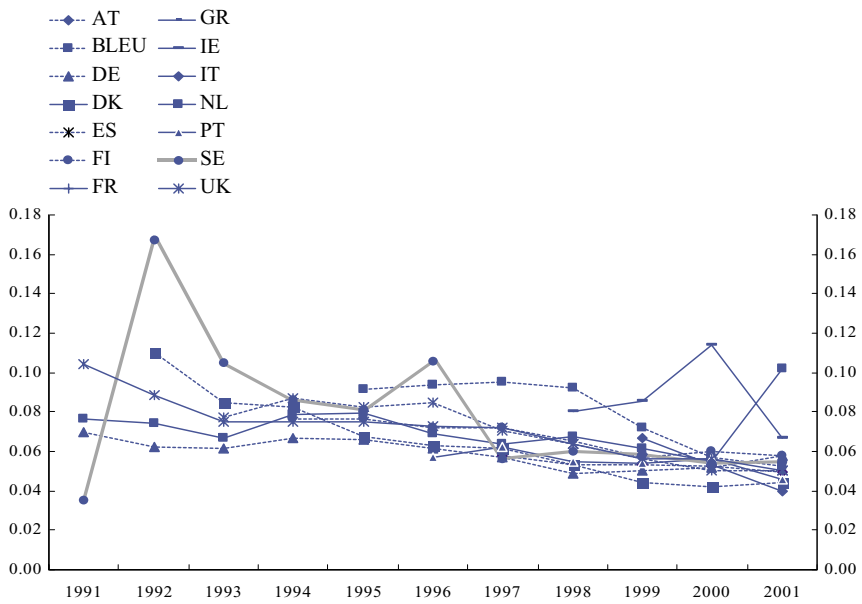
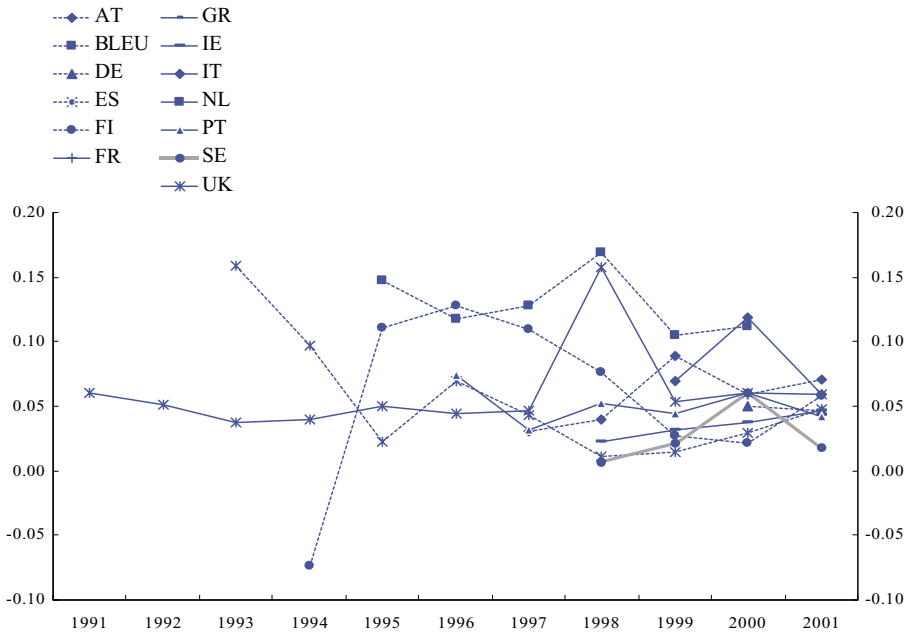


Figure 7

Portfolio investment – Money Market Instruments: credits over average assets

(Average Yield)



67. Although it hints at specific, potentially problematic areas, the visual and descriptive analysis conducted so far is not very informative about the concrete sources behind the heterogeneity observed. This issue is assessed in more detail in the following section.

Analysis of compilation method-specific influences

68. Finally, we analysed whether stylised characteristics of the method applied to compile portfolio investment Income have a systematic influence on the magnitude of the resulting income figures which may not be explained by economic (country-specific) or overall business cycle influences. For this purpose, we regressed the portfolio investment '*credits over assets*' and '*debits over liabilities*' ratios on the stylised characteristics of national portfolio investment income compilation methodologies, while controlling for country and time-related specifics of the economies.[7] The exercise was conducted separately for the instrument classes *Bonds & Notes* and *Money Market Instruments*. Additional details on the methodology applied in this exercise are provided in Annex 2 of this report.

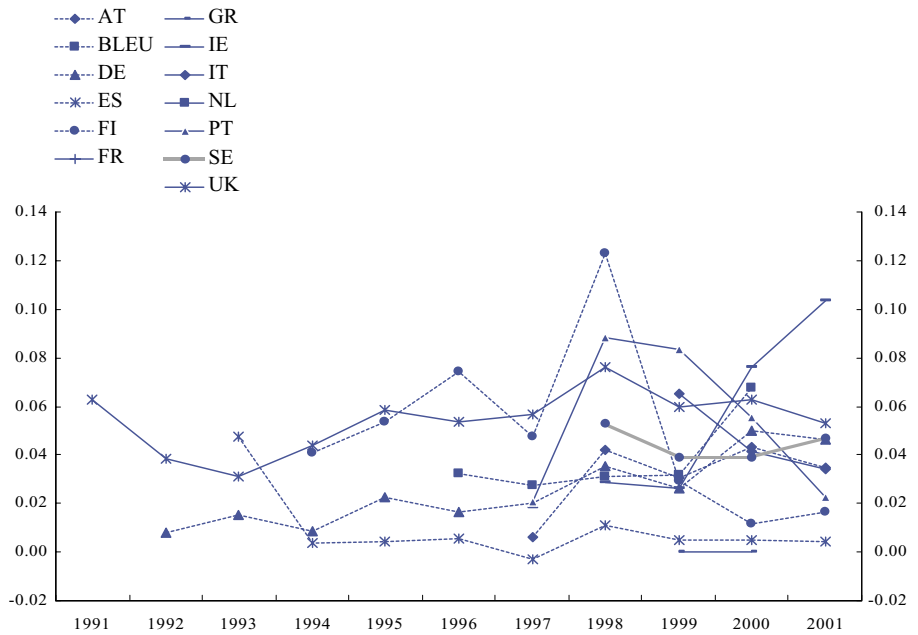
69. Concerning the estimated parameters for the indicator variables representing the stylised compilation methodology characteristics, we find significant effects owing to a non-application of the accruals principle for both assets and liabilities. This is in line with what we expected from the stock figures in Annex 2, given that the model controls for changes in the overall interest rate over time. Compared with the application of the accruals principle using the debtor/acquisition approach in an s-b-s environment, countries collecting income on a cash basis (NACCR = 1) report on average 2% (5%) lower values on the assets (liabilities) side. For both sides of the B&N class of instruments, we also observe significant effects from compiling income on an aggregated basis (–2% on the assets and +4% on the liabilities side) compared with doing so on an s-b-s basis. However, additionally estimating income using the creditor approach does not give rise to any significant effect

7 *These controls are implemented by including year and country-specific dummy variables.*

Figure 8

Portfolio investment – Money Market Instruments: debits over average liabilities

(Average Yield)



compared with the remaining group of aggregated income compilers.

70. For the MMI class of securities, we do find a significant effect from compiling income on an aggregated basis (- 6%) compared with doing so on an s-b-s basis. Furthermore, countries estimating income using the creditor approach show an important positive effect (+ 9%) compared with other countries compiling income on an aggregated basis. Compared with s-b-s compiling countries, the net effect of this group of countries is still significant, but at 3%. This may hint at the difficulties countries are currently facing while trying to identify an adequate benchmark yield which would enable them to estimate income on MMI securities on an aggregated basis. On the other hand, the non-application of the accruals principle does not seem to have a significant effect on the credits over assets ratio. On the liabilities side, the results of our model are not significant, indicating that the heterogeneity between countries is mostly attributable to reasons beyond those of over-market development or compilation methodology.

Summary

71. The aim of this study was to test the plausibility of portfolio investment income figures both at the national and at the euro area aggregate levels. For this purpose, we analysed unit-free ratios of return ([net] credits over assets) and of debt service ([net] debits over liabilities) for a euro area step I aggregate, and at the national level for all 15 EU countries. Data at the national level were further broken down by three types of instruments: *Equities, Bonds & Notes and Money Market Instruments*. A second strand of analysis was to regress overall portfolio investment *credits over assets* and *debits over liabilities* ratios on individual countries' stylised compilation methodologies' characteristics, business cycle and country-specific indicators. The purpose was to analyse whether the use of different compilation methods introduces systematic biases into the portfolio investment income figures which would forcibly lead to asymmetries in national data contributions to the euro area aggregate.[8]

8 *It has to be borne in mind that, in addition to the problems of aggregation which are likely to have an impact on this analysis (asymmetric treatment among countries, heterogeneous*

72. The most interesting finding was that, although we observe plausible net ratios at the step I euro area aggregate level, the variation of ratios on the national level broken down by instruments gives rise to significant concern. This is especially the case for *Equities* and *Money Market Instruments*. It seems that the plausible step I euro area aggregate simply results from a netting of positive and negative asymmetries in the two years analysed. Given the enormous degree of inconsistency in ratios which, whatever the economic theory followed, should at least be converging, we find strong evidence that large asymmetries in portfolio investment income recording exist within the euro area.[9]

73. This finding is further supported by the analysis of the impact of the use of different compilation methodologies. Here, we find a significant and systematic influence in the results on assets and/or liabilities with both the B&N and the MMI classes of securities for all stylised characteristics of compilation methodologies.[10] Given the significant lack of homogeneity in calculation methods applied by euro area countries, a strong argument is made for further harmonisation in this field.

methodologies, etc.), any difficulties in the geographical breakdown of the flows (intra-extra split) which are not considered in this analysis based on net flows/stocks could also add to inconsistencies in the process of aggregation – more specifically, in the correct assessment of separate extra-euro area credits and debits.

9 As mentioned in the Introduction, this result also depends on the assumption that either the stock information is an unbiased estimator, or that both stocks and flows are derived from the same compilation method. The regression exercise takes this possibility implicitly into account by including country-specific dummy variables that are designed to capture the effect of such country-specific differences in compilation methodologies between stocks and flows.

10 The results are robust as we control for an overall development in interest rates in the specification of the estimation model, as well as country-specific heterogeneity.

IV. Selected issues on the statistical reporting of portfolio investment income

1. Consequences of the non-application of the accruals principle

74. The recording of income on an accrual basis has been established as an international standard for the compilation of balance of payments statistics since 1993. According to ECB Guideline ECB/2000/4 on the statistical reporting requirements of the ECB, which follows current international standards, the compilation of income following the accruals principle is mandatory for debt instruments. The recording of income according to the accruals principle is based on the idea that the b.o.p. records 'the economic transactions of an economy with the rest of the world'[1].

75. One of the aims of the Task Force was to empirically investigate the consequences of the non-application of the accruals principle on the recording of portfolio investment income in the balance of payments. This was done by analysing for two countries, AT and DE, the respective amounts of portfolio investment income that would be recorded if

a) the accruals principle was not applied, i.e. income was recorded on a cash basis

b) the accruals principle was applied and income was recorded on an accruals basis.

76. Interest should be recorded on an accruals basis to ensure that the cost of capital continually matches the provision of capital in a periodically correct manner. Thus, income flows are attributed to the actual holders of the relevant securities, so that the recorded cost of capital matches the provision of capital, i.e. at the time when the claim or liability arises and not at the time when the payment is effected.

77. In practice, this means that income is converted in a series of monthly or quarterly payments.[2] Since accrued income will - in most cases - be recorded in the current account before the payment is effected, a counter-entry becomes necessary to keep the balance of payments in equilibrium. This counter-entry should be made in the financial account under the relevant financial instrument as if it were an investment in that instrument. This implicitly treats accrued interest as an additional investment in the underlying instrument. Once the actual payment of interest occurs, it will not affect the current account, as accrued income flows will have already been recorded. Instead, the payment will be entered as a disinvestment under the respective security segment in the financial account.

78. In calculating accrued interest, three methods may be distinguished which determine the amount of interest accrued at a given point in time: from the point of view of the issuer (debtor approach), the acquirer (acquisition approach) or the market (creditor or market approach) respectively. Although the empirical differences between these approaches have been analysed in another study in this report, it is important to bear in mind possible differences in this particular study: while in AT the effect of the non-application of the accruals principle was analysed using the debtor approach to calculate accrued interest, this was only possible in DE by using the creditor approach.[3]

79. A priori, a number of reasons can be identified which may distort income downwards if the accruals principle is not applied: (i) interest of zero coupons is not taken into account if income is purely collected on a cash settlement basis, (ii) interest of deep-discounted securities is underestimated in the case of coupon payments and (iii) while the accruals principle takes into account the interest of securities

1 An economic transaction is 'an economic flow that reflects the creation, transformation, exchange, transfer, or extinction of economic value and involves changes in ownership of goods and/or financial assets or liabilities.' (ECB BOP Book, 2000, p.17)

2 ECB Guideline ECB/2000/4 requests accrual recording on a quarterly basis, although a monthly recording is preferred and encouraged.

3 As will be discussed at length in the final chapter of this report, an aggregate data compilation system similar to the one used by DE in this exercise is more adapted to the creditor approach.

Box 1

The effect of the non-application of the accruals principle for AT

81. For AT, accruals were calculated s-b-s using monthly (average) nominal stocks and nominal interest rates[1] (debtor approach).

82. As demonstrated in the study[2] on the three b.o.p. sectors (government, MFIs, other sectors), the use of the accruals principle leads to higher yearly income figures.

83. A monthly analysis of the figures shows that in the case of government bonds, the coupon payments in January (and, in general, in the first quarter) and in July are much higher than the accrued income figures, owing to the high concentration of coupon payments in January and July.[3]

84. Finally, the development of global credit, debit and net income flows in million euros for the two different concepts since 1997 shows that differences on the liabilities side are on average 20% and on the assets side 5-10%.[4]

1 *Effects of premia, discounts etc. resulting from differences between price at issuance and price at redemption are taken into account by calculating a so-called 'implicit' interest rate for each individual security, and applying it to the nominal stocks together with the nominal interest rate.*
2 *See Figure 1 in the supplementary document mentioned in footnote number 5.*
3 *See Figure 2 in the supplementary document.*
4 *See Figure 3 in the supplementary document.*

Box 2

The effect of the non-application of the accruals principle for DE

85. Currently, the accruals principle is only applied on the assets side. Cash payments are reported too, but they are not used for income compilation owing to considerable under-reporting. In this exercise, the accrued interest was estimated by applying benchmark yields to broad aggregates. On the liabilities side the accruals principle has so far not been applied. Instead, the current account shows the reported cash payments, corrected by an estimation for interest payments on domestic securities held by Germans abroad.[1]

86. For DE, three time series were constructed: (i) coupon payments; (ii) interest recalculated (1/12th of the interest cash payments of the following 12 months is attributed to any given month[2]); and (iii) accrued interest using the creditor approach: a benchmark yield[3] is applied to monthly average stocks at market price (creditor approach).

87. On a monthly basis, differences between accrued income and cash payments are most obvious in January and July, owing to the fact that coupon payments are highly concentrated at these times.[4] On a yearly basis, all three time series show a rather continuous development, owing to the fact that the underlying aggregate has also developed continuously.[5]

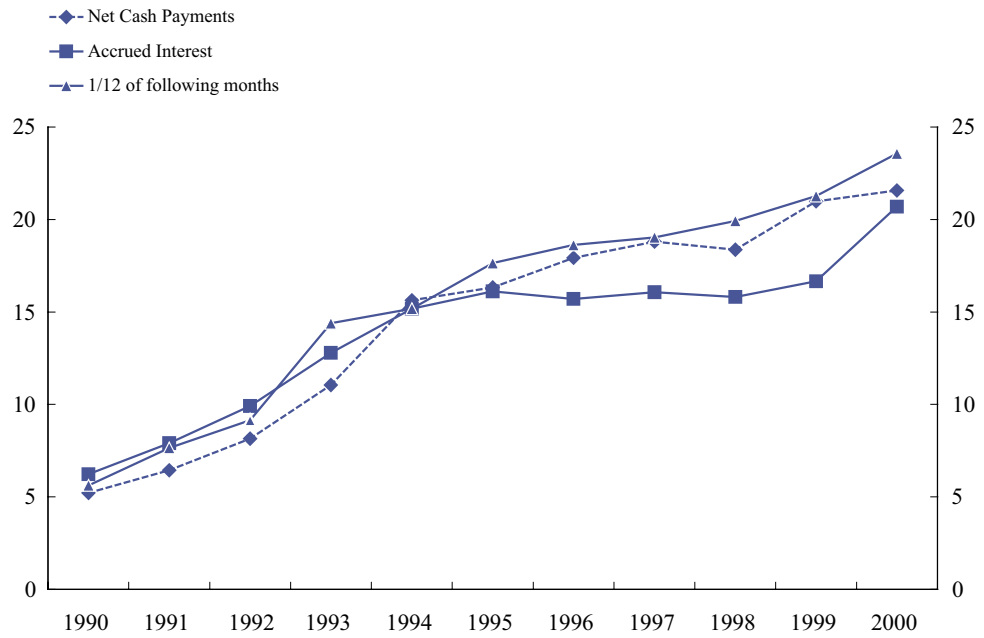
88. Given the constant increment in stocks, it is surprising that accrued interest is higher than paid interest until 1994, whereas in subsequent years it is lower (see Figure)[6].

1 *In the future, accrued interest on liabilities will also be calculated on an aggregate basis for government bonds and private bonds. The calculations will be based on the market value of monthly average stocks. A benchmark yield will be applied to these stocks.*
2 *These data are of no relevance to the future system of calculating accruals. However, this method could be applied to correct past time series. The method is based on the assumption that the majority of government bonds bear yearly coupons.*
3 *The example presented is simplified in that it calculates interest on the whole aggregate, without a split regarding remaining maturities. However, the calculation of the benchmark yield weights the aggregate according to remaining maturities of total amounts outstanding.*
4 *See Figure 4 in the supplementary document.*
5 *See Figure 5 in the supplementary document.*
6 *Although interest rates have decreased continuously during this period, this is also true for the period 1990 to 1993, when accrued interest was slightly higher than cash payments. An explanation for the too-high cash payments could be that the estimation of Germans' holdings of domestic securities abroad is quite uncertain.*

Figure 9

Comparison between net cash payments, accrued interest and 1/12 of following month

(Thousands)



issued in the present year, coupons may often be paid in the following year.[4]

80. For both countries, the analysis was conducted by comparing figures of coupon cash payments and accrued interest on a monthly, quarterly and yearly basis.[5]

Conclusions

89. The sub-group investigated two approaches for recording income figures: accruals recording versus pure cash settlement recording. Comparisons between the output of the two approaches were made on a yearly, quarterly and monthly basis.

90. On a quarterly (or even monthly) basis, the differences between the two approaches are likely to be higher than on a yearly basis. This is most likely due to a high concentration of coupon payments on very specific dates/months.

91. The following explanations for the differences between the two approaches were identified:

(i) a high concentration of coupon payments on specific months

(ii) zero coupons and deep-discounted securities

(iii) different sources for calculating (or estimating) accrued and cash income figures.

92. Concerning (i), the study found that movements in the level of stocks affects the magnitude of the differences. Given stable market interest rates, increasing stocks over time implies that *income recorded under the*

4 Ceteris paribus, the next year could suffer from the opposite effect. This effect may be reduced or even amplified further if there are significant changes in market interest rates, and depending on the evolution of portfolio investment stocks in the international investment position.

5 Full details of the individual country studies are available in the supplementary document 'Consequences of the Non-application of the Accruals Principle'.

accruals principle is higher than income calculated on a pure cash settlement basis. With regard to decreasing stocks, the inverse is true. This ceteris paribus effect may be reduced or even amplified further if there are significant changes in market interest rates[6].

Given these results, the conclusions of the TF-PII are as follows:

- Work has been carried out under the assumption that, from a theoretical point of view, applying the accruals principle is the most appropriate way of recording income in the spirit of b.o.p. recording.
- The magnitude of the discrepancies between the recording of income on a cash basis and the recording of accruals on practical grounds has proved significant for yearly, quarterly and monthly income figures, irrespective of the exact method followed in the calculation of the accrued interest.
- Owing to the role of intra-euro area flows in the algorithm applied to calculate portfolio investment income for the euro area aggregates, the application of the accruals principle by all countries at the same frequency and following the same methodology is crucial if the accuracy of the final product, i.e. the euro area b.o.p., is to be ensured.

2. Empirical evidence on the differences between the creditor and debtor approaches

Introduction

93. Since the adoption of accruals accounting, there has been a debate as to the most appropriate methodology that should be employed. Two approaches are currently being discussed:

- Using the prevailing interest rate in the market at the time of issuance. This views the accruing interest income as fixed over the life of the security; it is usually termed the debtor approach because the issuer is likely to view interest in this way.
- Using the prevailing interest rate in the market at the time of compiling accrued interest. This takes the view that there is no clear way of determining what proportion of the future payments stream represents interest and what proportion capital (or holding gains/losses). This is usually termed the creditor or market approach.

94. No clear consensus has emerged, although the WG-BP&ER has agreed that the creditor or market approach is preferable from a conceptual point of view. This section will not explore the theoretical merits of either approach in any detail, but instead focuses on the potential data requirements and the impact on the income estimates of applying either the creditor or debtor approach. This debate does not affect either floating rate notes or any other securities with indexed yields, because both approaches produce similar results for these specific instruments, especially if coupons are paid frequently (quarterly, for example).

6 *In Austria, the use of the accruals principle leads to higher yearly income figures using the debtor approach for all three b.o.p. sectors. However, a similar exercise based on German data revealed inverse results from 1994 onwards, which might be partially explained by a significant drop in market yields, as the German exercise was based on the creditor approach whereas the Austrian exercise followed the debtor approach.*

Theoretical example[7]

95. A practical example is analysed to illustrate the two different approaches. It is assumed that:

- the compiling economy holds three 10-year US-issued zero coupon securities, issued at 4%, 5% and 6% (i.e. assets/income credits), and

- the US holds three 10-year compiling economy-issued zero coupon securities, issued at 5%, 6% and 8% (i.e. liabilities/income debits).

96. The impact on debtor and creditor-based income is then determined under a period of rising interest rates and falling interest rates over the 10-year lifetime of the bonds. It is assumed that all the bonds are fully tradable in a highly developed market, i.e. that any changes in interest rates will result in bondholders reassessing whether to retain or sell the bonds they hold.

Rising interest rates

97. Under the debtor approach, changes in interest rates have no impact on the accrued income, as the issuer will simply record the income that it is obliged to pay, i.e. the yield to maturity determined by the issue price of the bonds.

98. Under the creditor approach, however, the acquirer faces a higher yield as interest rates rise, resulting in a fall in the market price of the bond. However, as income is estimated as market value * market interest rates, and as the interest rates have increased, the holder will actually accrue a higher income flow, i.e. the fall in the market price of the bond is more than offset by the rise in interest rates.

99. In our example, with interest rates increasing over the lifetime of the bonds, income earned was 1,060.9 under the debtor approach and 1,411.9 under the creditor approach. Similarly, for debits, income paid was 1,263.2 under the debtor approach and 1,679.0 under the creditor approach.

Falling interest rates

100. Under the creditor approach, the acquirer faces a lower current yield as interest rates fall, resulting in a rise in the market price of the bond. Again, with income estimated as market value * market interest rate, and as interest rates have fallen, the holder earns a lower income flow, i.e. the rise in the market price of the bond is more than offset by the fall in interest rates.

101. In our example, with falling interest rates over the lifetime of the bonds, income earned was 1,060.9 under the debtor approach, but only 833.1 under the creditor approach. Similarly, for debits, income paid was 1,263.2 under the debtor approach, but only 1,000.1 under the creditor approach.

Findings

- Using the debtor approach, income will remain the same over the lifetime of the bond, irrespective of any interest rate changes.

- Using the creditor approach, income will be higher than the debtor approach in times of rising interest rates, and lower in times of falling interest rates.

- The choice of approach therefore has an impact on total income credits, debits and balances. The impact on net income (receipts less payments) will depend on the relative size of both assets and liabilities and the development of the corresponding interest rates.

7 *For a full discussion of the impact of changing interest rates on market yields, see supplementary document 'Empirical evidence on the differences between the creditor and debtor approaches'.*

- An asymmetric approach for credits and debits will distort the b.o.p. income and current balance.

- A consistent approach for both credits and debits and between countries will reduce asymmetries, whichever approach is chosen.

Data requirements

102. A potential asymmetry clearly arises between accrued interest streams calculated by the issuer and accrued interest streams calculated by the holder. Typically, the holder may not have the information to calculate accrued income under the debtor approach, while the issuer may find it difficult to access the information required to follow the creditor approach. For example, if a bond is actively traded after issue, the issuer will only record in its accounts the coupon it is contracted to pay, while the holder will probably only record the market income accruing (or income accruing as at the time of acquisition of the financial instrument).

103. The B.o.p. Compilation Guide (paragraph 621) touches on the different data collection approaches required for the debtor and creditor approaches. The debtor approach requires issuers to record interest on the basis of the interest rate applicable at the time a security was issued, whereas the creditor approach requires interest to be accrued according to the prevailing rate of interest for that particular security. Pure data collection using the creditor approach requires the current yield for each tradable security to be collected (or estimated) for each period's income to be calculated.

104. The most accurate method of calculating interest payments following a creditor approach would be to calculate them for each and every bond in issue and sum the result. This would require all bonds in issue to be held on a securities database with an associated market price. Yields could either be collected or estimated as the rate of return, which makes the discounted stream of future coupon and principal payments equal to the current market price. Ideally these calculations would be made daily, with the interest flows for a particular month or quarter simply the

Box 3

Case study A

UK study on switching to a creditor approach for estimating accrued interest in the national accounts

This case study investigated the implications for the UK National Accounts of calculating accrued interest on government bonds (gilts) using the creditor approach.

The results in the table below are more or less what one would expect. Market-based interest flows should be smaller than historic coupon-based interest during a period of declining rates (since most of the bonds outstanding would have been issued when rates, and hence coupons, were higher). Yields on gilts peaked in 1990 and then dropped to a trough in 1993. They peaked again in 1996, but have been falling steadily since. Thus in 1996, when market rates were increasing, the difference is in the opposite direction to that observed in 1993 and 2000. The effect for 2000 (around 0.5% of GDP) would have been to increase the Central Government Net Borrowing surplus by over 20%.

Interest payments

(Billion £)

Year	Current Interest Payments	Yield-based Interest Payments	Difference Y-C
1993	13.2	12.2	-1.0
1996	17.7	18.3	+0.6
2000	19.5	15.1	-4.3

Box 4

Case study B

UIC comparison between creditor and debtor approaches for a selection of Italian bonds

To evaluate the impact on the current account as a result of the adoption of either a creditor or debtor approach, two empirical exercises were carried out. In the first exercise, the percentage difference between the accrued interest calculated by the debtor and the creditor approaches was analysed[1] for a zero coupon and for a fixed coupon bond. This percentage difference was calculated for different scenarios (changes in the interest rate, term to maturity and interest rate at issuance) at the valuation time with the aim of answering the question 'to what extent is the percentage variation in interest rate reflected in the current account in each reference period?'. In the second exercise, the accrued interest under the creditor and debtor approach was calculated for four real Italian bonds with different characteristics.

Findings

The UIC study shows that the change in interest rates is only one of a number of variables that will affect the income earned. The impact on the current account also depends on residual maturity, percentage change in the interest rates and interest rate at issuance. In the following examples, four cases of 'historic bond issues' with different characteristics are analysed.

Historic issuance with high nominal interest rates and low residual maturity is most sensitive to the choice of creditor or debtor approach. By contrast, the choice of approach will have little impact on income accrued for recent issues, as current interest rates will be similar to interest rates at the issue date.

Main features of the UIC empirical study

ISIN Code	IT0001132098	IT0001174611	IT0000576782	IT0000366325
Issue date	01/07/97	01/11/97	06/06/96	01/03/93
Maturity date	01/07/07	01/11/27	06/06/03	01/03/03
Frequency	Semi-annual	Semi-annual	zero coupon	Semi-annual
Annual nominal interest rate	6.75%	6.50%	8.87%	11.50%
Annual yield to maturity	5.08%	5.88%	4.49%	3.84%
Market price 30/04/2002	110,236	109,513	95,140	108,086
Interest accrued in May 2002: debtor	0.563	0.542	0.648	0.958
Interest accrued in May 2002: creditor	0.456	0.523	0.349	0.340

1 *The analysis refers to a single reference period, as a bond can be sold before maturity, and the market yields fluctuate during the life of a bond.*

sum of the daily calculations. Obtaining and linking price data on a daily basis for each and every bond would be however very resource-intensive. Two alternatives are envisaged:

- The Australian Bureau of Statistics (ABS) approach for long-term debt is to take the average stock of securities for a quarter valued at market value, and then apply appropriate market yields.

- An alternative aggregate approach would be to make use of data on prices and yields compiled by private sector agents, in order to derive accrued income according to the following formula:

Accrued income =
stock at market prices * market yield[8]

Conclusions

105. A number of conclusions can be drawn from the empirical studies.

8 *For an exhaustive description of the aggregate approach for compiling portfolio investment income, see Chapter V.*

- Different income flows accrue under the debtor and creditor approaches. These differences are more pronounced in times of rapid changes in interest rates, or when the bonds move closer to maturity.

- Within a country's b.o.p. compilation system, the same approach should apply to the calculation/estimation of income on both assets and liabilities in order to eliminate inconsistencies between income credits and debits.

- To reduce asymmetries, a consistent approach should be adopted across all b.o.p. compiling countries. With decreasing market interest rates, the creditor approach will produce lower income flows than the debtor approach. So, in countries with negative net portfolio investment positions (i.e. liabilities higher than assets), the creditor approach will decrease the deficit of the current account (or increase the surplus), because income flows are a proportion of positions. Similarly, with a net asset position, in times of increasing market interest rates the application of the creditor approach will increase the income surplus (or reduce the deficit) as compared with the debtor approach.

3. Empirical evidence on aggregate versus s-b-s recording

Introduction

106. One of the tasks included in the mandate of the TF-PII was to empirically test the size of the discrepancies arising from the use of different compilation methods among Member States. This section compares two distinct compilation methods for the calculation of income on securities:

(i) *Security-by-security approach*. This approach entails calculating income by combining resident investors' holdings of foreign securities and non-resident holdings of domestic securities with the information available (e.g. in a master file database) regarding the yield associated with each individual security.

(ii) *Aggregate approach*. This approach entails estimating income by combining portfolio investment stocks stratified by categories of securities (determined by, for instance, the type of securities, original maturity, currency of issue, economic sector, country of the issuer, etc.) with benchmark yields.

107. UK and ES analysed the feasibility of both options on the basis of the trade-off between the amount of resources required by each approach and the accuracy of the results offered. Additionally, in order to assess the magnitude of the differences in the volume of income compiled following both approaches, two empirical exercises were carried out using information available in both countries.

108. The main arguments put forward by both countries concerning the feasibility of the two approaches are summarised in the first sub-section. In the next sub-section, two boxes present the main results of the empirical exercises carried out in ES and UK. Finally, the main global conclusions reached by the TF-PII are presented.

Feasibility of both approaches for the compilation of income figures from the perspective of individual countries[9]

109. The decision as to the most suitable approach for compiling income figures should be taken from the starting point that the most precise results are obtained using as much information as possible, i.e. through the s-b-s approach. Other considerations could nevertheless compel b.o.p. compilers to consider a more simplified approach to estimate income on an aggregate basis. These considerations are mostly related to costs.

110. The introduction of s-b-s collection implies a considerable investment in technology, time, resources and training. Obviously, most of these are upfront costs. However, there would still be costs in terms of regular data production owing to the sheer number of securities traded in some countries (as in the UK). Additionally, some countries may encounter special difficulties in the collection of flows owing to the high volume of securities transactions. Similar problems could exist when calculating the income accrued on each individual security.[10] Finally, some countries may need to consider issues such as data coverage, or the adaptability of s-b-s compilation to sampling and grossing-up techniques.

111. Aggregate methods may reduce compilation costs, but at the expense of reduced accuracy. Two main factors lie behind this loss of accuracy:

(a) The choice of the most appropriate (representative) benchmark yield is crucial in the results obtained.[11] Unfortunately, those benchmark yields that would enable results closer to the target are not always those which are publicly available (i.e. pure market averages). This is due to the different composition of non-resident portfolio stocks as compared with market benchmarks based on outstanding securities.[12]

(b) An eventual decision on the most appropriate level of aggregation to carry out (aggregate) calculations by categories of securities may cause the quality of the results to decline. Different decisions across countries could lead to comparability problems and, potentially more worryingly, asymmetries in the calculation of the euro area aggregates. However, the higher the level of breakdowns of yields we consider in the estimation process, the closer we will be to the results obtained with an s-b-s system.

9 This sub-section presents those issues where both countries held similar views. For the complete assessment of each country, please refer to the supplementary document "Empirical evidence on aggregate versus security-by-security recording".

10 It is possible that the costs of aggregate reporting may decline in the future. Various initiatives, such as global reporting and electronic links to accounting software (e.g. XML and XBRL), may reduce the compliance burden and overall costs of data collection in a country. Conversely, the future availability of information through the CSDB may facilitate s-b-s calculations if the appropriate portfolio investment stocks are available to the compiler.

11 See the results obtained in the empirical exercise carried out by ES in the previously mentioned supplementary document.

12 Non-resident investments do not necessarily have to be homogeneously distributed among all domestic securities outstanding, i.e. the weights implicit in any average are not necessarily representative of the specific securities that are most attractive to foreign investors.

Box 5

Empirical exercise carried out by ES[1]

This exercise was based on the 2001 stock of non-resident holdings of euro-denominated bonds and notes issued by the Spanish general government.

• **First approach: accrued income s-b-s** The amount of income corresponding to each individual issue was calculated on a daily basis by applying the debtor principle as the product of daily stocks of each security (in nominal amounts) and the nominal interest rate. Monthly results were calculated thereafter.

• **Second approach: accrued income of a group of aggregated securities** Income was calculated as the product of the monthly average balance of non-resident holdings of Spanish euro-denominated bonds and notes issued by general government and the appropriate benchmark yield. The key point was the selection of the appropriate benchmark yield. Three benchmarks were used:

– Market benchmark yield of issues with a maturity of over two years

– Market benchmark yield of issues with a maturity of over four years

– Interest rate average of the nominal yields (nominal coupon paid) of each issue weighted by their outstanding balance.

The first two benchmarks are publicly available, while the third one was based on internal information only internally available within the Banco de España.

Conclusions of this exercise

The most significant conclusion is that if the calculation procedure is not the same (aggregated or s-b-s), the final results can be rather different. Even if consistent interest rates are used, countries may continue to show asymmetries because non-resident investments are not evenly distributed among all issued securities and, therefore, the use of average yields in aggregate estimations does not produce the same results as calculations made s-b-s.

The choice of the appropriate benchmark yield is crucial in the result obtained. As one might have expected a priori, an average yield based on nominal interest rates offers results closer to the s-b-s outcome in the exercise performed by ES. Unfortunately, such an average would not be available for other types of securities, since a large amount of the necessary information is not publicly available.

Choosing the appropriate yield and applying real interest rates to each holding can only be ensured by using a method based on stocks broken down s-b-s, as well as detailed information on interest rates also provided s-b-s. This requires a securities database to be available. Moreover, this database would have to be centralised so that all countries could use the same interest rates for each security.

1 The complete results, tables and charts of the empirical exercises carried out by ES and the UK are available in the supplementary document "Empirical evidence on aggregated versus security-by-security recording".

Box 6

Empirical exercise carried out by UK

The UK study was based on the data for holdings of non-resident securities supplied by one large custodian, and allowed a comparison between aggregate and s-b-s compilation to be made.
The following two exercises were conducted:
A The implied rate of return (i.e. income credits divided by level of assets) on UK holdings of non-resident-issued bonds in the published aggregate data was compared with the rate of return estimated using the sample security-by-security custodian data.
B The sample custodian data for securities issued in the USA were used to see how different portfolio investment income data would be used under both an s-b-s or an aggregate approach.

Conclusions of this exercise

The two empirical studies conducted by UK suggest that reasonably similar data can be produced using either an aggregate approach or an s-b-s approach. Obviously, the less aggregated the data, the more similar the aggregate approach will be to the security-by-security approach. However, it should be noted that these are two limited studies, and the results are subject to a number of important caveats.

Shortcomings of this exercise

There are four main issues that should be borne in mind when assessing this study:
– The data from the custodian only represent a small part of the overall UK figure.[1] The assumption is, therefore, that that the custodian's holdings are representative of the whole of the UK.
– The custodian's data are a snapshot of holdings at end-December 2001. Therefore, the results can only be used for different periods in time if we assume that the relationship between the custodian's data and the published data is constant.
– The yields of some of the securities held by the custodian were not available from the data source. These securities were therefore excluded from the study.
– Time constraints meant that only the interest on securities issued by the US could be calculated on a full s-b-s basis.

1 It is estimated that the sample custodian's data represented around 5% of the total UK holdings of non-resident issued bonds and notes.

Conclusions

112. The starting point for the work of this sub-group was the assumption that the most accurate results are obtained through a compilation procedure run at the level of individual securities, by applying the yield applicable to each specific security. The availability of portfolio investment stocks s-b-s is a necessary prerequisite.

113. Provided the s-b-s approach offers the most precise results, other considerations (mostly related to costs) could nevertheless compel b.o.p. compilers to consider a more simplified approach.

114. The conclusions reached in both empirical exercises did not fully converge. The exercise carried out in ES clearly concluded that the difference between both approaches was rather significant. Conversely, the UK exercise concluded that both approaches may yield reasonably similar results, even given certain caveats (e.g. that the securities analysed only represent a small proportion of the total portfolio investment stocks in the UK i.i.p.).

115. At the time of elaborating final recommendations, the TF-PII considered the risk of asymmetric treatments between the country of the issuer and the country of the holder. If both are euro area countries, this may jeopardise the compilation of the euro

area aggregates. For this reason, the TF-PII acknowledged the need to ensure that the results obtained by all approaches that had been finally recommended should be consistent. In particular, there should be consistent access to both nominal/marked-to-market stocks and nominal/market benchmark yields between the b.o.p. compiler of the country of the issuer and that of the final holder of the relevant securities.

116. Furthermore, even if the same interest rate is used by both counterparts (in terms of nominal or market interest rates), the results might be very different if the calculation procedure is not consistent (i.e. aggregated versus s-b-s-), as non-resident investments do not necessarily have to be homogeneously distributed among all domestic securities. This means that in the application of any average yield, there is a significant inherent error, since the implicit weights are not necessarily representative of the specific securities that are most attractive to foreign investors. Nevertheless, the more breakdowns that are considered for the application of benchmark yields to aggregate categories of stocks, the closer the results will be to those obtained with an s-b-s system (and the smaller the errors and asymmetries between countries). The only widespread solution which can fully ensure the absence of asymmetries would be a calculation performed at the level of individual securities. However, even if that is the case, the use of identical features for all individual securities can only be possible if the information is centrally available, for example through the Centralised Securities Database.

In summary, starting from the fact that the s-b-s approach offers very precise results, the conclusions of the TF-PII are as follows:

- A necessary prerequisite for s-b-s calculations is that detailed information must be available to the compiler at a sufficient level of quality. It is assumed that the CSDB will be essential for meeting this requirement in the future.

- The s-b-s approach is the most appropriate way of minimising asymmetries among countries.

- The existence of centralised information (e.g. through the CSDB) would be an additional key factor in reducing asymmetries further, regardless of the approach followed.

- Nevertheless, different circumstances (mainly associated with cost arguments, availability of appropriate information, internal compilation processes and checking procedures, available resources, etc.) could lead b.o.p. compilers to adopt a more simplified approach such as the aggregate one.

- At the time of deciding on the two components of the aggregated approach (i.e. stocks by categories of securities and relevant benchmark yields), it is important to:

(i) Select consistent components (nominal/marked-to-market stocks always combined with nominal/market yields)

(ii) Minimise the risk of asymmetries.

- A way to minimise asymmetries would be to use information that is publicly available in the calculation of both assets/credits and liabilities/debits (e.g. stocks of securities marked-to-market and market benchmark yields), and which may also be reconcilable with other countries' results computed at the level of individual securities.

- In order to minimise asymmetries among countries following distinct approaches (i.e. s-b-s versus aggregated), the ideal solution would be that the CSDB could include exhaustive information on each individual security (especially on the associated interest). This information could be used to calculate benchmark yields for each aggregation level on a centralised basis, thus promoting the use of more homogeneous information among countries.

- The second component of these calculations (i.e. stocks of securities by categories) should also be standardised as far as possible. It is therefore recommended to establish a minimum level of categories of securities (to which the appropriate benchmark yields should be applied), in order to ensure high quality income figures.

4. Further empirical evidence: debtor/s-b-s versus creditor/aggregated

Introduction

117. The analyses described in the previous two sections were carried out by two different sub-groups of the TF-PII. Owing to the evident links between both subjects, the TF-PII came to the conclusion that an additional empirical investigation should simultaneously consider both choices, i.e. by combining debtor versus creditor and aggregated versus s-b-s together.

118. The main combinations currently in place for the compilation of income figures in EU countries are (i) calculations based on s-b-s + debtor; and (ii) estimations based on aggregated + creditor. Therefore, these were the two basic combinations mainly tested by the three countries.[13] Other combinations were more difficult to test owing to the unavailability of the necessary information, e.g. indices/benchmark yields for nominal interest rates, nominal (aggregated) stocks of securities or market yields for individual securities.

119. Accordingly, the three countries participating in the sub-group (namely AT, IT and FR) tested the following two approaches for a number of domestic and foreign securities:

(i) *Security-by-security + debtor approach*, combining resident investors' stocks of individual foreign securities and non-resident investors' holdings of individual domestic securities with the information available in a master file database regarding the nominal interest rate associated with each individual (domestic or foreign) security.

(ii) *Aggregate + creditor approach,* by combining portfolio investment stocks stratified by categories of securities (established on the basis of some specific features, such as original maturity (or residual maturity where available), currency of issue, economic sector and country of the issuer, etc.) with marked-to-market benchmark yields.

120. As the three countries participating in the exercise collect portfolio investment stocks s-b-s,[14] the aggregate stocks considered in the empirical exercises were not representative of the situation in those

13 AT also partially checked the combination s-b-s + creditor.

14 This was a precondition before contributing to the analysis, as the exercise required the simulation of a proxy for aggregated stocks starting from stocks at the level of individual securities (to enable the comparison between the results following both approaches).

countries that compile PI directly on an aggregate basis. That is, the 'aggregate stocks' of the three countries in the exercise were approximations based on aggregations of individual securities information. This methodology resembles what the TF-PII termed the 'mixed approach' (which may indeed be an option for the compilation of portfolio investment income).

121. The main results of the three empirical exercises are briefly described in boxes 5, 6 and 7.[15]

15 The entire results of the empirical exercises carried out by the participating countries, as well as descriptive tables and charts, are available in the supplementary document "Further empirical evidence: debtor/s-b-s versus creditor/aggregated".

Box 7

Empirical exercise in Austria

Two different exercises were carried out for assets and liabilities.

Liabilities

Data used: long-term debt securities issued by the Austrian general government and by domestic MFIs, respectively. On one hand, accruals were calculated (following the debtor approach) s-b-s, while on the other, the creditor approach was used to calculate accrued interest in the following two different ways:

a. Applying quarterly average benchmark yields by five different categories of residual maturities (0-1, 1-3, 3-5, 5-10, >10 years), which are not differentiated by currencies and instruments (zero coupons, floating rate notes, index linked bonds, etc.). Additionally, a global average benchmark yield was calculated for each sector using the benchmark yields of the five categories.[1]
b. Under the assumption that market interest rates highly depend on currencies, market values for stocks (and benchmark yields) should be available by currencies. As benchmark yields for currencies other than EUR were not available, *the creditor approach was applied **s-b-s*** to part of the Austrian securities held abroad. Daily yields were taken from Data Stream.

Assets

For practical reasons, only a rough analysis was possible.

Data used: for three countries (DE, US and IT; 40% of the considered position), all long-term debt securities held by domestic banks.

The procedure for calculating accruals following the debtor approach s-b-s was similar to that for liabilities. The creditor approach was applied to all three countries using (quarterly) market values for stocks classified according to three different categories of residual maturities: 0-3, 3-7, >7 years. Stocks were not differentiated by **currencies**, instruments or **economic sectors of issuers**. As approximations of benchmark yields for these categories, monthly benchmark yields (average) for general government bonds with residual maturities of 2, 5 and 10 years were supplied by the ECB (extracted from Reuters).[2] For all government securities under consideration (and for 60% of the MFI securities), yields were available in Data Stream. However, yields were missing for securities with variable interest rates. When this was the case, the market interest rate of another security (same currency and residual maturity but not the same instrument) was used as an estimate. It is assumed that this estimation does not considerably bias the results (and conclusions) of the analysis.

Conclusions of this exercise

As expected, there are differences between the (s-b-s) debtor approach and the creditor approach, depending on the evolution of market interest rates. The differences were in the range of –10%<0<10%, although in extreme situations higher discrepancies can occur.

However, the results calculated by the creditor approach largely depend on the chosen benchmark yields and on the availability (and quality) of categories of stocks.

Therefore it is very difficult to compare the results of both approaches. In general, it can be concluded that there are (mostly slight) inconsistencies owing to the use of different methods for calculating accruals (debtor/creditor). From the Austrian point of view, inconsistencies in the euro area aggregate were more a result of different ways of applying the creditor approach – in particular the quality and availability of aggregate stocks and appropriate benchmark yields.

1 *This average benchmark yield is necessary for countries where it is not possible to generate categories of stocks by residual maturities. The global benchmark implicitly represents an estimation (or assumption) of the distribution of stocks to residual maturity categories.*
2 *These benchmark yields are only appropriate under the following strong assumptions: (i) there is no influence of currencies and instruments; (ii) government bond benchmark yields are good approximations for other issuing sector benchmark yields; and (iii) benchmark yields for residual maturities of 2, 5 and 10 years are good approximations for the chosen categories.*

Box 8

Empirical exercise in Italy

Data used: debt securities in portfolio assets derived from the 2000 IMF Portfolio Survey. Monthly stock data were obtained by cumulating flows starting from the 2000 benchmark.
The debtor approach was applied s-b-s using nominal yields and stocks.
For the creditor approach, the ECB supplied monthly benchmark yields for general government bonds by (original) maturities and issuing country[1]. The security categories included in the calculation covered approximately 22% of the total portfolio assets for debt securities. 99% of the portfolio stock used in the exercise consisted of fixed coupon bonds. Two different scenarios were considered (depending on the number of details available on the original maturity of the financial instruments concerned, i.e. whether or not the details were restricted to the simple split between B&N and MMI).

Conclusions of this exercise

The interest accrued calculated by following the different approaches did not show significant differences on a yearly basis, varying by approximately 10%. On a monthly basis using a time series of 15 observations, significant differences were only observed in two months (around 20%). From January 2001 to March 2002, the sign of the percentage difference was always negative, with the interest calculated following *debtor + s-b-s* constantly higher than that calculated by *creditor + s-b-s*.
When analysing the results, it should be kept in mind that this particular exercise was based on the available information supplied by the ECB. In scenario 1, the available market yields may represent, with an acceptable degree of precision, the s-b-s real market yields. In scenario 2, the loss of information concerning maturity caused an increase (albeit small) in the difference between the two approaches.
In a real situation, the difference in the calculated income would be strongly influenced by the level of breakdown for stocks combined with the level of detail of the available market yields. The breakdown for portfolio stocks differs from country to country, and information on currency and country of issuer is not necessarily included in the minimum requirements. Additionally, with regard to market yields, the level of detail of the data as well as the method adopted in using and extrapolating the available data can vary from country to country.
Since the accuracy (in terms of available information) in calculating interest on an aggregate basis can vary considerably, it is difficult to assess whether the loss of precision in general tends to overestimate or underestimate the differences between both approaches.

1 AT, DE, ES, FR, JP, UK, US.

Box 9

Empirical exercise in France

Data used: Treasury notes (about 40% of tradable French public debt).
Debtor approach: income calculated on a monthly basis as the product of monthly stocks of each security (in nominal amount) and the nominal interest rate.
Creditor approach: income calculated monthly as the product of the monthly balance of non-resident holdings of French bonds (marked-to-market) and appropriate market interest rates. Three different interest rates were calculated from market yields taken from the BSME (Banque de Séries Monétaires et Economiques):
– a market average yield of issues with a maturity over two years;
– a market average yield of issues with a maturity over five years;
– an average of the two previous ones, weighted by the proportion of two-year bonds and five-year bonds in the non-resident holdings.

Conclusions of this exercise
The main conclusion is that the choice of an average rate is essential when compiling accruals.
It would be optimistic to assume that the differences between both approaches should compensate in prolonged periods of time (e.g. one year), as the behaviour of non-resident holders should be taken into account and could lead to permanently biased results.
Therefore, the calculation of a representative average rate would need perfect knowledge of the different nominal rates related to the different bonds and their weights in the non-resident holdings.
However, this would lead to calculations that are very close to a security-by-security method. Therefore, the security-by-security method represents a better choice whenever possible.

Conclusions

122. Although the three countries were following the same patterns, they did not contrast their results and conclusions until they had finalised their respective investigations. Nevertheless, some of their findings were remarkably similar. The following observations summarise common conclusions:

123. It should be strongly emphasised that the results of these exercises cannot be deemed

(i) The magnitude of the gap encountered in the three exercises was similar.[16]

(ii) In general, the way that aggregated calculations (following the creditor approach) are performed – namely *(i) the number of categories of securities established and (ii) the selection of the appropriate benchmark yields* – could generate inconsistencies of comparable magnitude to those derived from the choice between creditor and debtor.

(iii) However, the *differences are largely dependent on other factors* such as interest rate volatility, composition of portfolio investment stocks, level of details available on market yields and portfolio investment stocks, etc.

16 The three exercises quantified the difference in the output produced by the aggregated/creditor and the s-b-s/debtor approaches respectively at around +/- 10 % of the total results over prolonged periods of time (differences tend to be higher on a monthly basis). However, it may be difficult to generalise these results to all situations, as most of the conclusions of the three exercises were purely based on government bonds. Additionally, even for such bonds, the participants in the sub-group recognised that larger differences may occur in exceptional cases (for instance, in times of significant changes in interest rates). A similar exercise carried out with Portuguese government bonds (not included in this report) concluded that income estimated according to the debtor approach was always higher than income compiled through the creditor approach, 31.9% higher at end-2002, 29.1% at end-2001 and 20.1% at end-2000.

fully conclusive, as they purely focus on a limited range of securities (mostly government bonds), producing results that greatly depend on the factors enumerated under (iii).

124. In particular, the categories of securities established in the empirical investigations were possible thanks to the availability of portfolio investment stocks security-by-security in the three countries, i.e. these exercises actually compared the so-called 'mixed approach'[17] with the 's-b-s approach'. ***Thus, differences in the s-b-s approach following a purely aggregated approach could not be tested.***

125. However, the results of these additional empirical exercises did not question any of the conclusions reached by the former two sub-groups investigating the choice between debtor and creditor and between aggregated and sec-by-sec respectively. Moreover, the participants in the sub-group found some evidence which reinforced some of the conclusions encountered by the former sub-groups, inter alia:

Creditor/debtor

- Different income flows accrue under the issuer and market approach. These differences are most pronounced in times of rapid changes in interest rates.

- To reduce asymmetries, a consistent approach should be adopted between assets and liabilities and across all b.o.p. compiling countries.

Aggregate/s-b-s

- At the time of deciding on the two components of the aggregated approach (i.e. stocks by categories of securities and relevant benchmark yields), it is important to:

(i) Select consistent components (nominal/ marked-to-market stocks always combined with nominal/market yields)

(ii) Minimise the risk of asymmetries.

- The second component of the aggregate calculations (i.e. stocks of securities by categories) should be standardised to the extent possible. To this end, it is recommended to establish a minimum level of categories of securities (to which the appropriate benchmark yields should be applied). This minimum level has to ensure high quality income figures.

It is important to stress that, as a result of this investigation, the TF-PII considers the way in which some countries carry out aggregated estimations or s-b-s calculations to be absolutely crucial when assessing the risk of asymmetries. For s-b-s compilers, the question relates to the debtor/creditor approach, and to whether one approach is being consistently followed. For aggregate compilers, in addition to these considerations, a minimum level of variables need to be considered in aggregated estimations.

5. Treatment of income on collective investment institutions (CIIs)

126. The mandate of the TF-PII called for a technical analysis of how income on investment into collective investment institutions (CIIs) is compiled and incorporated into portfolio investment income aggregates. This entailed the Task Force revisiting the conclusions and recommendations of the ECB's European Union Balance of Payments/International Investment Position Statistical Methods as this applies to the treatment of the income (and expenses) of collective investment institutions.

127. The motivation behind the approved treatment was primarily to prevent the distortion of GNP by attributing all income earned by the CII to investors, and then showing the element of the CIIs' total income not distributed through dividends as being reinvested by shareholders.

17 The mixed approach consists of establishing categories of securities starting with s-b-s portfolio investment stocks, to which aggregate benchmark yields are applied to calculate accruals.

Recommended treatment

128. The recommended approach is that the income flow from the CII to investors in the CII is reinvested, and represents all the interest and dividends earned by the CII on its investments. Application of this treatment means that all income is assigned to the investors, regardless of whether it is distributed or not. Income that is not distributed is considered as being reinvested in the CII and, consequently, capitalised income has a counterpart entry in the Financial Account.

129. In many cases, CIIs are exempt from tax. Where they are not tax exempt, the figures should be adjusted and appropriate offsetting entries recorded under the current transfer item. As it is recognised that the countries of the shareholders will not have access to the same detailed information on taxation as the countries where the funds are located, asymmetries between euro area countries could occur. Possible solutions that aim at minimising the risk of asymmetries could include the exchange of public information on taxation applicable to local CIIs among b.o.p. compilers, and/or perhaps in the future through the use of centralised information available in the CSDB.

130. According to these recommendations, the time of recording of investment income on the liability side of the CII will completely coincide with the time of recording on the asset side.

131. The treatment for the country where the CIIs are resident and in which non-residents invest forms the main focus of the previous paper[18] on this matter. However, this simplification was introduced only for illustrative purposes and, as stated in that paper, **'it must be clear that a completely symmetric treatment is proposed for residents investing in non-resident CIIs. The latter case is only mentioned explicitly when the direction of the investment in the CII affects the estimation method.'** This demonstrates, therefore, that the full symmetric treatment for the recording of reinvested income for CIIs was recommended for both the euro and EU areas.

132. However, such a symmetric treatment is very difficult to achieve on practical grounds owing to imbalances in the information available between resident and non-resident CIIs. Thus, to further examine this issue, a clear distinction is needed between resident CIIs or CIIs in the reporting economy, and non-resident CIIs or CIIs abroad.

CIIs in the reporting economy

133. The treatment proposed for resident CIIs in which non-residents invest is perhaps the most straightforward. Once the resident b.o.p./i.i.p. compiler has data covering the stocks of assets owned by the resident CII, he/she can then either estimate the income earned on an accruals basis or collect this income data directly through a survey.

134. Similarly, once the compiler knows the country of the non-resident investor in the resident CII, he/she can estimate how much of the accrued income needs to be attributed outwards to the non-resident investor country by way of an income debit. (Note: the capitalised element of this income is considered to be reinvested and is included in the b.o.p. under Financial account / Portfolio investment / Equity securities / Liabilities).

CIIs abroad

135. The recommendations on the treatment of investment in non-resident CIIs by the residents of the compiling country are clear: **a completely symmetric treatment is proposed for residents investing in non-resident CIIs.** However, it is possible that the compiler in the investor country will face difficulties in estimating the income from these investments.

18 The European Monetary Institute's Sub-group 1 of the B.O.P. Financial Flows and Stock Task Force: "Recording of income on an accruals basis or collective investment institutions, money market instruments and other bonds".

136. Estimation errors are most likely to occur in the following situations:

- Up-to-date stock information on these assets (value of units in the non-resident CII) is unavailable;
- The aggregate asset allocation of these CIIs abroad is unavailable;
- The country/currency attribution of these assets is also unavailable.

Possible difficulties with the current treatment

137. The possible sources of asymmetries in the recording of reinvested income by Member States are identified in detailed work examples contained in the supplementary document annexed to this report.[19] The main sources of asymmetries are as follows:

- Where the CII is a resident, the income on its non-resident assets is recorded on an accruals basis by the CII. This follows standard BPM5 treatment and does not normally pose any special difficulties. However, asymmetries will occur if the element of this income that is attributable to non-resident investors in the CII is not debited, and instead only dividends payable by the CII to the non-resident investor are recorded in the b.o.p.
- Where the compiler has resident investors in non-resident CIIs, the income on these investments may only be recorded when dividends are payable by the CII.
- These two deviations from the recommended treatment could cause substantial asymmetries, preventing a symmetric treatment between resident and non-resident compilers in respect of investment in a given resident CII.

138. The Task Force continued by considering the implications of this possible asymmetry for the EU/ euro area by reviewing the data on CIIs currently available.

139. It was clear from the data provided by Task Force members that, in general, there is a relatively low level of investment in EU/euro area resident CIIs by non-residents. The obvious exceptions are Ireland and Luxembourg. The analysis below measures the degree of foreign participation in resident CIIs.

Table 3

Participation by non-resident investors in resident CIIs

Country	Non-resident investment in resident CIIs in EUR millions	Total resident CIIs in EUR millions	Participation of non-residents in %
GB	2,063	424,286	0
FR	15,400	845,800	2
DE	20,125	821,211	2
AT	8,000	92,000	9
FI	1,160	14,235	8
PT	421	21,550	2
IE	203,000	208,000	98
LU	844,000	875,000	96
IT	1,915	449,931	0
Total	1,096,084	3,752,013	29

140. From the table above, we can see that in overall terms there is a significant level (29%) of non-resident investment in resident CIIs, which is almost entirely due to the nature of the CII industry in both Ireland and Luxembourg. If we exclude these countries from the participation calculation, we obtain a participation result of only 2%.

141. It therefore follows that, when considering the case of CIIs in the reporting economy, the major players are Luxembourg and Ireland. The Task Force's investigation determined that the recommended treatment is being followed in both countries.

142. The Task Force then focused on the case of resident investment in CIIs abroad. The data collected from Member States is listed in the table below.

19 See supplementary document "Treatment of income on collective investment institutions".

Table 4

Resident investment in CIIs abroad as a percentage of total European Union/ euro area

Country	Resident investment in CIIs abroad EUR millions	% of EU/euro area
GB	2,540	1
FR	23,400	8
DE	130,493	43
AT	10,000	3
FI	10,000	3
PT	2,221	1
IE	18,953	6
LU	20,000	7
IT	86,097	28
Total	303,704	100

143. The level of investment in CIIs abroad of €303bn is considerably less than the level of non-resident investment in resident CIIs of €1,096bn. This suggests that a large part of investment in CIIs in Ireland and Luxembourg comes from outside the EU/ euro area.

144. To the extent that this investment in CIIs abroad is in CIIs in other euro area countries, it is essential that the symmetric treatment of recording is followed. In other words, all the income earned on assets of CIIs abroad, as they relate to resident investors, must be recorded as credits in the resident b.o.p. Moreover, if the country where the CII is resident is in the euro area and is following the recommended treatment, and if the country of the investor in this CII (which is also a euro area resident) only includes as income the distributions (dividends) from this non-resident CII, then this will create asymmetries in the euro area b.o.p.

145. It was clear to the TF-PII from the discussions that took place that some countries have difficulties in applying the correct treatment for recording accrued income on resident investment in non-resident CIIs. **If we assume that all of the investment in the above table of €303bn are in other euro area CIIs, and these CIIs do not pay dividends, the annual asymmetry in the euro area would be approximately €9bn (€303bn * 3% income).** In 2000 the euro area had a b.o.p. surplus of €1.4bn.

146. The Task Force continued by elaborating an estimation method for income earned by non-resident CIIs with resident investors for the euro area.

Estimation method

147. This estimation method requires the following data:

- The value of the stock of CII shares/units held abroad;
- The breakdown of the assets of the foreign CII in order to estimate the income, i.e. to apply the appropriate return on each asset category, as well as ideally each country and currency of the investments;
- The value of any dividend payments by the non-resident CII to residents.

Value of shares/units in CIIs abroad

148. This can be obtained by using an aggregate or s-b-s information on stocks. The compilation of these data is a part of i.i.p. and CPIS compilation. It seems reasonable to suppose that these position data will be available once all of the countries meet, as a minimum, the acceptable data requirements for portfolio investment as set out in the TF-PICS document.

Breakdown of assets held by the CIIs

149. There are a number of data sources here for the breakdown of asset categories:

- Survey of investors in non-resident CIIs
- Money market fund (unpublished) information available from money and banking statistics compiled by the euro area Member States

- Security-by-security information will provide details of the fund investment strategy, e.g. Deutsche US Bond fund

- Data exchange with the counterpart country where the CII is resident

- Quarterly Portfolio Poll by the Economist magazine, which gives a breakdown for each asset category by country/currency.

How to estimate a rate of return for CIIs abroad

150. Once the position or stock of investment in CIIs abroad has been estimated and a reasonable breakdown between Equity, Bonds & Notes and Money Market Instruments (concerning the investment policy of the CII) determined, a rate of return can be applied to these asset positions in order to calculate the accrued income. A detailed approach is outlined in the supplementary document mentioned in footnote 65, which details a precise estimation of positions and related income. However, a simpler approach is set out in the following paragraphs.

151. For equity, a benchmark yield obtained from commercial data sources (such as the daily information detailed in the Financial Times under 'FTSE Actuaries Share Indices - European Series') could be appropriate. In the event no benchmark is available, a representative flat yield (e.g. 2%) could be applied which, as per the FTSE daily series, is a reasonable yield to apply to equity.[20]

152. For Bonds & Notes and MMI, we need information on the currency that the bonds or MMIs are denominated in. As far as an instrument breakdown of the resident CIIs' investments are concerned, it would seem possible to arrive at a reasonable estimate of the stock of resident investment in non-resident MMFs. The balance of total investment would then be in bonds and equity funds. In the absence of any further firm information, the ratios given in the Economist's Quarterly Portfolio Poll[21] could be used to estimate investment into bonds and equity and cash. In this way, we could then arrive at a composite rate of return.

153. Using the Economist's Quarterly Portfolio Poll data, a composite yield or rate of return of 3% was calculated, which can be applied to the stock of CII abroad for the final quarter of 2000. It is assumed that the country of the CII is known or at least the MUMs/non-MUMs breakdown of the stock is known. As the i.i.p. must be compiled on a step 2 basis from 2001 onwards, it is assumed that this breakdown for CIIs will be possible in the future. In addition, it should be noted that some estimation for fees payable by the investor needs to be factored into this calculation. In general, an acceptable estimate of fees payable is 1% of the net asset value of the CII.

154. Clearly an asymmetry will still exist if the compiler in the reporting economy is using firm data whereas the compiling country with the investment in a CII abroad is using estimates in relation to the same income. In general, however, the promotion of a single simplified method based on an agreed rate of return for CII investment will clearly improve the quality of the euro area accrued income statistics. This rate of return could apply to each asset class or simply to the entire investment.

155. There is a broader issue that needs to be examined in relation to extending this treatment to countries outside EMU/the EU, as otherwise there will still be asymmetries in the Global Balance of Payments. This issue is under consideration at the IMF.

Recommendations

156. In the light of the analysis outlined above, the Task Force made the following recommendations with the aim of improving

20 For further details, see supplementary document 'Treatment of income on collective investment institutions'.

21 Quarterly Portfolio Poll, The Economist (see 5 July 2002 edition for a recent example).

the recording of reinvested income as it relates to investments in CIIs abroad. [We consider that the recording of income on an accruals basis in respect of CIIs in the reporting economy broadly follows the recommended treatment.]

- It is assumed that stocks of investments in CIIs abroad will be available to Member States at the same frequency as that at which income needs to be calculated. These data are available from i.i.p. data to some extent, as well as from Financial Accounts. More frequent stocks, if not readily available, could be estimated.

- The second prerequisite before the recommended treatment can be applied is that Member States should obtain or estimate the asset allocation strategy of CIIs abroad. However, it is also assumed that this is virtually impossible on practical grounds.

- For this reason, it is recommended that all countries should apply similar estimation methods. Any estimation method should involve the use of the procedures outlined in the paper.

- In many cases CIIs are exempt from tax. When they are not tax exempt, the figures should be adjusted and appropriate offsetting entries should be recorded under the current transfer item. As it is recognised that the countries of the shareholders will not have access to the same detailed information on taxation as those countries where the funds are located, asymmetries between euro area countries could be minimised through the exchange of public information among b.o.p. compilers, and/or perhaps in the future through the use of centralised information available in the CSDB.

- An optimal element of the estimation procedure is that an agreed rate of return for either overall CII investment in the euro area or for each class of investment by CIIs, i.e. Bond Funds, Equity Funds and Money Market Funds will be set centrally and made available in the CSDB.

- Until this information may be made available through the CSDB, the following could be temporarily considered:

– The 3-month EIBOR rate could be applied to MMFs.

– For equity, a benchmark yield obtained from commercial data sources (such as that stated in paragraph 150) could be appropriate.[22]

– An appropriate euro bond benchmark yield could be applied for Bond Funds.

6. Practical difficulties in the collection of income on zero coupon bonds

Introduction

157. The mandate of the TF-PII included a specific point for investigation concerning practical difficulties in the collection of income on zero coupon bonds. Furthermore, the lack of information on accrued income on zero coupon bonds and deep-discounted notes was one of the most significant problems reported by a number of countries in the introductory meeting of the TF-PII, especially by those countries collecting income data from settlements.

22 As a fall-back solution, a representative flat yield could be applied (in the period analysed, 2% could be deemed fairly representative).

158. In view of the above, the TF-PII tried to investigate whether the specific situation of such countries concerning some data unavailability could be generalised and thus constitute a potential problem for other countries following different compilation methods.

159. Additionally, in the course of its investigations, the TF-PII became aware of the high degree of interdependence between the specific case of zero coupon bonds and other subjects being investigated in parallel concerning the specific methods used to compile income statistics in general (i.e. the approach used for compiling income figures, the choice of debtor/creditor, etc.). Therefore, a general analysis of these methods was also carried out.

160. The next sub-section deals with some general aspects linked to income compilation methods (such as the choice of debtor/creditor or the approach followed to collect/estimate/calculate income aggregated or s-b-s), making some specific references to the compilation of income on zero coupon bonds. The next sub-section touches briefly upon different methods to spread income over time to apply an accruals calculation. Finally, some general conclusions are presented.

Calculation of accrued income for zero coupon bonds in different systems

Direct collection from reporters

161. If income is collected from reporters, different methods should be applied to credits (assets) and debits (liabilities). For income on assets, a reliable register of holders of foreign debt securities would be a prerequisite. The b.o.p. compiler can get this information directly from the books of the domestic holders, normally following the so-called acquisition approach.

162. For income on liabilities, there are two possible approaches: the residual approach and the mixed approach. The residual approach derives payments to non-residents as the difference between total income paid by the issuer and that reported as received by domestic holders. The mixed approach is based on income information collected mainly from domestic custodians that have direct relations with non-resident counterparts, and augmented by information on holdings of domestic securities that are held by resident investors directly with non-resident custodians. One problem in this case is that custodians may not be able to report income on an accrued basis rather than a cash basis.

163. In any case, both issuers and holders should be able to report accrued income for zero coupon bonds.

Calculation/estimation by the b.o.p. compiler

164. In principle, if income is calculated or estimated by the compiler, the same compilation methods as for other debt securities may be applied to income on zero coupon bonds. In comparison with collecting this information directly from reporters, this way of compiling income figures entails the following advantages and disadvantages:

Pros:

- The compiler has control of the approach followed, while respondents can use a variety of methods (for example, the same respondent could use different ways of booking income for different parts of its portfolio).
- It enables a symmetric treatment of income for both assets and liabilities.
- The reporting burden can be kept low, since no information on income is collected.
- Information on income directly collected from custodians would not be on an accrued basis, as they report income payments received by the investor.

- The compiler's work process might become less resource-consuming as collecting, checking and controlling the figures received from reporters would be replaced by an automated calculation that has to be updated and checked at regular intervals. On the other hand, it does imply that the b.o.p. compiler will have to perform calculations/estimations previously left to reporters (thereby also assuming part of the burden).

Cons:

- Aggregate approaches, require more detailed stocks to be collected to reflect currency, maturity and credit risk differences.

- If income is estimated from stock data, then certain assumptions will be required. However, the assumptions can be based on more or less sophisticated grounds, depending on the relative importance of the portfolio investment item in the individual country's balance of payments, and the resources given to the production of statistics.

- In terms of compilers' costs, the direct collection of income on assets from securities' holders might be more cost-effective, provided there are good holder registers available.

Linear method versus cumulative method

165. For zero coupon bonds, no periodical interest is paid. Instead, the difference between the issue and the redemption prices is supposed to be the income associated with this kind of bond. This income accrues during the lifetime of the bond and can be calculated following two different methods: the linear method and the cumulative method.

In the linear method, the difference between the redemption price and issue price is evenly spread over the lifetime of the bond. This method is relatively simple. The basic underlying assumption is that the increase in invested capital is not reflected in the calculation of accruals.

166. The main alternative to this system is the so-called cumulative method. According to this method, accrued interest increases over time, reflecting the accumulation of invested capital. This method is somewhat more complicated than the linear method. However, theoretically it might be superior, as rising accruals reflect the evolution of the capital invested in the financial instrument, i.e. in the zero coupon bond.

167. Although both methods potentially offer acceptable results, the simplicity of the linear method could make it more advisable if reporters themselves calculate accrued interest (on zero coupon bonds). If accrued interest is calculated by the b.o.p. compiler, the cumulative method seems conceptually more robust, although it might prove costly and relatively time-consuming.

General conclusions

169. The TF-PII found that most problems related to the compilation of income on zero coupon bonds derived from the specific compilation methods in place in Member States. In this regard, two principal types of problems were encountered:

(i) The lack of information on accrued income of zero coupon bonds. This problem affects mainly those countries which continue using settlements for the collection of income figures.

(ii) Inconsistencies in the way reporters calculate income (debtor for liabilities, acquisition for assets). This problem exclusively affected those countries collecting information directly from reporters.

170. Therefore, the first conclusion of the TF-PII was that, for those compilation

methods in which compilers calculate/estimate income themselves, these problems are less important. The second conclusion of the TF-PII was that, if compilers calculate/estimate income themselves, no specific method is necessary for zero coupon bonds, since a standard method combining yields and outstanding stocks could be used, as with any other type of debt securities.

171. Consequently, these two preliminary conclusions concerning income on zero coupon bonds, in combination with the intrinsic general nature of the problems identified, imposed a somewhat general focus in the remaining conclusions which, although also applicable to other types of securities, have largely emerged in the context of investigations concerning zero coupon bonds.

Conclusions

(i) When income figures are directly reported, the compiler does not control how reporters make their calculations.[23] In order to contribute to more homogeneous and consistent statistics across Member States, it seems advisable that compilers calculate or estimate income themselves (by applying yields to outstanding stocks).

(ii) When compilers calculate or estimate income themselves, zero coupon bonds do not require any special income compilation method in either aggregated or s-b-s systems. As for other debt securities, calculations are always based on multiplying interest rates by appropriate stock information.

(iii) If the debtor approach is used on an s-b-s system, two different methods for calculating accruals are possible: the linear approach, which might be easier to implement, and the cumulative approach, which is theoretically stronger.[24]

7. Problems with the recording of income on shares

172. Income on shares (dividends) may be paid in cash or by means of stock dividends. Unlike income from debt securities (interest), where there is a binding agreement between debtor and creditor for the payment of interest, the payment of dividends relies upon the discretionary decision of the management/board of an enterprise. At any particular period of time, dividends may or may not be associated with the earnings of that particular period and their distribution can be made at any time, even in a period when the enterprise registers net losses.

173. Furthermore, dividends may be paid out of normal operating profits, realised or unrealised capital gains or other types of capital. For example, an enterprise may raise capital by issuing rights with a view to implementing a project. If, for any reason, the project were finally abandoned, the accumulated cash could then be returned to the shareholders.

174. There may be reasons that cause differences in the way income on portfolio investment/shares is recorded by b.o.p. compilers. The topics expanded on below may be at the root of various treatments which could have consequences for the compilation of the euro area aggregates. This section does not deal with either the issue of income on collective investment schemes (covered in a

23 For example, income on assets is most often reported following the creditor or acquisition approach, while income on liabilities is usually reported following the debtor approach.

24 If reporters calculate accruals on zero coupon bonds themselves, then the linear approach might represent a more practical solution. If the compiler calculates accruals on zero coupon bonds, then the cumulative approach is conceptually better.

previous section) or foreign direct investment income (e.g. reinvested earnings).

Data collection systems

175. Most countries currently collect income on shares from either settlements or direct reporting through surveys. A useful tool to check the plausibility of the results (especially over prolonged periods of time) could be the application of yields to the external stocks of shares. If discrepancies between such estimations and the methods currently in use in Member States are randomly distributed, then positive and negative differences should cancel each other out.

176. On this basis, the TF-PII carried out a comparison between country results and estimations following the above-described approach with the following results:

If N is the number of observations (36 in the exercise), and p the probability of a positive difference, then N*p = 36*0.5=18 is the number of expected positive differences.

If X is the number of observed positive differences, as N*p>5

then the variable Z=(X-N*p)/sqrt(N*p*(1-p)) follows (approximately) the normal distribution and in the exercise, with X=27, variable Z has the value of (27-18)/sqrt(18*0.5*0.5)=3, well above the 95% confidence interval.

177. Hence, the hypothesis of random errors cannot be accepted. The conclusion was that methods currently in use might underestimate income on shares (under the strong assumption that the benchmark method provides a rough but unbiased estimate).

178. However, this conclusion should be interpreted with caution. Firstly, dividends are not necessarily consistent with the corresponding holdings of shares used in the estimation based on benchmarks, at the time when they are paid. In addition, dividend yields quoted by data providers refer to stock exchange indices that reflect a particular market as a whole. These yields do not necessarily coincide with the yields of the particular shares held by non-resident portfolio investors. At least the practical exercise carried out by the TF-PII indicated that information collected on income on shares very much depends on the particular collection method of each country and, given the plethora of methods currently in use in Member States, asymmetries may cause serious distortions in the euro area aggregates.

Stock dividends

179. Stock dividends are construed as a way of capitalisation of earnings or capital gains. In such a case, earnings are still distributed to the shareholders, though not in the form of cash dividends. In the b.o.p., an entry should be made in the current account under Income on portfolio investment/shares, and a counter-entry in the financial account under Portfolio investment/shares.

180. Data collection systems based on settlements (e.g. an ITRS) cannot themselves keep track of stock dividends. Additional sources of information would therefore be required for the estimation of stock dividends.

181. At present, most countries do not record stock dividends. Through a stocktaking exercise, the TF-PII certified that in none of these countries are stock dividends substantial compared with cash dividends. Therefore, any asymmetries arising from the non-recording of stock dividends are of minor importance.[25]

The treatment of taxes

182. According to BPM5 (paragraph 287), dividends payable to non-resident shareholders (direct investors and portfolio investors) must be recorded gross of any withholding taxes. In practice, it is often the company itself

25 Portugal could be an exception. In 2001, stock dividends in PT represented 41% of the total dividends paid in that year.

that pays the taxes to the tax authorities of the country in which it operates and, subsequently, distributes the dividends to non-resident shareholders net of tax. In such cases, a correction should be ideally made so that dividends are considered as being paid in full to the non-resident shareholders by imputing a counter-entry (for the amount of tax) as a current transfer (credit). Likewise, a correction should be made for dividends receivable.

183. It is obvious that systems based on settlements can only record dividend payments on a net-of-taxes basis and, therefore, additional information would theoretically be required.

184. According to the information collected by the TF-PII, the majority of countries record dividends net of taxes. Additionally, some countries apply inconsistent treatments to both credits and debits. Given that tax rates are quite high in all countries, substantial asymmetries may arise. Hence, in those countries where dividends are recorded net of tax, an imputation should be made reflecting the amount of the corresponding tax (both the income on shares and the current transfers items should be corrected).

185. As most b.o.p. compilers stated that the additional information they need is on tax rates for dividends in other countries, Annex

3 provides this information for the EU countries as well as for USA, Japan and Switzerland. If residents of a Member State have significant portfolio investment assets/ shares in other countries (e.g. in the emerging markets of South-East Asia or eastern Europe), compilers who record the corresponding income on a net basis are encouraged to find out the corresponding tax rates and make the necessary corrections.

Time of recording

186. The time of recording may be a significant factor in asymmetries, owing to the particular algorithm used to construct portfolio investment income in the euro area b.o.p. (i.e. asymmetries at the time of recording intra-euro area flows directly translate into inaccurate extra-euro area b.o.p. flows and errors and omissions in the euro area b.o.p.).

187. International standards recommend that dividends should be recorded as of the date payable (BPM5, paragraph 282). According to the findings of the TF-PII, in most countries the lapse of time between the two events (dividends declared payable and dividends paid) may be longer than the recording period, though normally not too long. With only one exception (Ireland), all countries record dividends when they are actually paid.

188. The TF-PII recommends that, for practical reasons, dividends should be recorded in the period when they are paid rather than when they are declared payable.

Operating and non-operating profits

189. Dividends may originate from normal operating profits, as well as from non-operating profits or capital gains. For National Accounts, the ESA 95 suggests that the redistribution of capital gains should be classified as other capital transfers (paragraph 4.165). The November 2001 edition of the European Union balance of payments/ international investment position statistical methods (BOP Book) recognises this distinction on page 28. However, in practice it is very difficult to separate dividends from operating profits and dividends from capital gains. The BOP Book therefore suggests that, if the compiler is unable to make a distinction, both should be recorded under investment income. BPM5 makes no such distinction.

190. Countries currently do not distinguish between operating and non-operating profits. Considering the characteristics of their recording systems as briefly described above, it is clear that, were there to be a potential requirement for such a separation, countries would at present be unable to respond.

191. Therefore, as a practical solution to avoid asymmetries, it is recommended that dividends from both operating profits and capital gains should be recorded under investment income, following the BOP Book's advice.

Conclusions

192. Concerning dividends, the following conclusions were drawn from the analysis of the TF-PII:

- At present, most countries do not record stock dividends. Nevertheless, the TF-PII empirically checked that stock dividends were not substantial in any country; therefore, potential asymmetries due to non-recording cannot be deemed sizeable.
- Currently, most countries record dividends net of taxes. The TF-PII recommends that an imputation should be made reflecting the amount of the corresponding tax (both the income on shares and the current transfers items should be corrected).
- The TF-PII recommends that, for practical reasons, dividends should be recorded in the period when they are paid rather than when they are declared payable.
- As a practical solution to avoid asymmetries, it is recommended that dividends from both operating profits and from capital gains should be recorded under investment income, following the BOP Book's advice.

V. Approaches to the compilation of Income

Introduction

193. The first part of this chapter presents a general overview on how national compilers can produce the required b.o.p. aggregates on portfolio investment income. This is then followed by more detailed assessments of the methods of income compilation in the context of each of the three major channels of addressing the reporting population for portfolio investment statistics. The chapter concludes with an overall assessment of the various approaches.

194. It is not our intention to revisit the pros and cons of approaching the reporting population through any of the three channels set out below. Instead, readers are referred to the TF-PICS report (Chapter 5) for more detail on this matter. Additionally, in order to avoid repetition, where an item has been adequately examined in an earlier section, we will refer back rather than repeat the arguments again (e.g. on portfolio liabilities).

195. The first factor to be considered is how in general the b.o.p. aggregates of portfolio investment income are compiled. Essentially, three methods exist for the compilation of PI income:

- The compiler can collect the data on portfolio investment income from the reporter through surveys or through a settlement system.

- The compiler can estimate portfolio investment income by applying reference or benchmark rates of return at an aggregate level to positions data. These positions may be arrived at from an aggregate or s-b-s portfolio investment collection system (the latter was termed the "mixed approach" by the TF-PII).

- The compiler can calculate portfolio investment income by applying rates of return at the level of individual securities. This method can only be applied when the compiler follows the s-b-s compilation.

196. Additionally, the TF-PICS identified three different channels for addressing the reporting population:

(A) Indirect reporting through settlements reported by domestic banks on their own transactions and transactions executed on behalf of their clients;

(B) Direct reporting by all domestic issuers/ end-investors;

(C) Indirect reporting through the information gathered from custodians or other intermediaries (e.g. asset managers/brokers/ dealers).

197. The particular channel used by the compiler has a direct impact on the possibilities that can be explored when deciding how to compile portfolio investment income. In addition, whether the positions/ transactions data are collected on an s-b-s basis or on an aggregate basis has a clear impact on the approach to income compilation. However, it must be made clear that a compiler following an s-b-s approach to data collection may either use the estimation method or the calculation method to compile portfolio investment income.

198. This chapter therefore considers systems that consist of combinations of any of these methods of collection/calculation/estimation and alternative channels of reporting. We review the adaptability of each method to establish whether it can easily be used to compile income on an accruals basis, and also whether this income can be recorded on a debtor or a creditor basis. Moreover, it is a major concern of the Task Force that the strengths and limitations of any approach should be clearly apparent.

199. Compilation of financial account entry for accrued Financial account recording: We refer specifically to the balance sheet recording of income earned but not received/paid and how the stock/flow model of this item is recorded.

200. Comparison of income compiled on assets and liabilities: we review the consistency of the approach in the compilation of income for both assets (income credits) and liabilities (income debits).

201. The following requirements can be considered as basic prerequisites for income compilation in the euro area :

- Income should be recorded on an accruals basis (including a financial account entry for income accrued but not paid/received)
- A consistent measure of income should be used by all Member States, i.e. creditor or debtor
- Geographic detail
  – Monthly income flows, MUMs/non-MUMS
  – Quarterly/Annual income flows
- Sector of the holder according to BPM5 for income credits
- Country of the issuer (EMU/non-EMU) for income credits
- Timeliness (as currently set out in ECB Guideline ECB/2000/4):
  – Monthly flow data within 6 weeks
  – Annual or quarterly stock data within 3 months.

This chapter is structured as follows:
- Collection of income
  Channel A (indirect reporting through settlements)
  Channel B (direct reporting from resident issuers/end-investors)
  Channel C (indirect reporting through custodians)
- Estimation of income
  Channel A (indirect reporting through settlements)
  Channel B (direct reporting from resident issuers/end-investors)
  Channel C (indirect reporting through custodians)
- Calculation of income
  Channel A (indirect reporting through settlements)
  Channel B (direct reporting from resident issuers/end-investors)
  Channel C (indirect reporting through custodians)

Collection of income

202. When income is collected, the compiler receives data on income transactions from the reporter directly or indirectly from a custodian or a bank. Each of these alternatives is considered below in turn.

Channel A: indirect reporting through settlements

203. The settlement system, or International Transaction Reporting System (ITRS), which is widely used by euro area countries, represents an indirect channel for obtaining information. The relevant b.o.p. data are collected mainly from the resident MFIs, who report not only their own transactions, but also transactions executed on behalf of their customers.

204. In most cases, the information declared by MFIs in the ITRS is complemented by information declared by direct reporters. The main reason for this is that some information is missing, such as transactions settled through accounts abroad or offsetting transactions.

205. As the name indicates, in a settlement system the transactions are recorded in the b.o.p. in most cases when a payment takes place (made or received).

206. One of the advantages of this model is that the reporting population is relatively small and concentrated, and the reporters have a long history of co-operation with NCBs. This makes monthly reporting possible.

Income data derived from the settlement system

207. Income from portfolio investment is usually collected as part of the regular reporting in settlement systems.

208. The MFIs inform the compiler about the actual amounts of income received (or paid) from their own transactions and from the transactions made by their customers.

209. The resident direct reporters inform the compiler about the income they have received in their accounts abroad or the income they have paid from their accounts abroad.

210. The data recorded through the settlement system are the transaction flows.

211. Depending on the information collected, in a settlement system the institutional and geographical breakdowns could be made either by the reporter or by the compiler.

Institutional sector

212. Concerning institutional sector allocation, for inflows the institutional sector corresponding to these transactions is assigned according to the sector of the resident subscriber or buyer of the securities. For outflows, the institutional sector corresponding to these transactions is assigned according to the one the resident issuer belongs to.

Geographical allocation of assets/liabilities

213. With regard to the geographical breakdown of income on portfolio investment, the classification of income credits in a settlement system is made according to the country where the money originates from or goes to. However, if reporters are well informed by b.o.p. compilers, the classification of income credits could be made according to the country of the issuer, and the classification of income payments according to the first known counterpart. In settlement systems, it is not possible to ascertain the final beneficial owner, which represents a clear disadvantage.

Aggregate/s-b-s reporting

214. The settlement system is in principle compatible with s-b-s reporting, depending on the information requested by the reporters. However, the choice of aggregated or s-b-s data depends on each compiler.

Direct/portfolio investment income

215. In a settlement system, differences exist between the asset and liability side of the b.o.p. with regard to the classification between direct investment and portfolio investment. On the asset side, it is possible to distinguish between these two types of investment, because the reporters know the percentage of the total issued that they (or their customers) have bought. But on the liability side of the b.o.p., it is difficult to classify investments as direct or portfolio. The main reason is that it may be difficult to ascertain the final beneficial owner, and therefore it may not always be possible to establish the percentage of participation in the total amount of a security issued by a resident.

Accruals recording

216. Collecting the information on a payment basis means that once the compiler has been notified of the income paid or received, the information will be recorded in the current account. Therefore, the income is not recorded on an accrual basis, unless settlement figures are corrected using another calculation/estimation method.

217. As already mentioned, only information on flows can be collected in settlement systems. Therefore, stocks are calculated, if no other information source is available (i.e. stock surveys, balance sheets of MFIs and/or private companies, etc.), by accumulation of flows. The TF-PICS does not consider this practice as acceptable for calculating stocks, because any errors in the calculation of flows in one specific period would become permanent in any subsequent stock derived from the accumulation of flows.

Debtor/creditor basis

218. Income information collected directly from the settlement system is not on an accruals basis. Accrued income can be estimated as set out in the subsequent paragraphs (following either the debtor or the creditor approach, normally depending on the information available).

Calculation of the financial account posting

219. Income information reported through a settlement system is not on an accrual basis and, therefore, the accrued income needs to be estimated. The offsetting entry to the accruals income recorded in the current account has to be recorded in the financial account. When the interest is finally paid, income settlements may provide information on payments so as to register an appropriate decline in the relevant portfolio investment instrument.

Comparison of income compiled on assets and liabilities

220. The recording system for portfolio investment income is the same for assets and liabilities. As already explained, the income received (assets) is recorded on a payment basis in the current account, as is the income paid (liabilities). That means that there are no asymmetries created by the recording and valuation method.

Conclusion

221. The settlement system only records data on transaction flows. Therefore, through this system it is only possible to obtain data on income already paid and/or received. To compile income on an accruals basis, the b.o.p. compiler has to turn to other information sources.

Channel B: Direct reporting from resident issuers/end-investors

222. When the direct reporting channel is used to collect portfolio investment data, the reporting population consists in principle of all end-investors/issuers of portfolio investment assets/liabilities. However, in the case of some resident sectors, only a sample of the total population may be covered on practical grounds. Despite the fact that the reporting population is a sample of the total, it is still significantly larger than that of Channel A and Channel C.

Institutional sector

223. Information on the institutional sector can be readily obtained, as the sector of the holder corresponds to the sector of the reporter.

Income collection

224. The reporter is the holder/issuer of the asset/liabilities and, for reasons of compliance obligations, is normally required to compile income and expense statements (Profit & Loss). The income reported for these purposes conforms, in many cases, to the debtor/acquisition approach for income compilation in Balance of Payments. For example, in accounting standards there is the requirement that a clear distinction exists

between capital and income, and that exchange or market-related gains/losses from securities are not reported as interest income.

Accruals basis

225. It is also standard procedure for the majority of direct reporters to record income on an accruals basis, which is a fundamental concept in accounting laid down by SSAP No. 2 (Standard Statement of Accounting Practice), thus enabling recording for b.o.p. purposes.

Income on assets/liabilities – geographical allocation

226. The TF-PICS report identifies a number of different approaches to the collection of liabilities data:

– The residual approach

– The mixed approach

– The share register approach.

227. In the case of the mixed and residual approaches, there were difficulties in applying a full geographical breakdown to the stocks and flows of liabilities. It follows that the same problems will apply to the geographical allocation of income debits. In the case of the share register approach, a geographical allocation can be performed. However, difficulties regarding bearer securities and nominee accounts remain. In the case of assets (credits), a full geographical allocation of income is possible.

Debtor/creditor basis

228. In most cases, company accounts are currently prepared according to the historic cost convention. It follows therefore that the income reported by direct reporters will be on a debtor/acquisition basis. All income will be recorded on the basis of the original coupon; however, if the security is traded, the accrued income element of the transaction will be discounted on a market basis. As the creditor approach to recording income is not followed in the accountancy profession, there is little point in requesting data on this basis from the reporter. This is the situation at present, although International Accounting Standard No. 39 - Financial Instruments: Recognition and Measurement suggests new departures in this area. It is possible that, over the coming years, firms may start to record income on a creditor basis.

229. To summarise, only a debtor basis for compiling PI income is possible where income data is collected.

Financial account recording of income earned/payable but not received/paid

230. Income accrued but not received/paid is a standard balance sheet entry in statutory accounts. This will allow the financial account entry of transactions of the net difference between income earned/payable and income received/paid. This would be on a debtor/ acquisition basis.

Overall adaptability of compilation method

231. The adaptability of this approach is such that it is not possible to report on a creditor basis where income data is collected. This represents a serious limitation.

Channel C: Indirect reporting through custodians

232. Information gathered from custodians is an alternative for the b.o.p. compiler. Many countries use this channel for compiling stock positions.

Accruals basis - collection of income from custodians

233. Income can theoretically be collected from custodians on an accruals basis. However, in practice it seems quite unlikely that custodians would be in a position to easily report accruals on the behalf of their customers. General experience reveals that custodians have less difficulties in reporting income payments[26] that are forwarded to the investors than accrued income.

234. With this in mind, we will not consider further the collection of accrued income from custodians.

Summary qualitative assessment of income collection

- Collecting income via settlements is not suitable for the compilation of accrued portfolio investment income.
- Collection of income on an accruals basis is only possible in a direct reporting system (i.e. through surveys).
- In this case, there must also be an investigation to determine whether accounting and statistical methodologies and concepts coincide.
- Additionally, surveys can only compile income information on a debtor/acquisition basis. The potential for asymmetries between assets/credits and liabilities/debits should be borne in mind.

Estimation of income

235. The estimation of income requires stock statistics on portfolio investment to be available either on an s-b-s basis or an aggregate one. The compiler then estimates income by applying benchmark yields to these stocks.

Channel A: Indirect reporting through settlements

236. This approach of collecting income from the settlement system is not compatible with the estimation of accrued income in itself.

Channel B: Direct reporting from resident issuers/end-investors

237. A direct reporting system allows the compiler to estimate the income from stock data.

Income estimation/calculation

238. In the case of aggregate direct reporting systems, income can be estimated through the application of benchmark yields.

239. It is also the case that benchmark yields are sometimes applied in systems collecting portfolio investment data on an s-b-s basis, that is to say, aggregate income figures are estimated from s-b-s asset and liability stocks. There are a number of possible reasons for calculating aggregate income:

- PI Income is being compiled on a creditor basis and individual security yield information is not readily available;

26 Such data (eventually on an s-b-s basis) could still provide useful information for the recording of an offsetting entry in the financial account for the application of the accruals principle.

- The IT systems are not configured to deal with a dynamic situation in which yields continually change over time;

- Compilers consider that the difference between the aggregates compiled using benchmark yields and those using individual security yields are not sufficiently divergent to warrant the more resource-intensive individual security calculation for the purpose of Balance of Payments statistics;

- There is also the question whether the correct market yield information is available in all cases and is not confused with YTM (a market measure but not the current yield).

Accruals basis

240. The purpose of the estimation approach is to arrive at income aggregates on an accruals basis.

Institutional Sector

241. Information on the institutional sector can be readily obtained because the sector of the holder/issuer corresponds to the sector of the reporter.

Income on assets/liabilities – geographical allocation

242. The TF-PICS report lists a number of different approaches to the compilation of liabilities data; these have already been elaborated (see paragraphs 226-227).

Debtor/creditor basis

243. The estimation of income on a creditor basis involves the application of market rates to positions at market value. It is possible to make these calculations in a direct reporting system. The main prerequisite is whether sufficient detail exists to allow accurate estimation. In an aggregate collection system, for example, a country/currency analysis along with a maturity analysis is required to reasonably estimate income on bonds, equity and money market Instruments. The country detail is a minimum required for equity and similarly the currency is a minimum requirement for bonds and MMIs in order to obtain suitable yield information. Additionally, an adequate maturity breakdown is also necessary in the case of bonds to apply the appropriate benchmark yield. If the data is compiled on an s-b-s basis, this additional information is more easily obtained. [For a more detailed analysis, see Chapter VI of this report].

244. Where an aggregate system is used to estimate income, a creditor basis is presently the most suitable measurement, as the required benchmark yield information – as well as the nominal stocks for historic data needed to correctly estimate the income on a debtor basis – is difficult to obtain. This is also true if portfolio investment data are collected on an s-b-s basis and benchmark yields are applied to the aggregate stocks. However, when the CSDB is fully functional, it will be possible to apply the debtor approach through estimation.[27]

Financial account recording of income earned/payable but not received/paid

245. Income accrued but not received/paid is a standard balance sheet entry in statutory accounts. This will allow the financial account entry of transactions of the net difference between income earned/payable and income received/paid. This would be on a debtor/acquisition basis. Where income is estimated, it would appear to be difficult to estimate such transactions in the absence of an s-b-s collection system.

246. The collection of information on coupon payments is one of the most substantial problems for the correct application of the accruals principle in aggregate systems. In the absence of information corresponding to each

individual security, which would only be helpful if s-b-s stocks were also available, these systems can only access the necessary information to the extent that it is directly collected from reporters (e.g. through surveys) or indirectly collected from custodians[28], assuming that settlements may lose their capacity to cover the relevant flows with the gradual increase in the reporting thresholds. Such information on coupon payments should be collected at a very precise level of detail in order to record transactions in the correct financial account category. The collection of equivalent information for zero coupon bonds may constitute an additional problem, especially for settlement systems.

Overall adaptability of compilation method

247. If income is required on a creditor basis, the estimation approach may be used to compile PI income. On the other hand, if income on a debtor basis is required, these data are more difficult to estimate as the appropriate benchmark yields for historic coupons are not so readily available. Provided the CSDB is fully functional, both the creditor and the debtor approaches to the estimation of income should be possible.

Channel C: Indirect reporting through custodians

248. Many countries use this channel for compiling stock positions. This section reviews the compilation of portfolio investment income in an indirect reporting system.

Accruals basis - collection of income from custodians

249. The use of portfolio investment stock information gathered from custodians is an alternative for the b.o.p. compiler. Income can be compiled by estimating the return on stocks reported by the custodian.

Accruals basis - complementary information

250. If estimation of income on securities is based on stocks reported by custodians, it is important to keep in mind that complementary information is needed, since the total market is not covered. The information can be collected from two types of direct reporters.

- On the asset side, resident investors can report their foreign securities that are kept in custody directly with non-resident custodians.

- On the liability side, the issuer of domestic securities issued on international markets (in foreign currency) can report the holdings of non-resident custodians.[29]

- Furthermore, if the residual approach for liabilities is applied, domestic holdings of domestic securities should also be reported (when not directly included in the information reported by custodians, e.g. if in custody abroad).

251. This section only examines the elements that are connected with indirect reporting by custodians; the direct reporting aspects can be considered in the same framework as Channel B - Direct reporting.

Accruals recording - estimation of income

252. To ensure reasonable accuracy in the calculated income, b.o.p. compilers need to know the composition of the stocks. For this purpose, additional information is needed when the estimates are performed on an aggregated basis.

27 For a more detailed analysis of the applicability of the debtor approach in estimating income figures under an aggregated system, please see Fout! Verwijzingsbron niet gevonden..

28 As is currently the case in Portugal.

29 On the liability side, some further supplementary information might be needed from resident investors to achieve correct stock values – for example, on holdings of domestic securities issued abroad, and domestic securities issued on the domestic market and held in custody abroad.

Assets/liabilities geographical allocation of income

253. There are different conditions for calculating income on assets compared with calculating income on liabilities. The difference lies in different possibilities of accessing additional information about the debts. It is obviously easier to obtain further details about credit risks, market yields etc. when it comes to debt issued by residents.

254. Country (on the asset side) and institutional sector of the issuer (on the liability side) are essential readily available breakdowns. Most custodians are able to report these items on a monthly basis. Annual information on country breakdown is also available from the CPIS. It is not possible to accurately allocate income on liabilities to the country of the holder of the security.

255. The currency of issue is also rather important, because the currency affects the level of interest concerning the securities to a large degree. The custodians could probably report this without any problems.

256. Another important factor might be the maturity of the security. The slope of the yield curve implies that different maturities have different yields. Some information on the maturity distribution or at least assumptions regarding the average maturity has to be available. This can also be obtained from the custodians, at least with a breakdown into short and long term. However, the prevailing method of defining maturity in terms of original maturity has to be observed and adjusted for.

257. The credit risk of the security is another interesting topic. The credit rating of the issuer also determines the yield, which has to be taken into account somehow. One alternative would be based on detailed breakdowns made by the respondents. This information might however be quite difficult to obtain, since in an aggregated reporting system there is no information about each specific security. A more practical solution would be to make assumptions of margins based on market information and available information regarding the stocks (e.g. country distribution of the assets), as a certain correlation between credit risk and country of issuer is expected. On the liability side, sector distribution could be useful in order to take credit risk into account. Again, details are more difficult to obtain on the assets than on the liability side.

258. Yields have to be obtained for the same set of breakdowns (if not, stocks could be in a more aggregated form).

259. In the case where estimation of income is performed through the application of benchmark yields to aggregates compiled on an s-b-s basis, this additional information is more likely to be available. [For a more detailed analysis of aggregate calculations, see the next chapter].

Debtor/creditor basis

260. With an aggregated system it is very difficult to use the debtor approach, as "nominal" interest rates are difficult (or even impossible) to find in commercial databases, while nominal portfolio investment stocks are difficult to directly obtain. In summary, at present the creditor approach is best suited because market yields are often found in commercial databases. Market value is also the basis for the valuation of stocks. However, when the CSDB is fully functional, it should be possible to apply the debtor approach through estimation.

Summary qualitative assessment of income estimation

- Estimation of income from stock positions in portfolio investment is possible for two of the three channels of addressing the reporting population. It has no application in the case of settlement systems where no stock information is collected.
- However, it is clear that some supplementary data (such as currency) is required to perform these estimations with the necessary degree of accuracy.
- It also seems clear that, while income on a creditor basis can be readily estimated, there are difficulties associated with compilation on a debtor basis, which centre on the availability of historic benchmark yields and nominal stocks.
- Where s-b-s data is used to compile the stock aggregates, it is clear that the required additional breakdowns are available and a higher degree of accuracy is possible (the "mixed approach").

Calculation of income

261. By the term calculation we mean where the compiler operates an s-b-s data collection system for portfolio investment, and where individual yields are applied at a security level to calculate portfolio investment income. If the compiler has the full population of relevant securities in the collection system as well as individual yield data for all securities, it follows that this exercise can be more correctly termed calculation rather than estimation.

Channel A: Indirect reporting through settlements

262. This approach of collecting income from settlement systems is not compatible with the calculation of accrued income in itself.

Accruals recording

263. As already mentioned, only information on flows can be collected in settlement systems. Therefore, in the absence of any additional information source (such as a stock survey, balance sheets of MFIs or private companies, etc.), stocks are calculated by accumulation of flows. The TF-PICS does not consider this practice as acceptable for calculating stocks, because any errors in the calculation of flows in one specific period would become permanent in any subsequent stock derived from the accumulation of flows.

Channel B: Direct reporting from resident issuers/end-investors

264. A direct reporting channel can be used to collect portfolio investment data on an s-b-s basis. It is unlikely, however, that the approach of collecting all portfolio investment data on an s-b-s basis will be followed. It seems more likely that, in the case of households and non-financial corporations, an aggregate approach would be followed. In this section, we consider a scenario whereby all the relevant stock data are collected on an s-b-s basis.

Institutional sector

265. The information on the institutional sector can be readily obtained because the sector of the holder corresponds to that of the reporter.

Income calculation

266. Detailed security yield information would have to be available to allow the calculation of income at the level of individual securities.

Accruals basis

267. The calculation of income allows a more precise result for portfolio investment income when compared with the estimation approach. The individual security information includes nominal and market yields for debt securities, payment dates for bonds, and maturity dates for MMIs. These additional data should allow a more accurate compilation of portfolio investment income.

Income on assets/liabilities – geographical allocation

268. This issue has already been outlined in sufficient detail in paragraphs 226-227; some additional observations that relate to this section are set out below.

269. One issue needs to be considered in the context of income calculation: when an s-b-s system is being used, the identification of geographical data on the euro area issuer of intra assets held by a compiling country can be used to both identify the country of liability and also to form a reasonable estimate on the country allocation of income on these liabilities. This approach requires all Member States to have, either by s-b-s or aggregate means, information on the country of issuer of their non-resident assets, as this exercise would have to be performed centrally at the ECB or Eurostat. In this way, more accurate data on income on portfolio investment liabilities can be calculated.

Debtor/creditor basis

270. Where compilers utilise an s-b-s approach to collect portfolio investment stocks/transactions data, income on a creditor basis can be accurately estimated provided yield information is available through the CSDB. Additionally, income on a debtor basis can be accurately estimated on an s-b-s basis once all the historic data on the securities is available. Currently only nominal interest rates are widely used in s-b-s systems owing to the compiler costs of frequent updates required for market yields.

Financial Account recording of income earned/payable but not received/paid

271. Income accrued but not received/paid can be estimated provided some information on payments is available. The element of accrued income calculated can then be netted against the payments to give a result for the financial account entry under the appropriate instrument heading in portfolio investment. In the case where the estimation is on a creditor basis and the payments are on a debtor basis, the difference between the two measurements will be included under valuation changes (owing to the different time of recording between transactions and positions). In this context, we should consider the payments as withdrawals from the principal value of the instrument, which then offset the accrual when the coupon payment is made.

Overall adaptability of compilation method

272. Assuming a fully functional CSDB able to supply both market and nominal yields, this approach is the most flexible, as it can be used to derive income on both a creditor and a debtor basis.

Channel C: Indirect reporting through custodians

273. Information on an s-b-s basis can also be gathered from custodians. This section tries to sort out how applicable it is to the compilation of PI income. In general, the details of this

approach are similar to those of the direct reporting channel.

Accruals basis - Complementary information

274. The need to collect complementary information has already been covered in paragraph 252.

Accruals recording - estimation of income

275. Accurate aggregates for portfolio investment income can be obtained on an s-b-s basis. The calculation allows a more precise result for investment income when compared with the estimation approach. The individual security information includes nominal and market yields for debt securities, payment dates for bonds, and maturity dates for MMIs. These additional data should allow a more accurate compilation of portfolio investment income.

Assets/liabilities geographical allocation of income

276. See paragraphs 226-227.

Debtor/creditor Basis

277. Where compilers utilise an s-b-s approach to collect portfolio investment stocks/transactions data, income on a creditor basis can be accurately calculated provided yield information is available through the CSDB. Additionally, income on a debtor basis can also be accurately estimated on an s-b-s basis once all the historical information data on the securities are available, such as price at the time of issuance, coupon rate etc. At present the debtor approach is more appropriate because the application of market yields to s-b-s stocks is very resource-intensive.

Summary qualitative assessment of income calculation

- Not all respondents in specific countries may be in a position to supply s-b-s portfolio investment information.
- Nevertheless, calculation of income offers the greatest flexibility, as the detailed security data collected from compilers allows income to be compiled at a high level of accuracy.
- However, when income is compiled on a creditor basis, an operational CSDB is an absolute prerequisite, providing the necessary market information on yields etc. that allows income to be calculated.
- The calculation method is possible in the case of Channel B (Direct reporting) and Channel C (Indirect reporting). It has no application in the case of settlement systems where stock data are not collected.
- It is also clear that all the necessary data regarding issuer of the security, sector, currency maturity are available, allowing additional detailed analysis.
- Compiler costs are deemed higher than in the case of aggregate estimations.

Conclusions

Current Situation

278. Following a recent questionnaire on Recording of income on an accruals basis completed by all European Union members through the WG-BP&ER, it is clear that there are a number of issues that need to be addressed in order that the euro area and the EU can produce income on an accruals basis without the presence of significant asymmetries.

279. The already-mentioned assessments show that, as Member States can choose to compile income in any of the variety of approaches outlined above, the natural consequence is that a consistent measure of accrued income on either a creditor or a debtor basis will be difficult to achieve.

280. A particular approach therefore needs to be found that accommodates as many of the various approaches while at the same time delivering a consistent measure.

281. Based on the various conclusions, we can observe the following:

- Settlement systems cannot be directly used to estimate accrued income.
- Direct reporting systems (i.e. surveys) can only collect income from reporters on a debtor (acquisition) basis.
- Estimating/calculating income on a debtor basis requires an s-b-s system with individual yield calculations, or possibly the application of benchmark yields to aggregate estimated nominal stocks.

VI. Estimation of income on an aggregate basis

Introduction

282. The previous chapter highlights three broad approaches to the compilation of income: (i) collected by the compiler; (ii) calculated by the compiler; and (iii) estimated by the compiler. This chapter explores a derivative of the latter approach, using aggregate stock and yield information to estimate accrued income in the following simple formula:

Accrued income = stock * yield

283. The aggregate approach to income estimation can range from the minimum breakdown of stocks and yields required to meet the ECB breakdown of investment income, to more sophisticated models using stock and yield information broken down into the factors that determine the income earned on a particular security (currency, risk, maturity etc.). Taken to the extreme, this becomes an s-b-s approach.

284. The main advantage of such an approach is that it is less costly in terms of both compiler and respondent resources, compared with s-b-s compilation. Results derived from an aggregate approach can also be used to help validate the results obtained by another compilation method, e.g. data directly reported in a survey or results derived from an s-b-s methodology. Similarly, rates of return derived from a survey or s-b-s system can also be checked against the yield data supplied as part of the aggregate approach.

285. Theoretically, the more detailed the stocks and benchmark yields data in the stocks * benchmark yield calculations, the better the estimate of income will be. However, the availability of timely information on stocks and yields and of compiler resources may determine at what level of detail such calculations are made. Once the ESCB Centralised Securities Database is fully operational, it is assumed that timely yield information weighted by total amounts outstanding for aggregate (and s-b-s) stock breakdowns will be readily available to all EU b.o.p. compilers.

286. This chapter explores the alternative aggregate models that can be adopted for debt securities, assessing their validity and offering some conclusions as to the most appropriate breakdowns of stocks and yields that are needed to produce income estimates of sufficient quality.

The aggregate approach: alternative methodologies for calculating income

287. As the previous chapter has exhaustively described, it is possible to identify three different systems for compiling portfolio investment income (including two variants of the first type of system):

1.a Income directly reported by means of a settlement system

1.b Income directly reported by means of a survey-based system

2. Income estimated through an aggregate system (where estimations are made using benchmark yields)

3. Income calculated through an s-b-s system.

288. It should be noted that some countries use a mixed system that integrates some characteristics of one or more systems. From the information supplied by MSs, it is possible to summarise the data models used by different countries (Table 5).

Table 5
PII data models

Models	Countries
Settlements	DE, DK, ES, FR, GR and NL (SE partly)
Survey-based	FI, IE and SE (partly)
Mix of survey and aggregate	UK
Aggregate	BE, LU and PT
S-b-s	IT, AT (also ES, DK and SE for some instruments)

289. Only three countries use pure aggregate systems, although some countries do also use aggregate methods to complement data derived from other models.

290. Aggregate systems can be used in a variety of ways. For countries using settlement systems, an aggregate system represents a practical way of deriving income on an accruals basis, perhaps as a stepping stone toward an s-b-s system. Similarly, aggregate systems can be used to compile accrued income in support of s-b-s reporting, either when a complete securities database[1] is not available, or when income is not reported. Survey systems may also be complemented with an aggregate system, with the latter providing additional results in order to validate the directly reported data (or the other way round, i.e. the data collected through surveys could help check income data estimated through an aggregate system)[2]. For countries where income is collected from quarterly surveys, the aggregate approach can be used to obtain monthly accruals.

Creditor versus debtor approach

291. Currently, commercial data providers are the main source of benchmark yields information. In general, such data providers hold current yield data rather than nominal yields because they measure the rate of return of an investment in a bond (or basket of bonds), given the current market interest rate conditions. The results obtained under an aggregate system will at present therefore be consistent with the creditor approach. Of course, when the CSDB is operational, it will be possible to calculate benchmark indices based on nominal or market interest rates for a given set of breakdowns. This would enable income to be derived following either a creditor or debtor approach. Until then, however, aggregate systems are generally designed to produce results under the creditor approach.

292. Nevertheless, even with a fully operational CSDB, the application of the debtor approach under an aggregate system requires an additional step, namely the conversion of market stocks into nominal stocks[3]. This could prove an additional source of errors (which would then amplify the deviation created by using an aggregate instead of an s-b-s approach), and would decrease the level of precision achieved. The magnitude of this error is further analysed in the specific case of one country in Annex 3.

Estimation of stocks at the end of the current quarter/month (accumulation of b.o.p. flows)

293. In order to derive accrued income estimates consistent with BPM5 definitions, it is important to have the stock data at the beginning and the end of the reporting period. If only annual (or quarterly) stock data are available for a given set of breakdowns (stocks by instrument and country, for example), it will be necessary to calculate the end-quarter (or month) position by accumulating flows (which are usually produced more frequently and in more detail). This avoids using out-of-date stock data to derive accrued income estimates. To ensure stocks are valued at

1 *For example, yields are not collected frequently, as this could prove a very time-consuming procedure.*
2 *The same argument is valid for s-b-s systems where income is directly reported instead of being calculated by the compiler.*
3 *The most common output that compilers will find for portfolio investment stocks is probably based on a market valuation (which is the international standard); if so, a conversion into nominal valued stocks is needed. If countries are already compiling nominal valued stocks for debt securities, then they could directly apply nominal benchmark yields to nominal stocks.*

market prices, it is important that flows, price changes and exchange rate changes are all included.

294. If average stock information is not available, the initial or final stock could be used instead as an approximation. The justification for this shortcut is the following:

(Si + Sf) / 2 = (Si + Si + T) / 2 = 2 * Si / 2 + T / 2 = Si + T / 2 or

(Si + Sf) / 2 = (Sf - T + Sf) / 2 = 2 * Sf / 2 - T / 2 = Sf - T / 2

where Si = Initial stock, Sf = Final stock, T = Transactions and other changes and Sf = Si + T

295. Note that T / 2 would be statistically insignificant if transactions and other changes are relatively small when compared with overall positions (which is often the case, especially when the time period considered is short, i.e. a month or a quarter).

Calculation of accruals: dirty prices versus clean prices

296. Assuming that the creditor approach is the only option for the estimation of portfolio investment income on an aggregate basis, in principle the most accurate estimation would require stocks valued at clean prices (i.e. excluding accrued coupon) and marked-to-market yields, according to the following formula:

Ia = Vmc * Ip

Ia = income accrued; Vmc = stock data valued by using the clean price; Ip = market interest rate of the security (current yield).

297. Published portfolio investment positions generally include accrued income (dirty positions). Alternatively, if the b.o.p. compiler accumulates flows to derive current end-month/quarter positions, and as portfolio investment flows also include accrued income (at least, the quarterly version of b.o.p. flows reported to the ECB should include it), then dirty positions will also result. The aggregate approach will therefore usually derive income from dirty stocks.

298. By using dirty positions for all types of bonds, we will overestimate accrued income by an amount approximately equal to n * Ia * Ip (n being the number of periods elapsed since the latest coupon payment).

299. So, if the compiler uses an aggregate approach, it is important to acknowledge the potential difficulties stemming from the application of a general methodology, i.e. multiplying (dirty) stocks by yields to all types of bonds.

Index-linked bonds

300. Index-linked bonds also require consideration when applying the aggregate (stocks * yields) calculation. The BOP Manual (paragraph 397) states "the change in value resulting from indexation - periodically and at maturity - is treated as interest income. The change in value related to indexation should be estimated and recorded as interest income over the life of the security, and the offset should be recorded under debt securities in the financial account". A similar treatment is proposed in the SNA 93 (paragraphs 11.78 and 7.104), in the ESA 95 (paragraphs 4.46-c), and in the Financial Terminology Database.

301. Income from index-linked bonds usually depends on variables other than interest rates (such as stock exchange indices). Estimating accrued income of index-linked bonds with benchmark yields of normal bonds could therefore lead to a very imprecise estimate (for example, in years where stock exchange indices have large valuation changes, either positive or negative). However, as for most countries there is not such an instrument breakdown of stocks (normal bonds and index-linked bonds, at least), this problem is not easy to solve.

Short selling

302. One specific difficulty arises from income derived by the stock * yield calculations in the case of short-selling holdings. Short selling has become particularly prevalent in recent periods, leading to negative positions being recorded in balance sheets. Similarly, negative positions can arise when stocks are derived from flows, and when the accumulation of flows does not take into account price movements. Using the stock * yield calculations will result in negative income being recorded, especially when the calculations are performed at detailed levels of breakdown.

303. It is unclear whether the recording of negative income in these cases is economically valid. However, this seems to be the only way to avoid double counting at an overall level, since both the original owner and the subsequent acquirer will claim the income corresponding to such a single security at the same time. The attribution of negative income to the short seller (who normally gets the security through a repo/securities-lending transaction and subsequently sells it outright) seems to be the only means to balance the overall picture.

Alternative breakdowns of stocks and yields under an aggregate approach

Ideal breakdown of stocks and yields

304. Three key variables determine the yield of a given bond:

- Currency of issue (currency risk): This is an important variable, since the currency determines to a large degree the level of interest paid on securities.

- Residual maturity (interest rate risk): The slope of the yield curve implies that different maturities render different yields. Debt securities are classified according to original (rather than residual) maturity in b.o.p. statistics.

- Credit risk: The credit rating of the issuer also affects the yield. This could be taken into account by using, for example, the country and institutional sector distribution of stocks (the main practical difficulties are from the assets side, where these breakdowns may not be available, especially the non-resident issuer institutional sector).

305. Consequently, the ideal set of breakdowns for stocks and benchmark yields could be broadly defined as follows: currency of issue, residual maturity, country of the issuer and the institutional sector of the issuer.

306. In order to measure how each of the key variables affects yields, information from Reuters' database was used. The following indices are available:

- Global Government Bonds Indices, available on a country-by-country basis[4] (weighted average of yields of government bonds of a given country denominated in the national currency)

- Euro Corporate Bonds Index (weighted average of EUR-denominated bonds issued by corporate entities but not banking institutions, which are mainly resident in developed countries)

- Euro Emerging Markets Index (weighted average of EUR-denominated bonds from emerging markets countries, IIF definition[5])

- Jumbo Pfandbrief Bond Index (weighted average of EUR-denominated Jumbo Pfandbrief bonds from issuers located in the euro area)

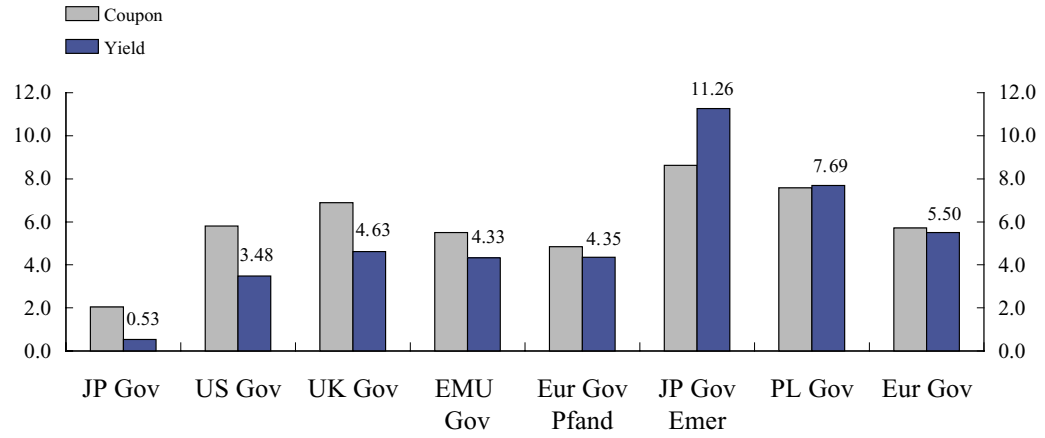
4 The GOVTOP indices started in May 1998 for EMU countries (Greece only joined EMU on 1 January 2000). Independent GOVTOP country indices also exist for the following major bond markets: US, CA, JP, AU, CH, DK, GB, SE (since 1 January 2000), NO and NZ (since 1 January 2001). PL was added 1 October 2000.

5 This includes countries such as Bulgaria, Croatia, Poland, Slovakia, Romania, Russia, Turkey, South Africa, Mexico, Colombia, Venezuela, Columbia, Uruguay, Brazil, etc.

Figure 10

Average coupons and yields of government and corporate bonds issued by different countries (or economic zones)

(Percentages)



Source: Real-time values from Reuters database on 23 Aug 2002 (14h30m).

307. From Figure 10, it is possible to conclude that the currency of issue and the country of the issuer are determinant factors affecting yields of bonds. For example, yields of government bonds denominated in national currencies vary considerably: Japan (0.53%), the US (3.48%), EMU (4.33%) and UK (4.63%). Clearly this reflects the different interest rates between economies. For bonds issued by developing and emerging economies, however, the country factor has probably the most significant impact on yields: for example, the difference in yields between EUR-denominated government bonds issued by EMU countries (4.33%) and ones issued in emerging market countries (11.26%) is close to 7%.

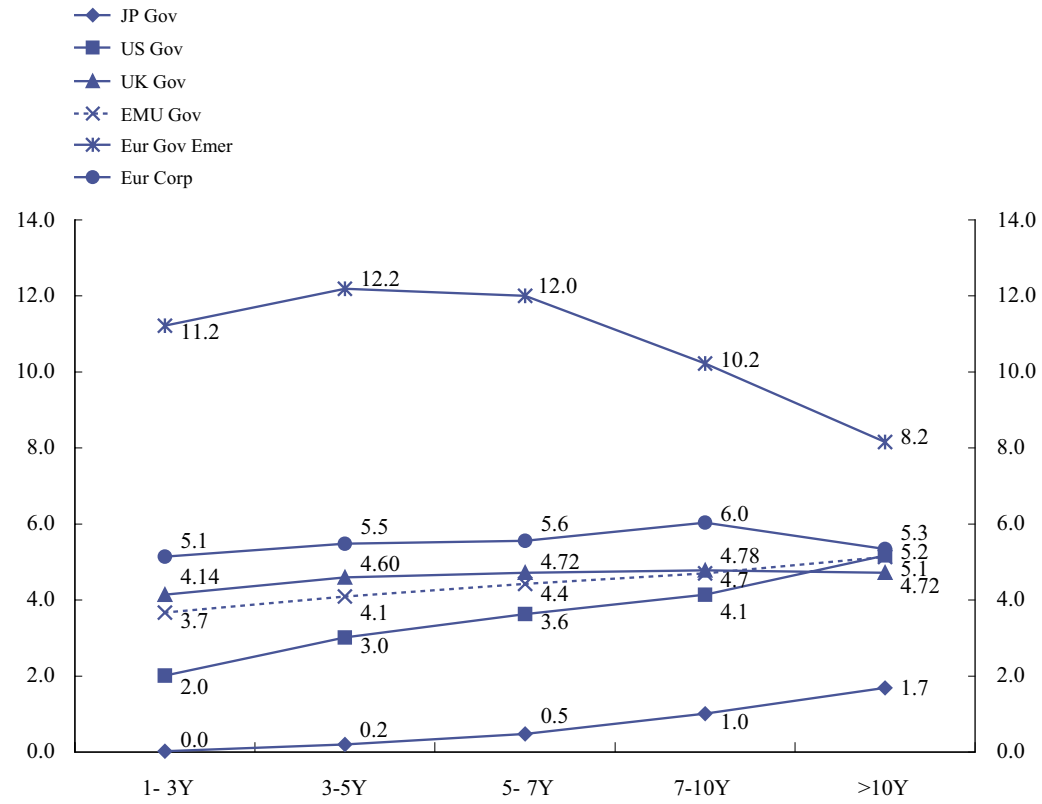
308. In the same figure, it is also possible to analyse the differences in yields between government bonds (4.33%) and corporate bonds (5.50%), both denominated in EUR. However, this is not a very comparable analysis, because the Euro Corporate Bonds Index also includes EUR-denominated bonds issued by US, UK and JP (in addition to issues by EMU countries).

309. It is also worth noting that, at the point of analysis, developed countries' coupon rates are higher than yields, meaning that accruals calculated under the debtor approach are higher than under the creditor approach. The symmetric conclusion is valid for emerging countries, at least for EUR-denominated bonds.

Figure 11

Average yields by residual maturity of government and corporate bonds issued by different countries (or economic zones)

(Percentages)



310. Figure 11 traces the yield curves of bonds across different residual maturity classes and for different countries. The JP, US and EMU yield curves increase with time (the difference between >10Y and 1-3Y average residual maturity is about 1.5% for JP and EMU, and about 3% for US). The UK yield curve is relatively steady across time. EUR-denominated bonds issued in emerging markets have a yield curve which slightly increases until bonds with 5-year residual maturity, and then decreases sharply until bonds with more than 10-year residual maturity.

Minimum breakdowns for stocks and yields

311. Owing to restrictions in the information available for stocks and yields and resource constraints, it is not possible for most, let alone all, countries to implement an aggregated system based on an "ideal" set of breakdowns, especially for assets.

312. It should also be noted that the "minimum" set of breakdowns will be determined by the minimum breakdowns available for either stocks or yields. However, when the CSDB is operational, it is assumed that the restrictions owing to lack of benchmark yields for the breakdowns required will no longer exist, i.e. all required breakdowns for yields will be able to be generated from the CSDB. So, at this stage,

the focus will be on the breakdowns required for stocks (in the next topic, the breakdowns available for yields collected from commercial data providers will also be analysed).

313. If we consider that the ECB "Step 2" requirements for b.o.p./i.i.p. are the minimum breakdowns for stocks, then it will be difficult to obtain satisfactory estimates of accrued income for the assets side. Basically, "Step 2" requires a breakdown of annual (rather than monthly or quarterly) stocks and monthly flows by instrument (equity securities, bonds and notes and money market instruments), resident institutional sector (monetary authorities, MFIs excluding central banks and non-MFIs; general government is only available quarterly) and intra-extra EMU. "Step 3" will require a geographical allocation (for extra-euro area) of the quarterly b.o.p. (until end-June 2004 with reference to 2004Q1) and of the annual i.i.p. (until end-September 2004 with reference to end-2003).

314. For liabilities, the information available for each country allows a more satisfactory estimation of accrued income, as there are less factors that affect yields (only one country of issue – i.e. calculating income accrued on domestic stocks held by all non-residents), while more data are available (the institutional sector of the issuer).

315. Therefore, for income debits it is possible to be near to the "ideal" set of breakdowns for stocks. However, the situation is more complex for assets because of the need to produce a geographical breakdown.[6]

316. As detailed country breakdowns are not required for "Step 2", aggregate estimations will be less precise. With the additional data required for "Step 3", it will become possible to estimate accrued income based on the geographical allocation available for extra-EMU area.

Alternative breakdowns of stocks and yields

317. Due to restrictions on the available breakdown of assets, the following solutions to estimate accrued income under an aggregate system (for both assets and liabilities)[7] were envisaged:

1. Breakdowns (of stocks and yields) by residual maturity, currency of issue and country and institutional sector of the issuer;

2. Breakdowns (of stocks and yields) by original maturity (as a minimum, a simple distinction between Bonds & Notes and MMI)[8], currency of issue and country of the issuer;

3. Breakdowns (of stocks and yields) by original maturity (as a minimum, a simple distinction between Bonds & Notes and MMI) and currency of issue;

4. Breakdowns (of stocks and yields) by original maturity (as a minimum, a simple distinction between Bonds & Notes and MMI) and country of the issuer.[9]

318. Clearly, harmonisation of compilation procedures will reduce asymmetries and guarantee more consistent and better quality

6 Eventually, an s-b-s system could provide breakdowns for stocks by currency of issue, country of the issuer, institutional sector of the issuer and residual maturity of the debt security, because these characteristics of securities are usually recorded in a securities database.

7 These solutions are listed in order of preference.

8 As already mentioned, benchmark yields are usually distributed by residual maturities, which creates problems if they are applied to stocks with a breakdown by original maturity. However, if just two simple classes (less than 1 year and more than or equal to 1 year) are used, the problems are minimised (on average, the difference in yields of bonds with one year of original maturity would not be significantly different from yields of bonds with one year of residual maturity).

9 This case could be quite problematic if, in a given country, issues are launched in many different currencies and if benchmark yields do not consider this issue (that is, benchmark yields for a given country can only be calculated for bonds issued in the domestic currency of that country). For example, suppose that in a given country, 33% of the issues are in USD, 33% in EUR and 33% in NC (national currency). If we were to use the yield associated with NC, imprecise estimates of accruals could be made.

EMU statistics. However, any asymmetries potentially introduced by MSs adopting different aggregate solutions should be minimised by using the CSDB as the sole source of information for yield information. In addition, it is likely that MSs would adopt a matrix approach to PI income compilation. That is, different approaches will be more appropriate for some sectors rather than others. For example, government bonds may have more detailed stock information available than corporate bonds, leading to the implementation of an approach that is higher up the cascade. It would also be preferable to harmonise aggregate methods for deriving income for both assets and liabilities; however, the chosen approach will again depend on the availability of stock data.

319. Considering the aim of harmonising statistical practices amongst countries, the following could be recommended as a minimum approach: a breakdown of assets and liabilities by original maturity and issue currency, i.e. solution (3). Option 4 is deemed unacceptable, as there could be significant issues in non-domestic currencies.

320. Countries following an aggregate approach for the calculation of portfolio investment income and that have additional information available are encouraged to introduce one of the other two upper solutions, as asymmetries across countries should be substantially reduced by reaching at least the minimum level highlighted above.

321. In order to be more precise in the aggregate estimations, it is advisable that benchmark yields by currency and/or original maturity are weighted by amounts outstanding of individual debt securities. Independently of the source which is used to obtain these benchmark yields (Reuters, Bloomberg, CSDB, etc), it would be useful if these yields were centralised in the CSDB so that each country was able to utilise them. This is an important point, as whichever option is chosen, a high level of harmonisation is achieved if all MS use yields derived from the CSDB.

Benchmark yields collected from data providers

Reuters

322. A diversified set of benchmark yields is available in the Reuters database, including indices weighted by amounts outstanding for government and corporate bonds. Government bond indices are available on a country-by-country basis by residual maturity, mostly for developed countries.

323. Benchmark yields for government bonds by country and residual maturities reflect the yield and price of just one bond that is chosen as the benchmark for a given country and class of residual maturity, because of its liquidity and amount outstanding. This type of benchmark index has the advantage of being available for a greater set of countries and maturities, but is clearly problematic in that it is constructed from just one single bond instead of being based on a weighted average of yields by amounts outstanding. The table below illustrates the differences in yields for both types of benchmark yields:

Table 6

Information available in Reuters

Date: 27 August 2002

Euro Benchmarks						Euro Zero Coupon Government Bonds Yield Curve	
0#EUBMK=						0#EUGOVTOPYZBMK=	
Residual	Maturity	Years Mat.	Coupon	Yield	Price	Residual	Yield
1M	26-Sep-02	0.08	0	3.269	99.73		
3M	21-Nov-02	0.24	0	3.285	99.23		
6M	23-Jan-03	0.41	0	3.32	98.65		
1Y	21-Aug-03	1.00	0	3.41	96.72	1Y	3.46
2Y	25-Jun-04	1.86	4	3.607	100.67	2Y	3.65
3Y	18-Feb-05	2.52	4.25	3.656	101.36	3Y	3.91
4Y	17-Feb-06	3.53	5	3.945	103.335	4Y	4.13
5Y	12-Jul-07	4.94	4.75	4.198	102.37	5Y	4.31
6Y	25-Apr-08	5.74	5.25	4.324	104.53	6Y	4.46
7Y	25-Apr-09	6.76	4	4.48	97.27	7Y	4.62
8Y	25-Apr-10	7.77	5.5	4.598	105.68	8Y	4.75
9Y	4-Jul-11	8.98	5	4.632	102.61	9Y	4.86
10Y	4-Jul-12	10.00	5	4.664	102.59	10Y	4.94
15Y	25-Oct-16	14.37	5	4.963	100.353	15Y	5.27
20Y	25-Oct-19	17.41	8.5	5.027	139.27	20Y	5.4
30Y	4-Jan-31	28.77	5.5	5.085	106.13	30Y	5.34

324. The main limitation with the Reuters benchmarks is that they only reflect yields of bonds issued in the domestic currency of a given country. For countries with a significant amount of issues in other currencies than the local one, the Reuters index is not very suitable. The problem of using residual rather than original maturities is less important, however, as only a breakdown of stocks into original maturities of less than one year and more than or equal to one year is required.

325. If a breakdown of stocks by original maturity and currency of issue is available, then the Reuters benchmark yield (of government bonds) could be used for the specific country where the particular currency is sovereign. For example, for the stock of bonds and notes denominated in USD, the overall Reuters benchmark yield (weighted average across different maturities) of US government bonds could be used. Similarly, for the stock of money market instruments denominated in USD, the Reuters benchmark yield of US with the lowest residual maturity class could be used (although, as the lowest class could be two years of residual maturity, it may be more appropriate to use USD deposit rates).

Bloomberg

326. Bloomberg holds generic yields for government bonds of 39 countries. For most, if not all countries, it should be possible to obtain the yield of the 5-year benchmark government bond - perhaps the most appropriate common denominator for all countries thanks to its availability. Corresponding price information is also available, so it is possible to calculate the monthly average price. In some cases, an average yield of all government bonds weighted with their outstanding volume is also calculated.

327. For corporate bonds, Bloomberg holds benchmark yields of AAA bonds per country. The average yield in the corporate bonds aggregate should be higher, so it may be possible to compare the AAA benchmark with bonds rated AA, BAA etc. and calculate an average. A common limitation in using

commercial sources is that yields are generally available on a residual maturity basis, rather than the original maturity breakdown used to classify into Bonds & Notes and MMI in b.o.p./i.i.p.

BIS database

328. Data held in the BIS database vary from country to country, and descriptions of individual time series are not exhaustive. It would be preferable to use the same yields (i.e. based on bonds or a basket of bonds with the same criteria) for all countries, but it is difficult to find a common denominator with regard to BIS data. Time series would have to be defined for each country, and then all compilers would have to use the same time series.

329. One advantage of the BIS data could be that most statistical departments have access to this database, whereas potentially only a few have access to Reuters or Bloomberg.

Benchmark yields calculated from the CSDB

330. It is foreseen that the CSDB will have the functionality to calculate benchmark yields from individual securities data. It should therefore be possible to calculate as many benchmark yield breakdowns as are required for calculating accrued income from stocks (as well as to replace missing yields of individual securities).

331. Preferably, the benchmark indices will be calculated on an s-b-s basis as weighted averages by amounts outstanding of bonds issued in a given currency and/or country and for a given original maturity. It should be noted that weighted averages will reduce the error caused by differences in yields among issues of the same country and original maturity, but issued with different residual maturities and by issuers from different institutional sectors and countries.

Conclusions

332. Three points were deemed relevant for the estimation of income on an aggregate basis:

(i) Identify a set of breakdowns for financial instrument classifications which may reasonably be established to attribute benchmark yields.

(ii) Find out, according to these categorisations, the most appropriate benchmark yields.

(iii) Establish a set of requirements which the CSDB should be able to fulfil in terms of provided information (for example, benchmark yield calculation for which set of instrument classification), in order to help NCBs satisfy the identified minimum categorisation.

333. These conclusions attempt to address these three key points.

(i) Identify a set of breakdowns for financial instrument classifications in portfolio investment stocks which may reasonably be established to attribute benchmark yields.

The breakdown of the benchmark yields in Section 3.6 of the report are represented here in the form of a cascade from ideal through to good, acceptable and unacceptable methodologies, in the manner of the final PICS report on portfolio investment collection systems (TF-PICS).

Ideal

- Breakdowns (of stocks and yields) by residual maturity, currency of issue, country of the issuer and institutional sector of the issuer.

Good

- Breakdowns (of stocks and yields) by original maturity (as a minimum, a simple distinction between Bonds & Notes and MMI), currency of issue and country of the issuer; for liabilities and intra-euro area assets, the sector of the issuer should also be considered.

Acceptable

- Breakdowns (of stocks and yields) by original maturity (as a minimum, a simple distinction between Bonds & Notes and MMI) and currency of issue; for liabilities and intra-euro area assets, the sector of the issuer should also be considered.

Not acceptable

- Breakdowns (of stocks and yields) by original maturity (as a minimum, a simple distinction between Bonds & Notes and MMI) and country of the issuer.

334. Currently, information indicated by MSs suggests that breakdowns by country of issue and currency of issue are not widely available. The feasibility of these proposals would require further analysis, although the overall picture could radically change once the CSDB becomes fully operational.

(ii) Sources for benchmark yields

335. The sub-group has investigated the use of benchmark yields from Reuters, Bloomberg and BIS. One key difficulty in using such sources is that not all yields are readily available (certainly not for the more obscure securities), and not all yields would be equally accessible or available to all compilers. This latter point could lead to asymmetries if counterpart compilers use different yields to calculate interest received or interest paid.

(iii) Establish a set of requirements which the CSDB should be able to fulfil

336. The TF-PII has assumed that the CSDB will be fully functional and populated with yields for all traded securities. It has also assumed that the CSDB will be accessible for all MS b.o.p. compilers. As such, the TF-PII recommends that the CSDB should be used as the prime source of yield information by all MSs, thereby minimising potential asymmetries.

337. In addition, the TF-PII recommends that the benchmark yields required to derive the breakdowns stated in (i) should be centralised in the CSDB. This will allow MSs which are developing both s-b-s and aggregate systems to use the same source of information, again minimising potential asymmetries as the aggregate yields will be derived from weighted yields of individual securities.

338. In addition to addressing the specific requirements of the mandate, the TF-PII has also drawn the following general conclusions:

The aggregate approach could represent a practical solution for countries that have income on a settlements basis, but are seeking to evolve toward estimating income on an accruals basis. Some countries may nevertheless prefer to change their systems directly to a more stable and long-lasting variant.

The aggregate approach is based on multiplying stocks by benchmark yields for a given set of breakdowns (e.g. currency, maturities, country of the issuer). For this approach to produce acceptable results, monthly stocks must be available within the 6-week compilation deadline. If monthly stock data are not available according to this timescale, accumulating flows to quarterly stocks (the minimum requirement in terms of frequency established by the TF-PICS for aggregate systems) could represent a potential solution.

Even in an s-b-s system, The mixed approach could function as a credible and efficient data model for estimating accruals. In principle, in an s-b-s system supported by a complete database with quality data (an ideal situation), stocks could have a very detailed set of breakdowns such as the currency of issue, residual or original maturity, and the country and institutional sector of the issuer. Benchmark yields could also be calculated across these detailed breakdowns and centralised in the CSDB (following the so-called "mixed approach"). This type of methodology is simpler to implement then making s-b-s calculations of accrued income. It will also allow a quick plausibility check on the results derived in an s-b-s system.

VII. Conclusions and recommendations

Introduction

339. In elaborating the final chapter, the TF-PII constantly had in mind the need to provide advice on the direction in which income compilation methods should move in the near future, especially in the context of ongoing changes in portfolio investment data collection. With this aim in mind, the TF-PII focused on identifying weaknesses in current national practices and on providing common solutions identified from either best practices or from ad hoc methods developed by the TF-PII.

340. Given the current situation regarding the different approaches followed by Member States for compiling portfolio investment income, it is clear that moves towards standardisation and homogeneity in the compilation process will trigger substantial improvements.

341. In this context, when elaborating solutions, the TF-PII is aware of the need to recommend "acceptable" approaches that could be considered as stepping stones towards "good" or "ideal" solutions. Realistically, some countries may find it difficult to move initially to such solutions. However, more in-depth investigations into implementation plans were deemed outside the scope of the TF-PII.

342. Throughout its analysis, the TF-PII always kept in mind that the forthcoming availability of the *Centralised Securities Database* (CSDB) should enable a significantly enlarged range of options for income compilation. **For this reason, all solutions provided in this chapter necessarily rely on or will benefit from the future centralised availability of necessary information through the CSDB.**

344. These specific solutions are analysed item-by-item within the next section. Subsequently, an overview of the analyses carried out by the TF-PII leads to specific recommendations concerning data collection models, the identification of good and best practices as well as – in particular – the establishment of unacceptable practices for income compilation. The chapter ends with some additional recommendations which summarise the most important conclusions of the TF-PII. Finally, some pending issues are cited with a view to assisting the WG-BP&ER and the STC in their work subsequent to the delivery of this report.

Conclusions and recommendations for individual items

Application of the accruals principle

345. In revisiting current practices for income compilation, it was evident that one of the most significant problems at present is the inability of some countries to follow the accruals principle. Only six EU countries currently compile interest income on a full accruals basis, while three countries apply it only to a limited range of financial instruments. Two more countries record accrued interest without any offsetting entry in the financial account. The remaining four countries do not currently compile interest income on an accruals basis. However, it is worth noting that some Member States have firm plans to solve this problem.

346. In the specific case of the euro area, the inconsistent application of this principle causes significant distortions in the compilation of the euro area aggregates. More specifically, the influence of this factor in the volume of monthly errors and omissions in the euro area b.o.p. may deserve further attention.

347. The TF-PII took as a basic premise that all solutions recommended should be compatible with the accruals principle[1], as required by international standards. Nevertheless, with a view to giving a sound foundation to its conclusions, the TF-PII empirically tested in Chapter 4 whether or not the magnitude of the gap produced by timing differences on the compilation of

income was significant enough to justify the need to insist that all countries both adopt the accruals principle[1], and do this in a co-ordinated manner.

The analysis of the TF-PII proved that the magnitude of the gap between the calculation of accruals and the pure cash settlement approach is indeed significant for monthly, quarterly and annual income figures, irrespective of the exact method followed in the calculation of the accrued interest.

Additionally, and owing to the role of intra-euro area flows in the calculation of euro area PII flows, the accruals principle should be applied by all countries at the same frequency, i.e. monthly, and following the same methodology.

The TF-PII considers this issue to represent the most substantial problem for the compilation of income statistics at the present time.

Should future developments not strictly stick to these recommendations, severe distortions are expected in the euro area current account balance.

The pivotal role of the Centralised Securities Database for the work of the TF-PII

348. The TF-PII was mandated to work under the assumption that the CSDB would be available by the time its final conclusions were scheduled to be implemented. This implied a number of consequences for the work of the TF-PII, as it enabled a much wider set of alternatives for income compilation to be considered. Although some of these may not currently be feasible, they may well become possible if the CSDB provides the necessary basic information to fill in current gaps. Additionally, the provision of centralised information on securities and yields should help ensure further symmetry in the treatment applied by the respective countries of securities' issuers and holders within the European Union.

349. At the time this report was written, the first phase of the CSDB project had been already approved by the Governing Council, and the implementation phase I was in progress. At the end of this phase (scheduled for mid-2004), the information required for the conclusions of the TF-PII should be available to Member States. Related details were being reviewed in the CSDB Business Co-ordination Group (BCG), which is the co-ordinating ESCB body in charge of defining the roles and responsibilities of NCBs and NSIs within the CSDB system of data exchange.

The CSDB should, in particular, be capable of providing a number of variables and functionalities to ensure that the range of solutions for income compilation identified by the TF-PII and listed at the end of this chapter are feasible.

350. These requirements were addressed in a letter from the TF-PII Chairman to the Chairman of the BCG and the Project Manager of the CSDB Project on 22 October 2002, and are attached to this report in Annex 5.

351. In addition to the availability of the variables and functionalities stated in the above-mentioned letter, the TF-PII considers it crucial that the range of securities included in the CSDB should ensure a sufficient level of coverage and quality of both euro area and foreign securities involved in cross-border trading at country level. This should guarantee the possibility of implementing the solutions proposed by the TF-PII.

Income collection versus income calculation/estimation

352. While investigating a number of different issues, the TF-PII was repeatedly confronted

1 As an exception, it was decided that dividends should be recorded when paid, mostly for practical reasons.

with the choice between two different ways of compiling income figures. One of them implies that the compiler calculates (s-b-s) or estimates (through an aggregate approach) income himself, while the other one consists of collecting information directly from reporters (either via surveys or through settlements).

The TF-PII is of the opinion that, for the bulk of portfolio investment income compilation, ***only calculations or estimations performed by the b.o.p. compiler can ensure high-quality results in the long run and ensure that either the creditor or the debtor approach can be consistently applied***, as this is the only way of keeping control of the procedures used to perform income calculations. Additionally, such solutions would avoid potential inconsistencies in respondents' interpretation of the guidelines provided by the b.o.p./i.i.p. compiler.

353. However, the TF-PII should like to make a clear distinction between collection through settlements and collection through surveys. While the sole collection of income figures through settlements should be abandoned as soon as possible, changes in the method applied by countries collecting this information through surveys might be less urgent, as this method may at least ensure a more correct application of the accruals principle (even if there are particular problems for the direct collection of creditor-based income).

354. Nevertheless, the existence of asymmetries between assets/credits and liabilities/debits, owing to the fact that income debits normally follow the debtor approach while income credits are most often aligned to the acquisition approach, suggests that surveys may only be a temporary solution for the compilation of income. This difference between debtor and acquisition methods of recording mainly affects the consideration of premia/discounts and is, therefore, more acute in the case of zero coupon bonds.

355. If income were to be exclusively calculated/estimated by the b.o.p. compiler, this decision could imply a significant reduction in the burden on respondents, as they would just have to provide information on the holdings of debt securities (either aggregate or s-b-s), with the income flows derived from information on yields provided by a commercial data supplier. Such an approach would allow the compiler to develop portfolio investment collection and processing systems that meet the recommendations of the TF-PICS and in addition suit the particular statistical environment (for aggregate or s-b-s reporting) in each Member State.

356. On the other hand, should countries decide to continue collecting income information from respondents through surveys in the long term, it could provide a powerful tool for checking the consistency of income calculations/estimations.

Calculation of income security-by-security versus estimation on an aggregate basis

357. When analysing the links between portfolio investment models and income compilation, it is important to consider at which level of detail calculations should be made. In this respect, the TF-PII felt that the calculation of income on an s-b-s basis offers precise results, provided that all necessary information is available at a sufficient level of quality. This approach is considered to be the most practical way to substantially reduce asymmetries among countries.

358. Nevertheless, different circumstances (mainly associated with cost considerations, availability of appropriate information, internal compilation processes and checking procedures, available resources, etc.) could lead b.o.p. compilers to adopt a more simplified approach such as the aggregate one.

359. The estimation of income on an aggregate basis consists of multiplying stocks by benchmark yields for a given set of

breakdowns (e.g. currency, maturities, country of the issuer). For this approach to produce acceptable results, monthly stocks (or quarterly/annual stocks plus cumulated monthly flows with the corresponding price and exchange rate adjustments) must be available to the compiler. These aggregate stocks could be built up from s-b-s information (see also *The mixed approach* below).

360. The aggregate approach could represent a practical solution for countries currently collecting income on a settlements basis, but which are seeking to evolve towards estimating income on an accruals basis.

361. The existence of centralised information (e.g. through the CSDB) would be an additional key factor in reducing asymmetries further, regardless of the approach followed. Any asymmetries which are potentially introduced by MSs adopting different aggregate solutions should be reduced by using the CSDB as the sole source of information for benchmark yields (given a minimum standard of breakdowns which ensures suitable income figures).

With the aim of harmonising statistical practices amongst countries, aggregate calculations should be carried out at least at a minimum level of detail. The TF-PII is of the opinion that aggregate estimations should be performed (and stocks should be available for this purpose) ***as a minimum with a breakdown of assets and liabilities by original maturity, currency of issue and issuer sector (for liabilities and intra-euro area assets).***

Of course, if additional information is available (e.g. residual maturity, country of issuance, sector of the issuer, etc.), countries are strongly encouraged to use this in their estimations to the greatest extent possible. This is intended as a way of further reducing the gap between aggregate estimations and s-b-s calculations.

The mixed approach

362. For those countries where portfolio investment stocks are available on an s-b-s level, aggregate estimations performed at a more detailed level could constitute an alternative to pure s-b-s calculations. S-b-s stocks could offer a very detailed set of breakdowns like the currency of issue, residual or original maturity, country and institutional sector of the issuer, etc. Benchmark yields could then be calculated across these detailed breakdowns in a centralised manner by the CSDB. This type of methodology is simpler to implement than conducting s-b-s calculations of accrued income. Even if this calculation is not directly used for the compilation of statistics, it could allow a quick plausibility check on the results derived from s-b-s calculations. As is the case with aggregate systems, the mixed approach is better suited to the creditor than to the debtor approach, as it is less resilient to changes in output demands. For securities without any identifier (e.g. an ISIN code), the estimation/calculation of income figures could be solved either with solutions closer to those in s-b-s systems (i.e. by using the yield of a security with similar features), or with solutions closer to those applicable to aggregate systems (i.e. the use of a benchmark yield).

Information on coupon payments

363. The collection of information on coupon payments is one of the most substantial problems in the correct application of the accruals principle in aggregate systems. The use of information corresponding to each individual security is only possible to the extent that s-b-s portfolio investment stocks may be available (mixed approach). Apart from this alternative, aggregate systems can only access the necessary information if it is directly collected from reporters (e.g. through surveys) or indirectly collected from custodians, assuming that settlements may lose their capacity to cover the relevant flows considering the gradual increase foreseen in the reporting thresholds. Such information on coupon payments should be collected at a very

precise level of detail in order to record transactions in the correct financial account category.

The availability of s-b-s portfolio investment stocks at a certain periodicity could help overcome problems such as the establishment of detailed categories of portfolio investment stocks (mixed approach) or the availability of additional information on coupon payments (which should be available in the securities database), and could offer additional consistency checks in order to assess the accuracy of aggregate estimations.

Debtor/creditor: magnitude of the differences and possible way out

364. The work of the TF-PII took place in the context of an international debate as to whether the interest rate to be used in the calculation of accruals should be the one prevailing at the time of issuance (the so-called debtor or issuer approach), or whether it should be the one at the time of compiling accrued interest (the so-called creditor or market approach).

365. The TF-PII did not enter into the conceptual debate as to which approach should be preferred for the calculation of accruals. As the mandate invited the TF-PII to consider income methods which could be compatible with whatever solution that is finally adopted, the TF-PII decided to provide data collection models at the end of this chapter, specifying whether or not they are potentially compatible with each respective approach.

366. In reviewing current practices, the TF-PII acknowledged that countries which calculate income on an s-b-s basis generally follow the debtor approach, while countries estimating income by means of an aggregate methodology mainly follow the creditor approach.

367. The TF-PII was mandated to assess the magnitude of the difference in the calculation of accrued interest following both approaches. To this end, a number of empirical exercises were conducted, from which some conclusions can be drawn.

An important conclusion was that the magnitude of the difference was indeed relevant, and can be expected to be most pronounced in times of rapid changes in interest rates.

For this reason, the TF-PII recommends that, within a country's b.o.p. compilation system, the same approach should apply to the calculation/estimation of income on both assets and liabilities in order to eliminate inconsistencies between income credits and debits. To reduce asymmetries, a consistent approach should also be adopted across all b.o.p. compiling countries.

368. To ensure that calculations are consistent across all EU (euro area) countries, it is recommended that, irrespective of the approach adopted, estimations/calculations of income should be done as far as possible by the b.o.p. compiler him/herself and not by reporting agents (see *Income collection versus income calculation/estimation*).

369. The lack of appropriate information has repeatedly justified the impossibility of promoting a single approach across all EU/euro area countries for portfolio investment income compilation. It might therefore be relevant to note that, were the CSDB able to provide monthly information on market yields for individual securities in the future, it would be possible for countries with an s-b-s system to move to a creditor approach. *Similarly, the CSDB could also be used to derive aggregate nominal yields for groupings of securities, thus also permitting countries with aggregate systems to move to the debtor approach.*[2]

2 *In practice, however, the need also to have access to portfolio investment stocks based on nominal values could constitute an additional difficulty in this approach.*

370. Finally, the TF-PII should warn about the possible lack of co-ordination between the ongoing process of adaptation of portfolio investment income compilation systems towards acceptable solutions, and current discussions in international fora concerning the approach (debtor/creditor) to be followed. Since several countries are already planning a move from cash-based systems to accruals recording, changing these systems again at a later date in order to adopt a different approach would be extremely costly.

Income on CIIs

371. The treatment recommended at present[3] is responsible for some asymmetries, since it is more difficult to apply to income credits (i.e. involving non-resident CIIs) than to income debits (i.e. involving domestic CIIs), owing to the unavailability of detailed information on foreign CIIs to b.o.p. compilers. Assuming that stocks of investments in CIIs abroad have to be available to Member States at the same frequency as it is intended to calculate income, Member States should theoretically obtain or estimate the asset allocation strategy of the non-resident CIIs. As this is virtually impossible on practical grounds, it is recommended that all countries should apply similar estimation methods, namely those proposed in Chapter 3 of this report.[4]

372. Concerning taxes, the figures should be adjusted and appropriate offsetting entries should be recorded under the current transfer item. Since it is recognised that the countries of the shareholders will not have access to the same detailed information on taxation as the countries where the funds are located, asymmetries between euro area countries could be minimised through the exchange of public information among b.o.p. compilers and/or, perhaps in the future, through the use of centralised information available in the CSDB.

373. An optimal element of the estimation procedure is that an agreed rate of return for either overall CII investment in the euro area or for each class of investment by CIIs, i.e. Bond Funds, Equity Funds and Money Market Funds, is agreed and set centrally and made available in the CSDB. Until this information can be made available through the CSDB, some temporary solutions, as outlined in Chapter 3,[4] should be considered.

Income on shares

374. The TF-PII recommends that, for practical reasons, dividends should be recorded in the period when they are paid rather than when they are declared payable. Likewise, and as a practical solution to avoid asymmetries, it is recommended to record dividends from both operating profits and from capital gains under investment income, following the BOP Book advice.

375. At present, most countries do not record stock dividends. Nevertheless, the TF-PII empirically checked that stock dividends were not substantial in any country[5] and, therefore, potential asymmetries due to non-recording cannot be deemed sizeable. Additionally, most countries record dividends net of taxes at present. The TF-PII recommends that an imputation should be made reflecting the amount of the corresponding tax (both the income on shares and the current transfers items should be corrected).

3 The ECB's "EU b.o.p./i.i.p. statistical methods" recommends that all income received by the CII as a result of investments made should be attributed to the holders of the CII's units over the period under review.

4 See Treatment of income on collective investment institutions.

5 Portugal could be an exception in 2001.

Conclusions and recommendations for specific features of data collection models

Input dimensions

376. The final report of the *Task Force on Portfolio Investment Collection Systems* (TF-PICS) recognised that a single *data collection model* (DCM) was not able to satisfy the specific needs of all countries. Furthermore, it acknowledged that different types of reporters (economic sectors) could be more efficiently approached by means of different models.

377. For this reason, a limited range of data collection models were selected and ranked from acceptable to ideal for the compilation of portfolio investment statistics, giving countries the freedom to target a particular level in the overall ranking according to their specific situation. The identification of a restricted number of solutions provided a basis for convergence which, it was presumed, should pave the way for further harmonisation in data collection systems across the European Union and, thus, should minimise current problems in the compilation of euro area aggregates.

378. Against this background, the TF-PII investigated different solutions for portfolio investment income compilation which should be capable of meeting two requirements: (i) to be compatible with acceptable DCMs in the field of portfolio investment; and (ii) to guarantee consistent and good quality income statistics. Following this line of reasoning, the TF-PII selected a number of dimensions which may be combined to define individual income compilation models. These dimensions/variables have been gradually introduced along the previous sections of this chapter, and are presented in *Table VII.1*.

Table VII.1

Input dimensions of income data collection systems

Dimension	Options
Yield	1. Debtor 2. Creditor
Reporting channel	1. Collection from reporters (surveys) 2. Collection from reporters (settlements) 3. Calculation by compiler 4. Estimation by compiler
Level of detail of the information	1. Aggregate 2. Security-by-security (s-b-s) 3. Mixed[1)]
Features of PI stocks	Monthly collected Quarterly collected; monthly derived[2)] Yearly collected; monthly derived[3)]

1) Aggregate income estimations applied to categories of securities established from s-b-s portfolio investment stocks. See The mixed approach in the previous section of this chapter.
2) By accumulating monthly b.o.p. flows to quarterly stocks, with the relevant price and exchange rate adjustments.
3) By accumulating monthly b.o.p. flows to annual stocks, with the relevant price and exchange rate adjustments.

Ranking of combinations of input dimensions: the tree structure

379. Different combinations of the four above-mentioned variables may identify different income compilation models. Following this identification, the different models may be ranked in a manner consistent with the analysis carried out in the previous sections by basically judging whether these models could provide both national and euro area aggregate statistics of sufficient quality.

380. In considering these models concerning the debtor and the creditor approaches, the mandate of the TF-PII explicitly stated that the ability to adapt to any future change in standards (from one principle to another) should be deemed a highly positive feature in any technique proposed by the TF-PII. In the course of its investigations, the TF-PII came to the conclusion that not all models can provide

Table VII.2

Tree structure of data collection models

		DEBTOR[1]		CREDITOR
Ideal	**1**	Calculation by compiler [s-b-s][2] PI stocks: M collected [s-b-s]		
Good	**2**	Calculation by compiler [s-b-s][2] PI stocks: Q collected, M derived [s-b-s][3]		
	3	Estimation by compiler [mixed[4]][5] PI stocks: M collected [s-b-s]		
Acceptable	**4**	Estimation by compiler [mixed][5] PI stocks: Q collected [s-b-s], M derived [s-b-s][3]		
	5	Estimation by compiler [aggr.][5] PI stocks: Q collected [s-b-s], M derived [aggr.][6], [3]		
	6	Calculation/Estimation by compiler [s-b-s] [3], [5] PI stocks: Y collected [s-b-s], M derived [s-b-s][5]		
Transitional	**7a**	Collection from reporters [surveys][7] PI stocks: M or Q collected [aggr.]	**7b**	Estimation by compiler [aggr.][5],[6] PI stocks: M or Q collected [aggr.][96]
Not acceptable	**8**	Collection from reporters [settlements] PI stocks: irrelevant		

1) *The application of the debtor approach requires the availability of portfolio investment stocks at nominal values, while international standards require flows and stocks at market values. This point, in addition to the difficulties of obtaining benchmark yields based on nominal interest rates at present, could prove a problem for models based on estimation.*
2) *S-b-s calculations following the creditor approach will only be feasible in the future, assuming market yield information for individual securities is supplied monthly by the CSDB.*
3) *By accumulating monthly b.o.p. flows to less frequent stocks, with the relevant price and exchange rate adjustments. This approximation may produce results of inferior quality in the debtor approach compared with the creditor approach, since monthly b.o.p. transactions are valued at market prices rather than at nominal values. Some adjustments would thus be necessary.*
4) *Aggregate income estimations applied to categories of securities established from s-b-s portfolio investment stocks. See "The mixed approach" in paragraph 362.*
5) *To be considered acceptable, aggregate estimations should meet at least the minimum features required in Chapter VI, i.e. should be performed (and stocks should be available for this purpose) with a breakdown of assets and liabilities by original maturity (short term/long term), issuer sector (for liabilities and intra-euro area assets) and currency of issue as a minimum.*
6) *Aggregate income estimations following the debtor approach require, in addition to benchmark yields based on nominal interest rates, monthly nominal stocks, which should be estimated from marked-to-market aggregate stocks (quarterly stocks s-b-s + aggregate monthly flows). Monthly flows should be converted from market into nominal values. The CSDB should provide the necessary yields and ratios to permit such estimations in the future.*
7) *This model is only compatible with the debtor approach for liabilities/debits; for assets/credits, it is more closely aligned to the acquisition approach*

information according to both the creditor and debtor approaches (especially until the CSDB becomes fully operational). Models without this capacity should therefore be given a lower ranking.

381. For this reason, and sticking to what is stated in the Debtor/creditor section, the solutions provided by the TF-PII are presented following a tree structure, i.e. from a single stem encompassing models compatible with both the debtor and creditor approaches, to two different branches comprising models which are only compatible with either approach.

382. The tree structure shown in *Table VII.2* presents specific combinations of the four input dimensions. Some of these combinations represent models that are currently in place in individual Member States, while others may be seen as alternative options for the future.

383. The main advantage of the proposed approach is that Member States should be able to find out the correspondence between their current or planned system for income compilation, and the specific combinations of input dimensions as presented in the tree. Obviously, the construction of the tree implies a judgmental choice, particularly concerning the establishment of the borderline between acceptable and unacceptable practices. However, this judgement should be consistent with the analysis and conclusions on specific issues presented in the report so far.

384. The bottom line of the tree should be interpreted as the medium to long-term minimum acceptable solution for income compilation. It represents features that the data collection system for all institutional sectors should be able to meet at some point in time, thus constituting a "minimum benchmark". Combinations above this line provide a range of possible alternatives for moving forward in the future. Below the line, a number of solutions have also been identified which could be considered as acceptable alternatives over an interim period, whose extension is yet to be defined by other fora.

Milestones of the tree structure: the stepping approach

385. While the TF-PII analysed income compilation methods starting from the models considered to be acceptable by the TF-PICS, it was also acknowledged that the analysis and conclusions of the TF-PICS did not consider the specific needs for income compilation. In particular, the analysis of the TF-PII revealed that these specific needs for income compilation required the following analysis in portfolio investment stocks: (i) to be produced as frequently as income data are produced; and (ii) to be capable of providing more details than current output requirements, e.g. either the ideal of s-b-s stocks or, as a minimum, aggregate stocks broken down by instrument, original maturity, currency and sector of the issuer (except for extra-euro area securities).

386. At the same time, the TF-PII was also conscious of the risk of widening too far the commitments required from Member States concerning portfolio investment systems, especially in the framework of ongoing changes in general collection systems. In this context, it might be worth noting that the methodologies currently applied by a substantial number of Member States for income compilation range between unacceptable and transitional solutions as identified in the Tree structure. For this reason, it is important to bear in mind the significant effort that implementing the improvements proposed by the TF-PII will entail.

387. For this reason, the TF-PII would suggest the consideration of a stepping approach, by which countries would not be forced to jump directly into one of the acceptable, good or ideal solutions described in the tree structure in the short run. A rapid application of some of the enhancements proposed by the TF-PII (e.g. full application of the accruals principle, minimum breakdowns for aggregate estimations, single method for the estimation of income on CIIs, etc.) should guarantee a fairly significant improvement in the quality of the final product within a relatively short time frame.

388. At the same time, from a more forward-looking perspective, the TF-PII considered how to incorporate the special requirements of income compilation identified in paragraph 384 into the design of the tree, i.e. the need to have access to more frequent and detailed portfolio investment stocks. For this reason, ***the TF-PII encourages the collection of quarterly portfolio investment stocks s-b-s as a medium/long-term goal.***

389. The main argument in favour of collecting quarterly portfolio investment stocks s-b-s is that it will allow a broad set of breakdowns for stocks to be compiled (by currency, maturity, country and sector of the issuer, etc), which will contribute to producing acceptable to good income estimates. In addition, calculations on an s-b-s basis would also be feasible, at least when the CSDB is operational.

390. In addition to the obvious benefits offered in terms of accuracy for income compilation, the availability of s-b-s stocks at this frequency could ensure a smooth transition from one approach (debtor or creditor) to the other, as it can satisfy both. Moreover, besides the specific needs for income compilation, the establishment of such a benchmark could be a progressive way of anticipating other forthcoming output requirements, such as the provision of quarterly external debt to the IMF or the provision of quarterly information for the compilation of Monetary Union Financial Accounts.

391. ***This central recommendation basically depends on a favourable outcome of the national feasibility studies on s-b-s reporting currently in progress.*** Should these studies conclude that s-b-s reporting is not feasible, the aggregate model under (7b) presented as transitional should be considered as acceptable (to the extent that it should meet the data requirements in terms of breakdowns set out in Chapter 6 of the report).

Applicability of the models in the tree

392. As stated in previous paragraphs, the tree structure should be interpreted in the framework of the so-called "matrix approach" (i.e. different solutions may be applied to different sub-populations/economic sectors). The main aim of this approach is to reach a high level of coverage, i.e. to apply the best possible method to the major market players (which may relate to different economic sectors in different Member States) and, thus, cover the bulk of the market. For some economic sectors below a certain threshold of portfolio income/investment, the temporarily acceptable models (e.g. aggregate solutions or direct collection of income figures) could still be acceptable after the interim period to be defined by the STC and the WG-BP&ER.

Additional recommendations

393. Although the TF-PII was not mandated to tackle implementation plans, some clear-cut conclusions may help the WG-BP&ER and the STC in the subsequent tasks to be undertaken following the completion of this Task Force's work. In particular, the TF-PII identified three major causes of distortions concerning euro area b.o.p. income flows: (i) application/non-application of the accruals principle; (ii) different yields applied in calculations/ estimations (debtor/creditor); and (iii) calculations/estimations carried out at different levels of detail (aggregate/s-b-s)[6].

(i) Application of the accruals principle

The non-application of accruals is deemed to be the most significant factor causing distortions in the compilation of the euro area aggregates at present. ***The TF-PII is of the opinion that a simultaneous move to accruals recording by all countries as soon as possible should be regarded as the top priority of the implementation work subsequent to the delivery of this report.***

(ii) Different yields applied in calculations/ estimations (debtor/creditor)

394. The provision of separate solutions for either the debtor or creditor approach is intended to promote the use of models compatible with one single approach (whichever is eventually selected) by all euro area countries. For the time being, the adoption of one single model does not seem easy to promote as long as countries are not obliged to collect portfolio investment statistics on an s-b-s basis.

395. In general, the move to the debtor approach for income estimation for those countries which plan to continue collecting aggregate information (for both portfolio investment stocks and income) does not seem feasible in the absence of some specific functionalities that only the CSDB can provide at some stage in the future.[7]

396. Overall, the move to the creditor approach for countries currently running s-b-s systems requires the availability of frequent information on market yields for individual securities, which could make the creditor approach very difficult and costly to apply at this point in time. Once the CSDB becomes available and proves able to deliver the necessary information on market yields, the application of one approach for all countries, be it the debtor or creditor approach, seems to be realistic.

(iii) Calculations/estimations carried out at different levels of detail (aggregate/s-b-s)

397. The identification of a limited number of acceptable models as well as the minimum features recommended for aggregate solutions, in addition to the overall access to common and centralised information through the CSDB, should help narrow the gap between s-b-s calculations and aggregate estimations. Of course, an eventual move towards more detailed calculations/estimations (i.e. a transition to upper models in the cascade) would further improve the overall picture and must be promoted as far as possible. The long-term benchmark encouraged by the TF-PII in this report (i.e. quarterly s-b-s portfolio investment stocks) represents a substantial step towards further reducing this gap.

Pending issues

398. The following issues were not tackled by the TF-PII, as it was assumed they were not integrated into its mandate:

- Decide on the approach to be followed (debtor or creditor) and guarantee that all countries will stick to such a decision once the CSDB is operational. The possibility of estimating accruals using the debtor approach and aggregated stocks should be studied when the CSDB is operational. The WG-BP&ER and the STC could consider

6 *Assuming that the collection of income from reporters has been either disregarded as an acceptable option (settlements) or only temporarily accepted (surveys) in the conclusions of this report.*

7 *Even if this were the case, the need to approximate or estimate portfolio investment stocks at nominal values on an aggregate basis (a feature which is far beyond current output requirements) could imply a risk of deterioration in the quality of the results obtained. The reason is the apparent difficulty of defining an appropriate benchmark to transform marked-to-market stocks into nominal stocks with an error of approximation that could be deemed acceptable. An empirical study investigating the magnitude of the distortion has been carried out by one country and is provided in Annex 3.*

different decisions applicable both to the present situation and to a future scenario in which the CSDB is operational.

- Define a deadline by which all countries would accept the recommendation to start applying the accruals principle.

- Elaborate an implementation calendar comprising deadlines in order to successively undertake the following two steps: (i) firstly, to implement at least one of the solutions considered to be "temporarily" acceptable; (ii) subsequently, to implement at least one of the solutions considered to be acceptable.

399. In considering the above-mentioned points, the WG-BP&ER and the STC may want to consider the stepping approach proposed in this report as a starting point for discussions.

Annexes

1. Quality criteria relevant for b.o.p./i.i.p. statistics

Dimension	Sub-dimension / indicator	Relevance for portfolio investment data collection models
Serviceability	**Relevance** Degree to which the data fulfil the needs expressed by users.	The importance of securitisation in cross-border international investment relationships is undisputed; the prominent role of the financial account has been recently reconfirmed by the EB of the ECB.
	Timeliness Time lag between period or event in question and the availability of the statistical data that correspond to it.	A crucial feature of statistics on portfolio investment transactions owing to the extremely demanding requirement to produce monthly statistics within six weeks.
	Stability The likelihood of necessary revisions; on the basis of stable data, decisions can be made as soon as the data are released (see also Accuracy).	Revisions are in general unavoidable; however, in particular for the calculation of supranational aggregates, a consistent revision policy of all contributing sources is highly recommended.
	Consistency Consistency allows comparability of statistics by users; main features: - over time - between data collected at different frequencies - internationally - numerical, e.g. between stocks and flows.	Whereas the consistency of data produced at higher and lower frequency might not be seen as the top priority, the reconciliation between stocks and flows is a key quality feature of portfolio investment statistics; this is both relevant for analytical as well as for quality control purposes.
Accuracy	**Accuracy** The degree to which data correctly describe or quantitatively assess the phenomenon that the corresponding statistics were designed to measure; this can be defined as the closeness of the presented value (directly collected or estimated) to the (unknown) true population number.	In previous questionnaires within the WG-BP&ER, this indicator has received particular attention; the correct identification of the residency of the issuer of a security is the most critical item in cross-border portfolio investment statistics; furthermore, the demanding level of categorisation according to type of instruments, maturity or sector of holder / issuer augments the high standards which portfolio investment data should comply with;
	Plausibility Plausibility describes the (internal) likelihood of the data; for instance significant outliers or sudden and unexpected changes in the trend need to be investigated, especially when there is virtually no economic and/or methodological explanation for them.	Any secondary source drawn from the broad range of indicators describing the development in the financial industry should be employed.

Integrity	**Integrity** Integrity is achieved through transparent procedures and practices by which statistics are collected, compiled and disseminated.	The feature of being able (at least in theory) to trace the origin of a particular result in b.o.p./i.i.p. statistics is of particular relevance in the context of compiling a supranational aggregate on the basis of contributions generated by a variety of data collection models; consequently this indicator points to one of the most relevant arguments for the harmonisation of inputs.
Accessibility	**Accessibility** Accessibility reflects the ease of obtaining the information disseminated by a statistical agency, the suitability of the form in which it is shown, the media of dissemination and the availability of metadata.	
	Transparency Transparency is achieved if the dissemination of statistics is accompanied by a complete set of information (the "metadata") on the real content of the statistics themselves, including: i) a description of the data; ii) its coverage; iii) its compliance with international methodological standards; iv) the main cases for departure from agreed standards; v) a description of the main estimation procedures applied for missing data.	Both indicators are of national as well as supranational relevance; WG-BP&ER initiatives (for instance the B.o.p. Book, the methodological notes on the website, etc.) have already increased the transparency of national and supranational data for users.

2. methodological background to chapter III

It is important to highlight that the nature of this exercise implies that simplifications are necessary in order to classify each country's compilation method in one single stylised category, defined by a limited number of dimensions: application or not of the accruals' principle, debtor/acquisition versus creditor approach, and aggregated versus security-by-security compilation. As countries may apply different methodologies for the compilation of income for each specific instrument or sector, or differentiate between assets and liabilities, we try to take this into account by regressing the ratios separately for the mentioned instrument classes for assets and liabilities respectively.

Accordingly, Table 8 and Table 8, which were elaborated in an interactive procedure with Task Force members, show the attribution of the different countries which participated in the study to the different stylised types of compilation methodologies. While Table 7 shows this attribution for the class of medium and long-term debt instruments (Bonds & Notes), Table 7 shows the attribution of countries for short-term debt securities (Money Market Instruments).

Table 7

Stylised compilation methodologies for portfolio investment income – Bonds and Notes

	Assets' side			Liabilities' side		
	Accruals		Cash basis	Accruals		Cash basis
	Debtor/ acquisition	Creditor		Debtor	Creditor	
Collection settlements			DE, DK, ES, FR, GR, NL			DE, DK, FR, GR, NL
Calculation s-b-s	AT, IT			AT, ES, IT		
Collection aggregated – survey/direct reporting	FI, IE, SE			FI, IE, SE		
Estimation – aggregated (Benchmark yields)		BE, LU, PT, UK		UK	BE, LU, PT	

Table 8

Stylised compilation methodologies for portfolio investment income – Money Market Instruments

	Assets' side			Liabilities' side		
	Accruals		Cash basis	Accruals		Cash basis
	Debtor/ acquisition	Creditor		Debtor	Creditor	
Collection settlements			DE, DK, ES, FR, GR, NL			DE, ES, FR, GR, NL
Calculation s-b-s	AT, IT			AT, ES, IT		
Collection aggregated – survey/direct reporting	FI, IE, SE, UK			FI, IE, SE		
Estimation – aggregated (Benchmark yields)		BE, LU, PT		UK	BE, LU, PT	

Model specification

The test we implement is based on the dummy variable methodology, which builds upon the fact that in a regression of a variable y on a constant 1, the value of the parameter associated with this constant is equal to the mean of the variable y. This simple model may be augmented by an indicator (dummy) variable, which is defined as

$$D = \begin{cases} 1 & \textit{if y falls in a certain group} \\ 0 & \textit{otherwise} \end{cases} \quad (1)$$

Including this variable leads – in the simplest form - to the model

$$\gamma = \beta_o 1 + \beta_D D + \varepsilon \quad (2)$$

where ε is an error term with zero mean and unknown distribution. The least squares estimators[1] of β_o and β_D then capture the distribution of y in the following way: β_o will be equal to the mean of the group identified by $D = 0$, also called the *reference group*, and $\beta_o + \beta_D$ will be equal to the mean of the group identified by the dummy variable, i.e. for which $D = 1$ is valid. The inclusion of the dummy variable introduces a shift in the functional specification of y and allows a distinction to be made between the two groups identified via this dummy variable. Thus, the parameter β_D measures the difference between the two groups identified via *D*.

The interpretation of the parameter according to a given dummy variable is then the average difference in y which is specific to the characteristic of the group identified via the dummy variable compared with all other groups. For example, if D identifies a specific compilation methodology characteristic, then a significant parameter of this dummy variable would indicate the average effect on y (income over stocks ratio), which is due to the fact that the group identified via D does apply the specific compilation methodology characteristic.

In order to establish whether a given characteristic of the compilation methodology introduces a systematic bias, we have to

(i) identify the specific stylised characteristics of Table 3 and Table 4 via an appropriately chosen set of dummy variables.

(ii) ensure that the effect identified is not a proxy effect, i.e. does not capture an influence which in reality is not due to the calculation methodology's characteristic but rather to some other influence.

The result of the first task (i) is outlined in Table 5. It shows the different possibilities in the compilation of portfolio investment income, as identified using the three dummy variables:

NACCR: identifies whether a country does not apply the accruals principle (NACCR = 1) or whether it does apply the accruals principle (NACCR = 0);

AGG: identifies whether a country compiles income on an aggregated basis (AGG = 1) or on a security-by-security basis (AGG = 0);

CRED: identifies whether a country applies the creditor approach (CRED = 1) or another approach (CRED = 0).

Given these variables, we model the income over stocks ratios for a given country i at time (year) t as a linear function of these three dummy variables and a constant β_o :

$$ratio_{it} = \beta_o + \beta_{NACCR} NACCR + \beta_{AGG} AGG + \beta_{CRED} CRED \quad (3)$$

As the reference group for the three dummy variables is a security-by-security compilation system applying the accruals principle using the debtor/acquisition approach, the constant β_o in this model then measures the country-average

1 *For a derivation of this estimator and a discussion of its statistical properties, see Greene, W. H., 2002, Econometric Analysis, Prentice Hall.*

Table 9

Identification of different income calculation methodologies

	Accruals		Cash basis
	Debtor/acquisition	Creditor	
Collection settlements			NACCR = 1, AGG = 0, CRED = 0
Calculation s-b-s	NACCR = 0, AGG = 0, CRED = 0	NACCR = 0, AGG = 0, CRED = 1	
Collection aggregated – survey / direct reporting	NACCR = 0, AGG = 1 CRED = 0	CASH = 0, AGG = 1 CRED = 1	
Estimation – aggregated (Benchmark yields)	NACCR = 0, AGG = 1 CRED = 0	CASH = 0, AGG = 1 CRED = 1	

ratio, i.e. rate of return or debt service, as would normally be measured under such a compilation system. The parameter of the variable NACCR, β_{NACCR}, then measures the systematic difference for this reference group in the scenario that the accruals principle is not applied and income is compiled on the basis of a settlement system. Analogously, the parameter of AGG, β_{AGG}, measures the systematic difference of the compilation of income on an aggregated basis, using the debtor/acquisition approach as compared with the reference group.

Given the distribution of countries, where we only observe the application of the creditor approach for countries estimating income on an aggregated basis, the parameter of the variables CRED, β_{CRED}, then measures the systematic difference between countries estimating income and countries which collect income in an aggregated manner, either by using surveys or direct reporting.

$$ratio_{it} = \beta_o + \beta_{NACCR}NACCR + \beta_{AGG}AGG + \beta_{CRED}CRED + \sum_{t=2}^{T}\beta_t 1[T = t] \quad (4)$$

It seems reasonable to assume that the reference ratio (i.e. the average rate of return of countries calculating income on a security-by-security basis, applying the accruals principle and using the debtor/acquisition approach), is not constant over time. Therefore we introduce a set of year-specific dummy variables 1[T=t], with T being the set of years for which we observe the ratios in our data, which take on the value 1 if a ratio is observed in a given year and 0 otherwise. Corresponding parameters are then estimated. The use of dummy variables instead of a simple time trend permits much more flexibility and more erratic movements in the reference ratio resulting from changes in market interest rates. This specification augments our model to:[2]

Here again we define the first observed year (1991) as the reference period, so that the interpretation of the constant now switches to the average rate of return of countries calculating income on a security-by-security basis, applying the accruals principle and using the debtor/acquisition approach under 1991 market conditions. For the other years, we obtain the corresponding ratio by combining the overall constant with the year-specific dummy variable, i.e. using $\beta_o + \beta_t$.

Country-specific effects on the ratio represent another source of heterogeneity. These are not attributable to the stylised characteristics of the compilation methodology in place, nor to time trends, but may be the result of very specific market conditions, for example. For this reason, country-specific dummy variables

2 *Including the more restrictive formulation with a fixed time trend did not change the significance of our results and – in the case of bonds and notes debits over liabilities, even rendered the variable CRED significant.*

1[I=i], where I is the set of countries included in the study, are constructed and added to the model in order to net out such effects, where significant, from the other estimated parameters. This leads to the model

$$ratio_{it} = \beta_o + \beta_{NACCR}NACCR + \beta_{AGG}AGG + \beta_{CRED}CRED + \sum_{t-2}^{T}\beta_t 1[T = t] + \sum_{t-2}^{T}\beta_i 1[I = i] \quad (5)$$

These provisions leave us with the set of variables whose sample properties (mean and number of observations) are described in Table 6[3]. Here, the column headed by B&N shows the values for the class of medium and long-term debt instruments (Bonds & Notes) and MMI for the class of short-term debt securities (Money Market Instruments).

We exclude the observations for SE before 1995. This leads us to a total of 84 observations for the assets side of the Bonds & Notes class of instruments. On the liabilities side of Bonds & Notes, we do not exclude any observations, leading to a total of 92 observations. As for the Money Market Instruments class of securities, we eliminate the observations for AT, owing to doubts about the validity of the ratio used to analyse their data on MMIs.[4] This leads to 53 observations on the assets side and 65 observations on the liabilities side.

As may be seen from Table 6, the application of the different stylised characteristics of compilation methodologies is quite heterogeneous across our sample. This reflects the heterogeneous application of compilation methods across – but also within – countries. The numbers show the percentage of observations in our sample for which the corresponding variable takes on the value 1, given that the corresponding endogenous variable (the ratio analysed) is not missing[5].

On the assets side – after eliminating outliers – the average ratios are around 6% for both Bonds & Notes and Money Market Instruments, with the latter segment showing a volatility which is more than twice as high as with Bonds & Notes (4.5% percent compared with 1.7%). On the liabilities side, the average debt service is significantly higher with Bonds & Notes than with Money Market Instruments (about 7%, compared with about 4%), while – surprisingly, given Figure 5 and Figure 8 – both series have a very similar volatility of close to 3%.

Table 10

Summary statistics on the variables used in estimation

	Assets' side		Liabilities' side	
	B&N	MMI	B&N	MMI
	Mean	Mean	Mean	Mean
NACCR [Non-application of accruals]	0.39	0.20	0.30	0.34
AGG [Compilation on aggregated basis]	0.51	0.74	0.39	0.54
CRED [Creditor approach]	0.29	0.23	0.14	0.16
Number of observations	84	53	92	61
Ratio being analysed (std. error in brackets)	0.059 (0.017)	0.062 (0.045)	0.069 (0.028)	0.039 (0.026)

In order to estimate the model in (5), we have to specify a random term, vit, which captures the variation in the ratios analysed which is neither owing to market conditions, nor to characteristics in the compilation methodology, or to other important country-specific influences[5]. In specifying such an error term, we take into account that our observations are group-wise bounded, i.e. we have several observations for each country.

3 *As all variables used are dummy variables, we restrict ourselves to the mean. This is the only meaningful sample property of a dichotomous variable.*

4 *In the case of Austria, it was possible to compare average yearly stocks based on end-year stocks on one hand, and on monthly stocks on the other. The differences between the two methods were considerable for almost all sectors (liabilities and assets, especially for the government sector).*

5 *Note that we do not have observations for all countries over the entire period 1991 to 2001.*

Such a bounded-ness may induce autocorrelation between country-specific observations. To allow our model to capture such a possible effect, we split the error term, vit, into two parts : one, ci, which is specific to the country an observation belongs to; and another, eit, which is completely independent. This augments our model to

$$ratio_{it} = \beta_o + \beta_{NACCR} NACCR + \beta_{AGG} AGG + \beta_{CRED} CRED + \sum_{t=2}^{T} \beta_t I[T=t] + \sum_{t=2}^{T} \beta_i I[I=i] + c_i + \varepsilon_{it} \quad (6)$$

Concerning these random terms, we assume that they

(i) are independent of all other regressors, and

(ii) follow the covariance structure represented by the covariance matrix in (7).

$$\mathbf{V}[c_i+\varepsilon_{it}] = \quad (7)$$

$$\begin{bmatrix}
\sigma_c+\sigma_\varepsilon & \sigma_c & \sigma_c & 0 & 0 & \dots & 0 & 0 & 0 \\
\sigma_c & \sigma_c+\sigma_\varepsilon & \sigma_c & 0 & 0 & & 0 & 0 & 0 \\
\sigma_c & \sigma_c & \sigma_c+\sigma_\varepsilon & 0 & 0 & \dots & 0 & 0 & 0 \\
0 & 0 & 0 & \sigma_c+\sigma_\varepsilon & \sigma_c & & 0 & 0 & 0 \\
0 & 0 & 0 & \sigma_c & \sigma_c+\sigma_\varepsilon & & 0 & 0 & 0 \\
 & \vdots & & \vdots & & \ddots & & \vdots & \\
0 & 0 & 0 & 0 & 0 & & \sigma_c+\sigma_\varepsilon & \sigma_c & \sigma_c \\
0 & 0 & 0 & 0 & 0 & \dots & \sigma_c & \sigma_c+\sigma_\varepsilon & \sigma_c \\
0 & 0 & 0 & 0 & 0 & & \sigma_c & \sigma_c & \sigma_c+\sigma_\varepsilon
\end{bmatrix}$$

That is, the country-specific random term introduces a fixed autocorrelation between the observations belonging to the same country. This autocorrelation is assumed to be identical for all countries. In this structure, the covariance between two observations of the same country is equal to sc, and the variance of any single observation is equal to sc +se.

The system described in (6) and (7) may then be estimated via the feasible generalised least squares (FGLS) method, which consists of an iterative weighted OLS regression with the weights being equal to V[sc +se]-1/2, and the iteration leading to successive improvements in the precision of the actual parameters σ_c and σ_ε.[6]

Apart from V[sc +se]-1/2, we will not introduce any further (country-specific) weights, as the nature of the ratios analysed as unit-free variables renders control for the size of the underlying flows unnecessary.

Foreseeable results

We test the hypothesis that there is no compilation method-specific bias detectable, i.e. H0: $\beta_{NACCR} = \beta_{AGG} = \beta_{CRED} = 0$ for both the credits over assets and the debits over liabilities ratios.

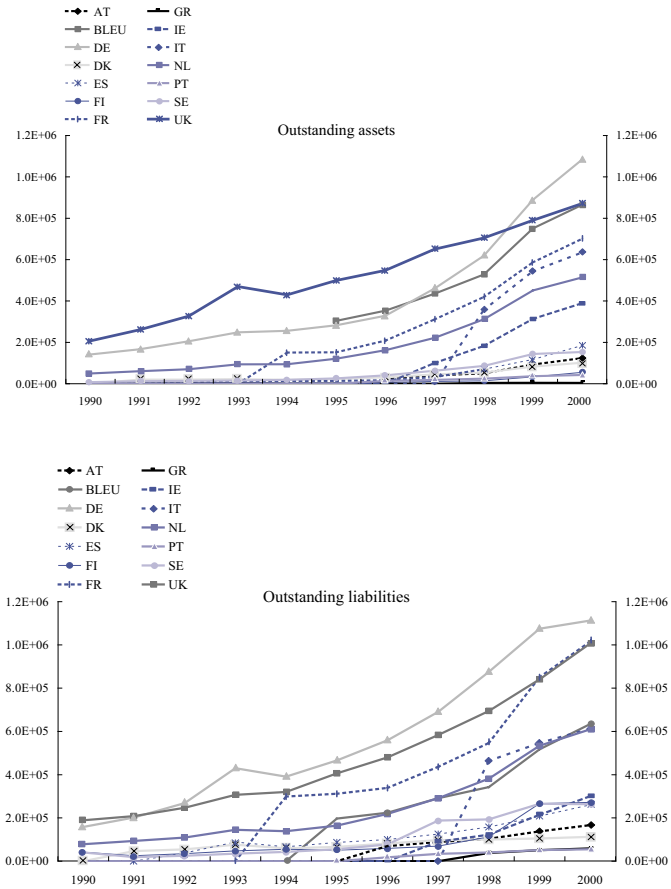
Intuition would suggest that we should reject the hypothesis that the application or non-application of the accruals principle does not matter. With increasing stocks, and taking into account possible changes in the interest rate, the application of the accruals principle should, ceteris paribus, lead to higher income figures than its non-application. A main reason for this is that future income cash payments will already be anticipated when applying the accruals principle, as they will be higher than present income cash payments.

Figure 9 shows clearly that the stock positions in portfolio investment assets and liabilities have considerably increased over the past ten years in all countries. This supports the hypothesis that the application of the accruals principle matters. The effects of other stylised features of the compilation methods applied are a priori not predictable. We therefore cannot set up a specific hypothesis as to whether the respective effect will result in a positive or negative parameter (measuring the average effect). However, studies conducted by Task Force members suggest that we should observe significant heterogeneity owing to varying stylised characteristics. A similar hypothesis could be constructed for the other variables tested.

6 *Examples of such noise may be reporting errors or other shocks to the data quality which are beyond the control of the compiler.*

Figure 12

Stock of assets and liabilities of portfolio investment over time



Estimation results

424. Table 7 shows the estimation results of the model composed by (6) and (7) for the two ratios (credits over assets and debits over liabilities) and for both classes of instruments (Bonds & Notes and Money Market Instruments). In order to test the significance of the parameters estimated, we assume that the ratio of the parameter to its estimation error (t-ratio) follows a t-distribution with N-1 degrees of freedom, with N being the overall number of observations. We may then say that (for $N \geq 50$) a parameter is different from zero with a confidence level of 5% if the absolute value of its t-ratio is larger than 1.68. Variables whose parameters satisfy this condition are slightly shaded in grey and are henceforth termed "significant".

425. In all estimated models, we do not detect any significant autocorrelation in the residuals, sc, of observations from the same country, beyond what is captured in the model specification of (5) itself. The estimated standard deviations for the idiosyncratic part of the residuals, se, clearly reflects the higher heterogeneity in the Money Market Instruments (MMI) class of securities compared with Bonds & Notes (B&N).

426. Figure 10 shows the estimated reference value over time in B&N credits over assets, B&N debits over liabilities, MMI credits over assets and MMI debits over liabilities. Starting from a high level of about close to 10% in 1991, the credits over assets ratio for B&N has decreased fairly monotonously to around 6.5% in the past three years. This is in line with the development of 10-year government

bonds in the euro zone in the past decade. On the liabilities side, after peaking in 1992, the debits over liabilities reference value has decreased monotonously from around 7% to around 5% in recent years. For the class of Money Market instruments, there is no significant variation around the reference value estimated for 1991 (about 9% on the assets and 5% on the liabilities side), rendering these values stable over the total observed period. The variation observed in the corresponding graphs in Figure 10 is spurious in the sense that it is owing to the high level of uncertainty of the time-specific.

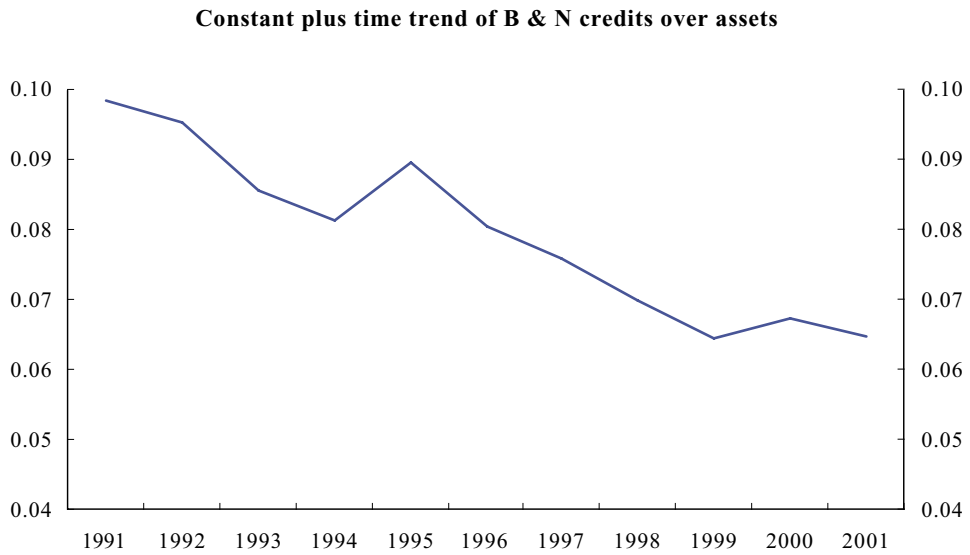
Table 11

Estimation results

	Credits over assets				Debits over liabilities			
	Bonds & Notes		Money Market Instruments		Bonds & Notes		Money Market Instruments	
	Parameter	Std. Error	Parameter	Std. Error	Parameter	Std. Error	Parameter	Std. Error
NACCR	-0.02	(0.01)	-0.04	(0.03)	-0.05	(0.01)	-0.03	(0.02)
AGG	-0.02	(0.01)	-0.06	(0.03)	0.04	(0.01)	0.01	(0.02)
CRED	-4e-3	(0.01)	0.09	(0.03)	-0.01	(0.01)	-2E-3	(0.02)
Country dummies	Significant for DE, GR, IE, NL & UK		Significant for PT		Significant for DE, DK, FI, NL, PT, SE & UK		None significant	
Time dummies	Significant for all except 1992 and 1995		None significant		Not significant except 1992 and 2001		None significant	
Constant	0.10	(0.01)	0.09	(0.05)	0.06	(0.01)	0.05	(0.03)
σ_c	0.00		0.00		0.00		0.00	
σ_e	0.01		0.04		0.01		0.02	
R^2	0.77		0.48		0.78		0.50	
N	84		53		92		61	

Figure 13

Time trends estimated



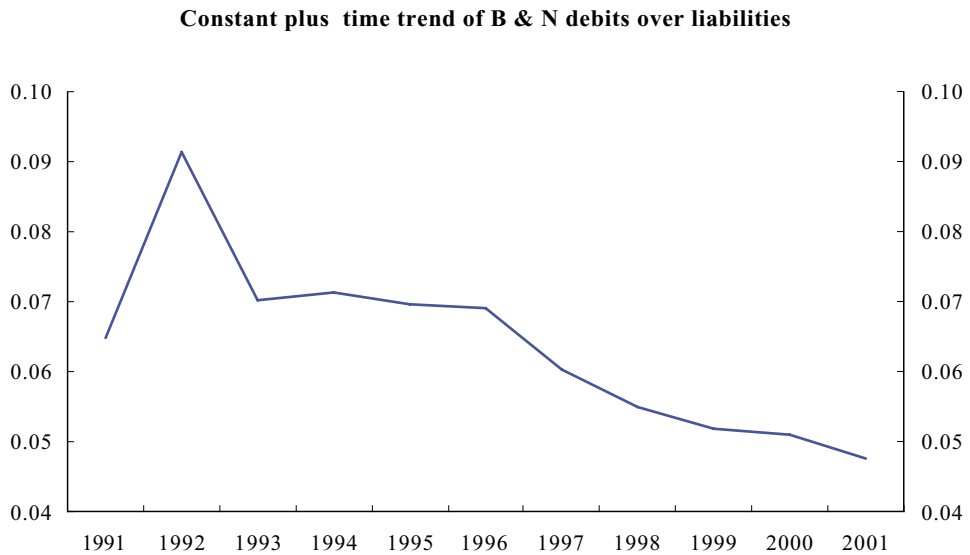
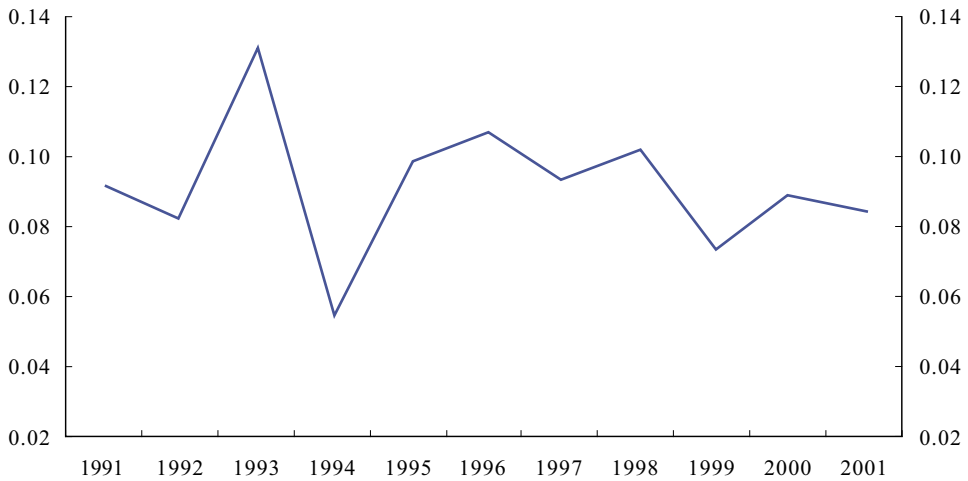
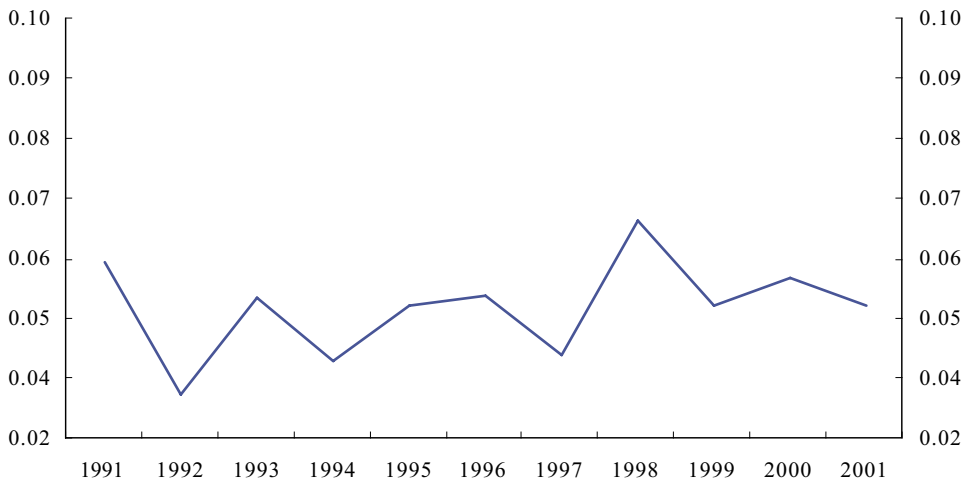


Figure 13 (cont'd)
Time trends estimated

Constant plus time trend of MMI credits over assets



Constant plus time trend of MMI debits over liabilities



3. Tax rates for dividends

(Percentages)

Country	Rate	Country	Rate
Greece	35	Italy	12.5 or greater
Luxembourg	20 (in 2002),	(depending on the beneficiary)	
	25 (in 2001)	Spain	18
Austria	25	Portugal	20
U.K.	20 or greater	Finland	29
Germany	25	Japan	20
Denmark	30	USA	35
Sweden	0-30	Switzerland	35
(depending on the beneficiary)		The Netherlands	25
France	33	Belgium	15-25
Ireland	25		

4. Debtor approach on an aggregated basis (with a fully operational CSDB)[3]

This section contains a suggested estimation method for applying the debtor approach on an aggregated basis and the results of an empirical analysis in the case of Austria.

For the estimation of aggregated nominal values (of each available category), it is necessary to include aggregated (average) market prices based on the suggested/available dimensions for the average yields, ideally weighted by the outstanding amounts (the same algorithm as for average yields) in the CSDB. With these "benchmark prices", every country with an aggregated system can estimate the nominal value of its asset allocation. Combined with average nominal yields (calculated in the same way as average market yields), the debtor approach can be applied in countries with an aggregated system. If the composition of the total outstanding amount in each category is similar to the composition of the assets allocation, then the estimation of the income on a debtor basis will not be worse than the estimation on a creditor basis. Both approaches rely on the same assumption.

The estimation of aggregated nominal values was tested for categories of Austrian long-term debt securities (mixed approach), and the results compared with the real nominal value of the liabilities. The results (at end-2001) are as follows:

Category of Austrian long-term debt securities	Differences between estimated and real nominal values of liabilities in %
Government/EUR	+2.5
Government/CHF	+2.4
Government/USD	+3.7
Government/JPY	+1.7
MFIs/EUR	+1.5
MFIs/CHF	+1.5
MFIs/USD	+2.0
MFIs/JPY	+0.8

On average, the differences between the estimated nominal values and the real nominal values lie between +2% and +3%. These positive differences can be attributed to the fact that this estimation takes into account accruals in the case of liabilities but not in the case of the total outstanding amount. These (small) differences could be further reduced if accruals were also taken into account for the total outstanding amount. This will of course be possible with the CSDB, since "clean and dirty marked-to-market prices in all common quotations" have been requested.

That means that only negligible differences can be expected between the estimated and the real nominal values. When the CSDB is fully operational, the creditor and the debtor approaches will both be applicable – with the same (high/low) quality.

3 *Figures in the table should purely be used as a very rough guide, as there are numerous exceptions and specific treatments that cannot be quoted here.*

5. Letter from the Chairman of the TF PII to the CSDB BCG

ESCB Task Force on Portfolio Investment Income

Mr Alexandre Cruz
Project Manager

Mr Werner Bier
Chairman of the Business Coordination Group
Centralised Securities Database Project
European Central Bank
Frankfurt am Main, Germany
Frankfurt am Main, 22 October 2002

By internal mail

Centralised Securities Database (CSDB): Requirements identified by the Task Force on Portfolio Investment Income

Dear Alexandre and Werner,

I am writing to you in my capacity as chairman of the Task Force on Portfolio Investment Income (TF-PII). The TF-PII was set up by the Statistics Committee in its February 2002 meeting as a follow up to the Task Force on Portfolio Investment Collection Systems (TF-PICS). The TF-PII was mandated to investigate practical solutions for further harmonisation in the collection / calculation of accrued Portfolio Investment Income in balance of payments (b.o.p.) statistics. By identifying sources for asymmetries in national data contributions to the euro area b.o.p. and recommending appropriate action, the TF-PII is expected to improve the quality of both the euro area aggregates and national statistics.

In its mandate, the TF-PII was asked to consider in its analysis any foreseeable changes in Portfolio Investment data collection systems. Bearing this in mind, the role of the Centralised Securities Database (CSDB) has been deemed crucial for the future compilation of these statistics and, therefore, the STC mandated the TF-PII to work under the assumption that the CSDB will be fully operative for the implementation of its final recommendations. In this framework, the TF-PII is also discussing all CSDB requirements necessary for the calculation of Accrued Portfolio Investment income.

In your letter to the chairmen of the Working Groups of Money and Banking Statistics, Balance of Payments and External Reserves Statistics and Monetary Union Financial Acounts, dated 27 August 2002, you asked the Working Groups to "finalise their a) evaluation of the inclusion or

exclusion of the CSDB variables and b) the assessment/review of the level of importance (essential or desirable) of each variable and its priority."

Although its final report is not due until December 2002, the TF PII has already identified a number of requirements which we deem indispensable for the succesful implementation of our findings. We found it appropriate to communicate these requirements to you at this point in time so that you can ensure their implementation in the course of phase 1 of the project.

To ensure the calculation of Accrued Portfolio Investment income the CSDB needs to provide - with a monthly frequency - two types of benchmark yields:

(i) one based on marked-to-market yields, and

(ii) another one based on nominal yields.

Such benchmark series of current yields are required for all the following dimensions and for any subset of dimensions (conditional on their applicability for a given type of instrument):

by instrument: Equities (with a separate distinction of collective investment institutions' shares), Bonds & Notes, Money Market Instruments

by original and residual maturity (1, 2, 5, 10 and > 10 YEARS)
by currency of issue : EUR, USD, JPY, GBP, CHF, other
by country of issue, as a minimum, according to the step 3 country breakdown (see annex)
by sector of issuer : Monetary Authorities, General Government, MFIs, Other.

As we conclude from the User Requirements Document (URD), the respective functionalities are already foreseen. The above-mentioned benchmark series might however deserve a high priority in the design and implementation of the CSDB system.

Similarly, the TF-PII identified a list if items describing the characteristics of individual securities, which are the prerequisite for calculating the requested information. Again they all seem to be covered by the URD, either as an item directly stored or derived on the basis of other variables. However, according to the importance of the calculation of Income, the TF-PII suggests to classify all of them as "essential" elements of the CSDB data dictionary:

country of the issuer (ISO code)
country of the issue market (ISO code)
currency of issue (ISO code)
sector of issuer (institutional sector according to ESA 95)
original and residual maturity
nominal value
nominal coupon (debt securities)
payable dividends and reinvested earnings (equity securities)
issue premium/discount
current marked-to-market yields calculated by all common calculation methods
clean and dirty marked-to-market prices in all common quotations

While calculating the aggregated yields, the individual securities' information should be ideally weighted by the outstanding amounts.

In any level of requirements (i.e. aggregated and security by security information), the TF-PII puts a special emphasis on completeness, as well as on the application of reliable and generally accepted estimation procedures for replacing missing observations. In this regard, the above-mentioned benchmark yields might also be used for the estimation of missing observations.

If you have any questions on these requirements, please do not hesitate to contact myself or Mr Carlos Sánchez Muñoz.

Best regards,

[signed]

Michael Connolly

Chairman of the Task Force on Portfolio Inv estment Income

Cc: Mr. Steven Keuning, Chairman of the Statistics Committee
Mr. Jean-Marc Israël, Chairman of the WG BP & ER
Mr. Michel Stubbe, Chairman of the WG MBS
Mr Carlos Sánchez Muñoz, Secretary of the TF-PII
Mr Jung-Duk Lichtenberger, Secretary of the BCG
Members of the TF-PII

Annex: step 3 list of countries

Denmark
United Kingdom
Sweden
European Union Institutions
Total candidate countries
Switzerland
Canada
United States
Japan
Offshore centres
International Organisations outside the European Union
Rest of the World

Supplementary documents

1. Consequences of the non-Application of the Accruals Principle

Introduction

The recording of income on an accruals basis has been established as an international standard since 1993. It is the aim of this study to elaborate the rationale behind this principle and to empirically investigate the consequences of its (non-)application on the recording of Portfolio Investment Income in the balance of payments at the level of both national and euro area statistics.

This document intends to prepare the final position of the Task Force on Portfolio Investment Income (TF-PII) on this issue based on empirical investigations. It focuses on the differences in amounts recorded caused by the non-application of the accruals principle.

The paper is structured as follows: Section 2 presents the conceptual background behind accruals recording. Section 3 presents a theoretical example illustrating the distortions caused by the non-application of the accruals principle. Section 4 outlines the details of the empirical investigation for the two countries concerned: Austria and Germany. After a description of the data (data collection and instrument coverage) and of the calculation methods applied, the empirical results are presented and discussed. Section 5 concludes.

Recording portfolio investment income on an accruals basis

The euro area portfolio investment account includes (i) equity securities and (ii) debt securities in the form of bonds and notes and money market instruments, except for those falling into the category of either direct investment or reserve assets.

According to the ECB Guideline ECB/2000/4 on the statistical reporting requirements of the ECB, which follows current international standards[1], the compilation of income following the accruals principle is mandatory for debt instruments.

The purpose of applying the accruals principle is to record the cost of capital continuously, i.e. at the time when the claim or liability arises, not at the time the payment is effected. In practice this means that income is converted in a series of monthly or quarterly payments.[2] Thus the recorded cost of capital matches with the provision of capital. Since under this method income will in most cases be recorded in the current account **before** the payment is effected, a counter-entry to keep the balance of payments in equilibrium becomes necessary. According to the IMF's Balance of Payments Manual (BPM 5) this counter-entry is to be made in the financial account under the relevant security as if it were an investment in that instrument. The actual payment of the investment income will then not effect the current account as the sum has already been recorded. Instead, the payment will be entered as disinvestment under the relevant security segment in the financial account. This implies that, while applying the accruals principle, a distinction is to be made between the recording of interest accrued (which is usually estimated or calculated) and the recording of interest actually paid.

Therefore, in the b.o.p. and i.i.p. statistics the accrued interest has to be included in the underlying instrument. By this, accrued interest is implicitly treated as an additional investment in the underlying instrument.[3]

In practice, at the time interest accrues, the amount of the **claim** associated with the non-payment **must be recorded** (i) in the *current account* under investment income and (ii) in the *financial account* under portfolio investment - according to the underlying instrument. When the actual coupon payment occurs, this

1 *The Annex 1.*
2 *The ECB Guideline ECB/2000/4 request accrual recording on a quarterly basis, yet a monthly recording is preferable.*
3 *This treatment differs from the consolidated MFI balance sheet statistics where the accrued interest is recorded separately from the instruments to which it relates under the (sub-) categories of remaining assets and remaining liabilities respectively (ECB Guideline ECB/2001/13).*

payment then should not be recorded under investment income, but in the financial account, representing a reduction in the liabilities/assets.[4]

Methods to calculate accrued income

As for the calculation of the accrued interest, several approaches are currently under discussion:

– The **debtor approach** assumes that the future flow of interest is determined at the point of issue. This means essentially that it is not affected by any subsequent changes in market conditions. This method uses the nominal value and the nominal interest rate to calculate the accrued interest. The nominal value of the outstanding amount has to be multiplied by the nominal interest rate. The method can be extended to zero coupons bonds and deep discounted securities by using a so called implicit interest rate. The main arguments for choosing this approach are that

  - it best represents the cost of capital associated with the security[5] and
  - it is easy to implement if security-by-security reporting combined with a securities database is used.

The approach derives its name from the fact that it records the accrual of interest from the perspective of the issuer (debtor), which is why it is also sometimes called **issuer approach**.

– The **acquisition approach** is recommended in the BPM5 for cases when a deep discounted security is traded in the secondary market (zero coupon bonds):[6]

  "If, prior to maturity, a zero coupon or deep discounted bond is traded in the secondary market ... prevailing interest rates reflecting the difference between the new owner's cost and the value of the bond at maturity should be used for the subsequent recording of interest on the bond." (BPM5, paragraph 396)

– The **creditor approach** is widely seen as the main alternative to the debtor approach. It calculates the accruing interest flows for both counter-parties, following each change in market conditions. It uses the principles of fair value recognition and is described in the IMF's balance of payments compilation guide (BPCG) as follows:

  "For securities (portfolio investment) accrued interest for a particular period should be calculated by applying the prevailing interest rate to the average market rate of the security. The result may differ from coupon interest payments made during the period." (BPCG, paragraph 620) As this approach relies heavily on market information it is also sometimes referred to as the **market approach**.

Along the logic of the creditor approach, estimation methods used to **calculate accrued interest** should be based (i) on the market value for stocks and (ii) on the prevailing interest rate in the market *at the time of compiling the accrued interest* ("market principle"). Nevertheless, the prevailing interest *rate at the time of issuance* ("debtor principle") may be used as a pragmatic approach in the case of bonds with a fixed interest rate (e.g. government bonds), if data in accordance with the market principle are difficult to obtain.[7] The results of such estimates should be improved by introducing a

4 Offsetting entries for accrued interest are required in the quarterly b.o.p. financial account and in the i.i.p.; in the monthly b.o.p. key items the same treatment is recommended (but not required), in line with the income account.

5 It is further argued that it reflects the market price principle in the sense that the figures used represent the market price at the time of issue.

6 Like the debtor approach, the acquisition approach relies on an amortised cost measure of interest income - this time viewed from the perspective of the acquirer -, which is why some authors do not view it to be materially different from the debtor approach (see Joisce and Wright, IMF Working Paper, WP/01/132.)

7 It may be pointed out, however, that such an approximate "debtor" approach which applies average rates to debt securities with differing maturities may lead to significantly distorted figures, thus much of the proposed conceptual advantages of he debtor approach.

maturity, sectoral and currency breakdown for the stocks held by non-residents, thus enabling the compiler to apply a **benchmark interest rate** to each maturity.[8]

The optimal way to calculate accrued interest is on a security-by-security basis, using detailed information from a securities database - if such a database is available.

The rationale of recording interest on an accruals basis

The recording of income according to the accruals principle is based on the notion that the b.o.p. records "the economic transactions of an economy with the rest of the world" (ECB BOP - Book, 2000, p.17). An economic transaction is "an economic flow that reflects the creation, transformation, exchange, transfer, or extinction of economic value and involves changes in ownership of goods and/or financial assets or liabilities." Thus, interest should be recorded on an accruals basis in order to ensure that the cost of capital continually matches the provision of capital in a *periodically correct manner*.

To illustrate the conceptual difference of the application of the accruals principle in the accounting of the balance of payments, we consider a **10-year bond** issued in January 2002 by the government of country A with a nominal value of 100. The annual coupon rate is supposed to be 12 % and is payable each end-January. To simplify calculations, the interest accrued each month is assumed to be 1.

At the time of issue, the bond is acquired and held by a resident MFI. Due to tax reasons (different taxation on revenues between residents in country A and non-residents) the bond is sold at the beginning of January 2003 to an MFI resident in country B. The price of the transaction includes the accrued interest (i.e. amounting to 111). No other valuation changes affect the price of the bond meanwhile.

In January 2003, the General Government of country A pays the coupon to the holder (12). Once the coupon is paid to the non-resident MFI, the MFI resident in A repurchases the bond at the beginning of February 2003 (for an amount of 100). Finally, we assume that all transactions are settled via MFIs accounts. The following table shows the entries in the respective balance of payments accounts of country A if the accruals principle is not applied in January and February 2003.

8 If such a breakdown is not available, a feasible way forward may be to assume that non-residents hold debt instruments in proportion to the share of each maturity in the total outstanding amount of debt instruments.

Balance of payments of country A if the accruals principle is not applied : January 2003

Credits/inflows		Debits/outflows	
111	*[Financial account/Liabilities/ General Government/Bonds and notes]*	*[Financial account/Liabilities/ MFIs /Other investment]* 1)	111
12	*[Financial account/Liabilities/MFIs/ Other investment]*	*[Current account/income]* 2)	12

1) Sale of the bond by the resident to the non-resident MFI.
2) Coupon payment from the General Government to the non-resident.

Balance of payments of country A if the accruals principle is not applied : February 2003

Credits/inflows		Debits/outflows	
100	*[Financial account/Liabilities/MFIs/ Other investment]*	*[Financial account/Liabilities/General Government/Bonds and notes]* 1)	100

1) Repurchase of the bond by the resident from the non-resident MFI.

Not applying the accruals principle, i.e. compiling the interest on a due-for-payment basis leads to the following annual balance of payments for country A:

Annual balance of payments of country A if the accruals principle is not applied

Credits/inflows		Debits/outflows	
11	*[Financial account/Liabilities/ General Government/Bonds and notes]*	*[Current account/income]*	12
1	*[Financial account/Liabilities/MFIs/ Other investment]*		

To contrast this to the transactions that would take place if the accruals principle is applied we take a look at the following table:

Balance of payments of country A if the accruals principle is applied : January 2003

Credits/inflows		Debits/outflows	
111	*[Financial account/Liabilities/ General Government/Bonds and notes]*[1)]	*[Financial account/Liabilities/MFIs/ Other investment]*	111
1	*[Financial account/Liabilities/ General Government/Bonds and notes]*	*[Current account/income]*[2)]	1
12	*[Financial account/Liabilities/MFIs/ Other investment]*	*[Financial account/Liabilities/ General Government/Bonds and notes]*[3)]	12

1 Sale of the bond by the resident to the non-resident MFI.
2 Attribution of the monthly accrued interest to the non-resident holder.
3 Coupon payment from the General Government to the non-resident.

Balance of payments of country A if the accruals principle is not applied : February 2003

Credits/inflows		Debits/outflows	
100	*[Financial account/Liabilities/MFIs/ Other investment]*	*[Financial account/Liabilities/ General Government/Bonds and notes]*[1)]	100

1 Repurchase of the bond by the resident from the non-resident MFI.

These transactions lead to the following annual balance of payments of country A:

Annual balance of payments of country A if the accruals principle is applied

Credits/inflows		Debits/outflows	
1	*[Financial account/Liabilities/MFIs/ Other investment]*	*[Current account/income]*	1

Based upon this schematic example, we may therefore state the following consequences of a non-application of the accruals principle:

- Over-estimation of the current account deficit of country A since the whole of the coupon is attributed to the non-resident, who in fact only holds the bond for one month (1/12 out of the bond's life).

- Over-estimation of financial account inflows of country A due to the attribution to the non-resident MFI of financing flows (to the general government), which actually correspond to domestic funding by the resident MFI

- Should countries A and B be part of the euro area and should only one of them apply the accruals principle (e.g. country B), these intra euro area transactions would not cancel out. Asymmetries would directly show up in the euro area b.o.p., both in the current account (income on portfolio investment) and the financial account (portfolio investment liabilities of the General Government). The reason is the specific algorithm used for the compilation of both euro area b.o.p. items

To illustrate further the last item, the following table shows the annual balance of payments of the euro area if country B would apply the accruals principle whereas country records income on a due-for-payment basis.

Annual balance of payments of the euro area if only country B applies the accruals principle

Credits/inflows		Debits/outflows	
11	*[Financial account/Liabilities/ General Government/Bonds and notes]*	*[Current account/income]*	11

However, since ideally all intra-euro area transactions should cancel out no transaction should show up in the euro area b.o.p., since there are no flows vis-à-vis non-euro area residents.

The example shows the importance of a homogenous application of the accruals principle in Portfolio Investment Income calculation throughout the euro zone.

Empirical Studies

As described in the previous chapters, the implementation of the accruals principle effects both, the recording of portfolio investment transactions and the corresponding income streams. This chapter presents two country specific (Austria and Germany) empirical analyses which demonstrate the impact of accruals recording versus pure cash payment recording in practice.

Austria

Calculation of accruals is done security-by-security based on monthly (average) nominal stocks using nominal interest rates from the securities database. Effects of premiums, discounts etc. resulting from differences between price at issuance and price at redemption are taken into account by calculating a so called "implicit" interest for each individual security and applying it to the nominal stocks together with the nominal interest rate. For this reason zero coupons and deep discounted papers can be treated correctly. The same methods are applied for assets and liabilities. The quality of the accrued income data depends highly on the quality of the securities database and of the reported stocks.

Actual interest payments are currently collected via our settlement system. The collection of these payments in case of

portfolio investment is also done on a security-by-security basis. In the Austrian case it is possible to compare figures of coupon payments and accrued interest on a monthly, quarterly and yearly basis.

There are some reasons why we can expect lower income figures (debit/credit) under the recording-upon-payment-principle (with respect to accruals recording) on a yearly basis:

1) Interest of zero coupons is not taken into account in the case of using coupon payments for the income position

2) Interest of deep discounted securities is underestimated in the case of coupon payments

3) The liabilities and assets position in Austria (nominal and market values) has increased over the last years. While the accruals principle takes into account the interest of securities issued in the present year, coupons will often be paid in the next year. For decreasing stocks the inverse is true. This effect may be reduced or even amplified further if there are significant changes in the market interest rates.

As an example we consider an Austrian government bond: AT0000385067 (20010116 - 20110104; 5.25%; coupon date: January)

– non residents holdings at the end of 2001: ~6bn Euro

– accrued interest 2001: ~280m Euro (debet)

– no coupon payments in 2001

These points can be generalised to all other countries. Additional reasons for differences between income figures generated by applying one of the two concepts are:

4) Using coupon payments interest contained in dirty prices is not recorded under PI/income but under the financial account as PI. Only the coupon payments are recorded as income.

As an example we consider the following bond of Slovakia (SK**, 20000406 - 20050406; 9%; coupon date: April):

– no resident holdings at the end of February

– resident holdings at the end of March: ~6bn SKK

– no resident holdings at the end of April

– accrued interest (2001): 50m SKK inflow

– coupon payments (2001): 600m SKK inflow

5) In one case the data quality depends on the correct recording of the coupon payments and in the other case the correct calculation of accrued interest depends on the quality of our securities database and on the stocks reported by domestic banks and non-banks.

The following examples compare figures generated by applying the accruals principle on the one hand and the principle of coupon payments on the other hand.

On the liabilities side sectoral income outflows (government, MFI, other sectors) of long term bonds and notes for both concepts were considered. Figure 14 shows the development of sectoral income outflows on a yearly basis since 1997.

We can see that for all three sectors the use of the accruals principle leads to higher yearly income figures. In the case of government bonds the differences between the two concepts are as expected (about 5%). The differences are mainly due to point 3 described above. An analysis (year: 2001) of the considerable differences (about 20-30%) in the case of MFI bonds came to the following (rough) results:

– about 15-20% are due to points 1 and 2

– about 25-30% are due to point 3 (under consideration of the yield curve)

– about 20-25% are due to quality problems with our securities data base

– about 25-35% are due to incorrect reporting of coupon payments; coupon payments are often reported as portfolio investment (that means that under the accruals principle the payments are correctly recorded in the b.o.p.)

– the consequences of point 4 are not significant

Therefore we can say that the published accruals are a little bit too high (about 3-5%) but have a high quality. The (biggest) mistakes identified in our securities database will be corrected. A monthly analysis of the figures shows that in the case of government bonds the coupon payments in January (and in the first quarter) and in July are much higher than the accrued income figures - that is due to the high concentration of coupon payments in January and July. Figure 15 shows the time series in million Euros on a quarterly basis.

Figure 14

Sectoral income outflows - accruals versus coupon payments

(Thousands)

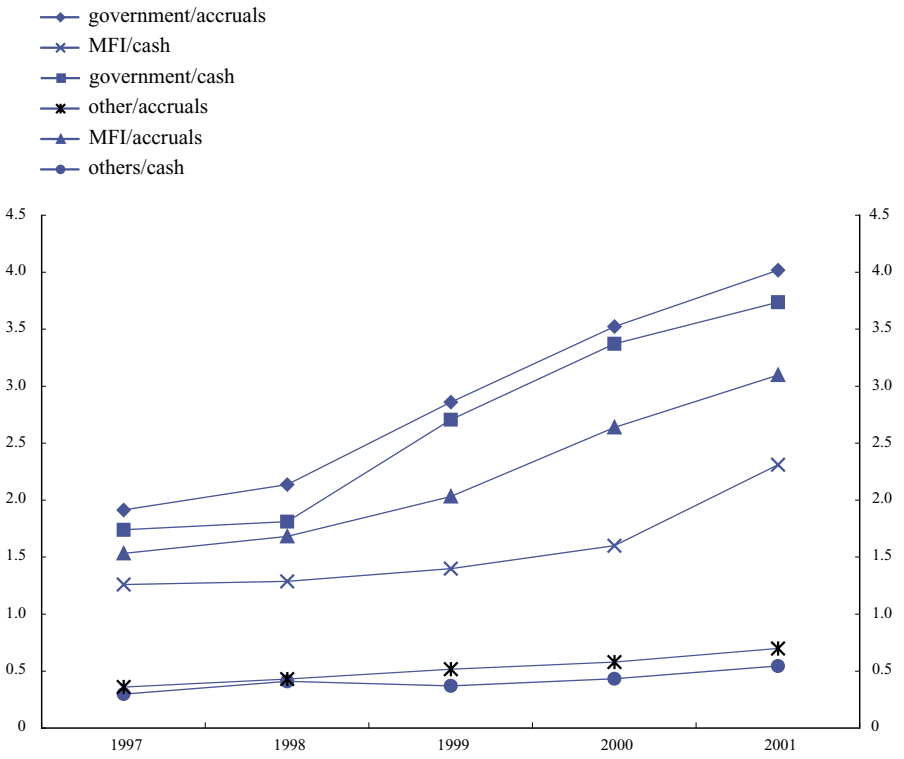


Figure 15
Income outflows/government - accruals versus coupon payments

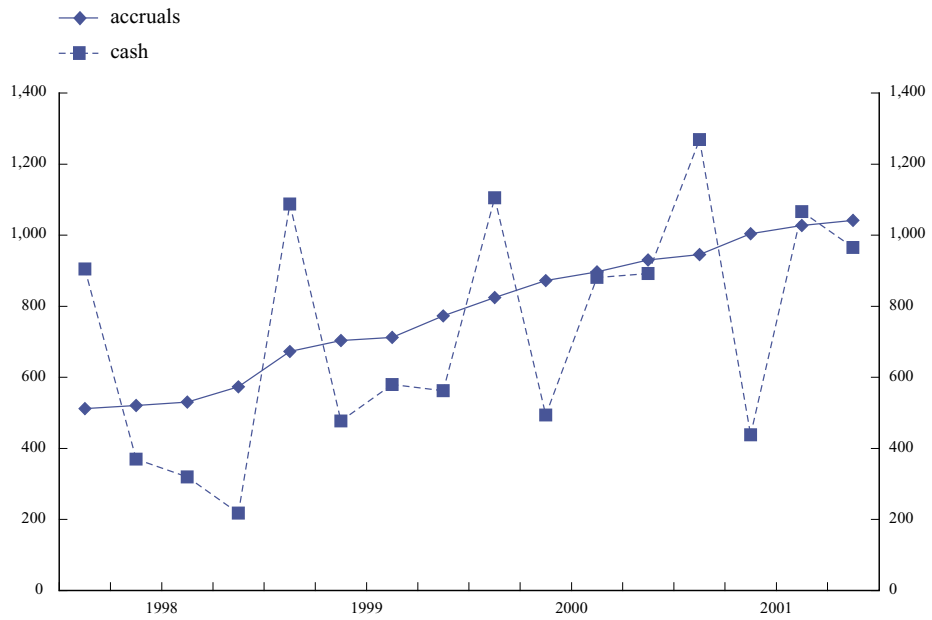
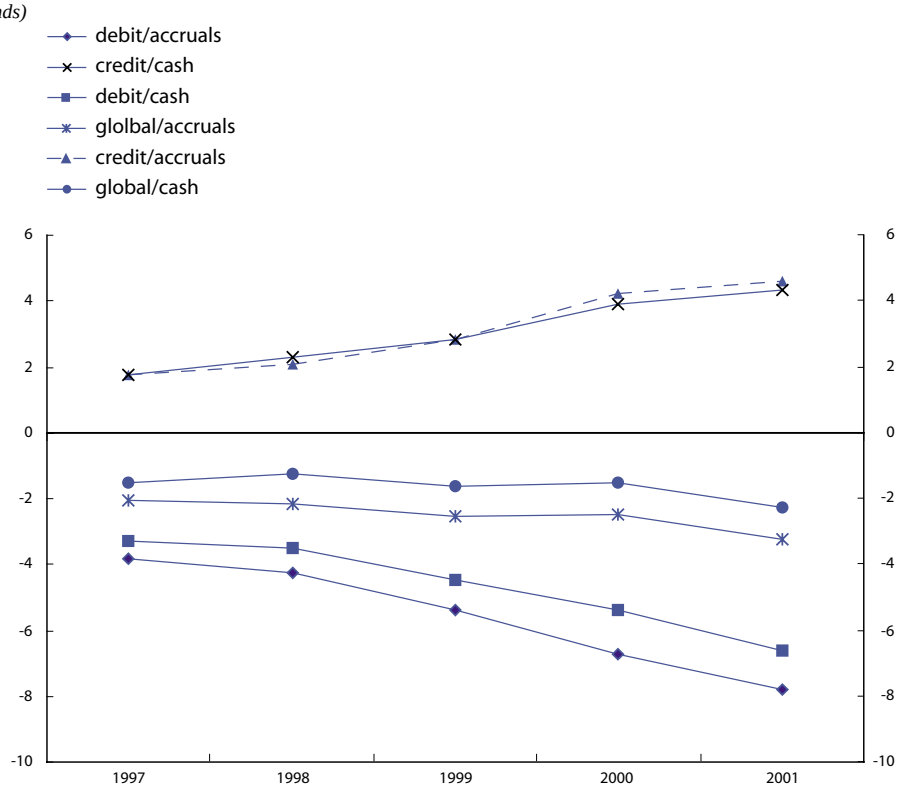


Figure 16 shows the development of global credit, debit and net income flows in million Euros for the two different concepts since 1997. The differences on the liabilities side are on average 20% and on the assets side 5-10%.

Figure 16
Global income - accruals versus cash payments

(Thousands)



Detailed tables concerning income figures on a monthly, quarterly and yearly basis for the two concepts are available.

Germany

Currently the accruals principle is applied only on the assets side. Interest is estimated by applying benchmark yields to broad aggregates. Although cash payments are also reported for these items, they are not compiled owing to considerable under-reporting.

On the liabilities side, however, the accruals principle is so far not applied. Instead, the current account shows the reported cash payments, corrected by an estimation for interest payments on domestic securities held by Germans abroad.

In future, accrued interest on liabilities will also be calculated on an aggregate basis for government bonds and private bonds. The calculations are based on the market value of monthly average stocks. A benchmark yield is applied to these stocks.

The following study concentrates on the discrepancies between recorded income streams for domestic government bonds under the cash approach and the accruals approach.

The study shows three time-series for income:

1) Paid interest: Reported cash payments

2) Interest recalculated: Here 1/12th of the paid interest of the following 12 months is attributed to the present month.

(These data are of no relevance to the future system of calculating accruals. However, this method could be applied in order to correct past time series. The method is based on the assumption that the majority of government bonds bear yearly coupons.)

3) Accrued interest: Benchmark yield is applied to monthly average stocks at market price (creditor approach).

Figure 17 shows that, with regard to the monthly data, differences between accrued income and cash payments are most obvious

Figure 17

Cash payments, 1/12 of following month and accrued interest, monthly

(EUR billions)

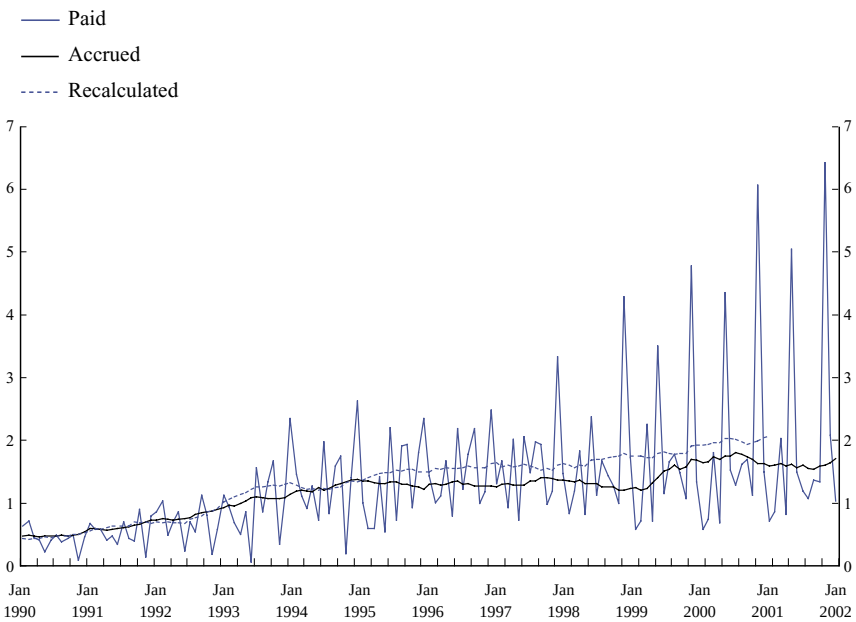
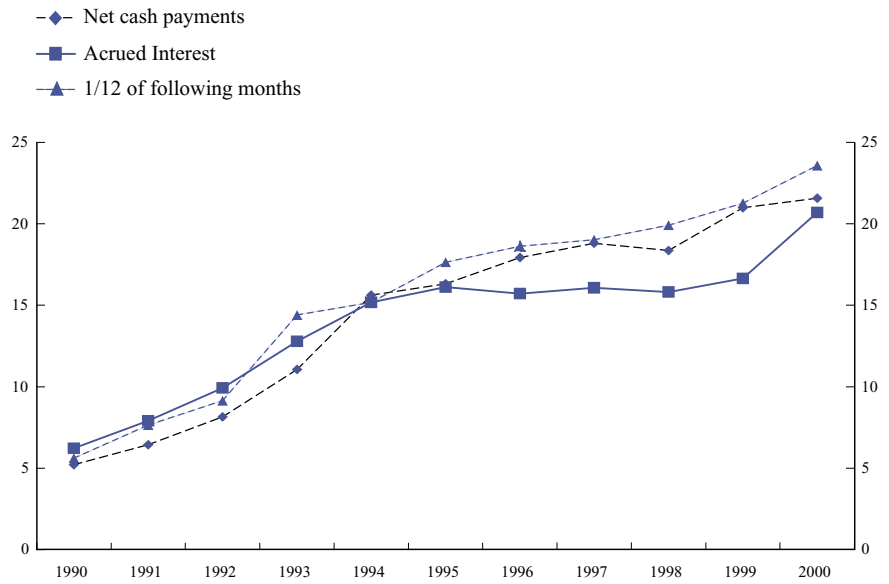


Figure 18

Cash payments, 1/12 of following month and accrued interest, monthly

(Thousands)



in January and July, owing to the fact that coupon payments are highly concentrated on these dates. On a yearly basis - as demonstrated in Figure 18 - all three time series show a rather continuous development. This is due to the fact that the underlying aggregate has also developed continuously.

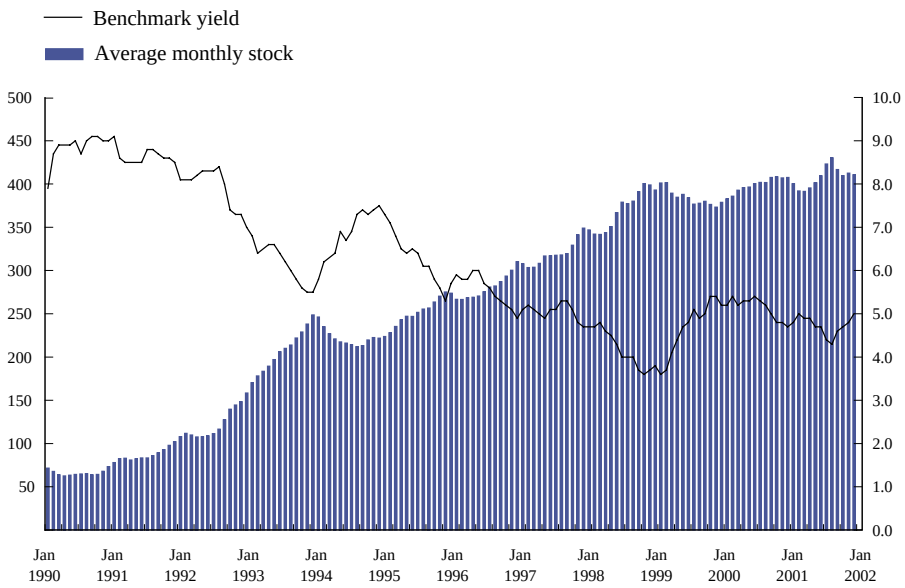
Given the constant increment in stocks, it is surprising that accrued interest is higher than paid interest until 1994, whereas in the following years it is lower. Although interest rates have decreased continuously during this period, this is also true for the period 1990 to 1993, when accrued interest was slightly higher than cash payments, as is to be expected under this approach (see Figure 19).

Figure 19

Stocks at market value and benchmark yields applied

(EUR millions, left-hand scale)

(Percentages, right-hand scale)



The possibility of compiled cash payments being too high cannot be rule out because the above-mentioned estimation on Germans' holdings of domestic securities abroad is very uncertain. This means that cash payments might have to be reduced further.

Figure 6 shows the yearly average IIP stocks as well as the yearly average net cash payments. Both series increase rather continuously over time.

The example presented is simplified in that it calculates interest on the whole aggregate, without a split regarding remaining maturities. However, the calculation of the benchmark yield weights the aggregate according to remaining maturities.

Conclusions

The main purpose of the recording under the accruals principle is to attribute income flows to the actual holders of the relevant instruments in a periodically consistent way .

The sub-group investigated two approaches for recording income figures: accruals recording versus pure cash payment recording. Comparisons between the output of the two approaches were made on a yearly, quarterly and monthly basis

The sub-group found the following explanatory items for differences between the two approaches on a yearly basis:

- evolution of (nominal) stocks (in connection with evolution of interest rates)
- zero coupons and deep discounted securities
- different sources for calculating (or estimating) accrued and cash income figures

Another reason for differences on a yearly basis might be due to the application of the creditor approach for estimation of accrued interest (whereas cash payments refer to the perspective of the issuer - debtor approach). This is the case for Germany. Concerning the impact of differences between the debtor and creditor approach see the report of the sub-group on the "Empirical investigation on the differences in the results following the creditor / debtor approaches".

Concerning the impact of the evolution of stocks the sub-group found that, given stable market interest rates and increasing stocks over time, income recorded under the accruals principle has to be higher than income calculated on a pure cash settlement basis. For the case of decreasing stocks, the inverse would be true. This ceteris paribus effect may be reduced or even amplified further if there are significant changes in the market interest rates.

In the case of Austria we can see that for all three sectors the use of the accruals principle leads to higher yearly income figures. However a similar exercise based on German data revealed inverse results from 1994 onwards, which might be partially explained by a significant drop in market yields (as in the German exercise the estimation of accruals is based on the creditor approach in contrast to the calculation of accruals in Austria, which based on the debtor approach).

The investigations also show that on a quarterly (or even monthly) basis the differences between the two approaches might be much higher than on a yearly basis. Besides the reasons mentioned above this is due to a high concentration of coupon payments at specific dates (often the case for government bonds).

Given these results, our conclusions are the following:

- From a theoretical point of view, applying the accruals principle is the adequate way to record income in the spirit of b.o.p. recording.
- Given this statement, significant discrepancies have been revealed in the empirical investigations carried out by the sub-group between the recording of income on a cash basis and the recording on an accruals basis for yearly, quarterly and monthly income figures irrespective of the exact method the accrued interest is calculated.
- Due to the role of intra-euro area flows in the algorithm applied to calculate portfolio investment income for the euro area aggregates, the application of the accruals principle by all countries at the same frequency is crucial to ensure the accuracy of the final product, i.e. the euro area b.o.p.

Annex
International Standards concerning the accruals Principle

In line with the System of National Accounts (SNA 93) regulation, the fifth edition of the IMF's Balance of Payments Manual (BPM 5) recommends that interest should be recorded on an accruals basis. This recommendation affects the current account (investment income), with a complementary effect on the financial account. For the b.o.p. statistics of the euro area, accrued investment income is required only on a quarterly basis.

The 1993 System of National Accounts guideline states:

"Accrual accounting records flows at the time economic value is created, transformed, exchanged or extinguished. ... The system favours accrual accounting because:

(a) The timing of accrual accounting is in full agreement with the way economic activities and other flows are defined by the System. This ... allows ... to evaluate the profitability of productive activities correctly (i.e. without the disturbing influence of leads and lags in cash flows) and to calculate a sector's net worth correctly at any point in time;" (SNA93, 3.94)

By the same token, for balance of payments, the BPM 5 indicates the same principle for income:

"Under investment income, interest is recorded on an accruals basis, which is the continuous method of recording that matches the cost of capital with the provision of capital. If the interest is not actually paid, an entry is required, together with an offsetting credit entry in the financial account for the claim associated with the non-payment (i.e. an increase in liabilities)." (BPM5, paragraph 121)

2. Empirical investigation on the differences between the creditor and debtor approaches

Introduction

Creditor versus debtor approach

When new international standards were published in 1993, one of the major changes to the SNA and BPM5 was the adoption of accruals, rather than cash recording, for income and expenditure. Since publication, a debate has emerged on the interpretation of accruals accounting in respect of interest flows associated with tradable debt. This debate has involved statisticians working in National Accounts, Balance of Payments Statistics, Monetary and Financial Statistics and Government Finance Statistics.

In essence, the crux of the debate is how to measure the property income from a fixed term debt security on which the cash flows are fixed, but whose market value is free to vary. Two approaches are under discussion:

- use the prevailing interest rate in the market at the time of issuance. This views the accruing interest income as fixed over the life of the security and has usually been termed the debtor approach, because the issuer is likely to view interest in this way.

- use the prevailing interest rate in the market at the time of compiling accrued interest. This takes the view that there is no clear way of determining what proportion of the future payments stream represent interest and what proportion capital (or holding gains/losses). This is usually termed the creditor or market approach.

This paper proposes a change of terminology to "issuer" and "market" approaches. These terms more accurately represent the method of calculation rather than who does the calculation.

Choosing between the two raises issues about the boundary between income and holding gains, and the interpretation of a "historical cost" view of interest under fair value accounting. The principle that interest can be delivered through a change in the value of security, as well as by means of an explicit payment is well established.

Also the interest deliverable by a tradable security can be viewed differently by different holders, because the acquisition cost for new holders will be determined by market conditions at the time of acquisition rather than at the time of issue.

No clear consensus has emerged, although the WGBP&ER have agreed that the creditor or market approach is conceptually preferable.

This paper will not explore the theoretical merits of either approach in any detail, but focus on the potential data requirements and impact on the income estimates of applying either the creditor or debtor approach.

Theoretical example

To illustrate the 2 different approaches a practical example is discussed (based on BOPCOM-00/14 - prepared by John Joisce and Chris Wright).

A 5-year zero coupon bond, issued for $747 but with a redemption value of $1000, has a yield to maturity of 6 per cent and would be shown by both the issuer and acquirer as generating accrued interest of $45 ($747*6 per cent) during the first year of its life. If there were no change in market conditions, then a new acquirer, purchasing the this security in the secondary market at the end of the first year would pay $792 ($747 + $45) and would amortise this smaller discount over the remaining four years to maturity. Both the issuer and the acquirer would record accrued interest of $48 ($792*6 percent) in the bond's second year ie there would be no differences in the interest accrued under both

Table 12

Main features of the example

(USD)

	Issuer (issuer)		New acquirer (market)	
Year	Year opening pv	Interest accrual	Year opening pv	Interest accrual
1	747	45	-	-
2	792	48	823	41
3	840	50	864	43
4	890	53	907	45
5	943	57	952	48
Redemption value	1,000	-	1,000	

the issuer and market approaches, primarily as there is no underlying change in interest rates during the lifetime of the bond.

However, market conditions would normally change over the life of such a bond, so that a new acquirer will typically view the return differently from the issuer. If, in our example, market interest rates had fallen at the end of the first year of the bond, immediately prior to the new acquirer's purchase, so that the new acquisition price rose to $823, then the new acquirer will face a yield to maturity of 5 per cent and will amortise the new discount to redemption over the four years to maturity. This gives accrued interest of just $41 ($823*5 percent) in the second year of the bond under the market approach, against the $48 ($792*6 percent) which will be reported by the issuer (issuer approach).

More detailed examples of the income accruing under changing interest rate conditions are provided in the empirical studies section.

Clearly a potential asymmetry arises between accrued interest streams calculated by the issuer and accrued interest streams calculated by the holder. Typically the holder may not have the information to calculate accrued income under the issue approach and the issuer will not have the information available to calculate the market approach. For example, if a bond is actively traded after issue, the issuer will only record in their accounts the coupon he is contracted to pay, while the holder will probably only record the market income accruing.

Data requirements

The BoP Compilation Guide (para 621) touches on the different data collection approaches required for the issuer and market approaches. The issuer approach requires issuers to record interest on the basis of the interest rate applicable at the time a security was issued. The market approach requires interest to be accrued according to the prevailing rate of interest for that particular security. Pure data collection using the market approach would probably imply a higher compliance burden, as the current yield to maturity for each tradable security would need to be collected (or estimated) for each period to be calculated.

The most accurate method of estimating interest payments on a market approach would be to calculate them for each and every bond in issue and sum the result. This would require all bonds in issue to be held on a securities database with an associated market price. Yields could either be collected or estimated as the rate of return which makes the discounted stream of future coupon and principal payments equal to the current market price. Ideally these calculations would be done daily, with the interest flows for a particular month or quarter simply the sum of the daily calculations. Taking the UK as an example, these calculations would need to be calculated for all bonds issued by UK residents and held by non-residents (UK debits) and all non-resident issued bonds held by UK residents (UK credits).

Obtaining and linking price data on a daily basis for each and every bond would be very resource intensive. Two alternatives can be envisaged:

- The Australian Bureau of Statistics (ABS) approach for long term debt, is to take the average stock of securities for a quarter (ie half the opening plus half the closing stock), valued at market value and apply market yields appropriate for each security. The ABS are planning to move to a security by security approach in the longer term, but currently applies average yields to average stocks. The main weakness with this approach is that prices and yields vary significantly in a month (or quarter).

- An alternative aggregate approach would be to make use of existing data on prices and yields compiled by private sector agents. The sterling bond indices produced by Barclays Capital for example cover over 80% of listed securities and can be sub-divided by sector, maturity and rating. The aggregate method would then be as follows:

(i) step 1 - calculate nominal levels of bonds separately by issuing sector, currency and by credit rating

(ii) step 2 - estimate market values for each category in aggregate

(iii) step 3 - multiply average market values by the average yield over the period for that category.

These calculations could be done for any period. A further sub-group of the PI Income Task Force is looking in more detail at the practicalities of estimating accrued income on a security-by-security and aggregate basis, but under stable market conditions, the market approach would appear to be well suited to estimation.

Case studies

The role of this subgroup is to determine the possible impact on BoP income estimates of using the market or issuer approach. The following section introduces two specific case studies that have been undertaken, and one theoretical example of the impact of changing interest on income accrued under the issuer or market approaches.

A. UK theoretical study of changing interest rates and their impact on income accruing under the issuer and market approach

The spreadsheet attached in annex I provides an illustrative example of the impact on accrued income under the issuer and market approaches under a range of interest rate scenarios. The spreadsheet assumes:

- the UK hold 3 10-year US issued zero coupon securities, issued at 4%, 5% and 6% (ie UK credits), and

- the US hold 3 10-year UK issued zero coupon securities, issued at 5%, 6% and 8% (ie UK debits).

The impact on issuer and market-based income is then determined under a period of rising interest rates, falling interest rates and fluctuating interest rates over the 10-year lifetime of the bonds. Also, the example analyses the impact on the UK and US portfolio investment income balances of adopting consistent issuer/market approaches and the impact of using different approaches. It is assumed that all the bonds are fully tradable in a highly developed market ie that any changes in interest rates will result in bond holders reassessing whether to retain or sell the bonds they hold.

Rising interest rates

Under the issuer approach, changes in interest rates have no impact on the accrued income, as the issuer will simply record the income that he is obliged to pay ie the yield to maturity determined by the issue price of the bonds.

Under the market approach however, as interest rates rise, the acquirer faces a higher yield to maturity, requiring the market value of the security to fall ie the new premium needs to be amortised over the remainder of the bond's lifetime, reducing the market price of the bond. However, as income is estimated as market value * market interest rates, and as the interest rates have increased, the holder will actually accrue a higher income flow ie the fall in the market price of the bond is more than offset by the rise in interest rates.

In our example, taking the 3 UK held securities, and interest rates increasing from 4% to 7%, 5% to 7% and 6% to 8.5% over the lifetime of the bonds, income earned was 1,060.9 under the issuer approach and 1,411.9 under the market approach. Similarly, for the three UK-issued securities held by the US, income paid was 1,263.2 under the issuer approach and 1,679 under the market approach. The higher income paid by the UK, is the result of the assumed higher interest rates in the UK (compared with the US).

Table 13

For ascending interest rates

	Issuer			Market		
Year	Credits	Debits	Balance	Credits	Debits	Balance
1	-	-	-	-	-	-
2	95.8	107.8	-11.9	105.1	116.7	-11.6
3	100.7	114.7	-14.0	112.7	129.8	-17.0
4	105.8	122.1	-16.3	126.3	144.9	-18.6
5	111.2	130.0	-18.8	139.2	158.3	-19.2
6	116.9	138.5	-21.6	151.1	176.1	-25.0
7	122.9	147.5	-24.6	164.6	196.5	-32.0
8	129.1	157.1	-27.9	183.2	220.0	-36.8
9	135.7	167.3	-31.6	204.8	251.8	-47.0
10	142.7	178.3	-35.6	225.0	285.0	-60.0
Total	1,060.9	1,263.2	-202.3	1,411.9	1,679.0	-267.2

Falling interest rates

Under the market approach, as interest rates fall, the acquirer faces a lower yield to maturity, requiring the market price to rise ie the new discount needs to be amortised over the remainder of the bond's lifetime, increasing the market price of the bond. Again as income is estimated as market value * market interest rate, and as interest rates have fallen, the holder earns a lower income flow ie the rise in market price of the bond is more than offset by the fall in interest rates.

In our example, again looking at UK credits, interest rates fell from 4% to 2%, 5% to 3% and 6% to 3% over the lifetime of the three bonds. Resulting income earned was 1,060.9 under the issuer approach, but only 833.1 under the market approach. It is worth noting that the income accruing under the issuer approach is unchanged in times of increasing, decreasing (or variable) interest rates. Similarly, for the three UK-issued securities held by the US, income paid was 1,263.2 under the issuer approach, but only 1,000.1 under the market approach.

Clearly the choice of approach will have a significant impact on the total income credits and debits. However, it should be noted that no asymmetries will arise between the UK and

Table 14

For descending interest rates

Year	Issuer			Market		
	Credits	Debits	Balance	Credits	Debits	Balance
1	-	-	-	-	-	-
2	95.8	107.8	-11.9	98.9	111.7	-12.8
3	100.7	114.7	-14.0	98.4	113.8	-15.4
4	105.8	122.1	-16.3	100.3	115.8	-15.4
5	111.2	130.0	-18.8	94.9	113.2	-18.3
6	116.9	138.5	-21.6	98.6	115.2	-16.6
7	122.9	147.5	-24.6	90.3	109.4	-19.1
8	129.1	157.1	-27.9	89.1	110.4	-21.2
9	135.7	167.3	-31.6	82.6	105.6	-23.1
10	142.7	178.3	-35.6	80.0	105.0	-25.0
Total	1,060.9	1,263.2	-202.3	833.1	1,000.1	-167.0

US in our example, as long as the same approach is used by both countries and for both credits and debits ie consistent use of either issuer or market approach.

Findings

Using the issuer approach, income will remain the same over the lifetime of the bond, irrespective of any interest rate changes.

Using the market approach, income will be higher than the issuer approach in times of rising interest rate and lower in times of falling interest rates.

The choice of approach, will have an impact on total income credits, debits and balances. The impact on net income (receipts less payments) will depend on the relative size of both assets and liabilities and the development of the corresponding interest rates.

An asymmetric approach for credits and debits will distort the BoP income and current balance. Consistency of approach for both credits and debits and between countries will eliminate asymmetries (whichever approach is chosen).

B. UK study of switching to a market approach for estimation of accrued interest in the national accounts

Introduction

ONS has recently undertaken a short consultant project to investigate the implications for the UK National Accounts of calculating accrued interest on debt securities using the 'creditor or market' approach. The objectives were

- outline a broad methodology that could be used readily in UK for all estimates of this type of accrued interest
- review the data needed to do the calculations, assess their availability and identify whether new data would need to be collected
- estimate the overall effect, by sector, on published National Accounts and Balance of Payments figures

In the time available the investigation focussed on 1993, 1996 and 2000 (using quarterly data) for the central government, financial corporations, private non-financial corporations and the rest of the world sectors. Short-term debt was excluded. This note outlines the broad results for government bonds (Gilts).

Background

The market approach to measuring accrued interest flows is conceptually very simple: it is the market value of the security multiplied by the market yield. Prices of marketable securities change from day to day to reflect a number of factors such as credit risk, liquidity and market rates of interest. The mid price (between buy and sell quotes) in a free market is that price which generates a market rate of return (called the yield) on the security taking account of credit risk and any liquidity premium.

This market yield will differ from the historic cost accounting concept of interest flows which broadly equals the pre-set coupon rate (accrued over time) plus (or minus) any discount (or premium) at the time of issue of the security (again accrued over time). This historic cost measure of interest flows is currently used in the UK national accounts. It is commonly referred to as the 'debtor' approach to accruing interest flows. It tends to be preferred by those organisations issuing the securities/liabilities for their own accounts, and in particular by central government for their own accounts.

Outline of Current Procedures in UK National Accounts

Interest flows are calculated on a historic coupon basis, supplemented by discounts/ premiums calculated at the time of issue of some bonds. All flows are on an accruals basis, which involves spreading the payments evenly over a year. Most data are not available on a full flow of funds (sector to sector) basis, so payments are calculated for each issuing (liability) sector in total and receipts are also calculated for each holding (asset) sector. Total payments across all sectors are reconciled with total receipts.

Data sources for **payments** are a mixture of reported interest flows (for central government, banks, other corporate sector fixed rate listed bonds) and calculated flows based on implied coupon based interest rates (unlisted, floating rate bonds and RoW bonds). The calculated interest paid represents various forms of the 'debtor' approach, from the point of view of the issuer.

Interest **receipts** for each sector are calculated in a rather different manner. Banks and Government are as reported. For the UK non-bank private sector a single composite derived rate is calculated from the payments side as all interest flows divided by total levels

(which are at nominal value). This covers all types of bonds and all currencies. This composite rate is then applied to the estimated levels of bonds held as reported in regular enquiries or as estimated within the ONS balance sheet system. Conceptually the resulting estimates are therefore on the same historic coupon basis as the payments side, but make use of more comprehensive data on the stock of bonds held. However reported asset levels are more likely to be (but not exclusively) at market value. This will bias the receipts up as market values have in recent years been higher than nominal values. The reconciliation of payments and receipts should reduce this potential bias at the total level.

Outline of a Potential Broad Methodology

The most accurate method of estimating interest **payments** for UK issued bonds on a market approach would be to calculate them (daily) for each and every bond at issue and sum the result. Current databases at the ONS and Bank of England could be extended to pick up a market price and yield for each bond. It is likely that this method would be resource intensive.

An alternative aggregate approach would be to make use of existing data on prices and yields compiled by private sector agents. Market prices are available on a daily basis for over 80% of listed bonds. The aggregate method would then be

- calculate nominal levels of bonds separately by issuing sector, currency and by credit rating
- estimate market values for each category in aggregate
- multiply average market values by the average yield over the period for that category.

No new data would be required on the liabilities/payment side for Government bonds (Gilts). The existing calculations of market price, done by the Bank of England, could easily be extended. For each month and for each Gilt at issue, the existing spreadsheets system could be extended to pick up yields as well as market prices. Market based interest would then be calculated as the average monthly yield multiplied by the average monthly price (or the sum of the daily calculations). Ideally these data should be monthly averages of daily data. If this proves impracticable then the average of end month and previous end month could be used as an approximation.

The absence of equivalent disaggregated data on bonds held by the various sectors, makes the equivalent **receipts** calculations much more difficult. The current approach of using a composite rate derived from the payments side could still be used. However the derived rate would be on a market yield basis as above and the calculations should at least be done separately for Sterling and foreign currency. Total market based interest flows would not be constrained to reported interest flows, as these would be on a historic coupon basis.

Overall effects on Government Bonds

Start and end month or end quarter data have been used to estimate quarterly averages, instead of the much more accurate daily basis. For the year 2000 total Gilts issued have been used, adjusted at the end for official holdings (which are consolidated out in the National Accounts). For 1996 and 1993, market holdings were used from the start.

End month market price data are available in aggregated form split between conventional and index linked Gilts. Accrued interest and the uplift on index linked are correctly included in these market prices. For 1998 and 1999 this was only available quarterly, and annually for earlier years. Quarterly data on market and nominal values are available for all years, but without a split between conventional and index linked Gilts. Approximations were therefore estimated for

this project for the benchmark years of 1993 and 1996.

Average yields on conventional Gilts were weighted averages of the short, medium and long end month yields published by Bank of England. The weights were taken from quarterly data on outstanding nominal stock published by the Debt Management office (DMO). No similar data were readily available for index linked so an arithmetic average was used for the illustrative purposes of this project.

Table 15
Results for gilts

Year	Current Interest Payments (£bn)	Yield Based Interest Payments (£bn)	Difference Y-C (£bn)
1993	13.2	12.2	-1.0
1996	17.7	18.3	+0.6
2000	19.5	15.1	-4.3

These results are in the direction to be expected. Market based interest flows should be smaller than historic coupon based interest during a period of declining rates (since most of the bonds outstanding would have been issued when rates, and hence coupons, were higher). Yields on Gilts peaked in 1990 and then dropped to a trough in 1993. They peaked again in 1996 and have been falling steadily since then. Thus in 1996, when market rates had been increasing, the difference is in the opposite direction to that for 1993 and 2000. The effect for 2000 (around 0.5 percent of GDP) would have been to increase the Central Government Net Borrowing surplus by over 20 percent.

Check: an alternative approach was tried as a check on the calculations for the year 2000, and as an illustration of a potential alternative method. The difference between the market value of Gilts at any one point in time and the nominal repayment value is equal to the discounted present value of the difference in the two income streams for interest (the repayments being the same). For March 2000 this difference was £36bn and the average maturity profile of Gilts was 9.9 years (say 10), and the average yield was 5.4%. The implied difference in interest flows expected by the market in the coming 12 months (X) can be calculated as

$$X\,[1 + 1/(1+r) + \ldots\ldots + 1/(1+r)10] = 36$$

This calculation gives a value for X of £4.1bn, reassuringly close to the above direct calculations.

Further Work

The investigation also covered bonds issued by the private sector and by non-residents. Limited time, and limited detail in the data available, have produced some results which are more tentative than those for the government sector. We plan to do follow-up work to ensure that the results and conclusions are more reliable.

There has been an additional bonus from the work. A number of ways in which the current methodology can be improved quickly were highlighted. These mainly concerned the way in which various rates of return are calculated and used - include discounts/premiums, include the fixed element of a floating rate bond), check that the derived rate is consistent with the valuation basis of the asset level to which it is being applied. Documentation of the current system could certainly be improved.

C. UIC comparison between creditor and debtor approach for a selection of Italian bonds

Introduction

In order to evaluate the difference in the current account due to the adoption of different methods of calculation of the accrued interest two empirical exercise have been carried out. In the first exercise the percentage difference between the accrued interest calculated respectively from the debtor and the creditor approach has been analysed. In particular the trend of this difference has been analysed with respect to different variables (term to maturity, percentage of change in the interest rates and interest at the creation date) for respectively a zero coupon with a repayment value equal to 1 and for a fixed coupon bond with a nominal value equal to 1.

In the second exercise the accrued interest for the month of May 2002 has been calculated according to the creditor and debtor approach for 4 real examples of Italian bonds, with different characteristics.

The analysis of the difference between creditor and debtor approach

t = valuation time:
t = 0 issuance time;
t = n maturity time;
i_0 = interest rate at the creation date
i_m = interest rate when t=m (0< m<n)
$\Delta=i_m-i_0$ = change in the interest rates from t=0 to t=m
PD_m = Price calculated when t=m (debtor approach)
PC_m = Price calculated when t=m (creditor approach)
ID_m = Interest accrued between t=m and t=m+1 (debtor approach)
IC_m = Interest accrued between t=m and t=m+1 (creditor approach)

Zero coupon bond

Repayment value=1

$PD_m = 1*(1+i0)\text{-}(n\text{-}m)$
$PC_m = 1*(1+im)\text{-}(n\text{-}m)$
$ID_m = PDm+1\text{-}PDm = PDm*i0$
$IC_m = PC_m * i_m = 1*(i0+\Delta)*(1+i0+\Delta)\text{-}(n\text{-}m)$
$IC_m\text{-}ID_m = (1+i_0+\Delta)^{-(n-m)}*(i_0+\Delta)-(1+i_0)^{-(n-m)}*i_0$

Fixed Coupon bond

Nominal value=1

$$PD_m = 1*(1+i_0)^{-(n-m)} + \sum_{i=m+1}^{n} i_0*(1+i_0)^{-(n-m)}$$

$$PC_m = 1*(1+i_m)^{-(n-m)} + \sum_{i=m+1}^{n} i_0*(1+i_m)^{-(n-m)}$$

$$ID_m = i_0$$

$$IC_m=PC_m*i_m=((1+i_m)^{-(n-m)}+\sum_{i=m+1}^{n} i_0*(1+i_m)^{-(n-m)})*i_m$$

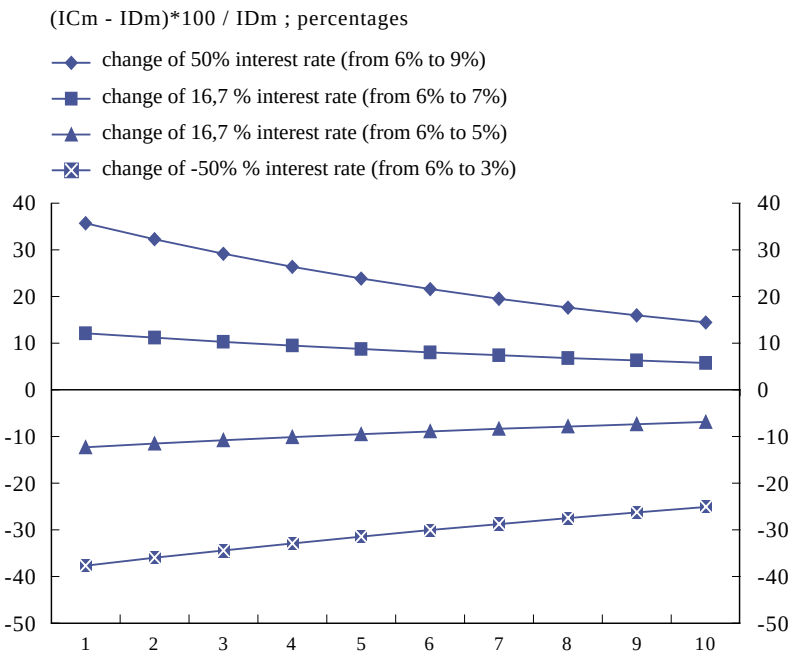
$$IC_m=PC_m*i_m=((1+i_0+\Delta)^{-(n-m)}+\sum_{i=m+1}^{n} i_0 * (1+i_0+\Delta)^{-(n-m)})*(i_0+\Delta)$$

$$IC_m\text{-}ID_m=(PC_m*i_m)-i_0=((1+i_0+\Delta)^{-(n-m)} + \sum_{i=m+1}^{n} i_0*(1+i_0+\Delta)^{-(n-m)})*(i_0+\Delta)-i_0$$

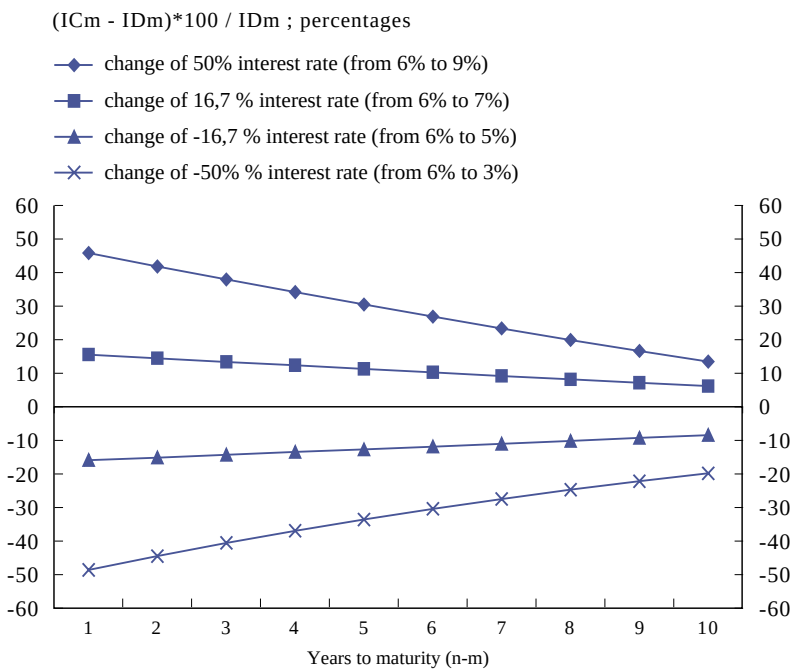
The value of the difference ICm - IDm has been calculated for different values of i0, D, (n-m) for both zero coupon bond and fixed coupon bond.

Figure 20
Interest rate at issuance 6%

Fixed Coupon Bond



Zero Coupon



In the following tables the value of the difference (ICm – IDm) / IDm has been calculated under different hypothesis for I0, D= It - I0 , (n - m).

Table 16

Results under different hypotheses

Zero Coupon		Term to maturity (n - m)									
I_0 = 7%		1	2	3	4	5	6	7	8	9	10
	$I_t - I_0$										
Change of 43% (from 7% to 10%)	3,00%	0,39	0,35	0,31	0,28	0,24	0,21	0,18	0,15	0,11	0,08
Change of 28,6% (from 7% to 9%)	2,00%	0,26	0,24	0,22	0,19	0,17	0,15	0,13	0,11	0,09	0,07
Change of 7,14% (from 7% to 7,5%)	0,50%	0,07	0,06	0,06	0,05	0,05	0,04	0,04	0,03	0,03	0,02
Change of 0%	0,00%	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Change of -7,14% (from 7% to 6,5%)	-0,50%	-0,07	-0,06	-0,06	-0,05	-0,05	-0,04	-0,04	-0,04	-0,03	-0,03
Change of -14,3% (from 7% to 6%)	-1,00%	-0,13	-0,13	-0,12	-0,11	-0,10	-0,09	-0,08	-0,08	-0,07	-0,06
Change of -28,6% (from 7% to 4%)	-2,00%	-0,27	-0,26	-0,24	-0,23	-0,22	-0,20	-0,18	-0,17	-0,15	-0,14
Change of -43% (from 7% to 4%)	-3,00%	-0,41	-0,40	-0,38	-0,36	-0,34	-0,32	-0,30	-0,28	-0,26	-0,24

Fixed Coupon Bond		Term to maturity (n - m)									
I_0 = 6%		1	2	3	4	5	6	7	8	9	10
	$I_t - I_0$										
Change of 50% (from 6% to 9%)	3,00%	0,46	0,42	0,39	0,35	0,32	0,30	0,27	0,25	0,23	0,21
Change of 33,3% (from 6% to 8%)	2,00%	0,31	0,29	0,26	0,25	0,23	0,21	0,19	0,18	0,17	0,15
Change of 16,7% (from 6% to 7%)	1,00%	0,16	0,15	0,14	0,13	0,12	0,11	0,10	0,10	0,09	0,08
Change of 8,35% (from 6% to 6,5%)	0,50%	0,08	0,07	0,07	0,06	0,06	0,06	0,05	0,05	0,05	0,04
Change of 0%	0,00%	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Change of -8,35% (from 6% to 5,5%)	-0,50%	-0,08	-0,07	-0,07	-0,07	-0,06	-0,06	-0,06	-0,05	-0,05	-0,05
Change of -16,7% (from 6% to 5%)	-1,00%	-0,16	-0,15	-0,14	-0,14	-0,13	-0,12	-0,12	-0,11	-0,11	-0,10
Change of -33,3% (from 6% to 4%)	-2,00%	-0,32	-0,31	-0,30	-0,28	-0,27	-0,26	-0,25	-0,24	-0,23	-0,23
Change of -50% (from 6% to 3%)	-3,00%	-0,49	-0,47	-0,46	-0,44	-0,43	-0,42	-0,41	-0,39	-0,38	-0,37

The impact on the current account progressively decreases as the term to maturity increases. Furthermore for big changes in interest rates and high interest rates at issue, the effect of reduction due to the years to maturity tends to increase.

Example of the calculation of accrued interest for real cases

In the following examples, four cases of "old issuance" with different characteristics have been taken into account. Italy experienced very high interest rates in the years preceding the entry into monetary union. As a consequence, the examples proposed can be considered as limit cases.

Table 17

Main features of the UIC empirical study

Isin Code	IT0001132098	IT0001174611	IT0000576782	IT0000366325
Issue date	01/07/97	01/11/97	06/06/96	01/03/93
Maturity date	01/07/07	01/11/27	06/06/03	01/03/03
Frequency	semi annual	semi annual	zero coupon	semi annual
Annual nominal interest rate	6,75%	6,50%	8,87%	11,50%
Annual yield to maturity	5,08%	5,88%	4,49%	3,84%
market price 30/04/2002	110,236	109,513	95,140	108,086
interest accrued in may 2002 debtor	0,563	0,542	0,648	0,958
interest accrued in may 2002 creditor	0,456	0,523	0,349	0,340

Findings

The absolute value of the percentage of variation of the interest rate is an upper limit for the percentage difference in the current account.

$$\frac{|\ i_m - i_0\ |}{i_0} \geq \frac{|\ IC_m - ID_m\ |}{ID_m} \quad \text{for } i_0 > |\ i_m - i_0\ |$$

In particular, in case of decreasing interest rates, for a security with a maturity of 2/3 years, the percentage of variation of the interest rate reflects almost entirely (85%-90%) in the current account. The impact on the current account progressively decreases as the term to maturity increases. For a term to maturity that is approximately 5 years the impact on the current account is around the 75% of the percentage variation of the interest rate. For a term to maturity that is approximately 10 years the impact on the current account is around the 60% of the percentage variation of the interest rate.

The component of portfolio assets/liabilities consisting of old issuance (high nominal interest rates) of fixed coupon bond with relatively short residual life is the most sensitive to the difference in the calculation method of accrued interest. The percentage of this component on the total amount of portfolio/assets liabilities could be taken into account to quantify the potential impact due to the different calculation methods.

For recent issues (small difference between current interest rate and interest rate at the creation date) since this difference in the interest rates is also further reduced in the calculation of accrued interest, we can expect that the difference in the calculation methods does not strongly impact on the current account.

If the interest rates are quite stable over time and a symmetric method of calculation is adopted for both assets and liabilities, and furthermore the composition and the amount of stocks for issue date and residual life of bonds is not very different between assets and liabilities, we can expect that the different calculation method does not strongly affect the net flow of current account.

Overall conclusions stemming from the three studies

A number of conclusions can be drawn from the empirical studies.

- Different income flows accrue under the issuer and market approach. These differences are most pronounced in times of rapid changes in interest rates.
- When the bonds move closer to maturity the differences increase, and vice versa.
- A consistent approach for estimation of income credits and debits within a country's BoP compilation system will eliminate inconsistencies between income credits and debits.
- To reduce asymmetries, a consistent approach should also be adopted across all BoP compiling countries.
- If interest rates are stable over time, and a symmetric approach is adopted for both assets and liabilities, there is unlikely to be a significant impact on the current account, whichever methodology is adopted.
- Another conclusion is that, with decreasing market interest rates, the market approach will produce lower income flows than the issue approach. So, if liabilities positions are higher than assets positions, the market approach will decrease the deficit of the current account (or increase the surplus), because income flows are a proportion of positions. Similarly, with a net asset position, increasing market interest rates will increase the income surplus (or reduce the deficit).
- Data requirements are higher/more complex under the market approach, but could be simplified by aggregate estimation (market value of bonds * market interest rates)
- To ensure that calculations are done consistently, it is recommended, that whichever approach is adopted, the calculations be done by the BoP compiler. This will allow any economies to be gained to be exploited and reduce potential inconsistencies in interpretation by respondents. For assets, this would require respondents to simply provide information on the holdings of debt securities (either aggregate or security x security), with the income flows derived from information on either nominal (issuer) or market interest rates provided by a commercial data supplier. For liabilities, information on holdings would need to be derived by residual (ie total in issue, less domestic holdings), but then the same estimation process could be adopted by the compiler. Such an approach would allow the compiler to develop portfolio investment collection and processing systems that both meet the PICS recommendations and suit the particular statistical environment (for aggregate or security by security reporting) in each Member State.

References:

- Calculating the accrual of interest on tradable debt securities (IMF research paper) – John Joisce (IMF) and Chris Wright (Bank of England)
- Accrual of interest on debt securities and Accrued interest in the euro-area BoP and IIP – ECB BoP&ER WG papers
- Accrual recording of interest revisited: why the SNA must be revisited – (OECD paper) – Peter Hill
- Accounting for interest on debt securities: why the creditor approach should be preferred (IMF BoPCOM paper) – Australian Bureau of Statistics
- Accrued interest in the UK national accounts (ONS research paper) – Philip Turnbull

Annex

Additional tables and charts

Table 18

Example

Year	Issuer			New Acquirer		
	Interest Year opening pv	Year Fixed IR (%)	Market Accrual	Interest opening pv	IR (%)	Accrual
1	747	6.01	45		10.17	
2	792	6.01	48	823	4.98	41
3	839	6.01	50	864	4.98	43
4	890	6.01	53	907	4.96	45
5	943	6.01	57	952	5.04	48
Redemption Value	1,000		1,000			

Table 19

Calculation of accrued interest for zero coupon bonds (based on a simulated example)

8.01%
Set IR against Ascenting Interest Rates

Dates	Positions		Yield to maturity %	Year	Income flow					
					Debtor approach			Creditor approach		
	Nominal price	Market price			"Nominal" income	Ratio Incom/Stk %	Ratio Incom/Stk %	"Yield" income	Ratio Income/Stk %	Price changes
(1)	(2)	(3)	(4)	(5)	(6)= (2)t-(2)t-1	(7)= (6)/(3)	(8)= (6)/(2)	(9)= (3)t*(4)t	(10)= (9)/(3)	(11)
1	500.0	500.0	8.01	1						
2	540.0	530.1	8.26	2	40.0	7.6	7.4	43.8	8.3	-13.6
3	583.3	564.7	8.51	3	43.2	7.7	7.4	48.0	8.5	-13.5
4	630.0	604.3	8.76	4	46.7	7.7	7.4	52.9	8.8	-13.3
5	680.4	649.8	9.01	5	50.4	7.8	7.4	58.5	9.0	-13.1
6	734.9	701.8	9.26	6	54.5	7.8	7.4	65.0	9.3	-12.9
7	793.7	761.5	9.51	7	58.8	7.7	7.4	72.4	9.5	-12.7
8	857.2	830.1	9.76	8	63.5	7.7	7.4	81.0	9.8	-12.4
9	925.9	909.0	10.01	9	68.6	7.5	7.4	91.0	10.0	-12.0
10	1,000.0	1,000.0	10.26	10	74.1	7.4	7.4	102.6	10.3	-11.6
				Total	500.0			615.1		-115.1

Table 19 (cont'd)

Calculation of accrued interest for zero coupon bonds (based on a simulated example)

Set IR against Descending IR

	Positions				Income flow					
					Debtor approach			Creditor approach		
Dates	Nominal price	Market price	Yield to maturity %	Year	"Nominal" income	Ratio Incom/Stk %	Ratio Incom/Stk %	"Yield" income	Ratio Income/Stk %	Price changes
(1)	(2)	(3)	(4)	(5)	(6)= (2)t -(2)t-1	(7)= (6)/(3)	(8)= (6)/(2)	(9)= (3)t *(4)t	(10)= (9)/(3)	(11)
1	500.0	500.0	8.01	1						
2	540.0	550.1	7.76	2	40.0	7.3	7.4	42.7	7.8	7.5
3	583.3	602.5	7.51	3	43.2	7.2	7.4	45.2	7.5	7.2
4	630.0	656.9	7.26	4	46.7	7.1	7.4	47.7	7.3	6.7
5	680.4	712.8	7.01	5	50.4	7.1	7.4	49.9	7.0	6.0
6	734.9	769.9	6.76	6	54.5	7.1	7.4	52.0	6.8	5.1
7	793.7	827.7	6.51	7	58.8	7.1	7.4	53.9	6.5	4.0
8	857.2	885.7	6.26	8	63.5	7.2	7.4	55.4	6.3	2.6
9	925.9	943.3	6.01	9	68.6	7.3	7.4	56.7	6.0	1.0
10	1,000.0	1,000.0	5.76	10	74.1	7.4	7.4	57.6	5.8	-0.9
				Total	500.0			461.0		39.0

Set IR against fluctuating IR

	Positions				Income flow					
					Debtor approach			Creditor approach		
Dates	Nominal price	Market price	Yield to maturity %	Year	"Nominal" income	Ratio Incom/Stk %	Ratio Incom/Stk %	"Yield" income	Ratio Income/Stk %	Price changes
(1)	(2)	(3)	(4)	(5)	(6)= (2)t-(2)t-1	(7)= (6)/(3)	(8)= (6)/(2)	(9)= (3)t*(4)t	(10)= (9)/(3)	(11)
1	500.0	500.0	8.01	1						
2	540.0	560.5	7.51	2	40.0	7.1	7.4	42.1	7.5	18.4
3	583.3	564.7	8.51	3	43.2	7.7	7.4	48.0	8.5	-43.8
4	630.0	666.1	7.01	4	46.7	7.0	7.4	46.7	7.0	54.7
5	680.4	649.8	9.01	5	50.4	7.8	7.4	58.5	9.0	-74.9
6	734.9	777.1	6.51	6	54.5	7.0	7.4	50.6	6.5	76.8
7	793.7	761.5	9.51	7	58.8	7.7	7.4	72.4	9.5	-88.0
8	857.2	889.9	6.01	8	63.5	7.1	7.4	53.4	6.0	74.9
9	925.9	909.0	10.01	9	68.6	7.5	7.4	91.0	10.0	-71.8
10	1,000.0	1,000.0	5.51	10	74.1	7.4	7.4	55.1	5.5	35.9
				Total	500.0			517.7		-17.7

Table 20
Balances

a) For Fluctuating Interest Rates

Year	Issuer			Market		
	Credits	Debits	Balance	Credits	Debits	Balance
1						
2	95.8	107.8	-11.9	104.0	115.9	-11.9
3	100.7	114.7	-14.0	112.6	122.1	-9.5
4	105.8	122.1	-16.3	122.0	129.8	-7.8
5	111.2	130.0	-18.8	125.2	130.2	-5.1
6	116.9	138.5	-21.6	125.3	149.9	-24.7
7	122.9	147.5	-24.6	127.4	173.1	-45.7
8	129.1	157.1	-27.9	130.9	188.2	-57.3
9	135.7	167.3	-31.6	142.6	194.2	-51.7
10	142.7	178.3	-35.6	150.0	185.0	-35.0
Total	1,060.9	1,263.2	-202.3	1,140.0	1,388.5	-248.5

Balance after 10 years
UK Credits - US Debits

		UK approach		US approach		Balance UK-US	
		Issuer	Market	Issuer	Market	Issuer	Market
UK	Debtor	-202.3	-327.6	202.3	327.6	0.0	0.0
	Creditor	-123.2	-248.5	123.2	248.5	0.0	0.0

b) For Descending Interest Rates

Year	Issuer			Market		
	Credits	Debits	Balance	Credits	Debits	Balance
1						
2	95.8	107.8	-11.9	98.9	111.7	-12.8
3	100.7	114.7	-14.0	98.4	113.8	-15.4
4	105.8	122.1	-16.3	100.3	115.8	-15.4
5	111.2	130.0	-18.8	94.9	113.2	-18.3
6	116.9	138.5	-21.6	98.6	115.2	-16.6
7	122.9	147.5	-24.6	90.3	109.4	-19.1
8	129.1	157.1	-27.9	89.1	110.4	-21.2
9	135.7	167.3	-31.6	82.6	105.6	-23.1
10	142.7	178.3	-35.6	80.0	105.0	-25.0
Total	1,060.9	1,263.2	-202.3	833.1	1,000.1	-167.0

Balance after 10 years
UK Credits - US Debits

		UK approach		US approach		Balance UK-US	
		Issuer	Market	Issuer	Market	Issuer	Market
UK	Debtor	-202.3	60.8	202.3	-60.8	0.0	0.0
	Creditor	-430.1	-167.0	430.1	167.0	0.0	0.0

Table 20 (cont'd)

Balances

c) For Ascending Interest Rates

Year	Issuer			Market		
	Credits	Debits	Balance	Credits	Debits	Balance
1						
2	95.8	107.8	-11.9	105.1	116.7	-11.6
3	100.7	114.7	-14.0	112.7	129.8	-17.0
4	105.8	122.1	-16.3	126.3	144.9	-18.6
5	111.2	130.0	-18.8	139.2	158.3	-19.2
6	116.9	138.5	-21.6	151.1	176.1	-25.0
7	122.9	147.5	-24.6	164.6	196.5	-32.0
8	129.1	157.1	-27.9	183.2	220.0	-36.8
9	135.7	167.3	-31.6	204.8	251.8	-47.0
10	142.7	178.3	-35.6	225.0	285.0	-60.0
Total	1,060.9	1,263.2	-202.3	1,411.9	1,679.0	-267.2

Balance after 10 years

UK Credits - US Debits

		UK approach		US approach		Balance UK-US	
		Issuer	Market	Issuer	Market	Issuer	Market
UK	Debtor	-202.3	-618.1	202.3	618.1	0.0	0.0
	Creditor	148.6	-267.2	-148.6	267.2	0.0	0.0

Table 21

Fluctating Interest Rates

UK Owns 3 US securities
Interest Rates
4%
5%
6%

a) UK Credits
US issued Security 1 - IR = 4%
Interest Rate 4%

Dates	Issuer	Market	Interest Rate	Yield	Issuer	Market
	Nominal price	Market price			Nominal income	Market income
1	702.6	702.6	4.0	1		
2	730.7	703.2	4.5	2	28.1	31.6
3	759.9	710.7	5.0	3	29.2	35.5
4	790.3	725.2	5.5	4	30.4	39.9
5	821.9	747.3	6.0	5	31.6	44.8
6	854.8	762.9	7.0	6	32.9	53.4
7	889.0	827.8	6.5	7	34.2	53.8
8	924.6	881.7	6.5	8	35.6	57.3
9	961.5	943.4	6.0	9	37.0	56.6
10	1,000.0	1,000.0	5.0	10	38.5	50.0
				Total	297.4	423.0

Table 21 (cont'd)
Fluctating Interest Rates

US issued Security 2 - IR = 5%
Interest Rate 5%

Dates	Issuer	Market	Interest Rate	Yield	Issuer	Market
	Nominal price	Market price			Nominal income	Market income
1	644.61	644.61	5.0	1		
2	676.84	703.19	4.5	2	32.2	31.6
3	710.68	759.92	4.0	3	33.8	30.4
4	746.22	813.50	3.5	4	35.5	28.5
5	783.53	862.61	3.0	5	37.3	25.9
6	822.70	923.85	2.0	6	39.2	18.5
7	863.84	928.60	2.5	7	41.1	23.2
8	907.03	942.60	3.0	8	43.2	28.3
9	952.38	966.18	3.5	9	45.4	33.8
10	1,000.00	1,000.00	4.0	10	47.6	40.0
				Total	355.4	260.2

US Issued Security 3 - IR = 6%
Interest Rate 6%

Dates	Issuer	Market	Interest Rate	Yield	Issuer	Market
	Nominal price	Market price			Nominal income	Market income
1	591.90	591.90	6.0	1		
2	627.41	582.01	7.0	2	35.5	40.7
3	665.06	583.49	8.0	3	37.6	46.7
4	704.96	596.27	9.0	4	39.9	53.7
5	747.26	680.58	8.0	5	42.3	54.4
6	792.09	762.90	7.0	6	44.8	53.4
7	839.62	839.62	6.0	7	47.5	50.4
8	890.00	907.03	5.0	8	50.4	45.4
9	943.40	947.87	5.5	9	53.4	52.1
10	1,000.00	1,000.00	6.0	10	56.6	60.0
				Total	408.1	456.8

b) US Debits

Dates	Security 1		Securtiy 2		Security 3	
	Issuer	Market	Issuer	Market	Issuer	Market
	Approach					
1						
2	28.1	31.6	32.2	31.6	35.5	40.7
3	29.2	35.5	33.8	30.4	37.6	46.7
4	30.4	39.9	35.5	28.5	39.9	53.7
5	31.6	44.8	37.3	25.9	42.3	54.4
6	32.9	53.4	39.2	18.5	44.8	53.4
7	34.2	53.8	41.1	23.2	47.5	50.4
8	35.6	57.3	43.2	28.3	50.4	45.4
9	37.0	56.6	45.4	33.8	53.4	52.1
10	38.5	50.0	47.6	40.0	56.6	60.0
Total	297.4	423.0	355.4	260.2	408.1	456.8

Table 21 (cont'd)
Fluctating Interest Rates

c) Balance after 10 years
UK Credits + US Debits

	Security 1			Security 2			Security 3	
	US			US			US	
UK	Issuer	Market		Issuer	Market		Issuer	Market
Debtor	0.0	125.6		0.0	-95.2		464.7	468.1
Creditor	125.6	0.0		95.2	0.0		513.4	516.8

d) For Fluctuating Interest Rates

	Debtor			Creditor		
Year	Credits	Debits	Balance	Credits	Debits	Balance
1	-	-	-	-	-	-
2	95.8	107.8	-11.9	104.0	115.9	-11.9
3	100.7	114.7	-14.0	112.6	122.1	-9.5
4	105.8	122.1	-16.3	122.0	129.8	-7.8
5	111.2	130.0	-18.8	125.2	130.2	-5.1
6	116.9	138.5	-21.6	125.3	149.9	-24.7
7	122.9	147.5	-24.6	127.4	173.1	-45.7
8	129.1	157.1	-27.9	130.9	188.2	-57.3
9	135.7	167.3	-31.6	142.6	194.2	-51.7
10	142.7	178.3	-35.6	150.0	185.0	-35.0
Total	1,060.9	1,263.2	-202.3	1,140.0	1,388.5	-248.5

Table 22
Fluctuating Interest Rates

US Owns 3 UK issued securties
Interest Rates
5%
6%
8%

a) UK debits
US Owned Security 1 - IR = 5%
Interest Rate 5%

	Issuer	Market			Issuer	Market
Dates	Nominal price	Market price	Interest Rate	Yield	Nominal income	Market income
1	644.6	644.6	5.0	1		
2	676.8	651.6	5.5	2	32.2	35.8
3	710.7	665.1	6.0	3	33.8	39.9
4	746.2	666.3	7.0	4	35.5	46.6
5	783.5	729.9	6.5	5	37.3	47.4
6	822.7	762.9	7.0	6	39.2	53.4
7	863.8	805.0	7.5	7	41.1	60.4
8	907.0	857.3	8.0	8	43.2	68.6
9	952.4	921.7	8.5	9	45.4	78.3
10	1,000.0	1,000.0	7.5	10	47.6	75.0
				Total	355.4	505.5

Table 22 (cont'd)
Fluctuating Interest Rates

US Owned Security 2 - IR = 6%
Interest Rate 6%

Dates	Issuer	Market			Issuer	Market
	Nominal price	Market price	Interest Rate	Yield	Nominal income	Market income
1	591.90	591.90	6.0	1		
2	627.41	651.60	5.5	2	35.5	35.8
3	665.06	710.68	5.0	3	37.6	35.5
4	704.96	767.90	4.5	4	39.9	34.6
5	747.26	821.93	4.0	5	42.3	32.9
6	792.09	838.56	4.5	6	44.8	37.7
7	839.62	863.84	5.0	7	47.5	43.2
8	890.00	924.56	4.0	8	50.4	37.0
9	943.40	970.87	3.0	9	53.4	29.1
10	1,000.00	1,000.00	2.0	10	56.6	20.0
				Total	408.1	305.8

US Owned Security 2 - IR = 8%
Interest Rate 8%

Dates	Issuer	Market			Issuer	Market
	Nominal price	Market price	Interest Rate	Yield	Nominal income	Market income
1	500.25	500.25	8.0	1		
2	540.27	520.67	8.5	2	40.0	44.3
3	583.49	583.49	8.0	3	43.2	46.7
4	630.17	647.96	7.5	4	46.7	48.6
5	680.58	712.99	7.0	5	50.4	49.9
6	735.03	735.03	8.0	6	54.4	58.8
7	793.83	772.18	9.0	7	58.8	69.5
8	857.34	826.45	10.0	8	63.5	82.6
9	925.93	913.24	9.5	9	68.6	86.8
10	1,000.00	1,000.00	9.0	10	74.1	90.0
				Total	499.8	577.1

b) UK Debits

Dates	Security 1		Securtiy 2		Security 3	
	Issuer	Market	Issuer	Market	Issuer	Market
	Approach					
1						
2	32.2	35.8	35.5	35.8	40.0	44.3
3	33.8	39.9	37.6	35.5	43.2	46.7
4	35.5	46.6	39.9	34.6	46.7	48.6
5	37.3	47.4	42.3	32.9	50.4	49.9
6	39.2	53.4	44.8	37.7	54.4	58.8
7	41.1	60.4	47.5	43.2	58.8	69.5
8	43.2	68.6	50.4	37.0	63.5	82.6
9	45.4	78.3	53.4	29.1	68.6	86.8
10	47.6	75.0	56.6	20.0	74.1	90.0
Total	355.4	505.5	408.1	305.8	499.8	577.1

Table 22 (cont'd)
Fluctuating Interest Rates

c) Balance after 10 years
UK Credits + US Debits

	Security 1			Security 2			Security 3	
	US			US			US	
UK	Issuer	Market		Issuer	Market		Issuer	Market
Debtor	403.0	430.4		464.7	428.1		573.8	589.8
Creditor	553.1	580.5		362.4	325.8		651.2	667.1

Table 23
Descending Interest Rates

UK Owns 3 US securities
Interest Rates
4%
5%
6%

a) UK Credits
US issued Security 1 - IR = 4%

	Issuer	Market			Issuer	Market
Dates	Nominal price	Market price	Interest Rate	Yield	Nominal income	Market income
1	702.6	702.6	4.0	1		
2	730.7	730.7	4.0	2	28.1	29.2
3	759.9	786.0	3.5	3	29.2	27.5
4	790.3	813.5	3.5	4	30.4	28.5
5	821.9	862.6	3.0	5	31.6	25.9
6	854.8	888.5	3.0	6	32.9	26.7
7	889.0	928.6	2.5	7	34.2	23.2
8	924.6	951.8	2.5	8	35.6	23.8
9	961.5	980.4	2.0	9	37.0	19.6
10	1,000.0	1,000.0	2.0	10	38.5	20.0
				Total	297.4	224.4

b) US issued Security 2 - IR = 5%
Interest Rate 5%

	Issuer	Market			Issuer	Market
Dates	Nominal price	Market price	Interest Rate	Yield	Nominal income	Market income
1	644.61	644.61	5.0	1		
2	676.84	676.84	5.0	2	32.2	33.8
3	710.68	734.83	4.5	3	33.8	33.1
4	746.22	767.90	4.5	4	35.5	34.6
5	783.53	821.93	4.0	5	37.3	32.9
6	822.70	854.80	4.0	6	39.2	34.2
7	863.84	901.94	3.5	7	41.1	31.6
8	907.03	933.51	3.5	8	43.2	32.7
9	952.38	970.87	3.0	9	45.4	29.1
10	1,000.00	1,000.00	3.0	10	47.6	30.0
				Total	355.4	291.9

Table 23 (cont'd)
Descending Interest Rates

US Issued Security 2 - IR = 6%
Interest Rate 6%

	Issuer	Market			Issuer	Market
Dates	Nominal price	Market price	Interest Rate	Yield	Nominal income	Market income
1	591.90	591.90	6,0	1		
2	627.41	651.60	5,5	2	35,5	35,8
3	665.06	687.44	5,5	3	37,6	37,8
4	704.96	746.22	5,0	4	39,9	37,3
5	747.26	802.45	4,5	5	42,3	36,1
6	792.09	838.56	4,5	6	44,8	37,7
7	839.62	889.00	4,0	7	47,5	35,6
8	890.00	933.51	3,5	8	50,4	32,7
9	943.40	966.18	3,5	9	53,4	33,8
10	1,000.00	1,000.00	3,0	10	56,6	30,0
				Total	408,1	316,9

US Debits

	Security 1		Securtiy 2		Security 3	
Dates	Issuer	Market	Issuer	Market	Issuer	Market
	Approach					
1						
2	28.1	29.2	32.2	33.8	35.5	35.8
3	29.2	27.5	33.8	33.1	37.6	37.8
4	30.4	28.5	35.5	34.6	39.9	37.3
5	31.6	25.9	37.3	32.9	42.3	36.1
6	32.9	26.7	39.2	34.2	44.8	37.7
7	34.2	23.2	41.1	31.6	47.5	35.6
8	35.6	23.8	43.2	32.7	50.4	32.7
9	37.0	19.6	45.4	29.1	53.4	33.8
10	38.5	20.0	47.6	30.0	56.6	30.0
Total	297.4	224.4	355.4	291.9	408.1	316.9

c) Balance after 10 years
UK Credits + US Debits

	Security 1			Security 2			Security 3	
	US			US			US	
UK	Issuer	Market		Issuer	Market		Issuer	Market
Debtor	0,0	-73,1		0,0	-63,5		464,7	438,1
Creditor	-73,1	0,0		63,5	0,0		373,5	346,9

For Descending Interest Rates

Year	Debtor			Creditor		
	Credits	Debits	Balance	Credits	Debits	Balance
1	-	-	-	-	-	-
2	95.8	107.8	-11.9	98.9	111.7	-12.8
3	100.7	114.7	-14.0	98.4	113.8	-15.4
4	105.8	122.1	-16.3	100.3	115.8	-15.4
5	111.2	130.0	-18.8	94.9	113.2	-18.3
6	116.9	138.5	-21.6	98.6	115.2	-16.6
7	122.9	147.5	-24.6	90.3	109.4	-19.1
8	129.1	157.1	-27.9	89.1	110.4	-21.2
9	135.7	167.3	-31.6	82.6	105.6	-23.1
10	142.7	178.3	-35.6	80.0	105.0	-25.0
Total	1,060.9	1,263.2	-202.3	833.1	1,000.1	-167.0

Table 24

Ascending interest rates

UK Owns 3 US securities
Interest Rates
5%
6%
8%

a) UK Debits
US Owned Security 1 - IR = 5%

Dates	Issuer Nominal price	Market Market price	Interest Rate	Yield	Issuer Nominal income	Market Market income
1	644.6	644.6	5.0	1		
2	676.8	651.6	5.5	2	32.2	35.8
3	710.7	665.1	6.0	3	33.8	39.9
4	746.2	685.3	6.5	4	35.5	44.5
5	783.5	713.0	7.0	5	37.3	49.9
6	822.7	748.8	7.5	6	39.2	56.2
7	863.8	793.8	8.0	7	41.1	63.5
8	907.0	849.5	8.5	8	43.2	72.2
9	952.4	917.4	9.0	9	45.4	82.6
10	1,000.0	1,000.0	9.5	10	47.6	95.0
				Total	355.4	539.6

US Owned Security 2 - IR = 6%
Interest Rate 6%

Dates	Issuer Nominal price	Market Market price	Interest Rate	Yield	Issuer Nominal income	Market Market income
1	591.90	591.90	6.0	1		
2	627.41	627.41	6.0	2	35.5	37.6
3	665.06	643.51	6.5	3	37.6	41.8
4	704.96	666.34	7.0	4	39.9	46.6
5	747.26	712.99	7.0	5	42.3	49.9
6	792.09	748.80	7.5	6	44.8	56.2
7	839.62	793.83	8.0	7	47.5	63.5
8	890.00	857.34	8.0	8	50.4	68.6
9	943.40	921.66	8.5	9	53.4	78.3
10	1,000.00	1,000.00	9.0	10	56.6	90.0
				Total	408.1	532.6

Table 24 (cont'd)
Ascending interest rates

US Owned Security 2 - IR = 8%
Interest Rate 8%

	Issuer	Market			Issuer	Market
Dates	Nominal price	Market price	Interest Rate	Yield	Nominal income	Market income
1	500.25	500.25	8.0	1		
2	540.27	540.27	8.0	2	40.0	43.2
3	583.49	564.93	8.5	3	43.2	48.0
4	630.17	596.27	9.0	4	46.7	53.7
5	680.58	649.93	9.0	5	50.4	58.5
6	735.03	708.43	9.0	6	54.4	63.8
7	793.83	772.18	9.0	7	58.8	69.5
8	857.34	834.01	9.5	8	63.5	79.2
9	925.93	909.09	10.0	9	68.6	90.9
10	1,000.00	1,000.00	10.0	10	74.1	100.0
				Total	499.8	606.8

b) US Credits

	Security 1		Securtiy 2		Security 3	
Dates	Issuer	Market	Issuer	Market	Issuer	Market
	Approach					
1						
2	32.2	35.8	35.5	37.6	40.0	43.2
3	33.8	39.9	37.6	41.8	43.2	48.0
4	35.5	44.5	39.9	46.6	46.7	53.7
5	37.3	49.9	42.3	49.9	50.4	58.5
6	39.2	56.2	44.8	56.2	54.4	63.8
7	41.1	63.5	47.5	63.5	58.8	69.5
8	43.2	72.2	50.4	68.6	63.5	79.2
9	45.4	82.6	53.4	78.3	68.6	90.9
10	47.6	95.0	56.6	90.0	74.1	100.0
Total	355.4	539.6	408.1	532.6	499.8	606.8

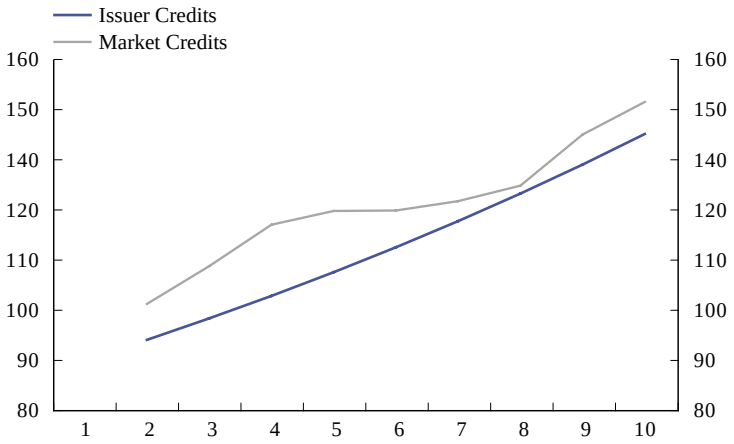
c) Balance after 10 years
UK Debits + US Credits

	Security 1			Security 2			Security 3	
	US			US			US	
UK	Issuer	Market		Issuer	Market		Issuer	Market
Debtor	403.0	450,4		464.7	498,1		573.8	599,8
Creditor	587,3	634,6		589,2	622,6		680,9	706,8

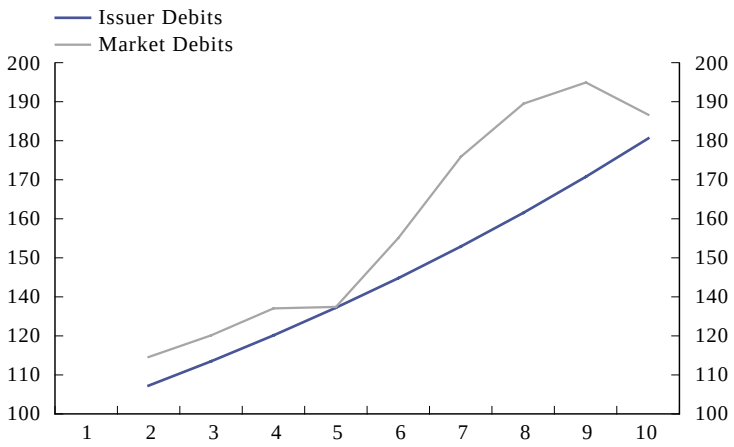
Figure 21

Interest accrued under fluctuating interest rates

a. Credits



b. Debits



c. Balance

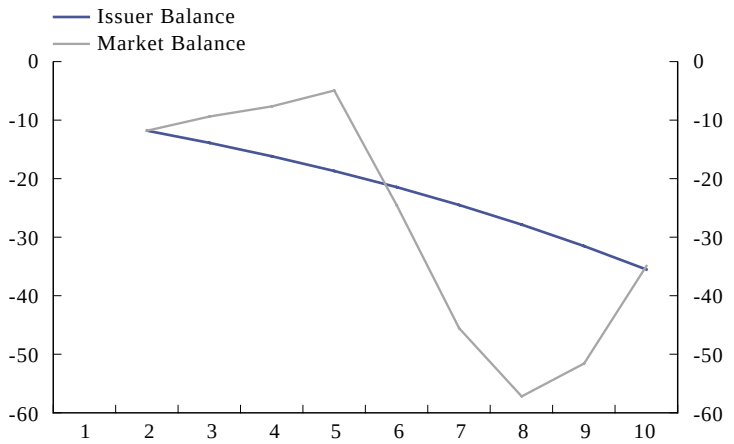
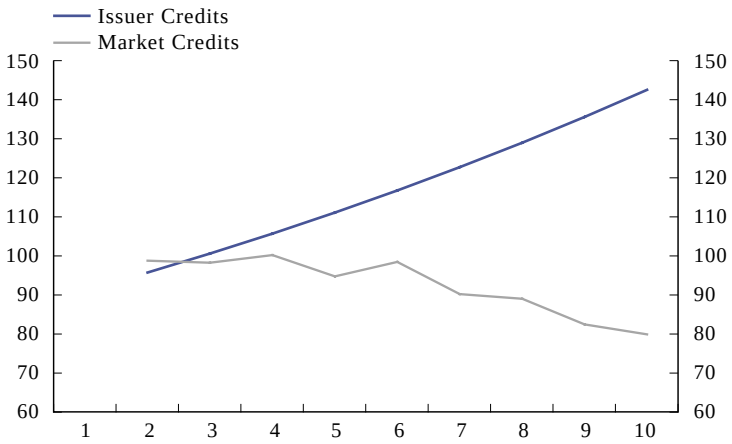
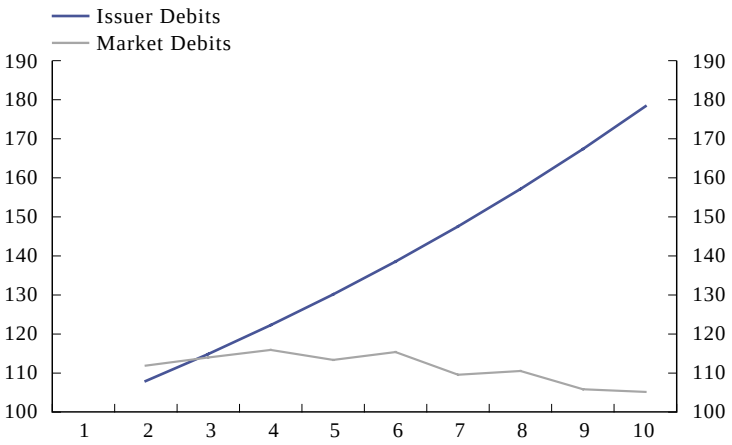


Figure 22
Interest accrued under descending interest rates

a. Credits



b. Debits



c. Balance

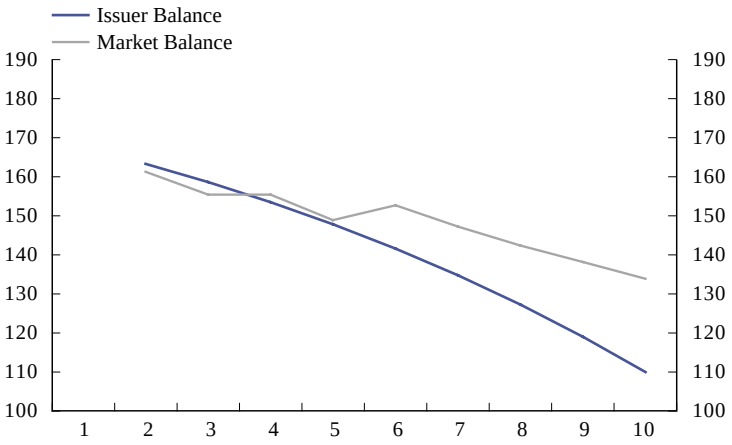
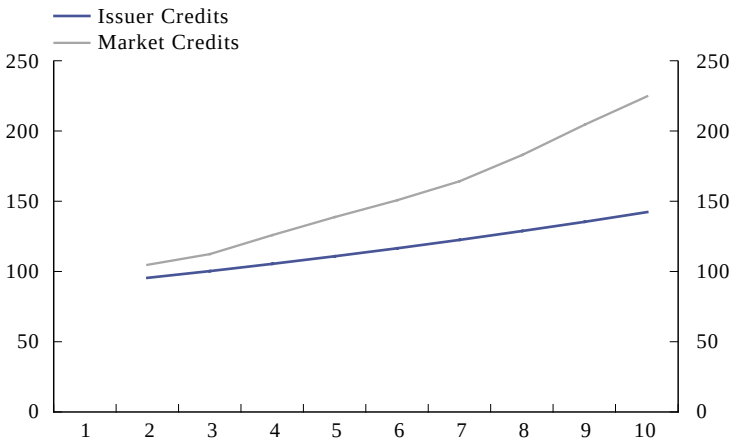


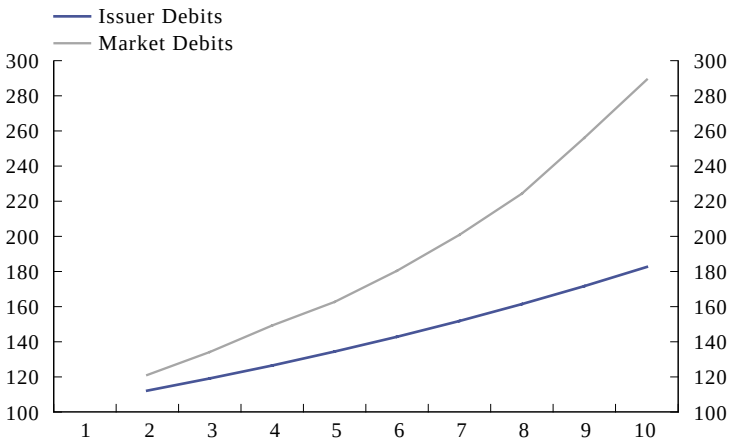
Figure 23

Interest accrued under ascending interest rates

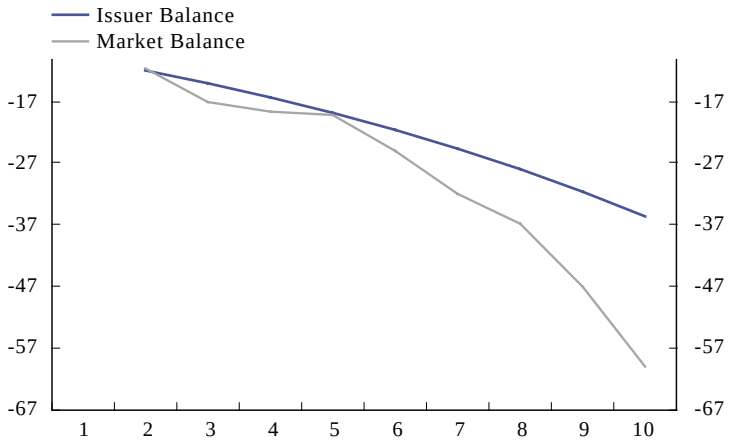
a. Credits



b. Debits



c. Balance



3. Empirical evidence on aggregate versus security-by-security recording

Introduction

This document aims at carrying out a comparison between two distinct approaches which may be used for the calculation of income on securities:

(i) *Security-by-security approach*. This approach entails combining resident investors' holdings of foreign securities and non-resident holdings of domestic securities (by individual securities) with the information available (e.g. in a master file database) regarding the interest rate associated to each individual security.

(ii) *Aggregate approach*. This approach entails combining portfolio investment stocks stratified by categories of securities (determined by the type of securities, original maturity, market of issuance, economic sector of the issuer, etc.) with benchmark yields

Of course, there are other possibilities to compile income figures on an accruals basis. For instance, an other alternative is receiving the final information as directly provided by reporters, who would then be requested to perform themselves the calculation of accruals and split the results by type of securities, counterpart country, and any other required statistical classifications. Normally this approach relies on the fact that resident issuers/investors have direct access to the whole of the information which is necessary to carry out these calculations, e.g. individual securities and the associated coupon. Therefore, respondents would most probably follow the first approach in their internal calculations, even though the final provision of information to the b.o.p. compiler often takes place on an aggregated basis. The caveats of this approach with respect to calculations performed by the b.o.p. compiler security-by-security are well known (e.g. less checking procedures available, dependence on respondents' judgement and interest, use of accounting rules rather than statistical methods, etc.), but this choice has not directly been considered by the subgroup.

This note is in three sections. The first one briefly summarises pros and cons of security-by-security versus aggregated reporting in very general terms (i.e. not specifically for the calculation of income). Section two presents advantages and disadvantages of both approaches for the calculation of income, from the individual countries' perspective in terms of e.g. resources for both respondents and compilers, availability of information on (domestic and foreign) individual securities/ associated coupon, accuracy of the results, etc. Section three introduces the results of two empirical exercises carried out in Spain and the UK which aimed at assessing the differences in the outcome (i.e. income figures) produced under both approaches (i.e. aggregate and security-by-security). Section four concludes.

Pros and cons of a security-by-security versus an aggregated reporting: general overview

This section briefly recalls advantages and disadvantages of recording information on portfolio investment flows and stocks and income figures using two different approaches: on the one hand, by individual securities and, on the other hand, by aggregate types of securities. There are no new ideas in this section, which is basically a summary of the most salient points contained in the final report of the Task Force on Portfolio Investment Collection Systems. For this reason, this section is intentionally kept short. Additionally, the specific features of income compilation compared with that of portfolio investment might be worth a warning as regards the wide-ranging validity of all points mentioned in this section.

Advantages of the security-by-security approach:

Using the security-by-security approach, the statistical breakdowns are calculated in a standardised way by the compiler. This avoids potential miscalculation or the use of non-generalised aggregation procedures by the different reporting entities, with clear advantages in terms of quality and homogeneity.[1]

The security-by-security approach increases the quality of the data as it allows additional checking procedures and greater accuracy in the calculation of stock and/or flow data. For example: it may enable the identification of double-counting among custodians and sub-custodians; it allows reconciliation of flows and stocks at a security level and improves bilateral geographical comparisons of data; it allows detailed comparisons of outstanding amounts and reported securities deposits indicating gaps or double reporting.

Another feature of the security-by-security approach is the greater flexibility to take care of new/additional output requirements (for example change in the geographical zones, in the instrument breakdown or a split by currency) and to easily obtain consistent time series. This is most often possible, without additional requests to the reporting entities, by means of adaptations in the aggregation procedures managed by the compiler.

The availability of more detailed data allows synergies with other statistics such as financial account statistics, monetary statistics, securities issues statistics.

Data on a security-by-security basis also allow a much more precise calculation of accrued interest, at the level of individual securities.

Elaborating further on this argument, security-by-security reporting would reduce the amount of details (in terms of breakdowns) to be reported by respondents, with a consequent reduction in their reporting burden. The reduction of details is strictly connected to the existence of a securities database, available to the compiler. It also allows a more efficient dialogue with the respondents.

Disadvantages of the security-by-security approach:

The likely complexity in the internal procedures to be run by the b.o.p. compiler may imply a deterioration in timeliness for the provision of the final product.

The compiler has to bear the *cost of* buying/managing a securities database, of developing compatible software in order to receive the information from the respondents and to develop/update the aggregation procedures. Moreover, in a security-by-security system the volume of information recorded and its treatment by the compiler implies an adequate data processing system (in terms of capacity and complexity). Also from a human resources point of view the security-by-security reporting requires specifically skilled operators (staff well trained for properly working within the highly automated system and with an additional expertise in financial markets and instruments). It must also be stressed though that the amortisation of the initial investment for the SDB, procedures and employees' training can be considered to be rapid as the system is usually very intensively used.

Especially for very short-term securities or other less liquid instruments (e.g. private placements or mutual funds' units in some countries), no unique and internationally standardised identifier (such as an *ISIN code*) might be available, at the time the respondent is asked to report the data. Moreover there is the problem of private placements for which the issuer does not care to retrieve an ISIN code from the national numbering agency. Consequently there might be the need to use generic codes and/or employ some

1 *The quality of the results (in terms of e.g. accuracy, consistency, etc.) would be significantly enhanced with the availability of the Centralised Securities Database.*

supplementary aggregated reporting. According to recent experience, the assignment of ISIN codes is fast becoming more widespread, although the problem of lack of ISIN codes for e.g. private placement remains.

Summary

In conclusion, the choice of the security-by-security reporting means essentially to translate the bigger part of the costs to the compiler. The advantages in terms of quality, standardisation and of synergies with other statistics are very relevant. The amortisation of the initial investment (securities database, procedures, etc.) by the compiler can be considered rapid if the system is very intensively used. Because of the wide range of the reports' design (from paper form to electronic data) a compiler is currently obliged to run a professional data processing system in which adding new fields imply increasing costs. The introduction of security-by-security techniques would imply that the marginal costs of additional breakdowns would diminish. The availability of a CSDB would largely improve the degree of standardisation and harmonisation.

Advantages and disadvantages of both approaches for the compilation of income figures from the individual countries' perspective

Spain

The decision on the most suitable approach to compile income figures should be taken under the assumption that, in principle, the best results are obtained using as much information as possible.

Regarding the collection of income figures using aggregate stocks of securities and benchmark yields, a first difficulty is that it is not easy to choose the most appropriate benchmark yield and the results are quite different according to the interest rate chosen.[2] This choice may be crucial in obtaining results closer to the target (which may be represented by the product obtained using the security-by-security approach). Unfortunately, according to the results got through the empirical exercise carried out in Spain, those benchmark yields that would enable results closer to the target are not always the ones which are publicly available (i.e. pure market averages).

This issue may be somehow connected with the controversy debtor/acquisition/ creditor approach, since market yields can only be used to the extent that the compiler wants to stick to the creditor approach. The conclusion would be that it might be difficult to choose the most appropriate yield for the accrued income on portfolio investment liabilities.

These problems are even more apparent for the calculation of accrued income on portfolio investment assets, due to the difficulties to access representative benchmark yields in foreign markets. However, the option of calculating income by individual securities would only alleviate the problem to the extent that the necessary information could be available on a centralised basis, e.g. through a Centralised Security Database.

One additional factor that could be worth considering concerns the possible asymmetries in the compilation of assets and liabilities, with obvious implications for the calculation of the euro area aggregates. If the calculation procedure is not consistent (i.e. either aggregated or security by security) between the country of the issuer and the country of the investor, the results can be very different, even if the same interest rate (in terms of nominal or market interest rate) is used, as non-resident investments do not necessarily have to be homogeneously distributed among all domestic securities (i.e. the weights implicit in any average could not necessarily be

2 *See the results of the empirical exercise carried out in Spain, presented in the following section.*

representative of the specific securities which are most attractive to foreign investors).[3]

As regards portfolio investment liabilities, the issuer country will most probably have access to very extensive information about domestic issues. But considering portfolio investment assets, taking a decision on the most appropriate level of aggregation is not an easy task. In addition, each country may have its own criteria to decide on aggregate levels, relevant market yields, etc. This fact would be at the origin of problems of comparability across countries and, what may be more worrying, asymmetries in the calculation of the euro area aggregates.

Both problems mentioned for the correct application of the aggregate approach (which, though not ideal, could still be an option to some compilers due to the above-mentioned arguments of costs, timeliness, resources, etc.), i.e. choosing the appropriate interest rate and applying them to the appropriate categories of holdings, could only be solved having access to security-by-security stocks and detailed information on interest rates also security by security. This requires the availability of a securities database, and only if this database were a "centralised" one, all countries could theoretically use the same interest rates for each security.

To conclude, with the objective of ensuring that the calculation of accrued income for portfolio investment is performed in a homogeneous way by all countries, and the results obtained are accurate enough, the security-by-security approach is the most appropriate. The correct application of this method requires the availability of the information contained in a Centralised Securities Database.

United Kingdom (UK)

This note will discuss some issues relating to aggregate and security-by-security collection of portfolio investment income data in the UK. Conclusions on this topic will largely be determined by the feasibility studies commissioned as a result of the TF-PICS report. The Bank of England is conducting a study into security-by-security reporting and the ONS is investigating the collection of monthly aggregate flows and quarterly aggregate stocks. This means that many of the issues discussed below are outside the scope of the TF-PII. However, these arguments are still relevant to the choice of collection system for portfolio investment income, flows and levels from the UK's perspective.

Costs

The main issue surrounding the set-up of a security-by-security collection system is the cost. There would have to be a considerable investment in technology, time, resources and training. Obviously, most of these are up-front costs. However, there would still be costs in terms of regular data production due to the sheer number of securities traded in London.[4] Discussions up to now have focussed on the fact that a high volume of securities transactions will make the collection of flows particularly difficult. Indeed, the UK is only considering the collection of stock on a security-by-security basis in the feasibility study. However, there would also be similar problems if an attempt was made to calculate the income accrued on each individual security.

There would also be non-monetary costs associated with moving from an aggregate collection system to security-by-security approach. There is a great deal of knowledge and information in current systems that would potentially be lost. Furthermore, there may be costs to the users of the data if there are significant breaks in series after the introduction of a new collection system.

3 Please refer again to the results of the empirical exercise.

4 One Global Custodian estimated that around one million securities transactions were recorded on its books in one month. Not all of these would be UK balance of payments transactions, but the figure provided is a useful guide to the potential numbers involved. In the UK we would probably need to collect data from around 10 custodians in order to obtain a large enough sample.

Conversely, it is possible that the costs of aggregate reporting may fall in the future. Various initiatives, such as global reporting and electronic links to accounting software (e.g. XML and XBRL) may reduce the compliance burden and overall costs of data collection in a country.

Data quality

A second major issue to be considered is the quality of portfolio investment income data that could be collected through a security-by-security system. In particular, there are two instances where data may be attributed to portfolio investment income incorrectly. These problems are not confined to the UK, but the points are still relevant. First, it is unlikely that direct investment income can be collected directly from a security-by-security system at present. These data would probably have to be collected separately. This is a particularly important aspect of the UK balance of payments accounts, due to the large number of non-resident owned branches and subsidiaries operating in the UK.

A second problem is the collection of income on repos. Again it is not clear how securities traded in their own right can be distinguished from securities that are used as collateral in repo and reverse repo transactions. This means that income on securities used in repo transactions would be incorrectly attributed to the cash lender in the repo, rather than the actual owner of the security. However, this is less of an issue with investment income than with the financial account. A sub-group of the TF-PICS concluded that although repos do have a large impact on the flows, there is a much lesser effect on the levels (income data would be derived from levels). Furthermore, this issue could potentially be resolvable as US custodians may soon have to separately identify repo transactions for statistical purposes.[5]

Another point to raise is sampling. The UK's feasibility study is considering the collection of security-by-security data from around ten different custodians. These data would then be grossed-up to the whole population. The current aggregate reporting system samples companies from different sectors in the economy using a stratified approach (i.e. data are collected from a stratified sample of securities dealers, a stratified sample of pension funds, etc.). The issue is whether a sample of the largest custodians, representing different sectors of the economy, would provide data that were of similar quality to data collected using a stratified sample from several economic sectors. However, this issue could be addressed if data were collected from end-investors on a security-by-security basis, rather than custodians. The ONS should be able to assess whether end-investors would be able to send security-by-security information after their proposed survey of end-investors (part of the feasibility study following the conclusions of the TF-PICS).

One final point linked to data quality is the briefing provided to users alongside the figures. Stories and anecdotal evidence can add real value to the data and can help to validate the figures. This information is best collected directly from the investor and thus most easily available from aggregate reporting systems. It would be very difficult to obtain stories from custodians as they would not necessarily have that information. Furthermore, for confidentiality reasons, custodians may not be able to provide the information on their clients that would allow compilers to contact the companies directly.

Data coverage

The third major issue is the coverage of data available. Custodians in the UK have stated that they will not be able to provide the sector of the resident holding the securities. This is because they do not hold information on the industrial classification of their clients, as there is no need to do so for business

5 Recent technological advancement in the US means that it is now possible to separately identify repo transactions. It is likely that the US authorities will ask custodians to provide them with these data.

reasons. This means that there would be a gap in the data required in BPM5. Furthermore, the data source for the UK's rest of world sector would also be missing and, potentially, a separate collection system would be required for national accounts. One of the strengths of the UK's current aggregate system is that the data used in balance of payments statistics are also used in the rest of the world sector in the national accounts. Again, this issue could potentially be resolved if end-investors were able to supply security-by-security data (see paragraph 7 above).

Finally, custodians would only supply data on the UK's assets (holdings of securities issued by non-residents). Data for UK liabilities would presumably be compiled using either counterpart asset data collected by other countries (perhaps using the results of the IMF CPIS, although clearly this would only work correctly if all countries that invest in the UK were able to supply data), or by using a residual method (as is currently employed in aggregate reporting systems).

Empirical exercises

Spain

Introduction

This empirical exercise aims at exploring whether there are significant differences between two distinct ways of compiling portfolio investment income, i.e. security by security and aggregating securities, respectively.

Methodology applied

The data used in this exercise have been taken from the 2001 stock of non-resident holdings of Spanish euro-denominated bonds and notes issued by the General Government, i.e. only portfolio investment liabilities have been considered. The main reason to use these data is the availability of two pieces of information which are basic for the analysis:

(i) daily balance of securities owned by non residents and broken down by issue; and

(ii) interest rates associated to each issue.

These two pieces of information should enable the calculation of accrued income security-by-security. The Entry-Book Department of the Banco de España provides the first piece of information (non-resident holdings of these securities).

First approach: accrued income security by security

The amount of income corresponding to each individual issue is calculated on a daily basis by applying the debtor principle as the product of daily stocks of each security (in nominal amounts) times the nominal interest rate.

Subsequently, the daily results corresponding to individual issues are aggregated to obtain the total daily-accrued income. The monthly-accrued income is obtained by cumulating the daily results over each month. The outcome is, thus, obtained following a security-by-security approach.

This is the procedure used in the Spanish Balance of Payments to calculate the accrued interest for these securities.

Second approach: accrued income of a group of aggregated securities

First of all, the daily stocks of non-resident holdings of Spanish euro-denominated bonds and notes issued by the General Government have been aggregated for each month in 2001 (see column 2, *"General government bonds and notes"*). Secondly, the monthly results were divided by the number of days of the corresponding month to obtain a monthly average based on daily stocks (see column 4 *"Monthly average balance"*). The final result consists of total amounts of outstanding securities in hands of non-resident investors without any further detail. The total is the same as in the calculation security by security.

The product of the monthly average balance of non-resident holdings of Spanish euro-denominated bonds and notes issued by the General Government times the appropriate benchmark yield would be the accrued income for that specific group of aggregated securities. The key point would be the selection of the appropriate benchmark yield.

In this exercise, three different benchmark yields have been used:

– The first one is a market average yield of issues with a maturity over two years (table 1),

– the second one is a market average yield of issues with a maturity over four years (table 2),

– and the third one is an interest rate calculated as an average of the nominal yields (nominal coupon paid) of each issue weighted by their circulation balance (table 3).

It is important to bear in mind that the calculations applied for the Spanish Balance of Payments are based on nominal interest rates and performed security-by-security. The first two interest rates used above are publicly available in the Banco de España Monthly Bulletin, but they are not consistent with the ones used for the official series (i.e. nominal interest rates). For the third one, the interest rates used in both calculations (aggregate and sec-by-sec) would be consistent (i.e. nominal yields), but, as in the case of the other two yields, some discrepancies occur due to the different approaches followed.

Therefore, at the time of comparing the results of the aggregate approach using the two first (market) benchmark yields and those obtained through the security-by-security approach, there might be differences caused by two factors:

(i) the interest rate applied, i.e. nominal versus market yields

(ii) the calculation method, i.e. aggregate versus security by security

As mentioned above, in the third case the interest rate applied is conceptually the same as in the security-by-security calculation. Therefore, the differences are supposed to be caused only by the second factor (calculation method). However, it is important to bear in mind that this average nominal interest rates used for the calculations are not publicly available, as it can only be obtained using internally-restricted information from the Entry-Book Department of the Banco de España, which is the Spanish central depository for these securities. Therefore, external users do not have access to this third average nominal yield, and only the yields used in the first and second examples could be used under an aggregate approach.

The three yields have been calculated by applying the formula of the compound interest[6] to the yearly interest rates (the only available ones).

Once the accrued income for all months in 2001 is calculated applying both methods (aggregated, on the basis of the three different yields, and security by security), the next step is to compare the results. The underlying assumption is that the accrued income calculated security by security is the most accurate. Therefore, it is sought whether the accrued income calculated for a group of aggregated securities is similar to the one calculated sec-by-sec, for the three yields applied.

Results of the empirical exercise

Taking a look at the results of applying the three (aggregate) yields, they are totally different. In the first example, i.e. using a market average yield of issues with maturity over two years, the result differs from the accrued income calculated security by security, and the differences are not equal for all

6 *The formula of the compound interest is the following: $(1+i)^{12}= (1+I)$, where i is the monthly interest rate and I the yearly interest rate*

Table 25

Empirical exercise

Accrued income security by security versus a group of aggregated securities (using an average yield of issues with maturity over two years)

(EUR thousands)

1	2	3	4	5	6	7	8	9
Month (2001)	General Government Bonds & notes	Number of days	Monthly average balance	Yearly interest rates	Monthly interest rates	Accrued income 'aggregate'	Accrued income 'sec-by-sec'	Differences
January	2,89 9,25 8,79 3	31	93,524,477	4.978	0.004056591	379,391	406,940	-27,549
February	2,60 1,46 9,59 7	28	92,909,628	4.994	0.004069342	378,081	368,232	9,849
March	2,92 4,43 6,81 4	31	94,336,671	4.902	0.003995996	376,969	395,765	-18,796
April	2,92 1,14 1,45 0	30	97,371,382	4.928	0.004 01673	391,115	392,892	-1,777
May	2,94 9,17 8,84 5	31	95,134,801	5.079	0.004137056	393,578	392,943	635
June	2,96 1,39 3,82 6	30	98,713,128	5.091	0.004146611	409,325	383,244	26,081
July	3,14 7,35 1,51 7	31	101,527,468	5.071	0.004130685	419,378	398,601	20,777
August	3,15 2,90 6,77 2	31	101,706,670	4.961	0.004 04304	411,204	415,353	-4,149
September	3,11 0,58 5,88 5	30	103,686,196	4.829	0.003937755	408,291	402,624	5,667
October	3,27 3,90 9,34 7	31	105,609,979	4.666	0.003807576	402,118	425,052	-22,934
November	3,17 0,63 6,52 2	30	105,687,884	4.458	0.003641187	384,829	457,617	-72,788
December	3,24 4,10 2,10 8	31	104,648,455	4.742	0.003868296	404,811	469,817	-65,006
Total						4,759,090	4,90 9,080	-149,990

2 General Government Bonds and notes = calculated adding the daily stocks of euro denominated bonds and notes issued by the General Government and owned by non residents (nominal amounts)
4 Monthly average balance = column 2 divided into column 3
6 Monthly interest rates = calculated applying to column 5 the formula of the compound interest
7 Accrued income 'aggregate' = column 4 multiplied by column 6
9 Differences = column 7 less column 8

months of 2001, being sometimes positive and sometimes negative (see table 25).

The results of applying the second average yield (market yield of issues with maturity over four years) to the "aggregated" average monthly balance of securities are more similar to the accrued income calculated security-by-security. This could also be observed in the column of "Differences". The amounts of this column are smaller than in the first example. Although the results are better than applying a market average yield of issues with maturity over two years, they are not good enough. The differences are still sometimes positive and sometimes negative and very different for all the months of 2001 (table 26).

Regarding the third approach, i.e. applying average nominal yields, it can be observed that

Figure 24

Comparison between the two methods of calculating the accrued income

(Thousands)

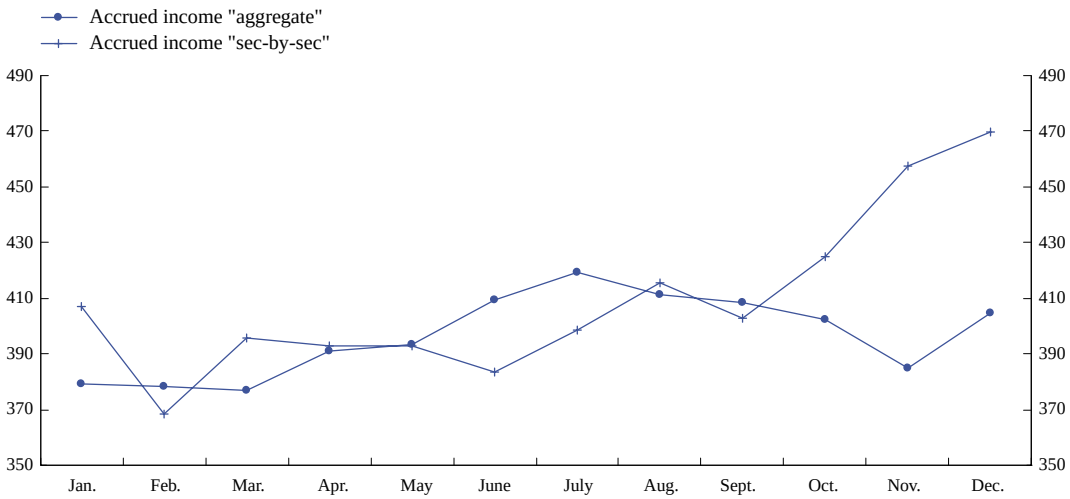
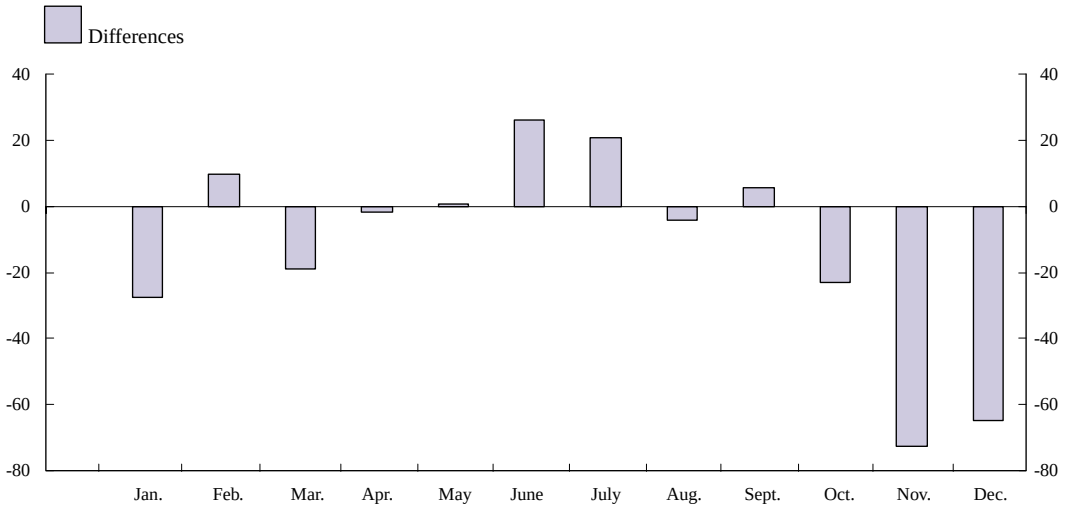


Figure 25

Differences between accrued income calculated for a group of aggregated securities and calculated security by security

(Thousands)



there are still differences with the accrued income sec-by-sec. But these differences are always positive, i.e. the evolution of income figures goes in the same direction in both methods. The yields applied are conceptually the same as the ones applied in the sec-by-sec method, but using an average (see table 27).

Conclusions of the empirical exercise

The first conclusion is that it is not easy to choose the most appropriated benchmark yield, and the results are quite different according to the interest rate chosen. Apparently, the market average yield of issues with maturity over two years seems to be the most appropriate, because in order to

Table 26

Empirical exercise

Accrued income security by security versus a group of aggregated securities (using an average yield of issues with maturity over four years)

(EUR thousands)

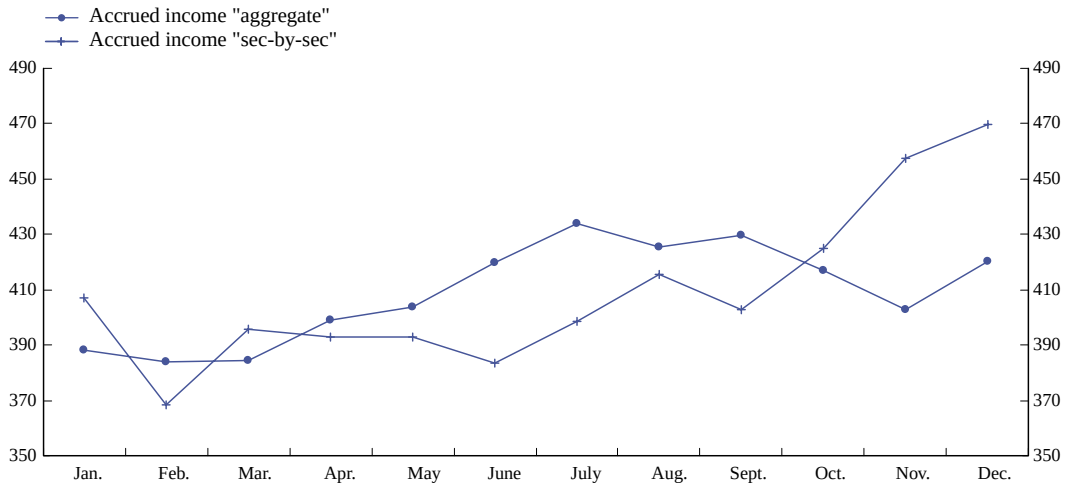
1	2	3	4	5	6	7	8	9
Month (2001)	General Government Bonds & notes	Number of days	Monthly average balance	Yearly interest rates	Monthly interest rates	Accrued income 'aggregate'	Accrued income 'sec-by-sec'	Differences
January	2,899,258,793	31	93,524,477	5.096	0.004150593	388,182	406,940	-18,758
February	2,601,469,597	28	92,909,628	5.075	0.004133871	384,076	368,232	15,844
March	2,924,436,814	31	94,336,671	5.003	0.004076514	384,565	395,765	-11,200
April	2,921,141,450	30	97,371,382	5.031	0.004098824	399,108	392,892	6,216
May	2,949,178,845	31	95,134,801	5.214	0.004244498	403,799	392,943	10,856
June	2,961,393,826	30	98,713,128	5.222	0.004250861	419,616	383,244	36,372
July	3,147,351,517	31	101,527,468	5.249	0.004272333	433,759	398,601	35,158
August	3,152,906,772	31	101,706,670	5.135	0.004181644	425,301	415,353	9,948
September	3,110,585,885	30	103,686,196	5.085	0.004141834	429,451	402,624	26,827
October	3,273,909,347	31	105,609,979	4.842	0.003948129	416,962	425,052	-8,090
November	3,170,636,522	30	105,687,884	4.669	0.003809973	402,668	457,617	-54,949
December	3,244,102,108	31	104,648,455	4.928	0.004016773	420,345	469,817	-49,472
Total						4,907,832	4,909,080	-1,248

2 General Government Bonds and notes = calculated adding the daily stocks of euro denominated bonds and notes issued by the General Government and owned by non residents (nominal amounts)
4 Monthly average balance = column 2 divided into column 3
6 Monthly interest rates = calculated applying to column 5 the formula of the compound interest
7 Accrued income 'aggregate' = column 4 multiplied by column 6
9 Differences = column 7 less column 8

Figure 26

Comparison between the two methods of calculating the accrued income

(Thousands)



calculate the average the majority of issues have been taken into account. But the results show that this yield is not the best one. The interest rate used in the second example seems to be better than the first one. The reason is that the bulk of the issues have maturities over four years. But the results of the second example are not good either.

In the first two examples, the yields applied are market yields. Therefore, when the accrued income is calculated for the group of aggregated securities the underlying method is the creditor approach. If we compare the results obtained using these market yields to the accrued income sec-by-sec obtained using nominal interest rates, we are not comparing two similar amounts. However, if we compare with the results of the third example, the interest rates used are consistent. The problem is that the average nominal yields, as already mentioned, are not publicly available to

Figure 27

Differences between accrued income calculated for a group of aggregated securities and calculated security by security

(Thousands)

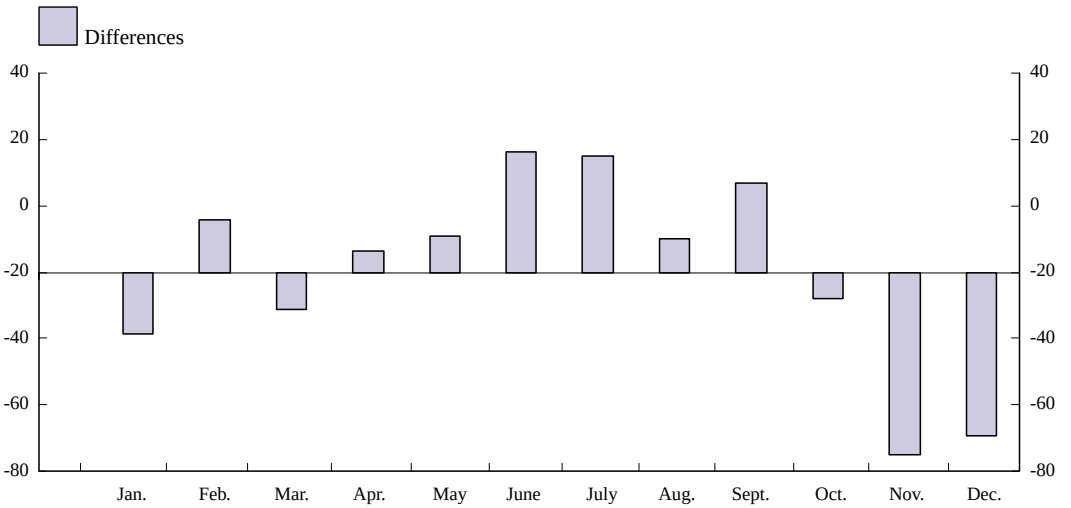


Table 27

Empirical exercise

Accrued income security by security versus a group of aggregated securities (using an average of the yields prevailing at the moment of creation of the issues)

(EUR Thousands)

1	2	3	4	5	6	7	8	9
Month (2001)	General Government Bonds & notes	Number of days	Monthly average balance	Yearly interest rates	Monthly interest rates	Accrued income 'aggregate'	Accrued income 'sec-by-sec'	Differences
January	2,899,258,793	31	93,524,477	6.051	0.004908092	459,027	406,940	52,087
February	2,601,469,597	28	92,909,628	5.973	0.004846195	450,258	368,232	82,026
March	2,924,436,814	31	94,336,671	5.948	0.004826849	455,349	395,765	59,584
April	2,921,141,450	30	97,371,382	5.901	0.004788896	466,308	392,892	73,416
May	2,949,178,845	31	95,134,801	5.888	0.004779377	454,685	392,943	61,742
June	2,961,393,826	30	98,713,128	5.873	0.004766795	470,545	383,244	87,301
July	3,147,351,517	31	101,527,468	5.865	0.004760468	483,318	398,601	84,717
August	3,152,906,772	31	101,706,670	5.865	0.004760958	484,221	415,353	68,868
September	3,110,585,885	30	103,686,196	5.858	0.004755683	493,099	402,624	90,475
October	3,273,909,347	31	105,609,979	5.857	0.004754575	502,131	425,052	77,079
November	3,170,636,522	30	105,687,884	5.855	0.004753088	502,343	457,617	44,726
December	3,244,102,108	31	104,648,455	5.841	0.004741539	496,195	469,817	26,378
Total						5,717,478	4,909,080	808,398

2 General Government Bonds and notes = calculated adding the daily stocks of euro denominated bonds and notes issued by the General Government and owned by non residents (nominal amounts)
4 Monthly average balance = column 2 divided into column 3
6 Monthly interest rates = calculated applying to column 5 the formula of the compound interest
7 Accrued income 'aggregate' = column 4 multiplied by column 6
9 Differences = column 7 less column 8

the rest of the users, apart from the Banco de España.

It is very difficult to choose the most appropriate yield for accrued income on portfolio investment liabilities, but it is even more difficult for income accruing on portfolio investment assets. The only way to accurately calculate accrued income for portfolio investment is having available a Centralised Security Database.

The second conclusion is that if the calculation procedure is not the same (aggregated or security by security), the results can be very different, even if the same interest rate is used (as shown in table III), because non-resident investments are not evenly distributed among all issued securities.

Figure 28

Comparison between the two methods of calculating the accrued income

(Thousands)

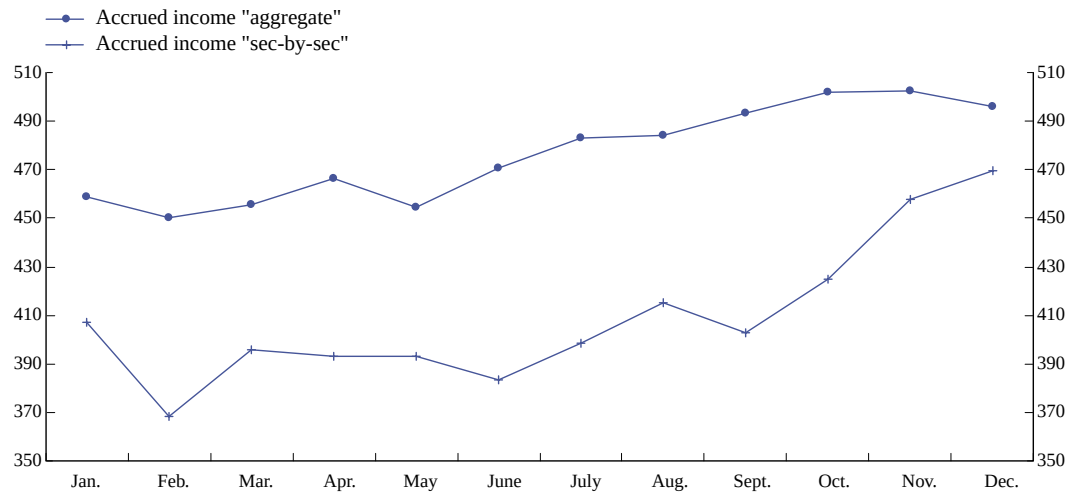
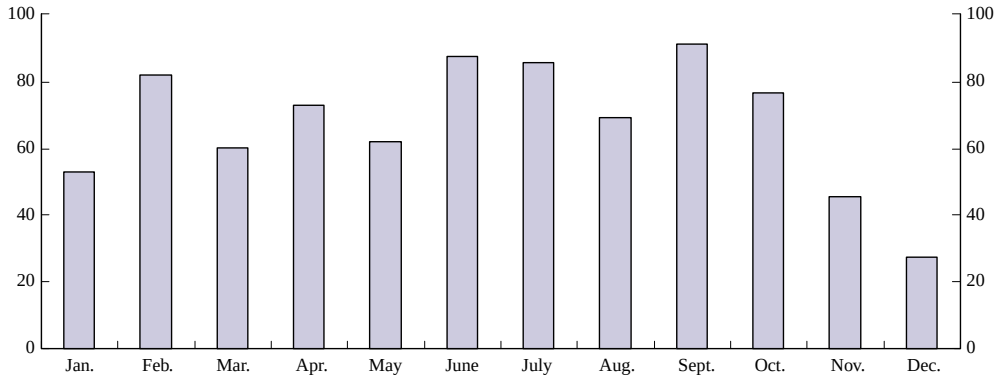


Figure 29

Differences between accrued income calculated for a group of aggregated securities and calculated security by security

(Thousands)



If we consider the liability side of the balance of payments, probably the issuer country has very extensive information about their own issues. But if we take into account the asset side of the balance of payments, to take a decision on the level of aggregation is not easy. And also, each country would have its own criteria. To calculate the accrued income of portfolio investment in a homogeneous way for all countries, the security-by-security approach is the most indicated. And to apply this method in a proper way, a Centralised Security Database is necessary.

Both problems (choosing the appropriate interest rate and applying real interest rates to each holding) could only be solved using a method based on stocks given security-by-security and detailed information on interest rates also security by security. This requires the availability of a security database, and only if this database were a "centralised" one, all countries would use the same interest rates for each security.

United Kingdom (UK)

Introduction

This note summarises the UK's empirical study on the collection of portfolio investment income statistics using an aggregate or security-by-security approach. The UK only has an aggregate dataset, so a full comparison between aggregate and security-by-security approaches could not be undertaken. However, at the time of writing, one large custodian in the UK has supplied data to the Bank of England for holdings of non-resident securities. These figures were collected as part of the feasibility study into security-by-security reporting, following on from the TF-PICS.

Given the data sources available, the following exercises were conducted:

A the implied rate of return (i.e. income credits divided by level of assets) on UK holdings of non-resident issued bonds in the published aggregate data was compared to the rate of return estimated using the sample security-by-security custodian data.

B the sample custodian data, for securities issued in the USA, were used to see how different portfolio investment income data could be if a security-by-security or aggregate approach is used.

Exercise A

The aim of this exercise is to compare the published data to the rate of return implied by the sample security-by-security data obtained from the custodian. The starting point for this

Table 28

UK investment in non-resident issued bonds and notes

	2001			
	Q1	Q2	Q3	Q4
Income (£ billion)	6.0	5.4	5.3	5.1
Level (£ billion)	454.4	448.4	455.6	448.1
Implied rate of return (%)	5.3	4.8	4.7	4.5

Source: ONS and Bank calculation

exercise was the data currently published by the ONS and collected using a survey-based aggregate reporting system (Table 28).

There are four main issues that should be borne in mind when assessing this study. First, the data from the custodian only represent a small part of the overall UK figure.[7] This means that we are assuming that the custodian's holdings are representative of the whole UK. Secondly, the custodian's data are a snapshot of holdings at end-December 2001. Therefore, the results can only be used for different periods in time if we assume that the relationship between the custodian's data and the published data is constant. Thirdly, the yields of some of the securities held by the custodian were not available from our data source. These securities were excluded from my study. Finally, time constraints meant that only the interest on securities issued by the USA could be calculated on a full security-by-security basis (see paragraph below).

Table 29

Calculation of the implied rate of return on the custodian's data

Country of issuer	Type of bond	Weight	Yield (%)
United States	Government	17.9	4.3
Germany	Government	16.4	4.5
France	Government	9.7	4.5
Germany	Corporate	9.3	5.3
Luxembourg	Corporate	8.5	5.3
Netherlands	Corporate	8.1	5.3
Japan	Corporate	7.7	1.0
Japan	Government	5.8	1.0
United States	Corporate	5.5	6.5
Cayman Islands	Corporate	3.8	6.0
Canada	Corporate	3.5	4.9
Netherlands	Government	1.9	4.6
Canada	Government	1.8	4.4
Total		100	4.4

The custodian's data were used to estimate an implied rate of return on bonds and notes. This was calculated by weighting yields for securities issued in each of the main countries by the value of the holdings of the securities in each country. For the USA, the yield was compiled by calculating the interest on a security-by-security basis and aggregating this so that one yield for the USA could be estimated (where yield is total interest divided by total amount outstanding). For other countries, a benchmark yield was used.

The implied rate of return from the custodian's data was 4.4%, which compares favourably with the 4.5% in the aggregate published data (see table 29). Subject to the issues raised above, this shows that a similar result can be obtained by using either an aggregate or security-by-security approach.

Exercise B

This exercise used the custodian's data for bonds issued in the USA. There were 677 bonds issued in the USA listed by the custodian (342 government bonds and 335 corporate bonds). The interest figure was calculated for each security and this was aggregated to produce a figure for total income from the USA (this was sub-divided into government and corporate bonds). This figure was compared to an aggregate approach where interest was calculated by taking the total amount outstanding and applying a benchmark yield to estimate income (again the data were sub-divided into government and corporate bonds).

This study also showed that reasonably similar results are produced by the security-by-security and aggregate approaches (table 30). The results were more similar for government bonds than corporate bonds, although this is

7 *It is estimated that the sample custodian's data represent around 5% of the total UK holdings of non-resident issued bonds and notes.*

Table 30

Results of Exercise B

Format: income (£mn) | rate of return (%)

	Aggregate		Sec-by-sec		Difference		Difference in %
Government bonds	32	4.7	28	4.3	3	0.5	10.3
Corporate bonds	12	5.6	13	6.5	-2	-0.9	-15.1
Total	43	5.0	42	4.8	2	0.2	3.5

Source: ECB calculations

not surprising given the wide range of yields on corporate bonds. The results could be improved by further sub-dividing the corporate bonds (e.g. by broad credit rating category).

Conclusion

The two empirical studies conducted here suggest that reasonably similar data can be produced using either an aggregate approach or a security-by-security approach. Obviously, the less aggregated the data, the more similar the aggregate approach will be to the security-by-security approach. However, it should be noted that these are two limited studies and the results are subject to a number of important caveats (discussed in the paragraph above).

Summary and conclusions

The controversy between aggregated and security-by-security collection systems has been at the origin of an exhaustive debate in the framework of portfolio investment collection systems. However, any conclusions at the level of portfolio investment cannot be directly applicable to the collection of portfolio investment income figures. In order to extract conclusions which may be deemed valid for portfolio investment income, the analysis needs to be slightly adapted to some other specific problems.

Along these lines, the starting point for the work of this subgroup was the assumption that the most accurate results are obtained through a compilation procedure run at the level of individual securities, by applying the coupon inherent to each specific security. The availability of portfolio investment stocks security-by-security is a necessary prerequisite.

Provided the security-by-security approach would offer the most precise results, other considerations could nevertheless compel b.o.p. compilers to consider a more simplified approach. These considerations are mostly related to costs (in terms of technology, time, resources and training of staff, etc.), but also some other factors such as likely difficulties to collect income on direct investment and repos could be additional obstacles for the adoption of a security-by-security approach.

Against this background, the target of the empirical exercises was precisely to determine to which extent the quality of the final product (income figures) could be affected if the b.o.p. compiler, on the basis of the arguments mentioned in the preceding paragraph, decided to collect income figures following a simplified (aggregated) approach, i.e. by applying benchmark yields to stratified categories of portfolio investment stocks (which could be determined by the type of securities, original maturity, market of issuance, economic sector of the issuer, etc.).

The conclusions reached in both empirical exercises are not fully convergent. The exercise carried out in Spain (ES) clearly concludes that the differences obtained following both approaches are rather significant. On the contrary, even if the caveats of the UK exercise have been brought to the attention of the reader (e.g. that the securities analysed only represent a small proportion of the total portfolio investment stocks in the UK i.i.p.), it concludes that both approaches may get to reasonably similar results.

A factor that could affect the comparability of the results obtained through both exercises is the fact that the results of the exercise carried out in ES are presented in levels (i.e. in terms of differences in the monthly income flows), while most of the discrepancies in the exercise performed in the UK are presented in percentage (i.e. by analysing the difference between the implicit rates of return), due to the unavailability of complete information (i.e. total income figures). In the case of the second exercise, this fact could hide significant differences, since just a few percentage points of difference applied over a sizeable stock (as portfolio investment stocks in the UK) could produce significant differences in the levels obtained.

Another factor that could stand behind these not fully coincident results is the fact that the analysis in the UK refers to one point in time and used annualised yields, due to lack of security-by-security data, while the exercise in ES shows monthly differences. In this latter case, the two first differences obtained through the first two aggregated approaches (based on market yields) tend to be less pronounced over longer periods of time (i.e. the whole year), as they switched from positive to negative or vice versa over the months.

These two empirical exercises offered some other interesting features. For instance, the exercise carried out in ES proves that any aggregated approach which tries to combine stocks and yields which are not conceptually consistent (for instance, stocks of securities in nominal value and marked-to-market yields) may offer extremely incoherent results (see results with the first two aggregate market yields applied on nominal portfolio stocks).

An other remarkable result in the UK exercise is that the differences are more relevant for securities issued by private companies than for General Government securities, which, broadly speaking, account for the largest proportion of portfolio investment stocks. As it could be logically expected, the less aggregated the data (calculations made by additional categories of securities), the closer the results to the security-by-security approach.

Finally, at the time of elaborating final recommendations, there is an important point to be borne in mind: the risk of asymmetric treatments between the country of the issuer and the country of the holder. If both are euro area countries, this may certainly jeopardise the compilation of the euro area aggregates. For this reason, the TF-PII should ensure that the results obtained through all approaches finally recommended are reconcilable. To this aim, for any aggregated approach included in the final recommendations of the TF-PII, it would be important considering asymmetries in the access to the relevant information (i.e. nominal/marked-to-market stocks and nominal/market benchmark yields) between the b.o.p. compiler of the country of the issuer and that of the final holder of the relevant securities.

Furthermore, even if the same interest rate is used by both counterparts (in terms of nominal or market interest rates), if the calculation procedure is not consistent (i.e. aggregated versus security by security) the results can be very different, as non-resident investments do not necessarily have to be homogeneously distributed among all domestic securities. This means that in the application of any average yield there is an inherent error since the weights implicit could not necessarily be representative of the specific securities which are most attractive to foreign investors.

The only widespread solution which can fully ensure absence of asymmetries would be a calculation performed at the level of individual securities. However, even if that is the case, the use of identical features for all individual securities can only be possible if the information is centrally available, for instance, through the Centralised Securities Database.

The conclusions of the subgroup can be summarised as follows:

- The security-by-security (s-by-s) approach offers the most precise results, provided all the necessary information is available to the compiler at a sufficient level of quality. It is assumed the CSDB will be essential to meeting this requirement in the future.

- The s-by-s approach is the only way to fully rule out asymmetries among countries. The existence of centralised information (e.g. through the CSDB) would be an additional key factor in reducing asymmetries further, regardless the approach followed.

- Nevertheless, different circumstances (mainly associated to cost arguments, availability of appropriate information, internal compilation processes and checking procedures, available resources, etc.) could lead b.o.p. compilers to a more simplified approach like the aggregated one

- At the time of deciding on the two components of the aggregated approach (i.e. stocks by categories of securities and relevant benchmark yields), it is important to:

  (i) Select consistent components (nominal/marked-to-market stocks always combined with nominal/ market yields)

  (ii) Minimise the risk of asymmetries

- A way to minimise asymmetries would be the use of information which may be publicly available in the calculation of both assets/credits and liabilities/debits (e.g. stocks of securities marked-to-market and market benchmark yields), and which may also be reconcilable with other countries' results computed at the level of individual securities

- In order to minimise asymmetries among countries following distinct approaches (i.e. s-by-s versus aggregated), the ideal solution would be that the CSDB could include exhaustive information on each individual security (especially on the associated interest). This information could be used to calculate benchmark yields for each aggregation level on a centralised basis, thus promoting the use of more homogeneous information among countries.

- The second component of these calculations (i.e. stocks of securities by categories) should also be standardised to the extent possible. To this aim, it is recommended to establish a minimum level of categories of securities (to which the appropriate benchmark yields should be applied).

4. Further empirical evidence: debtor/s-b/ss versus creditor/aggregated

Introduction

This subgroup continued the work initiated by the two subgroups that, at a former stage in the work of the TF-PII, investigated the differences in the assessment of portfolio investment income (i) following the debtor/creditor approaches and (ii) compiling figures on an aggregated and on a security-by-security basis, respectively. Provided the evident links between the topics investigated by both subgroups, in the June 2002 meeting of the TF-PII it was decided to carry out further empirical investigation considering both issues simultaneously.

To this aim, the main goal of these investigations was to further explore through empirical exercises whether the use of different approaches may imply significantly dissimilar results in terms of income.

In principle, and theoretically at least, four combinations between debtor/creditor and s-b-s/ aggregated could be considered. However, on practical grounds, two combinations are very difficult to test due to the following reasons:

(i) The combination s-b-s + creditor is difficult to test due to the problems in the accessibility to the necessary information on market yields at the level of individual securities and for all the time periods tested. Only AT could partially check this approach.

(ii) The combination aggregated + debtor cannot be tested due to the unavailability of indexes/benchmark yields for nominal interest rates and nominal stocks of securities.

In the end, apart from what has been mentioned above about AT, only two combinations could be tested: (i) s-b-s + debtor; and (ii) aggregated + creditor. These two combinations are actually the only two approaches in place in all countries (most likely due to the above-mentioned reasons).

The three countries participating in the subgroup (namely Austria, Italy and France) have tested the following two approaches for a number of domestic and foreign securities:

(i) *Security-by-security + debtor approach*, combining resident investors' stocks of individual foreign securities and non-resident investors' holdings of individual domestic securities with the information available in a master file database regarding the nominal interest rate associated to each individual (domestic or foreign) security.

(ii) *Aggregated + creditor approach*, by combining portfolio investment stocks stratified by categories of securities, determined by the type of securities, original maturity (or residual maturity where available), market of issuance, economic sector of the issuer, etc.) with marked-to-market benchmark yields.

The three participating countries collect portfolio investment stocks security-by-security. This was a precondition to contribute to the work of the subgroup, as the exercise required the simulation of a proxy for aggregated stocks starting from stocks at the level of individual securities (to enable the comparison between the results following both approaches).

This way of proceeding implies that the "aggregated" stocks considered in the empirical exercises are not purely representative of the situation in other countries (those who compile PI directly on an aggregated basis), as the "aggregated stocks" considered by the three countries are just an approximation based on information at the level of individual securities, which is subsequently aggregated to form categories of securities. This methodology would resemble what was called during the meeting the "mixed approach" (which may indeed be an option for the compilation of portfolio investment income).

This document is in four sections. Following this introduction, sections two to four present the results of the empirical exercises carried out in Austria, Italy and France respectively. Section five concludes. Annex I contains some benchmark yields used in the Italian (and partially in the Austrian) exercises.

Empirical exercise in Austria

1. Liabilities

The following analysis was done for long term debt securities issued by the Austrian general government and by domestic MFIs, respectively. On the one hand accruals were calculated by the debtor approach using the Austrian security-by-security processing system (as described in my initial statement). On the other hand the creditor approach was used to calculate accrued interest in the following two different ways:

a. Based on our security-by-security processing system (quarterly) stocks valued at dirty prices were generated for each of the two sectors by five different categories of residual maturities: 0-1, 1-3, 3-5, 5-10, >10 years. The stocks were not differentiated by currencies and instruments (zero coupons, floating rate notes, index linked bonds, etc.). For these categories daily benchmark yields (based on securities with fixed interest rates) were taken from a securities database of the Austrian numbering agency (not on a s-b-s basis!). It should be mentioned that these benchmark yields are characteristic of Austrian issues, but not of the holdings abroad. These yields were used to calculate quarterly average benchmark yields for the five residual maturity categories. Additionally a global average benchmark yield was calculated for each sector using the benchmark yields of the five categories. This average benchmark yield is necessary for countries where it is not possible to generate categories of stocks by residual maturities. This global benchmark represents implicitly an estimation (or assumption) of the distribution of stocks to residual maturity categories.

b. Under the assumption that market interest rates depend highly on currencies, market values for stocks (and benchmark yields) should be available by currencies, e.g. EUR, USD, JPY, GBP, CHF and other currencies. Due to the problem that benchmark yields for other currencies than EUR were not available I decided to apply the creditor approach on a security-by-security basis for a part of the Austrian securities held abroad. Daily yields for the chosen securities were taken from Data Stream.

General government

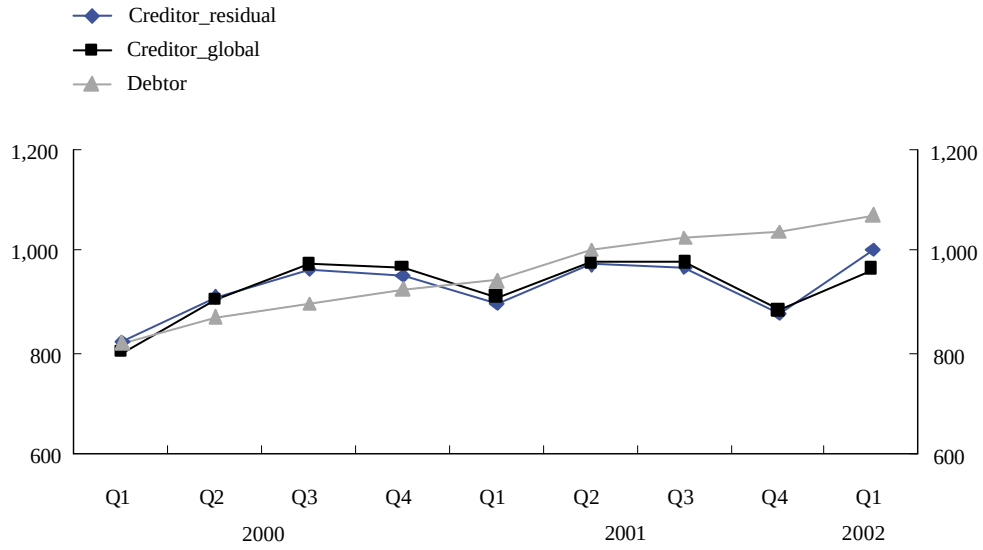
Figure 1 shows for the government sector (whole database) the (quarterly) time series for the (s-b-s) debtor approach (published data), creditor approach with categories of residual times to maturity (creditor_residual) and creditor approach without categories of maturities (creditor_global).

The figure shows that in the case of Austrian government bonds there are almost no differences between a global benchmark and benchmarks which take the residual times to maturity into account, i.e. the stocks are almost uniquely distributed between the five chosen categories. These results depend on the appropriate choice of a global benchmark yield, i.e. on a correct estimation (assumption) of the distribution of stocks to residual maturities. If I take for example a simple average of the benchmark yields of residual maturities from 1 to 12 years as a global benchmark yield, the differences between the two global yields will lie between 0% and 5%. However taking original maturities as basis for benchmark yields will distort the results up to 10%.

Figure 30

Accruals for the government - comparison between debtor and creditor approach

(Millions)



The differences between the debtor approach and the applied creditor approach are lying between -15% (fourth quarter of 2001) and +8% (third quarter of 2000). In 2000 the accruals calculated by the debtor approach are lower and in 2001 higher with respect to the figures calculated by the creditor approach. The results have to be interpreted with caution because figures calculated by the creditor approach depend highly on the chosen benchmark yields. The chosen yields are appropriate for debt securities issued in EUR but not for securities issued in USD, JPY or CHF. For this reason the creditor approach was additionally applied on a s-b-s basis as described above.

The following Table 1 shows for the two quarters with the highest differences (third quarter in 2000 and fourth quarter in 2001) accruals calculated by the global creditor approach, the s-b-s creditor approach and the s-b-s debtor approach for all government securities with a market value higher than 500

Table 31

government accruals calculated by different approaches

	Number	Creditor-residual (aggregated; no distinction in currencies)	Creditor/s-b-s	Debtor/s-b-s
Q3 2000				
All relevant securities	225	964,474,010	-	891,550,000
Sample (all currencies)	38	697,088,255	639,908,237	617,290,128
Sample (EUR)	26	581,418,991	575,260,755	522,243,520
Sample (USD)	3	26,794,489	34,013,193	28,629,477
Sample (JPY)	6	56,782,645	7,945,723	48,324,158
Sample (CHF)	3	32,092,130	22,688,566	18,092,973
Q4 2001				
All relevant securities	215	874,656,409	-	1,035,700,000
Sample (all currencies)	36	710,885,537	682,655,002	804,469,459
Sample (EUR)	25	623,873,988	624,157,491	716,599,055
Sample (USD)	4	34,826,867	37,101,831	43,249,218
Sample (JPY)	4	24,226,829	2,179,256	24,213,796
Sample (CHF)	3	27,957,853	19,216,424	20,407,390

million Euro. For all these securities a yield was available in Data Stream.

The table shows that categorising the stocks by currencies and using appropriate benchmark yields can increase the quality of the results considerably. For the securities issued in EUR the results for the aggregated and s-b-s creditor approach are similar but for the other currencies the results are - as expected - different. In the case of Austrian government bonds the creditor approach applied without a distinction in currencies provides too high results (about 5%). This is due to the Austrian government securities issued in JPY and CHF which have much lower yields than securities issued in EUR.

The following table explains the differences between the three approaches for the sample of government securities issued in JPY (Q3 2000) and CHF (Q4 2001) in detail.

All the results for the government sector show that the differences between the debtor approach and creditor approach can be expected between -10%<0<10%. In extreme situations the differences can be higher. Under the assumption of a high quality of the aggregated stocks (!) the results of the creditor approach depend on the level of available categories of stocks (and appropriate benchmark yields).

MFIs

The same analysis was done for securities issued by MFIs. Figure 31 shows a similar trend to government bonds. However for MFI debt securities the accruals calculated by the creditor approach are higher with respect to the income figures calculated by the debtor approach for all quarters (between 3% and 19%). Theses results are surprising because for 2001 lower figures for the creditor approach were expected.

The following Table 32 shows for the third quarter in 2000 and the fourth quarter in 2001 accruals calculated by the global creditor approach, the s-b-s creditor approach and the s-b-s debtor approach for all MFI securities with a market value higher than 200 million Euro. For 60% of these securities a yield was available in Data Stream. However especially for floating rate notes a yield was missing (!). In the case of a missing yield the market interest rate of another security (same currency and residual maturity but not the same instrument) was used as an estimate. It should be mentioned that floating rate notes usually have not the same benchmark yields as securities with fixed interest rates.

Table 32 shows that the accruals based on benchmark yields are much higher (between 10% and 20%) than the results based on s-b-s

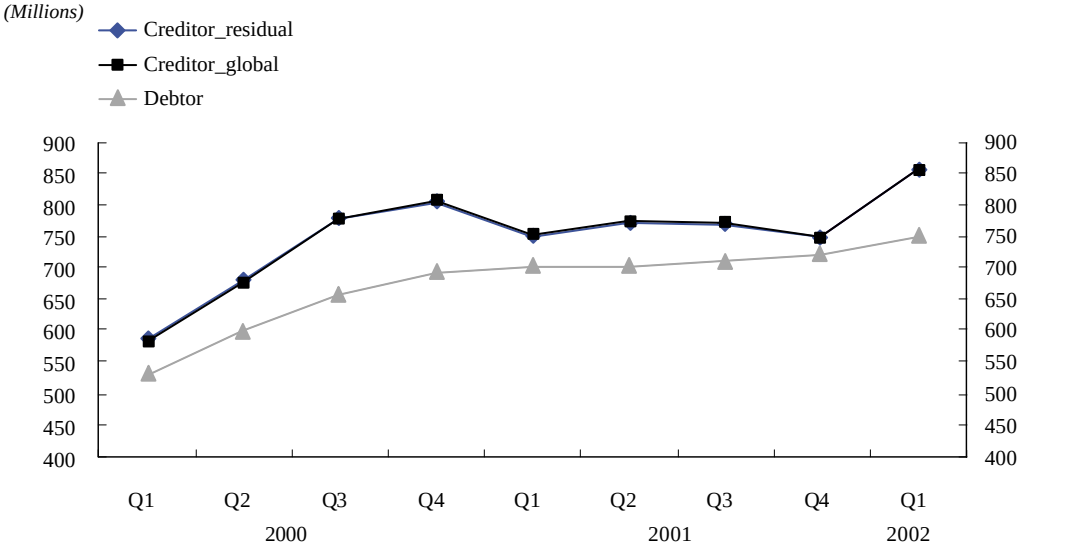
Table 32
Detailed analysis of government securities issued in JPY and CHF

WPKNR	Currency	Duration	Nominal interest rate	Price at issue	Average benchmark yield*	Average individual yield**	Average (clean) price
XS0054962849	JPY	19950120 - 20041220	4,75	100,22%	5,496766	0,998300	115,3%
XS0054962682	JPY	19950120 - 20010119	4,40	100,05%	5,294375	-0,023200	101,4%
XS0048303423	JPY	19940203 - 20090203	3,75	99,21%	5,565022	1,732600	115,1%
XS0046006655	JPY	19930928 - 20050928	4,50	100,00%	5,565022	1,128500	116,5%
XS0041354589	JPY	19930120 - 20010122	5,00	100,00%	5,294375	0,026900	102,4%
XS0034092014	JPY	19911016 - 20031016	6,25	100,00%	5,496766	0,706300	117,0%
CH0008375153	CHF	19980127 - 20060127	3,25	102,20%	4,048325	2,7643	102,6%
CH0006111394	CHF	19990421 - 20090821	3,00	102,35%	4,600433	3,2025	98,7%
CH0004182074	CHF	19960209 - 20060209	4,00	101,75%	4,048325	2,7833	104,2%

* *Based on Austrian government securities issued in EUR with the same residual maturity category (taken from the Austrian numbering agency)*
** *Taken from Data Stream*
All other data are taken from the Austrian securities database

Figure 31

Accruals for MFIs - comparison between debtor and creditor approach



market interest rates. Apart from the expected lower interest rates for securities issued in JPY and CHF there are also on average lower interest rates for securities issued in EUR in the case of using s-b-s market interest rates. Reasons for this could be:

- About 90% of the considered domestic securities (in EUR) were issued abroad. These securities usually have not the same average yield as all securities issued by domestic MFIs.
- More than a half of the considered securities issued in EUR are floating rates notes. As mentioned above a yield was not available for these securities.

That means that the chosen benchmark yields (for the aggregated stocks) do not seem to be appropriate. The same analysis could be done for the other sectors.

Table 33

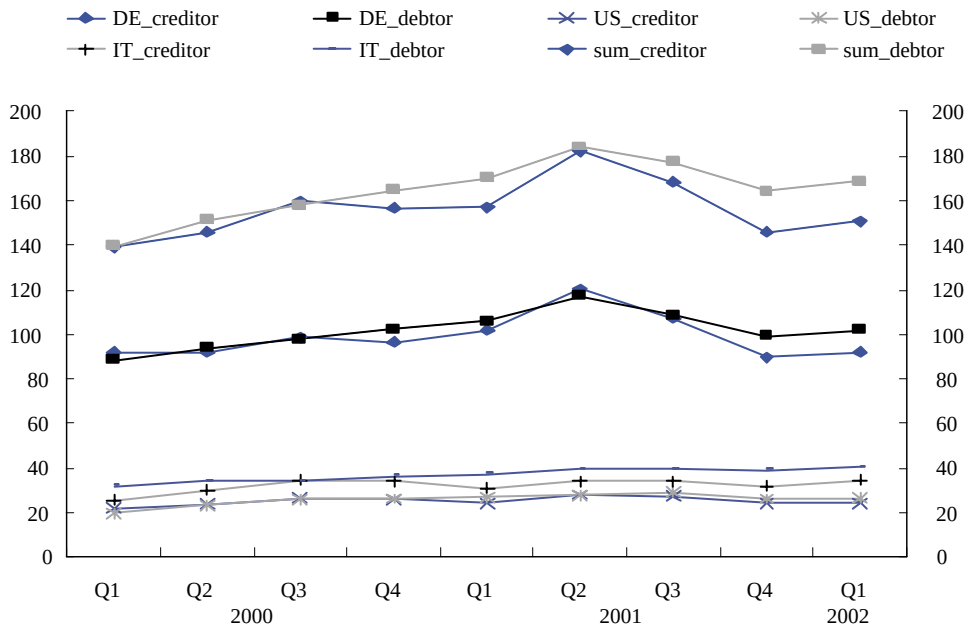
MFI accruals calculated by different approaches

	Number	Creditor_residual (aggregated; no distinction in currencies)	Creditor/s-b-s	Debtor/s-b-s
Q3 2000				
All relevant securities	about 5000	777,148,826	-	693,190,000
Sample (all currencies)	75	412,317,318	373,503,187	349,820,858
Sample (EUR)	29	164,465,715	147,367,754	134,634,075
Sample (USD)	19	116,726,947	145,819,040	125,943,149
Sample (JPY)	7	45,882,185	13,436,111	18,832,581
Sample (CHF)	15	63,769,838	44,623,278	46,466,966
Other currencies	5	21,472,633	22,257,004	22,607,553
Q4 2001				
All relevant securities	about 5400	746,015,251	-	721,390,000
Sample (all currencies)	87	426,398,901	346,772,984	405,185,975
Sample (EUR)	40	194,853,394	175,645,324	170,575,720
Sample (USD)	19	122,151,019	111,066,420	149,111,414
Sample (JPY)	4	28,850,807	5,279,637	11,106,092
Sample (CHF)	18	59,782,366	35,340,580	49,045,124
Other currencies	6	20,761,315	19,441,023	25,347,625

Figure 32

Debtor versus creditor approach on the assets side

(Millions)



2. Assets

For practical reasons only a rough analysis was done on the assets side. For three countries (Germany, USA and Italy; 40% of the considered position) all long term debt securities held by domestic banks were taken from our securities database to analyse differences between the debtor approach (on a s-b-s basis) and the creditor approach (on an aggregated basis). The creditor approach was applied in the following way:

For all three countries (quarterly) market values for stocks were generated by three different categories of residual maturities: 0-3, 3-7, >7 years. The stocks were not differentiated by currencies, instruments (zero coupons, floating rate notes, index linked bonds, etc.) and economic sectors of issuers[1]! As approximations of benchmark yields for these categories, monthly benchmark yields (average) for general government bonds (!!) for residual maturities of 2, 5, and 10 years were taken. The information was supplied by ECB (extracted from Reuters). These benchmark yields are only appropriate under strong assumptions:

- no influence of currencies and instruments
- the benchmark yields of government bonds are a good approximation for benchmark yields of other issuer sectors
- the benchmark yields for residual maturities of 2, 5, and 10 years are good approximations for the chosen categories

Therefore the following results have to be interpreted with caution. Figure 32 shows the results for the period between the first quarter of 2000 and the first quarter of 2002.

We can see that the differences between the applied aggregated creditor and the (s-b-s) debtor approach are slight and as expected. In 2000 there are almost no differences and in 2001 the figures calculated by the creditor approach are lower with respect to the calculations with the debtor approach (6% on average with increasing tendency). Detailed tables to all figures of this work are available.

1 Information on currencies and instruments is (partially) available in our securities database but the information on economic sectors of (non-domestic) issuers is missing.

3. Conclusions

- As expected there are differences between the (s-b-s) debtor approach and the creditor approach depending on the evolution of market interest rates. The differences can be expected in the interval -10%<0<10%. In extreme situations the discrepancies can be higher.

- However the results calculated by the creditor approach depend highly on the chosen benchmark yields and on the availability (and quality) of categories of stocks.

Therefore it is very difficult to compare the results of both approaches. In general it can be concluded that there are (mostly slight) inconsistencies due to using different methods for calculating accruals (debtor/creditor). From the Austrian point of view the inconsistencies in the euro area aggregate could be even more attributed to different practices and possibilities of applying the creditor approach. These different practices depend on the quality (and available details) of (aggregated) stocks and on the availability of appropriate benchmark yields of each country.

Empirical exercise in Italy

1. Main goal

This analysis is aimed at exploring through empirical exercises whether the use of different approaches may imply significantly different results in terms of income. In particular the interest accrued calculated with two different methods respectively aggregated/ creditor and security-by-security/debtor will be compared in the context of an empirical exercise regarding a subset of the Italian Portfolio assets.

The results of this exercise cannot be deemed fully conclusive since the diversity of the results calculated with the two approaches is strongly influenced by many factors (stability of interest rates, composition of stock, level of detail of market yield and stock). The empirical exercise can only partially test the impact of these factors on the final results.

2. Specific features of the empirical exercise

In this exercise the portfolio assets data derived from the 2000 IMF Portfolio Survey have been used. Monthly stock data have been obtained by cumulating flows starting from year 2000 benchmark. At present the results of the portfolio survey referring to year 2001 have not been validated jet. This empirical exercise involves only debt securities. The UIC currently calculates the accrued interest for debt securities according to the security-by-security/debtor approach and as a consequence the detailed time series of market yields is not currently used to calculate interest and then this information is not available. For the empirical exercise in order to calculate the interest income by adopting the creditor approach, the benchmark yields supplied by ECB have been used. In particular monthly market yields for general government bonds, from January 1999 to June 2002 have been supplied for the following maturities: 2,5,10 years for AT, IT, DE, ES and the same ones plus 1 year for FR, UK, JP and US (see annex1). The accrued interest has been calculated on a monthly basis (from January 2001 to March 2002) for general government bonds issued by AT, DE, ES, FR, JP, UK, US. Only securities with a term to maturity beyond 1 year have been included in the calculation. The security categories included in the calculation cover approximately the 22% of the total portfolio assets for debt securities. The 99% of the portfolio stock used in exercise consists of fixed coupon bonds (the percentage of zero coupon bonds and floating rate bonds is negligible).

The following table shows the percentage distribution by country of the general government bonds included in the exercise.

Table 34
Country breakdown

Issuer country	percentage
AT	3
DE	43
ES	13
FR	21
JP	4
UK	3
US	13
Total	100

Data Sources

The first data source that has been used consists of the end 2000 stock data derived from the IMF Portfolio Survey. The monthly stock has been derived by cumulating flows. At the end of each month on a security-by-security basis the available information is the following:

- *Total amount (market value)*
- *Total amount (nominal value)*

The second data source that has been used in this exercise is the UIC security database (master file data-base) from which all the required information concerning the securities involved in the exercise has been derived. The UIC database contains information for both domestic and foreign securities.

For the section Aggregated + creditor approach the information which has been used to simulate the stock reported on an aggregated basis is the following: issuance date and redemption date (to calculate original maturity), financial category (to select debt instruments), issuer sector (to select Government bonds), country of issuer (to aggregate by country).

For the section Security-by-Security + debtor approach the nominal annual interest rate for each security has been used. For zero-coupon bonds the interest rate at issuance has been calculated by using the issuance price from the price database derived from transactions (in this exercise the component of zero coupon bond was negligible).

The monthly time series of market yield for the application of the creditor approach has been supplied by ECB.

Debtor/security-by-security approach

In order to calculate the accrued interest according to the security-by-security + debtor approach the monthly nominal interest rates have been multiplied by the monthly average nominal amount on a security by security basis. The average value is calculated as follows: (nominal value at the beginning of period + nominal value at the end of period)/2. For coupon bonds the interest calculated does not include premiums and discounts since the necessary information, which is necessary for the calculation, is not available in the UIC masterfile.

Creditor/aggregated approach

In the second section of the exercise regarding Aggregated + creditor approach two different scenarios have been taken into account concerning the available breakdown of debt security portfolio stocks.

Scenario (1)
The available breakdown is the following:
- *Type of security*
  - *Equity*
  - *Debt instruments*
- *Economic sector of the issuer (IMF BPM5)*
- *Country of the issuer*
- *Original maturity (number of years)*

In this case the assumption has been made that the original maturity is expressed in terms of years and, as a consequence, the percentage distribution by number of years to maturity can be determined precisely. The monthly market yields supplied by the ECB have been interpolated for the seven available countries

in order to obtain values for all different maturities from 1 to 10 years. As a consequence for each month a weighted average of the market yields has been multiplied by the monthly average market value of stock. The weights used in the calculation of the monthly average yields consist of the percentage amounts for the breakdown by issuer country, years to maturity. The average value for monthly stocks is calculated as follows: (market value at the beginning of period + market value at the end of period)/2.

Since the monthly time series refers to yearly yield, the corresponding monthly yield has been proxied dividing by 12 these annual yields.

Scenario (2)
The available breakdown is the following
- *Type of security*
  - *Equity*
  - *Bonds and notes*
  - *Money Market Instruments*
- *Economic sector of the issuer (IMF BPM5)*
- *Country of the issuer*

In this case the assumption has been made that only the distinction between bonds and notes and money market instruments (original maturity up to/more than 1 year) is available. For each month a weighted average of the market yields have been multiplied by the monthly average market value of stock. The weights used in the calculation of the monthly average yields consist of the percentage amounts for the breakdown by issuer country. For each of the seven countries a simple average of the available yields has been taken into account since we assume in this scenario that no information concerning the distribution by original maturity beyond one year is known. The average value for monthly stocks is calculated as follows: (market value at the beginning of period + market value at the end of period)/2.

Since the monthly time series refers to yearly yield, the corresponding monthly yield has been proxied dividing by 12 these annual yields.

3. The results

The following table shows the results of the comparison exercise. In the last two columns the percentage differences between the interest calculated respectively with debtor +

Table 35

Monthly accrued interest calculated by following different approaches

(EUR millions)

Reference month	Monthly average stock (market value)	Accrued interest debtor + s-b-s approach	Accrued interest creditor+aggr. approach scenario (1)	Accrued interest creditor+aggr. approach scenario (2)	Percentage difference creditor+aggr debtor+ sec-by sec scenario (1)	Percentage difference creditor+aggr debtor+ sec-by sec scenario (2)
(a)	(b)	(c)	(d)	(e)	(d-c)/c	(e-c)/c
2001 Jan.	69.223	278	257	256	-8	-8
Feb.	70.464	286	261	259	-9	-9
Mar.	73.203	292	262	259	-10	-11
Apr.	74.668	298	273	269	-8	-10
May	75.011	300	283	279	-5	-7
June	72.468	293	272	267	-7	-9
July	70.184	281	265	260	-6	-8
Aug.	66.813	271	240	235	-11	-13
Sep.	67.651	269	230	225	-15	-17
Oct.	69.496	271	221	214	-18	-21
Nov.	70.219	274	219	212	-20	-23
Dec.	71.905	282	243	236	-14	-16
2002 Jan.	71.998	283	248	242	-12	-15
Feb.	70.516	279	249	241	-11	-14
Mar.	69.282	272	262	251	-4	-8

s-b-s approach and creditor + aggregated (scenario 1 and 2) have been calculated. The yearly percentage difference is approximately 10%. From October to December 2001 the highest values of the percentage difference have been observed since a quite generalised decrease of interest rates occurred in those months. The time series of the interest calculated in scenarios 1 and 2 of the creditor + aggregated approach does not differ significantly.

4. Conclusions

The interest accrued calculated by following the different approaches does not show significant difference (approximately 10%) on a yearly basis. On a monthly basis in a time series of 15 observation in only 2 months relevant differences (around 20%) have been observed. The sign of the percentage difference is always negative (the interest calculated by following debtor + s-b-s is constantly higher than that calculated by creditor +s-b-s) from January 2001 to March 2002.

In order to analyse the results, we have to take into account that this particular exercise has been patterned on the available information supplied by the ECB. As a consequence we can assume that in this exercise, especially in the scenario 1, the available market yields represent with an acceptable precision the security-by-security real market yields. In the scenario 2 the loss of information concerning maturity causes an increase (even though not very relevant) in the difference between the two approaches.

In a real situation the difference in the calculated income can be strongly influenced by the level of breakdown for stocks combined with the level of detail of the available market yields. The breakdown for portfolio stocks differs from country to country and information on currency and issuer country is not necessarily included in the minimum requirement. Also for market yields the level of detail of the data as well as the method adopted in using and extrapolating the available data can differ from country to country. Since the accuracy (in terms of available information) in calculating interest on an aggregated basis could be extremely variable, it is difficult to assess whether the loss of precision in general tends to overestimate or underestimate the difference due to the different approaches.

Empirical exercise in France

1. Introduction

This exercise aims at exploring whether there are significant differences between two distinct ways of compiling portfolio investment income: security by security (+ debtor) and aggregating securities (+ creditor).

The present study will focus on a special category of French tradable public debt: the Treasury notes. The choice of this sample is due to the following reason: the number of issues is not very large, which enable the security-by-security calculation, but they involve sizeable amounts (about 40% of tradable French public debt). These notes have the specificity that the maturity can only be two years or five years.

For each bond, the following information is available :

– issue price

– maturity (two years or five years)

– coupon rate

– coupon date

– monthly stock held by non-residents

This information is coming from internal French Balance of Payments data, calculated from French Treasury data.

The study will compare the results of the two methods for each month of 2001

First approach: accrued income security by security

The amount of income corresponding to individual issues is calculated on a monthly basis by applying the debtor principle as the product of monthly stocks of each security (in nominal amount) times the nominal interest rate.

For each month, the stock considered is the stock held at the end of the month. The nominal rate is constant for each bond.

Second approach: accrued income of a group of aggregated securities

With this approach, the amount of income corresponding to the total of bonds held by non residents is calculated on a monthly basis by applying the creditor approach as the product of the monthly balance of non-resident holdings of French bonds times an appropriate interest rate.

The monthly stock is calculated from French Balance of Payments data. The stock considered is the stock at the end of the month.

The monthly market yield is calculated at the Bank of France - BSME (Banque de Séries Monétaires et Economiques). It is an average market interest rate over the month.

This study will present the results for three different rates :

– the first one is a market average yield of issues with a maturity over two years.

– the second one is a market average yield of issues with a maturity over five years.

– the third one is an average of the two previous ones weighted by the proportions of two-year bonds and five-year bonds in the non-resident holdings.

To mention, about 83% of the non-resident holdings of the French bonds considered are held in five-year bonds, hence the third rate listed below tends to be close to the five-year rate. Another point is that the different weights (two-year or five-year) do not change much during the year even though within each maturity-field (two-year bonds or five-year bonds) some movements appear every month.

Each monthly rate has been calculated by applying the formula of the compound interest to the yearly interest rate: $(1+i)\ 12 = 1+I$, where i is the monthly interest rate and I the yearly interest rate.

Once the accrued income for each month in 2001 is calculated applying both methods, the next step is to compare the results. Two factors might create a difference :

– The calculation method: aggregate versus security by security. The underlying assumption is that the accrued income calculated security by security is the most accurate.

– The interest rate applied: the market average yield is characteristic to French issues. Its calculation takes into account the issues made in France, not the holdings outside France.

2. Results of the exercise

The three tables of results are extremely different. As what might have been expected since only 17% of the non-resident holdings relates to two-year bonds, the figures for the aggregated method using a two-year rate are rather far from the figures obtained with the security-by-security method.

The differences are mainly negative. That can be explained by the fact that the two-year rates are usually lower than the five-year rates (and therefore than the majority of the

Table 36

Accrued income security by security versus a group of aggregated securities 2001

using an average yield of issues with maturity over two years
(EUR thousands)

Month	Non-resident holdings in bonds	Yearly interest rates	Monthly interest rates	Accrued income aggregate	Accrued income security-by-security	Difference
1	2	3	4	5	6	7
January	70,277,357.70	4.450	0.363	255,419.84	251,928.62	3,491.21
February	72,495,943.70	4.492	0.367	265,947.18	264,248.35	1,698.82
March	73,895,004.62	4.345	0.355	262,387.52	266,297.83	-3,910.32
April	74,454,235.62	4.420	0.361	268,827.42	266,903.65	1,923.76
May	73,149,829.62	4.481	0.366	267,672.19	263,374.03	4,298.16
June	74,944,186.62	4.301	0.352	263,452.52	269,868.30	-6,415.78
July	71,852,223.86	4.288	0.351	251,857.31	264,619.63	-12,762.32
August	73,093,371.86	4.079	0.334	243,921.72	268,331.08	-24,409.36
September	77,635,464.86	3.728	0.305	237,166.11	284,196.74	-47,030.63
October	75,564,811.97	3.379	0.277	209,565.78	275,637.42	-66,071.64
November	77,918,467.97	3.264	0.268	208,851.45	281,912.43	-73,060.98
December	78,665,928.97	3.671	0.301	236,697.51	282,949.44	-46,251.93
Total				2,971,766.55	3,240,267.54	-268,500.99

2 : bonds issued by the French Government and owned by non residents
4 : calculated from column 3 applying the formula
5 : column 2 times column 4
6 : calculated by summing every bond's accrued interest.. Each bond's interest is calculated by multiplying the nominal stock held by non-residents and the monthly interest rate.
7 : column 5 less column 6

individual rates of the bonds held by non residents) during the period considered

Using the five-year rate, the results obtained by the two methods are closer. This can be explained by the fact that bonds held by non residents are mainly five-year bonds.

The sign of the difference changes over the year. Mainly it is positive at the beginning of the year (the "aggregated" results are bigger than the security-by-security ones) and negative at the end of the year. Some explanation will come further.

Figure 33

Comparison between the two methods of calculating the accrued income

(Thousands)

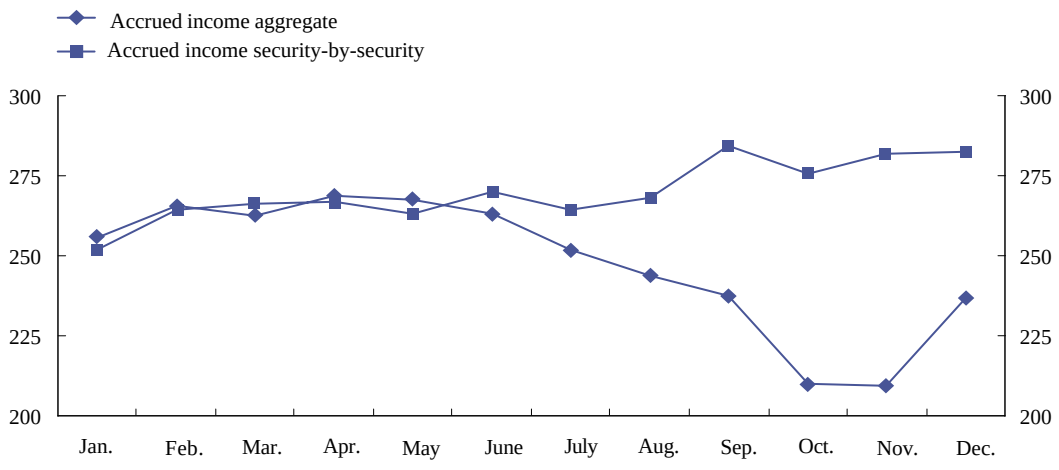


Figure 34

Differences between accrued income calculated for a group of aggregated securities and calculated security by security

(Thousands)

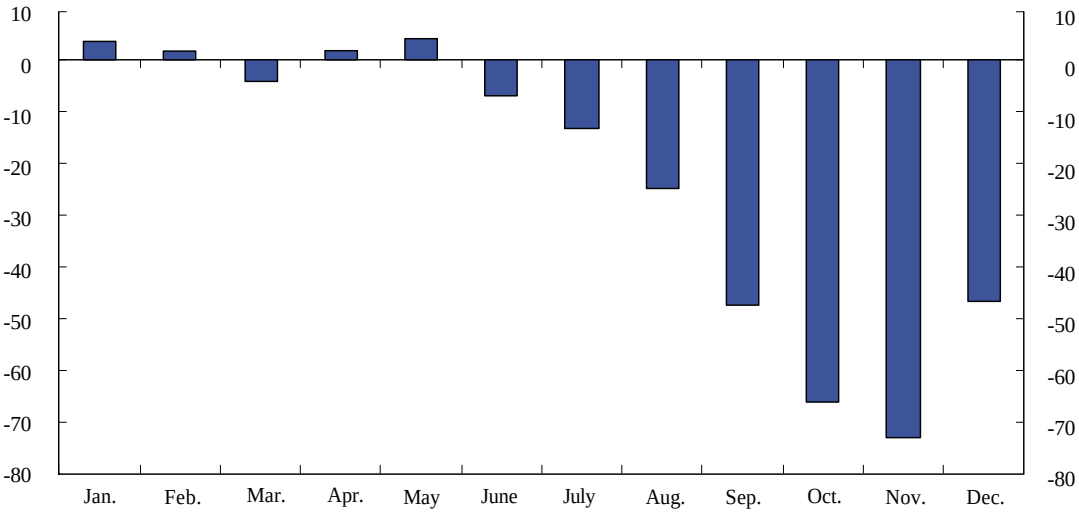


Table 37

Accrued income security by security versus a group of aggregated securities 2001

using an average yield of issues with maturity over five years
(EUR thousands)

Month	Non-resident holdings in bonds	Yearly interest rates	Monthly interest rates	Accrued income aggregate	Accrued income security-by-security	Difference
1	2	3	4	5	6	7
January	70,277,357.70	4.559	0.372	261,594.44	251,928.62	9,665.82
February	72,495,943.70	4.603	0.376	272,364.08	264,248.35	8,115.72
March	73,895,004.62	4.465	0.365	269,470.65	266,297.83	3,172.81
April	74,454,235.62	4.598	0.375	279,438.54	266,903.65	12,534.89
May	73,149,829.62	4.743	0.387	283,045.04	263,374.03	19,671.01
June	74,944,186.62	4.636	0.378	283,566.14	269,868.30	13,697.83
July	71,852,223.86	4.639	0.379	272,053.36	264,619.63	7,433.73
August	73,093,371.86	4.429	0.362	264,424.31	268,331.08	-3,906.77
September	77,635,464.86	4.234	0.346	268,757.98	284,196.74	-15,438.76
October	75,564,811.97	3.995	0.327	247,097.72	275,637.42	-28,539.70
November	77,918,467.97	3.932	0.322	250,794.28	281,912.43	-31,118.15
December	78,665,928.97	4.282	0.350	275,348.50	282,949.44	-7,600.95
Total				3,227,955.03	3,240,267.54	-12,312.51

2 : bonds issued by the French Goverment and owned by non residents
4 : calculated from column 3 applying the fromula
5 : column 2 times column 4
6 : calculated by summing every bond's accrued interest.. Each bond's interest is calculated by multiplying the nominal stock held by non residents and the monthly interest rate.
7 : column 5 less column 6

Figure 35

Comparison between the two methods of calculating the accrued income

(Thousands)

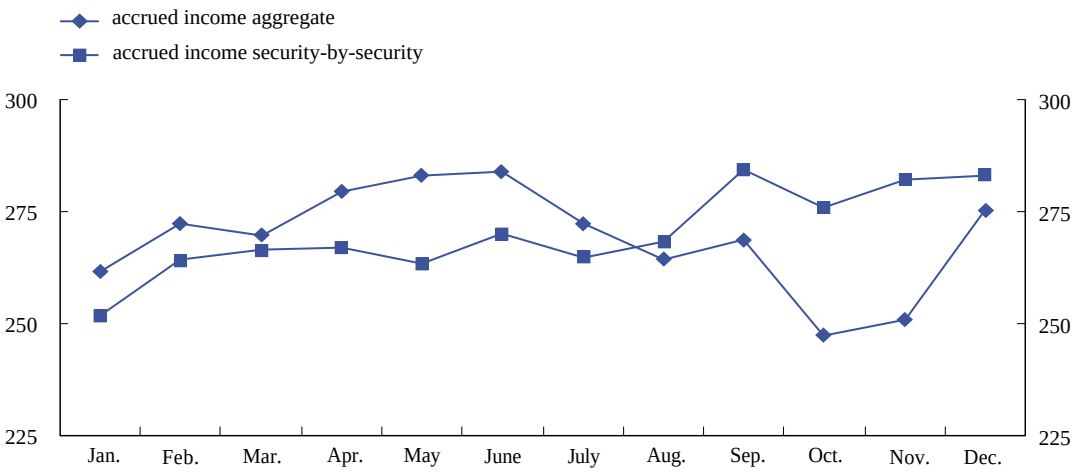
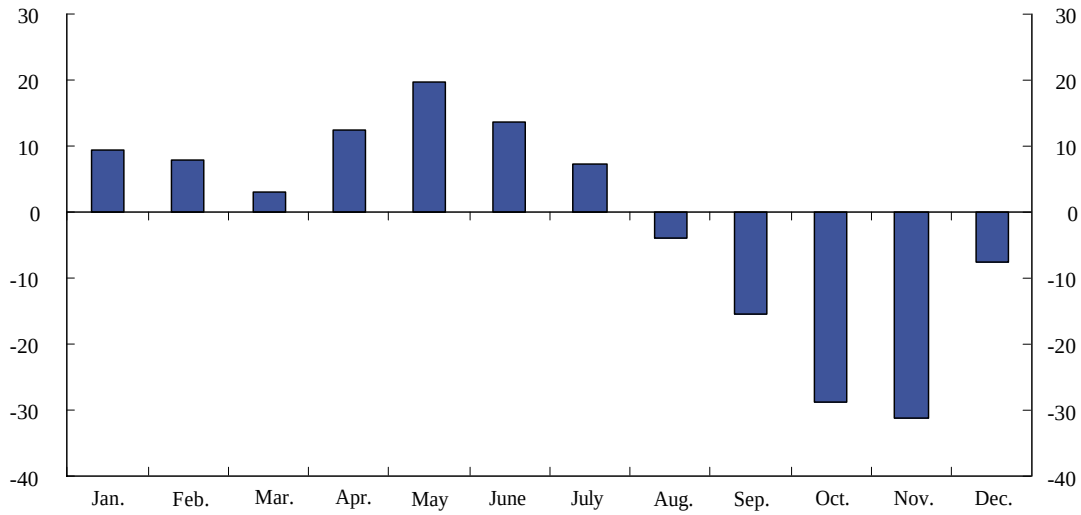


Figure 36

Differences between accrued income calculated for a group of aggregated securities and calculated security by security

(Thousands)



The total difference over the year is ten times lower than in the previous example, coming down to 12 millions EUR (negative).

As for an average rate, the differences are smaller than with the two-year rate but slightly higher than with the five-year rate. The shape of the differences graph is the same than with a five-year rate, but each result using an average rate is lower than the one using a five-year rate.

3 Comments and explanation

Two major comments can be made :

– First, while the use of an average yield built with the knowledge of the weights given to two-year bonds and to five-year bonds would be seen as a way to reduce the errors, it appears however that the results are closer with a five-year yield.

Table 38

Accrued income security by security versus a group of aggregated securities 2001

using an average of the yields available
(EUR thousands)

Month	Non-resident holdings in bonds	Yearly interest rates	Monthly interest rates	Accrued income aggregate	Accrued income security-by-security	Difference
1	2	3	4	5	6	7
January	70,277,357.70	4.541	0.371	260,548.08	251,928.62	8,619.45
February	72,495,943.70	4.584	0.374	271,276.65	264,248.35	7,028.30
March	73,895,004.62	4.445	0.363	268,270.36	266,297.83	1,972.53
April	74,454,235.62	4.568	0.373	277,640.80	266,903.65	10,737.14
May	73,149,829.62	4.699	0.383	280,441.36	263,374.03	17,067.34
June	74,944,186.62	4.579	0.374	280,160.42	269,868.30	10,292.12
July	71,852,223.86	4.580	0.374	268,633.89	264,619.63	4,014.26
August	73,093,371.86	4.369	0.357	260,952.93	268,331.08	-7,378.15
September	77,635,464.86	4.148	0.339	263,412.10	284,196.74	-20,784.64
October	75,564,811.97	3.891	0.319	240,749.28	275,637.42	-34,888.14
November	77,918,467.97	3.818	0.313	243,701.10	281,912.43	-38,211.33
December	78,665,928.97	4.178	0.342	268,810.61	282,949.44	-14,138.83
Total				3,184,597.59	3,240,267.54	-55,669.95

2 : bonds issued by the French Government and owned by non residents
4 : calculated from column 3 applying the formula
5 : column 2 times column 4
6 : calculated by summing every bond's accrued interest.. Each bond's interest is calculated by multiplying the nominal stock held by non residents and the monthly interest rate.
7 : column 5 less column 6

– Second, and this is valid for any of the three samples of figures obtained by an aggregated method, the trend is not the same for both methods. The income calculated with a security-by-security method keeps on growing over the year whereas the income calculated with an aggregated method grows up to June and then gets down.

In the very specific case of 2001, what happened is that up to March, two bonds (five-year) with rates 6% and 5.75% were pulling up the average yield. Non residents had few holdings in these two bonds (they owned about 20% of these bonds, compared to an owning of 40% in general), so the aggregated method was getting higher results than the security-by-security one. After March, without

Figure 37

Comparison between the two methods of calculating the accrued income

(Millions)

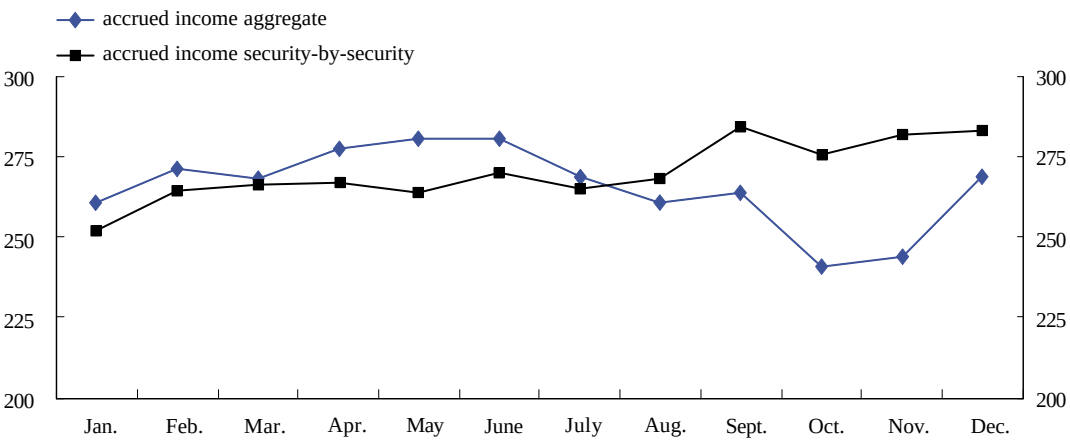
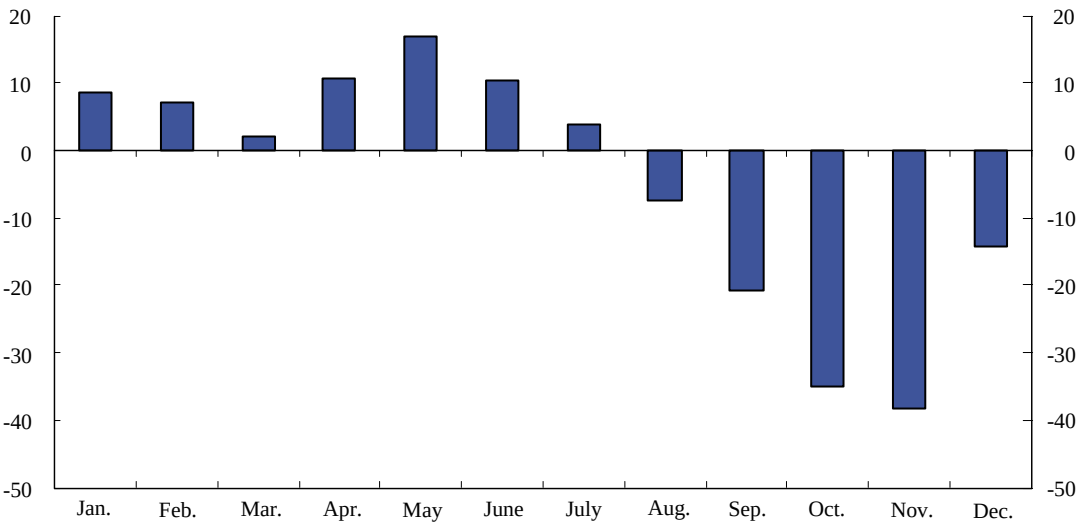


Figure 38

Differences between accrued income calculated for a group of aggregated securities and calculated security by security

(Thousands)



these two bonds pulling up the average yield, the two methods tended out to get closer. Then in September and October, two new bonds with 4% and 3.75% rates appeared, pulling down the average yield, but non residents did not buy lots of them. This is why the results of the aggregated method were smaller than the ones from the security-by-security method.

In point 20, the reason of both phenomena is mainly that the non residents, depending on their forecast, invest in bonds of different interest rates, hence the percentage of the holdings in a bond owned by non residents (as the stock held by non residents in that bond divided by the total stock held by non residents) has no reason to be the same that the percentage of the issues of the same bond in France (as the total issues in that bond divided by the total issues in Treasury notes in France). Then the differences come from the fact that there are different five-year issues, with different rates. Also, there are different two-year issues, with different rates.

The following table shows in the second column a rate calculated as an average of the different nominal rates of the bonds, using weights calculated from the knowledge of the non-resident holdings. The other columns are the three different yields used for the exercise.

During 2001, the non-resident holdings were growing while the average nominal rate remained almost constant. This is why the security-by-security approach gives growing incomes over the year. On the other hand, the different market yields decreased at the end of the year. This is why the aggregated method shows a decreasing trend of income from June (with a return in December).

Table 39

Results

(Percentages)

Month	Average nominal rate	Two-year rate	Five year rate	Average two-year versus five-year rate
January	4,487	4,450	4,559	4,541
February	4,507	4,492	4,603	4,584
March	4,475	4,345	4,465	4,445
April	4,478	4,420	4,598	4,568
May	4,497	4,481	4,743	4,699
June	4,501	4,301	4,636	4,579
July	4,604	4,288	4,639	4,580
August	4,586	4,079	4,429	4,369
September	4,572	3,728	4,234	4,148
October	4,538	3,379	3,995	3,891
November	4,503	3,264	3,932	3,818
December	4,493	3,671	4,282	4,178

Figure 39

Comparison between four methods of calculating the accrued income for 2002

(Thousands)

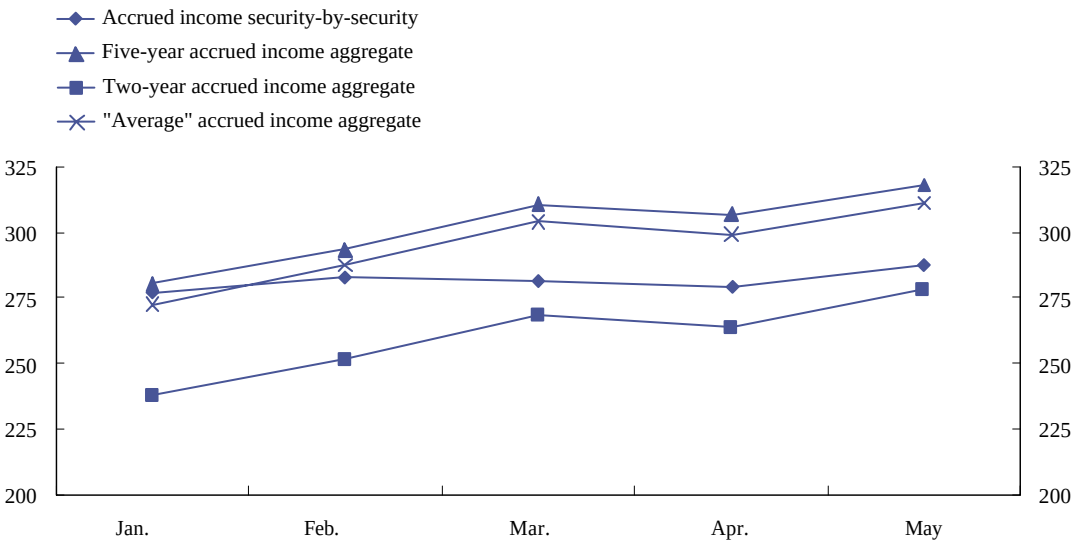
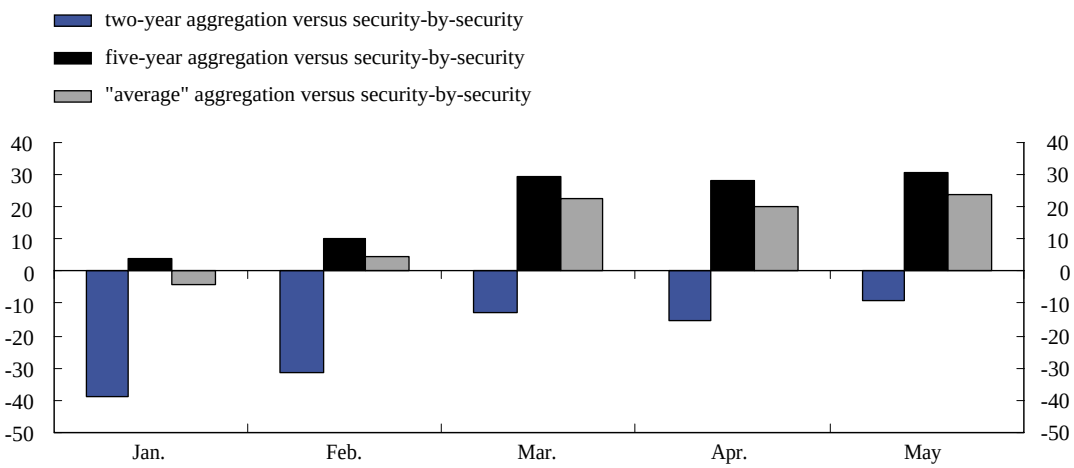


Figure 40

Differences between aggregated results and security-by-security results for 2002

(Thousands)



Some results have also been obtained for 2002. Using a five-year yield or an average one, the two methods give close results in January and February but later on, the redemption of a bond with an important holding rate from non residents and the issue of a bond with a 4.75% rate, rendered the aggregated incomes higher than the security-by-security ones.

4. Conclusion

The results of this exercise are very similar to the results obtained by Spain for the same exercise: Spain obtained a small total difference using four-year yields (about a million EUR) whereas France obtains a small total difference using five-year yields.

The main conclusion is that the choice of the average rate is essential when compiling accruals.

The use of the five-year yield gives aggregated results which are comparable to the ones obtained with a security-by-security method and the differences seem to compensate over the year.

But it would be really optimistic to assume that the differences have to compensate over a one-year period since the behaviour of non-resident holders would have to be taken into account. Therefore, the calculation of a representative average rate would need a perfect knowledge of the different nominal rates related to the different bonds and their weights in the non-resident holdings. But this would lead to calculations that are very close to a security-by-security method. So, when it is possible, the security-by-security method would be a better choice.

Globally, if r1 is the average yield calculated in France and r2 the average rate calculated while considering only the bonds held by non-resident, it would appear that

- when r1 (r2 then the aggregated method gives higher results than the security-by-security one.

- when r2 (r1 then the security-by-security one gives higher results than the aggregated method.

To mention, when both rates are close, these inequalities might not be true, since there is still some uncertainty regarding the turning rate.

General conclusions

Although the three countries have worked following the same patterns, they have not contrasted their results and conclusions until the finalisation of their respective investigations. However, some of their findings are remarkably coincident. The following tips may summarise the conclusions which are common to the three exercises:

(i) The magnitude of the gap encountered in the three exercises was similar.[2]

(ii) In general, the way how aggregated calculations (following the creditor approach) are performed – namely (i) the number of categories of securities established and (ii) the selection of the appropriate benchmark yields – could generate inconsistencies of comparable magnitude to those derived from the choice between creditor and debtor.

(iii) However, the differences are largely dependent on several factors such as interest rates volatility, composition of portfolio investment stocks, level of details available on market yields and portfolio investment stocks, etc.

It is of utmost importance to emphasise that the results of these exercises cannot be deemed fully conclusive since they have just focused on a limited range of securities (mostly government bonds) and the results are very much dependent on the factors enumerated under (iii).

2 *The three exercises quantified the difference in the output produced by the aggregated/creditor and the s-b-s/debtor approaches respectively at around +/- 10 % of the total results in prolonged periods of time (differences tend to be higher on a monthly basis). However, it may be difficult generalising these results to all situations, since most of the conclusions of the three exercises are just based on government bonds. Additionally, even for such bonds the participants in the subgroup recognise that larger differences may happen in exceptional cases (for instance, in times of significant changes in interest rates).*

In particular, the categories of securities established in the empirical investigations were possible thanks to the availability of portfolio investment stocks security-by-security in the three countries, i.e. these exercises actually compare the so-called "mixed approach" with the "s-by-s approach". Differences of the s-by-s approach with a purely aggregated approach have, thus, not been tested.

However, it is important to highlight that the results of these additional empirical exercises do not dispute none of the conclusions reached by the former two subgroups investigating the choice between debtor and creditor and between aggregated and sec.-by-sec. respectively. Moreover, the participants in the subgroup have found some evidence which reinforces some of the conclusions encountered by the former subgroups, inter alia:

Creditor/debtor

- Different income flows accrue under the issuer and market approach. These differences are most pronounced in times of rapid changes in interest rates.
- To reduce asymmetries, a consistent approach should be adopted between assets and liabilities and across all b.o.p. compiling countries.

Aggregate/s-b-s

- At the time of deciding on the two components of the aggregated approach (i.e. stocks by categories of securities and relevant benchmark yields), it is important to:

(i) Select consistent components (nominal/ marked-to-market stocks always combined with nominal/market yields)

(ii) Minimise the risk of asymmetries

- The second component of the aggregate calculations (i.e. stocks of securities by categories) should be standardised to the extent possible. To this aim, it is recommended to establish a minimum level of categories of securities (to which the appropriate benchmark yields should be applied).

Annex

Benchmark yields

		Austria 2 Years	Austria 5 Years	Austria 10 Years	France 1 Year	France 2 Years	France 5 Years	France 10 Years	Italy 2 Years	Italy 5 Years	Italy 10 Years
1999	Jan.	3.08	3.29	3.89	2.91	2.98	3.27	3.78	3.05	3.34	3.93
	Feb.	3.11	3.39	4	2.93	3.05	3.41	3.94	3.1	3.44	4.06
	Mar.	3.13	3.48	4.18	2.94	3.06	3.48	4.14	3.14	3.56	4.28
	Apr.	2.82	3.38	4.06	2.66	2.83	3.26	3.99	2.89	3.32	4.13
	May	2.82	3.47	4.23	2.58	2.84	3.35	4.17	2.85	3.37	4.3
	June	3.1	3.87	4.56	2.71	3.11	3.75	4.49	3.11	3.8	4.65
	July	3.28	4.24	4.89	2.83	3.29	4.1	4.82	3.35	4.2	4.95
	Aug.	3.51	4.5	5.1	3.02	3.44	4.31	5.01	3.69	4.51	5.15
	Sep.	3.64	4.68	5.3	3.04	3.55	4.46	5.2	3.8	4.63	5.32
	Oct.	4.06	5.02	5.56	3.36	3.95	4.78	5.44	4.22	4.99	5.56
	Nov.	3.99	4.77	5.29	3.42	3.91	4.58	5.15	4.08	4.77	5.28
	Dec.	4.18	4.85	5.39	3.61	4.2	4.67	5.29	4.21	4.87	5.41
2000	Jan.	4.56	5.19	5.77	3.78	4.38	5.02	5.67	4.4	5.22	5.79
	Feb.	4.64	5.27	5.78	3.98	4.47	5.12	5.62	4.62	5.38	5.77
	Mar.	4.67	5.19	5.59	4.09	4.47	5.05	5.45	4.69	5.26	5.61
	Apr.	4.69	5.16	5.5	4.22	4.47	5	5.35	4.67	5.19	5.51
	May	5.11	5.44	5.66	4.65	4.89	5.27	5.5	5.12	5.5	5.71
	June	5.14	5.3	5.52	4.78	4.95	5.1	5.33	5.13	5.36	5.52
	July	5.28	5.46	5.61	4.95	5.12	5.23	5.41	5.28	5.47	5.59
	Aug.	5.37	5.46	5.55	5.1	5.22	5.25	5.37	5.37	5.5	5.57
	Sep.	5.28	5.42	5.58	5.07	5.16	5.23	5.43	5.32	5.48	5.64
	Oct.	5.23	5.34	5.53	5.11	5.12	5.15	5.36	5.27	5.39	5.6
	Nov.	5.2	5.3	5.47	5.04	5.06	5.1	5.29	5.21	5.35	5.55
	Dec.	4.86	4.92	5.21	4.74	4.68	4.72	5.05	4.81	4.96	5.3
2001	Jan.	4.62	4.75	5.13	4.46	4.46	4.57	4.95	4.53	4.8	5.19
	Feb.	4.65	4.75	5.11	4.49	4.49	4.6	4.94	4.54	4.82	5.19
	Mar.	4.49	4.62	5.03	4.38	4.34	4.47	4.84	4.44	4.71	5.13
	Apr.	4.55	4.72	5.18	4.37	4.42	4.6	5.01	4.52	4.8	5.27
	May	4.6	4.83	5.36	4.44	4.49	4.75	5.21	4.59	4.93	5.44
	June	4.39	4.7	5.3	4.22	4.3	4.64	5.15	4.4	4.83	5.41
	July	4.36	4.79	5.29	4.21	4.29	4.64	5.15	4.37	4.82	5.42
	Aug.	4.12	4.57	5.1	4.02	4.07	4.43	4.96	4.15	4.59	5.22
	Sep.	3.79	4.39	5.08	3.62	3.7	4.24	4.95	3.85	4.38	5.2
	Oct.	3.44	4.13	4.84	3.27	3.34	4.01	4.75	3.52	4.1	4.96
	Nov.	3.32	4.05	4.71	3.11	3.23	3.95	4.61	3.41	4.01	4.81
	Dec.	3.56	4.37	5	3.19	3.66	4.3	4.9	3.66	4.36	5.08
2002	Jan.	3.84	4.59	5.06	3.37	3.77	4.46	4.95	3.91	4.6	5.13
	Feb.	4.16	4.76	5.11	3.46	3.89	4.55	5	4.04	4.72	5.2
	Mar.	4.45	5.02	5.37	3.7	4.17	4.84	5.26	4.32	4.99	5.43
	Apr.	4.38	4.98	5.35	3.72	4.11	4.8	5.25	4.28	4.95	5.41
	May	4.41	4.99	5.36	3.81	4.23	4.85	5.26	4.3	4.95	5.41
	June	4.22	4.8	5.22	3.75	4.13	4.69	5.12	4.12	4.75	5.26

Source: Reuters

5. Treatment of income on collective investment institutions

Abstract

The purpose of this paper is primarily to revisit the conclusions and recommendations of the ECB's *European Union Balance of Payments/International Investment Position Statistical Methods* as it applies to the treatment of the income (and expenses) of Collective Investment Institutions. The recommended treatment was motivated primarily to prevent the distortion of GNP as stated in Paragraph 19 *'the approach proposed by the Sub-group appears to be in overall agreement with the spirit of ESA 1995 and the GNP Committee's interpretation of ESA 1979 (Commission decision 12 February 1997 No. C(97) 345 final). The treatment in the EMU balance of payments will therefore be consistent with the way GNP will be measured in Europe and will prevent a distortion of the Current Account Balance and GNP. This was a major concern of the Sub-group from the outset'*.

The paper will review the recommended treatment through worked examples and highlight the source of any problems that may exist. This will be followed by some new ideas on refining the existing treatment and will conclude with recommendations for consideration, initially, by the Task Force.

Background

In line with the approach by sub-group 1 (SG1) in the report 'Recording Income on an Accruals Basis for Collective Investment Institutions (CIIs) etc.' we consider collective institutions to comprise *'incorporated (investment companies or investment trusts) and unincorporated undertakings (mutual funds or unit trusts) that invest the funds, collected from investors by means of issuing shares/units (other than equity), in financial assets (mainly marketable securities and bank deposits) and real estate'*.

In the SG1 paper when discussing the recording of the investment income of CIIs on an accruals basis, the first point to be addressed was the distinction between the income that the CII earns on its investments (asset side) and the income of the investor holding units of the fund (liability side of the CII).

With reference to the ***asset side***, SG1 was of the opinion that this income did not require special investigation as it is covered by the guidance provided by the IMF Manual (paragraphs 121 and 282, regarding the time of recording for investment income). According to these paragraphs, investment income from assets of the CIIs in the form of equity has to be recorded when payable and interest earned by the CIIs has to be recorded on an accruals basis.

In contrast to the asset side, the appropriate treatment of investment income on the liability side was less clear-cut, given the fact that CIIs can have different distribution policies (full distribution of the income in the form of dividends; full capitalisation of the income; or a mixed policy which combines distribution and capitalisation). Accordingly, SG1 focussed on the recording of the income of the investors in the CIIs. In particular, the following questions were considered:

- What is the time of recording of income when the CII distributes all or part of the income earned on its assets?
- What is the appropriate treatment in the case of capitalisation?
- Should capitalised income be treated as the income of the investor in the CII and, if so, what is the time of recording of this income flow?
- Should capitalised income be regarded as a holding gain?

SG1 proposed a *broader approach* at the liability side of the CIIs, under which all income was covered, regardless of the type of assets in which the CII invests or the distribution policy of the CII.

The recommended approach is that the income flow from the CII to the investor in the CII is recorded on an accruals basis when it corresponds to interest earned by the CII and is recorded, in principle, once the dividend is paid to the CII, in the case where the CII has invested in equity. Application of this method means that **all income is assigned to the investors, regardless if it is distributed or not**. This is a reflection of the fact that the investor in the CII can claim, at any time, the income that the CII earned on its assets. Income that is not distributed is considered as being reinvested in the CII and, consequently, capitalised income has a counterpart entry in the Financial Account.

According to these recommendations, the time of recording of investment income on the liability side of the CII will completely coincide with the time of recording on the asset side.

The SG1 focussed mainly on the treatment for the country where the CIIs were resident and in which non-residents invest. However, this simplification was introduced only for illustrative purposes and as stated in the SG1 report ***'it must be clear that a completely symmetric treatment is proposed for residents investing in non-resident CIIs. The latter case is only mentioned explicitly when the direction of the investment in the CII affects the estimation method.'***

The SG1 report goes on to say that concerning the asset allocation of non-resident CIIs and the corresponding rate of return, 'Member States are encouraged to exchange information.' The Sub-group recommends that national compilers should, at least, try to make a distinction between the following broad categories of assets in which the CIIs invest (bonds, money market instruments and equities). In addition, the accuracy of the estimation method will be improved significantly if an additional breakdown is made using the currency in which the CII has made its investment (for investments in bonds and in money market instruments) and using the country in which the CII has invested (for investment in equity).'

We can see, therefore, that the full symmetric treatment for the recording of income on an accruals basis for CIIs has been proposed by SG1, which, following approval by the STC, became the approved method of compiling this data in the Euro and EU areas.

Possible difficulties with Current Treatment

We will distinguish between resident CIIs or CIIs in the reporting economy and non-resident CIIs or CIIs abroad.

CIIs in the reporting economy

The treatment proposed for resident CIIs in which non-residents invest is perhaps the more straightforward. Once the resident BOP/IIP compiler has data covering the stocks of assets owned by the resident CII it can then either estimate the income earned on an accruals basis or collect this data directly through a survey.

Similarly once the compiler knows the country of the non-resident investor into the resident CII it can estimate how much of the accrued income needs to be attributed outwards to the non-resident investor country by way of an income debit. (Note: The capitalised element of this income is considered to be reinvested and is included in the BOP under Financial Account, Portfolio Investment, Equity Securities, Liabilities)

Estimation errors are most likely to occur in the following situations:

- Up to date stocks are not available on the Asset side
- Up to date stocks are not available on the Liability side
- The geographical breakdown of the liabilities is not available

CIIs abroad

The SG1 recommendations on the treatment of investment into non-resident CIIs by the residents of the compiling country are clear ***i.e. a completely symmetric treatment is proposed for residents investing in non-resident CIIs. …*** However, it is possible that there are difficulties in estimating the income from these investments by the compiler in the investor country.

Estimation errors are most likely to occur in the following situations:

- The up to date stock information on these assets (value of units in the non- resident CII) is not available
- The aggregate asset allocation of these CIIs abroad is not available.
- Country/currency attribution of these assets is also not available.

Example of Correct Treatment

The most satisfactory method of examining these difficulties is through a worked example where the implications of following certain approaches can be shown and their impact on the euro area BOP examined.

First, we will consider a worked example of correct reporting by the compiler for the following:

- Countries where the CII is resident
- Non-resident investors into this CII
- Country where the non-resident assets of the CII are issued

In this example the CII is resident in Country B Country A is the country of the Non-resident investor into the CII and Country C is the issuer of the non-resident assets of the CII. The CII has no other assets and there are no resident investors in Country B into the CII. *We do not consider the service charges of the CII as these will mirror the treatment of income. In other words whatever fees are incurred by the CII and recorded as debits will be passed on to the investor.*

The BOP account for Period 1 for Country B is as follows:

Table 40

Reporting by country of resident CII - Country B

(EUR millions)

	Credits	Debits	Net
Current Account			
Portfolio Investment Income			
Income on Equity	105	318	-213
Income on Bonds	108		108
Income on MMI	105		105
Balance on current a/c			0
	Assets	**Liabilities**	**Net**
Financial Account			
Portfolio Investment			
Equity	0	200	200
Other Investment	-200		-200
Balance on Financial Account			0
Errors and omissions			0

In the Current Account for Country B the income received on the non-resident assets in country C is € 318 (credit). The debit income € 318 corresponds to the same income attributed to Country A, the sole investor into the CII, in line with the approved treatment as set out above. **All of this income earned is also paid in the period.**

During period 1 the CII makes a dividend payment to the unit holders in Country A of € 118 (recorded under other investment). Accordingly, the posting of € 200 under Equity liabilities is the capitalised element of total earnings of the CII.

The postings in the Financial Account are explained as follows:

- € -200 represents the receipt of income on the assets of –318 which is offset by the dividend payment of 118

- € 200 is the income capitalised by CII (not distributed)

If we now consider the BOP account for Country A – investor into CII in Country B.

Table 41

Reporting by country of non-resident CII investments - Country A

(EUR millions)

	Credits	Debits	Net
Current Account			
Portfolio Investment Income			
Income on Equity	318	0	318
Income on Bonds	0		0
Income on MMI	0		0
Balance on current a/c			318
	Assets	**Liabilities**	**Net**
Financial Account			
Portfolio Investment			
Equity	-200	0	-200
Other Investment	-118	0	-118
Balance on Financial Account			-318
Errors and omissions			0

- The income credit of € 318 reflects the income earned by the CII on its investments.
- The Financial account statement shows the following:
- – € 200 relates to the undistributed element of the earnings of the CII and therefore are an increase in Equity assets of Country A
- – € 118 is the payment of the dividend by the CII in country A

Finally we will consider the BOP account for the country C which issued the non-resident assets of the CII

Table 42

Reporting by country of assets – Country C

(EUR millions)

	Credits	Debits	Net
Current Account			
Portfolio Investment Income			
Income on Equity		105	-105
Income on Bonds		108	-108
Income on MMI		105	-105
Balance on Current a/c			-318
	Assets	**Liabilities**	**Net**
Financial Account			
Portfolio Investment			
Equity	0	0	0
Other Investment	318	0	318
Balance on Financial Account			318
Errors and omissions			0

As outlined above the full income payable on the liabilities to the CII are paid in the reporting period i.e. € 318 is the accrued income payable to country B and is also in fact paid. There is therefore a deficit on the Current account which is balanced in the Financial account by the decrease in Other Investment assets.

If all countries A, B&C are members of the Euro area the consolidated BOP statement for transactions with non-residents of the Area should be be zero in respect of these transactions as they are all resident- to-resident transactions. The statement is set out below:

Table 43

Calculation of euro area BOP for AB&C in respect of these transactions

(EUR millions)

	Credits	Debits	Net
Current Account			
Portfolio Investment Income			
Income on Equity	423	423	0
Income on Bonds	108	108	0
Income on MMI	105	105	0
Balance on Current a/c			0
	Assets	**Liabilities**	**Net**
Financial Account			
Portfolio Investment			
Equity	-200	200	0
Other Investment	0	0	0
Balance on Financial Account			0
Errors and omissions			0

This statement should only be shown on a net basis, the gross flows are included for illustrative purposes only.

Example of Incorrect Treatment

Having considered how the correct reporting should be made, we now explore the consequences of possible asymmetries or misreporting in this worked example.

The main areas for possible errors in the recording of accrued income are the following:

Country C – Country of non-resident issuer of assets held by CII.

The main difficulty that could arise here is if the compiler in Country C did not identify the correct element of accrued income payable by the resident issuer of the securities to the non-resident CII investor. This type of error, as it is of a more general nature, is not specifically relevant to this analysis and is not unique to the treatment of CIIs. Accordingly this issue will not be given further consideration here.

Country B – Country of the resident CII,

The main areas for potential problems in recording accrued income are that the compiler does not apply the correct treatment where income earned on the assets of the CII should be attributed to the non-resident investor into the CII in country A. Our understanding is that this treatment, which is in line with the STC approved proposals of SG1 is being correctly applied in countries where the stock of CIIs with non-resident investors is most significant in the Euro Area.

Country A – Country of non-resident investor in the CII

This is the main area of difficulty. The compiler in country A must know the following:

- The value of the stock of CII assets held in the country B
- The breakdown of the assets in order to estimate the income i.e. the appropriate return on each asset category and also ideally the country and currency of the investments.
- The value of any dividend payments

At present there is an obvious asymmetry in this area and we need to consider the implications for the Euro Area Balance of Payments.

If the compiler in country A only records the dividends receivable from the CII in country B, the BOP statement for Country A would be as follows:

Table 44

Reporting by country of non-resident CII investor - Country A

(EUR millions)

	Credits	Debits	Net
Current Account			
Portfolio Investment Income			
Income on Equity	118	0	118
Income on Bonds	0		0
Income on MMI	0		0
Balance on current a/c			118
	Assets	Liabilities	Net
Financial Account			
Portfolio Investment			
Equity	0	0	0
Other Investment	-118	0	-118
Balance on Financial Account			-118
Errors and omissions			0

If we then leave the original BOP statements for country B and C unchanged and consolidate them with the revised BOP statement for Country A to recalculate the Euro area BOP we get the following result:

Table 45

Calculation of euro area BOP for AB&C in respect of these transactions

(EUR millions)

	Credits	Debits	Net
Current Account			
Portfolio Investment Income			
Income on Equity	223	423	-200
Income on Bonds	108	108	0
Income on MMI	105	105	0
Balance on Current a/c			-200
	Assets	Liabilities	Net
Financial Account			
Portfolio Investment			
Equity	0	200	200
Other Investment	-118	118	0
Balance on Financial Account			200
Errors and omissions			0

This results in a Balance of Payments deficit for the Euro area of € 220. In the context of this sector where capitalising of all or a large element of income earned by CIEs is common this is a serious error. In other words the greater the difference between the dividend payable by the CII to unit holders and the income earned on the assets of the CII the greater the asymmetry.

Incorporation of Actual Data

We now consider the implications of this asymmetry for the Euro/EU area by reviewing the available data on CIEs.

Table 46

EU Data on CII investment

(In EUR millions at end 2000)

Country	Resident investment into CIIs abroad	Non-resident investment into resident CIIs	Total resident CIIs
GB	2,540	2,063	424,286
FR	23,400	15,400	845,800
DE	130,493	20,125	821,211
AT	10,000	8,000	92,000
FI	10,000	1,160	14,235
PT	2,221	421	21,550
IE	18,953	203,000	208,000
LU	20,000	844,000	875,000
IT	86,097	1,915	449,931
Total	303,704	1,096,084	3,752,013

Note: this data is not available from other EU countries not detailed above.

It is clear from the data available that in general there is a relatively low level of investment into EU/Euro resident CIIs. The obvious exceptions are Ireland and Luxembourg. The analysis below measures the degree of foreign participation in Resident CIIs.

Participation by Non–Resident Investors in Resident CIIs

Table 47

Participation by Non-Resident Investors in Resident CIIs

Country	Non-resident investment into resident CIIs	Total resident CIIs	Participation of non-residents in %
GGB	2,063	424,286	0
FR	15,400	845,800	2
DE	20,125	821,211	2
AT	8,000	92,000	9
FI	1,160	14,235	8
PT	421	21,550	2
IE	203,000	208,000	98
LU	844,000	875,000	96
IT	1,915	449,931	0
Total	1,096,084	3,752,013	29

From the table above, we can see that in overall terms there is a significant level of non-resident investment in resident CIIs of 29% this is almost entirely due to the nature of the CII industry in both Ireland and Luxembourg. If we exclude these countries from the participation calculation we get a result of 2% participation.

It follows therefore that when considering the case of CIIs in the reporting economy the major players are Luxembourg and Ireland. *In Appendix I we can see that the recommended treatment is being followed in Luxembourg and it is also the case that Ireland is following the recommended treatment.*

We will now consider the case of resident investment into CIIs abroad

Table 48

Resident Investment into CIIs abroad as a percentage of Total EU/euro area

Country	Resident investment into CIIs abroad	% of EU/euro area
GB	2,540	1
FR	23,400	8
DE	130,493	43
AT	10,000	3
FI	10,000	3
PT	2,221	1
IE	18,953	6
LU	20,000	7
IT	86,097	28
Total	303,704	100

The level of investment into CIIs abroad of 303bn is considerably less than the level of non-resident investment into resident CIIs of € 1,096bn. This suggests that a large element of the investment into the CIIs in Ireland and Luxembourg comes from outside the Euro/EU areas.

To the extent that this investment into CIIs abroad is into CIIs in other Euro Area countries it is essential that the symmetric treatment of recording proposed in the SG1 document is followed. In other words, all the income earned on assets of the CIIs abroad, as they relate to resident investors, are recorded as credits in the resident BOP. Moreover, if the country where the CII is resident is in the Euro area and follows the recommended treatment and if the country of the investor into this CII (also Euro area resident) only includes as income the distributions (dividends) from this non-resident CII, this will create asymmetries in the Euro Area BOP.

From our discussions at the first Task Force meeting it is clear that some countries have difficulties in applying the correct treatment for recording accrued income on resident investment into non-resident CIIs. If we assume that all of the investment in the above table of € 303bn are into other Euro Area CIIs, and these CIIs do not pay dividends, the annual asymmetry in the Euro area would be approximately € 9bn (€ 303bn @3% income)). The Euro Area had a Balance of Payments surplus for 2000 of € 1.4bn.

Accordingly, we now investigate an estimation method for income earned by non-resident CIIs with resident investors for the Euro Area.

Estimation Method

How can we estimate the Income on CII investment abroad? we require, as already outlined above, the following:

- The value of the stock of CII assets held abroad

- The breakdown of the assets of the foreign CII in order to estimate the income i.e. the appropriate return on each asset category and also ideally the country and currency of the investments.

- The value of any dividend payments by the non-resident CII to residents.

Value of Shares/Units in CIIs Abroad

This can be obtained by using an aggregate or security by security information on stocks. The compilation of this data is a part of IIP and CPIS compilation. It seems reasonable to suppose that once all of the countries meet, at a minimum, the acceptable data requirements for Portfolio Investment as set out in the TF-PICS document that this position data will be available.

Breakdown of Assets Held by the CIIs

There are a number of data sources here for the breakdown of asset categories:

- Survey of Investors into the non-resident CIIs

- Money Market Fund information available from Money&Banking statistics compiled in the Euro Area member states

- Security by security information will give details of the fund investment strategy e.g. Deutsche US Bond fund

- Data exchange with the counterpart country where the CII is resident

- Quarterly Portfolio Investment survey by the Economist magazine which gives a breakdown for each asset category by country/currency.

How to estimate a rate of return for CIIs abroad.

First we need to estimate the position or stock of investment into CIIs abroad. Secondly we arrive at a breakdown between Equity, Bonds&Notes and Money Market Instruments. We then need to apply a rate of return to these asset positions in order to calculate the accrued income. A detailed approach is outlined in Section 1 of the Bank of Finland document & spreadsheet calculation in Appendix 6. Here a precise estimation of positions and related income is detailed. However we have also a simpler approach and this is set out in the following paragraphs.

For equity we can reasonably apply a flat yield of 2%. Reference to the daily information detailed in the Financial Times under *FTSE Actuaries Share Indices – European Series* shows that this is a reasonable yield to apply to equity (see Appendix 2 for further details).

For Bonds & Notes and MMI we need information on the currency that the Bonds or MMIs are denominated. As far as MMIs are concerned we know from the paper 'Steady State Approach on the Holders of MMF Shares/Units' presented at the May 2002 WGBP&ER that the level of non-resident investment into Euro Area Money Market Funds is approximately 100m and of this almost 70m comes from outside the Euro Area. It also appears that Ireland and Luxembourg are the most important countries for Money Market Funds with non-resident investors. It would seem possible to arrive at a reasonable estimate of the stock of resident investment into non-resident MMFs. The balance of total investment would then be in Bond and equity funds. In the absence of any further firm information we could use the ratios given in the Economist Quarterly Portfolio Poll (see appendix 3& appendix 4) for investment into Bonds and Equity and Cash. In this way we could then arrive at a composite rate of return.

In Appendix 5 we have detailed an approach to estimating the income on CIIs abroad which could be used in the absence of any information on Asset Allocation of a CII abroad. It can be seen that using the Economist Portfolio Poll data, a composite yield or rate of return of 3% can be applied to the stock of CII abroad for the final quarter of 2000. It is assumed that the country of the CII is known or at least the MUMs/NON MUMs breakdown of the stock is known. As the IIP must be compiled on a step 2 basis from 2001 onwards it is assumed that this breakdown for CIIs will be possible. It addition it should be noted that some estimation for fees payable by the investor need to be factored in to this calculation. In general an acceptable estimate of fees payable is 1% of the Net Asset Value of the CII.

Clearly an asymmetry will still exist if the compiler in the reporting economy is using firm data while the compiling country with the investment into a CIIs abroad is using estimates in relation to the same income. In general it will clearly improve the quality of the Euro Area accrued income statistics if one agreed rate of return for CII investment. This rate of return could apply to each asset class or simply to the entire investment.

There is the broader issue that needs to be examined in relation to extending this treatment to countries outside of EMU/EU as otherwise in the Global Balance of Payments there will still be asymmetries. This issue is under consideration at the IMF.

Recommendations

In the light of the analysis outlined above we will now make some recommendations aimed at improving the recording of income on an accruals basis as it relates to investments in CIIs abroad. (We consider that the recording of income on an accruals basis in respect of CIIs in the reporting economy to broadly follow the recommended treatment).

- It is recommended that all Member States identify the value of investments in CIIs abroad. This data is available to some extent from Financial Accounts and Money and Banking Statistics and also from IIP data.

- In addition to estimating the stock it is recommended that Member States obtain or estimate the geographical analysis of this stock data and the asset allocation strategy of the CIIs abroad.

- Any estimation procedure should involve the use of the procedures outlined in the attached Bank of Finland paper or some benchmark such as the Economist Portfolio Poll data as outlined in this paper.

- An optimal element of the estimation procedure is that an agreed rate of return for either overall CII investment in the Euro Area or for each class of investment by CIIs i.e. Bond Funds, Equity Funds and Money Market Funds is agreed and set centrally and made available in the ECB Financial Markets Database (FMDB). In this context the following could be considered :

  (i) the 3 month EIBOR rate could be applied to MMFs,

  (ii) a 2% rate of return could be applied to equity funds

  (iii) An appropriate Euro bond benchmark yield could be applied for Bond Funds

Appendix

1. Collective Investments Institutions In Luxembourg

Introduction

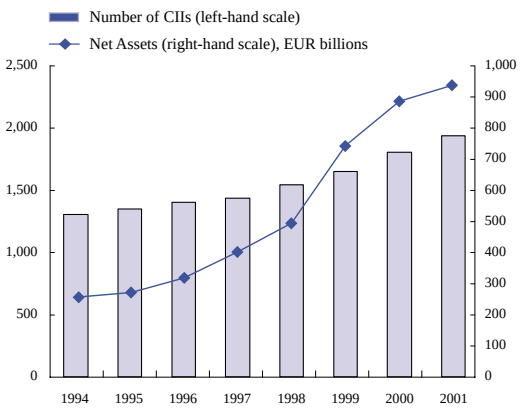
This note aims at giving an overview of the collective investment institution characteristics as regards the estimation of income, and presents methods used for Bop income estimation, and possible improvements. From the balance of payment viewpoint, Luxembourg could be seen as a transit country for investment income, and as a provider of financial services. Therefore, The distinction between income and financial services is crucial.

The impact of implementation / non-implementation of recommended treatment on the income earned.

Overview of Luxembourg Collective Investment Institutions (CIIs) industry.

End of 2001, the number of active CIIs was 1908, representing 6740 separate compartments. Since 1994, the total assets held by CIIs is growing continuously as follows:

Figure 41
Assets held by CIIs



Implementation / non implementation of recommended treatment

The BCL is in charge of the estimation of investment income since the 1st of January 2002. Therefore, rough estimations have been carried out in order to compare two methods of recording the debit side of resident CIIs income. We assume the estimation method is the same for the credit side in both cases.

The first method is based on the distributed earnings in cash or free shares declared by CIIs and the second one considers that all resident CIIs incomes are attributed to the shareholders.

From September 2001 to March 2002 (7 months), the estimations give about EUR 2,5 bn of distributed earning and about EUR 9 to 10 bn of income attributed to non-resident shareholders.

There is a big difference in the figures obtained. But the second method need to be supplemented by other data firstly, on the fees paid by the investors to the resident CIIs (FISIM[1]) that could be very roughly evaluated to EUR 6 to 7 bn and secondly, on the fees paid by resident CIIs for taxes and financial services abroad.

The offsetting entry in the financial account is also difficult to deal with since fees paid by investors could be included in the purchase price and even included in each transactions made by the managers on CIIs' assets.

The fees paid by the holders, that have to be indirectly measured, should be taken into account for the estimation of the reinvested earnings.

1 Financial intermediation services indirectly measured

Feeder and Master funds

Growth of fund of funds in Luxembourg

The net assets of resident fund of funds increase from 1,8% of the total net assets of resident CIIs end of 1998 to 6,8% at the end of 2001. However in Luxembourg, the funds of funds encompass the following three categories according to investment policy:

1. CIIs investing in other CIIs in order to diversify the risk.

2. Master fund investing at the most in 3 Feeder funds.

3. Funds of hedge funds

Remark funds of 'fund of funds' are not allowed in Luxembourg.

As far as master funds are concerned, the total asset is about 9 EUR bn of which 72% are invested in resident funds and 27% in non-resident funds.

This information is collected for prudential purpose on the asset side. On the liability side, no information is available on feeder funds held by non-resident master funds.

Treatment of capitalising funds

Generally, a compartment is commercialised with several alternatives. The basic ones are the choice between capitalisation and distribution. However, other differences could occur according to the kind of investors. For instance privileged clients may obtain a better income. Furthermore, other services provided by the CIIs may have an impact on the distributed income such as the currency used that is related to the country of trading. Therefore, the amounts distributed or distribution rates depend on the kind of shares, and that is the same for reinvested income.

Since it is not possible to distinguish pure capitalising funds/compartments from pure distributing funds/compartments, a single method should be applied for the income. For the offsetting entry in the financial account, the estimation could be based on CIIs accounts using a method like for direct investment. Nevertheless, the geographical breakdown according to the holder of capitalising funds is unlikely not the same as for distribution mainly because of taxes.

For Luxembourg balance of payments, the scheme of registration could roughly approximate by the following example that is based on fictive figures:

Table 49
Example

	CIIs accounts		BOP		Geographical breakdown		
	Credit	Debit	Credit	Debit	Criteria	LU	RoW
Income on assets	10,000		9,000		Issuer	10.0	90.0
Income distributed		2,000		2,000	Holder	0.0	100.0
Income non-distributed				7,760	Holder	3.0	97.0
Financial services from holders	5,000		4,880		Holder	2.4	97.6
Financial services paid		4,000		2,400	Provider	40.0	60.0
Taxes		1,000		600		40.0	60.0
Total	15,000	7,000	13,880	12,760			
Reinvested earning			7,760				

Income of CIIs in the reporting and income on investments into CIIs abroad.

Luxembourg solution to avoid asymmetry is to apply similar methods for the estimation of income. Income of resident CIIs is estimated using monthly stocks and quarterly and yearly information on breakdown by instruments and countries of issuers. The yield rates are applied to the monthly stocks. Where instruments are CIIs a global yield is used (average weighting rate without distinction of instrument and countries). The same rate is applied on the stocks of non-resident CIIs for estimating income on investments into CIIs abroad.

Since this amount of income is relatively small for Luxembourg, no estimation is made on the FISIM paid and no offsetting entry is made in the financial account. However, FISIM could be easily estimated according to resident CIIs information that could provide an average rate. The problem of the estimation of reinvested earnings could also be solved with resident CIIs information but the accuracy of such estimates is difficult to appreciate.

Impact on the euro area

The non-implementation of recommended treatment that is recording only distributed earnings has clearly a large impact on the asymmetry of the income item. Nevertheless, Financial services and more precisely the FISIM should counterbalance part of this asymmetry. The gap of reinvesting earnings that are not considered as income remains in the current account flows.

The effect on the net intra-asymmetry depends on the stocks held by each country and the way income is registered.

The same asymmetry occurs at EU/EMU level. Flows with the rest of the word are undervalued. Furthermore, and it is difficult to put an interpretation on the net without knowing the national stocks of non-resident CIIs held by EU/EMU members and the national method of recording in the balance of payments.

2. Example of data source for income on Equity (dividend yield)

FTSE Actuaries Share Indices — European series

Produced in conjunction with the Faculty and Institute of Actuaries

May 03	Euro Index	Day's %	change points	Yield gross %	xd adj ytd	Total retn (Euro) €
FTSE Eurotop 300	1211.39	-0.82	-9.96	2.43	11.93	1334.51
FTSE E300 Eurobloc	1266.69	-1.22	-15.63	2.36	9.18	1373.74
FTSE E300 Ex-Eurobloc	1156.46	-0.44	-5.10	2.58	14.13	1291.34
FTSE E300 Ex-UK	1266.21	-0.96	-12.22	2.27	10.15	1368.13
FTSE Eurotop 100	2706.48	-0.89	-23.58	2.41	26.66	1034.48
FTSE Euro 100	1036.03	-1.39	-13.53	2.37	7.47	1116.61
FTSE EuroMid	1365.21	-0.71	-9.74	2.41	14.45	1545.62
FTSE EuroMid Eurobloc	1283.20	-0.27	-3.51	2.27	8.02	1423.43
FTSE EuroMid Ex-UK	1283.99	-0.42	-5.40	2.09	14.68	1425.98
FTSE Eurotop 300 Industry Sectors						
RESOURCES	1369.52	+1.26	+17.89	2.83	9.03	1553.56
Mining	1806.05	+1.51	+26.81	3.01	38.71	2071.35
Oil & Gas	1288.85	+1.24	+15.79	2.81	7.23	1428.01
BASIC INDUSTRIES	1320.60	-0.22	-2.87	2.59	18.35	1485.43
Chemicals	959.82	-0.76	-7.39	2.73	16.62	1086.18
Construction & Bld Matls	1269.14	+0.28	+3.58	2.35	8.11	1381.46
Forestry & Paper	1957.96	+0.43	+7.06	3.15	52.83	2022.86
GENERAL INDUSTRIALS	1202.62	-1.93	-23.64	2.46	14.06	1317.39
Aerospace & Defence	674.85	-0.88	-5.99	2.46	5.88	742.42
Diversified Industrials	937.80	-0.25	-2.35	2.78	11.19	1036.80
Electronic & Elect Equip	1358.30	-3.46	-48.72	2.08	13.87	1440.15
Engineering & Machinery	919.56	-1.89	-10.11	3.13	18.15	1034.32
CYCLICAL CONS GOODS	1262.12	-0.61	-7.80	1.93	12.68	1484.19
Automobiles & Parts	830.75	-0.85	-5.42	2.13	10.67	918.87
Household Goods & Texts	1941.97	-0.54	-10.46	1.45	6.89	2082.56
NON-CYC CONS GOODS	1480.11	-0.36	-5.30	1.75	14.74	1614.82
Beverages	1330.23	+1.54	+20.17	2.41	12.88	1487.79
Food Producers & Packers	1291.28	-0.25	-3.27	1.91	11.19	1297.85
Health	1459.40	-1.19	-17.53	1.13	7.75	1550.80
Personal Care & Hse Prods	1681.46	-0.51	-8.45	1.14	4.12	1734.15
Pharmac'ls & Biotech	1231.82	-0.83	-10.36	1.52	12.33	1304.41
Tobacco	2718.48	+2.01	+53.48	3.42	65.27	3247.98
CYCLICAL SERVICES	988.96	-1.66	-16.74	2.31	6.62	1085.51
General Retailers	904.38	-0.47	-4.27	2.48	4.81	990.68
Leisure Entertmt & Hotels	971.74	+3.03	+9.26	3.47	5.74	1098.21
Media & Photography	872.03	-2.86	-28.83	2.29	6.99	1032.36
Support Services	851.45	-1.85	-14.30	1.54	6.34	916.54
Transport	863.49	-0.85	-5.89	2.47	0.00	734.39
NON-CYCLICAL SERVS	757.28	-4.54	-36.04	1.80	3.71	818.78
Food & Drug Retailers	1089.81	-6.69	-7.62	2.22	9.70	1175.70
Telecommunication Servs	662.06	-5.68	-39.83	1.80	2.45	696.08
UTILITIES	1329.85	-8.49	-8.54	4.84	9.66	1571.72
Electricity	934.66	-6.59	-5.50	4.39	7.86	1082.43
Gas Distribution	1497.12	+3.13	+1.46	3.44	7.37	1754.58
Water	743.53	-1.08	-8.10	4.80	0.00	833.38
FINANCIALS	1366.42	+0.18	+2.52	2.91	17.86	1523.10
Banks	1054.21	+0.54	+5.61	3.85	15.43	1173.43
Insurance	865.96	-6.83	-7.41	2.22	4.15	945.64
Life Assurance	788.06	+0.02	+0.16	3.83	17.29	873.98
Investment Companies	1244.44	-8.46	-5.05	2.32	15.88	1357.74
Real Estate	874.14	+0.30	+2.64	3.36	0.80	1801.34
Speciality & Other Fin	1008.98	-2.53	-25.10	1.59	7.10	1873.38
INFORMATION TECH	748.65	-6.44	-51.81	1.27	6.27	762.68
Information Tech Hardware	837.83	-7.56	-68.50	1.50	8.86	865.42
Software & Computer Serv	468.19	-2.48	-11.70	0.49	0.86	475.03

FTSE GOLD MINES INDEX

	May 3	% chg since 31/12/01	Mkt Cap $bn	% of Gold Mines	Gross div yld %	Total return	52 week High	52 week Low
Gold Mines Index (10)	**1296.86**	**+54.64**	**46.80**	**100.00**	**0.83**	**1383.04**	**1296.86**	**745.72**
■ Regional Indices								
Australasia (4)	1532.7	+35.83	3.86	6.10	1.26	1716.68	1586.52	812.58
Africa (5)	2874.38	+117.3	12.10	35.86	1.54	3423.28	2090.33	809.04
Americas (9)	1861.06	+40.11	31.84	68.04	0.86	1998.78	1081.86	696.96

3. Example of Economist Quarterly Portfolio Poll - Q2 2001

Portfolio poll

We have changed the format of our quarterly portfolio poll, so the table lacks comparative figures for the euro area and the rest of Europe. Otherwise this poll is similar to the most recent exercises—and so is the gloomy state of the world economy. With the spectre of world recession looming, investment managers remain prudent. Credit Suisse and Lehman have considerably reduced their holdings of equities; only Commerzbank greatly raised its equity allocation. There are few economic signals that inspire confidence, and growth is stalling around the globe. Despite this, our fund managers' view of American shares was surprisingly upbeat; all except Credit Suisse raised their holdings this quarter. However, all our managers cut their preferred holdings of euro-zone bonds.

2nd quarter 2001 — ▼▲ A change of 5% points or more on last quarter — ▽△ A change of less than 5% points on last quarter

	Holdings by instrument, %			Equity holdings by area, %							Bond holdings by currency, %				
	Equities	Bonds	Cash	United States	Other Americas	Britain	Euro area	Other Europe	Japan	Other Asia	Dollar	Yen	Sterling	Euro-zone	Others
Robeco Group	53	47 ▽	0 △	57 ▲	2	10	15	4	9	3 ▽	36 △	19 ▲	11 ▲	31 ▼	3 △
Julius Baer PB	54	41	5†	65 △	0	4	14	5	8	4 ▽	78	0	0	11 ▽	11 △
Commerz Int. CM	59 ▲	41 ▼	0	57 △	2	11 △	15	2	11 △	2	31 ▽	24 ▽	8 △	28 ▼	9 ▲
Credit Suisse PB	34 ▼	46 △	20‡ ▲	47 ▽	0	11 △	25	3	14	0 ▼	89 △	0	0	11 ▽	0
Lehman Brothers	60 ▼	35 ▲	5 ▲	49 △	0 ▽	9	19	5	13	5	49 ▽	22 ▲	3 ▽	24 ▼	2
Standard Life	62 △	38 ▽	0	55 △	1	11	17	4	10	2	26 ▽	30 ▲	5 △	39 ▽	0
Daiwa	54 ▽	40	6 △	48 ▲	2 △	9	21	2	15 ▽	3	42 △	16 ▽	5	31 ▽	6
Average	54 ▽	41 ▽	5 △	54 △	1	9	18	4	11 ▽	3 ▽	50	16 △	5 △	25 ▼	4 △
Neutral*				53 △	2 ▽	10	17	5	11	2	26 ▽	28 △	5	35 ▽	6

*Morgan Stanley Capital International (developed) world equity index; Salomon Brothers world government-bond index †Of which 3% invested in non-traditional funds ‡Of which 11% invested in alternative investments

4. Example of Economist Portfolio Poll - Q4 2000

Fourth quarter 2000 — ▼▲ A change of 5% points or more on last quarter — ▽△ A change of less than 5%

	Holdings by instrument, %			Equity holdings by area, %							Bond holdi by currenc		
	Equities	Bonds	Cash	United States	Other Americas	Britain	Germany	France	Other Europe	Japan	Other Asia	Dollar	Yen	Sterling
Robeco Group	50	50	0	53	3	10 ▲	4	6 ▲	14 ▲	7 ▽	3 ▽	33 ▲	15 ▼	5 ▲
Julius Baer PB	54	39	7†	60	0	4 ▲	5	3	11 ▽	12	5	77 ▽	0	0
Commerz Int. CM	53 ▲	47 ▽	0	49 ▲	0	7 ▲	6	4	20	12 ▽	2 ▽	30	28 ▲	3 ▽
Credit Suisse PB	43	45	12‡	51 ▲	0	9 ▲	7	5	9 ▼	14 ▲	5	88	0	0
Lehman Brothers	60 ▲	35 ▼	5	45 ▼	2 ▲	10 ▲	11 ▲	10 ▲	11 ▽	9 ▽	2	40 ▲	12	6 ▲
Standard Life	60	40	0	52 ▽	1	11 ▲	5	6	13 ▲	10 ▽	2 ▲	28 ▽	25 ▽	4 ▽
Daiwa	50 ▼	45 ▲	5	39 ▽	2 ▲	9 ▲	7 ▽	9	16 ▲	14 ▽	4	35 ▲	18 ▽	6 ▲
Average	53	43	4	50 ▽	1	9 ▲	6	6 ▲	13 ▽	11 ▽	3	47 ▲	14 ▽	3
Neutral*				51 ▽	2 ▽	10 ▲	4	6 ▲	14 ▲	11 ▽	2 ▽	26 ▽	26 ▽	5 ▽

*Morgan Stanley Capital International (developed) world equity index; Salomon Brothers world government-bond index †Of which 3% invested in non-traditional funds ‡Of which 7% invested

5. Method of Estimating Income of CIIs when no Asset Allocation information is available

Information from Economist Quarterly Portfolio Pol - January 13 2001

Country/currency

%Equity	*DE*	*FR*	*US*	*JP*	*Other*	**Weighted yield**
proportion	5	5	5	5	5	
yield	2%	2%	2%	2%	2%	**2%**

%Bonds	US$	JPY	GBP	Euro	Others	**Weighted yield**
weighting	0.26	0.26	0.05	0.36	0.07	**1**
yield	4.8%	0.4%	5.2%	4.3%	4.5%	
	0.01235	0.00 0962	0.00261 5	0.015624	0.00315	**3.5%**

		Euro	**Weighted yield**
Cash		5%	5%

Overall yield based on 53% equity, 43% Bonds and 4% Cash

Proportions	*Asset type*
53%	Equity
43%	Bonds
4%	Cash

Total yield	***3%***

Fees Payable	***1%***

A flat yield of 1% of Net Asset Value of the CII should be applied.

Net yield on CII Investment	***2%***

6. How to estimate a rate of return for CIIs abroad[2]

This paper describes estimation methods for CII investment income for Balance of Payments purposes. The paper is divided into three sections: income on resident CIIs' investments, income on resident end-investors investments in non-resident CIIs, and income on non-resident end-investors investment in resident CIIs'. Non-resident investment income on resident CIIs' was set as a main task to the follow-up group in TFPII.

CII investment income in BoP can be divided into two different categories. First one is the share of the profits that the CII pays out to the investors. Second one is the income that the CII earns on its investments: dividend and coupon payments. In the BoP, asset side CII income consists of both of previously mentioned parts whereas liability side CII income includes only the first type of income. It was necessary to include all parts of the CII income in the practise to maintain picture of the problem as a whole. Generally, when speaking of income on CIIs it includes also valuation changes, which from the BoP perspective should be reported separately.

Credits: income on resident end-investors investment in non-resident CIIs

In Finland, stock of non-resident CII investment is compounded with the equity stock in the survey data. Hence, it was necessary to break down the stock between equity securities and CII units. The stock was divided by investor sector, and each sector data was divided geographically and by instrument. Basis for the breakdown within each sector was the information from the biggest reporter. Assumption was made that all investments in non-resident CIIs' are made in equity funds (as a result of information from reporters with biggest figures).

Income as percentage from the stock was calculated from the existing portfolio investment asset survey data, which contains income and stock broken down to instruments and geographical areas. For each instrument (equity securities, bonds and notes, and money market instruments) and geographical area (extra/intra euro area) income as percentage was individually determined. Income on non-resident CII investment was then calculated utilizing estimated stock and income percentage.

The reason for not using market indexes as an approximate for return was that index income includes valuation and exchange rate changes which both are reported separately in the BoP.

Stock was not divided into growth and income units due to the recommendation made by EMI[3]. Furthermore, on the basis of the information from reporting institutions all units are assumed to be growth units.

Credits: income on resident CIIs' investment in securities issued by non-residents

Estimate was based on the CII census survey stock data that is collected quarterly by Statistics Finland. The data includes resident CIIs' investment abroad broken down geographically and by instrument. Data is also divided by the type of the resident CII (into money market funds and other CIIs).

Income was estimated as in the previous subsection according to the survey data, and by using existing time series. Income was calculated separately for money market funds and other CIIs' weighted by instruments.

2 *Contribution by Finland*

3 *European Monetary Institute, BOP Financial Flows and Stock Task Force, Final report by sub-group 1: Recording of income on an accruals basis for collective investments institutions, money market instruments and other Bonds. 25 November 1997.*

Debits: income on non-resident investors investment in resident CIIs

Estimation was based on the stock data from Statistics Finland. Data includes geographical breakdown. Data is also divided into money market funds and other CIIs.

Income was estimated in two ways. In the first method, share of profits paid by the biggest investment fund company to its income units was used as an approximate for the income. Total share of profits was proportioned to the stock. This was made separately for the money market funds and other CIIs. Income was then calculated by using estimated income percentage and stock of non-resident investors' investment in resident CIIs.

The second method is based on the BoP portfolio investment liabilities survey data. The return reported in the survey data by instrument was used as an approximate for the income. Calculated income as a percentage was then applied to the stock of non-resident investors' investment in resident CIIs.

Stock was not divided into growth and income units due to the recommendation made by EMI[4]. In Finland, according to the biggest brokers all foreign investments are made in growth units.

Generally, in Finland the recent development in the mutual fund market and tax incentives have leaded the share of income units to decrease. Most of the new funds are offering only growth units.

4 *European Monetary Institute, BOP Financial Flows and Stock Task Force, Final report by sub-group 1: Recording of income on an accruals basis for collective investments institutions, money market instruments and other Bonds. 25 November 1997.*

Table 50

Income on non-resident investment in resident CIIs, m eur

NA1=whole world, NU4=extra euro area, MA1=euro area
Stock=value of the foreigners' fund holdings
NA=not available

Method 1

	Money market funds					
Year	**Income NA1**	**Income NU4**	**Stock NA1**	**Stock NU4**	**Income % NA1**	**Income % NU4**
2000	2,529	NA	179,497	NA	1.41	NA
2001	6,858	6345	326,125	301,717	2.10	2.10

	Other CIIs					
Year	**Income NA1**	**Income NU4**	**Stock NA1**	**Stock NU4**	**Income % NA1**	**Income % NU4**
2000	21,491	NA	980,942	NA	2.19	NA
2001	21,268	18843	961,529	851878	2.21	2.21

Method 2
Stock as in method 1

	Money market funds		Other CIIs	
	Income NA1	**Income NA1**	**Income NA1**	**Income NA1**
2000	9540	5.31	7012	0.7
2001	16756	5.14	12549	1.31

Difference between method 1 and method 2

	Money market funds	Other CIIs
Year	**Income NA1**	**Income NA1**
2000	-7,010	14,479
2001	-9,898	8,720

Table 51

Resident CIIs investment income, m eur

Money market funds	Income NA1	Income NA1 Quarterly	Income NA1 Yearly	Stock, NA1	Income% NA1	Income NU4	Income MA1
Jan.	1.09	4.30	18.58	341	0.32	0.00	0.75
Feb.	1.43			428	0.33	0.17	1.13
Mar.	1.78			426	0.42	0.32	1.29
Apr.	1.74	5.65		430	0.41	0.19	1.25
May	1.86			431	0.43	0.15	1.68
June	2.05			571	0.36	1.68	0.62
July	1.29	3.87		578	0.22	0.93	0.52
Aug.	1.62			599	0.27	1.17	0.64
Sept.	0.96			612	0.16	0.63	0.43
Oct.	1.14	4.75		614	0.19	0.69	0.49
Nov.	1.48			585	0.25	1.48	0.50
Dec.	2.13			614	0.35	1.37	0.94
Jan.	2.46	7.64	57.41	647	0.38	1.42	1.29
Feb.	2.26			609	0.37	1.37	1.14
Mar.	2.93			724	0.40	1.31	1.62
Apr.	3.34	10.25		780	0.43	1.72	1.71
May	3.42			798	0.43	2.48	1.55
June	3.50			963	0.36	2.03	1.75
July	4.94	15.95		1,046	0.47	2.41	2.63
Aug.	4.97			1,172	0.42	2.42	2.69
Sept.	6.04			1,561	0.39	3.06	3.18
Oct.	8.13	23.57		1,701	0.48	3.77	4.57
Nov.	7.28			1,770	0.41	3.68	3.88
Dec.	8.15			1,530	0.53	3.76	4.43
Jan.	5.95	18.59		1,748	0.34	3.09	3.34
Feb.	6.74			1,854	0.36	2.83	3.93
Mar.	5.90			1,864	0.32	2.61	3.49

Other CIIs	Income NA1	Income NA1 Quarterly	Income NA1 Yearly	Stock, NA1	Income% NA1	Income NU4	Income MA1
Jan.	4.07	17.57	104.25	4,734	0.09	1.92	1.87
Feb.	5.43			5,397	0.10	2.57	2.73
Mar.	8.08			6,136	0.13	4.17	3.77
Apr.	14.44	37.47		6,186	0.23	7.73	6.48
May	11.10			6,210	0.18	4.87	6.25
June	11.93			6,759	0.18	6.08	5.77
July	7.28	27.85		6,838	0.11	3.16	4.10
Aug.	11.52			7,195	0.16	6.06	5.17
Sept.	9.04			7,975	0.11	3.79	5.28
Oct.	7.12	21.37		8,001	0.09	3.02	3.91
Nov.	6.62			7,683	0.09	2.77	3.86
Dec.	7.62			7,584	0.10	1.68	5.91
Jan.	10.00	31.56	164.91	7,983	0.13	2.44	7.26
Feb.	9.98			7,466	0.13	2.30	7.54
Mar.	11.58			7,462	0.16	4.08	7.01
Apr.	18.80	54.96		8,037	0.23	9.66	8.84
May	21.35			8,223	0.26	8.16	13.74
June	14.80			7,941	0.19	3.97	10.92
July	11.88	37.54		7,833	0.15	2.98	8.77
Aug.	11.75			7,621	0.15	3.45	8.12
Sept.	13.92			7,167	0.19	4.86	8.80
Oct.	13.59	40.85		7,699	0.18	4.68	8.62
Nov.	14.45			8,130	0.18	4.68	9.37
Dec.	12.81			7,921	0.16	3.89	8.97
Jan.	10.90	32.83		7,996	0.14	3.36	7.07
Feb.	10.47			8,029	0.13	3.01	7.38
Mar.	11.460 46			8,399	0.14	4.35 772 1	6.87 2587

Table 52

Resident investors' non-resident CII investment income, m eur

NA1=whole world, NU4=extra euro area, MA1=euro area

All CIIs

	Income NA1	Stock NA1	Income % NA1	Income NU4	Stock NU4	Income % NU4	Income M A1	Stock MA1	Income % MA1
1999	1.10	1339	0.08	1.06	1244	0.09	0.04	95	0.04
2000	1.30	2143	0.06	1.21	1991	0.06	0.09	152	0.06
2001	1.74	2267	0.08	1.53	2106	0.07	0.22	161	0.14

List of members of the Task Force on Portfolio Investment Income

Ms Judith Höhler	
Mr Martin Beck	**Deutsche Bundesbank**
Mr Thomas Elkjær	**Danmarks Nationalbank**
Mr Pedro Mandana Sequeira Silva	**Banco de Portugal**
Mr Alexandros Milionis	**Bank of Greece**
Ms Lucía Villavieja	**Banco de España**
Mr Claude Peyroux	
Ms Michèle Murez	**Banque de France**
Ms Valeria Pellegrini	**Ufficio Italiano dei Cambi**
Mr Enrico Vroombout	**De Nederlandsche Bank**
Mr Simon Humphries	**Office for National Statistics, United Kingdom**
Mr Will Kerry	
Mr Neil Bush	**Bank of England**
Ms Heléna Persson	**Sveriges Riksbank**
Mr Günther Sedlacek	**Oesterreichische Nationalbank**
Mr Diarmuid Reidy	
Mr Michael Connolly (chairman)	**Central Statistics Office, Ireland**
Ms Katri Hannuniemi	**Suomen Pankki**
Mr Philippe Arondel	**Bank Centrale du Luxembourg**
Mr Carlos Sánchez Muñoz (secretary)	**European Central Bank**
	Balance of Payments Statistics and External Reserves Division
Mr Wolfgang Schwerdt	**European Central Bank**
	Balance of Payments Statistics and External Reserves Division
Mr Frank Mayerlen	**European Central Bank**
	Money and Banking Statistics Division
Mr Celestino Girón Pastor	**European Central Bank**
	General Economics and Financial Statistics Division