EUROPEAN CENTRAL BANK

EURO AREA BALANCE OF PAYMENTS AND INTERNATIONAL INVESTMENT POSITION STATISTICS

FEBRUARY 2006

ANNUAL
QUALITY REPORT

EUROPEAN CENTRAL BANK

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publications
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EXECUTIVE SUMMARY

This annual quality report is required by Article 6 of Guideline ECB/2004/15[1] (hereinafter "the Guideline"). It follows the basic principles of the International Monetary Fund (IMF) Data Quality Assessment Framework (July 2003) in terms of the different dimensions of data quality, and includes quantitative indicators.[2] Key aspects of quality are: (i) integrity, (ii) methodological soundness, (iii) periodicity and timeliness, (iv) accuracy, (v) revision practice and policy, (vi) stability, (vii) consistency and (viii) accessibility.

The methodologies observed by Member States are covered in the country chapters of the ECB's yearly publication "European Union balance of payments and international investment position statistical methods" (last update: November 2005). The ECB's website also contains a methodological note on the euro area balance of payments (b.o.p.) and international investment position (i.i.p.), which focuses on common methodological issues and on the aggregation procedures.

In January 2005, the ECB published for the first time the geographical breakdown of the euro area b.o.p. and i.i.p. statistics by main counterpart, i.e. by country or group of countries. These new statistics start in the first quarter of 2003 for the (quarterly) b.o.p., and as from the year-end 2002 for the (annual) i.i.p.; they provide a greater insight into the effects of cross-border transactions and positions on the euro area economy.

In addition, in April 2005 the euro area quarterly i.i.p. was published for the first time. The quarterly frequency is recommended by the IMF for Special Data Dissemination Standard (SDDS) subscribers[3] and is needed for the compilation of the rest-of-the-world account in the euro area financial accounts.

In 2005, methodological changes were implemented by various euro area national

central banks (NCBs), which also triggered revisions to euro area data. The new data increased the methodological soundness and consistency of contributions to the euro area aggregate, but decreased the stability of the data, especially for investment income credits and debits.

In the first assessment of the b.o.p. current account, full information on services is not yet available in the reporting Member States and it is often necessary to use estimates to meet the deadlines to report the aggregated item. For the time being, the results of the stability indicators show that these first estimates systematically underestimate both credits and debits. Nonetheless, these patterns barely affect the net current account.

The data for portfolio investment liabilities, and related income debits, still constitute a weak point in the euro area b.o.p. and i.i.p. Incomplete information on the final holder of securities (i.e. the actual creditor) currently prevents the compilation of the sector breakdown required by the fifth edition of the IMF's Balance of Payments Manual (BPM5) and also affects the accuracy of the data.[4] The ECB and the EU NCBs are involved in an action plan to enhance the collection of data on portfolio investment, complemented by the Centralised Securities Database (CSDB), which will be used to overcome the current difficulties. This solution will have been implemented throughout the euro area by 2008. For the moment, the b.o.p. and i.i.p. statistics compiled in Germany (for the b.o.p.), Greece,

1 OJ L 354, 30.11.2004, p. 34. This Guideline replaced the Guideline ECB/2003/7 of 2 May 2003.
2 Based on the work of a joint ECB (DG-Statistics)/European Commission (Eurostat) Task Force on Quality, also involving representatives of most of the then 15 EU Member States. The Task Force report is available under www.cmfb.org.
3 All euro area countries, except Luxembourg, have subscribed to the IMF's SDDS.
4 Large worldwide discrepancies in portfolio investment flows and stocks triggered work under the umbrella of the IMF; this led the IMF to organise the "Coordinated Portfolio Investment Survey" (CPIS), first in 1997 and from 2001 onwards on an annual basis. A seminar on the use of and developments in the CPIS will be held by the Banco de España on 1-2 March 2006 to discuss the way forward on these issues.

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Spain, France, Italy, Austria, Portugal and the Netherlands are already collected on a security-by-security basis. This will be the case in Belgium from early 2006 onwards. The remaining euro area countries (Germany (for the i.i.p.), Ireland, Luxembourg and Finland) plan to move to a security-by-security basis in 2007.

In general, the picture shown in the euro area b.o.p. and i.i.p. appears credible and the quantitative indicators show an improvement since 1999. The results for 1999 and 2000 reflect the fact that national b.o.p./i.i.p. compilers were still in the process of adapting their data collection systems to cover the needs of euro area statistics and, hence, revisions were large. Lately, more moderate revisions also stem from the fine-tuning carried out to move closer to international standards.

Twelve-month cumulated errors and omissions remained negative since September 2003, although the revisions incorporated in late 2005 reduced the bias somewhat.

Net i.i.p. data are rather stable for 2003; revisions in net i.i.p. data published in November 2005 amounted to €49 billion, or 0.7% of GDP.

There are significant differences in levels between b.o.p. and external trade statistics due to the deviating underlying methodologies. The differences between the respective month-on-month growth rates were stable on the import side, but increased in absolute terms on the export side for the period 2002-2004. The consistency between b.o.p. statistics and money and banking data did not change in recent years.

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INTRODUCTION

In comparison with the first annual quality report on the b.o.p. and i.i.p., published in January 2005, this report contains additional information about prerequisites of data quality, integrity, accuracy and accessibility. Moreover, the quantitative indicator to assess revisions of b.o.p. transactions in the financial account has been adjusted. The new indicator relates b.o.p. revisions to the corresponding assets and liabilities in the i.i.p. Its calculation became easier after the introduction of a quarterly i.i.p. for the euro area in April 2005.

The calculations of quantitative indicators were performed on monthly b.o.p. observations from January 2002 to December 2004 (36 observations). Those results are compared with results for the previous three-year periods from January 1999 to December 2001, from January 2000 to December 2002 and from January 2001 to December 2003.[5] In contrast, the euro area i.i.p. with a breakdown into assets and liabilities was published for the first time in November 2002 (positions as at end-2001). Therefore, the analysis of revisions is limited to the data for positions as at end-2001, end-2002 and end-2003.

The rest of this report is organised as follows. Section 1 concentrates on the prerequisites of quality and on concrete steps to assess integrity. Section 2 focuses on the methodological soundness, while Section 3 focuses on timeliness. In Section 4, the data accuracy is assessed using intermediate results at the ECB. The current revision practice and steps towards a revision policy are explained in Section 5. This is complemented by quantitative indicators to measure the size and direction of revisions in Section 6. Section 7 deals with the consistency within the b.o.p. ("internal consistency") and with other related statistics ("external consistency"). Finally, Section 8 provides information on where to find the euro area b.o.p. and i.i.p. statistics.

I PREREQUISITES OF QUALITY AND ASSESSMENT OF INTEGRITY

The legal framework for collecting b.o.p./i.i.p. data stems from the Treaty, in particular Article 5 of the ESCB/ECB Statute on the collection of statistical information. Article 5.1 sets out that "in order to undertake the tasks of the ESCB, the ECB, assisted by the national central banks, shall collect the necessary statistical information either from the competent national authorities or directly from economic agents." In application of this provision, Council Regulation (EC) No 2533/98[6] defines in Article 2 the reference reporting population, which includes "legal and natural persons residing in a Member State, to the extent that they hold cross-border positions or carry out cross-border transactions […]." The legal obligation set out in the Treaty and this Regulation is the basis for the afore-mentioned ECB Guideline, which is legally binding for NCBs of euro area countries. A Recommendation (ECB/2004/16) was also issued to request national authorities other than NCBs that compile the b.o.p./i.i.p. statistics, i.e. the Irish Central Statistics Office and the Ufficio Italiano dei Cambi, to cooperate with the respective NCBs so as to meet the ECB requirements.

The IMF has established the Special Data Dissemination Standard (SDDS) to guide member countries in the provision of their economic and financial data to the public. Sixty-one of its member countries have subscribed to the standard, including almost all euro area countries. The ECB intends to conform to it as well in order to foster international comparability of euro area statistics. References to the SDDS benchmark are made in this report where appropriate.

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5 The results are based on data published in November 2005. The length of three years was chosen in order to produce statistically meaningful results which reflect an average for the whole period. The most recent observations were excluded to avoid underestimating the indicators of revisions.

6 OJ L 318, 27.11.1998, p. 8.

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Several measures have been implemented since 1999 to protect the integrity of euro area statistics and increase the efficiency and effectiveness of statistical procedures. Firstly, the ECB has procedures in place to protect confidential data received from Member States as required in the Council Regulation (EC) No 2533/98 concerning the collection of statistical information by the ECB. Secondly, the ESCB[7] Statistics Committee and the Committee on Monetary, Financial and Balance of Payments Statistics (CMFB) have assisted the ECB's Directorate General Statistics (DG-Statistics) and the European Commission (Eurostat) in developing a data quality framework; the current report is an important outcome of this work. Thirdly, the ECB/ESCB assesses the relevance of the statistics produced and identifies potential gaps.

The euro area b.o.p. and i.i.p. are based on the aggregation of statistics provided by individual euro area countries concerning transactions and positions between their residents and non-euro area residents. The current legal framework for the provision of data to the ECB is established by the Guideline ECB/2004/15, which entered into force on 1 September 2004. The Memorandum of Understanding between the Directorate General Statistics and Eurostat of March 2003 explains the shared responsibility between the Commission and the ECB in the field of b.o.p./i.i.p. statistics.[8]

The main purpose of euro area b.o.p. and i.i.p. statistics is to support the monetary policy of the ECB and other tasks of the Eurosystem[9] and the ESCB. In the Eurosystem's Mission Statement, accountability, transparency and good governance are important values which underpin the integrity of the statistical function as defined by the Treaty (Article 5 of the ESCB/ECB Statute).

2 METHODOLOGICAL SOUNDNESS

The methodologies observed by Member States when compiling the b.o.p. and i.i.p. are covered in the country chapters of the ECB's yearly publication "European Union balance of payments/international investment position statistical methods" (the "B.o.p. Book"; last update: November 2005). This publication describes the b.o.p./i.i.p. data collection and compilation system in each EU Member State (and in the acceding countries Bulgaria and Romania) and includes details about the reporting population, the sources, the periodicity of surveys, the estimation methods and the legal framework. The agreed methodology goes somewhat beyond the BPM5[10] to meet specific user requirements, e.g. the monthly frequency, the requirement for consistency with other monetary and financial statistics. The compilation methods for the ECB/Eurosystem international reserves (flows and outstanding amounts) are described in a separate report.[11]

In addition, the ECB's website contains a methodological note specific to the euro area b.o.p. and i.i.p.[12] focusing on methodological issues, as well as on the aggregation procedures at the euro area level. It is updated whenever changes occur.

In January 2005, the geographical breakdown of the euro area b.o.p./i.i.p. statistics was released for the first time, i.e. transactions and positions by country or group of countries. The geographical breakdown relates to the main b.o.p./i.i.p. items. These new statistics start in the first quarter of 2003 for the b.o.p., and as from the year-end 2002 for the i.i.p.; they provide a greater insight into the effects of cross-border transactions and positions on the euro area economy.

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7 The European System of Central Banks is composed of the ECB and the NCBs of all 25 EU Member States.
8 The Memorandum of Understanding is available on the ECB's website (www.ecb.int).
9 The Eurosystem is the central banking system of the euro area. It comprises the ECB and the NCBs of the 12 EU Member States that have adopted the euro.
10 The IMF Balance of Payments Manual (fifth edition) was released in October 1993.
11 "Statistical treatment of the Eurosystem's international reserves", ECB, October 2000.
12 https://stats.ecb.int/stats/download/eas_ch07/eas_ch07/eas_note_ch7.pdf

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In April 2005, the euro area quarterly i.i.p. was published for the first time. This frequency is recommended by the IMF for SDDS subscribers and it is needed for the compilation of the rest-of-the-world account in the quarterly euro area financial accounts.

Data on transactions and positions in debt securities broken down by currency (EUR/non-EUR) were received from Member States for the first time in June 2005 and are used to assess the role of the euro as an investment currency. The ECB's annual "Review of the international role of the euro" was published in December 2005.

In 2005, the historical series of the euro area reinvested earnings on direct investment and related income were revised to include estimates from Spain. Similarly, the data from Germany were revised to include accruals for interest income (see Chart 8 in Annex 2).

In comparison with the international standards set out in the BPM5, the euro area b.o.p. and i.i.p. still lack the sector breakdown on the liabilities side of portfolio investment, owing to difficulties in obtaining information on the final holder of securities (i.e. the actual creditor).[13]

The ECB and the NCBs are involved in an action plan to enhance the collection of data on portfolio investment (flows, stocks and income), complemented by a Centralised Securities Database (CSDB). In the future, the national compilers of b.o.p. and i.i.p. statistics will use the same characteristics, extracted from the CSDB, to classify the securities in terms of the sector and the residence of the issuer, the instrument, the maturity, etc. In addition, the database will assist the compilers when reconciling transactions and positions, or when calculating the income on portfolio investment. The CSDB will allow much flexibility in the compilation of statistics and will significantly reduce the burden on respondents. For the moment, the b.o.p. and i.i.p. statistics compiled in Germany (for the b.o.p.), Greece, Spain,

France, Italy, Austria, Portugal and the Netherlands are already collected security by security. This will be the case in Belgium from early 2006 onwards. The remaining euro area countries (Germany (for the i.i.p.), Ireland, Luxembourg and Finland) plan to move to a security-by-security basis in 2007.

3 PERIODICITY AND TIMELINESS

The euro area b.o.p. statistics are published at a monthly frequency. Additional sector, instrument or country breakdowns have a quarterly frequency.

The euro area i.i.p. statistics are published at a quarterly frequency. Additional geographical breakdowns have an annual frequency.

Together with the monthly release of the non-seasonally adjusted b.o.p. data, the ECB publishes data resulting from a seasonal adjustment of the b.o.p. current account items. These data ease the interpretation of latest developments in the current account by removing the seasonal pattern, as well as differences in working days and holiday effects.

In 2005, the ECB fully complied with its advance release calendar for publication: monthly data were published seven weeks after the end of the respective months, thereby enabling an assessment of the quarterly and annual flows within two months (e.g. the first assessment for the full year 2004 was published on 22 February 2005).[14] Further quarterly b.o.p. details as well as the quarterly i.i.p. were published four months after the end of the reference quarter.[15] The annual i.i.p. with further details was released eleven months after the end of the reference year.

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13 The necessary data for this breakdown will be made available by Member States from 2006 onwards.
14 The benchmark in the SDDS is three months.
15 For example, the i.i.p. as at end-2004 was published in April 2005, while the benchmark in the SDDS is nine months.

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4 ACCURACY

When compiling the euro area aggregate at all frequencies, several checks are run at the ECB on the contributions received from all euro area Member States and from the ECB itself (derived from data of its Accounting Department). The aim of these checks is to detect inaccurate, inconsistent or implausible data. Outliers in time series or inconsistencies with other data sources are analysed. If a potential problem is detected, the country involved has to check and to change or confirm the figures; in the latter case, a further explanation on the underlying economic development is often delivered. The box below elaborates on the assessment and validation of intermediate results at the ECB.

5 REVISION PRACTICE AND POLICY

The euro area b.o.p. and i.i.p. are revised according to the following schedule. Quarterly data are revised with the publication of the following quarter's data and thereafter twice a year, in April and November. Monthly b.o.p. data are revised with the publication of the following month's data, as well as with the revisions of the corresponding quarter. The annual i.i.p. is revised with the publication of data for the two subsequent years.

Revisions are necessary to improve the data coverage as first assessments of data may be based in part on estimates due to late or erroneous responses by reporting agents, and to provide users with more accurate data for time-series analysis and forecasting. However, large or biased revisions may signal weaknesses in the data collection or compilation systems that need to be checked and corrected.

Since 2003, euro area and EU b.o.p. aggregates (the former is compiled by DG-Statistics, the latter by Eurostat) have been revised simultaneously, according to a schedule that also enabled the publication of a reconciled euro area i.i.p. This increases the comparability of the data, while also easing the reporting by Member States.

Further steps towards a revision policy across integrated statistics, in particular between quarterly euro area/EU accounts and b.o.p./i.i.p. data, are being investigated by an ad hoc "Groupe de Réflexion", mandated by the ESCB Statistics Committee. EU Member States noted the interdependency of their national b.o.p. and i.i.p. revisions with external trade statistics (an important source) and with national accounts (an important user). Such a coordination of the revision practices at euro area/EU level may facilitate a process of gradual convergence of existing national practices towards a common European revision policy.

Box

ASSESSMENT AND VALIDATION OF INTERMEDIATE RESULTS AND STATISTICAL OUTPUT

Observance of deadlines for data transmission

This criterion is critical to keep to the advance release calendar and to deliver the statistics to the ECB Governing Council and other users in a timely manner. It is very well adhered to by all euro area Member States for all datasets.

Internal consistency

- Completeness checks are carried out to detect missing series. Validation rules concern linear constraints that must necessarily apply to the b.o.p. statement. In fact, all countries should already apply these checks before the data are transmitted to the ECB.
- B.o.p. data reported at a monthly frequency are summed and compared with the data reported at a quarterly frequency. The datasets at different frequencies should be consistent with each other.
- Patterns in errors and omissions are scrutinised.
- B.o.p. flow and i.i.p. stock data at a given frequency are reconciled.

External consistency

- Reserve assets positions (in the i.i.p. data) must be fully consistent with end-period positions shown in the template on international reserves and foreign currency liquidity. All countries should also apply this check before the data are transmitted to the ECB.
- The gross flows of the b.o.p. goods item are compared with the external trade in goods statistics as published by Eurostat. In euro area countries,[1] external trade statistics constitute the basis for the calculation of the goods item in the b.o.p. Although the two datasets differ in terms of time of recording and underlying concepts, their developments over time are expected to be similar. The seasonal patterns and geographical details of b.o.p. goods and external trade statistics are also compared.
- The direct and portfolio investment and other investment accounts of the monetary financial institution (MFI) sector are compared with data derived from the MFI balance sheets, reported to the ECB for the calculation of the monetary aggregates. Notional flows are derived from the MFI monthly positions in securities, deposits and loans vis-à-vis non-euro area residents, and adjusted for exchange rate and price changes and for other changes not related to transactions (e.g. revaluations). The data received for the quarterly i.i.p. are also compared with the MFI balance sheet statistics.
- The data received for the quarterly i.i.p. under other investment of the MFIs are compared with the International Banking Statistics published by the Bank for International Settlements (BIS).
- The end-year portfolio investment position is compared with the IMF Coordinated Portfolio Investment Survey (CPIS) in order to check the consistency of both datasets. The geographical details of the annual i.i.p. are also compared. In addition, CPIS (mirror) data are used to estimate a geographical breakdown of the euro area portfolio investment liabilities.
- Reserve assets items are compared with gold, positions in the IMF, and loans and securities as derived from the end-month Eurosystem consolidated balance sheet data.
- Bilateral b.o.p. and i.i.p. data (published since January 2005) are compared with mirror figures by partner country/economy, where available.

Revisions

- Before being published, new values reported for the same observation are checked by calculating the difference with the previously published value. Significant revisions in absolute terms are further investigated with the country concerned.
- The plausibility checks also aim to detect abnormal observations (outliers) in the reported data. For each country and each b.o.p. series, the latest value is compared with the previously

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1 Greece still does not use the external trade statistics as a source for b.o.p. data.

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reported data. Values that deviate markedly from the usual pattern of the series are further analysed. For the gross flows of goods and services, a comparison with the same month of the previous year is also performed.

- For the i.i.p., the reported data are reconciled with the flows for the assets and liabilities of the same country. Changes in i.i.p. positions between two end-of-period positions should be explained by (i) changes due to transactions (b.o.p. flows), (ii) valuation changes due to price and exchange rate effects, and (iii) other changes not related to transactions (for instance write-offs or reclassifications).[2]

Other checks

A number of other checks are performed on the data, although they are not structured in standardised procedures. These checks include:

- extra-euro area flows are compared with total world flows (for all items) with the aim of detecting any divergent patterns;
- cumulative flows are calculated over long periods in order to highlight abnormal patterns over longer time ranges;
- direct investment flows or stocks are compared with information reported by the press, in commercial databases or in national statistical publications on e.g. important cross-border mergers and acquisitions;
- portfolio investment flows (split into equity/debt securities and assets/liabilities) are compared with leading market indicators (e.g. interest rates or issuance of debt securities denominated in euro); and
- income flows are compared with the underlying stocks.

2 For more details, see Box 9 of the May 2005 issue of the ECB's Monthly Bulletin.

6   STABILITY

The first release of the monthly b.o.p. for the euro area occurs seven weeks after the reference period and is based on the contributions sent by the national compilers one week earlier. Users wish to know how much they can rely on this initial assessment. Although this assessment undergoes several revisions, the indicators developed in this report assess the stability of the b.o.p./i.i.p. statistics by just analysing how close the first assessments are to the final assessments.

In addition to the usual sources of revisions, changes in the underlying data collection or compilation methods, and methodological changes in one or a few Member States, may lead to breaks in the series or to substantial backward revisions. While this affects
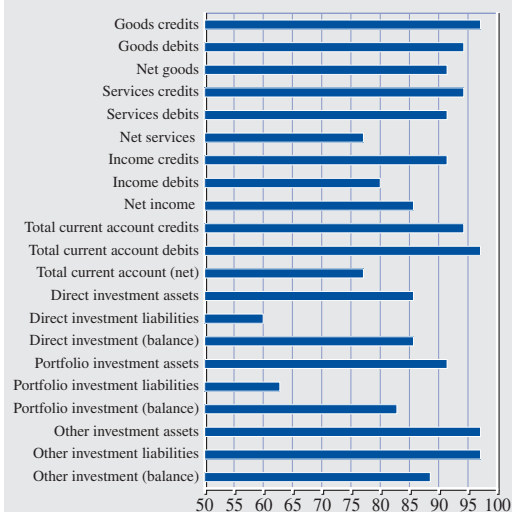
previous analyses of the series, it also increases the accuracy of the data and may be expected to increase the stability of the series over time.

Owing to recent methodological work carried out and agreements on direct investment and portfolio investment (for both b.o.p. flows and i.i.p. stocks) reached by the ESCB Statistics Committee, assisted by the Working Group on External Statistics,[16] new collection methods have been implemented by Member States or will be by 2007 (notably see page 8). The methods are designed to increase the methodological soundness and consistency of contributions to the euro area aggregate in the
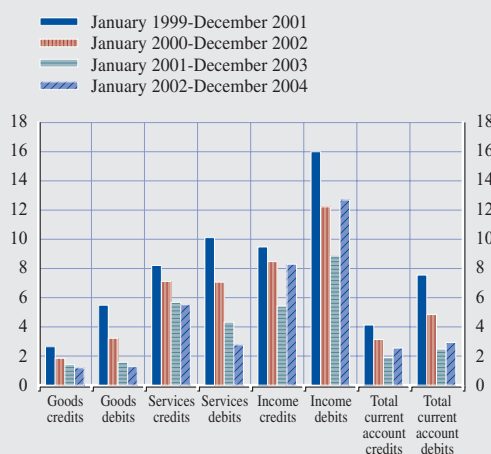
16 See reports of the Task Force on Foreign Direct Investment, ECB (March 2004), the Task Force on Portfolio Investment Collection Systems, ECB (June 2002), and the Task Force on Portfolio Investment Income, ECB (August 2003).

Chart 1 Overview of directional reliability

(as a percentage; Jan. 2002-Dec. 2004)

Goods credits
Goods debits
Net goods
Services credits
Services debits
Net services
Income credits
Income debits
Net income
Total current account credits
Total current account debits
Total current account (net)
Direct investment assets
Direct investment liabilities
Direct investment (balance)
Portfolio investment assets
Portfolio investment liabilities
Portfolio investment (balance)
Other investment assets
Other investment liabilities
Other investment (balance)

50 55 60 65 70 75 80 85 90 95 100

Chart 2 Revisions of the current account as a percentage of the respective flow

(MAPE)

- January 1999-December 2001
- January 2000-December 2002
- January 2001-December 2003
- January 2002-December 2004

Goods credits | Goods debits | Services credits | Services debits | Income credits | Income debits | Total current account credits | Total current account debits

medium term, but may also be a new source of revisions in the meantime. Furthermore, with regard to, for example, direct investment, the International Accounting Standards will not be implemented at the same pace and to the same extent across Member States and among companies, in particular for their individual (non-consolidated) accounts. This may also lead to some difficulties in statistical data collection and to later revisions.

The main results of the stability indicators are presented in the following sub-sections.

6.1 THE DIRECTIONAL RELIABILITY SHOWS A PERSISTENT RELATIVE WEAKNESS IN DIRECT INVESTMENT IN THE EURO AREA AND A SIGNIFICANT DECREASE IN PORTFOLIO INVESTMENT LIABILITIES

The directional reliability summarises how often the first assessments were able to correctly predict a decrease or an increase of the final value with respect to the previous observation. The indicator shows the worst results for the direct investment in the euro area item (60%), although this has slightly improved from the previous period (see tables

in Annex 2). Part of direct investment is composed of reinvested earnings, which are entirely based on estimates in the first assessment of the data. During this first assessment, no results of companies are known, which can also be observed in the below-average directional reliability for income debits. The reliability of portfolio investment liabilities has continuously decreased, showing for the current period that only 62% of the first assessment has rightly predicted the evolution of the monthly change.

The stability of the direction of the month-on-month changes constitutes a simple measure of reliability, which is applicable to all b.o.p. items. Chart 1 contains the results of this indicator for the main items of the b.o.p.

6.2 THE MEAN ABSOLUTE PERCENTAGE ERROR SHOWS A REDUCTION OF STABILITY IN THE INCOME ACCOUNT

The mean absolute percentage error (MAPE) was calculated for the gross series of the euro area current account. The MAPE is equal to the average of the absolute revisions in relation to the size of the respective flow.

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- bias component
- regression component
- unsystematic component

- January 1999-December 2001
- January 2000-December 2002
- January 2001-December 2003
- January 2002-December 2004

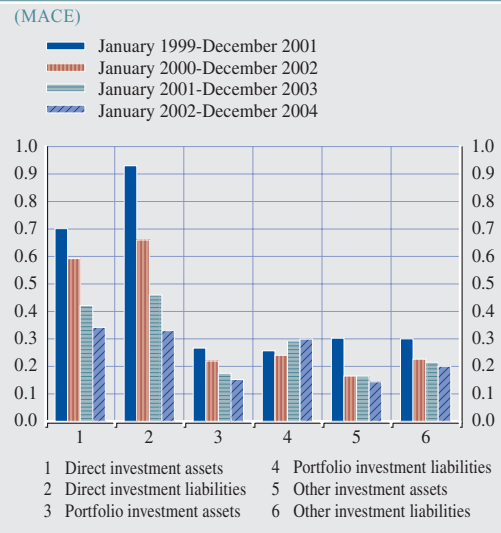| 1 | Direct investment assets | 4 | Portfolio investment liabilities |
| 2 | Direct investment liabilities | 5 | Other investment assets |
| 3 | Portfolio investment assets | 6 | Other investment liabilities |
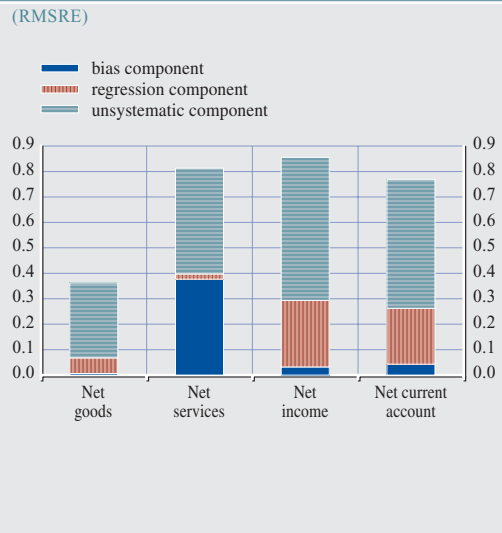
Chart 2 contains the results for 1999-2001, 2000-2002, 2001-2003 and 2002-2004.

The relative magnitude of revisions was larger for income and services than for goods. The impact of the revisions has been reduced in goods and services, while it recently increased again in income. For services, although the results have slightly improved, the initial assessments continued to be systematically lower than the final assessments for both credits and debits (see Charts 4 and 5 in Annex 2). The lower stability of the income results reflects the methodological changes incorporated in 2005 (see page 8). As a result, the average revisions of the total current account (net) increased by more than €0.5 billion. The large revisions in 1999 and 2000 were related to the initial compilation of euro area statistics (in 1999 countries compiled data according to the euro area requirements for the first time).

6.3 THE DETERIORATION IN THE SERVICES ITEM IS CONFIRMED BY THE ROOT MEAN SQUARE RELATIVE ERROR

For the net items of the current account and for the financial account, another type of indicator was used: the root mean square relative error (RMSRE). The RMSRE measures the distance between the first assessment and the final assessment in relation to the volatility of each time series, as it is more difficult to correctly estimate more volatile series. The volatility of each series was estimated by its standard deviation, assuming that the series fluctuate in a stable way around their average.[17]

17 The assumption of stationarity for the net/balance items was confirmed by standard statistical tests. In order to remove the effect of large outliers, mainly in the financial account, the standard deviation is calculated without considering the two extreme observations in the period concerned.

- bias component
- regression component
- unsystematic component

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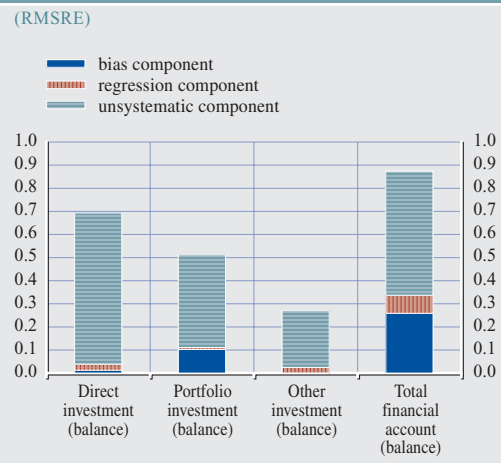
Chart 6 Revisions to i.i.p. assets

(as a percentage of i.i.p.)

- implemented in 2003
- implemented in 2004
- implemented in 2005
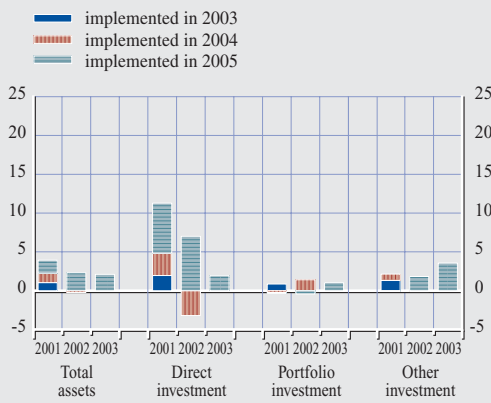
Chart 7 Revisions to i.i.p. liabilities

(as a percentage of i.i.p.)

- implemented in 2003
- implemented in 2004
- implemented in 2005
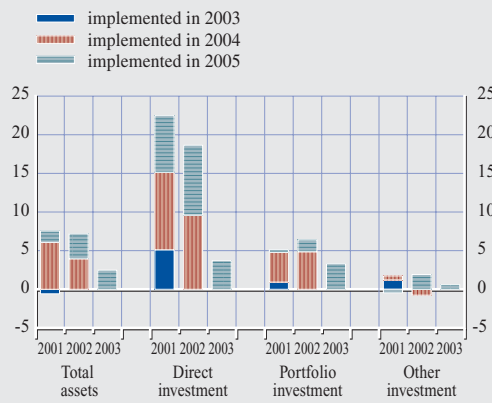
The results for previous periods are shown in the tables in Annex 2. Chart 3 contains the results for 2002-2004 and its further decomposition into bias, regression and unsystematic components. In the current account, the revisions have increased in the last period due to larger revisions of the net services item, in relation to its volatility. Furthermore, the decomposition results depicted a significant bias, which is statistically different from zero for net services. Net income still underwent the highest revisions on average, although the decomposition of the indicator shows virtually no bias; the high regression component reflects the methodological changes that caused the revisions.

6.4 THE MEAN ABSOLUTE COMPARATIVE ERROR SHOWS A CONTINUED IMPROVEMENT FOR DIRECT INVESTMENT

The indicator used to assess the revisions to assets and liabilities in the financial account is the mean absolute comparative error (MACE). The MACE is equal to the average of the absolute revisions in relation to the corresponding item in the i.i.p.

Chart 4 presents the results for assets and liabilities of direct, portfolio and other investment. The results depict a good evolution for direct investment assets and liabilities, although the average revisions for these items

are still the highest. The only negative evolution is seen for the portfolio investment liabilities item (see also Chart 17 in Annex 2).

6.5 SIGNIFICANT BIAS IN THE REVISIONS OF PORTFOLIO INVESTMENT

The RMSREs for the net items of the current account (Chart 3) are higher than those for the balance items of the financial account (Chart 5). This is not due to larger revisions but to the lower volatility of the net items in the current account.

The indicator for net direct investment is still the highest, although it decreased in the last period. For the total financial account, the decomposition of the indicators shows a bias that is statistically different from zero. The revisions in portfolio investment mainly contribute to this bias.

6.6 STABILITY OF THE NET INTERNATIONAL INVESTMENT POSITION

Charts 6 and 7 show the revisions to the main items of the euro area i.i.p. assets and liabilities respectively. The revisions of the total asset positions as at end-2003 amounted to €166 billion, which represents 2.1% of the total assets. On the liabilities side, the corresponding revisions were €216 billion (2.5% of the total liabilities).

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All the revisions to 2003 positions were positive. Revisions to total assets and liabilities almost offset each other in the net i.i.p., while the first revisions of the 2002 i.i.p. were much larger for the liabilities side.

The revisions implemented in 2005 still had a significant effect on direct investment positions for 2001 and 2002. These changes mainly stem from data for the Netherlands. These were revised backwards to avoid breaks owing to the introduction of a survey-based data collection system in 2003. This system yields a better coverage of the international positions of special-purpose entities (SPEs).

7 CONSISTENCY

Consistency indicators deal with two aspects: internal inconsistency, as revealed by the errors and omissions item, and external inconsistency, as revealed by discrepancies vis-à-vis other statistics, such as foreign trade statistics and external flows derived from the balance sheets of MFIs. Furthermore, consistency also covers other aspects, such as the effect of a given transaction on subsequent b.o.p. and i.i.p. data (e.g. a change in positions may affect future income flows) or the same recording of a transaction by both parties involved.

In 2005, revisions to data from 1999 to 2002 have been introduced in direct investment flows and related income in order to improve the overall consistency of the whole series. In 2004, the enhanced recording of SPEs in the Netherlands only concerned data from 2002 onwards.

However, the overall consistency of the same transactions and positions reported to different euro area statistical compilers has still not been achieved. This situation should improve in the future, because, following (i) a decision of the ECB Governing Council in April 2005 and (ii) the entry into force in 2006 of Council Regulation (EC) No 184/2005,[18] an exchange of bilateral detailed information across the ESCB and with statistical authorities contributing to Community statistics can take place, where relevant. Of course, all measures have been taken to protect the confidentiality of the data in compliance with the legal requirements, as set out in Article 8 of Council Regulation (EC) No 2533/98.[19]

The publication of data broken down geographically has allowed a comparison of some items of the euro area b.o.p. and i.i.p. with the corresponding figures published by main counterpart countries. The first results of this comparison with data from the United Kingdom, the United States and Japan show significant discrepancies in direct investment, mainly vis-à-vis the euro area countries hosting SPEs. Asymmetries may come from the use of different criteria for the identification of the origin or destination of direct investment transactions or positions. This issue is being further investigated together with the main partner countries of the euro area.
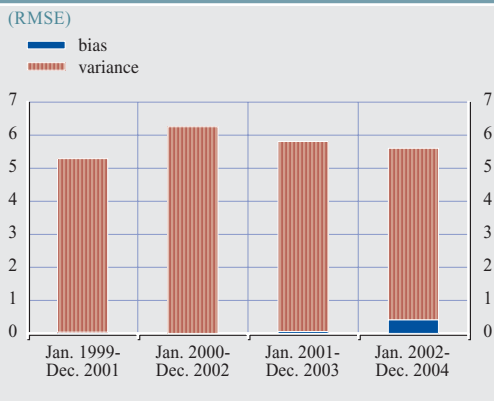
7.1 INTERNAL CONSISTENCY

Net errors and omissions constitute the overall balancing item of the b.o.p. and thus an indicator of internal inconsistency. In fact, the principle of double-entry bookkeeping implies that the sum of all transactions vis-à-vis the rest of the world should be equal to zero. The size of net errors and omissions is a lower bound of the relative inaccuracy of the b.o.p. (as some wrongly recorded, or missing, values may cancel out). In any case, a large or persistent residual may impede the data analysis or interpretation.

The root mean square error (RMSE) indicator was calculated from the time series on errors and omissions. This indicator is used to measure the size of the internal inconsistency, as well as to identify any potential bias.

18 OJ L 35, 8.2.2005, p. 23.
19 See reference in footnote 6.

Chart 8 RMSE of errors and omissions as a percentage of gross flows in the current account

(RMSE)

Table 1 RMSE of errors and omissions

(RMSE in EUR billions)

	Data available in:	
Period	Nov. 2004	Nov. 2005
Jan. 1999-Dec. 2001	13.44	11.66
Jan. 2000-Dec. 2002	15.59	15.14
Jan. 2001-Dec. 2003	15.12	14.03
Jan. 2002-Dec. 2004		13.50

In the period January 2002 to December 2004, the errors and omissions showed a bias, though this was not significant according to a standard statistical test. The RMSE amounted to 5.6% of the average gross flows in the current account during that period. Chart 8 shows that the internal consistency of the b.o.p. recently improved, but only slightly.

Table 1 shows the changes due to the revisions between November 2004 and November 2005. These revisions have slightly reduced the net errors and omissions, but did not eliminate the negative pattern of the 12-month cumulated errors and omissions since September 2003.

7.2 EXTERNAL CONSISTENCY

The b.o.p. series have been compared with the corresponding data published by Eurostat for euro area external trade, and with the external transactions derived from the balance sheets compiled in the context of MFI balance sheet statistics. Although the methodologies of those series are not fully consistent with the b.o.p., they broadly reflect the same economic phenomenon. Therefore, the comparisons are useful to check whether the differences are stable over time.

Moreover, Table 2 contains the results for the average absolute and simple differences between the growth rates of each series. The indicators show that the average of the absolute differences between growth rates has increased in 2002-2004 for exports, while for imports it remained stable. The average of the simple differences reveals that the differences do not seem to be systematic.

In Table 3, the root mean square relative error (RMSRE) reflects the distance between comparable b.o.p. and money and banking statistics in net terms, in relation to the

Table 2 Goods in the b.o.p. and external trade

(month-on-month growth rate in percentage points)

	Period	Exports	Imports
Average of absolute differences	1999-2001	0.8	1.0
	2000-2002	0.7	0.7
	2001-2003	0.8	0.7
	2002-2004	1.0	0.7
Average of simple differences	1999-2001	0.2	0.1
	2000-2002	0.1	0.0
	2001-2003	0.1	0.0
	2002-2004	0.0	0.0

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Table 3 Deposits/loans of MFIs – comparison with corresponding net transactions from money and banking statistics

Period	RMSRE	Bias component (%)	Regression component (%)	Unsystematic component (%)
1999-2001	15.5	3.4	0.5	96.0
2000-2002	9.0	0.9	1.2	97.9
2001-2003	9.3	0.4	0.4	99.3
2002-2004	9.3	3.7	1.2	95.0

volatility of the b.o.p. series. This indicator remained stable in the 2002-2004 period. The bias component increased, although it was not significantly different from zero.

8 ACCESSIBILITY

The press releases of the euro area b.o.p. and i.i.p. data are published through wire services and on the ECB's website in accordance with the advance release calendar. The most recent data and long time series are also available in downloadable format. Afterwards, the data are also published in the ECB's Monthly Bulletin.

The ECB has a specific e-mail address for external users of statistics: statistics@ecb.int. Complex queries concerning external statistics are forwarded to the External Statistics Division, which is in charge of the b.o.p. and i.i.p. statistics at the ECB.

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ANNEX I

METHODOLOGICAL DOCUMENTATION FOR QUALITY INDICATORS[1]

This annex contains the methodology used for the quantitative indicators to assess reliability/stability and serviceability/consistency.

1 RELIABILITY/STABILITY

In the IMF's terminology, the study of revisions is normally referred to as *reliability*, while in some quality work at the European level it is also referred to as *stability*. The underlying concept is however the same and can be defined as "*the closeness of the initial estimated value(s) to the subsequent estimated values. Assessing reliability involves comparing estimates over time. In other words, assessing reliability refers to revisions.*"[2]

The number of revisions observed depends on the revision policy/practice of a statistical agency or department, which normally decides beforehand (sometimes in collaboration with the users) how many times and when the estimates should be revised and communicated to the public.

As an example, with reference to a series X with N observations, the statistical agency can decide to publish it k times with predefined time lags $\{l_1, l_2, \ldots, l_k\}$. From the k sets of data, revisions can easily be derived, normally as the difference between two subsequent assessments. Therefore, a revision variable or series can be defined as the difference $R_{ij} = X_j - X_i$, where i and j identify two specific time-lags, with $j > i$. The joint ECB (DG-S)/ Commission (Eurostat) Task Force on Quality (TF-QA) suggested measuring revisions by means of the difference between the first and latest assessments: $R = X_k - X$.

Revisions may also be calculated over a transformation of the original series, such as the respective first difference or the growth rate.

1.1 SIMPLE MEASURES OF REVISIONS

1.1.1 Size indicators
Simple indicators of revisions express the changes in relation to the size of the variable X.

An average of these revisions ($\overline{R}$) then provides an indication of how far on average the first assessment was from the latest assessment. However, if large positive and negative revisions almost cancel out, this may provide a spuriously positive impression of data quality. Therefore, the average of the absolute revisions ($\overline{|R|}$) is generally seen as a better stability indicator.

1.1.2 Directional indicators
In principle, positive and negative revisions should occur with roughly the same frequency. If the revisions are systematically positive, this may point to an undercoverage in early estimates, which needs to be corrected somehow. A simple indicator for this phenomenon is the ratio between upward revisions and the number of observations (N):

upward revisions ratio = (# upward revisions)/N.

To assess whether the information on the direction of changes as contained in the earlier estimates has been altered by the revisions, a 2 x 2 contingency table can be set up. In this contingency table the columns consist of positive and negative first differences of the early estimates $\Delta x_{t_1} = x_{t_1} - x_{(t-1)_1}$, while the rows consist of positive and negative changes of the latest values $\Delta x_{t_k} = x_{t_k} - x_{(t-1)_k}$.

---

1 Based on the report by the joint ECB (DG-S)/Commission (Eurostat) Task Force on Quality.
2 Carol S. Carson and Lucie Laliberté, "Assessing accuracy and reliability: a note based on approaches used in national accounts and balance of payments statistics", IMF Working Paper 02/24, February 2002.

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Contingency table for directional reliability			
	$\Delta\chi_{t1} > 0$	$\Delta\chi_{t1} \leq 0$	**Subtotal**
$\Delta\chi_{tk} > 0$	n_{11}	n_{12}	$n_{11}+n_{12}$
$\Delta\chi_{tk} \leq 0$	n_{21}	n_{22}	$n_{21}+n_{22}$
Subtotal	$n_{11}+n_{21}$	$n_{12}+n_{22}$	N

The directional reliability indicator (Q) is then as follows:

$$Q = \frac{n_{11}+n_{22}}{N}.$$

This coefficient Q is equal to 1 if the changes following the earliest and the latest estimates always have the same sign ($n_{11} + n_{22} = N$), while it is equal to 0 when there is a total dissociation ($n_{11} + n_{22} = 0$). Obviously, higher values of this indicator are preferred.

1.2   RELATIVE MEASURES OF REVISIONS

It is often useful to also provide relative measures, which relate the revisions to dimensional measures of the variable concerned. Two main types of indicators have been developed depending on whether the observations of a time series have only positive values (series on gross transactions or on asset or liability positions) or can have either positive or negative values (series on net transactions or balances).

1.2.1   Gross transactions or asset/liability positions

In the case of gross data, the relative revision equals the percentage change of the initial assessment (R/X). If the average over time $\overline{(R/X)}$ is then computed, this is called the *mean percentage error* (MPE).

As revisions can be positive or negative, it is usually more appropriate to take the absolute value, in order to avoid that revisions of opposite signs cancel out in the resulting indicator. So, if the average is calculated with the absolute values, we get $\overline{|R/X|}$, the *mean absolute percentage error* (MAPE).

1.2.2   Net transactions or balances between assets and liabilities

In the case of net data, revisions cannot be properly related to the series value itself because the observations may have different signs and, even more importantly, the values of the series may often be close to zero.

Transactions in assets and liabilities

A solution for assets and liabilities of the b.o.p. financial account is to use the corresponding item in the i.i.p. for assessing the relative size of the revision. This provides a relative measure that the user can easily interpret. The indicator will be expressed as R/P, were P is the related i.i.p. item. As for the gross data, an average of the absolute value of this ratio can be taken over time, in order to avoid that revisions of opposite signs cancel out in the resulting indicator.

The *mean absolute comparative error (MACE)* is defined as $\overline{|R/P|}$.

As the i.i.p. is not available at a monthly frequency, the calculations of the MACE for b.o.p. data use the level of the i.i.p. at the end of the corresponding quarter.[3]

Net transactions in the current account and balances in the financial account

For the b.o.p. balance items, the i.i.p. can have positive and negative observations as well. Therefore, a measure of the volatility of the series X is used as a reference for the size of the revisions. This measure reflects that in practice it is more difficult to correctly estimate values of a volatile series.

3 Before 2003, this is done with annual data.

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The *mean absolute relative error (MARE)* is then defined as $\dfrac{\overline{|R|}}{vol(X_k)}$.

There are several ways of calculating the volatility of X, using the standard deviation, the average distance from the mean or the median of the distances from the median.[4] In principle, the volatility should be calculated for the latest assessment X_k, because those values should be the most accurate ones.

An advantage of using the average distance from the mean is that with a small transformation that indicator can be decomposed into a bias and a variance component. This indicator is calculated as the square root of the ratio between the average of the square revisions and the variance of the series (S^2). It is called the root mean square relative error (RMSRE):

$$RMSRE = \sqrt{\dfrac{\overline{R^2}}{S^2}} \; .$$

The value of the RMSRE is 0 when the first assessment always equals the latest, 1 if the first assessment is only as accurate as the reference forecast, which is the time series average, and greater than 1 when the first assessment is less accurate than such a forecast of the series.[5] The square of the RMSRE can be decomposed as follows:

$$RMSRE^2 = \left[\dfrac{\overline{X_k} - \overline{X_1}}{S_{X_k}}\right]^2 + \left[r_{X_k X_1} - \dfrac{S_{X_1}}{S_{X_k}}\right]^2 + \left[1 - (r_{X_k X_1})^2\right]$$

where $r_{X_k X_1}$ is the correlation between the two series, and S_{X_k} and S_{X_1} are the respective standard deviations.

The three components can be interpreted as follows:

1) The *bias component* provides an indication of systematic error, since it measures the extent to which the average values of the early and later assessments deviate from each other. The revisions can be considered biased if the mean of the revisions is significantly different from zero.[6]

2) The *regression component* is another systematic component which reflects whether the overall pattern of the series with the early estimates was close to that of the series with the later estimates. If the initial estimates correctly reflect the pattern/volatility of the later estimates, the correlation between both series will be quite high and this component of the indicator will be close to zero.

3) The *unsystematic component* is the variance of the residuals obtained by regressing the early estimates on the later estimates. This reflects more random revisions.[7]

The limitations of this indicator are: (i) in the case of non-stationary series, its value and decomposition become meaningless and (ii) its interpretation is less straightforward.

After successful tests of the stationarity of the series, this indicator has been applied to assess the revisions in the net current and capital accounts as well as to the balance items in the financial account.[8]

The following table shows the measures of revisions for the b.o.p. used in the annual quality report:

4 For more detailed information, refer to Annex 1 of the "Euro area balance of payments and international investment statistics annual quality report", January 2005, or the report by the joint ECB (DG-S)/Commission (Eurostat) Task Force on Quality (http://www.cmfb.org/pdf/TF-QAreport_final_CMFB_jul04.pdf).
5 Other measures, like the median and the trimmed mean, were tested as well. Assuming that the b.o.p. financial account net flows are stationary, the average was chosen owing to its simplicity and its ease of interpretation, and because it enables a decomposition of the indicator into meaningful components. If the series is not stationary, the indicator can still be applied using the previous value of the series as the reference value, or using the first difference of the series.
6 Assuming normality for revisions, so as to be able to apply the t test.
7 However, the unsystematic part could still hide systematic non-linear patterns.
8 To calculate the indicator for every period (36 observations), the two extreme values have been removed in order to make the results more comparable over time.

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Measures of b.o.p. revisions			
	Debits	Credits	Net
Current account	MAPE	MAPE	RMSRE
	Assets	Liabilities	Balance
Financial account	MACE	MACE	RMSRE

2 SERVICEABILITY/CONSISTENCY

In the IMF's Data Quality Assessment Framework (DQAF), *consistency* is defined as: (i) over time; (ii) between data collected at different frequencies; (iii) internationally; (iv) across variables, either vertically (across transactions), horizontally (across institutional sectors), and/or between flows and stocks. The TF-QA focused on the following sub-categories:

- internal consistency, e.g. within the integrated statistics (the b.o.p./i.i.p. or national accounts); and

- external consistency (between different sources of data and/or different statistical frameworks); this may include mirror statistics, as international statistics should be the same also when they are compiled by different institutions or by different units of the same institution.

2.1 INTERNAL CONSISTENCY

According to the IMF's 2001 DQAF for the b.o.p., internal consistency implies checking that "over the long run the errors and omissions item has not been large and has been stable over time".

A measure of the size of this item can be provided by the *average of the absolute net errors and omissions,* $\overline{|EO|}$.

As with revisions, an alternative measure of the size is the *root mean square error of the net errors and omissions:*

$$RMSE(EO) = \sqrt{\overline{EO^2}}.$$

As before, this indicator can be decomposed into bias and variance components:[9]

$$RMSE^2 = bias\ component + variance\ component$$

$$RMSE^2 = \overline{EO}^2 + S^2$$

where S is the standard deviation of the errors and omissions.

In addition, the number of positive EO divided by the number of observations can be used to assess the relative frequency of positive EO:

$$CP(EO) = \frac{Count(EO_t > 0)}{N}.$$

2.2 EXTERNAL CONSISTENCY
Although minor discrepancies arising from methodological differences can still be present in two sets of data stemming from different sources and/or different statistical frameworks,[10] a comparison of these two datasets can still provide a useful measure of consistency.

2.2.1 Size indicators

Series with positive values
Simple indicators of external consistency relate the differences to the values of the variable that is compared. A simple indicator measuring the consistency between b.o.p. and international trade statistics (ITS) can be computed using the latest assessment of both series.

A preferable indicator is similar to the MAPE ($\overline{|P|}$), but with the percentage differences calculated as proportions of the average of both time series.[11] This indicator captures the magnitude of the discrepancies in absolute value, and relates it to the average size of both series.

9 Following the simplest MSE decomposition. See Francis X. Diebold, "Elements of Forecasting", 2001.
10 E.g. the comparison between the euro area goods item (b.o.p.) and Eurostat's external trade data, or the comparison between the b.o.p. flows of the MFI sector and flows derived from the consolidated MFI balance sheet from money and banking statistics.
11 $C = \frac{1}{a}\sum_{t=T-a}^{T}\frac{|x_t - y_t|}{(x_t + y_t)/2}$

Based on S. Keuning and S. Algera, "Some elements of a quality framework for CMFB statistics", Statistics Netherlands, October 2001.

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Another simple measure is based on the average differences of the growth rates. This also has the advantage that it abstracts from differences in levels between time series, e.g. the imports of goods are measured on a c.i.f. basis in the external trade statistics and on a f.o.b. basis for the b.o.p., while in both statistics exports are measured on a f.o.b. basis. A simple indicator of <u>external</u> consistency then becomes: $G = \left| G_x - G_y \right|$.

Series with positive and negative values
Differences between b.o.p. transactions and similar transactions derived from the MFI balance sheet can be attributed to a variety of factors: time of recording and reporting, revision policies and valuation methods.

Relative indicators for assessing reliability can also be used to assess consistency between comparable net flows. The RMSRE indicator is calculated for the latest assessment of each series, using the b.o.p. series as the benchmark.

2.2.2 Directional indicators
Similar to the directional indicators set out in Sub-section 1.1.2, such indicators can also be constructed to check whether the signs of the changes are typically the same in both the series being compared.

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ANNEX 2

RESULTS OF STABILITY INDICATORS

Chart 1 Euro area goods – credits

(EUR billions)

- revision
- first assessment
- final assessment
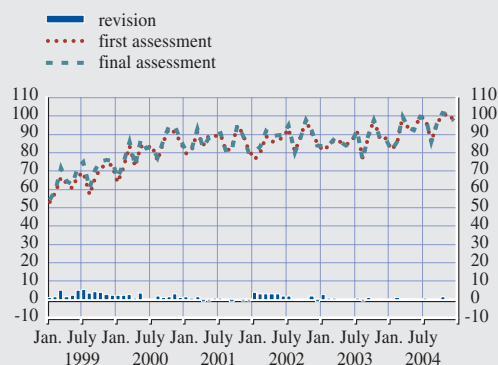
Chart 2 Euro area goods – debits

(EUR billions)

- revision
- first assessment
- final assessment
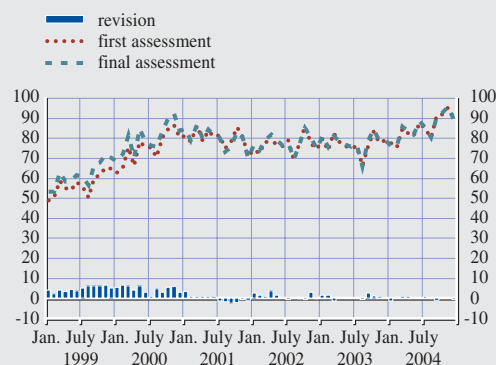
Chart 3 Euro area goods – net

(EUR billions)

- revision
- first assessment
- final assessment
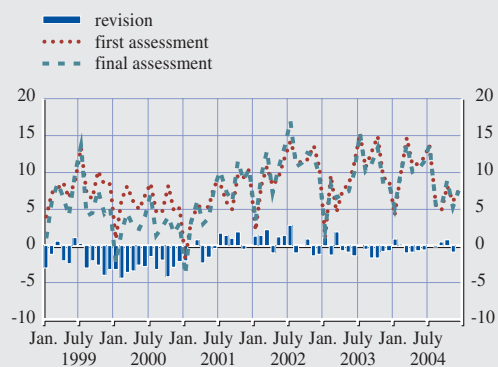
Table 1 Stability indicators for goods

Quality indicator	Reference period Jan.-Dec.	Goods		
		Credits	Debits	Net
$\overline{R}$ (EUR billions)	1999 - 2001	1.54	3.12	-1.58
	2000 - 2002	1.03	1.83	-0.80
	2001 - 2003	0.56	0.53	0.03
	2002 - 2004	0.64	0.66	-0.02
$\overline{|R|}$ (EUR billions)	1999 - 2001	1.91	3.62	2.08
	2000 - 2002	1.53	2.43	1.81
	2001 - 2003	1.20	1.23	1.16
	2002 - 2004	1.03	1.00	0.96
MAPE/ RMSRE (%)	1999 - 2001	2.64	5.49	0.72
	2000 - 2002	1.84	3.22	0.48
	2001 - 2003	1.41	1.58	0.34
	2002 - 2004	1.19	1.28	0.36
Q (%)	1999 - 2001	97.14	94.29	88.57
	2000 - 2002	97.14	94.29	88.57
	2001 - 2003	100.00	94.29	91.43
	2002 - 2004	97.14	94.29	91.43

Note: The MAPE is used for credits and debits and the RMSRE for net data.

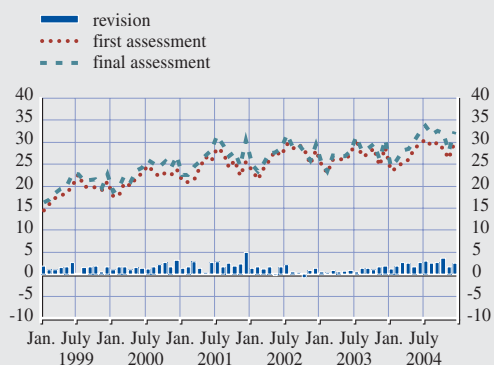## Chart 4 Euro area services – credits

(EUR billions)

- revision
- first assessment
- final assessment

Chart 5 Euro area services – debits

(EUR billions)

- revision
- first assessment
- final assessment
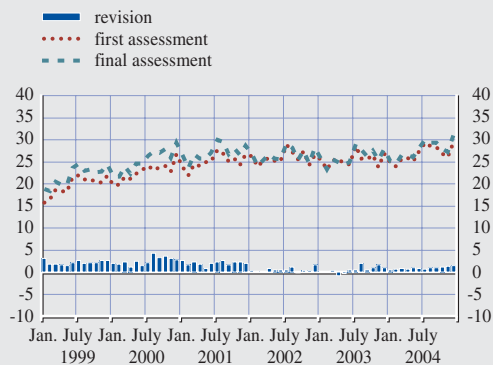
Chart 6 Euro area services – net

(EUR billions)

- revision
- first assessment
- final assessment
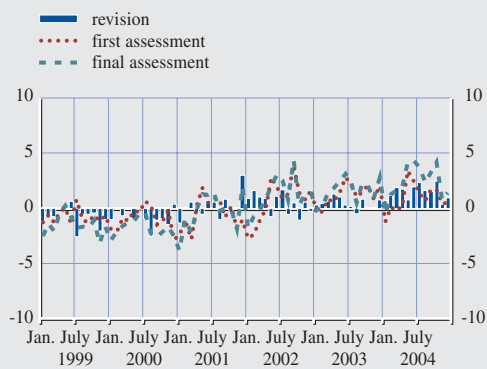
Table 2 Stability indicators for services

Quality indicator	Reference period Jan.-Dec.	Service		
		Credits	Debits	Net
$\overline{R}$ (EUR billions)	1999 - 2001	1.78	2.24	-0.46
	2000 - 2002	1.63	1.69	-0.05
	2001 - 2003	1.38	1.02	0.35
	2002 - 2004	1.43	0.66	0.78
$\overline{|R|}$ (EUR billions)	1999 - 2001	1.78	2.24	0.84
	2000 - 2002	1.69	1.70	0.85
	2001 - 2003	1.44	1.09	0.73
	2002 - 2004	1.49	0.73	0.96
MAPE/ RMSRE (%)	1999 - 2001	8.20	10.12	0.87
	2000 - 2002	7.12	7.06	0.63
	2001 - 2003	5.68	4.32	0.59
	2002 - 2004	5.51	2.77	0.81
Q (%)	1999 - 2001	88.57	82.86	77.14
	2000 - 2002	94.29	88.57	74.29
	2001 - 2003	91.43	91.43	80.00
	2002 - 2004	94.29	91.43	77.14

Note: The MAPE is used for credits and debits and the RMSRE for net data.

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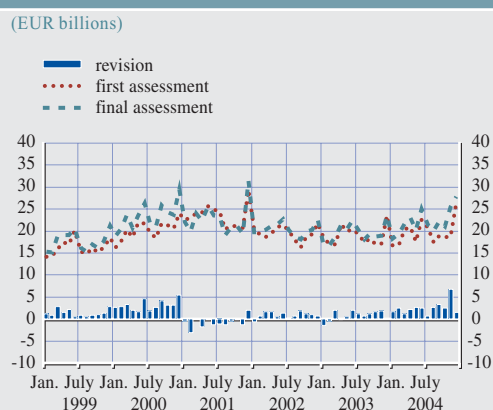Euro area balance of payments and international investment position statistics – Annual quality report
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Chart 7 Euro area income – credits

(EUR billions)

- revision
- first assessment
- final assessment

Chart 8 Euro area income – debits

(EUR billions)

- revision
- first assessment
- final assessment
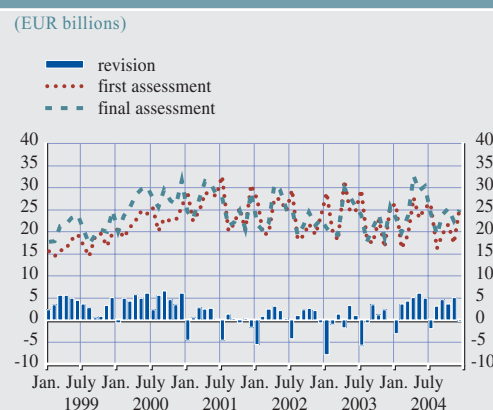
Chart 9 Euro area income – net

(EUR billions)

- revision
- first assessment
- final assessment
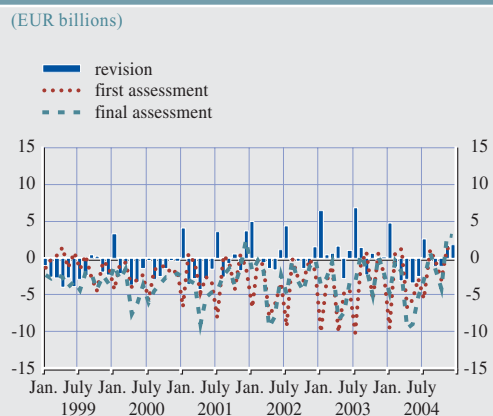
Table 3 Stability indicators for income

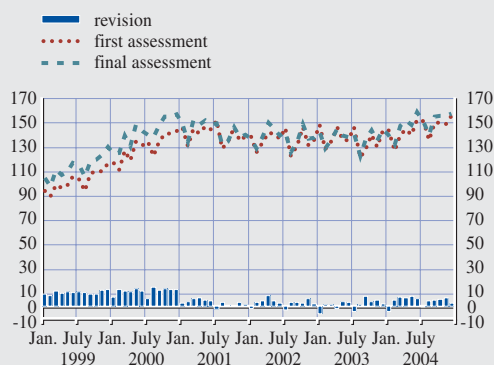| Quality indicator	Reference period Jan.-Dec.	Income		
		Credits	Debits	Net
R̄ (EUR billions)	1999 - 2001	1.25	2.64	-1.39
	2000 - 2002	1.10	1.64	-0.54
	2001 - 2003	0.31	0.01	0.29
	2002 - 2004	1.40	1.02	0.38
R̄ (EUR billions)	1999 - 2001	1.87	3.32	2.27
	2000 - 2002	1.76	2.90	2.05
	2001 - 2003	1.08	2.19	2.10
	2002 - 2004	1.56	2.85	1.95
MAPE/ RMSRE (%)	1999 - 2001	9.48	16.00	1.44
	2000 - 2002	8.47	12.22	1.08
	2001 - 2003	5.42	8.86	1.10
	2002 - 2004	8.29	12.70	0.86
Q (%)	1999 - 2001	82.86	77.14	68.57
	2000 - 2002	82.86	82.86	74.29
	2001 - 2003	82.86	82.86	77.14
	2002 - 2004	91.43	80.00	85.71

Note: The MAPE is used for credits and debits and the RMSRE for net data.
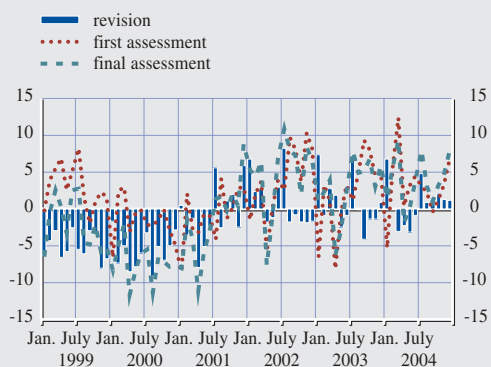
Chart 10 Euro area current account – credits

(EUR billions)

- revision
- ⋯⋯ first assessment
- – – final assessment
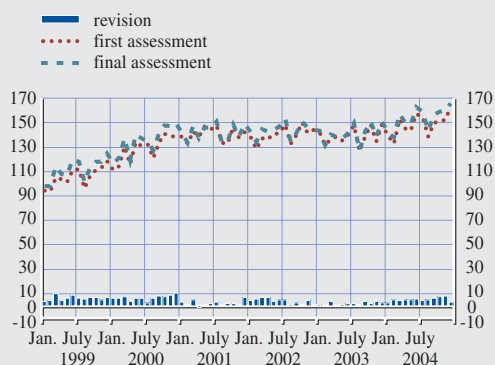
Chart 11 Euro area current account – debits

(EUR billions)

- revision
- ⋯⋯ first assessment
- – – final assessment

Chart 12 Euro area current account – net

(EUR billions)

- revision
- ⋯⋯ first assessment
- – – final assessment

Table 4 Stability indicators for the current account

Quality indicator	Reference period Jan.-Dec.	Current account		
		Credits	Debits	Net
$\overline{R}$ (EUR billions)	1999 - 2001	4.87	8.74	-3.87
	2000 - 2002	4.12	5.96	-1.84
	2001 - 2003	2.57	2.27	0.30
	2002 - 2004	3.64	2.81	0.82
$\overline{|R|}$ (EUR billions)	1999 - 2001	4.95	8.89	4.71
	2000 - 2002	4.20	6.42	3.96
	2001 - 2003	2.65	3.42	2.91
	2002 - 2004	3.64	4.08	2.56
MAPE/ RMSRE (%)	1999 - 2001	4.12	7.55	1.16
	2000 - 2002	3.14	4.84	0.71
	2001 - 2003	1.90	2.48	0.71
	2002 - 2004	2.54	2.92	0.77
Q (%)	1999 - 2001	88.57	88.57	77.14
	2000 - 2002	88.57	88.57	77.14
	2001 - 2003	88.57	97.14	74.29
	2002 - 2004	94.29	97.14	77.14

Note: The MAPE is used for credits and debits and the RMSRE for net data.

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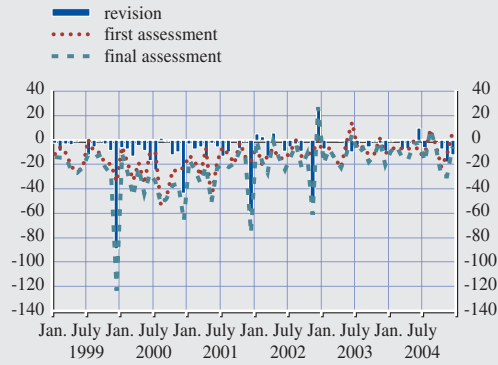**Chart 13 Direct investment abroad**

(EUR billions)

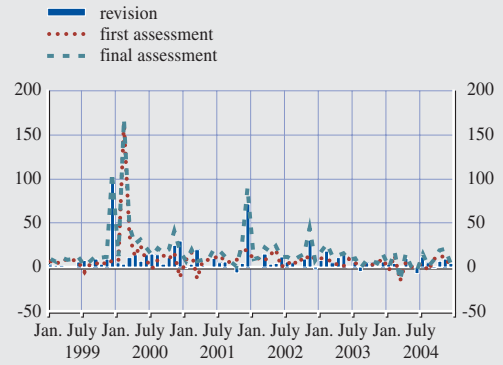**Chart 14 Direct investment in the euro area**

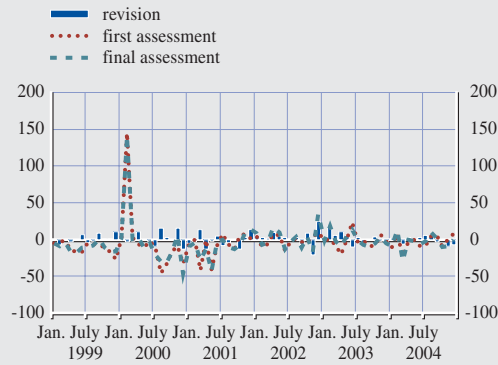(EUR billions)

Chart 15 Direct investment – net

(EUR billions)

Table 5 Stability indicators for direct investment

Quality indicator	Reference period Jan.-Dec.	Direct investment		
		Assets	Liabilities	Balance
$\overline{R}$ (EUR billions)	1999 - 2001	-11.54	11.51	-0.03
	2000 - 2002	-9.08	9.76	0.68
	2001 - 2003	-6.44	7.52	1.08
	2002 - 2004	-4.35	5.68	1.34
$\overline{|R|}$ (EUR billions)	1999 - 2001	11.64	11.95	5.74
	2000 - 2002	11.40	10.33	6.97
	2001 - 2003	8.70	8.39	6.71
	2002 - 2004	7.18	6.58	5.78
MACE/ RMSRE (%)	1999 - 2001	0.70	0.93	0.58
	2000 - 2002	0.59	0.66	0.57
	2001 - 2003	0.42	0.46	0.75
	2002 - 2004	0.34	0.33	0.69
Q (%)	1999 - 2001	82.86	65.71	74.29
	2000 - 2002	82.86	71.43	82.86
	2001 - 2003	91.43	57.14	85.71
	2002 - 2004	85.71	60.00	85.71

Note: The MACE is used for assets and liabilities and the RMSRE for balance data.

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Chart 16 Euro area portfolio investment – assets

(EUR billions)

- ▬ revision
- ⋯ first assessment
- -- final assessment
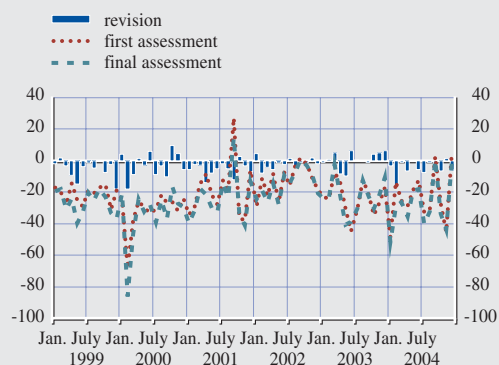
Chart 17 Euro area portfolio investment – liabilities

(EUR billions)

- ▬ revision
- ⋯ first assessment
- -- final assessment
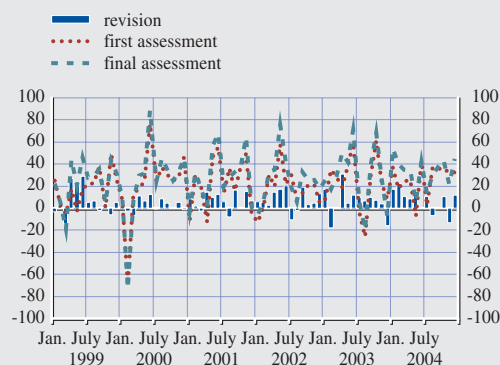
Chart 18 Euro area portfolio investment – balance

(EUR billions)

- ▬ revision
- ⋯ first assessment
- -- final assessment
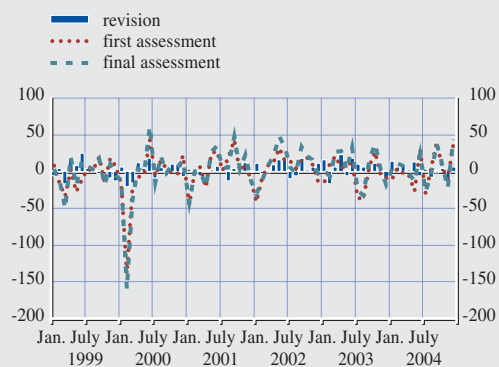
Table 6 Stability indicators for portfolio investment

Quality indicator	Reference period Jan.-Dec.	Portfolio investment		
		Assets	Liabilities	Balance
$\overline{R}$ (EUR billions)	1999 - 2001	-4.50	5.55	1.05
	2000 - 2002	-3.27	5.98	2.71
	2001 - 2003	-2.19	6.78	4.59
	2002 - 2004	-1.91	6.93	5.02
$\overline{|R|}$ (EUR billions)	1999 - 2001	6.19	8.09	8.04
	2000 - 2002	5.30	7.84	8.03
	2001 - 2003	4.35	9.90	8.45
	2002 - 2004	3.99	10.59	9.28
MACE/ RMSRE (%)	1999 - 2001	0.27	0.26	0.42
	2000 - 2002	0.22	0.24	0.40
	2001 - 2003	0.17	0.29	0.46
	2002 - 2004	0.15	0.30	0.51
Q (%)	1999 - 2001	74.29	94.29	88.57
	2000 - 2002	88.57	85.71	88.57
	2001 - 2003	91.43	74.29	82.86
	2002 - 2004	91.43	62.86	82.86

Note: The MACE is used for assets and liabilities and the RMSRE for balance data.

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Chart 19 Euro area other investment – assets

(EUR billions)

- revision
- first assessment
- final assessment
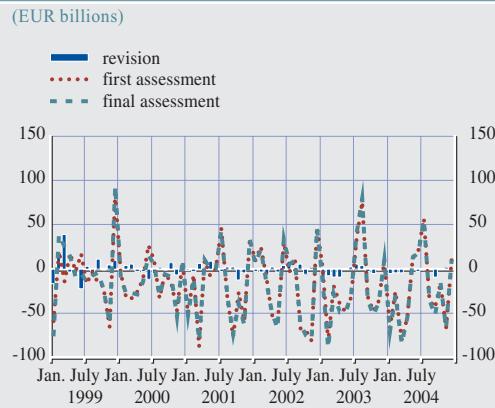
Chart 20 Euro area other investment – liabilities

(EUR billions)

- revision
- first assessment
- final assessment
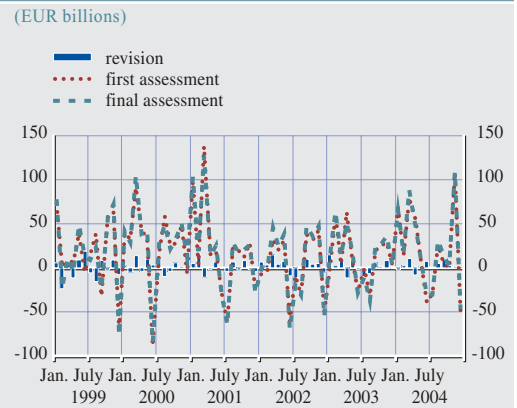
Chart 21 Euro area other investment – balance

(EUR billions)

- revision
- first assessment
- final assessment
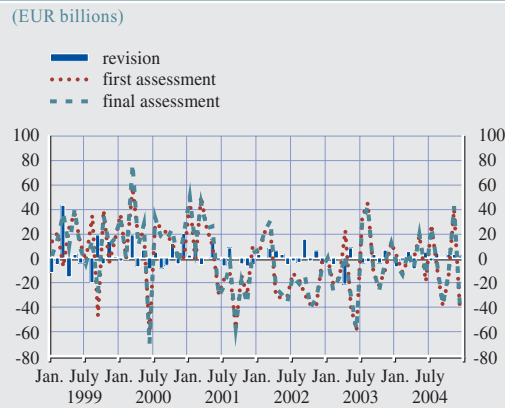
Table 7 Stability indicators for other investment

Quality indicator	Reference period Jan.-Dec.	Other investment		
		Assets	Liabilities	Balance
$\overline{R}$ (EUR billions)	1999 - 2001	0.25	1.27	1.53
	2000 - 2002	-0.67	2.39	1.72
	2001 - 2003	-1.35	1.81	0.46
	2002 - 2004	-1.90	2.25	0.34
$|\overline{R}|$ (EUR billions)	1999 - 2001	6.68	7.64	8.65
	2000 - 2002	4.11	6.48	6.32
	2001 - 2003	4.36	6.34	5.12
	2002 - 2004	3.90	5.97	4.47
MACE/ RMSRE (%)	1999 - 2001	0.30	0.30	0.43
	2000 - 2002	0.17	0.23	0.26
	2001 - 2003	0.16	0.22	0.26
	2002 - 2004	0.14	0.20	0.27
Q (%)	1999 - 2001	85.71	91.43	88.57
	2000 - 2002	91.43	91.43	82.86
	2001 - 2003	94.29	94.29	85.71
	2002 - 2004	97.14	97.14	88.57

Note: The MACE is used for assets and liabilities and the RMSRE for balance data.

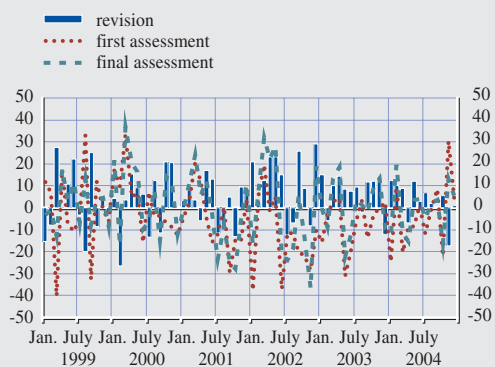## Chart 22 Total financial account – net

(EUR billions)

- ▬ revision
- ••••• first assessment
- – – final assessment

Chart 23 Euro area errors and omissions

(EUR billions)

- ▬ revision
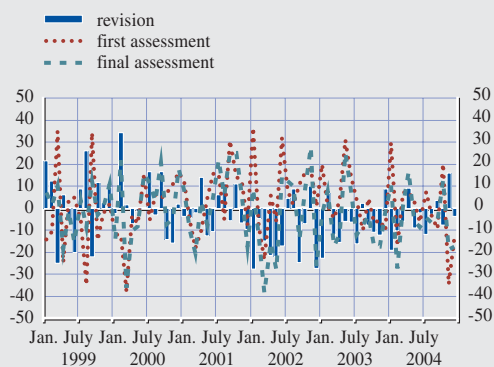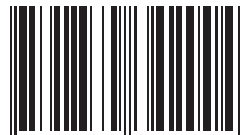- ••••• first assessment
- – – final assessment

Table 8 Stability indicators for errors and omissions and total financial account

Quality indicator	Reference period Jan.-Dec.	Errors and omissions	Total financial account
R̄ (EUR billions)	1999 - 2001	1.06	2.87
	2000 - 2002	-3.65	5.63
	2001 - 2003	-6.96	6.78
	2002 - 2004	-7.81	6.93
R̄ (EUR billions)	1999 - 2001	10.64	11.06
	2000 - 2002	11.18	12.16
	2001 - 2003	11.53	11.57
	2002 - 2004	11.63	11.18
RMSRE (%)	1999 - 2001	1.05	
	2000 - 2002	0.84	
	2001 - 2003	0.87	
	2002 - 2004	0.94	
Q (%)	1999 - 2001	71.43	
	2000 - 2002	77.14	
	2001 - 2003	80.00	
	2002 - 2004	82.86	

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