Methodological notes to the press release on the aggregated balance sheet of credit institutions

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.

This way, a transaction can be calculated using the following formula:

$$F_t = (S_t - S_{t-1}) - C_t - V_t - E_t$$

where

- $F_t$ = transaction in the $t^{th}$ time period (net amount, the resultant of stock increasing and stock decreasing transactions)
- $S_{t-1}$ = (opening) stock at the beginning of the period
- $S_t$ = (closing) stock at the end of the period
- $C_t$ = other volume changes in the $t^{th}$ time period, e.g. reclassifications
- $V_t$ = change in stock in the $t^{th}$ time period resulting from a change in the market price and loan write-off
- $E_t$ = change in stock in the $t^{th}$ time period resulting from exchange rate movements

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 presents the most important statistical series, i.e. the monetary aggregates and the time series for transactions in loans and deposits, both in the press release and as part of the statistical series available on its website. In addition, the introductory part of the press release generally refers to the seasonally adjusted data. 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, 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 used the indirect approach, we would 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 results are not optimal, and therefore, the ‘total’ seasonally adjusted 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 formula used to calculate real growth rates \((R)\) 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):
\[ R_t = \frac{X_{t-12} + T_{t-11}}{P_{t-11}} * \frac{X_{t-11} + T_{t-10}}{P_{t-10}} * ... * \frac{X_{t-1} + T_t}{P_{t-1}} - 1 \]

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)

In interpreting the trend shown in the chart plotting the growth of households’ foreign currency loans in the appendix of charts, it is important to note 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 borrowing in the press release.

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