Box 5

Measuring the cost of bank equity in the euro area

Adequately capturing the cost of bank equity is key for regulators, supervisors and banks given the fundamental role of equity in banks' capital structures. At the same time, the cost of equity cannot be directly observed and must be inferred from a combination of market prices and expectations of future cash flows. Indeed, measuring the rate of return investors expect from an investment in bank equity is not straightforward given difficulties in estimating future cash flows and assumptions about
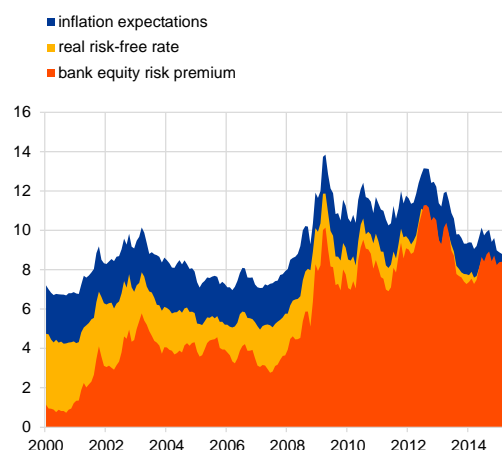
the retention of earnings; a high degree of uncertainty is therefore intrinsic to any estimate of the cost of equity, irrespective of the methodology employed.[20]

Chart A

Banks' equity premia have become the main driver of the cost of equity

Euro area banks' cost of equity and components

(Jan. 2000 – Mar. 2015; percentages)

- inflation expectations
- real risk-free rate
- bank equity risk premium

Chart B

After peaking in mid-2011, the cost of bank equity is now on a declining path

Euro area banks' cost of equity: cross-sectional distribution of individual estimates and European Banking Authority's survey (modal bracket)

(Jan. 2000 – Mar. 2015; interquartile range and 10th/90th percentiles; percentages)

- interquartile range
- 10th/90th percentiles
- median
- EBA survey

One means of inferring the cost of bank equity is by combining insights from the capital asset pricing model and the dividend discount model (CAPM and DDM respectively). Such an approach can be applied to a portfolio of large and listed euro area banks, by imputing the equity risk premium for the whole equity market via the DDM and by projecting this onto individual banks via their respective CAPM beta, thus yielding bank-specific equity risk premia.[21]

The (time-varying) equity risk premium is computed using a two-stage version of the DDM. Dividend growth in the first period is derived from the Institutional Brokers' Estimate System (I/B/E/S), assuming that dividends are a constant fraction of earnings. In the second period, dividend growth converges to the long-term growth expectations for the whole economy over a period of ten years.[22]

Next, bank-specific betas are estimated through the CAPM where the "market portfolio" is proxied by the EURO STOXX index. The choice of using the euro area market as the pricing factor in the

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[20] "Valuing stock markets and the equity risk premium", *Monthly Bulletin*, ECB, November 2008.

[21] The portfolio includes 33 euro area banks included in the EURO STOXX index. These banks account for approximately 55% of euro area banks' total assets and 85% of those of listed banks.

[22] Fuller, R.J. and Hsia, C., "A simplified common stock valuation model", *Financial Analysts Journal*, Vol. 40, No 5, 1984, pp. 49-56. In this model, H = 5, the number of years for which "abnormal" growth rate forecasts are available as reported in the I/B/E/S database. Within ten years, the forecasted growth rate of earnings transits smoothly to the forecasted long-term growth rate (of GDP) as reported by Consensus Economics forecasts.

CAPM is motivated by the (virtual) absence of currency risk and the low cross-border transaction costs that characterise the currency union. Betas are estimated with standard linear regression, on short rolling windows of one year of daily data.[23]

According to model estimates, the beta for the portfolio of listed banks was fairly stable between 2000 and the first half of 2007, ranging between 1.0 and 1.2. Since the eruption of the financial crisis, the quantity of risk carried by bank shares (i.e. banks' beta) constantly increased until it reached 1.7 in the second half of 2012. Consequently, banks' equity premia (orange area in Chart A representing a "beta-amplified" version of the market equity premium) became the main driver of the cost of equity after the crisis, while the risk-free rate continued to drop. The real risk-free rate, which has recently turned negative, contributed to keeping the real and nominal cost of equity subdued in the most recent period. In the last part of the sample, banks' equity premia declined, possibly as a reflection of banks' deleveraging processes. Results for most individual banks currently lie within the 8% to 10% range, i.e. broadly in line with estimates from surveys of financial sector practitioners (Chart B).[24]

Chart C

National developments in banks' cost of equity diverged after 2008

Cost of bank equity in selected euro area countries

(Jan. 2000 – Mar. 2015; percentages)
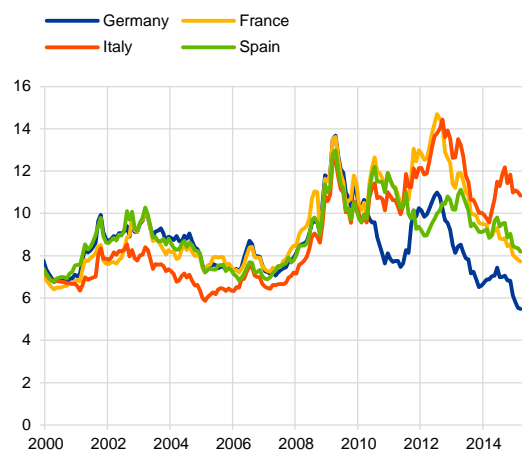
Sources: Bloomberg, Thomson Reuters Datastream and ECB.
Notes: 10 banks are included in the German portfolio of banks, 18 in the French, 18 in the Italian and 10 in the Spanish. Cut-off date: February 2015.

Diverging national developments in the cost of bank equity can be gauged by applying the CAPM to national portfolios of listed banks, weighting each bank by its market capitalisation. Prior to the global financial crisis, the banking sectors of the largest four euro area economies enjoyed similar levels of cost of equity. Following the peak observed after the collapse of Lehman Brothers in November 2008, the cost of equity diverged along country lines (Chart C), displaying considerable fragmentation in recent years. While signs of a gradual reversal to pre-crisis levels can be observed, it is hard to predict where a stable resting point for banks' cost of equity will lie. To the extent that reductions in bank leverage can contribute to containing bank risk and reducing the cost of equity, less-leveraged institutions may experience cheaper equity market access. Nevertheless, in the face of low banking sector profitability and limited progress in leverage ratios (see Chart 3.12), developments in the cost of bank equity continue to require close monitoring in terms of financial stability.

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[23] Fama, E. and MacBeth, J., "Risk, Return, and Equilibrium: Empirical Tests", *Journal of Political Economy*, Vol. 81, No 3, 1973, pp. 607-636.

[24] The majority of respondents to the latest EBA risk assessment questionnaire (December 2014) reported cost of equity estimates in the range of 8-10%, while they reported a 10-12% range in all previous waves. These ranges, presented in Chart B as black squares, embrace a large part of the cross-sectional distribution of our estimates for individual banks.