EUROPEAN CENTRAL BANK

EUROSYSTEM

EURO AREA BALANCE OF PAYMENTS AND INTERNATIONAL INVESTMENT POSITION STATISTICS

MARCH 2010

2009 QUALITY REPORT

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In 2010 all ECB publications feature a motif taken from the €500 banknote.

the R2 indicator that measures the smoothness of the series against its trend shows a preference for the indirect method; however, based only on the analysis of the last three years, the results provided by the two indicators of roughness are in favour of the direct approach.

4. Seasonal adjustment quality statistics

There is a group of 11 statistics used to judge the quality of the seasonal adjustment. A composite indicator is also set up as a linear combination of these 11 statistics.[3] These statistics measure different aspects of the estimation such as the relative contribution of the irregular component to the total variance, the relationship between the month-to-month changes in the irregular component and those in the trend cycle, the autocorrelation of the irregular component, the number of months needed for the variations in the trend cycle to surpass the changes in the irregular, moving seasonality or amount of the year-on-year change of the irregular as compared with the amount of the year-on-year change in the seasonal. The values of these indicators show that both direct and indirect estimations are considered to be of acceptable quality for exports and imports of goods. In particular, the weights of the irregular components are only slightly better on the direct estimations; therefore, this is not the case where the irregularities have a greater impact on the indirect approach and make the estimation of the seasonal patterns more difficult.

5. Analysis of seasonal factors and residual seasonality in the indirect adjusted series

The moving seasonality is not significant for any of the cases; therefore, the seasonal factors are quite stable during the period estimated. The largest differences in the seasonal factors were found for exports of goods, where January, February and December show more stable seasonal factors in those directly estimated, and October shows more stable indirectly estimated factors.

No residual seasonality effect remains in the indirect seasonally adjusted series for both exports and imports of goods, which also confirms the good quality of this seasonal adjustment. For exports of goods, however, the results for the indirect estimation indicate that a trading-day effect may still remain in the adjusted data, despite the working day-adjustment applied individually to each euro area country. This lack of quality is also observed in the higher correlation of the residual showed by the indirect estimation.

6. Analysis of stability

Country data normally describe defined variables more homogeneously than aggregated data that covers several countries. Hence, the stability of the set of conditions responsible for seasonal patterns is more likely, in principle, to be found at the level of the country data, so that indirect adjustment could generally be preferable.

The analysis of stability here refers to the size of revisions that occur when additional observations in the raw time series become available. This analysis considers that the rest of the variables in the model remained stable. The results for export of goods indicate a better performance of the direct method. For import of goods, the indirect method presents slightly smaller revisions.

3 See J. Lothian and M. Morry, "A set of quality control statistics for the X-11-Arima Seasonal Adjustment Method", 1978.

Conclusions

The two alternative approaches were evaluated in order to verify whether the initial choice of the direct adjustment method is still empirically supported for euro area exports and imports of goods. Given the non-uniform results of the quality measures obtained for the direct and indirect methods, there is no clear evidence of a superior performance of either of the two methods of estimation. Against that background, from a practical point of view, the direct approach is preferred, considering that it entails a lower operational risk.

The ECB follows a revision practice that is publicly available. The euro area b.o.p. and i.i.p. are revised in line 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 end of 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 proximity of these first assessments to the final assessments. 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. However, large or systematic revisions may signal weaknesses in the data collection or compilation systems that need to be resolved.

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 to reduce, the statistical reporting burden of economic agents.

Owing to methodological work on the financial account that was carried out by the STC, assisted by the Working Group on External Statistics,[23] new collection methods have been implemented by several Member States in recent years. This has also been the case in 2009. The new methods are designed to improve the methodological soundness and harmonisation of national contributions to the euro area aggregate in the medium term, in particular regarding the geographical dimension and the strict application of the so-called debtor/creditor principle in other investment within the financial account. However, there may also be a new source of revisions and temporal asymmetries. Furthermore, the International Accounting Standards (IASs) will

23 See the reports of the Task Force on Portfolio Investment Collection Systems, ECB, June 2002, and the Task Force on Portfolio Investment Income, ECB, August 2003 and the Task Force on Foreign Direct Investment, ECB, March 2004. See Box 2 for the outcome of the workshop to enhance the internal consistency of the euro area b.o.p. (2008-2009).

be also 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.

In addition, following the workshop to enhance the internal consistency of the euro area b.o.p. the compilation method for the euro area b.o.p. financial account for other sectors (namely households and corporations that are not monetary financial institutions) was modified as from November 2009.[24] This triggered sizeable revisions in portfolio investment liabilities and in other investment assets, as from January 2004.

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

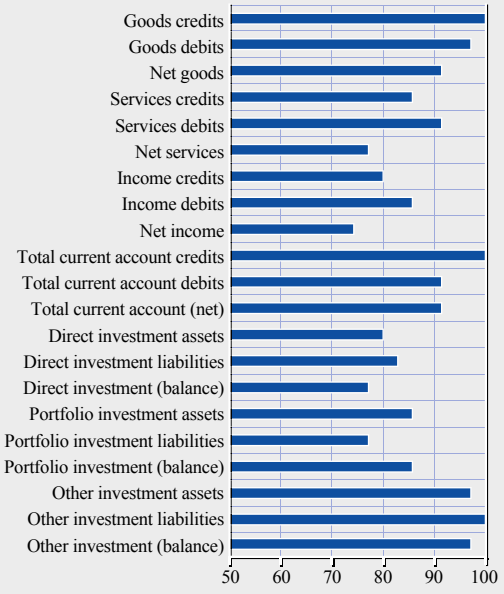
3.1.1 The directional reliability shows less weaknesses in the estimates of net income and the direct investment balance, while the situation has deteriorated for portfolio investment liabilities

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 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. for the period from 2006 to 2008.

Chart 1 shows the poorest result for the net income item in the euro area (74%), although the directional reliability has been constantly improved since 2004 (see indicator Q in Table 3 in Annex 2). The indicator also displays rather weak results for net services and the direct investment balance. The latter may also have been triggered by the net income item relating to reinvested earnings, which are based entirely on estimates in the first assessment of the data as the profit and loss results of companies usually become known a few months later.

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; 2006 - 2008)



Source: ECB.

The reliability of portfolio investment liabilities data, as can be derived from this indicator, has been visibly eroded since the publication of euro area revisions in November 2009. The revisions due to the introduction of new compilation systems in France and Italy, as well as the new compilation system for the euro area portfolio investment liabilities, are the main reasons for this deterioration.

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 the size of the respective flow. Chart 2 contains the results for five periods

24 The first publication took place in the annual press release published on 2 November 2009: ECB: Euro area international investment position and its geographical breakdown (as at end-2008).

of three years: 2002 - 2004, 2003 - 2005, 2004 - 2006, 2005 - 2007 and 2006 to 2008.

The relative magnitude of the revisions continues to be large for income, which is often underestimated in the first assessments. Nevertheless, a trend towards more stable income estimates, and also towards both services credits and debits, can be observed in the latest three-year periods.

The lower stability for income is due to (i) the difficulty to estimate the profits of the affiliates, i.e. the frequent correction of the first estimate of the reinvested earnings sub-item and (ii) the recent changes in the compilation system for portfolio investment. The initial assessments of income debits continued to be systematically lower, while the recent estimates of income credits have overestimated the final assessments. All in all, the stability of income credits and debits has improved in 2008. Furthermore, the initial assessments of services credits and debits continued to be systematically lower than the final assessments, but this bias has been reduced. As a result of these developments, the stability of the current account credits and debits has improved. (See Table 4 and Chart 4 in Annex 2). All in all, the relative magnitude of the revisions to the current account decreased by almost 200 percentage points for credits and by 65 percentage points for debits (see Chart 2).

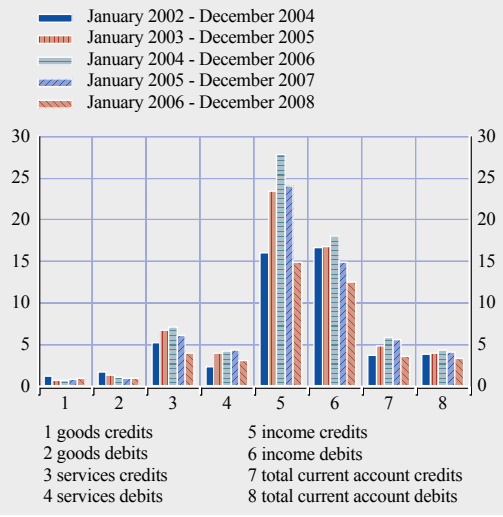
3.1.3 Reduced bias in the estimates of net services and suppression of the bias in net income is shown by the root mean square relative error

For both the net items of the current account and 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.[25]

25 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 2 Revisions to the euro area current account as a percentage of the respective flow

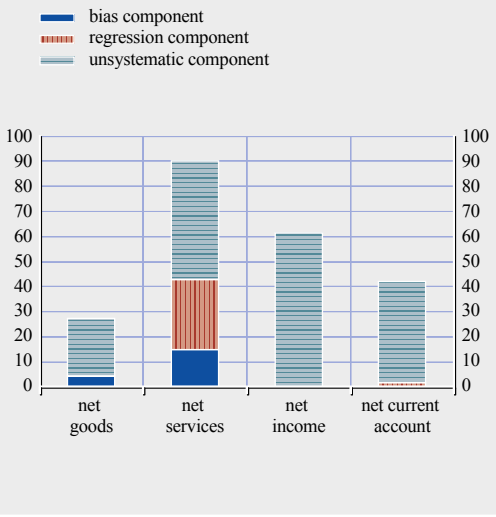
(MAPE)



Source: ECB.

Chart 3 Breakdown of the revisions to the euro area current account as a percentage of volatility in the period from 2006 to 2008

(RMSRE)



Source: ECB.

Chart 3 contains the results for the period from 2006 to 2008, and their further breakdown into a bias, a regression and an unsystematic component. The results for all periods are shown in the tables in the Annex 2. The revisions to the current account balance have decreased significantly in comparison with the previous period, mainly on account of smaller relative revisions to the net income items. Furthermore, the bias component of the revisions in the current account has disappeared. This was mainly due to the suppression of the bias in net income and the reduced bias component in the revision of net services.

The results of the breakdown by item show that the relative revisions to net goods have a small bias component. Furthermore, the bias component has decreased significantly for the net services (from 43% to 16% of the RMSRE value) and has been suppressed for the net income items (from 42% to 0% of the RMSRE value). The bias component in services is partly due to late availability of data from certain respondents. The reduced bias indicates that some Member States have already pre-adjusted the first estimates better. The suppression of the bias component in the net income revisions is due mainly to the unusual overestimation of the direct investment income credits for the 2008 first assessments, and to a more accurate first estimation of portfolio investment income. In turn, the regression component is only relevant for net services.

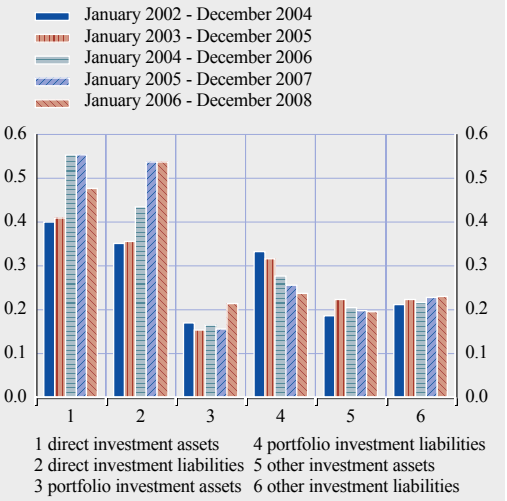
3.1.4 The mean absolute comparative error shows the highest revisions to the estimates of direct investment

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

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.

continue to be the highest, both abroad (assets) and in the euro area (liabilities), however, the stability of the estimates for direct investment abroad has improved in the last three-year period. The portfolio investment assets are the only item in the financial account for which relative revisions have increased in the last three-year period, as compared with previous periods, while the relative revisions to the estimates of portfolio investment liabilities seem to have continued to decrease from the first period considered in Chart 4 (2002 - 2004).

In spite of this trend towards more stable data, the revisions to data from 2004 included in November 2009 have triggered a level shift in the relative revisions; for example, while the average relative revisions for the period 2004 - 2006 were around 0.22% of the i.i.p. in the last quality report, the revisions for this period now represent 0.28%. This level shift in the relative revisions is also applicable to other investment assets: while the revisions for the period 2004 - 2006 were around 0.15% of the i.i.p. last year, they now represent 0.21%. The reason behind these level shifts in the revisions is

the new euro area compilation system applied to these two items: portfolio investment liabilities and other investment assets (see Box 2 for further information). The relative revisions to the estimates for the other investment liabilities have remained quite stable.

3.1.5 Increasing bias in the revisions to estimates of portfolio investment

The preliminary estimates of net direct investment show revisions in relation to their volatility that are similar to those in previous periods, but the bias component has decreased. The relative revisions to the estimates of net portfolio investment have largely increased in comparison with the results shown in last year's report. The bias component has become significantly different from zero for the period shown in Chart 5. Furthermore, the relative revisions to the other investment estimates have increased slightly, but the bias component has decreased and is no longer significantly different from zero.

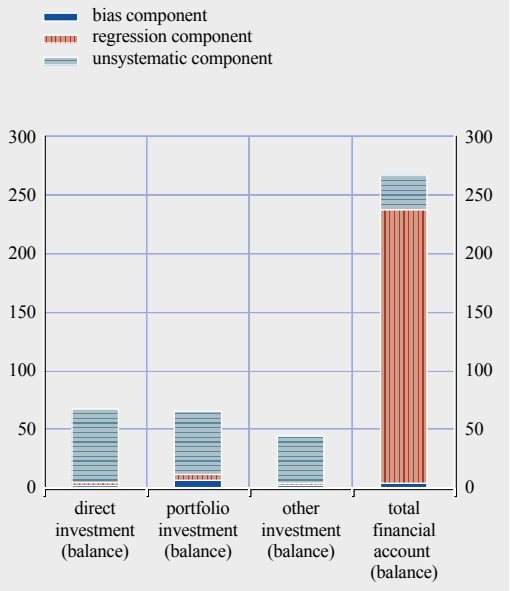
Consequently, the balancing item of the financial account as a whole shows a very large increase in the RMSRE value that is attributed mainly to the regression component. This deterioration is due to two simultaneous factors, namely (i) a moderate increase of revisions and (ii) a significant decrease in the volatility of the financial account series.

3.1.6 Stability of the international investment position

The revisions by vintages for main items of euro area i.i.p. assets and liabilities are shown in Charts 6 and 7 respectively. The main regular revisions implemented in 2009 refer to 2007 and 2008 data, and the relative revisions were smaller than the comparable revisions implemented in 2008. This holds true of direct investment both abroad and in the euro area, of portfolio investment assets and of other investment liabilities. The charts also show large relative revisions, as from 2004, in other investment assets and portfolio investment liabilities. These

Chart 5 Breakdown of the revisions to the euro area financial account as a percentage of volatility in the period from 2006 to 2008

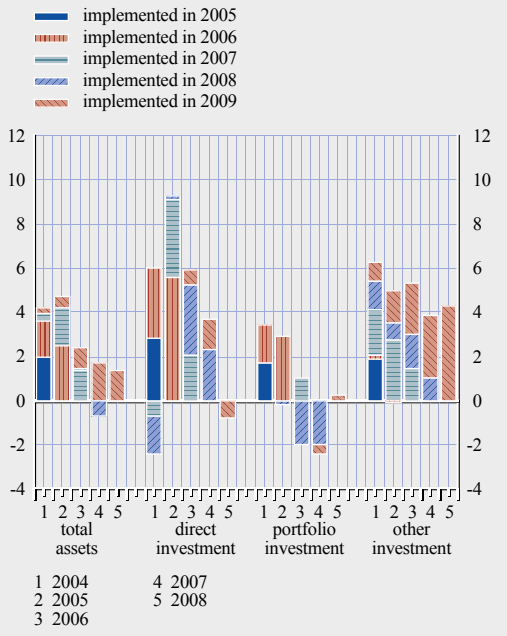
(RMSRE)



Source: ECB.

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

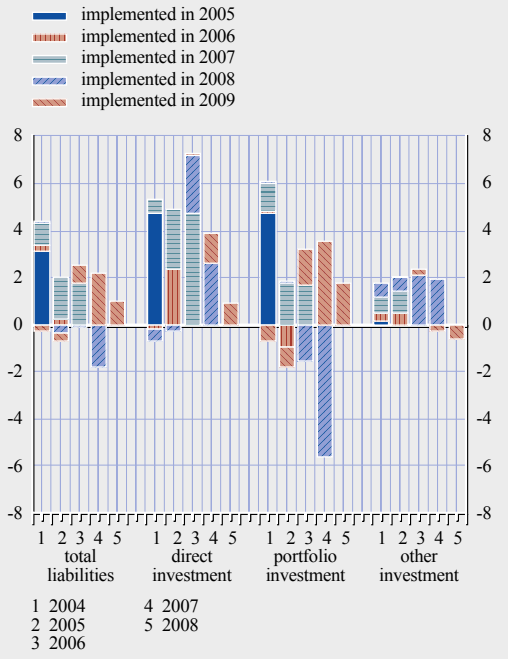
(as a percentage of the i.i.p.)



Source: ECB.
Note: The first assestment is based on the quarterly i.i.p.

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

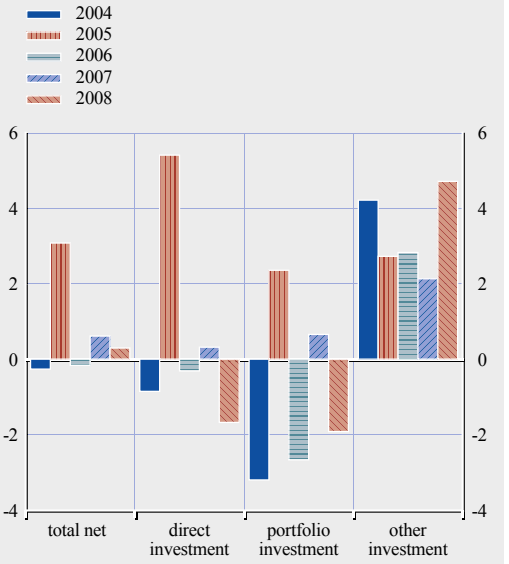
(as a percentage of the i.i.p.)



Source: ECB.
Note: The first assestment is based on the quarterly i.i.p.

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

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



Source: ECB.
Note: The first assestment is based on the quarterly i.i.p.

revisions are due to the new euro area compilation method, which results in a higher asset position in loans and deposits abroad, and in a lower liability position in equity securities (see Box 2).

The total relative revisions to the direct investment items have been reduced in the last few years; however, they are still usually upward revisions. In addition, at the balance level, most of those revisions were cancelled out, except those for 2005 and 2008 data (see Chart 8). The total relative revisions to the portfolio investment assets have likewise remained stable in the last few years. Furthermore, the small revisions to the 2008 data (i.e. the revisions to the first assessment of end-2008 that was released with a lag of four months) may already indicate the stability gains that are due to the full implementation of the security-by-security data compilation systems.

All in all, the revisions to the total asset positions as at end-2007 amounted to €152 billion, which represents 1.1% of the total assets, while the revisions to positions as at end-2006, which include one vintage more of revisions, amounted to €310 billion (2.5% of the total assets). On the liabilities side, the corresponding revisions to the end-2007 positions amounted to €61 billion (0.4% of total liabilities), while the revisions to the end-2006 positions came to €332 billion (2.5% of total liabilities).

Most of the revisions were upward revisions. Chart 8 shows that the overall revisions to the estimates for total assets and liabilities almost offset each other, except in the case of 2005 data. The revisions to the 2005 i.i.p. on the assets side of direct, portfolio and other investment were much larger than on the liabilities side.

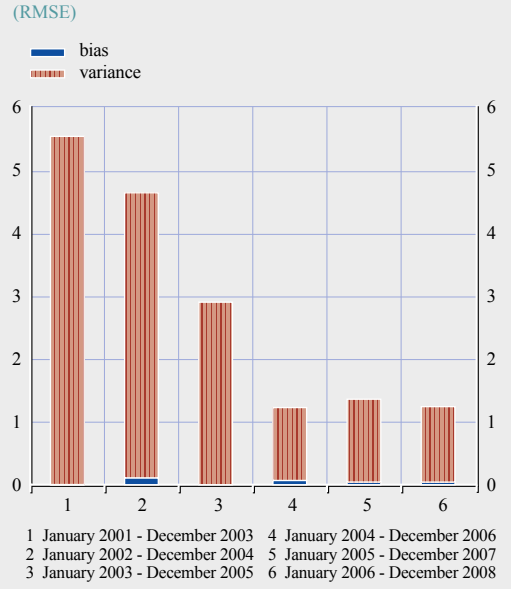
3.2 CONSISTENCY (COHERENCE) AND COMPARABILITY OF THE STATISTICAL OUTPUT

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 into different components: price changes, exchange rate changes and other adjustments. A box included in the 2007 annual quality report 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 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.

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



Source: ECB.

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 2006 to December 2008, the RMSE of the net errors and omissions amounted to 1.2% of the average gross current account flows. Compared with previous year's quality report, Chart 9 shows that the internal consistency of the b.o.p. has largely improved after the implementation of the new compilation system for the euro area aggregates in November 2009, with backwards revisions from January 2004, (see Box 2).

Box 2

METHODOLOGICAL CHANGES IN THE COMPILATION OF THE EURO AREA BALANCE OF PAYMENTS AND INTERNATIONAL INVESTMENT POSITION

In the last few years, the euro area balance of payments (b.o.p) has been characterised by a growing statistical discrepancy between the current and capital accounts, on the one hand, and the financial account, on the other, which should conceptually amount to zero. This has been reflected, since 2004, in an increasingly negative "net errors and omissions" component (see the chart below). As this has proved to be a non-transitory phenomenon, the ECB and the euro area national central banks initiated work on enhancing the method used for the compilation of the euro area b.o.p. and, thereby, to reduce the net errors and omissions. While the resulting methodological changes have had a rather limited impact on recent major trends in the euro area b.o.p. and international investment position (i.i.p.) series, they have had a more visible impact on the indicators of stability of this report, and have produced a significant "level" adjustment in 2008, given their downward impact on net financial inflows and their improving the euro area's net liability position vis-à-vis the rest of the world.

Historically, the b.o.p. was compiled on the basis of reports prepared for the purpose of foreign exchange controls. When such controls were abolished, b.o.p. compilers relied on information from bank settlements. However, as a result of developments in the organisation of international markets and information technology, bank settlements data started to diverge from the underlying transactions, in particular on account of differences in timing, the classification of b.o.p. items and the geographical allocation. In most euro area countries, b.o.p. compilation is now based on surveys, instead of bank settlements data, which have reduced the burden on respondents, but are also subject to sampling and other errors.

Against this background, the methodology for three financial account items has been improved, as from 2004, by incorporating information that was previously not used in the compilation of the euro area b.o.p. and i.i.p., such as intra-euro area transactions and positions. As a result, revisions have been introduced directly in the aggregate euro area b.o.p., to adjust for asymmetrical intra-euro area recording (see the points below). These revisions have reduced the euro area portfolio investment liabilities and increased the foreign assets held by euro area residents in loans and deposits, as recorded under "other investment" in the financial account.

Specifically, the following inconsistencies have been addressed by the improved methodology:

- a comparison of the portfolio investment liabilities of each euro area country and the respective assets held by residents abroad, using data from the IMF's Coordinated Portfolio Investment Survey, revealed that euro area residents' holdings of equity securities issued in Luxembourg and Ireland (by investment funds) were underestimated. This seemed to be associated with an under-reporting of euro area households' holdings of investment fund shares;

- a geographically asymmetrical recording of transactions between euro area countries was observed for loans between non-monetary financial institutions (non-MFIs). The reporting of more assets than liabilities in the case of intra-euro area loans was attributable mainly to difficulties in the statistical coverage and residency classification of financial vehicle

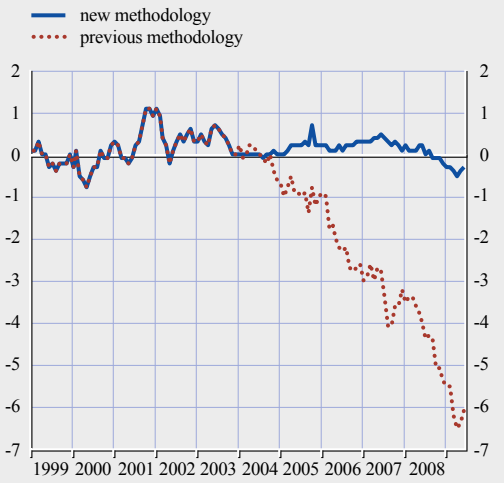
corporations. As a result, some of these transactions were reclassified to counterparts located outside the euro area;

- finally, evidence from the BIS banking statistics showed an underestimation of non-MFIs' deposits held abroad. Many of those deposits may in fact be held by euro area households.

The implementation of the new methodology for these three items,[1] together with the annual country data revisions, has entailed substantial adjustments in the financial account, while changes to the current account figures have been marginal and mostly due to revisions affecting the income account. Overall, this new methodology has significantly reduced the statistical discrepancy in the euro area b.o.p. (see the Chart). For the period from the first quarter of 2004 to the second quarter of 2009, these revisions resulted in a reduction of negative cumulated net errors and omissions from €555 billion (6.1% of euro area GDP) to €30 billion (0.3% of GDP). Most of this reduction (€430 billion) was due to the new methodology, and its impact is split as follows: 47% in portfolio investment liabilities, 44% in loans in other investment assets and 9% in deposits in other investment assets. Although the impact on the patterns in the time-series of the adjusted b.o.p. items was limited,[2] the magnitude of the effect on the i.i.p. was considerable. The euro area's net liability position for 2008 was revised downwards from 19.5% to 17.7% of GDP, with the methodological adjustments accounting for a decrease equal to 4.5% of GDP (which was partly offset by upward revisions arising from the country data).

Net errors and omissions of the euro area balance of payments

(cumulated totals; Q1 1999 to Q2 2009; as a percentage of euro area GDP)



Sources: ECB and ECB calculations.

The current account deficit for 2008 was revised upwards by 0.4% of GDP (from 1.1% to 1.5% of GDP), only 0.05% of which can be directly related to the new methodology, as the income account was adjusted as a result of the changes to the i.i.p. Overall, with these methodological changes, the external financing of the euro area, as presented by the financial account, has become more aligned with the developments on the non-financial side of the economy, in particular developments in external trade in goods and services.

The financial account of the euro area b.o.p. and the related stocks in the euro area i.i.p. have been based on the new improved methodology – implemented consistently for all compiled frequencies – as from the press release published on 2 November 2009.

1 The related end-period positions in the euro area i.i.p. have been adjusted accordingly.
2 Further information is available on the ECB's website in the "Balance of payments and international investment position" sub-section of the "Statistics" section (http://www.ecb.europa.eu/stats/external/balance/html/index.en.html).

3.2.2 External consistency

3.2.2.1 Consistency with data released by the main euro area counterparts

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 balance of the euro area and that of 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 far higher exports of services to the United Kingdom than those recorded as imports from the euro area in the United Kingdom. The relative difference has increased, reaching 55% in 2008. For previous years, the revisions in both statistics have slightly increased the differences. With respect to imports of services, the euro area figures are also higher than those recorded as exports to the euro area by the United Kingdom, but the discrepancies are significantly lower than in the case of exports. The relative discrepancy has also increased, reaching 26% in 2008.

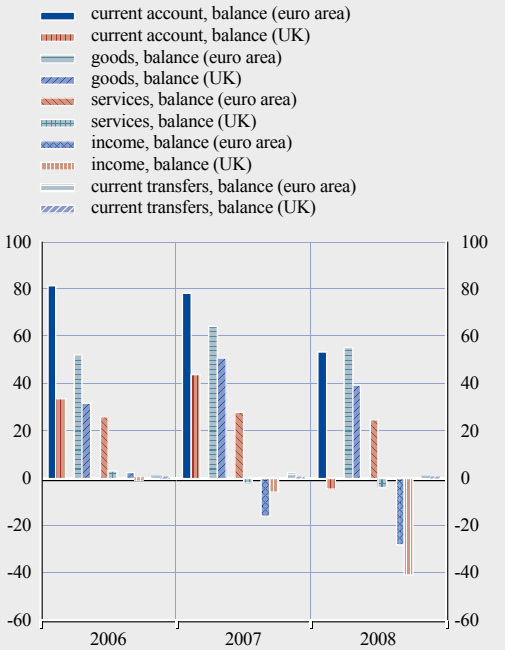
For income credits and debits, the discrepancies have increased significantly in 2008, from 2% to 30% in the case of credits and from 8% to 16% in that of debits. In analytical terms, while the euro area shows a yearly reduction of €15 billion in the income received from the United Kingdom, the United Kingdom shows a reduction of €51 billion in the income paid to the euro area. The revisions in both statistics, in particular by the United Kingdom, have improved the consistency for previous years in both credits and debits. In the last two years, asymmetries in goods credits and debits have started to show the same pattern as services, i.e. the flows recorded by the euro area largely exceed the mirror flows recorded by the United Kingdom. The relative discrepancies for exports and imports of goods have continued to increase, reaching 17% and 11% respectively in 2008.

All in all, the current account balance in 2008 shows the same sign in both balance of payments statistics. The euro area countries show a surplus of €53.7 billion vis-à-vis the United Kingdom, while the United Kingdom also shows a small surplus of €4.9 billion vis-à-vis the euro area countries.

The current account balances of the euro area and the United States showed less sizeable asymmetries (see Table 10 in Annex 3). The revisions published by the ECB and the US Bureau of Economic Analysis (BEA) in 2009 have not had a major impact on the consistency for 2006 and 2007. The gaps between the two datasets for 2008 have been reduced for the euro area debits in goods, services and income to the United States, while the asymmetries for euro area income receipts from the United States have increased slightly. All in all, the asymmetries for the balances of goods, services and income have decreased in 2008.

Chart 10 Euro area current account transactions with the United Kingdom from 2006 to 2008

(EUR billions)



Sources: ECB and the Office for National Statistics of the United Kingdom (2009 edition of the Pink Book).
Note: For the sake of comparability, the UK data have been adjusted, excluding Financial Intermediation Services Indirectly Measured (FISIM) from services and including them in the income account.

The current account balances of the euro area and Japan show asymmetries that have remained quite steady as from 2007 data. Estimates for services flows are now the main source of differences (see Table 11 in Annex 3).

3.2.2.1 Consistency with other datasets

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

In all euro area countries except Greece, foreign trade statistics are the source used to compile the goods balance of the b.o.p. statistics. Table 1 presents a preliminary reconciliation table of euro area external trade in goods and b.o.p. goods for exports and imports in 2007 and 2008. The conceptual adjustments to the external trade data mainly reflect the differences in the definition of foreign transactions applied in the two statistics. While trade statistics consider a transaction to have taken place when there is a physical movement of goods across borders, the b.o.p. compiler has to measure goods on a change-of-ownership basis. From 2007 and 2008 data, Table 1 shows that the total conceptual adjustments made to foreign trade statistics data for b.o.p. purposes are quite stable in magnitude for imports of goods, while the adjustments for exports of goods have doubled.

Table 2 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 for exports, while consistency in the case of imports is gradually diverging. The ordinary averages of the differences reveal no systematic divergence of the growth rates of both series.

Table 1 Reconciliation of the euro area data on external trade and b.o.p. goods

(EUR millions)

	Exports/Credits		Imports/Debits	
	2007	2008	2007	2008
1. "Goods" as published by Eurostat foreign trade statistics [1]	1,502,005	1,556,910	1,489,860	1,614,412
2. Adjustments made to foreign trade statistics data for b.o.p. purposes	11,422	23,086	-22,364	-23,297
2.1.0 CIF/FOB adjustment			-56,363	-59,181
2.1.1 Goods for processing not returning to the reporting Member States	-2,765	-2,156	1,283	407
2.1.2 Repairs of goods (net value)	3,403	3,215	2,596	2,123
2.1.3 Goods procured in ports by carriers	853	2,517	9,489	12,315
2.1.6 Returned goods	-5,796	-6,381	-5,819	-6,390
2.1.7 Goods entering/leaving custom warehouses	4,031	4,015	3,543	4,660
2.1.8 Stocks of goods located abroad (goods object of merchanting activity, including goods for processing under merchanting)	14,227	18,762	16,241	20,954
2.1.9 other adjustments [2]	-2,531	3,114	6,666	1,815
3. B.o.p. item "100=Goods" as used by Eurostat when compiling the EU aggregate [3]	1,513,427	1,579,997	1,467,495	1,591,115

Sources: Eurostat and ECB estimations.
1) Sum of monthly data from table "External Trade/Ext Trade aggregated data/short term indicators/macro-economic series for each Member States of EU27 and the main commodities BEC nomenclature", as on 23.10.2009.
2) This item includes (i) other conceptual adjustments as for example non-monetary gold, operational leasing longer than 24 months and valuation and (ii) other differences.
3) Sum of quarterly data from table "Economy and Finance/Balance of Payments-International Transactions/Balance of Payments Statistics and International Investment Positions/Balance of Payments by country published by Eurostat", as on 23.10.2009.

Table 2 Euro area goods in b.o.p. and in external trade statistics

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

	Period	Exports	Imports
Average of absolute differences	2003 - 2005	0.98	0.68
	2004 - 2006	0.77	0.66
	2005 - 2007	0.59	0.70
	2006 - 2008	0.51	0.74
Average of differences	2003 - 2005	0.02	0.00
	2004 - 2006	-0.05	-0.11
	2005 - 2007	0.02	-0.02
	2006 - 2008	0.02	-0.04

Sources: ECB and Eurostat.

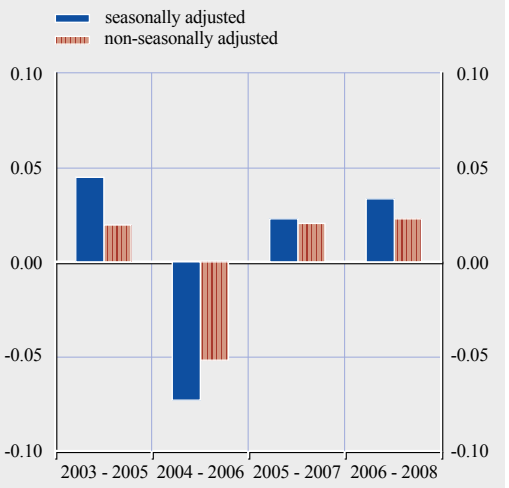
Both statistics are also published adjusted for seasonal and calendar effects. Charts 11 and 12 show three-year averages of the differences in month-to-month grow rates for exports and imports of goods respectively on the basis of both seasonally and calendar-adjusted data (sa) and raw data (nsa). In both cases, the indicator for the adjusted data is generally slightly worse than that for the raw data. This implies that the different methodologies applied by the ECB and Eurostat to adjust the raw data add some additional noise to the consistency of (Eurostat's) trade and (the ECB's) b.o.p. statistics.

Table 3 summarises the main aspects of the methodologies followed by the two organisations to adjust data on exports and imports of goods for seasonal effects in b.o.p. and trade statistics. In addition to the different software used for the estimations, the main differences between the seasonal adjustment methods that may have caused the increase in the inconsistency are as follows:

(i) The ECB adjusts the euro area aggregate directly for seasonal effects, while Eurostat aggregates seasonally adjusted country data, which is obtained by indirectly taking

Chart 11 Exports of goods in b.o.p. and external trade statistics

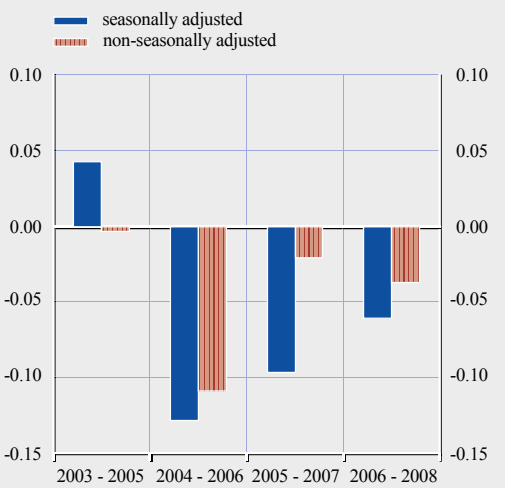
(three-year average of the differences in month-to-month grow rates; percentage points)



Sources: ECB and Eurostat.

Chart 12 Imports of goods in b.o.p. and external trade statistics

(three-year average of the differences in month-to-month grow rates; percentage points)



Sources: ECB and Eurostat.

Table 3 Procedures used by the ECB and Eurostat for the seasonal adjustment of the goods data series

ECB: b.o.p. goods	Eurostat: external trade in goods
X12	Demetra (Tramo-seats)
Direct adjustment of the euro area aggregate	Indirect adjustment of the euro area aggregate based on the addition of adjusted country data,which are likewise indirectly adjusted on the basis of adjusted extra-EU contribution and adjusted non-euro area EU contributions
ARIMA specification: once a year	Once a year or as required (automatic)
Multiplicative decomposition	Multiplicative decomposition
Quarterly re-estimations	Monthly re-estimations
Working days corrected in accordance with full and updated national/regional calendars and for Easter effects (if significant)	Working days, fixed national calendars, Easter and leap year effects (if significant)

into consideration the adjusted extra-EU contributions and the adjusted non-euro area EU contributions.

(ii) The ECB uses a single holiday-related calendar-adjustment variable that takes into account working days per month excluding the national/regional holidays of each euro area country from 1999 and the weight of each country in the euro area aggregate, whereas Eurostat uses several calendar-adjustment variables that take a fixed number of holidays into account per country.

Even though, in principle, the b.o.p. and the MFI balance sheet both comply with consistent international statistical standards, a number of differences can be identified with regard to their practical implementation, including the use of different statistical sources, differences in the timeliness of the data reporting and a series of differences related to simplifications in one or the other reporting system, which are accepted for the sake of reducing the reporting burden. In terms of compilation systems, the b.o.p. transactions for the MFI sector are, in some countries, reported directly by the MFIs, whereas in the BSI data, transactions are derived from differences in stock data (adjusted for reclassifications, foreign exchange rate changes and price revaluations). In practice, this may give rise to a number of differences in the resulting net transaction data, in particular if a large proportion of transactions are denominated in foreign currencies and if the volatility of exchange rates or security prices is high.

In general, the methodological differences between the b.o.p. data and the transactions derived from the MFI balance sheets are very limited. In certain cases, information which is available for the b.o.p. is not identified separately in the BSI data: accrued interest on external assets and liabilities, for instance, would imply the collection of additional data within MFI balance sheet statistics. The different treatment of (i) border line cases between loans and securities, as well as between securities and derivatives, and (ii) inter-companies financing should be resolved with the implementation of the current update of international statistical standards in the medium term.

In Table 4, the RMSRE reflects the distance between the recording of net deposits and loans of MFIs excluding the Eurosystem in b.o.p. and monetary statistics, in relation to the volatility of the b.o.p. series concerned. This indicator shows that after an increase in the period from 2005 to 2007, the levels in the last three years have become similar to those of previous periods. The bias and the regression components have also decreased for the period from 2006 to 2008. The bias component had reflected some methodological issues such as the different recording, by some NCBs, of short-selling transactions in b.o.p and monetary statistics that have recently been resolved.

Table 4 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 (%)
2002 - 2004	9.0	2.4	2.8	94.8
2003 - 2005	7.8	1.2	0.6	98.2
2004 - 2006	7.6	9.4	0.0	90.6
2005 - 2007	10.3	2.5	8.5	88.9
2006 - 2008	8.1	1.6	2.9	95.5

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 details on foreign direct investment (FDI) and breakdowns by geographical counterpart are provided with 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.[26]

In 2009, the ECB fully complied with its advance release calendar. Monthly data were published seven weeks after the end of the respective month, thereby also making an assessment of the quarterly and annual flows possible within two months (e.g. the first assessment for the full year 2008 was published on 24 February 2009).[27] 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.[28] The annual i.i.p. with further details was released 11 months after the end of the reference year. Moreover, it is envisaged to shorten the publication process of the euro area monthly b.o.p. by one day in 2010, i.e. the data will be published four days after their receipt by the ECB.

3.4 ACCESSIBILITY AND CLARITY OF THE STATISTICAL OUTPUT

The press releases on 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. In 2010, the number of press releases will be reduced to 14 – as from the publication of date for the fourth quarter of 2009 (April 2010), the press releases on the quarterly and monthly data will be combined in the month in which the quarterly publication takes place. The most recent data and longer time series with the current or historical composition of the euro area, and the corresponding metadata, are also available in the ECB's Statistical Data Warehouse (SDW)[29] 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.

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 analysing the data.

26 See http://www.ecb.europa.eu/stats/pdf/sa_procedures.pdf.
27 The benchmark in the IMF Special Data Dissemination Standard (SDDS) is three months.
28 For example, the end-2008 i.i.p. was published in April 2009. The benchmark in the SDDS is nine months.
29 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 of the distances from the median.[4] In principle,

3 Before 2003, this is done with annual data.

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.

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

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;

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 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.

(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 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 $(\overline{|P|})$, 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 $C = \frac{1}{a_t} \sum_{t=T-a}^{T} \frac{|x_t - y_t|}{(x_t + y_t)/2}$

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 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.

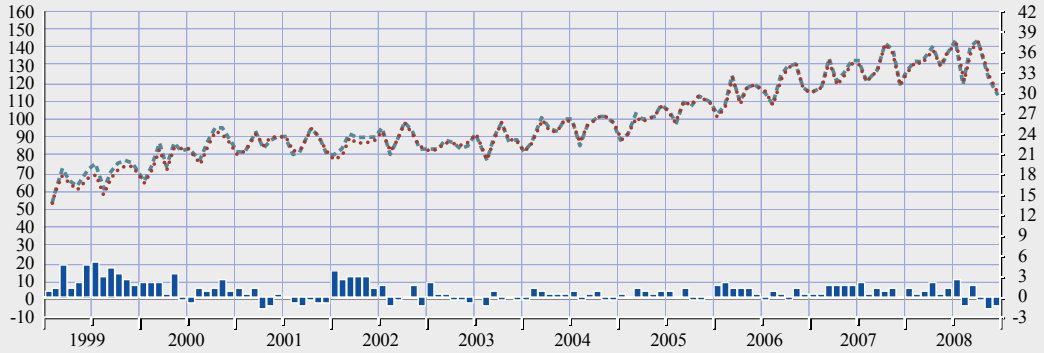
2 RESULTS OF STABILITY INDICATORS

Chart 1 Euro area goods

(EUR billions)

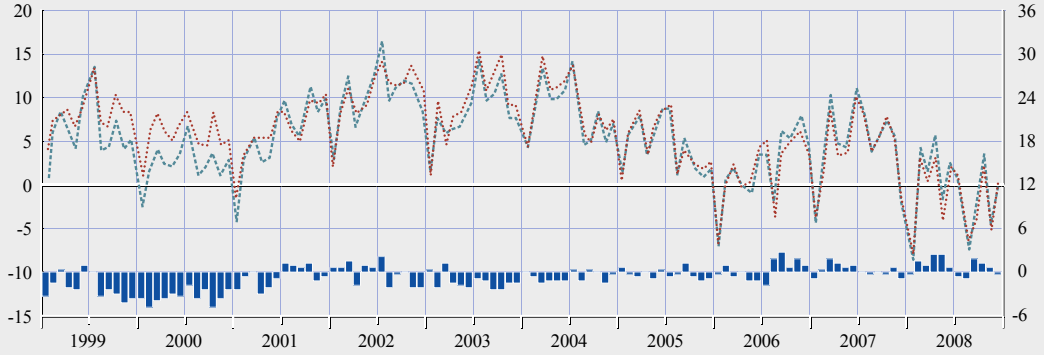
revision (right-hand scale)
first assessment (left-hand scale)
final assessment (left-hand scale)

a) Credits



b) Debits

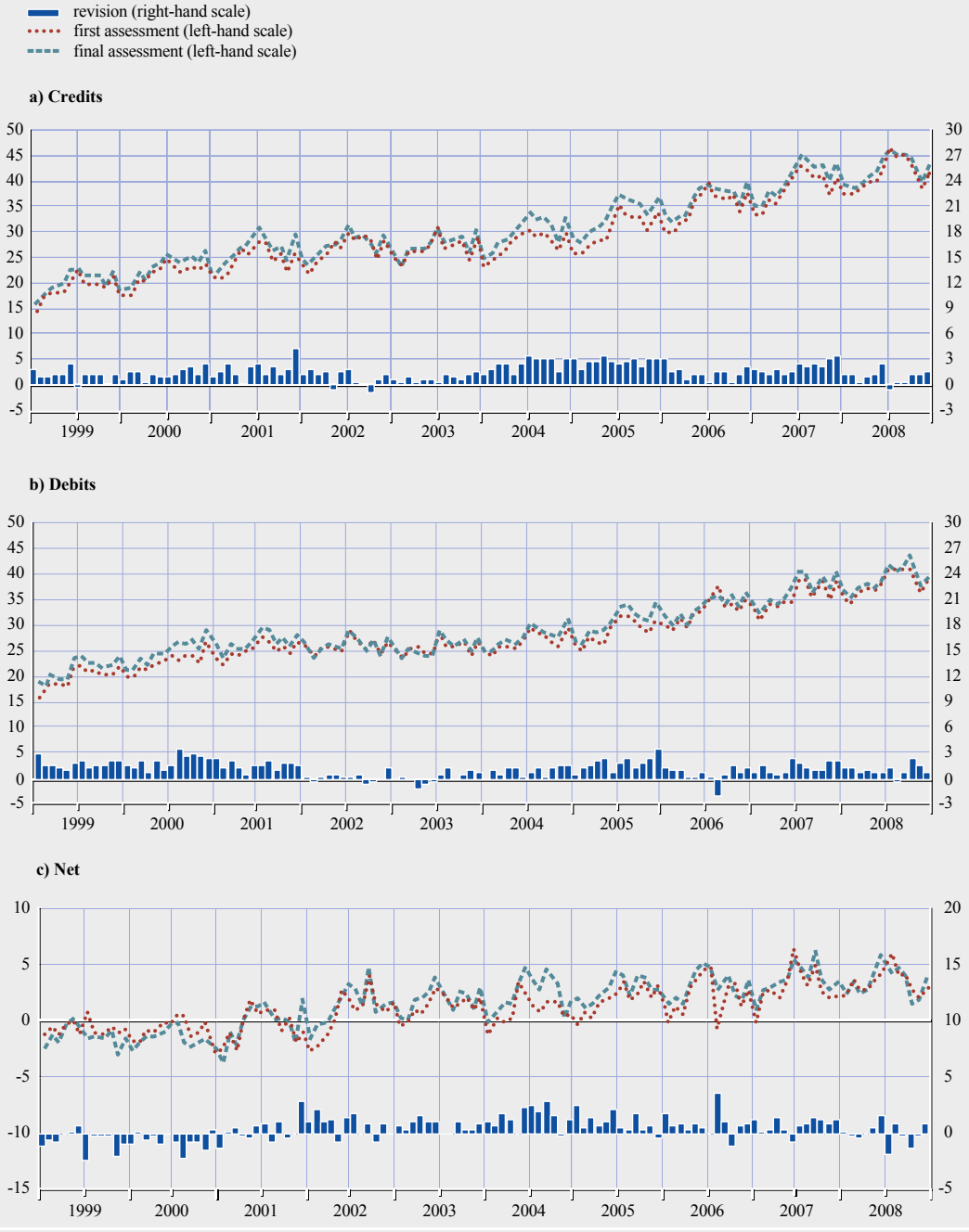
c) Net



Source: ECB.

Chart 2 Euro area services

(EUR billions)



Source: ECB.

Table 1 Stability indicators for euro area goods

Quality indicator	Reference period Jan.-Dec.	Goods		
		Credits	Debits	Net
$\overline{R}$ (*EUR billions*)	1999 - 2001	1.34	3.27	-1.93
	2000 - 2002	0.83	2.15	-1.31
	2001 - 2003	0.38	0.98	-0.61
	2002 - 2004	0.61	1.25	-0.64
	2003 - 2005	0.29	0.96	-0.67
	2004 - 2006	0.58	0.72	-0.14
	2005 - 2007	0.80	0.65	0.15
	2006 - 2008	0.84	0.34	0.50
$\lvert\overline{R}\rvert$ (*EUR billions*)	1999 - 2001	1.80	3.67	2.26
	2000 - 2002	1.48	2.58	1.93
	2001 - 2003	1.18	1.47	1.32
	2002 -2004	1.07	1.35	1.16
	2003 - 2005	0.61	1.06	0.95
	2004 - 2006	0.72	1.06	0.82
	2005 - 2007	0.90	0.99	0.79
	2006 - 2008	1.15	1.16	1.00
MAPE/ RMSRE (*%*)	1999 - 2001	2.49	5.55	0.78
	2000 - 2002	1.79	3.42	0.53
	2001 - 2003	1.40	1.89	0.41
	2002 - 2004	1.24	1.72	0.45
	2003 - 2005	0.65	1.27	0.34
	2004 - 2006	0.69	1.08	0.26
	2005 - 2007	0.77	0.89	0.26
	2006 - 2008	0.93	0.95	0.28
Q (*%*)	1999 - 2001	100.00	94.29	88.57
	2000 - 2002	97.14	94.29	88.57
	2001 - 2003	97.14	94.29	91.43
	2002 - 2004	94.29	97.14	91.43
	2003 - 2005	97.14	100.00	97.14
	2004 - 2006	97.14	97.14	91.43
	2005 - 2007	100.00	97.14	91.43
	2006 - 2008	100.00	97.14	91.43

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

Table 2 Stability indicators for euro area services

Quality indicator	Reference period Jan.-Dec.	Services		
		Credits	Debits	Net
$\overline{R}$ (*EUR billions*)	1999 - 2001	1.38	1.79	-0.40
	2000 - 2002	1.30	1.25	0.05
	2001 - 2003	1.12	0.62	0.50
	2002 - 2004	1.32	0.42	0.90
	2003 - 2005	1.95	0.98	0.98
	2004 - 2006	2.15	1.12	1.03
	2005 - 2007	2.04	1.25	0.79
	2006 - 2008	1.44	0.98	0.47
$\lvert\overline{R}\rvert$ (*EUR billions*)	1999 - 2001	1.40	1.79	0.79
	2000 - 2002	1.38	1.32	0.85
	2001 - 2003	1.21	0.82	0.80
	2002 - 2004	1.40	0.61	1.02
	2003 - 2005	1.95	1.10	1.02
	2004 - 2006	2.15	1.22	1.13
	2005 - 2007	2.04	1.36	0.93
	2006 - 2008	1.48	1.10	0.83
MAPE/ RMSRE (*%*)	1999 - 2001	6.46	8.09	0.83
	2000 - 2002	5.80	5.53	0.62
	2001 - 2003	4.79	3.25	0.62
	2002 - 2004	5.16	2.33	0.86
	2003 - 2005	6.77	3.96	1.04
	2004 - 2006	7.13	4.19	1.19
	2005 - 2007	6.09	4.28	1.04
	2006 - 2008	3.94	3.09	0.90
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	94.29	77.14
	2006 - 2008	85.71	91.43	77.14

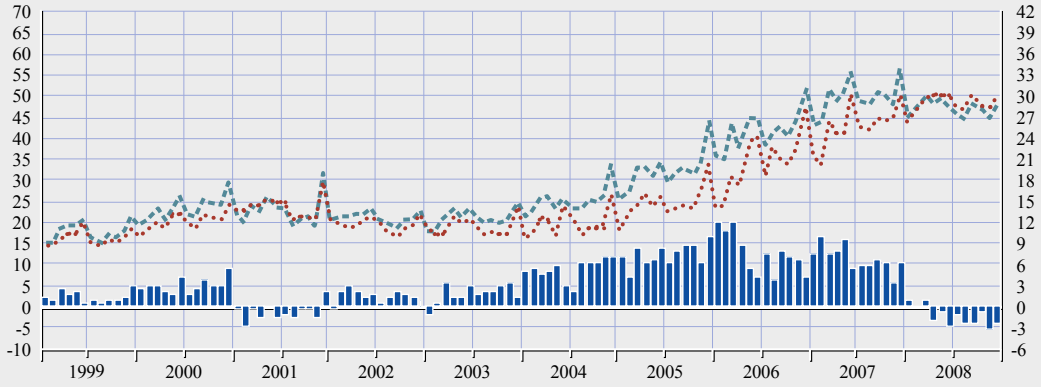
Source: ECB.
Note: The MAPE is used for credits and debits and the RMSRE for net data.

Chart 3 Euro area income

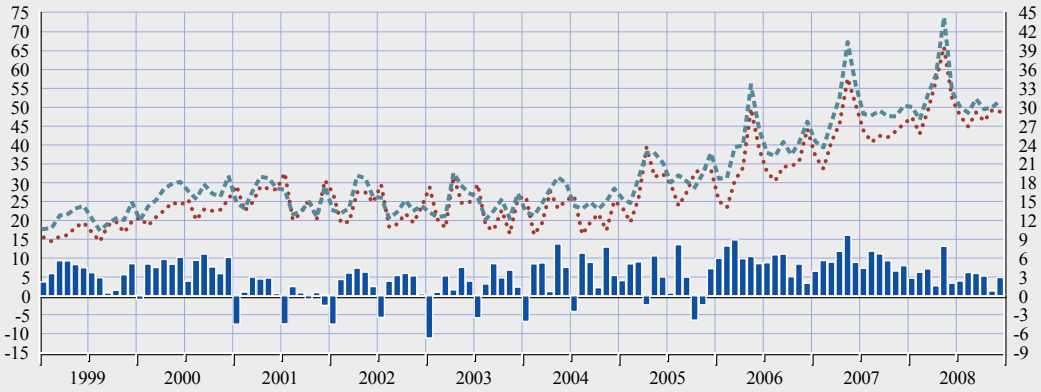
(EUR billions)

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

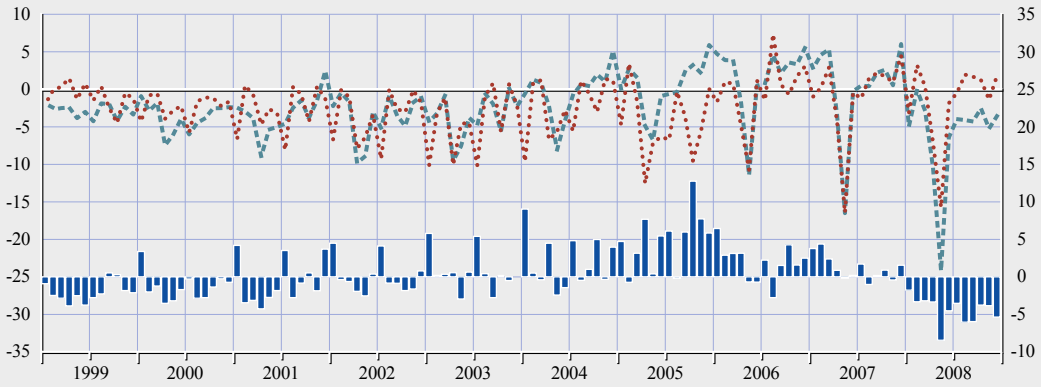
a) Credits



b) Debits



c) Net



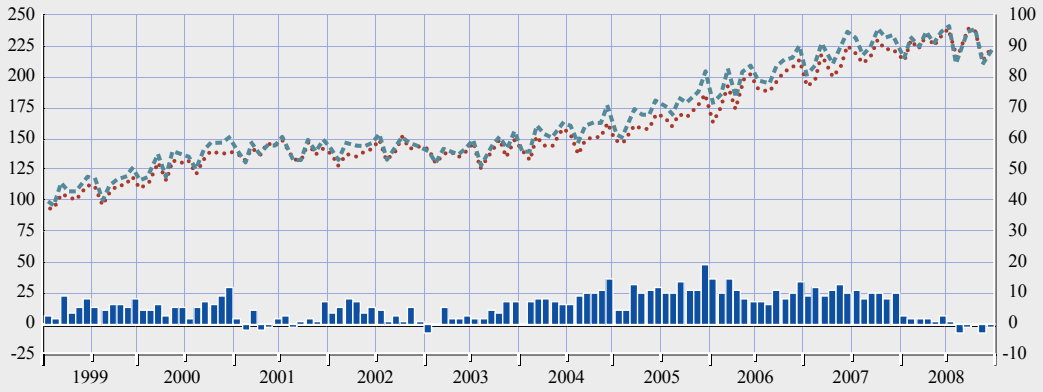
Source: ECB.

Chart 4 Euro area current account

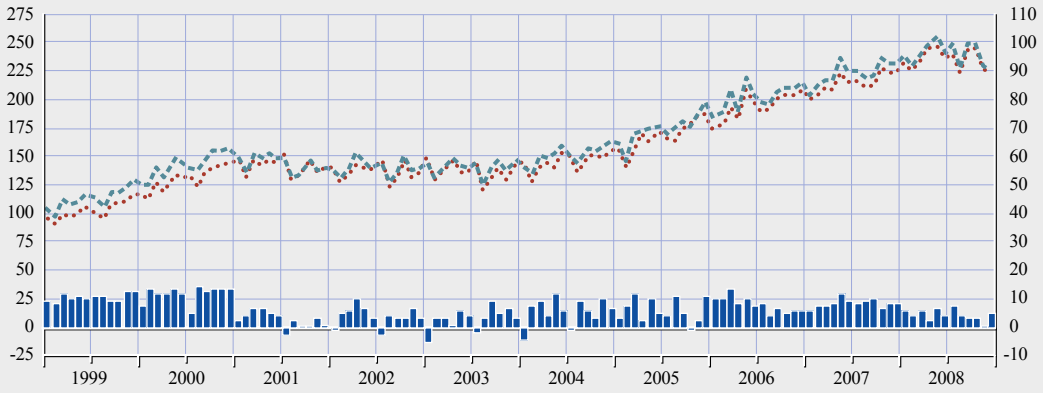
(EUR billions)

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

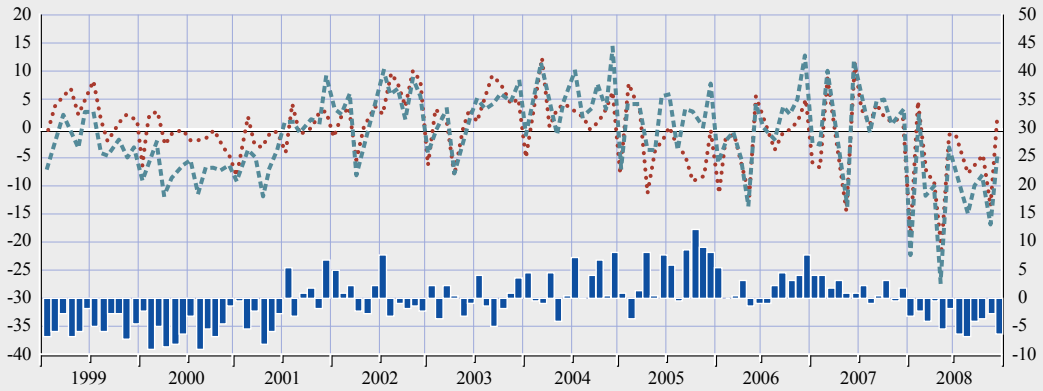
a) Credits



b) Debits



c) Net



Source: ECB.

Table 3 Stability indicators for euro area income

Quality indicator	Reference period Jan.-Dec.	Income		
		Credits	Debits	Net
$\overline{R}$ (*EUR billions*)	1999 - 2001	1.33	2.72	-1.39
	2000 - 2002	1.37	2.10	-0.73
	2001 - 2003	0.97	1.05	-0.08
	2002 - 2004	3.00	2.18	0.82
	2003 - 2005	4.97	2.48	2.48
	2004 - 2006	6.87	3.92	2.94
	2005 - 2007	7.37	4.69	2.68
	2006 - 2008	4.46	4.89	-0.43
$\lvert\overline{R}\rvert$ (*EUR billions*)	1999 - 2001	1.91	3.36	2.29
	2000 - 2002	1.95	3.19	2.12
	2001 - 2003	1.60	2.67	2.02
	2002 - 2004	3.06	3.55	2.05
	2003 - 2005	5.02	3.79	3.16
	2004 - 2006	6.87	4.66	3.51
	2005 - 2007	7.37	5.07	3.05
	2006 - 2008	5.41	4.89	2.84
MAPE/ RMSRE (*%*)	1999 - 2001	9.72	16.22	1.46
	2000 - 2002	9.54	13.62	1.10
	2001 - 2003	8.16	11.40	1.02
	2002 - 2004	16.08	16.64	0.95
	2003 - 2005	23.41	16.82	1.33
	2004 - 2006	27.86	18.08	1.40
	2005 - 2007	24.03	14.95	1.13
	2006 - 2008	14.95	12.47	0.61
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	65.71
	2006 - 2008	80.00	85.71	74.29

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

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	4.29	8.47	-4.18
	2000 - 2002	3.83	6.29	-2.46
	2001 - 2003	2.79	3.37	-0.58
	2002 - 2004	5.10	4.42	0.68
	2003 - 2005	7.31	5.10	2.21
	2004 - 2006	9.77	6.75	3.02
	2005 - 2007	10.39	7.63	2.76
	2006 - 2008	6.88	7.06	-0.18
$\lvert\overline{R}\rvert$ (*EUR billions*)	1999 - 2001	4.59	8.63	4.95
	2000 - 2002	4.12	6.64	4.17
	2001 - 2003	3.25	4.10	2.98
	2002 - 2004	5.29	5.27	2.84
	2003 - 2005	7.50	5.83	3.74
	2004 - 2006	9.78	7.10	3.85
	2005 - 2007	10.39	7.69	3.35
	2006 - 2008	7.36	7.06	2.93
MAPE/ RMSRE (*%*)	1999 - 2001	3.79	7.32	1.17
	2000 - 2002	3.06	5.00	0.75
	2001 - 2003	2.33	2.99	0.62
	2002 - 2004	3.66	3.80	0.70
	2003 - 2005	4.82	3.94	0.98
	2004 - 2006	5.81	4.28	0.90
	2005 - 2007	5.54	4.03	0.83
	2006 - 2008	3.64	3.38	0.42
Q (*%*)	1999 - 2001	85.71	85.71	71.43
	2000 - 2002	85.71	85.71	71.43
	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	82.86	85.71
	2006 - 2008	100.00	91.43	91.43

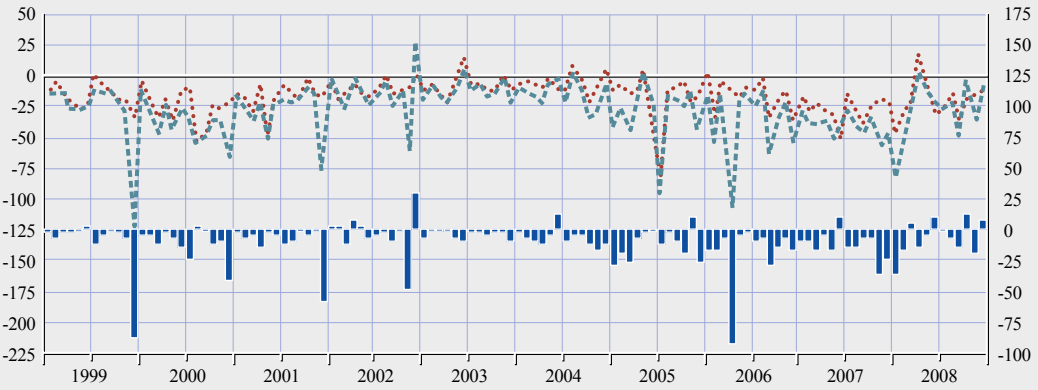
Source: ECB.
Notes: The MAPE is used for credits and debits and the RMSRE for net data.

Chart 5 Direct investment

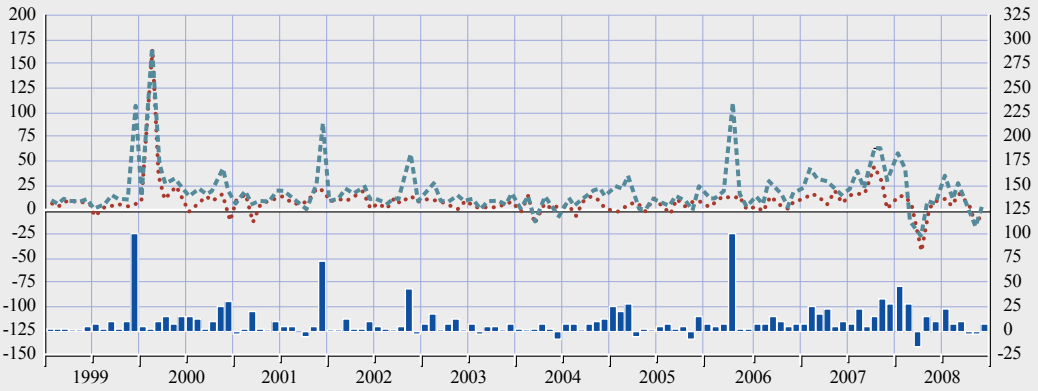
(EUR billions)

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

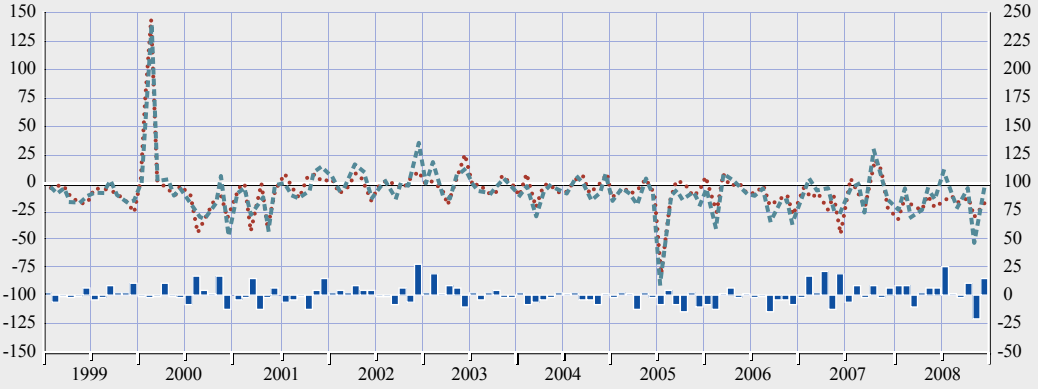
a) Abroad



b) In the euro area



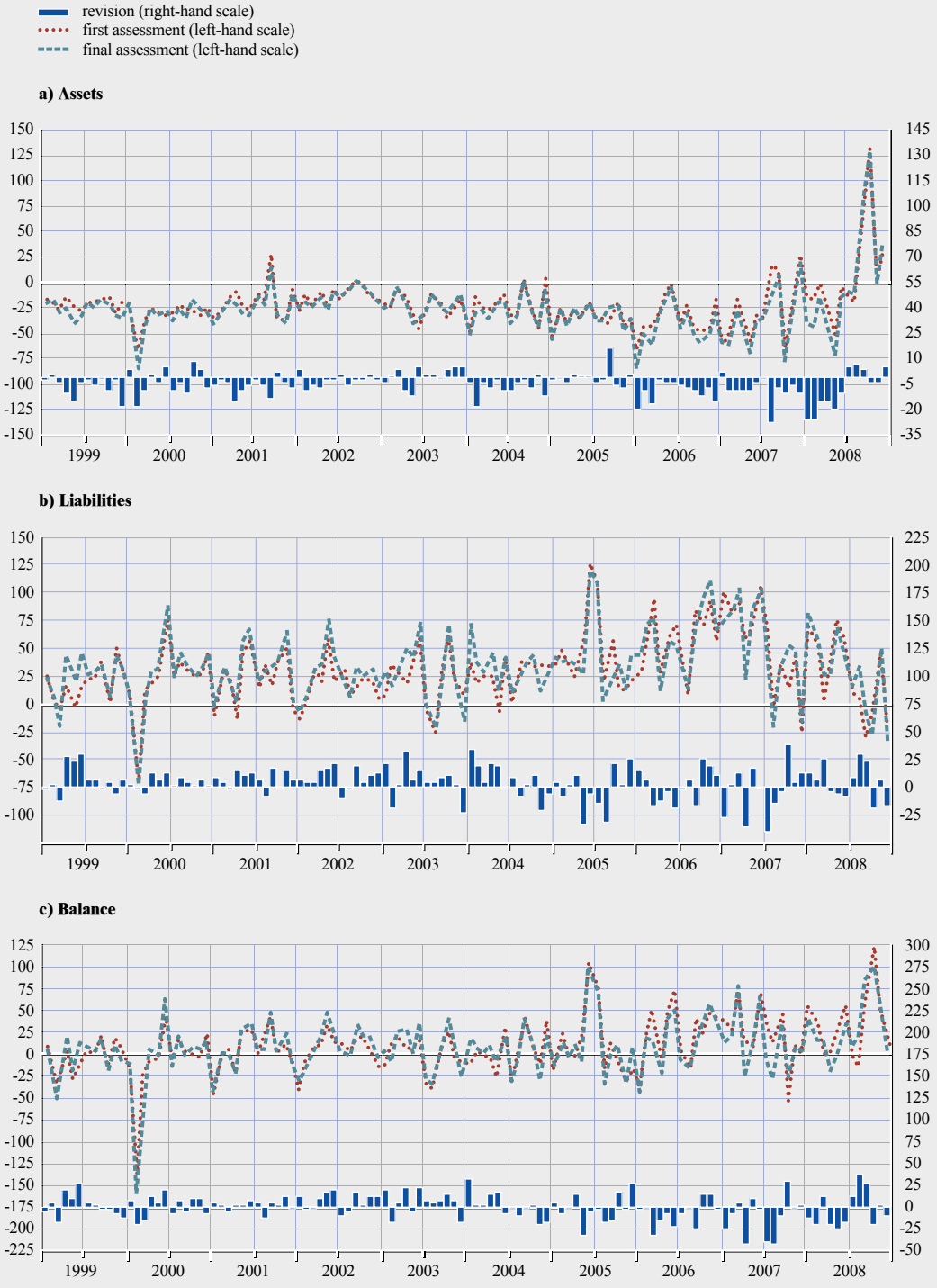
c) Balance



Source: ECB.

Chart 6 Euro area portfolio investment

(EUR billions)



Source: ECB.

Table 5 Stability indicators for 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	-6.72	7.56	0.85
	2002 - 2004	-5.75	5.91	0.16
	2003 - 2005	-8.66	6.28	-2.37
	2004 - 2006	-13.79	9.36	-4.44
	2005 - 2007	-15.65	13.65	-2.00
	2006 - 2008	-13.68	14.35	0.68
$\lvert\overline{R}\rvert$ (*EUR billions*)	1999 - 2001	11.63	11.94	5.72
	2000 - 2002	11.37	10.42	6.33
	2001 - 2003	8.85	8.38	5.86
	2002 - 2004	8.48	6.80	4.95
	2003 - 2005	9.77	7.74	5.12
	2004 - 2006	14.90	10.58	5.42
	2005 - 2007	16.62	14.36	6.93
	2006 - 2008	15.83	15.66	8.01
MACE/ RMSRE (*%*)	1999 - 2001	0.74	0.97	0.58
	2000 - 2002	0.61	0.69	0.54
	2001 - 2003	0.44	0.49	0.70
	2002 - 2004	0.40	0.35	0.61
	2003 - 2005	0.41	0.35	0.71
	2004 - 2006	0.55	0.43	0.61
	2005 - 2007	0.55	0.54	0.66
	2006 - 2008	0.48	0.54	0.67
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	74.29	77.14	74.29
	2006 - 2008	80.00	82.86	77.14

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

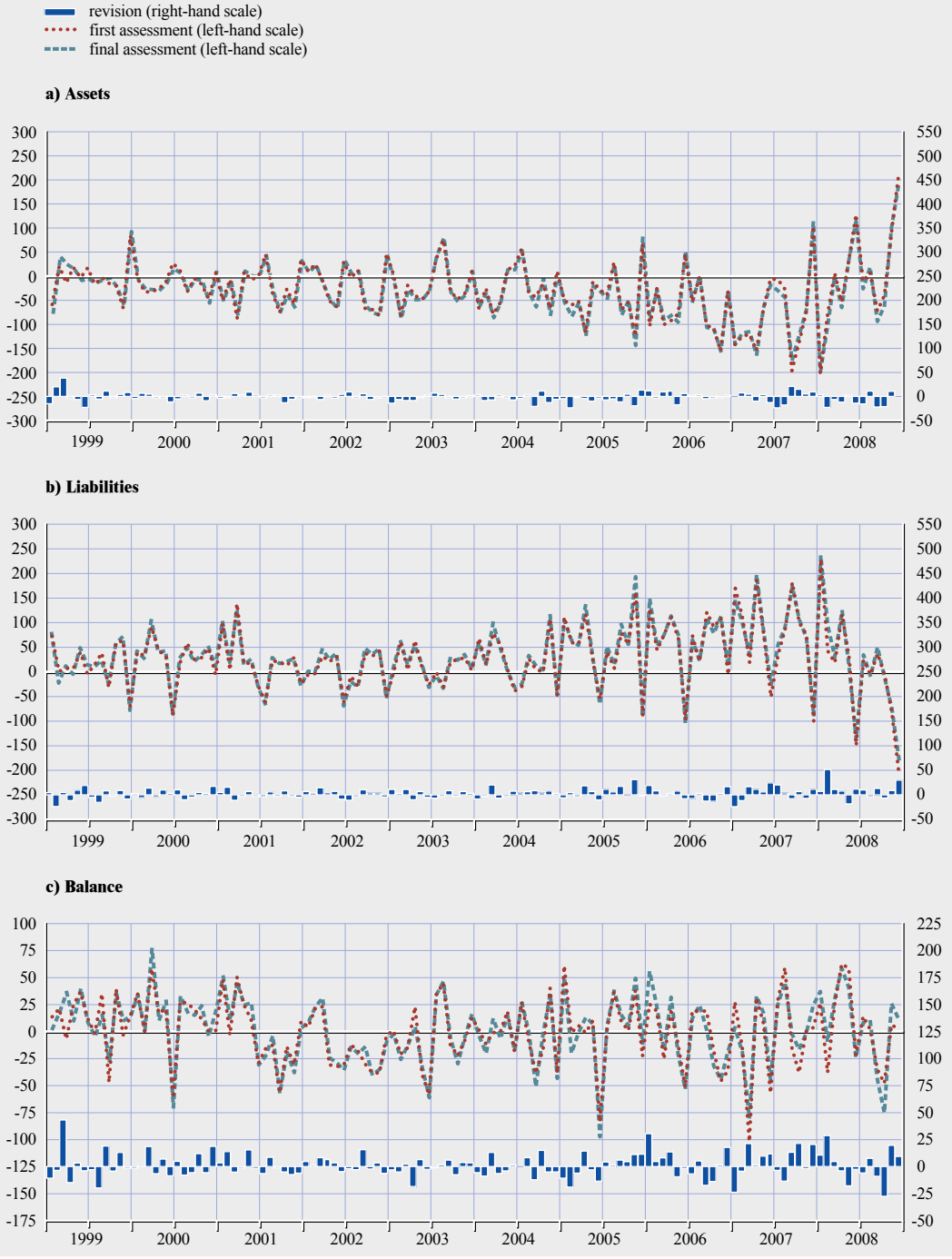
Table 6 Stability indicators for euro area portfolio investment

Quality indicator	Reference period Jan.-Dec.	Porfolio investment		
		Assets	Liabilities	Balance
$\overline{R}$ (*EUR billions*)	1999 - 2001	-4.49	5.57	1.08
	2000 - 2002	-3.27	6.10	2.83
	2001 - 2003	-2.27	6.60	4.34
	2002 - 2004	-2.38	6.44	4.06
	2003 - 2005	-1.73	2.84	1.12
	2004 - 2006	-4.74	1.51	-3.23
	2005 - 2007	-5.29	-1.75	-7.04
	2006 - 2008	-7.88	0.52	-7.36
$\lvert\overline{R}\rvert$ (*EUR billions*)	1999 - 2001	6.18	8.12	8.04
	2000 - 2002	5.29	7.99	8.18
	2001 - 2003	4.44	10.24	8.86
	2002 - 2004	4.45	11.71	10.93
	2003 - 2005	4.46	12.79	11.83
	2004 - 2006	5.89	13.16	11.81
	2005 - 2007	6.58	14.63	14.26
	2006 - 2008	9.31	14.67	16.19
MACE/ RMSRE (*%*)	1999 - 2001	0.28	0.28	0.42
	2000 - 2002	0.22	0.25	0.41
	2001 - 2003	0.18	0.31	0.49
	2002 - 2004	0.17	0.33	0.62
	2003 - 2005	0.15	0.32	0.62
	2004 - 2006	0.17	0.28	0.58
	2005 - 2007	0.16	0.26	0.62
	2006 - 2008	0.21	0.24	0.65
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	65.71	74.29
	2003 - 2005	82.86	65.71	74.29
	2004 - 2006	85.71	68.57	80.00
	2005 - 2007	82.86	71.43	80.00
	2006 - 2008	85.71	77.14	85.71

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

Chart 7 Euro area other investment

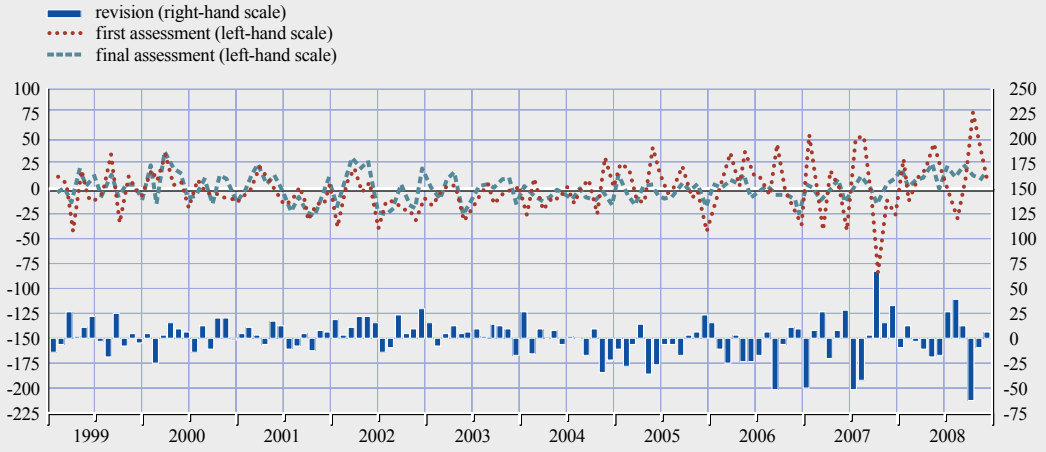
(EUR billions)



Source: ECB.

Chart 8 Total financial account – net

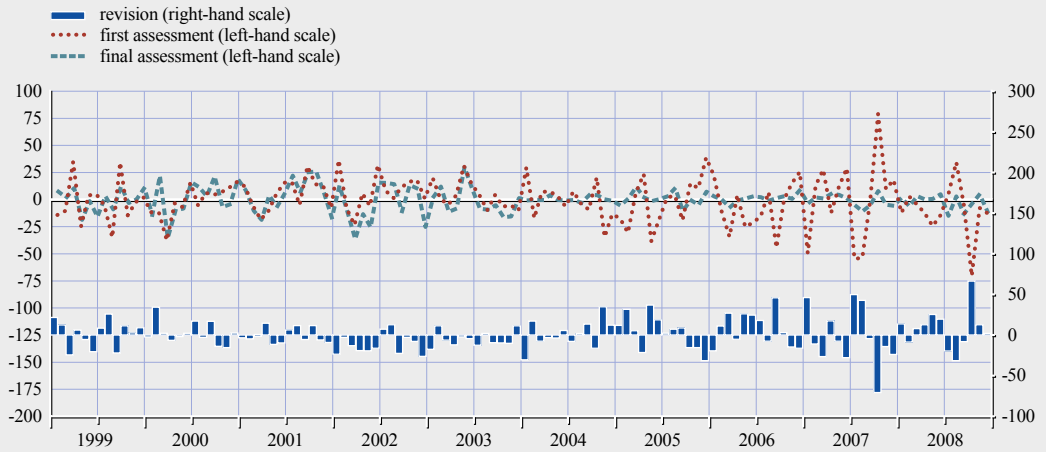
(EUR billions)



Source: ECB.

Chart 9 Euro area errors and omissions

(EUR billions)



Source: ECB.

Table 7 Stability indicators for euro area other investment

Quality indicator	Reference period Jan.-Dec.	Other investment		
		Assets	Liabilities	Balance
$\overline{R}$ (*EUR billions*)	1999 - 2001	0.20	1.31	1.51
	2000 - 2002	-0.72	2.42	1.70
	2001 - 2003	-1.28	1.89	0.62
	2002 - 2004	-2.51	2.58	0.07
	2003 - 2005	-4.45	3.83	-0.62
	2004 - 2006	-3.07	3.70	0.63
	2005 - 2007	-1.61	3.98	2.37
	2006 - 2008	-2.59	5.33	2.74
$\lvert\overline{R}\rvert$ (*EUR billions*)	1999 - 2001	6.74	7.67	8.58
	2000 - 2002	4.17	6.52	6.43
	2001 - 2003	4.29	6.13	5.41
	2002 - 2004	5.30	6.44	5.70
	2003 - 2005	7.08	7.50	6.92
	2004 - 2006	7.27	8.22	8.87
	2005 - 2007	8.55	10.23	10.61
	2006 - 2008	9.97	11.96	11.78
MACE/ RMSRE (*%*)	1999 - 2001	0.31	0.30	0.42
	2000 - 2002	0.17	0.23	0.26
	2001 - 2003	0.16	0.21	0.26
	2002 - 2004	0.19	0.21	0.29
	2003 - 2005	0.22	0.22	0.31
	2004 - 2006	0.21	0.22	0.38
	2005 - 2007	0.20	0.23	0.42
	2006 - 2008	0.19	0.23	0.43
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	91.43
	2004 - 2006	97.14	100.00	91.43
	2005 - 2007	97.14	100.00	94.29
	2006 - 2008	97.14	100.00	97.14

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

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

Quality indicator	Reference period Jan.-Dec.	Errors and omissions	Total financial account
$\overline{R}$ (*EUR billions*)	1999 - 2001	1.35	2.90
	2000 - 2002	-3.09	5.68
	2001 - 2003	-5.62	6.33
	2002 - 2004	-5.02	4.31
	2003 - 2005	-0.25	-1.95
	2004 - 2006	3.97	-6.89
	2005 - 2007	2.71	-5.04
	2006 - 2008	4.21	-3.60
$\lvert\overline{R}\rvert$ (*EUR billions*)	1999 - 2001	10.56	11.02
	2000 - 2002	10.70	12.00
	2001 - 2003	10.45	11.17
	2002 - 2004	12.07	12.41
	2003 - 2005	12.91	12.52
	2004 - 2006	16.01	14.99
	2005 - 2007	21.28	20.56
	2006 - 2008	21.91	21.77
RMSRE (*%*)	1999 - 2001	1.05	
	2000 - 2002	0.84	
	2001 - 2003	0.82	
	2002 - 2004	1.13	
	2003 - 2005	2.22	
	2004 - 2006	4.88	
	2005 - 2007	5.32	
	2006 - 2008	5.33	
Q (*%*)	1999 - 2001	71.43	
	2000 - 2002	74.29	
	2001 - 2003	82.86	
	2002 - 2004	71.43	
	2003 - 2005	71.43	
	2004 - 2006	65.71	
	2005 - 2007	62.86	
	2006 - 2008	51.43	

Source: ECB.

3 CURRENT ACCOUNT TRANSACTIONS BETWEEN THE EURO AREA AND ITS MAIN PARTNER COUNTRIES

Table 9 Current account transactions between the euro area and the United Kingdom from 2006 to 2008

(EUR billions)

B.o.p. item.	2006		2007		2008		2006		2007		2008	
	as recorded by the euro area	as recorded by the UK	as recorded by the euro area	as recorded by the UK	as recorded by the euro area	as recorded by the UK	difference	relative difference (%)	difference	relative difference (%)	difference	relative difference (%)
Current account, balance	82.1	-34.1	78.8	-44.3	53.7	4.9	48.0	83	34.4	56	58.5	200
Exports to the UK/imports from the euro area	478.3	431.9	536.3	453.6	508.3	374.8	46.5	10	82.7	17	133.5	30
Imports from the UK/exports to the euro area	396.2	397.7	457.5	409.3	454.6	379.6	-1.6	0	48.3	11	75.0	18
Goods, balance	52.5	-31.9	64.9	-51.4	56.0	-39.3	20.6	49	13.5	23	16.7	35
Exports to the UK/imports from the euro area	226.9	231.9	240.7	218.8	233.6	197.7	-5.0	2	21.9	10	35.9	17
Imports from the UK/exports to the euro area	174.3	200.0	175.8	167.4	177.6	158.4	-25.6	14	8.4	5	19.2	11
Services, balance	26.5	-3.1	27.7	2.1	25.0	3.6	23.5	159	29.8	200	28.6	200
Exports to the UK/imports from the euro area	107.7	69.3	117.0	70.5	112.3	63.8	38.5	43	46.5	50	48.5	55
Imports from the UK/exports to the euro area	81.2	66.2	89.3	72.6	87.3	67.4	15.0	20	16.7	21	19.9	26
Income, balance	2.6	1.0	-16.1	5.4	-28.2	41.2	3.5	200	-10.7	100	13.0	37
Receipts from the UK/ expenditure in the euro area	132.2	127.1	164.1	161.2	149.0	110.3	5.2	4	2.8	2	38.7	30
Expenditure in the UK/ receipts from the euro area	129.7	128.0	180.2	166.6	177.2	151.5	1.6	1	13.6	8	25.7	16
Current transfers, balance	0.5	-0.1	2.4	-0.4	0.9	-0.7	0.4	125	2.0	144	0.2	31
Receipts from the UK/ expenditure in the euro area	11.5	3.6	14.6	3.0	13.4	3.0	7.9	104	11.5	131	10.4	127
Expenditure in the UK/ receipts from the euro area	11.0	3.5	12.2	2.7	12.5	2.3	7.5	103	9.6	129	10.2	137

Sources: ECB and UK Office for National Statistics.
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 Current and capital account transactions between the euro area and the United States from 2006 to 2008

(EUR billions)

B.o.p. item	2006		2007		2008		2006		2007		2008	
	as recorded by the euro area	as recorded by the US	as recorded by the euro area	as recorded by the US	as recorded by the euro area	as recorded by the US	difference	relative difference (%)	difference	relative difference (%)	difference	relative difference (%)
Current account, balance	51.15	-56.57	40.94	-24.91	-6.78	-7.54	-5.42	10	16.03	49	-14.33	200
Goods, balance	65.96	-75.34	58.37	-67.30	48.76	-53.84	-9.39	13	-8.93	14	-5.08	10
Exports to the US/imports from the euro area	198.54	196.56	194.27	196.18	191.22	189.06	1.98	1	-1.91	1	2.16	1
Imports from the US/exports to the euro area	132.59	121.22	135.90	128.88	142.46	135.22	11.37	9	7.02	5	7.24	5
Services, balance	-10.65	5.03	-13.28	10.88	-17.64	14.67	-5.62	72	-2.40	20	-2.97	18
Exports to the US/imports from the euro area	76.75	64.24	78.20	65.48	78.80	65.99	12.51	18	12.73	18	12.81	18
Imports from the US/exports to the euro area	87.41	69.27	91.48	76.36	96.44	80.66	18.14	23	15.13	18	15.78	18
Income, balance	-3.59	16.46	-4.65	36.24	-36.36	36.51	12.87	128	31.59	155	0.15	0
Receipts from the US/expenditure in the euro area	113.98	115.61	124.12	115.36	108.14	100.83	-1.63	1	8.76	7	7.31	7
Expenditure in the US/receipts from the euro area	117.57	132.07	128.77	151.60	144.50	137.34	-14.50	12	-22.83	16	7.16	5
Current transfers, balance	-0.57	-2.71	0.50	-4.73	-1.55	-4.88	-3.28	200	-4.23	162	-6.43	200
Capital account, balance	-1.88	-0.21	-0.39	-0.19	0.25	0.20	-2.09	200	-0.57	200	0.45	200

Sources: ECB and 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 Current and capital account transactions between the euro area and Japan from 2006 to 2008

(EUR billions)

B.o.p. item	2006		2007		2008		2006		2007		2008	
	as recorded by the euro area	as recorded by Japan	as recorded by the euro area	as recorded by Japan	as recorded by the euro area	as recorded by Japan	difference	relative difference (%)	difference	relative difference (%)	difference	relative difference (%)
Current account, balance	-36.11	38.49	-41.39	42.42	-42.32	44.04	2.37	6	1.03	2	1.72	4
Goods, balance	-20.38	17.75	-22.73	19.55	-21.77	18.04	-2.64	14	-3.19	15	-3.73	19
Services, balance	2.48	-0.32	2.85	0.17	3.02	3.29	2.16	155	3.02	200	6.31	200
Income, balance	-18.02	21.14	-21.45	22.91	-23.33	22.78	3.12	16	1.45	7	-0.55	2
Current transfers, balance	-0.18	-0.08	-0.05	-0.21	-0.24	-0.07	-0.26	200	-0.26	200	-0.31	200
Capital account, balance	0.38	-0.17	-0.07	-0.44	-0.06	-0.09	0.21	76	-0.50	200	-0.16	200

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