EUROPEAN CENTRAL BANK

EUROSYSTEM

Cost-of-borrowing indicators[1]

Methodological note

1 Introduction

One of the main uses of MFI interest rate statistics is to analyse the monetary policy transmission mechanism, since these rates are the final link from monetary policy actions to the consumption and investment expenditure of households and non-financial corporations and ultimately prices. Stable, efficient and integrated financial markets are the basis for a smooth transmission of monetary policy within a country or across countries belonging to a monetary union like the euro area.

In the period following the start of Economic and Monetary Union (EMU) at the beginning of 1999 until the beginning of the financial crisis in September 2008 with the default of Lehman Brothers, the rates charged by euro area MFIs to households, mainly for new house purchases, and to non-financial corporations for new loans recorded a low level of dispersion. Even though a certain degree of heterogeneity in MFI interest rates still persisted as a consequence of differences in regulatory and fiscal frameworks across countries, different degrees of competition between banks or differences in the position in the economic cycle across countries, among other factors, the level of integration of the financial markets could be qualified as highly satisfactory[2].

This situation suddenly changed with the eruption of the financial crisis, which fragmented the financial markets of the euro area. This complicates the assessment of the monetary policy transmission mechanism, since in some countries the expansive monetary policy adopted by the ECB during the crisis was mirrored, more or less, by the expected correspondence of growth in bank credit to the non-financial private sectors, while in other countries this variable recorded a much lower response compared with the results foreseen in periods prior to the crisis. These different effects across countries can be explained as follows: on the one hand, *the pass-through of monetary policy decisions to the real economy* experienced before the crisis cannot explain the levels of heterogeneity in bank lending rates during the crisis; on the other hand, *the relative importance of loan instruments* changed with the crisis.

Regarding the *pass-through models* (i.e. models where policy interest rates and market interest rates are considered the most important determinants of retail bank lending rates), they have failed to correctly measure the rate of adjustment of bank

1 Further information on the usage of these indicators can be found in the August 2013 ECB Monthly Bulletin article entitled “Assessing the retail bank interest rate pass-through in the euro area at times of financial fragmentation” ECB Monthly Bulletin article.

2 For more information on the level of integration of the financial markets in Europe, please refer to the Financial integration in Europe annual publications Financial integration in Europe.

lending rates to changes in reference rates, because they do not include risk factors and sovereign debt spreads among the explanatory variables. These two kinds of variables have had a strong impact on bank lending rates in some countries. However, users require less volatile instruments than the broad range of MFI interest rate instrument categories for modelling and forecasting purposes.

With respect to the *relative weight of the different loan instruments*, the financial crisis has increased the relative weight of short-term instruments which in a situation of growing uncertainty cover better credit and interest rate risks than long-term instruments. Regarding bank loans to non-financial corporations, there has been a significant increase in overdrafts and other short-term loans in the countries more affected by the crisis compared with the other countries. Therefore, it is necessary to use a measure of the borrowing costs of non-financial corporations and households which is accurate and more comparable across countries.

The reasons mentioned above have led the ECB together with the NCBs to develop a set of aggregate indicators to measure the cost of borrowing of non-financial corporations and households.

The composite cost-of-borrowing indicators are based on MFI interest rate statistics. Thus there are arguments for using monetary policy econometric models with smoothed rate volatility and which allow the comparison of credit conditions across euro area countries with different household and NFC borrowing structures.

There are four categories of cost-of-borrowing indicators, which are available in the ECB SDW at the euro area and the national levels:

1. Cost-of-borrowing indicator for households for house purchase
2. Cost-of-borrowing indicator for non-financial corporations
3. Cost-of-borrowing indicator for short-term loans to households and non-financial corporations
4. Cost-of-borrowing indicator for long-term loans to households and non-financial corporations

For most countries, the data are available as of January 2003, although for certain countries, due to the lack of backdata, the cost-of-borrowing indicators have only been calculated for a shorter period of time. The indicators are derived following the methodology explained in the following sections.

1.1 Cost-of-borrowing indicator for households for house purchase

The cost of borrowing for households includes only loans for house purchase. Loans for consumption and other purposes have been excluded as they are very volatile and less relevant for macroeconomic projections. “Short-term” refers to loans with an initial period of interest rate fixation of up to one year regardless of maturity.

Accordingly, “long-term” refers to loans with an initial period of interest rate fixation over one year.

This indicator is calculated as a weighted average of MFI interest rates on short-term and long-term loans to households for house purchase, where the new business volumes used are smoothed with a moving average of the previous 24 months’ observations. The precise formula is as follows:

At time t:

$$CB^H = \frac{R^H_{ST}(NB) * \frac{1}{24}\sum_{i=t}^{t-23} V^H_{ST}(NB)_i + R^H_{LT}(NB) * \frac{1}{24}\sum_{i=t}^{t-23} V^H_{LT}(NB)_i}{\frac{1}{24}\sum_{i=t}^{t-23} V^H_{ST}(NB)_i + \frac{1}{24}\sum_{i=t}^{t-23} V^H_{LT}(NB)_i} \quad [1]$$

where:

CB^H is the cost of borrowing for households for house purchase

$R^H_{ST}(NB)$ are interest rates on new business of loans to households for house purchase with a floating rate or an initial rate fixation up to 1 year (MFI interest rate indicator 16)

$V^H_{ST}(NB)$ are volumes of new business of loans to households for house purchase with a floating rate or an initial rate fixation up to 1 year (MFI interest rate indicator 16)

$R^H_{LT}(NB)$ are interest rates on new business of loans to households for house purchase with an initial rate fixation over 1 year (MFI interest rate indicators 17, 18 and 19)

$V^H_{LT}(NB)$ are volumes of new business of loans to households for house purchase with an initial rate fixation over 1 year (MFI interest rate indicators 17, 18 and 19)

1.2 Cost-of-borrowing indicator for non-financial corporations

The aggregated cost-of-borrowing indicator for non-financial corporations is calculated in a similar way to the one for households above, i.e. as a weighted average of rates on short-term and long-term loans to non-financial corporations.

As regards short-term loans to non-financial corporations, the MFI interest rate data on new business do not include overdrafts, revolving loans, or convenience and extended credit. For companies in some euro area countries, these instruments (mainly overdrafts) are however a significant source of short-term finance. Thus, since interest rates on overdrafts are, on average, higher than other short-term bank lending rates, their exclusion tends to lower average short-term rates in these countries. To improve comparability across countries, for cost-of-borrowing purposes, revolving loans and overdrafts and extended credit card credit are incorporated into the calculation of short-term lending rates as described below.

At time t:

$$CB^{NFC} = \frac{\tilde{R}_{ST}^{NFC} * \tilde{V}_{ST}^{NFC} + R_{LT}^{NFC}(NB) * \frac{1}{24}\sum_{i=t}^{t-23} V_{LT}^{NFC}(NB)_i}{\tilde{V}_{ST}^{NFC}(NB)_i + \frac{1}{24}\sum_{i=t}^{t-23} V_{LT}^{NFC}(NB)_i} \quad [2]$$

where:

CB^{NFC} is the cost of borrowing for non-financial corporations

$R_{LT}^{NFC}(NB)$ are interest rates on new business of long-term loans (i.e. loans with interest rate fixation over one year) to non-financial corporations (MFI interest rate indicators 39 to 42; 45 to 48; and 51 to 54)

$V_{LT}^{NFC}(NB)$ are volumes of new business of long-term loans (i.e. loans with interest rate fixation over one year) to non-financial corporations (MFI interest rate indicators 39 to 42; 45 to 48; and 51 to 54)

$\tilde{R}_{ST}^{NFC}$ is the estimated interest rate on new business of short-term loans to non-financial corporations adjusted to take into account overdrafts

$\tilde{V}_{ST}^{NFC}$ is the estimated volume of new business of short-term loans to non-financial corporations slightly inflated to take into account overdrafts, as these are an important source of short-term funding for non-financial corporations. The way to do this is to increase the volume of new business in short-term loans by the share of overdrafts in the total amounts outstanding of short-term loans. When calculating the total amounts outstanding of short-term loans, long-term loans with a residual maturity over one year and interest reset below one year are considered short-term and therefore their amounts are added to the outstanding amounts of short-term loans as taken from BSI statistics.

The estimated volume is calculated as follows:

$$\tilde{V}_{ST}^{NFC} = \frac{1}{24}\sum_{i=t}^{t-23} V_{ST}^{NFC}(NB)_i \times \left(1 + \underbrace{\frac{V_o^{NFC}(OA)}{V_{ST}^{NFC}(OA) + \tilde{V}_{LT,IR<1\ year}^{NFC}(OA)}}_{=\beta}\right) \quad [3]$$

where:

$V_{ST}^{NFC}(NB)_i$ are volumes of new business of short-term loans to non-financial corporations (MFI interest rate indicators 37, 38, 43, 44, 49 and 50)

β is the share of overdrafts in the total amounts outstanding of short-term loans

$V_o^{NFC}(OA)$ is the volume of overdrafts, revolving loans, and convenience and extended credit (outstanding amounts)

$V_{ST}^{NFC}(OA)_i$ are volumes of total short-term loans to non-financial corporations (i.e. loans with contractual maturity up to one year – taken from the BSI statistics)

$\tilde{V}_{LT,IR<1\,year}^{NFC}(OA)$ is the estimated volume of long-term loans with original maturity over 1 year, residual maturity over 1 year and with interest rate reset within a year

$$\tilde{V}_{LT,IR<1\,year}^{NFC}(OA) = \frac{1}{12}\sum_{i=0}^{11}\left(\frac{V_{LT,IR<1\,year}^{NFC}(OA)}{V_{LT}^{NFC}(OA)}\right)_{t-i} \times V_{LT}^{NFC}(OA)_t \quad [4]$$

with:

$V_{LT}^{NFC}(OA)$ as volumes of total long-term loans (loans with original maturity over 1 year) to non-financial corporations (taken from the BSI statistics)

$V_{LT,IR<1\,year}^{NFC}(OA)$ as the real volume of long-term loans with original maturity over 1 year, residual maturity over 1 year and interest rate reset within a year, taken from the BSI statistics

The estimated rate $\tilde{R}_{ST}^{NFC}$ is calculated as follows:

$$\tilde{R}_{ST}^{NFC} = \beta R_o^{NFC}(OA) + (1-\beta)R_{ST}^{NFC}(NB) \quad [5]$$

where:

$R_o^{NFC}(OA)$ are interest rates on overdrafts, revolving loans, convenience and extended credit to non-financial corporations (MFI interest rate indicators 23 and 36)

$R_{ST}^{NFC}(NB)$ are interest rates on new business of short-term loans to non-financial corporations (MFI interest rate indicators 37, 38, 43, 44, 49 and 50)

1.3 Cost-of-borrowing indicator for short-term loans to households and non-financial corporations

$$CB_{ST}^{H,NFC} = R_{ST}^{H}(NB) \times \frac{\frac{1}{24}\sum_{i=t}^{t-23} V_{ST}^{H}(NB)_i}{\frac{1}{24}\sum_{i=t}^{23} V_{ST}^{H}(NB)_i + \bar{V}_{ST}^{NFC}} + \tilde{R}_{ST}^{NFC} \times \left(1 - \frac{\frac{1}{24}\sum_{i=t}^{t-23} V_{ST}^{H}(NB)_i}{\frac{1}{24}\sum_{i=t}^{23} V_{ST}^{H}(NB)_i + \bar{V}_{ST}^{NFC}}\right) \quad [6]$$

where all the components of the formula are already defined in the previous sections 1.1 and 1.2.

1.4 Cost-of-borrowing indicator for long-term loans to households and non-financial corporations

$$CB_{LT}^{H,NFC} = \frac{R_{LT}^{H}(NB) * \frac{1}{24}\sum_{i=t}^{t-23} V_{LT}^{H}(NB)_i + R_{LT}^{NFC}(NB) * \frac{1}{24}\sum_{i=t}^{t-23} V_{LT}^{NFC}(NB)_i}{\frac{1}{24}\sum_{i=t}^{t-23} V_{LT}^{H}(NB)_i + \frac{1}{24}\sum_{i=t}^{t-23} V_{LT}^{NFC}(NB)_i} \quad [7]$$

where all the components of the formula are already defined in the previous sections 1.1 and 1.2.