Box 4

THE COST OF EQUITY IN THE EURO AREA AND IN THE UNITED STATES

This box examines the behaviour of the cost of equity in the euro area and in the United States from a long-term perspective by means of two indicators. The first is the earnings yield, and spans the last 30 years; the second derives from a three-stage specification of the dividend discount model, and covers the period since 1990.

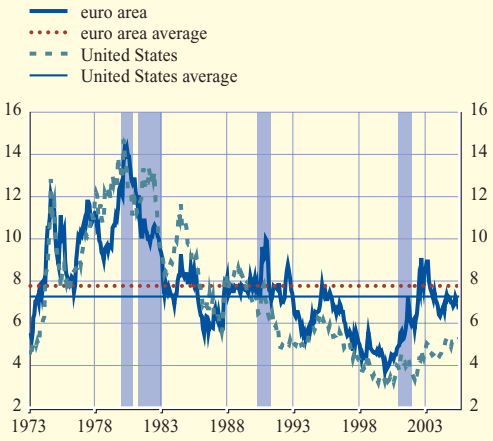
The cost of equity can be defined as the rate of return that investors require for holding a stock. In standard valuation approaches, this rate of return also coincides with the discount rate used to calculate the present value of expected future dividends. Hence, estimating the cost of equity is intrinsically linked to estimating the equity premium. This variable, however, cannot be measured reliably, as evidenced by the huge quantity of literature on the equity premium puzzle.[1] There are, however, at least two common ways to assess the real cost of equity without adopting proxies of the risk premium. One is based on the earnings yield, i.e. the ratio between current earnings and current equity prices, the other on the dividend discount model.

Chart A plots the monthly values of the earnings yield for broad equity indices of the euro area and the United States since January 1973. On average, the indicator was 7.8% and 7.3% in the two areas, respectively. After peaking during the first of the US recessions reported in the chart (January-July 1980) at more than 14% annualised, it started to decrease, reaching historical minima close to 4% at the beginning of 2000. Since then, it has started to rise again and stood at 5.3% in the United States and at 6.9% in the euro area at end-July 2005. In the United States the current level is significantly lower than the average recorded since 1973, while in the euro area it is only slightly below the respective average. Besides being at different levels, the cost of equity in the two economic areas has also evolved differently in recent years. A steady rise has occurred in the United States since the spring of 2002 while, in the euro area, there has been an initial steep rise, between January 2000 and March 2003, followed by a rapid decline and a phase of stability.

1 Simply stated, the puzzle arises from the fact that over the last century, especially for the US market, a broad equity index yielded a much higher real return than bonds and that the gap between the two returns can be reconciled only by implausible levels of the relative risk aversion coefficient.

Chart A Earnings yield in the euro area and in the United States

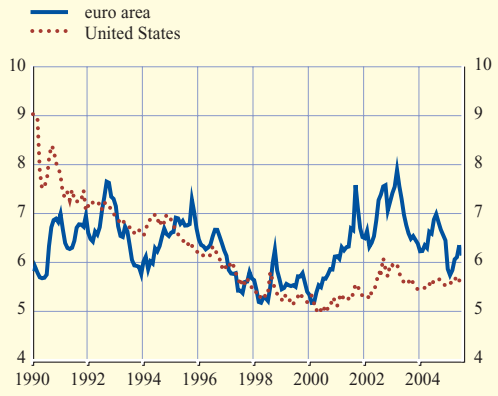
(percentages per annum; monthly data)



Source: Thomson Financial Datastream.
Note: For each economic area the earnings yield is calculated as 100 times the inverse of the price/earnings ratio for the Datastream Global Equity Index. Shaded areas denote US recessions, as determined by NBER.

Chart B Cost of equity in the euro area and in the United States

(percentages per annum; monthly data)



Sources: Thomson Financial Datastream and ECB calculations.
Note: The cost of equity is based on the three-stage dividend discount model.

The simple calculation of the cost of equity via the earnings yield may not take properly into account the influence of business cycle developments on the main economic determinants of equity prices, in particular market participants' expectations of dividend growth. A straightforward way to include this in the analysis is through the Gordon's dividend discount model. As discussed in previous issues of this Bulletin, this model may provide a more accurate estimate of the cost of equity when the original one-stage formulation is extended to a three-stage version.[2] Such a modification allows dividends to grow at a higher rate in an initial period, eventually converging to the long-run growth rate over a pre-defined period, which is generally assumed to be eight years. To estimate the expected dividend growth we rely on earnings forecasts, with a horizon of 3-5 years, provided by market participants and collected by the Institutional Broker's Estimate System (IBES).

Chart B plots the monthly time series of the cost of equity for the euro area and the United States calculated through the three-stage dividend discount model between January 1990, when the IBES survey became available, and July 2005. In the calculations, the nominal expected rates of earnings growth have been converted to real figures by subtracting the expected inflation obtained from Consensus Economics. The real long-run rate of growth of earnings was set at 2.25% per annum for the euro area and at 3.0% for the United States.

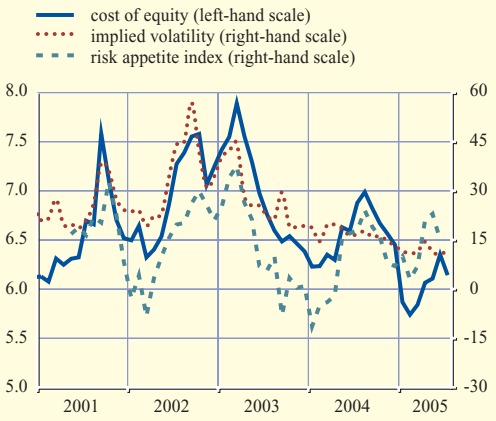
All in all, the results show that the indications derived from the earnings yield are in line, especially for the euro area, with the outcome of the three-stage dividend discount model, at least over the sample analysed. Such estimates of the cost of equity must be used with some caution as they rely on figures for expected earnings provided by market participants, which have been shown to include a sizeable bias. Some light can nonetheless be shed on the plausibility of the estimated cost of equity by relating it with variables which are among its main determinants. In

2 See Box 2 in the November 2004 issue of the Monthly Bulletin and Box 4 in the March 2005 issue.

Chart C, the cost of equity for the euro area, based on the three-stage dividend discount model, is displayed together with the implied volatility of the Dow Jones EURO STOXX 50 index and an indicator of risk appetite.[3] The estimated cost of equity closely tracks the movements of the risk appetite index and equity market volatility. Such findings lend support to the plausibility of the indications provided by the Gordon's scheme. Further support may be obtained by regressing the cost of equity on the two variables reported in Chart C and on the equity market return. The R-squared of the regression is 75%, with the volatility and the risk appetite index having approximately the same weight in determining the movements of the cost of equity. All explanatory variables have the expected sign, i.e. the cost of equity rises with higher volatility and falls with increasing risk appetite and positive stock market returns. Analogous indications are obtained for the US stock market, although the R-squared drops to 50%.

Chart C Cost of equity in the euro area and its determinants

(percentages per annum; monthly data)



Sources: Thomson Financial Datastream, Merrill Lynch and ECB calculations.
Note: The cost of equity is derived from the three-stage dividend discount model. The implied volatility is extracted from the price of options on the Dow Jones EURO STOXX 50 index. The risk appetite index refers to the net percentage balance of respondents to the Merrill Lynch Global Fund Manager Survey.

To sum up, the analysis revealed that, measured through the earnings yield, the cost of equity in the euro area and in the United States was, at the end of July 2005, lower than the averages recorded since 1973, although the recent behaviour has been rather different in the two economic areas. Overall, the three-stage dividend discount model confirms the findings based on the earnings yield and the estimated cost of equity seems to move in line with broad measures of risk, such as equity market volatility and an index of risk appetite.

3 This chart starts in 2001, when the Merrill Lynch risk appetite index became available.