Box 4

A MEASURE OF THE REAL COST OF THE EXTERNAL FINANCING OF EURO AREA NON-FINANCIAL CORPORATIONS

This box introduces a measure of the marginal real cost of the external financing of euro area non-financial corporations. Such measure provides a synthetic indicator of the cost of financing of non-financial corporate borrowers, which is an important determinant of firms' investment decisions.

The marginal real cost of the external financing of non-financial corporations in the euro area is computed as a weighted average of the real cost of bank lending on new business, the real cost of market-based debt – traded on the secondary market – and the real cost of equity (see Chart 24 in the main text). In this respect, it is important to mention that, under the rather strict assumptions of the Modigliani and Miller (1958) theorem,[1] the actual value of the firm would, in equilibrium, be independent of its capital structure. In this environment the analysis of the development of the different sources of financing – including their costs – would not provide additional informative value for assessing the financing conditions of firms. In the real world, however, there are a number of factors – such as taxes, the existence of different levels of information between borrowers and lenders, or the liquidity of markets – that make the actual value of the firm dependent on its capital structure. Therefore, it may be informative to provide indicators of the cost of financing that reflect the capital structure of firms.

The real-cost-of-external-financing indicator for non-financial corporations has been calculated on a quarterly basis back to 1990. Its components are weighted by their amounts outstanding (corrected for valuation effects) according to the quarterly financial accounts, on the assumption that they reflect the long-term financing structure of euro area non-financial corporations. Its components are deflated by inflation expectations as provided by the Consensus Economics Forecast. Clearly, this indicator could often result in an overestimation of the cost incurred by non-financial corporations, as borrowers tend to take advantage of the less costly financing instruments available and modify their capital structure accordingly.

The real cost of bank lending

For the cost of bank lending of euro area non-financial corporations, a short-term and a long-term MFI lending rate are calculated by weighting single MFI lending rates by their respective amounts outstanding wherever possible.

When calculating the cost of bank lending of euro area non-financial corporations, it should be taken into account that there was a statistical break in the MFI lending rates at the beginning of 2003. This was due to the substitution of the non-harmonised MFI interest rates by the more accurate harmonised interest rate statistics (i.e. the so called MIR rates).[2] As no reliable adjustment of the rates before 2003 is possible for the time being, the difference in the level has not been corrected.

1 See F. Modigliani and M. Miller (1958), "The cost of capital, corporation finance and the theory of investment", American Economic Review, Vol. 48.

2 For further details on the new harmonised statistics, see the box entitled "New ECB statistics on MFI interest rates" in the December 2003 issue of the ECB's Monthly Bulletin.

From 2003, based on harmonised MFI lending rates, the short-term MFI lending rate is a weighted average of:
– overdraft rates and
– floating rates and rates on new loans with an initial rate fixation period of up to one year.

The long-term MFI lending rate is a weighted average of:
– rates on new loans with an initial rate fixation period of over one year and up to five years and
– rates on new loans with an initial rate fixation period of more than five years.

Before 2003, on the basis of non-harmonised MFI lending rates, there was only one short-term MFI lending rate for loans with maturities of up to one year and one long-term rate for loans with maturities of over one year. In order to show the cost of bank lending back to 1990, the non-harmonised long-term MFI lending rate, which dated back to November 1996, was extended backwards on the basis of national retail rates.

In addition, as regards the harmonised statistics, there is a mismatch between the definition of the rates on new business, which are defined according to the initial rate fixation period of the loan, and the amounts outstanding, which are defined by original maturity. Consequently, the weighting of the rates by the corresponding amounts outstanding leads to an implicit assumption of no financing at variable rates. For instance, rates with an initial fixation period of more than five years are weighted by the total amount outstanding of loans with an original maturity of over five years, although part of this amount outstanding might be financed at rates for shorter fixation periods. Accordingly, the weight applied to the long-term rates is likely to be somewhat too high, whereas the weight applied to the short-term rates is likely to be somewhat too low. The impact of this potential bias is probably relatively limited and should not affect developments over time.

Moreover, in the harmonised statistics, the breakdown of the rates is deeper than the breakdown of the amounts outstanding. Consequently, the rates for the credit sizes (up to €1 million and over €1 million) have been weighted by the annual moving sum of the new business volume in these two credit sizes.

As regards the deflation of the nominal cost by inflation expectations, the rates have been deflated on the basis of forward-looking measures covering periods related to the duration of the instruments. Short-term MFI lending rates are deflated by the average Consensus Economics Forecast inflation expectations for this year and the next (leading to an average horizon of around nine months). For the long-term MFI lending rates, two-year-ahead inflation expectations are used in line with empirical evidence.

The real cost of market-based debt

The calculation of the real cost of market-based debt is based on a Merrill Lynch index of the average yield of corporate bonds with a maturity of more than one year issued by euro area non-financial corporations with investment grade ratings (data available since April 1998), corporate bond yields in the six largest euro area countries in the period before April 1998 and a euro-currency high-yield index. National yields are aggregated using GDP weights corresponding to the purchasing power parities in 2001. A distinction between the short-term

and the long-term cost of market-based debt is not provided as there is no appropriate measure of the short-term cost of market-based debt of euro area non-financial corporations.

The indicator is deflated by the inflation expectations provided by the Consensus Economics Forecast, in line with the duration of the corporate bonds, which is broadly five years, on average.

The real cost of equity

The estimation of the real cost of equity of euro area non-financial corporations is measured by the Three-Stage Gordon Dividend Discount model as applied by Fuller and Hsia (1984).[3] This model states that the price of a share is equivalent to the expected discounted sum of all future dividends paid out by the stock. Hence the model is relatively simple and does not account for a number of other factors which could have an impact on stock market prices. In addition, in order to estimate the model, a number of additional assumptions are needed. First, it is assumed that dividends are a constant proportion of earnings so that the expected dividend growth rate can be replaced by the expected future growth rate of earnings. Second, it is also assumed that corporate earnings growth is expected to develop in three stages:

- The first stage includes the first four years. Thomson Financial First Call earnings forecasts by analysts for the Morgan Stanley Capital International (MSCI) EMU stock market index are used as a forecast of the average growth of earnings over the next four years. This average growth rate has been deflated with average inflation expectations over the next four years to attain a real growth indicator.
- The second stage is expected to last for an interim period of eight years, during which a linear adjustment of real corporate earnings growth towards the long-term growth rate is assumed.
- In the third stage, the long-term growth of real corporate earnings is assumed to be constant at 2.25%, which is within the range of the estimate of the trend potential growth of the euro area.

Overall, when estimating the cost of equity via the Three-Stage Gordon Dividend Discount model, it is assumed that the discount rate, which can be decomposed as the sum of a risk-free interest rate and an equity risk premium, can be taken as a proxy for the cost of equity. Against the background of the assumptions taken (for instance, the long-term earnings growth), the measure of the cost of equity is surrounded by higher uncertainty than the other cost-of-financing components. This needs to be kept in mind when comparing the cost of the various financing instruments.

3 For a description of the application of the model to the euro area, see Box 2 in the article entitled "Extracting information from financial asset prices" in the November 2004 issue of the Monthly Bulletin. See also M. J. Gordon, "The Investment, Financing and Valuation of Corporations", Greenwood Publishing Group, 1962, and R. J. Fuller and C.-C. Hsia, "A simplified common stock valuation model", Financial Analysts Journal, September-October 1984.