

Methodological notes to the Press Release on the aggregated balance sheet of credit institutions

In September 2010, the Bank's Statistics area introduced a new processing system to compile monetary statistics. Because the new framework has greater capacity to handle statistical data, it is now possible to directly use individual securities statistics and to execute computing and estimating procedures applied in monetary statistics at the individual level. The methodological developments also rely on extra information made available by collecting monetary statistics from January 2010, in accordance with the new ECB regulation, in addition to the opportunities offered by the new framework.

Key methodological developments

- The multi-dimensional database enables the new system to disaggregate changes in stocks for all instruments separately, at the level of individual data providers.
- In order to avoid an undue increase in the burden on data providers, collections of monetary statistics for 2010 do not include breakdowns into certain instruments, sector or maturity of smaller importance. In contrast with the previous procedures for estimating on an aggregate basis, the system estimates the missing breakdowns using individual data, at the individual level.

Due to the extremely large data processing capacity required by the above, this could not be done in the previous system of compiling monetary statistics.

- In credit institutions' balance sheet, data showing the stocks, foreign currency composition of the securities they issue and the sectoral breakdown of securities holdings are produced using individual data available in the securities statistics in a more accurate way.
- Using more detailed information available in the new data reports available from 2010 and individual securities data, the monetary statistical area compiles data broken down into sector, country group and maturity based on the actual data from the more aggregated data shown in monthly balance sheet reports. The previous system only allowed a procedure based on aggregate, more rough estimates, as in the past money market funds produced detailed balance sheets only once a year. In contrast, the more detailed balance sheet data of mutual funds are available on a monthly basis in the new data collections in 2010. In addition, there was only a limited scope for using securities statistics.

In 2010, individual data in the ISIN registry were adjusted and made consistent, in order to change over to the use of individual securities statistics.

Further methodological changes

Another methodological change, consistent with the IMF's handbook on monetary statistics, is that credit institutions' equity stakes in each other will not be consolidated in the future.

In the consolidated balance sheet of monetary financial institutions (Table 3), the column 'Shares and other equity issued by residents' will also include investments within the credit institutions sector. At the same time, the related adjustments will not be shown in the column 'Excess of inter-MFI liabilities'. This methodological change has been taken back through the entire time series.

The size of this change is equal to the data in the time series for investments within the credit institutions sector, which are included in column No. 20 of 'Aggregated balance sheet of MFIs (S.122)' (Table 2.1) detailing shares and other equity issued by monetary financial institutions.

Another methodological change is the revision of the calculation of the central bank's derivative transactions from the final quarter of 2008. In calculating the forint equivalent of derivative transactions, actual exchange rates were taken into account, instead of average exchange rates applied previously. This was made necessary by the fact that the volatility of the forint exchange rate during the financial crisis diverted actual exchange rates significantly from the

average. All this has caused changes in the transaction tables (1.a.4 and 1.a.5) of the statistical balance sheet of the MNB (S.121), in the columns detailing other assets and other liabilities.

Presenting modified 2010 data collections changes due to the methodological developments

The new processing system has been producing monetary statistics from 1 January 2010, the date when the new data collection framework was introduced. In the time series, the differences between the data produced using the old and new methods are shown among other volume changes.

Other methodological changes

Percentages and ratios are calculated from data without rounding. The sums of sub-totals may not add to total due to rounding.

According to the original definition, net borrowings and repayments as well as net new deposits and withdrawals (collectively: transactions) are the difference between aggregate borrowings and repayments in the case of loans and between aggregate depositing and withdrawals in the case of deposits, which do not include the effects from exchange rate movements and other changes.

Consequently, these transaction data, in principle, can be defined directly by way of observing transactions conducted by economic agents in the reference period. However, this approach would place excessive burden on data providers, therefore, the Bank has chosen to use the so-called balance sheet method (indirect approach) instead of the above method to compiling financial statistics. This means that, instead of directly observing transactions, the effects of revaluations and other changes are subtracted (eliminated) from changes in stocks (closing stock less opening stock) to arrive at the proxies for net borrowing or net repayment as well as net deposit inflows or net withdrawal. Generally, exchange rate changes are generally the most important of these adjustments, therefore, in the press release the expression 'exchange rate adjusted' is used, although all of the other effects (i.e. price changes and other volume changes) are also eliminated, as can be seen in the formula below.

For example, according to the aggregated balance sheet of credit institutions containing not seasonally adjusted data, the table attached to the end of the press release text shows the following data on foreign exchange borrowing by households in October:

Assets	Opening stock	Revaluations and other changes	Transactions	Change in stock	Closing stock
Households (S.14)					
FX loans	5148.5	32.3	-8.2	24.1	5172.6

The difference between the opening and closing stocks (5172.6 less 5148.5) is HUF 24.1 billion, that is, the value of households' FX loans increased. This resulted from two factors: net repayments of HUF 8.2 billion and revaluations and other changes of HUF 32.3 billion. Despite the fact, therefore, that households repaid more FX loans than they borrowed in October, their outstanding borrowing rose, due to an increase caused by revaluations and other changes.

Economic data often exhibit within-year, more or less regular, seasonal, fluctuations, which arise from the dependence of economic activities on the natural environment, calendar differences and variations in the number of days worked. While original data contain the effects of long-term trends, irregular patterns and their periodical occurrence, these regularly occurring effects are eliminated from seasonally adjusted data, and therefore, time series data for adjacent periods are easier to compare. Due to the above, if available, it may

be more useful to analyse seasonally adjusted data in the case of a given statistical series, also taking account of the original data. Accordingly, in the press release and the time series published on its website the MNB also presents the most important statistical series, including the monetary aggregates and transactions in loans and deposits after adjusted for seasonal effects. A feature of seasonal adjustment that cannot be eliminated is the lack of automatic additivity, i.e. that the sum of the seasonally adjusted series for the individual components is not equal to the seasonally adjusted series for the total value of components.

The MNB also presents the most important statistical series, i.e. for the monetary aggregates and transactions in loans and deposits, in seasonally adjusted format both in the press release and as part of the statistical series made available on its website, provided that the results are interpretable in an economic context. The press release does not include the seasonally adjusted series for the entire set of credit institutions' aggregated balance sheet, as the additivity relationships, damaged due to the seasonal adjustment, are of key importance in the balance sheet. It is important to note in order for an accurate interpretation of the seasonally adjusted series in the press release that all statistical series, for example, the totals for forint and foreign currency as well as their totals, as a general rule are also individually seasonally adjusted, i.e. the so-called direct approach is used. Due to the above and as a consequence of using the direct approach (where the components and the aggregated data are seasonally adjusted simultaneously, independently of each other), the sum of the seasonally adjusted values of the individual series is not equal to the seasonally adjusted value of the total.

If we use the *indirect* approach, we only seasonally adjust the individual components and treat the sum of the seasonally adjusted series as the seasonally adjusted value of the aggregate. An advantage of the indirect approach is that the seasonally adjusted data 'can be added together'; however, the seasonally adjusted 'total' series does not provide any additional information compared with the seasonally adjusted series of the 'components'.

For example, in the time series containing original data for net borrowing (net transactions) by non-financial corporations, a net repayment of HUF 139.5 billion appears 'suddenly' in December 2008, after a slight amount of net borrowing. However, a net repayment of HUF 70 billion in October 2008 already appears in the seasonally adjusted time series, followed by HUF 49 billion and HUF 91 billion in November and December, respectively.¹ The simplified interpretation of seasonal adjustment is as follows: although it is true that net borrowing amounted to only HUF 13 billion in October, actually net borrowing 'usually' amounts to HUF 13.1 billion + HUF 70 billion in the same months of the previous period. Accordingly, taking into account the seasonal effects it can be stated the process of net repayment has begun earlier.

¹ The actual numerical data may change slightly from one month to another, due to the mathematical properties of the seasonal adjustment method.

The indirect method is used when the seasonally adjusted 'total' time series data are substantially different from the seasonally adjusted series of the components and such difference is not supported by economic developments.

The formula used to calculate real growth rates (R_t) presented in the press release only takes into account the effects of transactions and eliminates changes in the price level, apart from revaluations and other changes in stock (see, for example, the chart plotting the growth of the monetary aggregates):

$$R_t = \frac{\frac{X_{t-12} + T_{t-11}}{P_{t-11}}}{\frac{X_{t-12}}{P_{t-12}}} \times \frac{\frac{X_{t-11} + T_{t-10}}{P_{t-10}}}{\frac{X_{t-11}}{P_{t-11}}} \times \dots \times \frac{\frac{X_{t-1} + T_t}{P_t}}{\frac{X_{t-1}}{P_{t-1}}} - 1$$

where

t = serial number of the current period

X_t = closing stock at time t

T_t = transaction in the t^{th} time period

P_t = relative price level in the t^{th} time period (average of 1995=100)

When interpreting the trend shown in the chart plotting the growth of households' foreign currency loans in the appendix of charts, it should be borne in mind that the real rate of growth of foreign currency loans moderated up to September 2008 mainly in response to strong increases in the stock values in the denominators in the formula for growth rates. This so-called base effect is the result of the fact that foreign currency borrowing was still at a high level compared to the outstanding stock, as is shown in the chart plotting developments in net borrowing in the press release.

MAGYAR NEMZETI BANK
STATISTICS