EUROPEAN CENTRAL BANK

EUROSYSTEM

EURO AREA BALANCE OF PAYMENTS AND INTERNATIONAL INVESTMENT POSITION STATISTICS

MARCH 2009

2008 QUALITY REPORT

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In 2009 all ECB publications feature a motif taken from the €200 banknote.

2008 QUALITY REPORT

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EXECUTIVE SUMMARY

This annual quality report is required by Article 6 of Guideline ECB/2004/15[1], (hereinafter referred to as the "Guideline"). It follows the basic principles of the ECB Statistics Quality Framework (SQF),[2] which was published in April 2008 and includes quantitative indicators. The ECB has placed a strong emphasis on key aspects of statistical quality such as relevance, accuracy, reliability, timeliness, consistency, cost-effectiveness, a non-excessive burden on reporting agents and statistical confidentiality.

The methodologies followed by the Member States are covered in the country chapters of the ECB's publication "European Union balance of payments and international investment position statistical methods"[3]. 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.[4]

In 2008, some new breakdowns relating to income on equity, current transfers and the capital account were introduced in the quarterly b.o.p. and i.i.p. In March, Member States started to transmit the required country data for the fourth quarter of 2007. These data have also been used in the compilation of the quarterly euro area accounts.

In 2008, various Member States implemented methodological enhancements that improved the methodological soundness and consistency of their contributions, but also triggered sizeable revisions to the euro area statistics. In particular, the introduction of a security-by-security reporting system in Germany and France has had an important impact on previous years' positions as regards portfolio investment.

In recent years, current account credits and debits have been underestimated in the first assessment. When releasing the first monthly b.o.p. estimates, full information on services and income is usually not yet available in the euro area Member States. The results in this report show that these first estimates often underestimate services, credits and debits, as well as investment income credits. Nonetheless, those patterns have an only very marginal impact on the net current account balance.

In 2008, Cyprus and Malta joined the euro area. Consequently, Cyprus has introduced the new residency criterion in the production of b.o.p. and i.i.p. statistics, as also required by the Guideline; this change was introduced in July 2008 for the b.o.p. statistics and in the third quarter of 2008 for the i.i.p. data. Malta is still in the process of complying fully with the residence definition for those enterprises that are incorporated in Malta but have no physical presence in this country.

In 2008, the requirement of a full implementation of a security-by-security data collection system in all euro area countries was met to a very large extent. Currently, the b.o.p. and i.i.p. statistics compiled in Belgium, Germany, Ireland, Greece, Spain, France, Italy, Cyprus, the Netherlands, Austria, Portugal and Slovenia are already based on a security-by-security reporting system. Luxembourg, Malta and Finland are expected to fully implement such a system by the first quarter of 2009.

Data on intra-euro area portfolio investment assets, broken down by euro area sector of the issuer, were reported by euro area Member States for the first time in June 2006. This allowed the publication of a sector breakdown of euro area portfolio investment liabilities in the first quarter of 2008. These new statistics start in the first quarter of 2006 for the quarterly b.o.p. and in the last quarter of 2005 for the quarterly i.i.p.

1 Official Journal of the European Union (OJ), L 354, 30.11.2004, p. 34, and amending Guideline ECB/2007/3, OJ L 159, 20.6.2007, p. 48.
2 http://www.ecb.europa.eu/pub/pdf/other/ ecbstatisticsqualityframework200804en.pdf.
3 Latest update: May 2007.
4 https://stats.ecb.europa.eu/stats/download/eas_ch07/eas_ch07/eas_note_ch7.pdf.

Since December 2008, a currency breakdown (EUR/USD/Other currencies) of portfolio investment debt securities for euro area b.o.p. and i.i.p. statistics is available in the ECB's Statistical Data Warehouse (SDW)[5], covering the period from the second half of 2004 to the second half of 2007.

Revisions to the net euro area i.i.p. at end-2006, published in November 2008, decreased the net liability position by €27 billion (from €1,033 billion to €1,006 billion). This decrease corresponds to 0.3 % of euro area GDP.

The size of twelve-month cumulated euro area net errors and omissions has increased in absolute terms since mid-2003, with only a short interruption from end-2005 to early 2006. However, it seems that the increasing trend has slowed down from early 2007 to end-2007. In 2008, the ECB, the euro area NCBs and Eurostat worked together to enhance the internal consistency of the euro area b.o.p. and to jointly take action to correct the bias observed since 2003 towards negative net errors and omissions. A summary of the diagnosis of this problem is described in Box. It may take some time to remedy, but first results are expected in 2009.

The ECB regularly performs a "mirror data" analysis to study the external consistency of the euro area data with the closely corresponding data released by its main counterparts, namely the United Kingdom, the United States and Japan. Whereas the asymmetries between the euro area b.o.p. and those for the two latter countries seem to be contained, the asymmetries between the euro area b.o.p. and that of the United Kingdom give rise to some concerns, in particular with respect to euro area services exports to the United Kingdom. These largely exceed the imports of services from the euro area as recorded by the United Kingdom.

There are differences in levels between b.o.p. and external trade statistics due to the diverging underlying methodologies. In the recent periods, however, this discrepancy has gradually decreased, more so for exports than for imports. The growth rates of both series follow similar patterns.

The consistency between b.o.p. and monetary statistics has been improving steadily. Nevertheless, in recent periods, the bias component of the discrepancy between these statistics has become significant. This bias mainly reflects the differences in the recording, by some NCBs, of short-selling transactions in b.o.p statistics and in monetary statistics.

5 http://sdw.ecb.europa.eu.

INTRODUCTION

In comparison with the previous quality report, the order and the number of the sections has changed so as to follow the structure proposed by the ECB Statistics Quality Framework (SQF),[6] which was published in April 2008. The report is also in line with the ECB's Mission Statement, in which the ECB has committed itself to adhering to values such as integrity, efficiency, transparency and accountability.

The report is organised in three sections. Section 1 focuses on the quality principles that refer to the ECB's institutional environment. Six principles apply: (i) independence and accountability; (ii) mandate for data collection; (iii) impartiality and objectivity; (iv) statistical confidentiality; (v) coordination and cooperation among the members of the ESCB[7] and with European and international organisations; and (vi) resources and efficiency. Section 2 concentrates on the statistical processes, the relevant principles being (i) sound methodology and appropriate statistical procedures; (ii) cost-effectiveness; and (iii) a non-excessive burden on reporting agents. Finally, Section 3 deals with the quality of the statistical output, namely its (i) relevance; (ii) accuracy and reliability (stability); (iii) consistency and comparability; (iv) timeliness and punctuality; and (v) accessibility and clarity.

As in previous years, the report includes quantitative indicators[8] to measure stability (or reliability). These quantitative indicators have been computed on the basis of the monthly b.o.p. observations from January 2005 to December 2007 (36 observations), as released up to November 2008. The results for that period are compared with those for the four previous three-year periods, i.e. from 2001 in the main text and from 1999 in Annex 2. By contrast, the study of the euro area i.i.p. revisions is based on the different vintages of the estimates for each year. The analysis of the i.i.p. revisions focuses on the data for positions from end-2002 to end-2007.

1 PRINCIPLES RELATED TO THE INSTITUTIONAL ENVIRONMENT

The institutional environment has a direct impact on the quality of statistics. The statutory *independence* and *accountability* of the ECB, based on the provisions of the Treaty,[9] also applies to its statistical tasks. The euro area b.o.p. and i.i.p. are based on the aggregation of statistics provided by individual euro area countries on transactions and positions between their residents and non-euro area residents. The legal framework for collecting b.o.p./i.i.p. data stems from the Treaty, in particular Article 5 of the Protocol on the Statute of the European System of Central Banks and of the European Central Bank (ESCB Statute), which deals with the collection of statistical information.[10] In application of this provision, Article 2 of the Council Regulation (EC) No. 2533/98 on the collection of statistical information by the ECB[11] defines the reference reporting population, including "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 Council Regulation (EC) No. 2533/98 form the basis for Guideline ECB/2004/15 and for the amending Guideline ECB/2007/3 of the ECB on the statistical reporting requirements of the ECB in the field of balance of payments (b.o.p.) and international investment position (i.i.p.)

6 http://www.ecb.europa.eu/pub/pdf/other/ecbstatisticsqualityframework200804en.pdf.
7 The European System of Central Banks comprises the ECB and the NCBs of all 27 EU Member States.
8 Based on the work of a joint ECB (Directorate General Statistics)/European Commission (Eurostat) Task Force on Quality, in which representatives of most of the then 15 EU Member States were also involved. The Task Force report is available under www.cmfb.org.
9 http://www.ecb.europa.eu/ecb/orga/governance/html/index.en.html.
10 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".
11 OJ L 318, 27.11.1998, p. 8.

statistics, and the international reserves template. The Memorandum of Understanding of March 2003 between the ECB's Directorate General Statistics and Eurostat defines how responsibility in the field of b.o.p./i.i.p. statistics is shared between the European Commission and the ECB.[12]

The International Monetary Fund (IMF) has established a Special Data Dissemination Standard (SDDS) to guide its member countries in the provision of their economic and financial data to the public. Sixty-four of its member countries have subscribed to the standard, including all euro area countries except Cyprus and Malta. The euro area as a whole is also regarded as a subscriber. References to the IMF's SDDS are made in this report where appropriate.

Since the start of Stage Three of Economic and Monetary Union in 1999, several measures have been implemented to protect the integrity and credibility of euro area statistics and to increase the *efficiency* and *effectiveness* of statistical procedures. First, the ECB has procedures in place to protect *statistical confidentiality* as required in Council Regulation (EC) No. 2533/98. Second, the Statistics Committee (STC) of the ESCB and the Committee for Monetary, Financial and Balance of Payments Statistics (CMFB) have assisted the ECB's Directorate General Statistics and the European Commission (Eurostat) in developing the data quality framework.

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[13] 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 Statute). Moreover, as a first step, the Eurosystem adopted a public commitment in the area of statistics[14] in 2007, with the ECB's SQF and quality assurance procedures being published in April 2008. These contain the main principles and elements guiding the production of ECB statistics.

2 PRINCIPLES RELATED TO STATISTICAL PROCESSES

2.1 METHODOLOGICAL SOUNDNESS

The methodologies applied by Member States when compiling the b.o.p. and i.i.p. statistics are covered in the country chapters of the ECB's publication "European Union balance of payments/international investment position statistical methods" (the "B.o.p. Book").[15] This publication describes the b.o.p./i.i.p. data collection and compilation system in each EU Member State and includes details about the reporting population, the sources, the periodicity of surveys, the estimation methods and the legal framework. In order to meet specific user requirements, the agreed methodology goes somewhat beyond what is set out in the IMF Balance of Payments Manual (BPM5)[16]. This holds true, for instance, of the monthly frequency and the requirement for consistency with other monetary and financial statistics. The methods for compiling the statistics on the international reserves (flows and outstanding amounts) of the ECB/Eurosystem are described in a separate report.[17]

In addition, the ECB's website contains an up-to-date methodological note on the compilation of the euro area b.o.p. and i.i.p., including the aggregation procedures.[18]

12 The Memorandum of Understanding, dated 10 March 2003, is available on the ECB's website http://www.ecb.europa.eu/ecb/legal/pdf/en_mou_with_eurostat1.pdf.
13 The Eurosystem is the central banking system of the euro area. It comprises the ECB and the NCBs of the 16 EU Member States that have adopted the euro.
14 http://www.ecb.europa.eu/stats/html/pcstats.en.html.
15 Latest update: May 2007.
16 The IMF Balance of Payments Manual (fifth edition), released in 1993.
17 "Statistical treatment of the Eurosystem's international reserves", ECB, October 2000.
18 https://stats.ecb.europa.eu/stats/download/eas_ch07/eas_ch07/eas_note_ch7.pdf.

Data on intra-euro area portfolio investment assets, broken down by euro area sector of the issuer, were reported by euro area Member States for the first time in June 2006. This allowed the inaugural publication of the sector breakdown of the euro area portfolio investment liabilities in the first quarter of 2008. These new statistics start in the first quarter of 2006 for the quarterly b.o.p. and in the last quarter of 2005 for the quarterly i.i.p.

In March 2008, the ECB started publishing the b.o.p. for the enlarged euro area, including Cyprus and Malta. Consistent time series for the b.o.p. and i.i.p. of the enlarged euro area since January 1999, as well as the historical euro area b.o.p. and i.i.p. time series, can be downloaded from the ECB's Statistical Data Warehouse (SDW)[19].

The Banque de France started to compile general government trade credit positions in November 2007. Revisions to stocks statistics were carried out, while back data for flows compiled according the new stock data were published in 2008.

At present, the ESCB is completing the implementation of a regular collection of security-by-security data on portfolio investment (flows, stocks and income). As from March 2009, all national compilers of b.o.p. and i.i.p. statistics will be able to use harmonised characteristics, as extracted from the Centralised Securities Data Base (CSDB), to classify securities by sector and residence of the issuers, by type of instrument, by maturity, etc. In addition, this database will assist compilers when reconciling transactions and positions, or when calculating the income on portfolio investment. The CSDB also provides information on prices.

The CSDB will provide extensive flexibility in the compilation of statistics and will significantly reduce the burden on respondents. The full implementation of a security-by-security data collection system by euro area countries is envisaged for early 2009.[20] Currently, the b.o.p. and i.i.p. statistics compiled in Belgium, Germany, Ireland, Greece, Spain, France, Italy, Cyprus, the Netherlands, Austria, Portugal and Slovenia are based on security-by-security data collection systems. Luxembourg, Malta and Finland are expected to adopt the security-by-security reporting system by the first quarter of 2009.

In 2008, the above-mentioned implementation of the new security-by-security reporting system in France and Germany triggered back data revisions that have, however, contributed to improving the consistency between euro area stock and flow statistics.

In March 2008, euro area Member States started to transmit new breakdowns for the quarterly b.o.p., namely breakdowns with respect to income on equity, current transfers and capital account for the fourth quarter of 2007, according to the new requirements foreseen in Table 13 of Guideline ECB/2007/3.

Further breakdowns of the euro area b.o.p. and i.i.p. by currency contribute to the annual review of the international role of the euro. Data on cross-border transactions in goods and services of selected euro area countries (Belgium, Germany, Greece, Spain, France, Italy, Luxembourg, the Netherlands, Portugal and Slovenia) with countries outside the euro area are broken down by currency on an annual basis and released on the ECB's website.[21] In addition, the currency breakdown of portfolio investment debt securities for euro area b.o.p. and i.i.p. statistics is available in the ECB's SDW, covering the period from the second half of 2004 to the second half of 2007. Debt securities are broken down in euro, US dollars and "other currencies"; the data will be available at a half-yearly intervals as from December 2008.

19 http://sdw.ecb.europa.eu.

20 The Guideline ECB/2007/3 requires security-by-security reporting to be implemented by March 2009 at the latest.

21 http://www.ecb.europa.eu/stats/external/balance/html/Exports_imports_IRE_pub2008.pdf.

In 2008, Cyprus and Malta joined the euro area. Consequently, Cyprus introduced a new residency criterion in the production of b.o.p. and i.i.p. statistics in order to align its practices with the European Union requirements. This implies that residents include enterprises which have been incorporated or registered in a country without a physical presence. This change was introduced in July 2008 for b.o.p. statistics, and in the third quarter of 2008 for i.i.p. data. On the other hand, Malta is still in the process of complying fully with the residency definition for those enterprises which are incorporated in Malta but have no physical presence.

2.2 COST-EFFECTIVENESS AND A NON-EXCESSIVE BURDEN ON THE REPORTING AGENTS

Since 2003, the ECB's Directorate General Statistics and Eurostat have fully aligned their release and revision calendars. This increases the comparability of their statistics, while also *easing the reporting burden* of Member States.

3 QUALITY PRINCIPLES RELATED TO STATISTICAL OUTPUT

3.1 ACCURACY AND RELIABILITY (STABILITY) OF THE STATISTICAL OUTPUT

When compiling the euro area aggregate at all frequencies, the ECB performs quality assurance procedures on the contributions received from all euro area Member States, and from the ECB itself (derived from its accounting ledgers). The aim of these checks is to detect inaccurate, inconsistent or implausible data. Outliers in time series or inconsistencies with other data sources are also analysed. If a potential problem is detected, the compiler in the country involved has to check, change or confirm the figures; in the latter case, a further explanation with regard to the underlying economic development is often supplied.

The ECB follows a clear revision policy that is publicly available. The euro area b.o.p. and i.i.p. are revised in accordance with the following predetermined schedule: quarterly data are revised with the publication of the following quarter's statistics, and twice a year thereafter, namely in April and November. Monthly b.o.p. data are revised with the publication of the following month's statistics, as well as with the revisions of the relevant quarter. The annual i.i.p. is revised with the publication of the same data for the two subsequent years. In addition, extraordinary revisions are justified in the case of major changes in methodology, coverage or data collection systems in the Member States, or when the composition of the euro area changes.

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 national compilers one week earlier. This report also involves a revision analysis to asses the *reliability* (or stability) of the euro area monthly b.o.p., based on a number of indicators that measure the closeness of these first assessments to the final estimates. Similarly, the i.i.p. revisions are analysed with due consideration of the different vintages resulting from the annual revisions.

Revisions are necessary to improve the data quality as the first assessments may be based, in part, on estimates due to late or erroneous responses by reporting agents. Revisions also provide users with more accurate data for time series analysis and forecasting. Frequently, however, large or systematic revisions may signal weaknesses in the data collection or compilation systems that need to be solved.

When reviewing the stability indicators, it should be kept in mind that all changes in the underlying data collection or compilation methods, or methodological changes in one or a few Member States, may lead to breaks in, or substantial backward revisions to, the euro area series. At the same time, these reforms generally increase the accuracy of the statistics and may be expected to increase the stability of the series over time. Moreover, it is clear that the quality of the b.o.p. and i.i.p. can be negatively affected by increasing globalisation

and by the requirement to limit, and sometimes even reduce, the statistical reporting burden of economic agents.

Owing to methodological work on direct investment and portfolio investment (for both b.o.p. flows and i.i.p. stocks) that were carried out by the STC, assisted by the Working Group on External Statistics,[22] new collection methods have been implemented by several Member States in recent years. This has also been the case in 2008. The new methods are designed to improve the methodological soundness and harmonisation of national contributions to the euro area aggregate in the medium term, but there may also be a new source of revisions and asymmetries. Furthermore, the International Accounting Standards will be implemented at different times 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 revisions at a later stage.

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

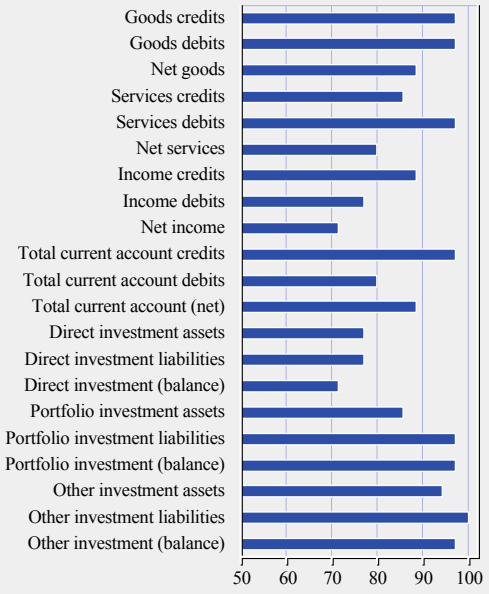
3.1.1 The directional reliability shows some weaknesses in the estimates of net income and the direct investment balance, while the situation has improved for portfolio investment liabilities

The directional reliability indicator summarises how often the first assessments were able to correctly predict a decrease or an increase of the final value in comparison with the previous observation. The stability of the direction of the month-on-month changes constitutes a simple reliability measure, 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. for the period 2005-07.

The indicator shows unsatisfactory results for the net income item in the euro area (71%), although there was a significant improvement in comparison with the previous period (54%; see variable Q in Table 3 in Annex 2). The indicator also displays rather poor results for the direct investment balance (71%), which is a deterioration in comparison with the previous period (83%; see Table 5 in Annex 2). Part of direct investment is composed of reinvested earnings, which are based entirely on estimates in the first assessment of the data. During this first monthly assessment, no profit and loss results of companies are known, which also affects the directional reliability for income debits. The reliability of portfolio investment liabilities data, as can be derived from this indicator, continues to improve over time.

Chart 1 Overview of directional reliability

(correctly predicted sign of the month-on-month change in the first estimates as a percentage of all monthly estimates; 2005 - 2007)



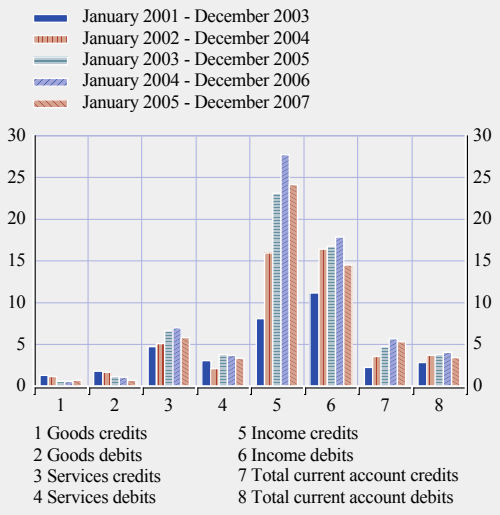
Source: ECB.

3.1.2 The mean absolute percentage error shows an improvement of the stability of the estimates of income and services

The mean absolute percentage error (MAPE) has been 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

22 See the 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 2 Revisions to the euro area current account as a percentage of the respective flow



Source: ECB.

the size of the respective flow. Chart 2 contains the results for five periods of three years: 2001 to 2003, 2002 to 2004, 2003 to 2005, 2004 to 2006 and 2005 to 2007.

The relative magnitude of the revisions continues to be large for income, in particular for income credits, which are often underestimated in the first assessment. Nevertheless, a reversal of the deteriorating trend for services and income can be observed in the latest three-year period.

While the stability of the preliminary estimates for income has been lower since 2006, the stability of the estimates for services has improved; especially for services debits (see Charts 2 and 3 in Annex 2). The lower stability for income is also due to the frequent correction of the first estimate of the reinvested earnings sub-item (see the previous section for an explanation). Furthermore, the initial assessments continued to be systematically lower than the final assessments for services credits and debits. This feature is also observed for the recent estimates of income credits and debits. Consequently, the first releases have frequently underestimated the current account credits and debits. At the same time, the revisions of the current account credits have been more significant in recent years than those of the debit side (see Table 4 and Chart 4 in Annex 2). All in all, the relative magnitude of the revisions to the current account as a whole decreased moderately, by 0.3 percentage point for credits and by 0.6 percentage point for debits (see Chart 2).

3.1.3 Increased bias in the estimates of net services and net income is shown by the root mean square relative error

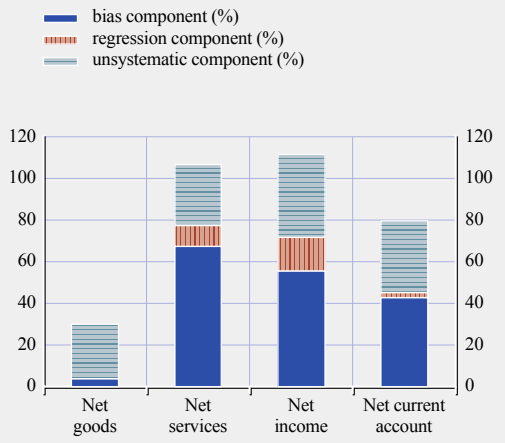
For the net items of the current account and for the balancing items of the financial account, another type of indicator is used due to the difficulty to correctly estimate very volatile series: the root mean square relative error (RMSRE). The RMSRE measures the distance between the first assessment and the final assessment in relation to the volatility of each time series. The volatility of each series is estimated by its standard deviation, assuming that the series fluctuate around the average in a stable way[23].

Chart 3 contains the results for the period from 2005 to 2007, and their further break down into a bias, a regression and an unsystematic component. The results for all periods are shown in the tables in Annex 2. The revisions to the current account balance have decreased moderately in comparison with the previous period, mainly due to smaller relative revisions to both the net services and the net income items. The revisions to net income have been significantly influenced by the inclusion of estimates for income on foreign direct investment (FDI) by special-purpose entities (SPEs) in Luxembourg.

23 The assumption of stationarity for the net/balancing items has been 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 most extreme observations in the period concerned.

Chart 3 Breakdown of the revisions to the euro area current account as a percentage of volatility for 2005-2007

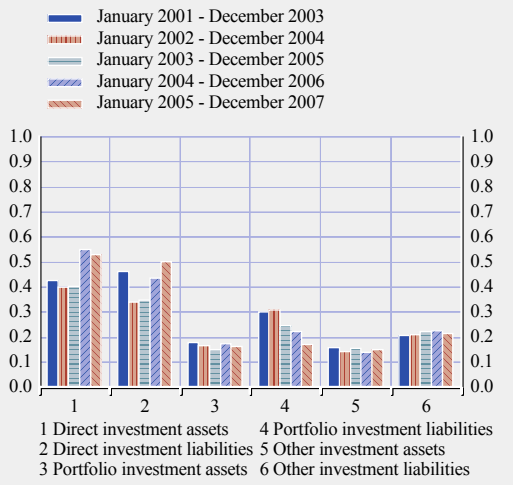
(RMSRE)



Source: ECB.

Chart 4 Revisions to the euro area financial account assets and liabilities as a percentage of the corresponding i.i.p. item

(MACE)



Source: ECB.

The results of the breakdown show that a small bias component has appeared with respect to the net goods item (4%), and that the bias component has increased significantly for both the net services (from 59% to 67% of the RMSRE value) and the net income items (from 44% to 55% of the RMSRE value). In the case of services, the bias is partly due to the generally late availability of several data sources for some of the services components in some Member States, which may in future be better pre-adjusted in the first estimates. The bias for income is due mainly to the revisions to the direct investment income item. In turn, the regression component has decreased for all net current account items.

In general, the balances for income and services have been somewhat underestimated (see Section 3.1.2), while the goods balance has been underestimated from mid-2006 onwards, when the upwards revisions to goods debits ended, thanks to a smaller difference between the first and the final assessments. From mid-2005 onwards, the current account balance has generally been underestimated as a result of higher revisions on the credit side (See Chart 4 in Annex 2).

3.1.4 The mean absolute comparative error shows the highest and increasing revisions to the estimates of direct investment

The indicator used to evaluate the revisions to the preliminary estimates of 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 the estimates of direct, portfolio and other investment assets and liabilities. The average revisions to the preliminary estimates of direct investment continue to be the highest, both abroad (assets) and in the euro area (liabilities), and show a decrease in the last three-year period of the direct investment positions abroad, and an increase of the direct investment positions in the euro area, in comparison to the previous three-year period. The portfolio investment liabilities are the only item in the financial account for which relative revisions have continued to decrease. The relative revisions to the estimates for the other items have remained quite stable.

3.1.5 Increasing bias in the revisions to estimates of portfolio and other investment

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

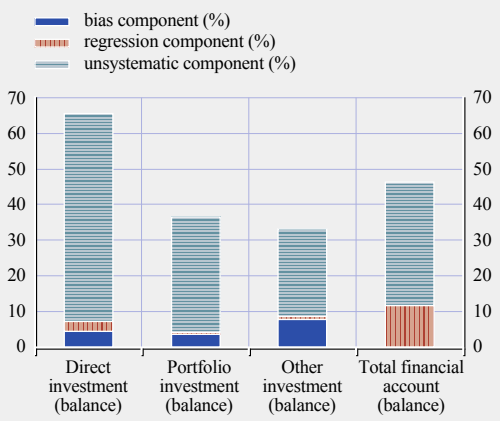
As in previous periods, the preliminary estimates of net direct investment show the highest revisions in relation to their volatility. Furthermore, the stability of the first estimates has deteriorated slightly in comparison with previous years; at the same time, the bias component has decreased notably and is no longer significant. The relative revisions to the estimates of net portfolio investment have also increased, and the same applies to the bias component. The bias component of the relative revisions to the other investment estimates has increased as well, and has also become significantly different from zero. Conversely, the balancing item of the financial account as a whole shows an improvement in the stability of the first estimates, while its bias component is almost equal to zero.

3.1.6 Stability of the international investment position

The revisions to the data for main items of euro area i.i.p. assets and liabilities are shown in Charts 6 and 7 respectively. The revisions to the total asset positions as at end-2006 amounted to €183 billion, which represents 1.5% of the total assets. On the liabilities side, the corresponding revisions came to €231 billion (1.7% of total liabilities). The first assessment of end-2006 data was released with a lag of four months. On the assets side, the largest revisions were needed for the direct investment estimates, which were revised upwards by 2.1% in 2007 and by 3.2% in 2008. On the liabilities side, the most relevant revisions were also recorded for direct investment, which was revised upwards by 4.7% in 2007 and by 2.5% in 2008. For the end-2007 data, the revisions implemented on the assets side in 2008 mainly concerned the data on direct investment and portfolio investment assets (revised upwards by 2.4% and downwards by 1.9% respectively), while the largest revisions on the liabilities side related to portfolio investment, which was revised downwards by 5.6%.

Chart 5 Breakdown of the revisions to the euro area financial account as a percentage of volatility for 2005-2007

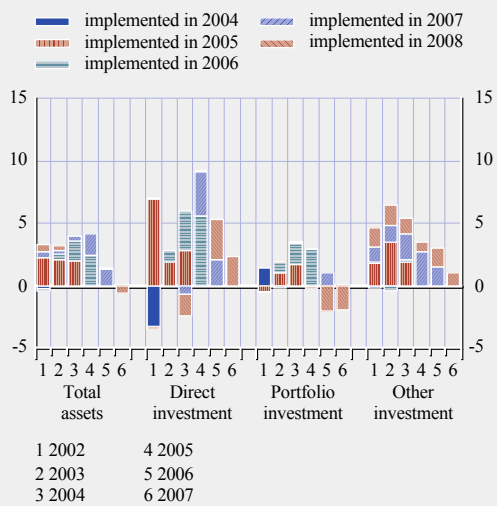
(RMSRE)



Source: ECB.

Chart 6 Revisions to the first estimates of the euro area i.i.p. – assets by reference period

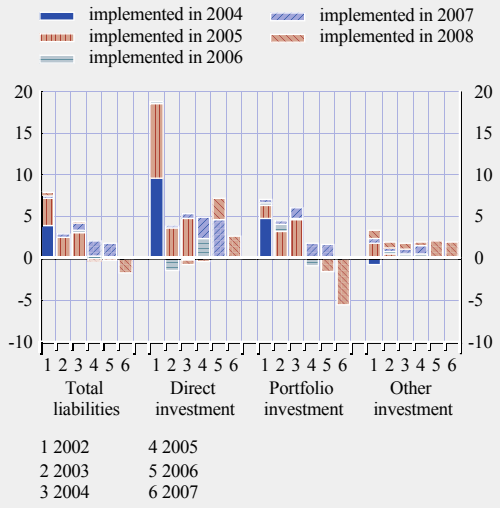
(as percentage of i.i.p.)



Source: ECB.
Note: From 2004, the first assessment is based on quarterly i.i.p.

Chart 7 Revisions to the first estimates of the euro area i.i.p. – liabilities by reference period

(as percentage of i.i.p.)

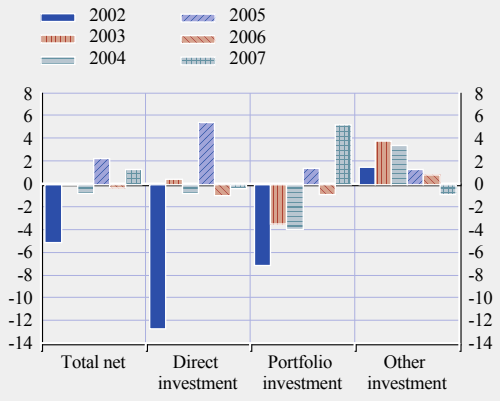


Source: ECB.
Note: from 2004, the first assestment is based on quarterly i.i.p.

Most of the revisions have been upward revisions. Chart 8 shows that the overall revisions to the estimates for total assets and liabilities almost offset each other in the case of the 2003 and 2006 data. The revisions to the 2002 i.i.p. were much larger on the liabilities side, while the revisions to the 2005 and 2007 i.i.p. were larger on the assets side.

Chart 8 Total revisions to the first estimates of the end-year net euro area i.i.p. by reference period

(as percentage of average of i.i.p. assets and liabilities)



Source: ECB.
Note: From 2004, the first assessment is based on quarterly i.i.p.

In general, the revisions introduced in November 2008 still had an effect on the positions for all previous years. In the case of other investment assets and, to a lesser extent, other investment liabilities, the improvement in the coverage achieved by some Member States in 2007 and 2008 had a significant effect on positions dating back to 1999. In addition, the introduction of the security-by-security reporting system in some Member States, namely Germany and France, triggered a set of revisions in 2008, with a substantial impact on the 2006 and 2007 positions for portfolio investment.

3.2 CONSISTENCY (COHERENCE) AND COMPARABILITY OF THE STATISTICAL OUTPUT

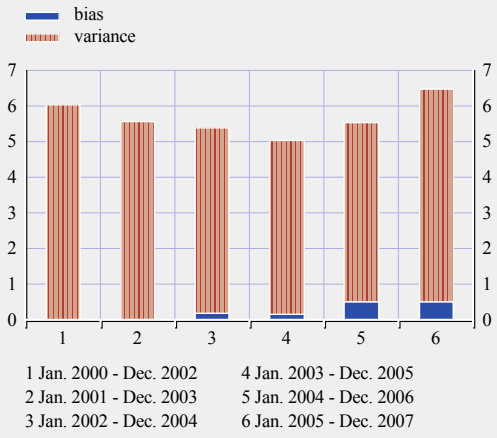
Consistency indicators deal with several aspects: (i) consistency over time; (ii) consistency within one dataset (internal consistency); (iii) consistency across datasets (external consistency); and (iv) consistency across frequencies. For the euro area b.o.p. and i.i.p., internal consistency, as revealed by the item on net errors and omissions, and external consistency, as revealed by discrepancies vis-à-vis other statistics such as foreign trade statistics and external MFI balance sheets, are crucial. Furthermore, consistency also covers 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 single transaction by both parties involved. Since 2007, the ECB has published the reconciliation between the b.o.p. and i.i.p. statistics. The change in the annual positions (i.i.p.) that is not explained by transactions (b.o.p.) is broken down by type of adjustment: price changes, exchange rate changes and other adjustments. A box included in the 2007 annual quality report has explained the reconciliation between the financial transactions included in the b.o.p. and the stocks reflected in the i.i.p.

3.2.1 Internal consistency

Net errors and omissions constitute the overall balancing item of the b.o.p., and thus provide an indicator of its internal (in)consistency. In

Chart 9 RMSE of net errors and omissions as percentage of gross flows in the euro area current account

(RMSE)



Source: ECB.

Chart 10 12-month cummulated euro area net errors and omissions

(EUR billions)

Source: ECB.

fact, the principle of double-entry book-keeping implies that the sum of all transactions with the rest of the world should be equal to zero. A large or persistent residual may hinder data analysis and interpretation.

The root mean square error (RMSE) indicator was calculated from the time series on net errors and omissions as a percentage of the gross flows in the euro area current account. This indicator is also used to identify a potential bias (as positive and negative errors and omissions should normally cancel each other out).

In the period from January 2005 to December 2007, the RMSE of the net errors and omissions amounted to 6.5% of the average gross current account flows. Compared with previous year's quality report, the net errors and omissions showed an increasing variance component, while the bias remained stable and not significant. Chart 9 shows that the internal consistency of the b.o.p. has deteriorated since January 2003.

Chart 10 shows how the size, in absolute terms, of the 12-month cumulated euro area net errors and omissions has increased continuously since mid-2003, with only a short interruption from mid-2005 to mid-2006 and some signs of a reversal of this trend since end-2006. The ECB and the euro area NCBs have stepped up their efforts to correct this persistent bias (see Box).

Box

ENHANCING THE INTERNAL CONSISTENCY OF THE EURO AREA BALANCE OF PAYMENTS

In December 2007, the ESCB's Statistics Committee (STC) mandated a workshop to enhance the internal consistency of the euro area balance of payments (b.o.p.). With that initiative, the STC addressed the cumulating negative net errors and omissions observed in the euro area b.o.p. since mid 2003, which had reached -€143 billion in 2007.

The diagnosis emanating from this workshop was that intra-euro area asymmetries are closely related to the high net errors and omissions in the euro area b.o.p. As the sum of national net errors and omissions is low, the large net errors and omissions in the euro area b.o.p. are largely a result of an asymmetric recording of transactions by Member States, as well as of differences in coverage, valuation methods and geographical allocation.

A further analysis of the data revealed that the main causes for the large net errors and omissions were intra-euro area asymmetries in direct investment and in other investment. With regard to direct investment, a lack of coverage in some countries and imprecise geographical allocations are the two main issues. The allocation of special-purpose entities (SPEs) appears to be the greatest challenge because of complex group structures and difficulties connected to obtaining data from these entities. As to other investment, most asymmetries were detected in loans between non-MFIs. As a response to the asymmetries in direct investment and other investment, the need for a regular exchange of data among euro area b.o.p. compilers was stressed. This data exchange will now be stepped up, exclusively for statistical purposes.

Workshop participants also stressed the need to harmonise data collection systems, in particular regarding the geographical dimension. Common principles for performing geographical allocations are crucial for reaching consistent results at the euro area level. This concerns, for instance, the strict application of the so-called debtor/creditor principle in the financial account.

As a result of some agreed actions, it is expected that the asymmetries and the net errors and omissions of the euro area b.o.p. will gradually decrease.

3.2.2 External consistency

With regard to the external consistency of the euro area data with the data released by its main counterparts, the asymmetries between the current account balances of the euro area and the United Kingdom mainly relate to services exports from the euro area to the United Kingdom (see Table 9 in Annex 3). The euro area data show much higher exports of services to the United Kingdom than those recorded in the United Kingdom as imports from the euro area. The relative difference has increased, reaching 49% in 2007. With respect to imports of services, the euro area figures are also higher than those recorded by the United Kingdom as exports to the euro area, but the discrepancies are significantly lower than in the case of exports. Asymmetries in goods do not show a regular pattern, and have increased in comparison with last year's report. While the current account asymmetries in 2006 were due to the euro area's imports of goods from the United Kingdom, the main contribution in 2007 came from the exports side.

The current account balances of the euro area and the United States showed less sizeable asymmetries for 2005 and 2006 (see Table 10 in Annex 3). The revisions published by the ECB and the US Bureau of Economic Analysis (BEA) in 2008 have improved the consistency for 2005 and 2006, while the gap between the two data sets for 2007 may be reduced after integrating all results for income on direct investment. The main discrepancies are in income and have increased over time. On the other hand, the asymmetries for the balances of goods and services have decreased over the last three years.

The current account balances of the euro area and Japan show asymmetries that have gradually decreased over time, but diminished rapidly in 2007, due to decreasing differences in the income balance. Estimates for services flows are now the main source for the differences (see Table 11 in Annex 3).

Table 1 Euro area goods in b.o.p. and in external trade statistics

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

	Period	Exports	Imports
Average of absolute differences	1999-2001	0.75	1.01
	2000-2002	0.63	0.75
	2001-2003	0.74	0.69
	2002-2004	0.87	0.72
	2003-2005	0.94	0.75
	2004-2006	0.73	0.69
	2005-2007	0.56	0.63
Average of differences	1999-2001	0.13	0.12
	2000-2002	0.04	0.03
	2001-2003	0.08	0.03
	2002-2004	0.00	-0.05
	2003-2005	0.02	0.01
	2004-2006	-0.04	-0.08
	2005-2007	-0.03	-0.07

Source: ECB.

The b.o.p. series have also been compared with the corresponding data published by Eurostat for euro area external trade in goods, and with the external transactions derived from the MFI balance sheet statistics. Although the methodologies of those series are not fully consistent with that of the euro area b.o.p., they broadly reflect the same economic phenomena. Therefore, the differences should be fairly stable over time.

Table 1 contains the results for the average of the absolute differences between the growth rates of both series of export and import data. The indicators show that in recent periods, this discrepancy has gradually decreased, more rapidly for exports than for imports. The ordinary averages of the differences reveal no systematic divergence in the growth rates of both series.

In Table 2, the RMSRE reflects the distance between comparable b.o.p. and monetary statistics, in relation to the volatility of the b.o.p. series concerned. This indicator, which had improved between 2001 and 2003 and between 2005 and 2007, however, also shows a large increase in the bias component in recent periods. This bias mainly reflects the different recording, by some NCBs, of short-selling transactions in b.o.p statistics, on the one hand, and monetary statistics, on the other. In recent years, these transactions have become quite sizeable. The clarification and solution of this issue is being investigated by all compilers involved.

Table 2 Euro area deposits/loans of MFIs (excluding the Eurosystem) – comparison with corresponding net transactions from monetary statistics

Period	RMSRE	Bias component (%)	Regression component (%)	Unsystematic component (%)
1999-2001	15.5	3.1	0.6	96.3
2000-2002	9.0	0.5	1.4	98.1
2001-2003	9.3	0.1	0.4	99.5
2002-2004	8.8	3.2	1.5	95.3
2003-2005	7.8	2.3	1.0	96.8
2004-2006	8.3	13.4	0.6	86.0
2005-2007	7.4	10.3	0.4	89.2

Source: ECB.

3.3 TIMELINESS (AND PUNCTUALITY) OF THE STATISTICAL OUTPUT

The euro area b.o.p. statistics are published on a monthly basis. Additional breakdowns by sector, instrument and geographical counterpart are available on a quarterly basis.

The euro area i.i.p. statistics are published quarterly. Additional FDI details and breakdowns by geographical counterpart have an annual frequency.

Together with the monthly release of the non-seasonally adjusted b.o.p. data, the ECB publishes seasonally and working day-adjusted data for the b.o.p. current account items. These data facilitate the interpretation of the latest developments by removing the seasonal pattern as well as variations due to working day and holiday effects. A note on the methodology used for the seasonal adjustment of the euro area b.o.p. can be found on the ECB's website.[24]

In 2008, the ECB fully complied with its advance release calendar. Monthly data were published seven weeks after the end of the respective month, thereby also enabling an assessment of the quarterly and annual flows within two months (e.g. the first assessment for the full year 2007 was published on 21 February 2008).[25] Quarterly b.o.p details, as well as the quarterly i.i.p., were published three-and-a-half months after the end of the reference quarter.[26] The annual i.i.p. with further details was released 11 months after the end of the reference year. Moreover, a shortening of the publication process of euro area monthly b.o.p. is envisaged for 2009.

3.4 ACCESSIBILITY AND CLARITY OF THE STATISTICAL OUTPUT

The press releases of the euro area b.o.p. and i.i.p. data – in total, 17 per annum – are published through wire services and on the ECB's website in accordance with the advance release calendar. The most recent data and longer time series with current or historical composition of the euro area and the corresponding metadata are also available in the ECB's Statistical Data Warehouse (SDW)[27] and in CSV files.

The data are also contained in the issue of the ECB's Monthly Bulletin that is published after the press release. Starting with the February 2008 issue, Chapter 7, dedicated to External Statistics, has been restructured in order to present transactions and positions in the same table, also showing growth rates.

The ECB has a specific e-mail address for external users of statistics, namely statistics@ecb.europa.eu, which serves to provide assistance to users in accessing and understanding the data.

24 http://www.ecb.europa.eu/stats/pdf/sa_procedures.pdf.
25 The benchmark in the SDDS is three months.
26 For example, the end-2007 i.i.p. was published in April 2008. The benchmark in the SDDS is nine months.
27 http://sdw.ecb.europa.eu.

ANNEXES

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 some quality work at the European level 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: $R = X_k - X_1$.

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 ($\bar{R}$) 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 ($|\bar{R}|$) 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 $\Delta x_{t_k} = x_{t_k} - x_{(t-1)_k}$.

Contingency table for directional reliability

	$\Delta x_{t_1} > 0$	$\Delta x_{t_1} \leq 0$	Subtotal
$\Delta x_{t_k} > 0$	n_{11}	n_{12}	$n_{11} + n_{12}$
$\Delta x_{t_k} \leq 0$	n_{21}	n_{22}	$n_{21} + n_{22}$
Subtotal	$n_{11} + n_{21}$	$n_{12} + n_{22}$	N

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.

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 $\left(\frac{R}{X}\right)$. If the average over time $\overline{\left(\frac{R}{X}\right)}$ 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 sign cancel out in the resulting indicator. So, if the average is calculated with the absolute values, we get $\overline{\left|\frac{R}{X}\right|}$, 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.

1.2.2.1 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 $\frac{R}{P}$, 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 $\overline{\left|\frac{R}{P}\right|}$.

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]

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

For the b.o.p balancing 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.

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

There are several ways of calculating the volatility of X, using the standard deviation, the average distance from the mean or the median

3 Before 2003, this is done with annual data.

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):

$$RMSRE = \sqrt{\frac{\overline{R^2}}{S^2}}$$

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:

$$RMSRE^2 = \left[\frac{\overline{X}_k - \overline{X}_1}{S_{X_k}}\right]^2 + \left[r_{X_k X_1} - \frac{S_{X_1}}{S_{X_k}}\right]^2 + \left[1 - (r_{X_k X_1})^2\right]$$

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 balancing items in the financial account.[8]

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

	Debits	Credits	Net
Current account items	MAPE	MAPE	RMSRE
	Assets	**Liabilities**	**Balance**
Financial account items	MACE	MACE	RMSRE

4 For more detailed information, refer to Annex 1 of the "Euro area balance of payments and international investment statistics annual quality report", ECB, January 2005, or to 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, and to "Quantitative quality indicators for statistics – and application to euro area balance of payments", ECB, Occasional Paper No 54, November 2006.

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.

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 (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.

Besides, the number of positive *EO* divided by the number of observations N 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

2.2.1.1 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 $\left(\overline{|P|}\right)$, 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.

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 external consistency then becomes:

$$G = \overline{|G_x - G_y|}$$

2.2.1.2 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.

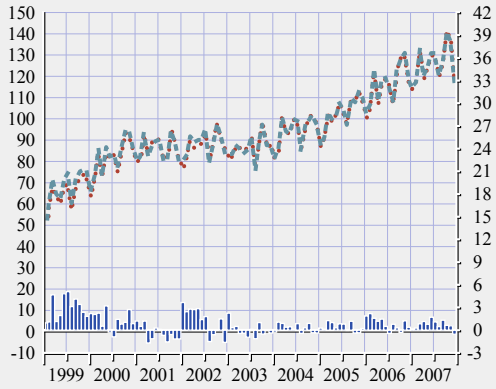
2 RESULTS OF STABILITY INDICATORS

Chart 1 Euro area goods

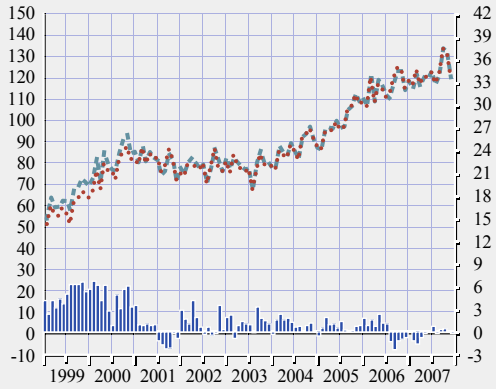
(EUR billions)

revision (right-hand scale)
first assessment (left-hand scale)
final assessment (left-hand scale)

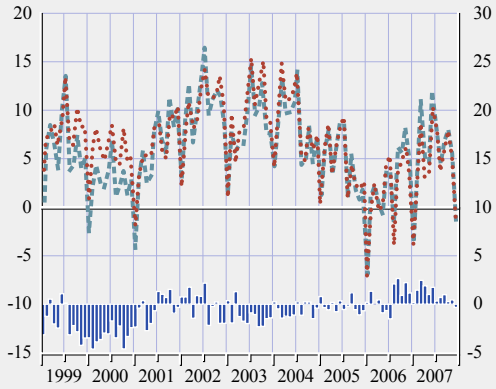
a) credits



b) debits



c) net



Source: ECB.

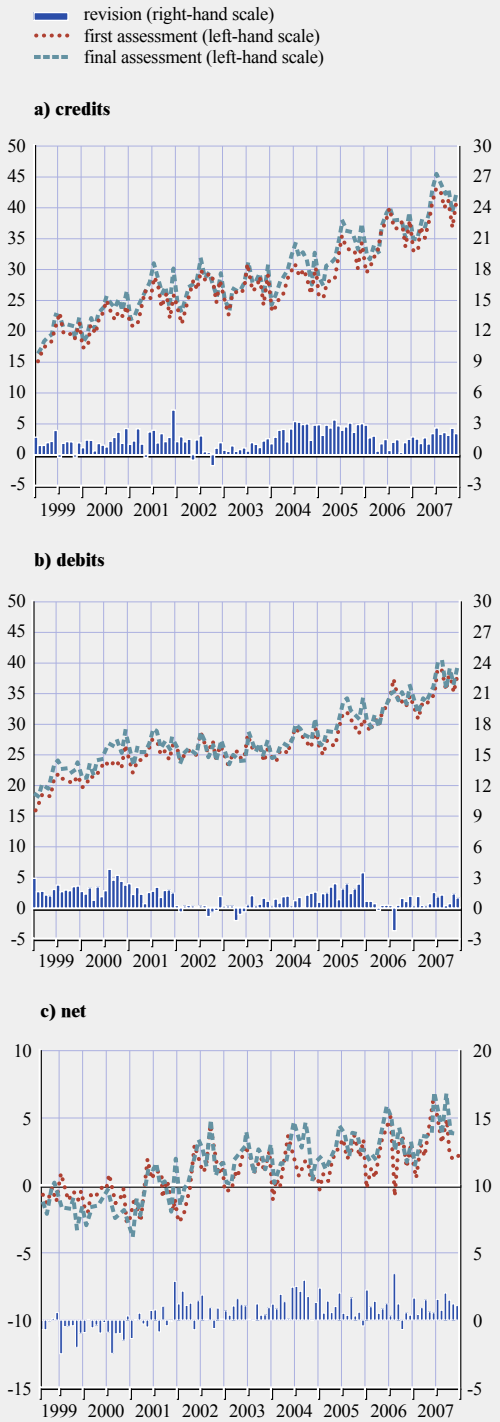
Table 1 Stability indicators for the euro area goods

Quality indicator	Reference period Jan.-Dec.	Goods		
		Credits	Debits	Net
$\overline{R}$ (EUR billions)	1999 - 2001	1.27	3.14	-1.87
	2000 - 2002	0.74	1.98	-1.23
	2001 - 2003	0.31	0.86	-0.55
	2002 - 2004	0.54	1.19	-0.65
	2003 - 2005	0.25	0.96	-0.71
	2004 - 2006	0.54	0.62	-0.08
	2005 - 2007	0.68	0.23	0.45
$\lvert\overline{R}\rvert$ (EUR billions)	1999 - 2001	1.78	3.60	2.23
	2000 - 2002	1.46	2.50	1.92
	2001 - 2003	1.17	1.43	1.32
	2002 - 2004	1.04	1.31	1.18
	2003 - 2005	0.59	1.06	0.96
	2004 - 2006	0.70	1.04	0.84
	2005 - 2007	0.79	0.86	0.91
MAPE/ RMSRE (%)	1999 - 2001	2.46	5.45	0.77
	2000 - 2002	1.76	3.30	0.53
	2001 - 2003	1.38	1.83	0.41
	2002 - 2004	1.21	1.67	0.46
	2003 - 2005	0.64	1.27	0.34
	2004 - 2006	0.67	1.05	0.27
	2005 - 2007	0.69	0.78	0.30
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	97.14	91.43
	2003 - 2005	97.14	100.00	97.14
	2004 - 2006	97.14	97.14	88.57
	2005 - 2007	97.14	97.14	88.57

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

Chart 2 Euro area services

(EUR billions)



Source: ECB.

Table 2 Stability indicators for the euro area services

Quality indicator	Reference period Jan.-Dec.	Services		
		Credits	Debits	Net
$\overline{R}$ (EUR billions)	1999 - 2001	1.37	1.82	-0.45
	2000 - 2002	1.28	1.22	0.06
	2001 - 2003	1.11	0.54	0.57
	2002 - 2004	1.31	0.28	1.02
	2003 - 2005	1.95	0.89	1.06
	2004 - 2006	2.11	0.96	1.15
	2005 - 2007	1.96	0.94	1.02
$\overline{R}$ (EUR billions)	1999 - 2001	1.39	1.82	0.83
	2000 - 2002	1.37	1.33	0.89
	2001 - 2003	1.20	0.80	0.85
	2002 - 2004	1.39	0.56	1.10
	2003 - 2005	1.95	1.06	1.08
	2004 - 2006	2.11	1.10	1.22
	2005 - 2007	1.96	1.07	1.08
MAPE/ RMSRE (%)	1999 - 2001	6.42	8.26	0.86
	2000 - 2002	5.75	5.55	0.63
	2001 - 2003	4.75	3.19	0.64
	2002 - 2004	5.12	2.14	0.91
	2003 - 2005	6.75	3.82	1.10
	2004 - 2006	7.03	3.76	1.27
	2005 - 2007	5.87	3.42	1.07
Q (%)	1999 - 2001	88.57	82.86	80.00
	2000 - 2002	91.43	88.57	77.14
	2001 - 2003	88.57	91.43	77.14
	2002 - 2004	94.29	91.43	74.29
	2003 - 2005	94.29	88.57	65.71
	2004 - 2006	88.57	94.29	68.57
	2005 - 2007	85.71	97.14	80.00

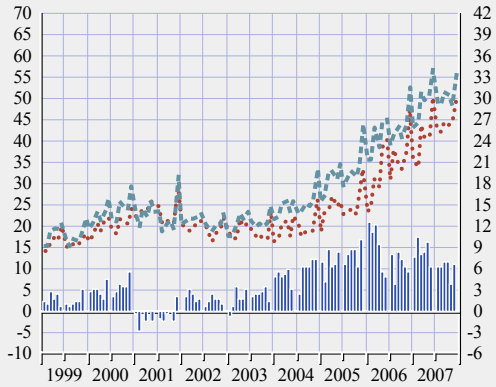
Source: ECB.
Note: The MAPE is used for credits and debits and the RMSRE for net data.

Chart 3 Euro area income

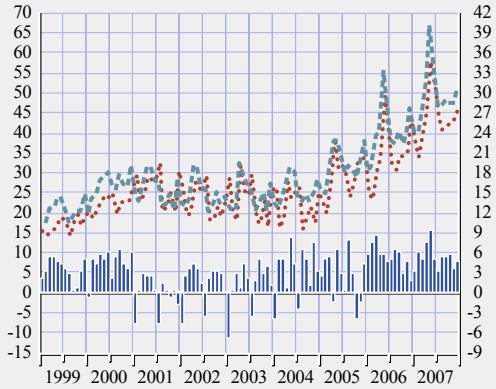
(EUR billions)

revision (right-hand scale)
first assessment (left-hand scale)
final assessment (left-hand scale)

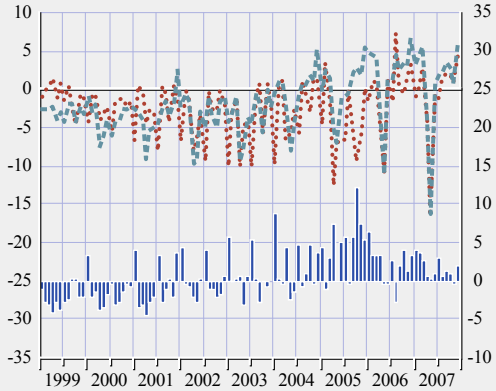
a) credits



b) debits



c) net



Source: ECB.

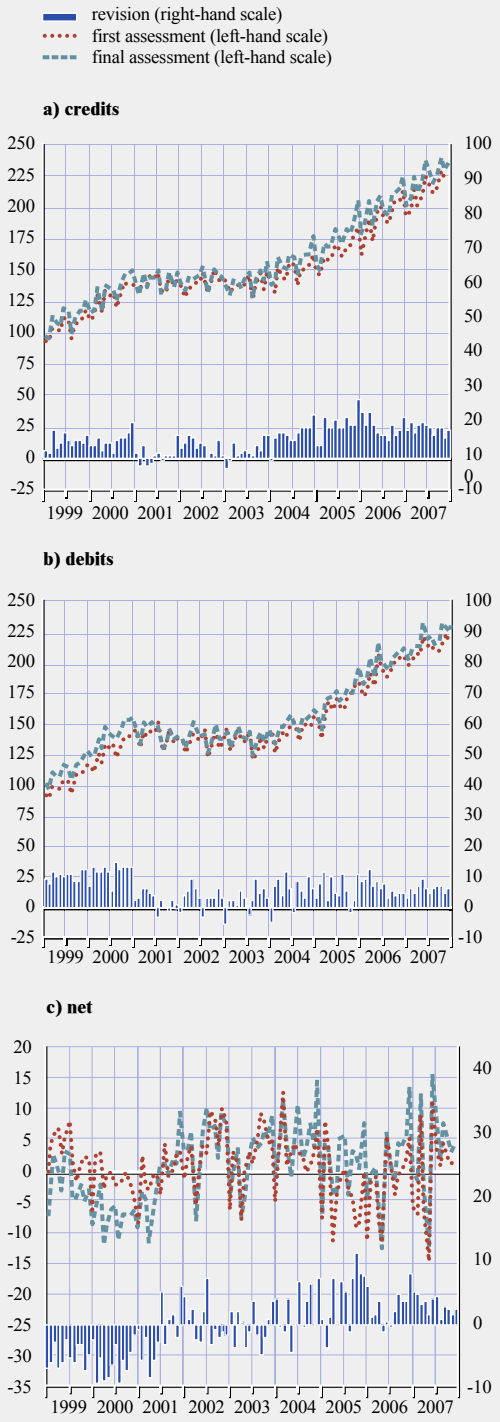
Table 3 Stability indicators for the euro area income

Quality indicator	Reference period Jan.-Dec.	Income		
		Credits	Debits	Net
$\overline{R}$ (EUR billions)	1999 - 2001	1.32	2.71	-1.40
	2000 - 2002	1.36	2.08	-0.73
	2001 - 2003	0.95	1.01	-0.06
	2002 - 2004	2.99	2.15	0.84
	2003 - 2005	4.92	2.50	2.42
	2004 - 2006	6.90	3.90	2.99
	2005 - 2007	7.50	4.58	2.92
$\lvert\overline{R}\rvert$ (EUR billions)	1999 - 2001	1.91	3.36	2.29
	2000 - 2002	1.95	3.18	2.12
	2001 - 2003	1.60	2.65	2.01
	2002 - 2004	3.04	3.53	2.05
	2003 - 2005	4.98	3.79	3.11
	2004 - 2006	6.90	4.62	3.53
	2005 - 2007	7.50	4.93	3.18
MAPE/ RMSRE (%)	1999 - 2001	9.72	16.22	1.46
	2000 - 2002	9.52	13.56	1.10
	2001 - 2003	8.13	11.30	1.02
	2002 - 2004	16.01	16.54	0.95
	2003 - 2005	23.23	16.82	1.31
	2004 - 2006	27.90	17.97	1.35
	2005 - 2007	24.29	14.63	1.11
Q (%)	1999 - 2001	80.00	77.14	71.43
	2000 - 2002	80.00	80.00	74.29
	2001 - 2003	80.00	80.00	80.00
	2002 - 2004	88.57	65.71	74.29
	2003 - 2005	94.29	57.14	62.86
	2004 - 2006	91.43	65.71	57.14
	2005 - 2007	88.57	77.14	71.43

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

Chart 4 Euro area current account

(EUR billions)



Source: ECB.

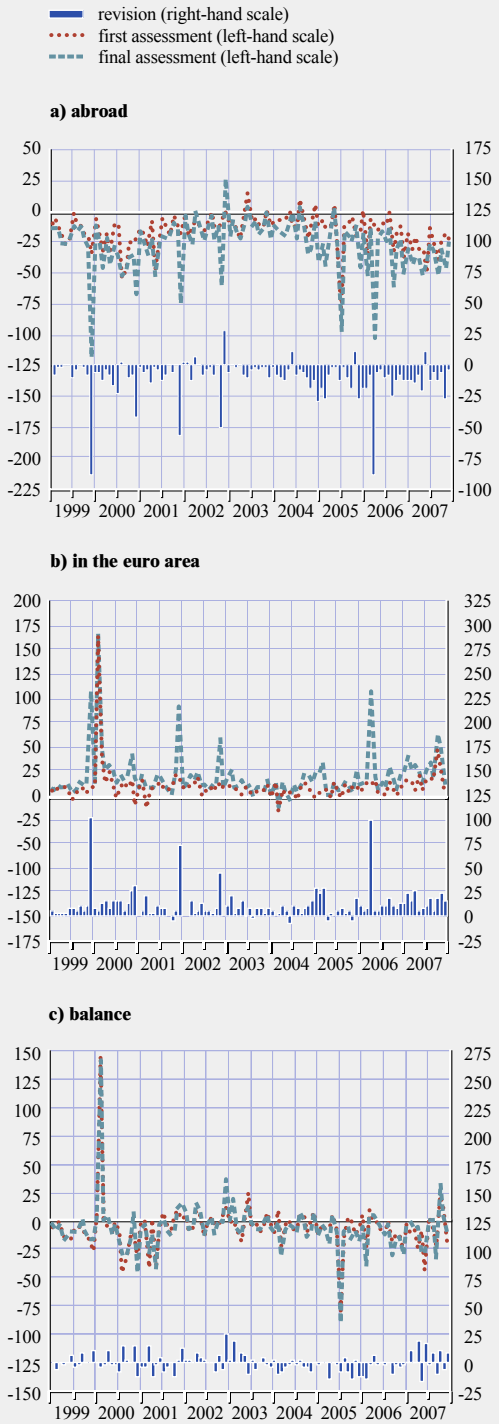
Table 4 Stability indicators for the euro area current account

Quality indicator	Reference period Jan.-Dec.	Current account		
		Credits	Debits	Net
$\overline{R}$ (EUR billions)	1999 - 2001	4.26	8.43	-4.18
	2000 - 2002	3.76	6.12	-2.36
	2001 - 2003	2.72	3.14	-0.42
	2002 - 2004	5.01	4.19	0.82
	2003 - 2005	7.23	5.03	2.19
	2004 - 2006	9.68	6.40	3.28
	2005 - 2007	10.22	6.61	3.61
$\lvert\overline{R}\rvert$ (EUR billions)	1999 - 2001	4.57	8.62	4.97
	2000 - 2002	4.08	6.53	4.15
	2001 - 2003	3.22	3.93	2.97
	2002 - 2004	5.22	5.11	2.84
	2003 - 2005	7.43	5.78	3.71
	2004 - 2006	9.70	6.76	3.94
	2005 - 2007	10.22	6.67	3.94
MAPE/ RMSRE (%)	1999 - 2001	3.78	7.32	1.17
	2000 - 2002	3.03	4.92	0.74
	2001 - 2003	2.30	2.87	0.62
	2002 - 2004	3.61	3.69	0.70
	2003 - 2005	4.77	3.90	0.95
	2004 - 2006	5.76	4.10	0.89
	2005 - 2007	5.46	3.54	0.80
Q (%)	1999 - 2001	85.71	85.71	68.57
	2000 - 2002	85.71	85.71	68.57
	2001 - 2003	88.57	94.29	68.57
	2002 - 2004	91.43	85.71	65.71
	2003 - 2005	91.43	74.29	68.57
	2004 - 2006	94.29	71.43	77.14
	2005 - 2007	97.14	80.00	88.57

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

Chart 5 Direct investment

(EUR billions)



Source: ECB.

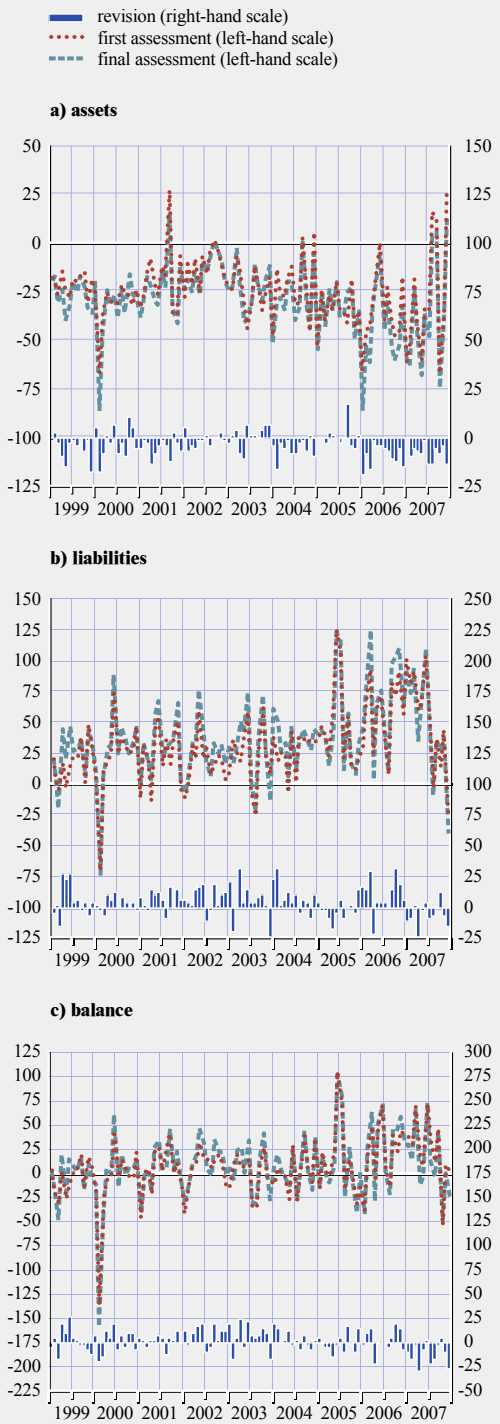
Table 5 Stability indicators for the euro area direct investment

Quality indicator	Reference period Jan.-Dec.	Direct investment		
		Abroad	euro area	Net
$\overline{R}$ (EUR billions)	1999 - 2001	-11.52	11.51	-0.01
	2000 - 2002	-9.16	9.84	0.68
	2001 - 2003	-6.70	7.56	0.86
	2002 - 2004	-5.74	5.91	0.17
	2003 - 2005	-8.66	6.28	-2.37
	2004 - 2006	-13.64	9.42	-4.22
	2005 - 2007	-14.75	12.54	-2.21
$\overline{R}$ (EUR billions)	1999 - 2001	11.63	11.95	5.73
	2000 - 2002	11.37	10.42	6.34
	2001 - 2003	8.84	8.38	5.86
	2002 - 2004	8.48	6.80	4.95
	2003 - 2005	9.77	7.74	5.11
	2004 - 2006	14.75	10.64	5.19
	2005 - 2007	15.78	13.25	6.90
MACE/ RMSRE (%)	1999 - 2001	0.70	0.93	0.58
	2000 - 2002	0.59	0.66	0.54
	2001 - 2003	0.43	0.46	0.70
	2002 - 2004	0.40	0.34	0.61
	2003 - 2005	0.40	0.35	0.71
	2004 - 2006	0.55	0.44	0.63
	2005 - 2007	0.53	0.50	0.66
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
	2003 - 2005	80.00	57.14	82.86
	2004 - 2006	77.14	74.29	82.86
	2005 - 2007	77.14	77.14	71.43

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

Chart 6 Euro area portfolio investment

(EUR billions)



Source: ECB.

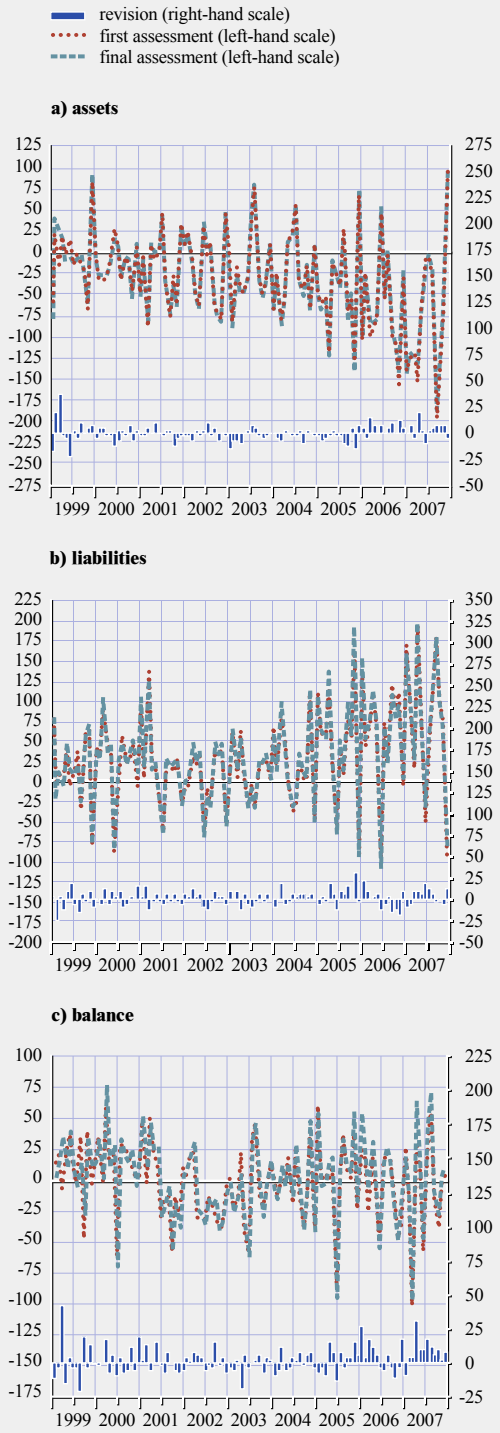
Table 6 Stability indicators for the euro area portfolio investment

Quality indicator	Reference period Jan.-Dec.	Porfolio investment		
		Assets	Liabilities	Balance
$\overline{R}$ (EUR billions)	1999 - 2001	-4.50	5.57	1.08
	2000 - 2002	-3.28	6.10	2.83
	2001 - 2003	-2.27	6.64	4.38
	2002 - 2004	-2.37	7.23	4.86
	2003 - 2005	-1.73	4.10	2.37
	2004 - 2006	-5.07	5.99	0.92
	2005 - 2007	-5.78	1.65	-4.12
$\lvert\overline{R}\rvert$ (EUR billions)	1999 - 2001	6.18	8.12	8.04
	2000 - 2002	5.29	7.99	8.18
	2001 - 2003	4.44	10.25	8.89
	2002 - 2004	4.45	11.00	9.54
	2003 - 2005	4.46	9.64	8.91
	2004 - 2006	6.23	10.41	7.60
	2005 - 2007	6.87	9.49	9.91
MACE/ RMSRE (%)	1999 - 2001	0.27	0.26	0.42
	2000 - 2002	0.22	0.24	0.41
	2001 - 2003	0.18	0.30	0.49
	2002 - 2004	0.17	0.31	0.53
	2003 - 2005	0.15	0.25	0.44
	2004 - 2006	0.17	0.22	0.32
	2005 - 2007	0.16	0.17	0.37
Q (%)	1999 - 2001	74.29	94.29	85.71
	2000 - 2002	88.57	85.71	82.86
	2001 - 2003	91.43	74.29	77.14
	2002 - 2004	88.57	68.57	80.00
	2003 - 2005	82.86	77.14	88.57
	2004 - 2006	85.71	85.71	100.00
	2005 - 2007	85.71	97.14	97.14

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

Chart 7 Euro area other investment

(EUR billions)



Source: ECB.

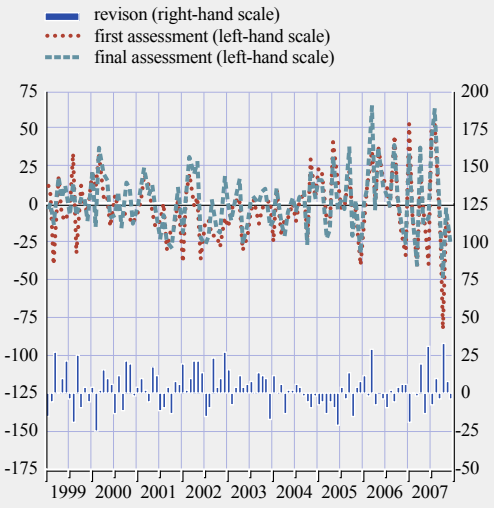
Table 7 Stability indicators for the euro area other investment

Quality indicator	Reference period Jan.-Dec.	Other investment		
		Assets	Liabilities	Balance
$\overline{R}$ (EUR billions)	1999 - 2001	0.30	1.29	1.58
	2000 - 2002	-0.66	2.40	1.73
	2001 - 2003	-1.27	1.87	0.59
	2002 - 2004	-1.80	2.56	0.76
	2003 - 2005	-2.92	3.82	0.90
	2004 - 2006	-0.15	3.30	3.14
	2005 - 2007	1.68	3.99	5.68
$\lvert\overline{R}\rvert$ (EUR billions)	1999 - 2001	6.64	7.64	8.62
	2000 - 2002	4.09	6.46	6.47
	2001 - 2003	4.29	6.12	5.40
	2002 - 2004	4.02	6.39	5.30
	2003 - 2005	4.82	7.43	6.34
	2004 - 2006	5.13	8.59	7.99
	2005 - 2007	6.45	9.37	9.59
MACE/ RMSRE (%)	1999 - 2001	0.29	0.30	0.42
	2000 - 2002	0.16	0.22	0.26
	2001 - 2003	0.16	0.20	0.26
	2002 - 2004	0.14	0.21	0.27
	2003 - 2005	0.15	0.22	0.27
	2004 - 2006	0.14	0.22	0.34
	2005 - 2007	0.15	0.21	0.33
Q (%)	1999 - 2001	88.57	91.43	88.57
	2000 - 2002	94.29	91.43	82.86
	2001 - 2003	94.29	91.43	85.71
	2002 - 2004	97.14	94.29	88.57
	2003 - 2005	97.14	97.14	94.29
	2004 - 2006	100.00	100.00	94.29
	2005 - 2007	94.29	100.00	97.14

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

Chart 8 Total financial account – net

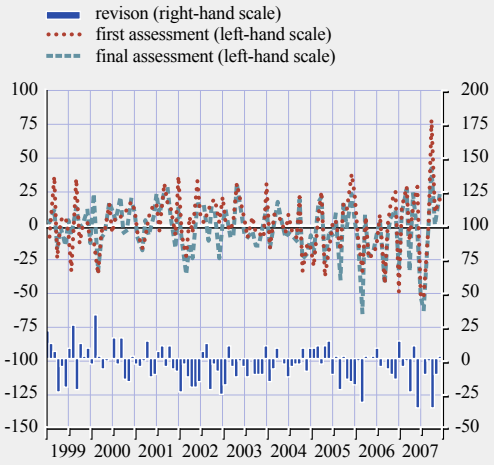
(EUR billions)



Source: ECB.

Chart 9 Euro area errors and omissions

(EUR billions)



Source: ECB.

Table 8 Stability indicators for the euro area errors and omissions and total financial accounts

Quality indicator	Reference period Jan.-Dec.	Errors and omissions	Total financial account
$\overline{R}$ (EUR billions)	1999 - 2001	1.26	2.97
	2000 - 2002	-3.24	5.72
	2001 - 2003	-5.81	6.36
	2002 - 2004	-6.63	5.80
	2003 - 2005	-3.00	0.82
	2004 - 2006	-3.27	0.09
	2005 - 2007	-4.80	1.37
$\lvert\overline{R}\rvert$ (EUR billions)	1999 - 2001	10.60	11.05
	2000 - 2002	10.77	12.01
	2001 - 2003	10.56	11.21
	2002 - 2004	10.04	10.04
	2003 - 2005	8.57	8.04
	2004 - 2006	8.40	7.27
	2005 - 2007	10.51	9.64
RMSRE (%)	2099 - 2001	1.05	
	2000 - 2002	0.84	
	2001 - 2003	0.82	
	2002 - 2004	0.83	
	2003 - 2005	0.63	
	2004 - 2006	0.57	
	2005 - 2007	0.55	
Q (%)	1999 - 2001	71.43	
	2000 - 2002	74.29	
	2001 - 2003	80.00	
	2002 - 2004	85.71	
	2003 - 2005	85.71	
	2004 - 2006	94.29	
	2005 - 2007	91.43	

Source: ECB.

3 EURO AREA CURRENT ACCOUNT TRANSACTIONS WITH MAIN PARTNERS

Table 9 Euro area current account transactions with the United Kingdom from 2005 to 2007

(EUR billions)

	2005		2006		2007		2005		2006		2007	
Item in EA b.o.p.	as recorded by the EA	as recorded by GB	as recorded by the EA	as recorded by GB	as recorded by the EA	as recorded by GB	difference	relative difference	difference	relative difference	difference	relative difference
Current account, balance	74.79	-42.66	82.27	-29.43	77.91	-41.29	32.12	55%	52.84	95%	36.62	61%
Current account, export to GB / import from EA	417.17	363.29	476.36	422.39	529.31	444.05	53.88	14%	53.97	12%	85.26	18%
Current account, import from GB / export to EA	342.38	320.63	394.09	392.96	451.40	402.76	21.76	7%	1.13	0%	48.65	11%
Goods, balance	53.13	-44.10	52.06	-29.85	63.55	-50.02	9.04	19%	22.21	54%	13.53	24%
Goods, export to GB / import from EA	208.81	203.12	224.18	227.26	236.43	215.52	5.69	3%	-3.08	1%	20.91	9%
Goods, import from GB / export to EA	155.67	159.02	172.12	197.41	172.88	165.50	-3.35	2%	-25.30	14%	7.39	4%
Services, balance	25.18	-2.16	25.79	-0.05	27.75	3.60	23.02	168%	25.74	199%	31.36	200%
Services, export to GB / import from EA	99.90	65.26	107.06	67.63	116.03	70.54	34.64	42%	39.43	45%	45.49	49%
Services, import from GB / export to EA	74.72	63.10	81.27	67.58	88.28	74.14	11.62	17%	13.69	18%	14.14	17%
Income, balance	-4.82	3.86	3.72	0.60	-16.53	5.05	-0.96	22%	4.32	200%	-11.48	106%
Income, receipts from GB / expenditure to EA	98.80	91.62	134.69	123.97	163.43	155.17	7.18	8%	10.72	8%	8.26	5%
Income, expenditure to GB / receipts from EA	103.63	95.48	130.97	124.57	179.96	160.22	8.15	8%	6.40	5%	19.74	12%
Current transfers, balance	1.29	-0.27	0.70	-0.14	3.14	0.07	1.02	131%	0.56	135%	3.22	200%
Current transfers, receipts from GB / expenditure to EA	9.66	3.30	10.44	3.54	13.42	2.82	6.36	98%	6.90	99%	10.60	131%
Current transfers, expenditure to GB / receipts from EA	8.37	3.03	9.74	3.40	10.28	2.89	5.34	94%	6.34	97%	7.39	112%

Sources: ECB and the Office for National Statistics of the United Kingdom.
Note: The relative differences are calculated as the absolute value of the difference divided by the average of the absolute values of both estimates.

Table 10 Euro area current and capital account transactions with the United States from 2005 to 2007

(EUR billions)

Item in EA b.o.p.	2005 as recorded by the EA	2005 as recorded by US	2006 as recorded by the EA	2006 as recorded by US	2007 as recorded by the EA	2007 as recorded by US	2005 difference	2005 relative difference	2006 difference	2006 relative difference	2007 difference	2007 relative difference
Current account, balance	51.93	-57.5	57.71	-53.23	54.99	-33.11	-5.57	10%	4.49	8%	21.88	50%
Goods, balance	66.86	-75.43	66.56	-74.20	59.85	-65.92	-8.57	12%	-7.64	11%	-6.08	10%
Goods, export to US / import from EA	180.55	184.63	198.56	196.56	194.96	196.16	-4.07	2%	2.01	1%	-1.21	1%
Goods, import from US / export to EA	113.69	109.20	132.01	122.36	135.11	130.24	4.49	4%	9.65	8%	4.87	4%
Services, balance	-7.36	6.31	-7.32	5.84	-9.62	10.33	-1.04	15%	-1.49	23%	0.70	7%
Services, export to US / import from EA	74.35	57.41	78.08	63.72	79.56	66.01	16.94	26%	14.36	20%	13.55	19%
Services, import from US / export to EA	81.71	63.72	85.40	69.55	89.18	76.34	17.98	25%	15.85	20%	12.84	16%
Income, balance	-5.96	17.59	-0.96	18.50	4.19	28.68	11.64	99%	17.54	180%	32.86	200%
Income, receipts from US / expenditure to EA	89.67	89.47	115.03	115.60	130.76	120.82	0.20	0%	-0.57	0%	9.94	8%
Income, expenditure to US / receipts from EA	95.62	107.06	115.99	134.10	126.58	149.49	-11.44	11%	-18.11	14%	-22.92	17%
Current transfers, balance	-1.62	-5.97	-0.56	-3.37	0.58	-6.19	-7.59	200%	-3.93	200%	-5.61	166%
Capital account, net	-0.13	-0.13	-1.89	-0.21	-0.47	-0.19	-0.26	200%	-2.09	200%	-0.65	200%

Sources: ECB and the US Bureau of Economic Analysis.
Note: The relative differences are calculated as the absolute value of the difference divided by the average of the absolute values of both estimates.

Table 11 Euro area current and capital account transactions with Japan from 2005 to 2007

(EUR billions)

Item in EA b.o.p.	2005 as recorded by the EA	2005 as recorded by JP	2006 as recorded by the EA	2006 as recorded by JP	2007 as recorded by the EA	2007 as recorded by JP	2005 difference	2005 relative difference	2006 difference	2006 relative difference	2007 difference	2007 relative difference
Current account, balance	-26.88	32.69	-34.27	38.49	-43.15	42.42	5.80	19%	4.22	12%	-0.73	2%
Goods, balance	-17.27	15.74	-20.13	17.75	-22.36	19.55	-1.53	9 %	-2.38	13%	-2.81	13%
Services, balance	3.61	-1.28	2.33	-0.32	2.88	0.17	2.33	95%	2.01	152%	3.05	200%
Income, balance	-13.69	18.63	-16.24	21.14	-23.60	22.91	4.93	31%	4.90	26%	-0.69	3%
Current transfers, balance	0.47	-0.39	-0.23	-0.08	-0.06	-0.21	0.08	18%	-0.31	200%	-0.27	200%
Capital account, balance	0.05	-0.23	0.38	-0.17	-0.07	-0.44	-0.17	123%	0.21	76%	-0.50	200%

Sources: ECB and the Ministry of Finance of Japan.
Note: The relative differences are calculated as the absolute value of the difference divided by the average of the absolute values of both estimates.