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

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Adjustment of liabilities side securities data for repo transactions

Data on debt securities issued by monetary financial institutions, recorded on the liabilities side of their balance sheets, are not adjusted for repo transactions. In the statistical publications, holders of these securities are defined in line with Hungarian accounting standards. Accordingly, such securities are recorded in the balance sheets of the owners of securities accounts, rather than in those of holders of such securities in an economic sense. The same accounting principle is applied in the case of the time series presenting the holding structure of money market fund shares.

Calculating early repayments of foreign currency loans

In the statistics, early repayments of foreign currency loans are recorded as transactions. As with all other publications on monetary statistics, the basis for calculating transactions is the monthly average foreign exchange rate of the MNB, instead of the amount actually paid by households at the early repayment exchange rate defined by the law.

Calculating monthly data on early repayments and loans granted for early repayment

Data on early repayments and loans granted for early repayment are derived from weekly reports, while aggregated balance sheet data are derived from monthly reports. Given that in most cases data for a calendar month cannot be produced by aggregating weekly data, monthly data produced on the basis of weekly reports are estimated, in order to achieve comparability across data.

Monthly volume of early repayments and loans for early repayment = (opening value for the week containing the last day of the month – estimated closing value for previous month) + (closing value for the week containing the last day of the month – opening value for the week containing the last day of the month)*(number of working days of the week containing the last day falling within the month)/(number of working days of the week containing the last day of the month).

Correction of seasonally adjusted loan transactions data due to early repayments

As an effect of early repayments, outstanding debt of households in other currencies – taking into account only transactions – have fallen significantly from October, while forint loans for early repayment have increased. However, these changes cannot be related to any seasonal effect.

If the data to be adjusted were not corrected by data on early repayments and loans for early repayment, it would significantly distort the seasonally adjusted transaction values.

Before seasonally adjusting data, negatively signed transactions data on household loans reported in other currencies are increased by the transaction value of early repayments calculated for a given month, and the time series derived in this way is seasonally adjusted. Finally, the amounts in the seasonally adjusted time series are reduced by the total amount of early repayments.

A similar method is followed in the case of loans granted for early repayment. The calculated transaction values in the 'forint' column are reduced by the amount of loans for early repayment, and the seasonally adjusted amounts, derived by adjusting the corrected time series, are increased by the transaction value of early repayments.

Overall, the effects of early repayments are eliminated in the case of both time series, while the time series containing the transaction amounts continue to be adjusted for other seasonal effects.

Statistical treatment of the change in the definition of money market funds

The European Central Bank, in cooperation with the European Securities Markets Authority, has changed the definition of money market fund. The MNB has been using this new definition for the statistical classification of mutual funds since 1 January 2012.

With the change in definition, 10 mutual funds are no longer classified as money market funds in a statistical sense from 2012. The main balance sheet items of these funds have been reclassified from the sector of money market funds (C6) to the sector of non-money market funds (D3) at the values contained in the table below:

Main balance sheet items of reclassified money market funds, 31 December 2011	HUF billions
Total assets	178.7
Cash and deposits	102.9
Net asset value of mutual fund shares	177.2

Handling repo type transactions in the monetary statistics

At the time of releasing 2011 Q2 data, the MNB published revised balance of payments and financial accounts statistics back to January 2008, due to changes in the treatment of securities repo transactions. Consistent with this, in its press release on 28 October 2011 the Monetary Statistics Area will also issue a revision of credit institutions' aggregated balance sheet data back to 2008 (at the time of releasing data for September 2011).

In international statistical methodology, ownership of the securities does not change in economic terms in a repo transaction or a securities lending transaction, and therefore the value of security assets may not change in statistical publications. In addition, the related cash movements must be recorded as credit or deposit claims or liabilities.

By contrast, the Hungarian statistical standards require that in the case of delivery repos (excluding special purpose delivery repos) and securities lending transactions, security assets should be reduced or increased (i.e. the sale or purchase of a security should be recorded). The balance sheet compiled in accordance with the Hungarian accounting standards is the basis for the most important monetary statistical reports. Accordingly, data on repo and securities lending transactions have so far been published in accordance with the Hungarian accounting standards.

In October 2011, a summary of the effects of the revision on monetary statistical data will be published, which will show the changes in securities data as well as asset and liability data separately, consistent with the structure of the various publication tables. These adjustments are detailed in the tables at the end of the methodological notes.

The old tables in the press release on the aggregated balance sheet of credit institutions containing September data, excluding the adjustment for repo and securities lending transactions, will also be published in October 2011.

- **Adjustment of liabilities side securities data for repo transactions**

  Data on debt securities issued by monetary financial institutions, recorded on the liabilities side of their balance sheets, are not adjusted for repo transactions. In the statistical publications, holders of these securities are defined in line with Hungarian accounting standards. Accordingly, such securities are recorded in the balance sheets of the owners of securities accounts, rather than in those of holders of such securities in an economic sense. The same accounting principle is applied in the case of the time series presenting the holding structure of money market fund shares.

Introduction of a new data processing system in the monetary statistics releases

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 times 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 mythological change is the revision of the calculation of the central bank's derivative transactions form 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 band 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 that 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 <u>direct</u> 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):

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

where

t = serial number of the current period
X_t = closing stock at time t
T_t = transaction in the tth time period
P_t = relative price level in the tth 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.

Summary of adjustments for repo-type transactions

All data providers obliged to report their balance sheet data are also required to report data on their repo positions. During the adjustment of positions in repo-type transactions, data provided by credit institutions are adjusted by gross purchase price data reported on their own repo-type transactions.

The published data on the stocks of assets that are shown with a positive sign in the tables below have been increased relative to the originally reported data, while the data shown with a negative sign denote that the aggregate stocks, calculated from the reported amounts, have been reduced.

Transaction and exchange rate effects are calculated after the data adjustment is made.

Adjustments according to types of transaction:

- Repo transaction: delivery repo (excluding special delivery repo), Sale and Buy Back
- Securities lending transaction: collateralised loan provided against cash or miscellaneous collateral, securities lending provided against other collateral and uncollateralised securities lending

Effect of data adjustments on the positions in various repo-type transactions:

- Data provider transfers securities under a repo transaction:
    - Increase in the securities position
    - Increase in deposits (repo liability)

- Data provider receives securities under a repo transaction:
    - Decrease in the securities position
    - Increase in loans provided

- Data provider transfers securities under a securities lending transaction:
    - Increase in the securities position
    - Decrease in loans provided

- Data provider receives securities under a securities lending transaction:
    - Decrease in the securities position
    - Decrease in borrowing

- Securities positions are adjusted in the currency denomination of securities, according to the place of issue, issuing sector and original maturity.

The related stocks of loans/deposits are always adjusted in forints, according to the country and sector of the counterparty as well as the maturity of the transaction.

	2010.											
	Jan.	Febr.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Assets	**91,8**	**175,6**	**170,0**	**63,8**	**53,6**	**26,9**	**54,6**	**57,2**	**67,3**	**-2,3**	**24,3**	**37,9**
Loans	**43,1**	**30,7**	**20,3**	**56,5**	**37,8**	**10,5**	**21,0**	**11,2**	**21,4**	**49,0**	**72,4**	**61,9**
Credit institutions	26,1	14,1	8,0	24,9	18,4	2,5	5,6	1,1	10,9	6,4	28,0	43,7
Other fin.intermediaries and fin. auxiliaries	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Insurance corporations and pension funda	0,0	1,2	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Central government	17,0	15,5	12,2	14,9	9,9	8,0	15,3	10,1	10,6	42,6	44,4	18,2
Non resident credit institutions	0,0	0,0	0,0	16,7	9,5	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Other non residents	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Securities	**48,7**	**144,8**	**149,8**	**7,3**	**15,8**	**16,4**	**33,6**	**46,0**	**45,9**	**-51,2**	**-48,0**	**-24,0**
Debt securities	*61,1*	*156,8*	*159,7*	*20,2*	*24,0*	*24,6*	*43,9*	*55,7*	*55,5*	*-39,6*	*-39,8*	*-15,7*
Central bank	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Central government	61,1	156,8	159,7	27,2	24,0	24,6	43,9	55,7	55,5	-39,6	-39,8	-15,7
Non resident credit institutions	0,0	0,0	0,0	-7,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Shares	*-12,4*	*-12,0*	*-10,0*	*-12,9*	*-8,2*	*-8,2*	*-10,3*	*-9,7*	*-9,6*	*-11,7*	*-8,2*	*-8,2*
Non-financial companies	-11,2	-10,7	-10,0	-10,0	-8,2	-8,2	-10,3	-9,7	-9,6	-10,0	-8,2	-8,2
Credit institutions	-1,2	-1,3	0,0	-3,0	0,0	0,0	0,0	0,0	0,0	-1,7	0,0	0,0
Other fin.intermediaries and fin. auxiliaries	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Insurance corporations and pension funda	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Liabilities	**91,8**	**175,6**	**170,0**	**63,8**	**53,6**	**26,9**	**54,6**	**57,2**	**67,3**	**-2,3**	**24,3**	**37,9**
Deposit, loans	**91,8**	**175,6**	**170,0**	**63,8**	**53,6**	**26,9**	**54,6**	**57,2**	**67,3**	**-2,3**	**24,3**	**37,9**
Non-financial companies	-8,2	-8,2	-8,2	-8,2	-8,2	-8,2	-8,2	-8,2	-8,2	-8,2	-8,2	-8,2
Credit institutions	43,0	28,2	16,5	63,2	35,0	5,1	5,7	1,1	11,5	7,5	27,6	46,1
Other fin.intermediaries and fin. auxiliaries	-1,1	-3,8	-1,7	-3,6	0,0	0,0	-2,0	-1,5	-1,4	-3,4	0,0	0,0
Insurance corporations and pension funda	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Central government	60,0	162,0	165,0	10,0	27,0	30,0	58,0	60,0	60,7	0,0	0,0	0,0
Households	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Non resident credit institutions	-1,9	-2,6	0,4	2,4	-0,2	0,0	1,2	5,8	4,7	1,9	4,9	0,0
Other non residents	0,0	0,0	-2,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0

	2011.								
	Jan.	Febr.	March	April	May	June	July	Aug.	Sept.
Assets	**31,6**	**180,4**	**234,1**	**119,9**	**259,2**	**285,0**	**192,5**	**131,0**	**95,1**
Loans	**57,0**	**76,7**	**34,0**	**41,4**	**30,8**	**38,2**	**35,1**	**76,9**	**53,0**
Credit institutions	43,0	12,5	12,3	7,7	21,3	27,6	21,3	58,3	37,8
Other fin.intermediaries and fin. auxiliaries	0,0	0,0	0,0	0,0	0,0	0,0	0,0	2,0	0,0
Insurance corporations and pension funda	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Central government	14,0	62,4	12,4	24,2	9,4	10,6	13,9	16,5	15,2
Non resident credit institutions	0,0	2,0	9,4	9,5	0,1	0,0	0,0	0,0	0,0
Other non residents	0,0	-0,2	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Securities	**-25,4**	**103,7**	**200,1**	**78,5**	**228,4**	**246,7**	**157,4**	**54,1**	**42,0**
Debt securities	*-13,2*	*115,0*	*210,4*	*89,7*	*238,5*	*255,4*	*166,2*	*62,4*	*50,5*
Central bank	0,0	123,8	125,8	66,9	161,8	170,8	27,0	0,0	0,0
Central government	-13,2	-8,8	84,6	22,8	76,8	84,6	139,2	62,4	50,5
Non resident credit institutions	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Shares	*-12,1*	*-11,3*	*-10,3*	*-11,2*	*-10,2*	*-8,6*	*-8,8*	*-8,3*	*-8,4*
Non-financial companies	-10,3	-10,4	-10,1	-10,0	-9,3	-8,3	-8,3	-8,3	-8,3
Credit institutions	-1,8	-0,9	-0,2	-1,1	-0,8	-0,3	-0,5	0,0	-0,1
Other fin.intermediaries and fin. auxiliaries	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Insurance corporations and pension funda	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Liabilities	**31,6**	**180,4**	**234,1**	**119,9**	**259,1**	**285,0**	**192,5**	**131,0**	**95,1**
Deposit, loans	**31,6**	**180,4**	**234,1**	**119,9**	**259,1**	**285,0**	**192,5**	**131,0**	**95,1**
Non-financial companies	-8,2	-8,2	-8,2	-8,2	-8,2	-8,2	-8,2	-8,2	-8,2
Credit institutions	43,8	13,9	11,5	7,8	21,7	28,2	21,5	61,5	39,3
Other fin.intermediaries and fin. auxiliaries	-3,9	-3,3	-2,0	-2,8	-1,9	-0,4	-0,5	2,7	1,0
Insurance corporations and pension funda	0,0	0,0	0,0	0,0	0,0	0,0	2,7	0,0	0,0
Central government	0,0	0,0	28,9	0,0	0,0	0,0	0,0	53,0	30,0
Households	0,0	0,0	-0,1	-0,1	-0,1	0,0	0,0	0,0	0,0
Non resident credit institutions	0,0	178,0	204,1	123,3	247,7	265,4	177,1	22,0	33,0
Other non residents	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0

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