EUROPEAN CENTRAL BANK

EUROSYSTEM

EURO AREA MONETARY AND FINANCIAL STATISTICS 2012 QUALITY REPORT

SUMMARY

The European System of Central Banks (ESCB) has continued to collect, compile and disseminate monetary and financial statistics for the euro area and the other countries pertaining to the ESCB. The monetary and financial statistics cover a wide range of deliverables, which are listed in Annex 1.

Overall, the quality of the published data has remained very high in order to meet policy needs. In addition, a detailed description of the methodology underpinning some of the key statistics is now available in a manual, published in April 2012[1].

The present Monetary and Financial Statistics Quality Report 2012 provides an overview of a core subset of these statistical products produced by the ESCB, focuses on selected quality features and provides information on recent enhancements to the data. Moreover, it updates the revision analysis for monetary aggregates which was introduced in previous releases of this report.

By early 2012, the new statistical definition for money market funds (MMFs) had been implemented in the ECB Monetary Financial Institutions' (MFIs; basically banks and MMFs[2]) statistics. This definition is aligned across countries and with the definition used for supervisory purposes in Europe and has, in turn, further promoted a harmonised identification and treatment of MMFs in ECB statistics. While the impact of this change on the MMF sector has been significant, the quantitative impact on the broad monetary aggregate M3 has been minor.

Turning to the reconciliation of the statistical measurement of money with its underlying economic definition, the statistical measurement of broad money (M3 aggregate) and credit to the private sector has been amended to exclude MFI repurchase agreement (repo) transactions with central counterparties (CCPs). Euro area monetary series were corrected for MFI repos with CCPs on both the liability and asset sides. MFI balance sheet statistics (e.g. the euro area aggregated and consolidated balance sheets) remain otherwise consistent with international statistical standards and are not adjusted for repurchase agreements involving CCPs.

This edition of the Monetary and Financial Statistics Quality Report is more focused than earlier reports. First, as background to the monetary presentation of the balance of payments (b.o.p.), it includes a quantitative comparison between the ECB monetary and b.o.p. statistics. The data consistency is assessed for the net flows with non-euro area residents for loans, deposits and foreign currency holdings, as well as flows relating to the holdings of securities issued by non-euro area residents. As a result of methodological and measurement differences between the two statistics, the quantitative discrepancies observed were not systematic (i.e. had altering signs). In some months or quarters they were sizeable. The largest difference observed was €18.5 billion. In relative terms, this amounted to 5% of the net balance, indicating thus a relative consistency between the two statistical sets.

1 For more information, please see: www.ecb.int/pub/pdf/other/manualmfibalancesheetstatistics201204en.pdf

2 A definition of MFIs is given in Regulation ECB/2008/32, available at: https://www.ecb.int/ecb/legal/pdf/l_01520090120en00140062.pdf

This report also updates the analysis of revisions to monetary aggregates, in view of the importance of reliable first estimates for monetary policy. According to the analysis carried out, revisions to the month-on-month growth rates of both the broad monetary aggregates M3 and M2[3] for the euro area continue to be very small. Overall, 80% of all revisions are less than or equal to 0.05 percentage points (p.p.). In particular, the concentration of revisions to the M1 month-on-month growth rate between -0.05 and +0.05 p.p. is 65%. Amongst the M3 components, the revisions to debt securities issued are the highest, but have a small impact on M3 due to the fact that the share of this instrument in broad money is only about 2%.

Last but not least, the quality report includes a brief description of an innovative methodology for ensuring the quality of the sampling for MFI interest rate statistics. The methodology proposes common principles for non-statistical samples in which only data from large institutions within each stratum are collected. Based on this methodology, confidence intervals of a synthetic measurement based on mean absolute errors are suggested. By comparing the country results it can be seen that all countries comply with their individual threshold estimated by using 10 basis point limits as currently established in the corresponding Regulation (ECB/2001/18[4]).

INTRODUCTION

The ESCB's statistical function is based on a legal mandate to collect all relevant data in order to produce and disseminate reliable, timely, consistent and accessible statistics in the areas under the ESCB's responsibility. These statistics comply with European and internationally-accepted standards, guidelines and good practices. The only departure relates to loans and deposits, which are measured at nominal value to best serve policy purposes. Adherence to high quality statistical standards is considered to be a key factor in maintaining the public's confidence in ESCB statistics, upon which monetary policy decisions are based. In turn, this ensures that the (euro area and national) statistics are comparable at international level. In the performance of its statistical function, the ESCB is committed to good governance and the highest ethical standards, as well as to executing its tasks in a spirit of cooperation and teamwork. In addition, in the production of statistics the ESCB has committed to adhere to values such as integrity, competence, efficiency and transparency as set out in the "Public commitment on European Statistics by the ESCB".[5]

This data quality report is a contribution to the "Public commitment on European Statistics by the ESCB". Overall, high quality euro area monetary and financial statistics have been compiled and published for more than a decade. In 2011 and 2012, approximately 60 statistical press releases were issued in the field each year in a timely and punctual manner and in line with the advanced release calendar. All underlying detailed tables and time series were regularly published in the ECB Statistical Data Warehouse and on the ECB's website.

This report is compiled on a biennial basis[6] and is structured as follows; the first section (together with Annex I) presents the main statistical products in the area of euro area monetary

3 A definition and composition of euro area monetary aggregates is provided at: http://www.ecb.int/stats/money/aggregates/aggr/html/hist.en.html
4 Please see: http://www.ecb.int/ecb/legal/pdf/l_1020020112en00240046.pdf
5 For more details, please see: http://www.ecb.europa.eu/stats/html/pcstats.en.html
6 For the last issue of this report published in March 2011 see: http://www.ecb.europa.eu/pub/pdf/other/euroareamonetaryandfinancialstatistics201103en.pdf

and financial statistics, highlighting at the same time quality aspects governing their production; the second section gives an overview of selected initiatives towards the enhancement of quality in 2011 and 2012, while the remaining sections are dedicated to specific analyses in the context of the quality assessment.

1 EURO AREA MONETARY AND FINANCIAL STATISTICS

In line with their Statute, the ESCB and the ECB collect monetary and financial statistics to help them conduct monetary policy, safeguard financial stability and ensure the smooth operation of payment systems. The ECB collects data (and metadata) primarily from the national central banks (NCBs); on occasion, data may also come from some National Statistical Institutes, Eurostat and various other (international) sources such as the Bank for International Settlements, the International Monetary Fund and the Organisation for Economic Co-operation and Development. Data reporting is mainly based on ECB regulations and an ECB Guideline, both of which support the collection of methodologically sound data, in line with internationally accepted standards and classifications. ECB regulations set common harmonised standards to be applied by reporting agents. The ECB guideline applies to statistics not covered by the regulations, and sets reporting standards for national central banks (NCBs) for data transmission to the ECB, but is typically less prescriptive in terms of predefined collection and compilation methods. The data collection is based on highly automated systems and procedures.

Data subject to further processing by the ECB are collected from NCBs according to a fixed and agreed timetable, which reporting agents need to adhere to. The ECB carefully monitors compliance, in particular, with the transmission deadlines.

The ECB's internal compilation procedures include a range of quality checks on the national contributions received and on the euro area aggregates compiled with the aim of detecting potential problems in the national data which may have a negative effect on the quality of the euro area aggregates. These quality checks can be grouped into four main categories: (1) completeness[7], internal and intra-period consistency[8]; (2) external consistency[9] (an example of this is given in Section 3 of this report); (3) revision studies to monitor the magnitude of data revisions, in particular for the monetary aggregates and their counterparts (also presented in Section 4); and (4) plausibility checks.

As regards the data accessibility and dissemination policy, the monetary and financial statistics are released via pre-announced press releases and in regular ECB publications, and are also accessible on the ECB's website.

Annex 1 presents in more detail the main Monetary and Financial Statistics products per quality element (in a tabular format).

7 Completeness checks enable missing series to be detected.
8 Internal consistency checks verify that all linear constraints are correctly applied in the data received, e.g. that the balance sheet balances and the totals and sub-totals add up; intra-period consistency implies that the sum of the monthly transaction values equals the quarterly values and that end-year stocks equal end-December stocks.
9 For example, the balance sheet statistics received by the ECB on the cross-border positions of euro area banks are compared with similar data collected by the Bank for International Settlements (BIS).

2 MAIN INITIATIVES ENHANCING THE QUALITY OF MONETARY AND FINANCIAL STATISTICS IN 2011-2012

Two initiatives were launched in 2011 and implemented in 2012 with the aim of enhancing the methodological soundness of data collected, compiled and disseminated. The former related to a new definition for money market funds (MMFs) that was intended to enhance the homogeneity of the MMFs population in the MFI balance sheet statistics. The latter initiative was the exclusion of MFI repurchase agreement (repo) transactions with central counterparties from the monetary aggregates and counterparties, to ensure the appropriate statistical measurement of money.

2.1 NEW DEFINITION OF MONEY MARKET FUNDS ENHANCING THE MFI BALANCE SHEET AND INVESTMENT FUND STATISTICS

Following a public consultation in late 2009, the Committee of European Securities Regulators (CESR, the predecessor of the European Securities and Markets Authority set up in 2011) published its guidelines on a common definition of European MMFs on 19 May 2010. They set out clear-cut quantitative and qualitative criteria to be applied by any fund that wishes to market itself as an MMF, so as to increase transparency for investors. In this context, two definitions were set out reflecting the various types of risk associated with MMFs in general, and very short term ones, i.e. interest rate, liquidity, credit and credit spread risk.

Bearing in mind the different timing and underlying rationales for the establishment of the ECB definition for statistical purposes (set out in 2001) and the CESR's definitions, the ECB decided to align the statistical and supervisory definitions. A fact-finding exercise run in summer 2010 showed that the new definition would (1) provide a clear guidance for the identification of the MMF population, (2) ensure a consistent treatment for statistical and supervisory purposes, and, simultaneously, (3) reduce the burden on both NCBs and national supervisory authorities, and potentially also on the respondents (or their managers).

Hence, in the interest of market transparency and efficiency[10], in August 2011 the ECB Governing Council endorsed the amended Regulation ECB/2008/32, which requires the use of the new supervisory definition of MMFs also for statistical purposes as of 1 February 2012.[11]

An ex-post assessment in early 2012 showed that the overall impact of changes to the reporting population was sizeable and, in terms of outstanding amounts, has led to a reduction of €193.7 billion (18%) of the money market fund sector's total net asset value since July 2011. The impact of the new definition on the monetary aggregate M3 is much smaller and is equivalent to a reduction of about €69 billion, corresponding to 0.7% in terms of M3 outstanding amounts in February 2012, because a major part of the affected MMF shares/units were not held by euro area residents. Furthermore, the impact of the change on transactions and growth rates was taken away by a statistical adjustment. Any residual distortion in the information content of the broad monetary aggregate can, thus, be considered negligible.

10 The statistical definition of MMFs was originally established in order to ensure consistent definitions of the money-issuing and money-holding sectors across Member States so as to compile euro area monetary statistics, and focus on the definition of the "close substitutes for deposits" in the definition of MFIs.

11 See Regulation ECB/2011/12 amending Regulation (EC) No 25/2009 concerning the balance sheet of monetary financial institutions (ECB/2008/32).

A complete measurement of the impact of the change of definition of MMFs on monetary statistics is not possible. Indeed, since 2010, EU MMFs were adapting their investment policies in anticipation of the new supervisory requirements – to either comply with the requirements or to shift to other types of fund categories (e.g. short-term bond funds). At the same time, as a result of low interest rates and increased competition for deposits by banks, the entire MMF industry has been subject to changing market conditions, and this effect cannot be disentangled from the impact of the regulatory change.

Finally, MMFs which were removed from the MFI population mostly joined the investment funds population (typically in the category of bond funds) and report for the related statistics. Overall, the new statistical definition has helped harmonise the statistical definition and treatment of MMFs and other investment funds across Europe, and made better aligning statistical and supervisory classifications and related reporting less burdensome.

2.2 THE ADJUSTMENT OF MONETARY STATISTICS TO EXCLUDE REPURCHASE AGREEMENT TRANSACTIONS WITH CENTRAL COUNTERPARTIES, ENHANCING MONETARY AGGREGATES AND COUNTERPARTS

The statistical measurement of broad money (M3) and credit to the private sector has been amended to exclude MFI repurchase agreement (repo) transactions with central counterparties. According to the decision taken by the ECB Governing Council, the change to the monetary statistics took place with the September 2012 release and was applied retroactively to monetary aggregates as of June 2010 inclusive.

The reason for implementing the adjustment of MFI repos with CCPs is that, in accordance with international statistical standards, the latter are classified within the "other financial intermediaries" institutional sector and are, thus, part of the "money holding sector" for monetary statistics purposes. However, MFI repos with CCPs represent different legs of a multi-party financial intermediation scheme, which MFIs use to carry out inter-bank lending transactions in a secured way. Although positions with euro area CCPs are deposits and loans vis-à-vis the "other financial intermediaries", a fact-finding exercise showed that the ultimate borrowers and lenders in the transactions are MFIs in nearly all cases. Hence, the interpretation of monetary figures has been facilitated by the exclusion of these transactions with euro area CCPs from the monetary aggregates. For a more exhaustive discussion on the CCP adjustment, please refer to the relevant box published in the September 2012 ECB Monthly Bulletin (page 28)[12].

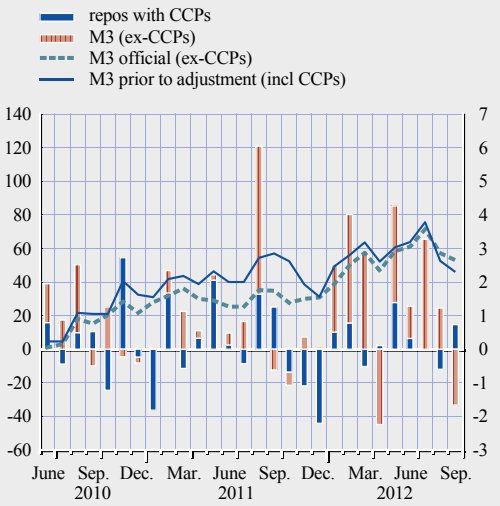
In terms of data revisions, the following euro area series, published in Table 2.3 of the euro area statistics section of the ECB Monthly Bulletin, were adjusted for MFI repos with CCPs starting with reference period June 2010 inclusive. On the liabilities side (i.e. euro area MFIs as the cash borrower), repo transactions with CCPs have been excluded from the balance sheet item "repurchase agreements", as well as from the monetary aggregates M3 minus M2 and M3. Conversely, on the asset side (i.e. euro area MFIs as the cash lender), reverse repo transactions with CCPs have been correspondingly excluded from "credit to other euro area residents" and "loans to the private sector". These items are instead included in the residual category "other counterparts of M3" (along with excess of inter-MFI liabilities and other residual positions). However, MFI (aggregated and consolidated) balance sheet statistics remain consistent with international statistical standards and are not adjusted for repos involving CCPs.

12 http://www.ecb.europa.eu/pub/pdf/mobu/mb201209en.pdf

To adjust and revise monetary aggregates and counterparts, data for outstanding amounts were revised by subtracting from the old outstanding amounts (i.e. not adjusted), the stock of (reverse) repos with CCPs for all periods after June 2010 inclusive. In order to ensure that transactions remain unaffected by the level shift generated by the revision, a reclassification adjustment is calculated for June 2010. Details on the calculations are shown in Box 1. The impact of this adjustment on the broad monetary aggregate is sizeable and, in particular, amounts to a downward revision of the euro area M3 outstanding amounts by €214 billion in June 2010. However, the largest impact of this adjustment is on the volatility of the monthly flows. Namely, the exclusion of repos with CCPs from broad money reduces the outstanding amounts of M3 by roughly 2% and at the same time reduces the standard deviation of M3 transactions by roughly 24% in the period June 2010 to September 2012. On the other hand, as CCP transactions tend to be very short term and are often reverted in successive months, the observed impact on annual growth rates is rather small. Chart 1 illustrates these findings and, moreover, shows how CCP repo transactions seem to have declined in volume in the course of 2012.

Chart 1 M3 and repos with CCPs

(Monthly transactions in EUR billions and annual growth rates, seasonally adjusted)



Source: ECB.

Box 1

ADJUSTMENT OF MONETARY AGGREGATES AND COUNTERPARTS FOR REPO/CCP TRANSACTIONS

Outstanding amounts:

$$L^{*}_{i,t} = \begin{cases} L_{i,t} & \text{for } t < \text{June 2010} \\ L_{i,t} - L_{CCP,t} & \text{for } t \geq \text{June 2010} \end{cases} \quad (1)$$

Reclassification adjustments:

$$C^{*}_{i,t} = \begin{cases} C_{i,t} & \text{for } t < \text{June 2010} \\ C_{i,t} - C_{CCP,t} - L_{CCP,t-1} & \text{for } t = \text{June 2010} \\ C_{i,t} - C_{CCP,t} & \text{for } t > \text{June 2010} \end{cases} \quad (2)$$

Index of notional stocks:

$$I_{i,t} = \begin{cases} I_{i,t-1} \cdot \left(1 + \dfrac{F_{i,t}}{L_{i,t-1}}\right) & \text{for } t < \text{June 2010} \\ I_{i,t-1} \cdot \left(1 + \dfrac{F^{*}_{i,t}}{L_{i,t-1} - L_{CCP,t-1}}\right) & \text{for } t = \text{June 2010} \\ I_{i,t-1} \cdot \left(1 + \dfrac{F^{*}_{i,t}}{L^{*}_{i,t-1}}\right) & \text{for } t > \text{June 2010} \end{cases} \quad (3)$$

Legend:

$L^*_{i,t}$ = outstanding amounts of aggregate i at time t, adjusted for CCP

$L_{i,t}$ = outstanding amounts of aggregate i at time t, not adjusted for CCP

$L_{CCP,t}$ = outstanding amounts of position vis-à-vis CCPs

$C^*_{i,t}$ = reclassification adjustment of aggregate i at time t, adjusted for CCP

$C_{i,t}$ = reclassification adjustment of aggregate i at time t, not adjusted for CCP

$C_{CCP,t}$ = reclassification adjustment of position vis-à-vis CCPs

$I_{i,t}$ = index of notional stocks of aggregate i at time t

$F^*_{i,t}$ = transactions of aggregate i during month t, adjusted for CCP

$F_{i,t}$ = transactions of aggregate i during month t, not adjusted for CCP

3 EXTERNAL CONSISTENCY OF THE MFI BALANCE SHEET STATISTICS WITH BALANCE OF PAYMENTS STATISTICS

A quantitative comparison between the balance of payments (b.o.p.) and MFI balance sheet datasets has so far only been included in the euro area b.o.p./international investment position (i.i.p.) quality reports.[13] Starting with this edition, the comparison of the two datasets is done yearly on an alternating basis, featuring this year in this report and next year in the b.o.p. report. The methodology and scope differ from the previous b.o.p. analysis in the sense that ratios and cumulative discrepancies are used for comparison. The focus lies on loans, deposits and non-euro cash holdings, while leaving debt securities aside.

Even though, in principle, both MFI balance sheet and b.o.p. statistics comply with international statistical standards, differences can be identified with regard to their practical implementation, including the use of different statistical sources, timeliness of the data reporting and simplifications in one or the other reporting system, which are accepted for the sake of minimising the reporting burden. In terms of compilation systems, the b.o.p. transactions for the MFI sector are reported directly by the MFIs in some countries, whereas in the Bank for International Settlements (BIS) data, transactions are derived from differences in stock data (adjusted for reclassifications, foreign exchange rate changes and price revaluations).

The forthcoming implementation of the revised European System of Accounts (ESA 2010) in the MFI balance sheet statistics and the current update of international statistical standards for b.o.p. will help reduce differences. This is the case for (i) borderline cases of financial instrument categories between loans and securities, as well as between securities and derivatives, (ii) recording

13 http://www.ecb.int/pub/pdf/other/euroareabalanceofpaymentsiipstatistics201203en.pdf

of inter-company financing, (iii) short selling and reverse transactions and (iv) the accrued interest that should be reported together with the asset to which it relates.

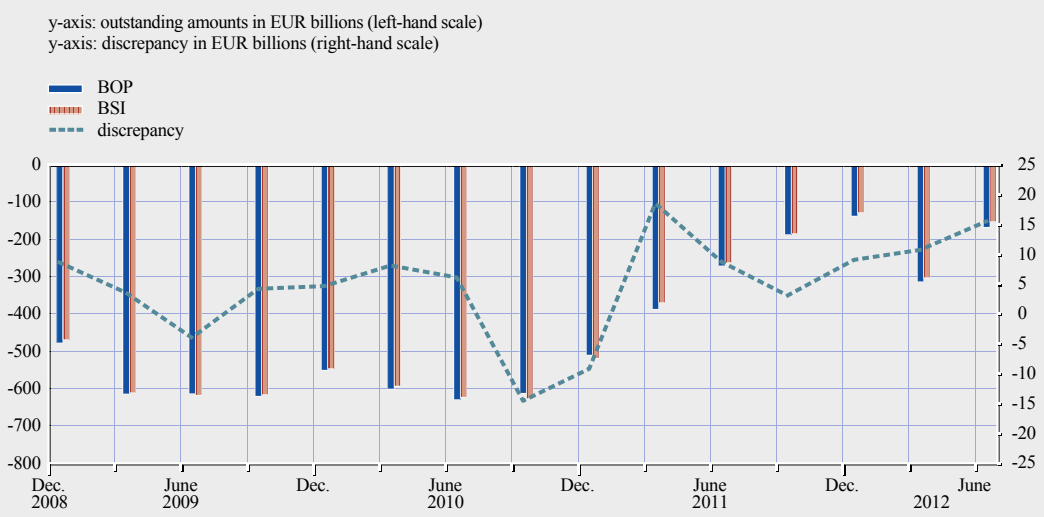
The external data consistency is assessed in this quality report for the reporting sector "other MFIs (excluding the Eurosystem)" and concerns the net flows with non-euro area residents for loans, deposits and foreign currency holdings, as well as flows relating to the holdings of securities issued by non-euro area residents. Securities issued by euro area MFIs (excluding the Eurosystem) to non-euro area residents cannot be compared as this geographic breakdown is not available for the maturity of over two years in the BSI data collection framework.

Annex 2 lists the components used for the comparison of the b.o.p. and MFI balance sheet datasets (an adjustment for different sign conventions in the two datasets has been made). The main methodological differences lie in the positions of "other assets and other liabilities" within the financial account, "other investment", and those direct investments, other capital and positions which are not classified as loans, deposits or currency holdings in MFI balance sheet statistics.[14] In this context, the b.o.p. definitions are somewhat broader, i.e. gross b.o.p. asset and liability positions exceed the BSI numbers; however, the effect of these differences on the net balance of assets and liabilities cannot be directly deducted.

Chart 2 shows the net balance of outstanding amounts between both datasets from the fourth quarter of 2008 to the second quarter of 2012. The discrepancy is measured as the BSI net balance minus the b.o.p. net balance (in absolute terms). Over the comparison period the difference is not systematic, i.e. it has altering signs. The largest difference observed is +18.5 billion, which amounts to 5% of the net balance of outstanding amounts of the BSI data. However, while the net balances

Chart 2 Net balance of outstanding amounts, loans, deposits, non-euro cash holdings, quarterly data

(EUR billions)

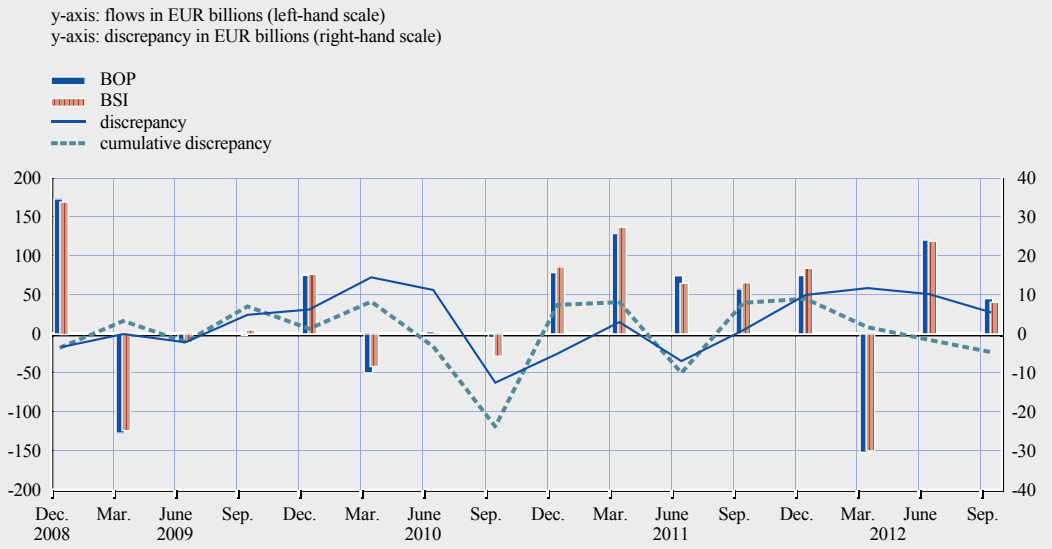


Source: ECB.
Note: The data includes revisions received up to October 2012.

14 Further information on the methodology of MFI balance sheet statistics and balance of payments statistics can be found in the Manual on MFI balance sheet statistics (http://www.ecb.int/pub/pdf/other/manualmfibalancesheetstatistics201204en.pdf) and the IMF's Balance of Payments Manual (BPM6) (for more information please see: http://www.imf.org/external/pubs/ft/bop/2007/bopman6.htm), as well as the ECB Guideline/2004/15, OJ L 354, 30.11.2004, p. 34, and amending Guideline ECB/2007/3, OJ L 159, 20.6.2007. 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 statistics (https://stats.ecb.europa.eu/stats/download/eas_ch07/eas_ch07/eas_note_ch7.pdf).

Chart 3 Transactions in the net balance of loans, deposits and non-euro cash holdings, quarterly data

(EUR billions)



Source: ECB.
Note: Cumulated discrepancies refer to periods from the fourth quarter of 2008; data as of November 2012.

are relatively consistent, this does not allow conclusions to be drawn on the consistency of the gross assets and gross liabilities from which the net balance is derived.

In Chart 3 quarterly net transactions for loans, deposits and non-euro cash holdings for the period from the third quarter of 2008 to the third quarter of 2012 are depicted for BSI and b.o.p. data. The discrepancy is measured as the BSI flow minus the b.o.p. flow. Positive net transactions indicate that the transactions in loans issued to rest of the world plus foreign currency holdings by euro area MFIs exceed deposits received by non-euro area entities. The reverse holds for negative net transactions.

The cumulative discrepancy is the sum of all quarterly differences starting from the first observation in the comparison period. Increasing cumulated differences may be seen as an indication of a systematic difference between the two statistics. Furthermore, in order to provide a measure for the relative size of the observed discrepancies, the ratio of the average absolute differences of flows to the average absolute MFI balance sheet flow is calculated[15]. This ratio is 0.076, which means that on average the absolute difference of net transactions amounts to 7.6% of the average absolute latter flow. This low value suggests that *on average* the difference between the net transactions is small (though deviations in individual periods can of course be greater).

The quarterly discrepancy in net transactions varies from €9 billion to €24 billion. The cumulative discrepancy remained relatively low until the first half of 2010; this indicates that no systematic discrepancy built up for the net outstanding balances during this period. Yet, in September 2010 the cumulative discrepancy peaked at €24 billion, which is much larger than the observed quarterly difference. Thereafter, the cumulative discrepancy returned to the prior low levels, albeit with a somewhat

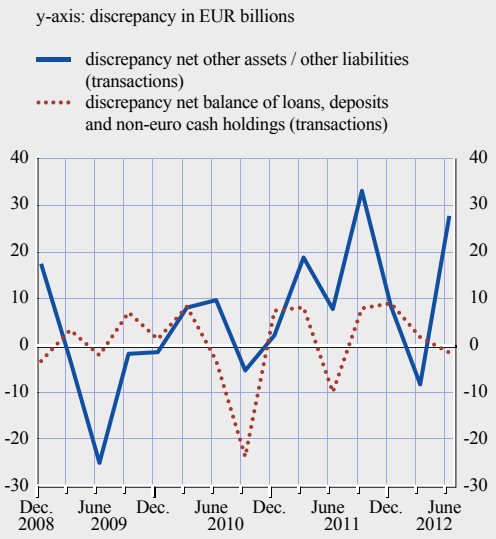
15 The ratio equals the average absolute difference in the net transactions from the fourth quarter of 2008 to the third quarter of 2012 divided by the average absolute BSI flow over the same period.

higher level of oscillation. Comparing monthly instead of quarterly figures for net transactions over the same time span yields the same results as the quarterly comparison. The monthly cumulative discrepancy is identical, which should be the case from a conceptual point of view. The monthly discrepancies have larger spikes than the quarterly ones. This highlights that using a lower frequency smoothens the differences.

The b.o.p. dataset also includes, on a quarterly basis, the geographical breakdown for other assets and other liabilities which conceptually are not included in the BSI data. The b.o.p. quality report found that these positions are partially responsible for discrepancies in the discussed net balance in the period of 2010. This effect can also be seen in the subsequent years; however, the effect is highly volatile and does not correlate significantly with the discrepancies observed for transactions in the net balance. The high volatility stems from the fact that in some quarters the transactions in other assets and other liabilities cancel out. The correlation coefficient for the net effect for transactions in other assets and other liabilities and the discrepancy in transactions derived from the net balance is 0.22. This indicates that there is no strong symmetric movement and thus highlights that other relevant sources of discrepancy exist. See also Chart 4.

Chart 4 Comparison of discrepancies between net other assets / liabilities and net balance of loans, deposits and non-euro cash holdings, transactions, quarterly data

(EUR billion)



Source: ECB.

Overall, the results shown above are in line with the findings of the 2011 b.o.p. quality report in the sense that the discrepancies tend to be of limited size and unsystematic. However, since the second half of 2011 discrepancies have accumulated, possibly pointing to a decreased level of consistency. This is mainly caused by differences occurring in the third and fourth quarters of 2011 and the first quarter of 2012. As shown in Chart 4, this cannot be explained by movements in other assets / other liabilities alone. It remains to be observed in the subsequent quarters whether the developments towards the end of the observation period are reversed again. Alternatively, the more recent inconsistencies may also be reduced in the future based on revisions that are still to be received.

4 REVISION ANALYSIS OF THE EURO AREA MFI BALANCE SHEET STATISTICS

4.1 BACKGROUND

The revision analysis in this section evaluates the reliability of first releases. This is an important quality feature, alongside compliance with harmonised definitions, timely incorporation of methodological changes and consistency with other statistics (e.g. balance of payment statistics). However, it should be noted that low revisions of first estimates are not necessarily an indicator of accurate measurement; revisions are primarily intended to improve statistics.

The revision practice for MFI balance sheet statistics entails few restrictions as in principle it allows data to be revised at any release in order to keep the statistics up-to-date and relevant. The

only restriction is that revisions to the monthly data have to be submitted by NCBs when quarterly statistics are submitted, in order to ensure consistency between the monthly and the quarterly statistics. A distinction is made between "ordinary" and "exceptional" revisions. Data are generally considered "provisional" at first release; therefore, revisions can be expected in the next update at t+1. Data collected quarterly provide more detailed breakdowns and can thus, in principle, lead to the detection of errors in the monthly data and to corresponding revisions. Exceptional revisions owing to reclassifications and improved reporting procedures, for example, can be made at any release.

In the following analysis, the vintages in the ECB's Statistical Data Warehouse (July 2005 to October 2012) covering data for the reference periods June 2005 to September 2012 have been used to analyse monthly data on monetary aggregates and components as regularly published in the press release. This revision analysis updates the one presented in the 2010 Data Quality Report and extends the data range used by 24 months. The method of analysis is presented in Annex 3.

4.2 REVISIONS OF EURO AREA MONETARY AGGREGATES

Revisions to the broad monetary aggregate M3 for the euro area continue to be very small. Overall, 80% of all revisions are less than or equal to 0.05 p.p. After an initial revision has taken place, which usually happens within the first three months after the initial release, there are usually no significant further revisions in the subsequent periods.

Table 1 presents the number of revisions and their range, while Chart 5 shows the revisions to the month-on-month growth rates of M3, both at different lags.

Table 1 Number of revisions of M3 and their range per time lag

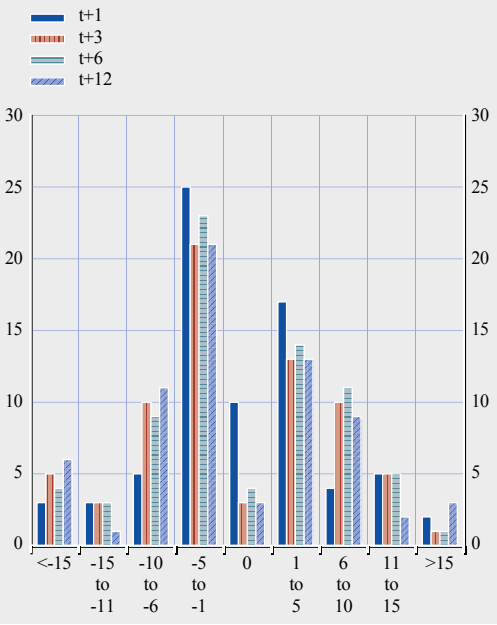
Time lag	No. of revisions	Range (in p.p.)
t+1	52	-0.05 to 0.05
	9	-0.10 to -0.06 and 0.06 to 0.10
	13	≥ +/-0.10
t+3	38	-0.05 to +0.05
	10	-0.10 to -0.06
	10	0.06 to 0.10
t+6	41	-0.05 to 0.05
	20	-0.10 to -0.06 and 0.06 to 0.10
	13	≥ +/-0.10
t+12	37	-0.05 to 0.05
	20	-0.10 to -0.06 and 0.06 to 0.10
	12	≥ +/-0.10

Highest revisions of M3 period-on-period growth rates

Month	M3 period-on-period growth rates
Dec. 09	Revised by -0.18 p.p. at lag t+1
Dec. 09	Revised by -0.20 p.p. at lag t+3 (also at lags t+6 and t+12)
May 10	Revised by +0.20 p.p. at lag t+12
Aug. 11	Revised by -0.32 p.p. at lag t+12
Sep. 11	Revised by -0.20 p.p. at lag t+3 (also at lag t+6 and -0.46 p.p. at lag t+12)
Oct. 11	Revised by +0.28 p.p. at lag t+12
May 12	Revised by -0.30 p.p. at lag t+3 (also at lag t+6)

Chart 5 Revision of M3 growth rate

(number of occurences (y-axis), hundredths of a percentage point (x-axis))



Source: ECB.

The absolute mean of revisions to the M3 growth rate (see Annex 4, Table 1) varies between 0.049 p.p. at lag t+1 and 0.072 p.p. at lag t+12. The bias (simple mean) of the early estimates for the M3 period-on-period growth rates[16] varies between -0.004 at lag t+1 to -0.015 p.p. at t+12.

As in the 2010 version of the report, the average absolute revisions of the month-on-month growth rate of M2 varies between 0.028 p.p. (t+1) and 0.046 p.p. (t+12). The bias of the initial M2 growth ranges between 0.001 and 0.005 p.p. across all lags. All in all, revisions to M2 monthly growth rates have been marginal.

Table 2 Number of revisions of M2 and their range per time lag

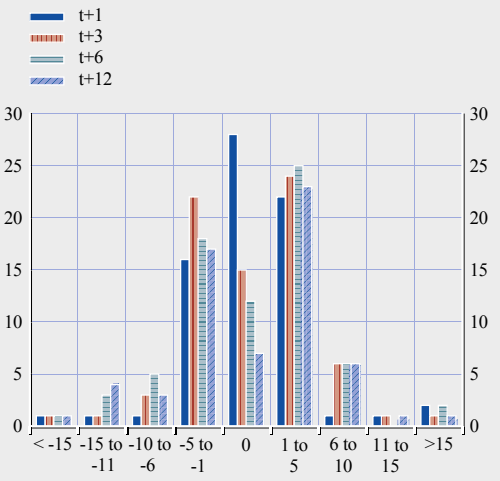
Time lag	No. of revisions	Range (in p.p.)
t+1	66	-0.05 to 0.05
	2	-0.10 to -0.06 and 0.06 to 0.10
	5	≥ +/-0.10
t+3	61	-0.05 to +0.05
	3	-0.10 to -0.06
	6	0.06 to 0.10
t+6	55	-0.05 to 0.05
	11	-0.10 to -0.06 and 0.06 to 0.10
	6	≥ +/-0.10
t+12	47	-0.05 to 0.05
	9	-0.10 to -0.06 and 0.06 to 0.10
	7	≥ +/-0.10

Highest revisions of M2 period-on-period growth rates

Month	M2 period-on-period growth rates
Oct. 09	Revised by 0.11 p.p. at lag t+3 (also at lags t+6 and t+12)
Nov. 09	Revised by -0.15 p.p. at lag t+1 (also at lags t+3 and t+6)

Chart 6 Revision of M2 growth rate

(number of occurences (y-axis), hundredths of a percentage point (x-axis))



Source: ECB.

Chart 7 presents the *revisions of M1 growth rate*. Turning to the number of revisions exceeding 0.15 p.p. in absolute terms, a larger number of these can be observed for M1 than for M2 or M3. As shown in Table 3, contrary to the broader aggregates, exceptional revisions for M1 can also be found for the longer lags.

The absolute mean of the revisions to the month-on-month growth rate of M1 is between 0.042 p.p. at t+1 and 0.071 p.p. at t+12, similar to the 2010 analysis results. The bias was between 0.003 and 0.008 p.p. for all lags. These average revisions are small in comparison to the average month-on-month growth rate of M1, which was 0.55%.

Most of the revisions are sufficiently small to not be visible in the monthly growth rates for the monetary aggregates, which are published at a precision of one decimal: at lag t+1, 61% of all M3 period-on-period growth rates remain unchanged and more than 50% are unrevised compared with the initial release if revisions up to lag t+3 are included. Furthermore, when M3 period-on-period growth rates were revised, only in exceptional cases did the revision exceed 0.1 p.p. The same is

16 The average monthly growth rate is calculated as $avgg = \left\{ \sqrt[35]{\frac{Stock_{Jul\ 12}}{Stock_{Aug\ 09}}} - 1 \right\} \cdot 100$

Table 3 Number of revisions of M1 and their range per time lag

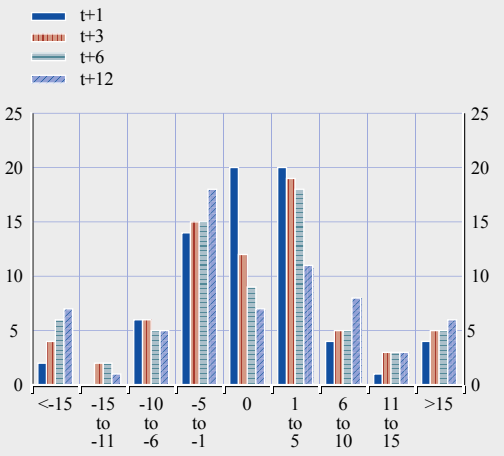
Time lag	No. of revisions	Range (in p.p.)
t+1	54	-0.05 to 0.05
	10	-0.10 to -0.06 and 0.06 to 0.10
	7	≥ +/-0.10
t+3	46	-0.05 to +0.05
	6	-0.10 to -0.06
	5	0.06 to 0.10
t+6	42	-0.05 to 0.05
	10	-0.10 to -0.06 and 0.06 to 0.10
	16	≥ +/-0.10
t+12	36	-0.05 to 0.05
	13	-0.10 to -0.06 and 0.06 to 0.10
	17	≥ +/-0.10

Highest revisions of M1 period-on-period growth rates

Month	M1 period-on-period growth rates
July 10	Revised by 0.085 p.p. at lag t+1
Sep. 10	Revised by 0.25 p.p. at lag t+1 (also at lag t+3, t+6 and t+12)

Chart 7 Revision of M1 growth rate

(number of occurences (y-axis), hundredths of a percentage point (x-axis))



Source: ECB.

true of M1 (70% of published M1 period-on-period growth rates were unchanged at t+1, and more than 55% were not visibly revised at lag t+3) and especially to M2 (83% unrevised at lag t+1, 73% unrevised at lag t+3).

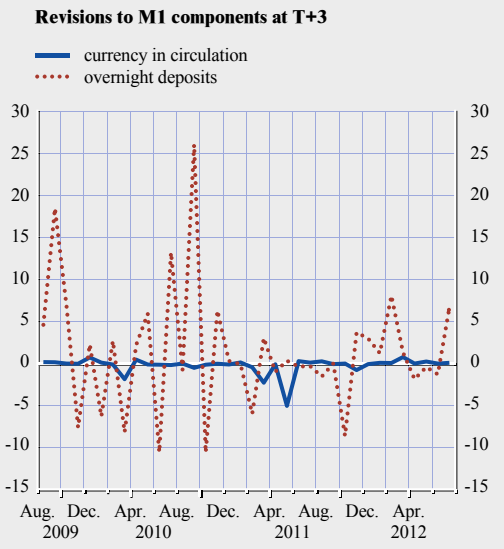
4.3 REVISIONS OF COMPONENTS OF EURO AREA MONETARY AGGREGATES

Revisions to the components of the monetary aggregates are shown below, including information on their development over time. In order to keep the presentation concise, only lag t+3 is shown. This is also because revisions closer to the first data release affect the monetary analysis more than revisions occurring at lag t+6 or later. Furthermore, in order to provide a recent picture of the revisions made, the following graphs show information for only the last three years' observations: from August 2009 to May 2012.

Chart 8 shows the revisions of the month-on-month growth rates of the M1 components: currency in circulation and overnight deposits. The revisions to month-on-month growth rates for currency in circulation are always close to zero. Revisions to overnight deposits are rather narrow and have moved in a corridor of +/- 0.20 p.p., except for the reference period September 2010 (0.26 p.p.), when exceptional revisions in a euro area country caused a deviation.

Chart 8 Revisions to month-on-month growth rates of M1 components

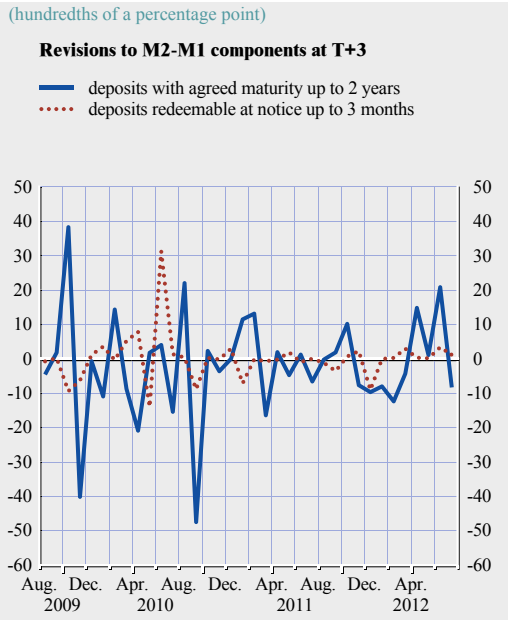
(hundredths of a percentage point)



Source: ECB.

Chart 9 Revisions to month-on-month growth rates of M2-M1 components

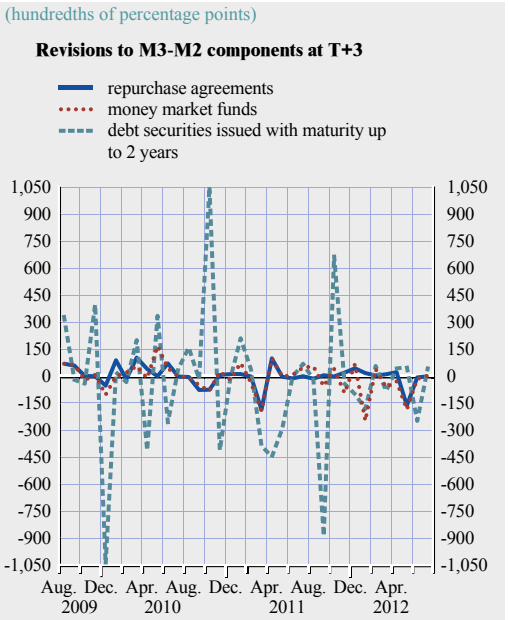
(hundredths of a percentage point)



Source: ECB.

Chart 10 Revisions to month-on-month growth rates of M3-M2 components

(hundredths of percentage points)



Source: ECB.

Chart 9 shows the revisions of the month-on-month growth rates for the components of M2-M1. In the case of deposits with an agreed maturity of up to two years, large revisions occurred for the reference periods October and November 2009. Further exceptional revisions occurred for August 2010, September 2010 and June 2012.

Deposits redeemable at a period of notice of up to three months are comparatively less revised, although revisions exceeded 0.1 p.p. on two occasions. Of these, the revisions to the reference periods May 2010 and June 2010 were exceptionally large.

Chart 10 shows that the month-on-month growth rates of the components of M3-M2 continued to be revised much more than those of the components shown earlier.[17] Of the three series, *repurchase agreements* are typically the least revised, except for three remarkably high revisions, of 1.02 p.p., -1.86 p.p. and -1.63 p.p. for March 2010, March 2011 and May 2012 respectively.[18] The revisions of the growth rates of *money market fund shares/units* show a large upward adjustment for the reference month May 2010 (1.67 p.p.) and two large downward adjustments for the reference months November 2011 (-1.14 p.p.) and January 2012 (-2.66 p.p.). Further exceptional revisions occurred for January and February 2011 and March and April 2012. As regards *debt securities issued*, two very exceptional revisions occurred; the first by -10.40 p.p. and the second by 12.03 p.p. for the reference months December 2009 and October 2010 respectively. These revisions have to be seen in the context of rather large flow movements and relatively small outstanding amounts in the underlying series. This leads to highly volatile month-on-month growth rates. Further exceptional revisions occurred for September and October 2011.

17 The scale of Chart 10 is different from that of Charts 8 and 9.

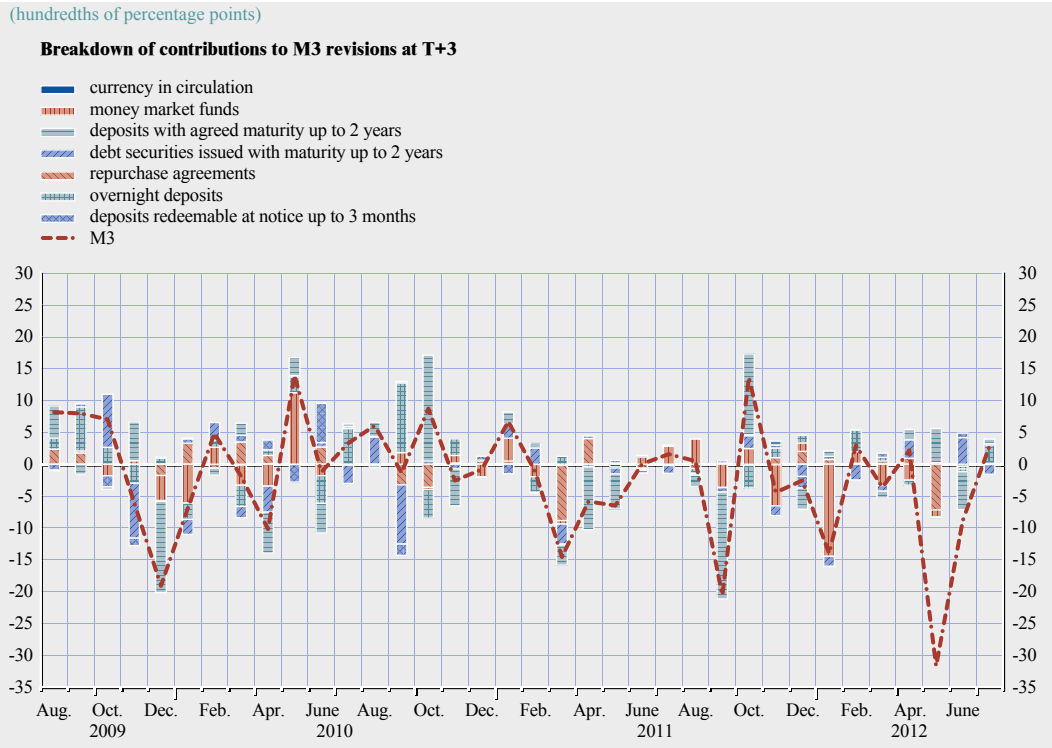
18 Since September 2012 MFI repurchase agreements involving euro area clearing counterparties (CCPs) have been excluded from M3, which has also led to revisions of M3 data to periods from June 2010. The data used for the revision analysis does not include this effect.

4.4 CONTRIBUTIONS TO M3 REVISIONS

In order to assess the contributions of individual instruments to the revisions of M3, the share of each instrument in the aggregate needs to be taken into account. Chart 11 shows that the largest contributions to the overall M3 revisions stem from revisions to debt securities issued, money market funds and overnight deposits.

Chart 11 Contributions of revisions in instruments to overall M3 revisions

(hundredths of percentage points)



Source: ECB.

4.5 OVERALL ASSESSMENT

To sum up, according to the analysis carried out, revisions to the month-on-month growth rates of both the broad monetary aggregate M3 and M2 for the euro area continue to be very small. Overall, 80% of all revisions are less than or equal to 0.05 p.p. The concentration of revisions to the M1 month-on-month growth rate between -0.05 and +0.05 p.p. is 65%, implying that a larger number of revisions exceeding 0.15 p.p. in absolute terms can be observed for M1 than for M2 or M3. Amongst the M3 components, the revisions to debt securities issued are the highest, but have a small impact on M3 due to the fact that the share of this instrument in broad money is only about 2%.

5 QUALITY MEASURES OF THE EURO AREA MFI INTEREST RATE STATISTICS

5.1 BACKGROUND

The Technical Expert Group on MFI interest rate statistics (TEG MIR) was mandated by the Working Group on Monetary and Financial Statistics "to investigate alternative measures of data quality that could potentially substitute the current requirements in Regulation ECB/2001/18 Annex I, part I, section IV, on minimum national sample size". The mandate also clarified that "the TEG MIR should be pragmatic and take into account the easiness to implement and to monitor and the auditability of the approaches considered and solutions proposed".

Initially the TEG MIR tried to investigate the quality of the data through sample theory measures. However, the group encountered significant difficulties in obtaining generally applicable formulae for the cases where the actual reporting population on MIR is based on the selection of the largest institutions. Hence, the group then tried to explore a wide range of possible alternatives. All the alternatives identified approached the issue from a different perspective than pure sample theory. In an attempt to find other possible alternatives, the TEG MIR studied whether direct information, external information or indirect information could be used to estimate maximum errors on the basis of some simple assumptions about the behaviour of non-sampled institutions, as explained below.

5.2 DIRECT INFORMATION ON THE NON-REPORTING INSTITUTIONS

Direct information could in principle be obtained by either running a low frequency census on the non-sampled institutions or by implementing a random sample on those non-sampled institutions. A census would have the advantage of providing full information on rates and business volumes in order to obtain a true measure of the quality of the sample. Alternatively, a random sample could be carried out to estimate the variables of the non-reporting institutions. This sample could be a simple random sample applied to all not regularly sampled institutions.

While both the census and the sample could be run at a low frequency, the TEG MIR considered that the costs implied by a census would be very high and the potential quality of the data provided by non-regular reporters would be questionable. Therefore, it was agreed that the collection of additional direct information from the non-reporting institutions was not a realistic option and should be discarded.

5.3 EXTERNAL INFORMATION ON THE NON-REPORTING INSTITUTIONS

External information on the maximum or minimum rate boundaries could be obtained, in principle, from legal provisions and business practices. Information on the boundaries would permit a maximum error to be estimated on the understanding that non-sampled institutions' rates cannot be above or below such limits.

Research by the TEG MIR into possible sources of this information revealed that, while this approach would be conceptually sound, its practical application would be hindered by the limitations of the available data. External information was only found in respect of a few MIR indicators and particular countries. As a result, the TEG MIR concluded that it was not possible to establish a general rule for the whole euro area on the basis of external information.

5.4 DATA ON SAMPLED INSTITUTIONS APPLIED TO NON-REPORTING INSTITUTIONS

Data on sampled institutions are assumed to represent the whole population and for this reason can be used to estimate the error from the non-reporting institutions. At the same time, approaches based on sampling theory had been explored by the TEG MIR in its previous composition and had already been excluded. Taking these considerations into account, four different ways of using sampled data were discussed by the group. First, it explored whether non-sampled rates could be estimated by applying a regression to the rates and business volumes of the reporting institutions. This approach would be based on the exploitation of a possible correlation between the rates and size of the institution, also considering that the largest institutions are selected for each stratum. The TEG MIR considered that there was not sufficient evidence on this correlation and that, given that the approach could be difficult to apply in practice, this option should rather be discarded.

A second alternative would be to extrapolate the data on small sampled institutions to the non-sampled institutions. This approach was also based on the possible correlation between the size of the institution and the interest rate, and was rejected by the TEG MIR for the same reasons as the previous proposal.

A third approach examined was the possibility of assessing the quality of the sample on the basis of the actual changes in the reporting population, i.e. the impact on interest rates at the time that a revision in the sample takes place. This approach implied some circularity, as the revision in the sample is expected to be based on considerations on the data quality and estimated error, and was not considered appropriate by the TEG MIR.

Finally, as a fourth alternative, the group considered whether the sampled data could be used to establish some boundaries on the possible impact of the non-sampled rates on the basis of simple dispersion measures of the sampled institutions. The sampled data would serve to calculate an estimated maximum boundary of the Mean Absolute Error (MAE) under the assumption that a) there would be a maximum bias from the non-sampled institutions determined by a measure of dispersion of the sampled institutions and b) the possible impact of the dispersion of the non-sampled institutions would not be considered (or assumed to be zero). This fourth approach was considered to be the most promising and was explored further.

5.5 ASSESSING SAMPLING QUALITY IN MIR BASED ON MAE MEASURES

Annex 5 describes in further detail the chosen alternative for measuring the overall data quality on MIR sampling. As mentioned above, this approach consists in constructing a synthetic indicator based on the estimated Mean Absolute Error (MAE) for a particular estimator $\hat{\theta}$. For a given country, this synthetic indicator would provide an aggregated quality measure for all reported series in all the different strata in which the data is collected under some assumptions about the data distribution of non-sampled institutions. Finally, the values of the synthetic indicator applied to the data reported by the NCBs give possible thresholds for considering the data reported to be of good quality.

5.6 RESULTS FOR THE SYNTHETIC INDICATOR AT NATIONAL LEVEL

Each NCB that participated in the MIR quality exercise calculated the $MAE(\hat{\theta})$ as defined in Annex 5.1, on the 43 MIR regulation series for new business and outstanding amounts as required in Regulation ECB/2001/18 and then aggregated for each MIR series to the national

Table 4 New Business MAE synthetic indicators

(average of the 5 periods)

	AT	DE	ES	FR	GR	IE	IT	LT	NL	PL
Q1	1.43	1.40	0.67	1.41	0.14	0.70	1.02	0.51	1.19	0.46
Q3	1.35	1.11	0.60	1.17	0.16	0.88	1.02	0.37	0.56	0.81
Q1 and Q3 mean	1.39	1.25	0.63	1.29	0.15	0.79	1.02	0.44	0.88	0.64

figures. The calculations were made for five different periods: September 2010, December 2010, March 2011, June 2011, and September 2011. A posteriori, these calculations were used to construct a synthetic $MAE_s(\hat{\theta})$ as defined in Annex 5.3, for new business and for outstanding amounts based on the first and third quarter estimators, as agreed by the TEG MIR. The reasons why the rest of the indicators were discarded directly depended on the estimator in consideration. As "outliers" often play a significant role in the construction of statistics, the minimum and maximum indicators should be interpreted as a conceptual extreme term of reference for the MAEs (and not used as actual measures of accuracy); similar caution in the interpretation of the results should be exercised when the 2-standard deviation indicator is considered, as in the weighted distributions the average interest rate increases by two times the standard deviation. The interest rate in this case may end up in outcomes lying outside the distribution of the reported rates and this could imply a very large MAE value for a particular stratum. This outcome may be magnified when the calculus refer to strata composed by a relatively small number of reporting agents.

Moreover, rather than taking the first quarter and the third quarter separately it has been observed that it is better to use the average of both estimators as a measure of central tendency and to avoid possible asymmetries between the two estimators. Tables 4 and 5 provide the results of the synthetic MAE for the mean of the first and third quarter estimators applied for each country. These figures are shown in pure units, as the synthetic MAE does not have a particular unit of measurement.

In order to make the above results comparable, it is necessary to use the synthetic MAE formula to express a threshold in terms of the same units. A threshold for the synthetic MAE can be calculated assuming that the largest MAE dispersion at each stratum is not bigger than 10 basis points, which is the current requirement in Regulation ECB/2001/18 Annex I, part 1, section IV, on minimum national sample size. In that case the formula specified above can be re-written as:

$$MAE_s(\hat{\theta}) = \sum_j \frac{0.1 * B_j}{\sum_j B_j} * \frac{1}{i_{j1} + (1/(1+i_{j1}))} = 0.1 * \sum_j \frac{B_j}{\sum_j B_j} * \frac{1}{i_{j1} + (1/(1+i_{j1}))} \quad (1)$$

Table 5 Outstanding amounts MAE synthetic indicators

(average of the 5 periods)

	AT	DE	ES	FR	GR	IE	IT	LT	NL	PL
Q1	2.40	1.98	0.45	0.87	0.16	1.11	1.87	0.19	0.58	3.76
Q3	2.18	1.95	0.46	0.58	0.18	1.06	1.62	0.23	0.56	2.73
Q1 and Q3 mean	2.29	1.97	0.46	0.73	0.17	1.09	1.74	0.21	0.57	3.25

The expression in (1) can then be used as a possible threshold to assess the quality of each country. The results at national level, obtained by using formula (3) as outlined in Annex 5 are presented for new business and outstanding amounts in the following tables below.

Table 6 New business MAE synthetic indicators

(average of the 5 periods)

	AT	DE	ES	FR	GR	IE	IT	LT	NL	PL
Threshold	4.54	4.26	3.82	3.80	2.43	4.07	3.71	4.81	4.47	2.47

Table 7 Outstanding amounts MAE synthetic indicators

(average of the 5 periods)

	AT	DE	ES	FR	GR	IE	IT	LT	NL	PL
Threshold	4.67	4.07	3.90	3.92	3.60	3.68	4.78	4.98	3.42	2.64

By comparing the results of Table 6 and Table 7 with those presented in Table 4 and Table 5 it can be seen that in all cases the threshold is well above the actual synthetic MAE, i.e. that all countries would comply with their individual threshold estimated by using the 10 basis point limit currently established in the Regulation.

A single common threshold could be established for the whole euro area by taking an average or a figure in the range of 3-5 units. This measure could potentially substitute the current requirements in Regulation ECB/2001/18 Annex I, part 1, section IV, on minimum national sample size.

5.7 ASSESSING SAMPLING QUALITY IN MIR BASED ON BUSINESS VOLUMES

Taking a different perspective, the synthetic MAE is ultimately calculated as a function of interest rates and business volumes. While rates and volumes are combined at stratum level, the relationship between the synthetic MAE as defined above and overall coverage in terms of business volumes (separately reported by NCBs) can be assessed.

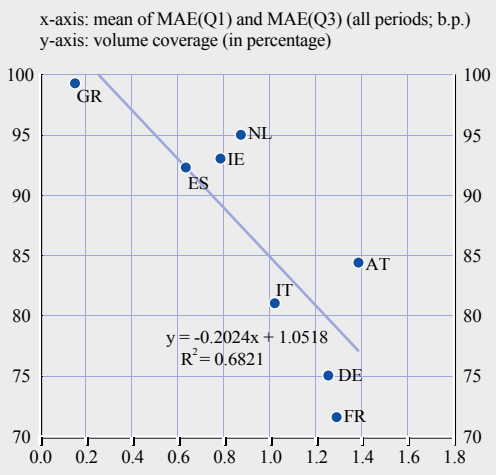
As presented in Chart 12, there is a relevant correlation between the overall volume coverage and the synthetic MAE estimator for the euro area countries participating in the TEG MIR. This relationship between synthetic MAE and volume coverage seems to indicate that there should be no reason to have a synthetic MAE beyond a certain threshold unless the reported volume considerably decreases.

Table 8 Country coverage in terms of business volumes and sampled credit institutions

(percentages)

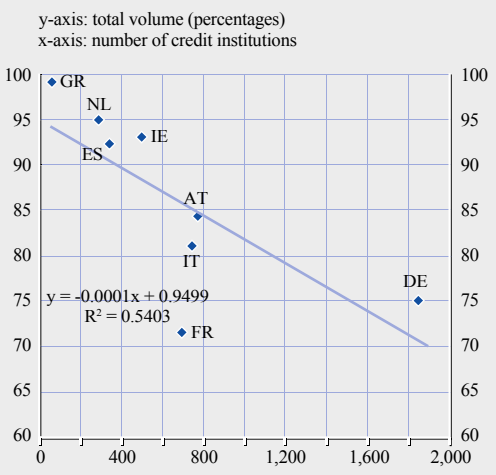
	AT	DE	ES	FR	GR	IE	IT	NL
Total volume	84	75	92	72	99	93	81	95
Percentage of the number of sampled credit institutions	15	12	35	38	56	20	14	18

Chart 12 Country volume coverage vs MAE



Source: ECB.

Chart 13 Total volume sampled and total number of credit institutions (as of May 2012) by country



Source: ECB.

Annex 5 includes also synthetic MAEs for different categories of series, in particular for loans and deposits for households vis-à-vis non-financial corporations.

A possible alternative would be to focus only on the coverage of the total volume data which could be implemented by defining a certain volume threshold. Although this measure would be very easy to calculate, the main disadvantage is that it would ignore rate dispersion and some aspects of the sample features. Table 8 shows that for those EU countries that participated in the TEG MIR exercise, there is in general a high percentage of total volume being covered for MFI interest rate statistics, although in practice this corresponds to the largest credit institutions within a country. If we use the threshold calculated for the MAE of 3 units, which corresponds to the largest MAE observed in the previous section, by using the regression line shown in Chart 12, this would be the equivalent of covering broadly 50% of the total volume.

Chart 13 shows that the number of credit institutions is correlated with the total volume being reported and that, in fact, those countries with a smaller number of credit institutions have greater volume coverage than those countries with a larger number of credit institutions.

In case it is decided that the MIR quality will be assessed on the basis of business volumes, a certain threshold should be defined that would be feasible for all countries based on the current reporting scheme.

5.8 QUALITY CONCLUSIONS ON MFI INTEREST RATES

The TEG MIR revisited the quality in MIR sampling, not by strictly applying sampling theory, but rather by using some simpler assumptions on the possible estimation of errors. The group examined and rejected several alternative approaches to assessing data quality and explored in further detail the possibility of using an estimation of a boundary for the mean absolute error based on the dispersion of sampled data. As a result of its investigations, two possible alternatives have emerged in those cases where the largest reporting institutions are selected as reporting agents. The

first solution relies on statistical analysis by proposing that the sample quality be assessed based on a synthetic MAE measure, which would provide an aggregated quality measure for all reported series for a certain period. This measure appears robust for the five observation periods tested and consistent for all countries that participated in the TEG MIR exercise, and takes into account the possible correlation between MAE and interest rate levels. Furthermore, this approach is consistent with the sample character of MIR reporting, takes into account the dispersion and coverage at the stratum level and would therefore be appropriate for reporting to experts and users. The second alternative would be based on the percentage of the total business volume covered in MIR data collection by country.

ANNEX 1

MAIN MFS STATISTICAL PRODUCTS PER QUALITY ELEMENT

1 Monetary financial institutions balance sheet statistics

Legal basis	Regulation ECB/2008/32.
Data collection and coverage	Data collected by NCBs from reporting agents by means of a modified census.[1)]
Methodological sources	Compliance with ESA95 whenever appropriate and possible, and with special requirements of ECB/2008/32 as well as ECB Manual.
Reporting periodicity and transmission deadlines	Monthly (t+15) and quarterly (t+28).
Revision policy	Data for the most recent reference period is flagged as provisional and may be revised in the following reference period.
Data quality management	A range of quality checks and time-series analyses are performed on both the national and the euro area data.
Compliance monitoring	The compliance of reporting agents with the Regulation is monitored systematically by NCBs and the ECB on a monthly basis.
Dissemination	- Publication of the advance release calendar - Monthly ECB press release - ECB Statistical Data Warehouse - ECB website
Special issues	- MFI balance sheet statistics also serve as a building block for the quarterly integrated (non-financial and financial) euro area accounts. - Work continues to investigate discrepancies in the statistical data included, for example between the net external assets of MFIs in monetary and external statistics, and to reconcile data for specific instruments.[2)]

1) NCBs may grant derogations to MFIs, provided that the MFIs which fully contribute to the monthly consolidated balance sheet account for at least 95% of the total MFI balance sheet in terms of stocks, in each participating Member State. NCBs which grant derogations to small MFIs gross up the data to a full coverage for the purpose of monthly and quarterly balance sheet item statistics.
2) E.g. valuation rules and accrual accounting conceptually differ in some cases between the MFI balance sheet data and the System of National Accounts framework.

2 Securities issues statistics

Legal basis	In accordance with MFS Guideline ECB/2007/9, as amended.
Data collection and coverage	Data are collected by NCBs and BIS from reporting agents; full coverage where possible.
Methodological sources	Compliance with ESA95 whenever appropriate and possible.
Reporting periodicity and transmission deadlines	In accordance with Article 15 of Guideline ECB/2007/9, NCBs should transmit data concerning securities issues statistics at a monthly frequency "no later than five weeks after the end of the month to which the data relate." In practice, this means the first working day of the second month following the reference period.
Revision policy	Revisions are usually received from the countries in the following month and refine data for the previous month(s). Brief explanatory notes for any revisions must clarify the reason for them and their extent.
Data quality management	A range of quality checks and time-series analyses are performed on both the national and the euro area data.
Compliance monitoring	-
Dissemination	Monthly press release. Data also available in the ECB's Statistical Data Warehouse, on the ECB's website and to Eurostat for the month t-2 on the 8th working day.
Special issues	-

3 Payments and securities settlement systems statistics

Legal basis	In accordance with MFS Guideline ECB/2007/9, as amended, also with the use of a number of other sources.
Data collection and coverage	Data collected by NCBs from reporting agents and from DG-P for selected international payment systems; full coverage where possible.
Methodological sources	-
Reporting periodicity and transmission deadlines	In accordance with the MFS Guideline ECB/2007/9 the series shall be reported annually to the ECB, regardless of the underlying data frequency. The ECB shall communicate to the NCBs for each year the precise dates for the data submission in the production round.

Revision policy	In accordance with the MFS Guideline ECB/2007/9 the data providers or the NCBs may perform revisions based on recalculations or on estimates. NCBs shall transmit revisions to the ECB as part of the production round.
Data quality management	A range of quality checks and time-series analyses are performed on both the national and the euro area data.
Compliance monitoring	-
Dissemination	Data available in the ECB's Statistical Data Warehouse and on the ECB's website in September following the end of the reference year. Annual press release in September.
Special issues	-

4 Monetary financial institutions interest rate statistics

Legal basis	In accordance with Regulation ECB/2001/18, as amended by Regulation ECB/2009/7.
Data collection and coverage	Data collected either via a census or using a stratified sampling approach, with the proviso that in the latter case the sample must be constructed in such a way that it is representative of the potential reporting population.
Methodological sources	-
Reporting periodicity and transmission deadlines	In accordance with Guideline ECB/2007/9, as amended by Guideline ECB/2009/23.
Revision policy	Revisions are usually received from the countries in the following month and refine data for the previous month(s).[1)]
Data quality management	A range of quality checks and time-series analyses are performed on both the national and the euro area data.
Compliance monitoring	Monitored systematically by NCBs and the ECB on a monthly basis; in accordance with the non-public Guideline ECB/2010/NP15 and the published Decision ECB/2010/10.
Dissemination	- In accordance with Guideline ECB/2007/9.[2)] - Data available in the ECB's Statistical Data Warehouse and on the ECB's website on the 23rd working day following the end of the reference month.
Special issues	- From MFI interest rate statistics cost of lending indicators have been derived and will be used for macroeconomic forecast purposes. - Alternative measures of data quality relating to the minimum national sample size have been considered by the WG MFS's Technical Expert Group – see Section 5.

1) E.g. data flagged as "provisional" in the previous month are often revised to the status of "actual" data in the following reference month.
2) OJ L 341, 27.12.2007, p. 1.

5 List of monetary financial institutions (MFIs)

Legal basis	In accordance with Guideline ECB/2007/9.[1)]
Revision policy	-
Dissemination	- In accordance with Guideline ECB/2007/9.[2)] - Data available in the ECB's Statistical Data Warehouse and on the ECB's website.
Data quality management	- Regular monitoring is undertaken either through correspondence with NCBs or via automated facilities. - Monitoring measures include checking of foreign branches and a consistency check between the list of MFIs and the list of eligible counterparties for monetary policy operations.
Compliance monitoring	All NCBs fulfilled the MFI ad-hoc updating requirements laid down in ECB/2007/9.
Special issues	-

1) OJ L 341, 27.12.2007, p. 1.
2) Loc. cit.

6 Investment funds balance sheet statistics

Legal basis	In accordance with Regulation ECB/2007/8.
Data collection and coverage	Data collected by NCBs from reporting agents by means of a modified census[1)].
Methodological sources	Compliance with ESA95.
Reporting periodicity and transmission deadlines	Monthly (t+28) and quarterly (t+28).

Revision policy	Data for the most recent reference period is flagged as provisional and may be revised in the following reference period.
Data quality management	A range of quality checks and time-series analyses are performed on both the national and the euro area data.
Compliance monitoring	The compliance of reporting agents is monitored systematically by NCBs and the ECB on a monthly basis.
Dissemination	- Publication of the advance release calendar - Monthly ECB press release - ECB Statistical Data Warehouse - ECB website
Special issues	- IF balance sheet statistics also serve as a building block for the quarterly integrated (non-financial and financial) euro area accounts. - Work continues to extend the external publication of euro area aggregates (i.e. monthly transactions in addition to IF shares/units issued; information on the holdings of IF shares/units issued broken down by counterpart sector).

1) NCBs may grant derogations to MFIs, provided that the MFIs which fully contribute to the monthly consolidated balance sheet account for at least 95% of the total MFI balance sheet in terms of stocks in each participating Member State. NCBs which grant derogations to small MFIs gross up the data to a full coverage for the purpose of monthly and quarterly balance sheet item statistics.

7 List of investment funds (IFs)

Legal basis	In accordance with Guideline ECB/2007/9.[1)]
Revision policy	-
Dissemination	- In accordance with Guideline ECB/2007/9.[2)] - Data available on the ECB's website.
Data quality management	Regular monitoring is undertaken either through dedicated correspondence with NCBs or via automated facilities.
Compliance monitoring	All NCBs fulfilled the IF quarterly updating requirements laid down in ECB/2007/9.
Special issues	-

1) OJ L 341, 27.12.2007, p. 1.
2) Loc. cit.

8 Financial vehicle corporations (FVCs) balance sheet statistics

Legal basis	In accordance with Regulation ECB/2008/30.
Data collection and coverage	- Data collected by NCBs from reporting agents (usually on behalf of FVCs). - NCBs may provide reporting agents with partial derogations to the FVC requirements where data are available from other statistical, public, or supervisory data sources provided that the FVC Regulation data can be derived according to the minimum statistical standards. - Where securitised loans are serviced by MFIs, the FVC reporting requirements may be partially met through direct reporting by MFIs of serviced loans within the BSI framework.
Methodological sources	Compliance with ESA95.
Reporting periodicity and transmission deadlines	Quarterly (t+35).
Revision policy	Data for the most recent reference period is flagged as provisional and may be revised in the following reference period.
Data quality management	- A range of quality checks and time-series analyses are performed on both the national and the euro area data. - Quality checks are performed between the FVC data and securitisation-related data reported within the BSI framework.
Compliance monitoring	-
Dissemination	- Publication of the advance release calendar - Quarterly ECB press release - ECB Statistical Data Warehouse - ECB website
Special issues	- FVC balance sheet statistics also serve as a building block for the quarterly integrated (non-financial and financial) euro area accounts. - A forthcoming update of the FVC Regulation will aim to make the data compliant with ESA 2010, and there will be some additional data requirements.

9 List of financial vehicle corporations (FVCs)

Legal basis	In accordance with Guideline ECB/2007/9.[1)]
Revision policy	-
Dissemination	- In accordance with Guideline ECB/2007/9.[2)] - Data available on the ECB's website.
Data quality management	Regular monitoring is undertaken either through correspondence with NCBs or via automated facilities.
Compliance monitoring	All NCBs fulfilled the FVC quarterly updating requirements laid down in ECB/2007/9.
Special issues	-

1) OJ L 341, 27.12.2007, p. 1.
2) Loc. cit.

ANNEX 2

COMPONENTS USED FOR THE COMPARISON OF THE B.O.P. AND BSI DATASETS

LOANS, DEPOSITS AND NON-EURO CASH HOLDINGS NET

B.O.P.

(-) Financial account, other investment, assets, MFIs (loans, non-euro currency holdings and other assets such as other equity,[19] other accounts receivable and payable).

(-) Financial account, other investment, liabilities, MFIs (deposits and other liabilities such as other equity, pension liabilities in the form of unfunded pension schemes, other accounts receivable and payable[20]).

(-) Financial account, direct investment abroad, other capital, MFIs (includes all financial operations between affiliated companies, borrowing and lending of funds, including debt securities and suppliers' credits between direct investors and subsidiaries, branches and associates).

(-) Financial account, direct investment in the reporting economy, other capital, MFIs (same explanation as above).

BSI

(+) Flows for loans granted by euro area MFIs (excluding the Eurosystem) to non-euro area residents.

(-) Flows for deposits in euro area MFIs (excluding the Eurosystem) by non-euro area residents.

(+) Flows for holdings of cash by euro area MFIs (excluding the Eurosystem), all currencies.

(-) Flows for holdings of cash denominated in EUR by euro area MFIs (excluding the Eurosystem).

19 Equity in quasi-corporations (branches, trusts, limited liability & other partnerships, unincorporated funds, and notional units for ownership of real estate and other natural resources) – if equity is < 10%. Ownership of many international organisations (but when not in form of securities, e.g. BIS) and ownership of currency union central banks – initial subscriptions are recorded as assets of a Member State's economy.

20 This includes accrued liabilities for taxes, purchase and sale of securities, wages and salaries, dividends and social contributions, as well as securities lending fees and gold loan fees.

ANNEX 3

METHOD OF ANALYSIS FOR MONETARY STATISTICS

In order to assess the revisions of the monthly monetary aggregates and components, differences between the revised, non-seasonally adjusted,[21] period-on-period growth rates at a pre-determined lag and the first release are calculated. The period-on-period growth rate is calculated as the ratio of the monthly flow to the respective stock at the end of the preceding period. This can be expressed as the following formula:

$$g = \frac{F_t^{\text{vintage}}}{S_{t-1}^{\text{vintage}}}$$

Furthermore, in order to assess the contributions of different instruments to the revision of M3, the growth rates of M3 components are also rescaled by multiplying them by the ratio of S_{t-1}^{vintage} to the stock of total M3 in the same period. It should be noted that the M3 stock series used to adjust the growth rates (S_{t-1}^{M3}) is the one corresponding to the vintage of September 2012. This can be expressed as the following formula:

$$adjg = \frac{F_t^{\text{vintage}}}{S_{t-1}^{\text{vintage}}} \cdot \frac{S_{t-1}^{\text{vintage}}}{S_{t-1}^{M3}} = \frac{F_t^{\text{vintage}}}{S_{t-1}^{M3}}$$

As an indicator of the magnitude of revisions, the average of the absolute revisions is calculated at each lag (with N reflecting the number of revisions considered):

$$\text{ABSOLUTE MEAN} = \frac{1}{N}\sum_{x=1}^{N}\left|\text{Revision}\right|_x$$

Furthermore, in order to detect whether revisions to first releases suffer from a bias, the average of the differences between the observation value at a certain time lag and the first release is calculated as:

$$\text{SIMPLE MEAN} = \frac{1}{N}\sum_{x=1}^{N}\text{Revision}_x$$

In the text, revisions are expressed in percentage points (p.p.), while in the charts they are expressed in hundredths of percentage points, i.e. a revision of 10 equals a revision of the monthly growth rate of 0.1 p.p. These units were chosen because the vast majority of all revisions of M3 growth are smaller than 0.1 p.p. The revision analysis is therefore carried out at a higher level of precision than for other variables published by the ECB. Furthermore, the revision analysis focuses on month-on-month changes instead of annual changes, in order to better identify the timing of a given revision.[22]

21 While seasonal adjustment factors applied by the ECB are revised when the need arises (usually at annual intervals) and can thus also retroactively alter monetary data, mixing the effect of updating seasonal adjustment factors with the effects of genuine revisions to the raw data would be misleading. This analysis therefore concentrates on the revisions to non-seasonally adjusted data.

22 A revision occurring in a given month may affect two monthly changes and 13 annual changes. Of course, the latter are affected to a lesser extent.

ANNEX 4

BIAS AND REVISION AVERAGES

Table 1 Bias (simple means) and revision averages (absolute means) in euro area monetary statistics (August 2009 to July 2012)

(hundredths of a percentage point, i.e. a value of 1.0 indicates a revision of 0.01 percentage point of the month-on-month growth rate of the respective instrument)

Revisions at:	t+1	t+3	t+6	t+12
Currency in circulation				
Simple mean	0.11	0.21	0.20	0.19
Absolute mean	0.54	0.78	0.83	0.95
Overnight deposits				
Simple mean	0.80	0.89	0.31	0.33
Absolute mean	5.02	6.87	7.93	8.54
M1				
Simple mean	0.69	0.77	0.29	0.30
Absolute mean	4.21	5.75	6.57	7.08
Deposits with agreed maturity up to two years				
Simple mean	-1.41	-1.00	-1.51	-1.21
Absolute mean	6.86	8.42	8.87	10.58
Deposits redeemable at notice up to three months				
Simple mean	1.22	1.02	1.05	1.58
Absolute mean	2.73	3.35	3.61	3.95
M2				
Simple mean	0.37	0.46	0.07	0.27
Absolute mean	2.81	3.61	4.14	4.60
Repurchase agreements				
Simple mean	3.20	-1.42	2.16	0.32
Absolute mean	18.56	26.79	27.26	28.50
Money market fund shares/units				
Simple mean	-5.67	-9.04	-6.27	-4.74
Absolute mean	20.61	30.41	30.21	27.62
Debt securities with maturity up to two years				
Simple mean	-28.03	-37.94	-37.01	-42.33
Absolute mean	131.10	177.58	180.95	203.67
M3				
Simple mean	-0.37	-1.37	-1.00	-1.51
Absolute mean	4.87	6.36	6.37	7.24

Note: Cells marked green (red) indicate a decline (increase) [in absolute value] of 1.0 or more compared with the absolute value from the analysis in the 2010 issue of the quality report.

ANNEX 5

TEG MIR NATIONAL RESULTS

5.1 MAE INDICATOR CONSTRUCTION

A sample which is divided in j stratums can be also theoretically sub-divided into two sub-stratums: j_0 for non-reporting institutions, i.e. the "take-none" substratum, and j_1 for reporting institutions, i.e. the "take-all" sub-stratum of stratum j. For a given estimator $\hat{\theta}$ the total error within a stratum j to estimate the interest rate i_j can be defined as:

$$error\,(\hat{\theta}_j) = (i_{j1} * B_{j1} + \hat{\theta}_{j0} * B_{j0}) / (B_{j1} + B_{j0}) - i_{j1} \tag{1}$$

where i_{j1} is the interest rate calculated from the take-all sub-stratum of stratum j, $\hat{\theta}_{j0}$ is the value of the estimator $\hat{\theta}$ for the take-none sub-stratum of stratum j, on the basis of collected information on j_1, for the estimation of j_0, B_{j1} is the business volume reported for the take-all sub-stratum of stratum j and B_{j0} is the estimated business volume for the take-none sub-stratum of stratum j.[23] The total error within stratum j gives an approximation of the error made to calculate the interest rate i_j taking into consideration the estimated business volume for the non-reporting institutions B_{j0}. In the event that $\hat{\theta}_{j0}$ is known and coincides with i_{j1} or that B_{j0} is zero, i.e. there are no non-reporting institutions, then the total error within the stratum j, i.e. $error\,(\hat{\theta}_j)$, is exactly equal to zero.

Hence, the MAE for a given estimator $\hat{\theta}$ of a particular series can be then defined as:

$$MAE\,(\hat{\theta}) = \frac{\sum_j |error(\hat{\theta}_j)| * (B_{j0} + B_{j1})}{B} \tag{2}$$

where $error\,(\hat{\theta}_j)$ is defined in (1), B_{j1} and B_{j0} are the previous volumes defined in (1) and $B = \sum_j (B_{j0} + B_{j1})$ i.e. the total volume of the MFI institutions. As the name suggests, the MAE is an average of the absolute errors weighted by the total volume of the stratum j. The MAE can be interpreted as a measure for which all the individual differences per stratum are weighted by the volume within each stratum. The main focus is to try to establish some reasonable boundaries to the MAE rather than to try to obtain a fully precise estimation of the variance in accordance with sampling theory.

5.2 DISPERSION MEASURES TO ESTIMATE THE ERROR

The TEG MIR discussed possible values that could be used for the estimator $\hat{\theta}$ in order to measure the MAE in a particular stratum j which is conceptually sub-divided into two sub-stratums j_0, for the non-reporting institutions and j_1, for the reporting institutions. The possible values that were initially considered for $\hat{\theta}$ in a stratum j included:

- the minimum error estimator, i.e. $\hat{\theta}_j = \min_{j1}$, defined as the lowest interest rate reported for the MIR category by the institutions in the stratum;

23 The business volume for outstanding amounts is calculated on the basis of reported figures whereas the business volumes are estimated.

- the maximum error estimator, i.e. $\hat{\theta}_j = \max_{j1}$, defined as the highest interest rate reported for the MIR category by the institutions in the stratum;

- the first and third quartiles, i.e. $\hat{\theta}_j = Q1_{j1}$ and $\hat{\theta}_j = Q3_{j1}$, defined as the lowest interest rate reported for the MIR category that is higher than 25 per cent and 75 per cent, respectively, of the reported volumes in that category by the institutions in the stratum;

- the 2-sigma standard deviation, i.e. $\hat{\theta}_j = (i_{j1} \pm 2\sigma_{j1})$, is the result of adding or subtracting to the stratum weighted average interest rate for the MIR category two times the standard deviation of the rates reported for the MIR category by the institutions in the stratum.

5.3 A SYNTHETIC INDICATOR BASED ON THE MAE

The MAE as defined in the previous section depends on the volatility and the magnitude of each series. Some series could have a bigger MAE which could be due to the magnitude of the interest rates rather than to their level of dispersion. Moreover, since each individual series would have a different MAE it might be very difficult to establish an overall boundary that could be representative for each particular country and series. In addition, those series with a high MAE but with a low volume might distort the overall interpretation. A possible solution to the problem of having an individual MAE for each particular series and to provide at the same time a single MAE figure would be to construct a synthetic MAE by weighting each series for its respective volume and dividing it by its interest rate.

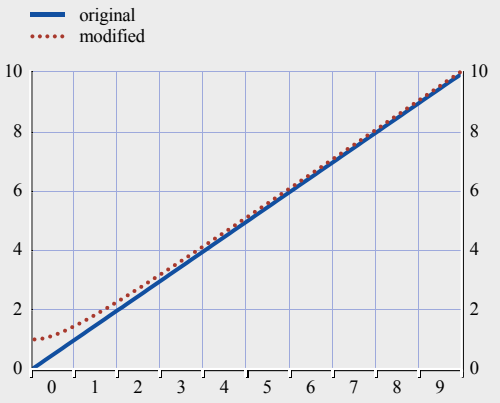
In more detail, the synthetic MAE_s for a given estimator $\hat{\theta}$ in a particular period can be defined as:

$$MAE_s(\hat{\theta}) = \sum_j \frac{MAE(\hat{\theta}_j) * B_j}{\sum_k B_k} * \frac{1}{i_{j1} + (1/(1+i_{j1}))} \qquad (3)$$

where for each series j, $MAE(\hat{\theta}_j)$ is the MAE as defined in the previous section, B_j is the total volume reported $B_j = B_{j0} + B_{j1}$ for this series, and i_{j1} is the (reported) aggregated interest rate of this series for this particular period.

The synthetic MAE aggregates the MAE for individual MIR indicators by first expressing them in relative terms in respect of the interest rate level and by weighting them by their relative business volumes. The expression in terms of the rate level is calculated by using a modified interest rate, i+(1/(1+i)), in the denominator (instead of simply i, in order to avoid a too large effect for those rates very close to zero). As shown in Chart 1, the modified interest rate approaches the original interest rates for high

Chart 1 Original and modified interest rate used in synthetic MAE formula



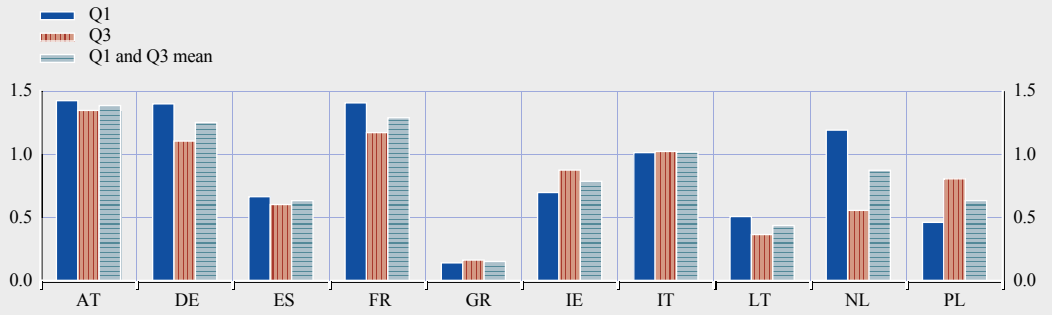
Source: ECB.

interest levels while not going below 1. In this way, the possible impact of very low interest rates on the synthetic MAE is avoided.

This synthetic construction thus represents an efficient way to condense the detailed information on sampling errors for each estimator and series in a single figure. It is noted that the synthetic MAE is expressed in terms of pure units, as the formula includes both rates and volumes in the numerator and the denominator.

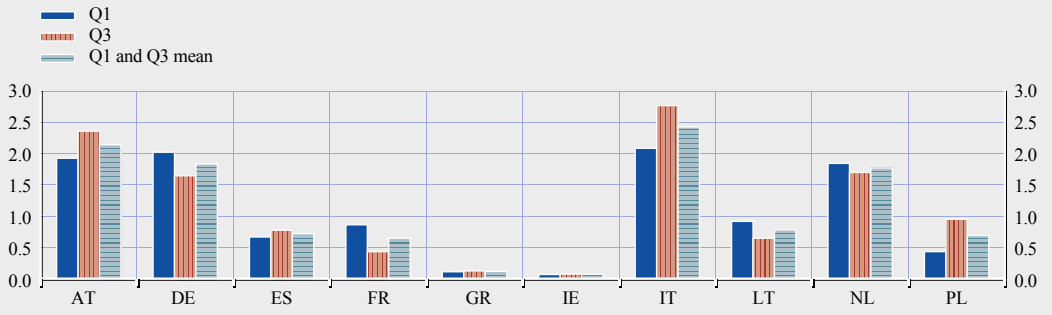
Synthetic MIR series weighted by volume and by interest rates (Total new business)

	AT	DE	ES	FR	GR	IE	IT	LT	NL	PL
Q1	1.43	1.40	0.67	1.41	0.14	0.70	1.02	0.51	1.19	0.46
Q3	1.35	1.11	0.60	1.17	0.16	0.88	1.02	0.37	0.56	0.81
Q1 and Q3 mean	1.39	1.25	0.63	1.29	0.15	0.79	1.02	0.44	0.88	0.64



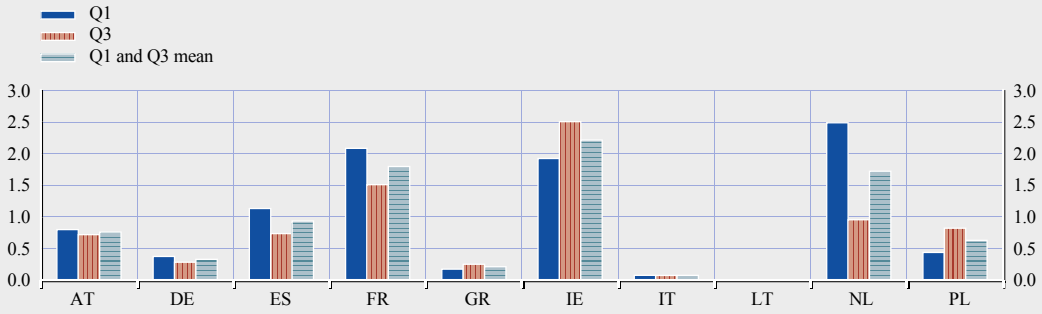
Synthetic MIR series weighted by volume and by interest rates (Deposits to HHs)

	AT	DE	ES	FR	GR	IE	IT	LT	NL	PL
Q1	1.93	2.02	0.67	0.86	0.11	0.06	2.08	0.92	1.84	0.43
Q3	2.36	1.65	0.77	0.43	0.12	0.07	2.77	0.65	1.70	0.95
Q1 and Q3 mean	2.14	1.83	0.72	0.65	0.12	0.07	2.43	0.78	1.77	0.69



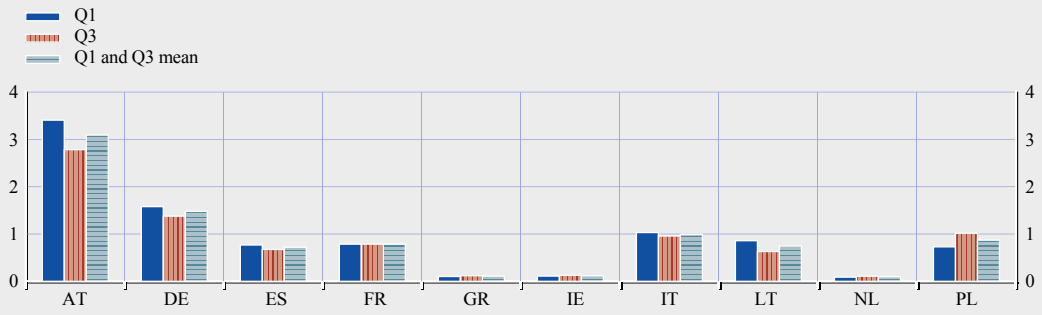
Synthetic MIR series weighted by volume and by interest rates (Deposits to NFCs)

	AT	DE	ES	FR	GR	IE	IT	LT	NL	PL
Q1	0.80	0.37	1.13	2.09	0.17	1.92	0.07	0.00	2.49	0.44
Q3	0.72	0.28	0.74	1.51	0.25	2.51	0.07	0.00	0.95	0.82
Q1 and Q3 mean	0.76	0.33	0.93	1.80	0.21	2.22	0.07	0.00	1.72	0.63



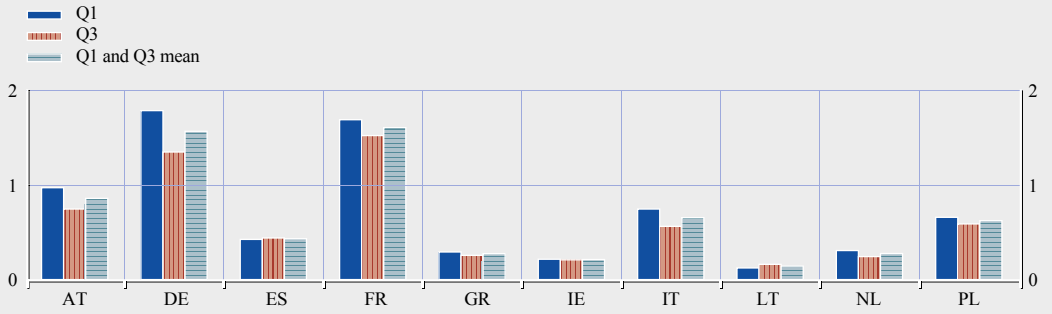
Synthetic MIR series weighted by volume and by interest rates (Loans to HHs)

	AT	DE	ES	FR	GR	IE	IT	LT	NL	PL
Q1	3.41	1.58	0.77	0.79	0.10	0.11	1.03	0.86	0.09	0.73
Q3	2.78	1.38	0.67	0.79	0.12	0.13	0.96	0.63	0.11	1.02
Q1 and Q3 mean	3.10	1.48	0.72	0.79	0.11	0.12	0.99	0.74	0.10	0.87



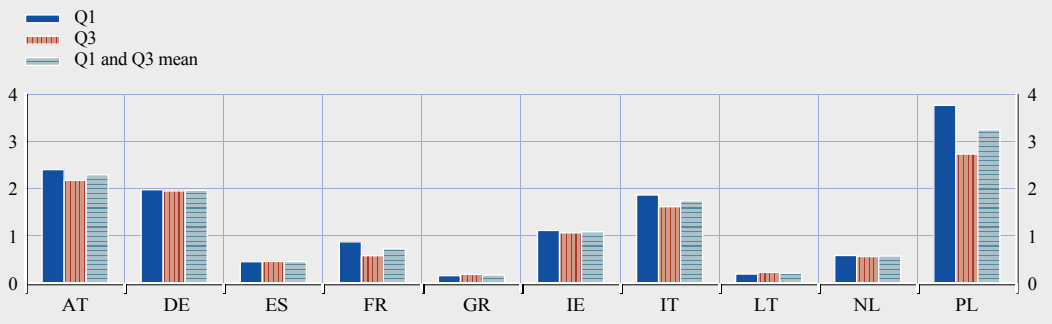
Synthetic MIR series weighted by volume and by interest rates (Loans to NFCs)

	AT	DE	ES	FR	GR	IE	IT	LT	NL	PL
Q1	0.97	1.79	0.43	1.69	0.29	0.22	0.75	0.12	0.31	0.66
Q3	0.75	1.35	0.44	1.52	0.26	0.21	0.56	0.16	0.24	0.59
Q1 and Q3 mean	0.86	1.57	0.43	1.61	0.27	0.21	0.66	0.14	0.28	0.62



Synthetic MIR series weighted by volume and by interest rates (Total outstanding amounts)

	AT	DE	ES	FR	GR	IE	IT	LT	NL	PL
Q1	2.40	1.98	0.45	0.87	0.16	1.11	1.87	0.19	0.58	3.76
Q3	2.18	1.95	0.46	0.58	0.18	1.06	1.62	0.23	0.56	2.73
Q1 and Q3 mean	2.29	1.97	0.46	0.73	0.17	1.09	1.74	0.21	0.57	3.25



Address: Kaiserstrasse 29, 60311 Frankfurt am Main, Germany

Postal address: Postfach 16 03 19, 60066 Frankfurt am Main, Germany

Telephone: +49 69 1344 0; Website: http://www.ecb.europa.eu; Fax: +49 69 1344 6000

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