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RECENT DEVELOPMENTS IN THE COST OF BANK EQUITY IN EUROPE

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ABSTRACT

This article assesses the cost of bank equity in Spain and the euro area since 2007, focusing particularly on the period of the COVID-19 pandemic. There was a marked rise in the cost of equity in March 2020, followed by a decline in the subsequent months. The article assesses the factors responsible for this movement, and compares it against the change in interest rates on alternative bank funding instruments.

Keywords: Cost of equity, bank funding, COVID-19.

JEL classification: G21, G12, E43.

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Introduction

A bank's cost of equity (COE) represents the rate of return that investors expect from an investment in its shares. This variable is key to determining the banking sector's situation, since it is an essential factor for assessing the viability of the business. As this is an unobservable variable, an accurate estimation is crucial. The value of an investment can therefore be calculated as the sum of all of its expected future cash flows, discounted at a rate that compensates for the investment risk. This discount rate is the COE. Therefore, the COE will be the value which equates the discounted expected future flows with the current share price. These future flows may be obtained by investors both through dividend payments and share price growth. For example, a stable price environment would only be sustainable if those banks with the highest cost of equity were to distribute larger dividend amounts, precisely in order to maintain the value of their shares.

This article focuses on assessing the cost of equity in the European banking sector, in particular how it has performed during the COVID-19 pandemic. The second section explains the methodology used to estimate the cost of equity in the banking sector, the third section details recent developments in the cost of equity and the fourth section assesses its main determinants following the COVID-19 outbreak in Europe.

Estimating the cost of bank equity

The methodology used in this article is similar to that employed by other institutions, such as the European Central Bank (ECB).[1] The returns demanded by investors on any asset can be broken down into two factors: the risk-free return on investment and the premium that compensates investors for the risk incurred by investing in that specific risky asset. The risk-free return is usually approximated by the return on a collateralised product (such as swaps) or sovereign debt, as discussed later in this article. The risk premium of each country's banking sector is estimated in two stages.

1 The ECB's *Financial Stability Review,* May 2015, and *Economic Bulletin,* Issue 1/2016, and the Banco de España's June 2016 *Financial Stability Review* and 2017 *Annual Report.*

In the first stage, a dividend discount model is used to estimate the risk premium demanded from a broad market index, in this case the Euro Stoxx stock index. The Euro Stoxx risk premium, or EP, can be calculated using the notion that an asset's price is equal to the discounted value of the expected future dividends. The required discount rate (subtracting the risk-free interest rate) is precisely that risk premium. As explained in the Annex, the model calculates the risk premium assuming that dividends initially increase at a rate estimated based on analysts' projections, and that this growth rate gradually converges with the long-term growth forecast for the economy.

In the second stage, the risk premium of a specific country's banking sector is estimated by linearly projecting the Euro Stoxx risk premium onto the sector using the Capital Asset Pricing Model (CAPM).[2] The main result of the CAPM used in this study is that the risk premium of an asset or of a specific sector is proportional to the risk premium of the market (in this article calculated in the first stage and represented by the Euro Stoxx index), where the coefficient of proportionality is identified as β and is easily calculable by means of an econometric regression.[3]

Lastly, the COE, or return, demanded from a specific country's banking sector will be equal to the sum of the risk-free rate plus the risk premium demanded from the sector analysed. In other words the COE for banks in country i can be calculated as the product of the sector's beta (β_i) and the risk premium of the broad market index (EP) plus the risk-free interest rate (r_f), according to the following equation:

$$COE_i = r_f + \beta_i \cdot EP \qquad [1]$$

For the risk-free rate, the yield of the inflation-linked bond issued by the French government is used. This choice allows consistency to be maintained with the risk premium estimated for the Euro Stoxx, which is also expressed in real terms or as the absence of inflation.

Recent developments in the cost of bank equity in Europe

Chart 1 shows recent developments in the COE of listed banks in the main euro area economies. The four countries considered (Spain, Germany, France and Italy) show a similar pattern. The COE for banks increased during the global financial crisis and, after a small decrease, picked up again during the 2012 sovereign debt crisis (except for Germany, where it held relatively low). This was followed by a progressive decline. Subsequently, between 2016 and 2018, there was a marked temporary increase

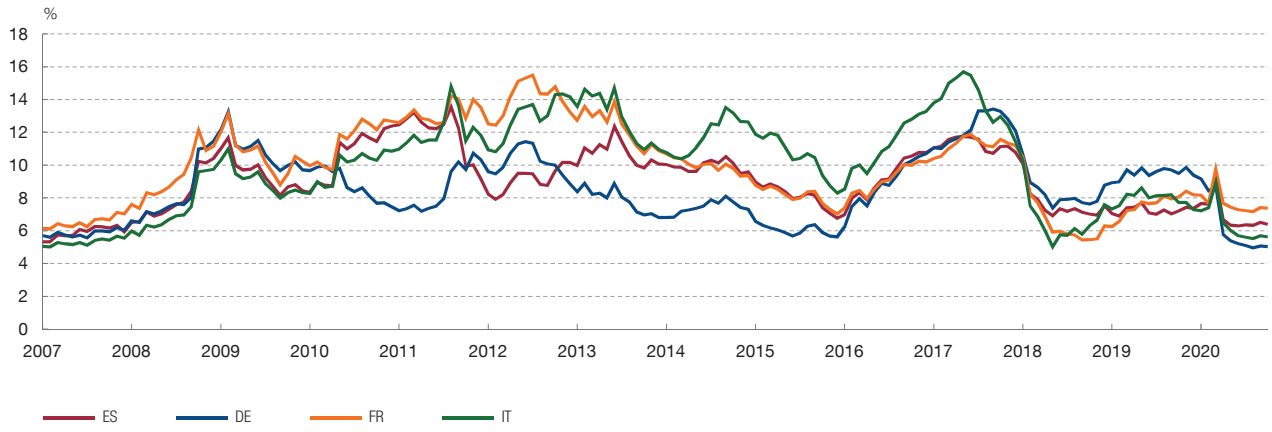
2 See W. F. Sharpe (1964). "Capital asset prices: A theory of market equilibrium under conditions of risk", *Journal of Finance,* 19 (3), pp. 425-442 and J. Lintner (1965), "The valuation of risky assets and the selection of risky investments in stock portfolios and capital budgets", *Review of Economics and Statistics,* Vol. 47, pp. 13-37.

3 This parameter results from the regression of the stock market yield r_i of asset i (which is being valued) on the market yield r_M: $\beta_i = Cov(r_i, r_M) / Var(r_M)$.

Chart 1

THE COST OF EQUITY FOR BANKS IN THE MAIN EUROPEAN COUNTRIES

The cost of equity has shown marked changes (from 5% to 16%) since 2007.



SOURCE: Banco de España calculations based on data from Datastream and Consensus Economics.

during a period of heightened market volatility (Brexit, financial tensions associated with the trade war, etc.) and deteriorating stock prices in the European banking sector. There was an abrupt rise in March 2020, following the outbreak of the COVID-19 pandemic, but this increase was quickly reversed. In October 2020, the COE for banks was similar to that observed in early 2007 in the four countries considered.

Chart 2 compares recent COE movements in Spain and the euro area with interest rates for AT1 and T2 capital instruments.[4] Unlike shares, AT1 and T2 instruments are issued at a specific interest rate, which provides alternative information on banks' funding costs. As can be seen, the yield on T2 instruments is far lower than that of AT1 instruments, which in turn is lower (with isolated exceptions)[5] than the COE. This is to be expected given the seniority of the instruments when absorbing losses in the event of the bank's failure. The chart likewise shows a substantial increase in the returns demanded from all three instrument types in March 2020, at the onset of the pandemic. This upturn subsequently corrected for all three instruments, although the correction in COE was somewhat faster. As can also be observed, the interest rate for AT1 instruments remained high at end-October 2020, whereas the COE and interest rates for T2 instruments stood closer to pre-pandemic levels. Hence, COE has followed a qualitatively similar course to the other bank funding instruments (AT1 and T2). The

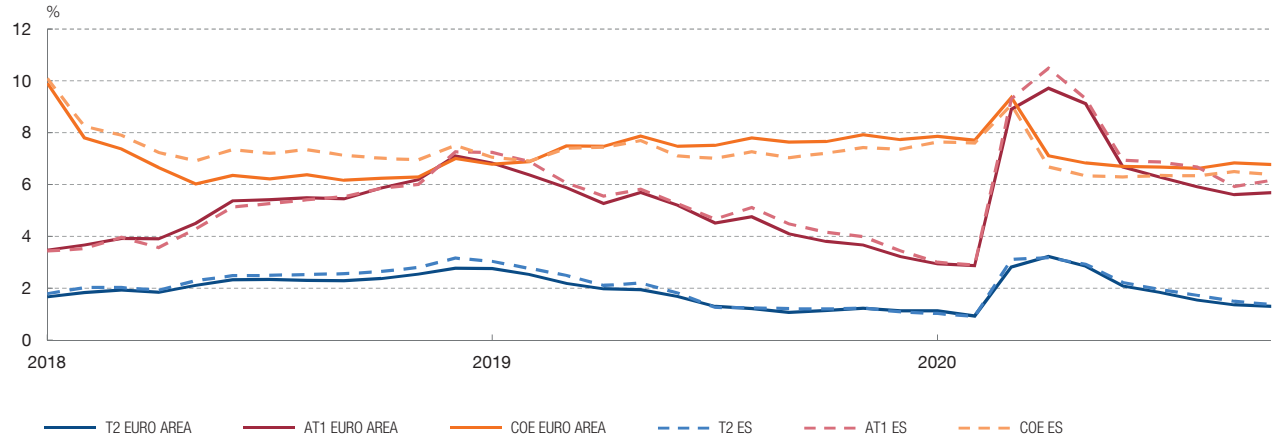
4 Chart 2 shows the issuance value-weighted average yield-to-maturity for bonds with issuances in excess of €100 million in Spain and the euro area. Instruments with a bid-ask spread or spread against the 6-month LIBOR swap below the 1st percentile and above the 99th percentile are excluded.

5 In some months the anomalous situation of AT1 interest rates exceeding the cost of equity can be observed. This may owe to the AT1 market being far less liquid than the equity market, which may lead to temporary interest rate spikes at times of liquidity stress.

Chart 2

RECENT DEVELOPMENTS IN THE COST OF EQUITY FOR BANKS AND THE INTEREST RATES OF AT1 AND T2 INSTRUMENTS IN SPAIN AND THE EURO AREA

The interest rates of AT1 and T2 instruments have followed a qualitatively similar course to the cost of bank equity during the COVID-19 crisis.



SOURCE: Banco de España calculations based on data from Datastream, Consensus Economics and Refinitiv.

correction of the upturn, observed in all three instrument types at the onset of the pandemic, was likely assisted by the measures implemented by the various authorities (monetary, prudential and governmental) to mitigate the effects of the current crisis.

The COVID-19 crisis and the determinants of cost of equity

Chart 3 compares the changes in COE for a broad set of euro area countries since February 2020, facilitating analysis of the impact of the COVID-19 crisis during recent months. Between February and March 2020, the COE for the euro area as a whole rose to 9.4%, up 1.7 pp on February (7.7%).[6] However, as Chart 3 illustrates, this increase was uneven across the countries. Hence, whereas the estimated COE for Greece showed the sharpest increase (3.7 pp to 11.8%), Germany's COE held practically stable, growing by just 0.2 pp in March to 8.6%. Spain stands midway between these two extremes, with the cost of equity rising 1.5 pp to 9.1% from 7.6% in February.

From April 2020 onwards, there was a broad-based correction of the initial COE increase, such that by end-October the values had returned to levels similar to those observed in February.[7]

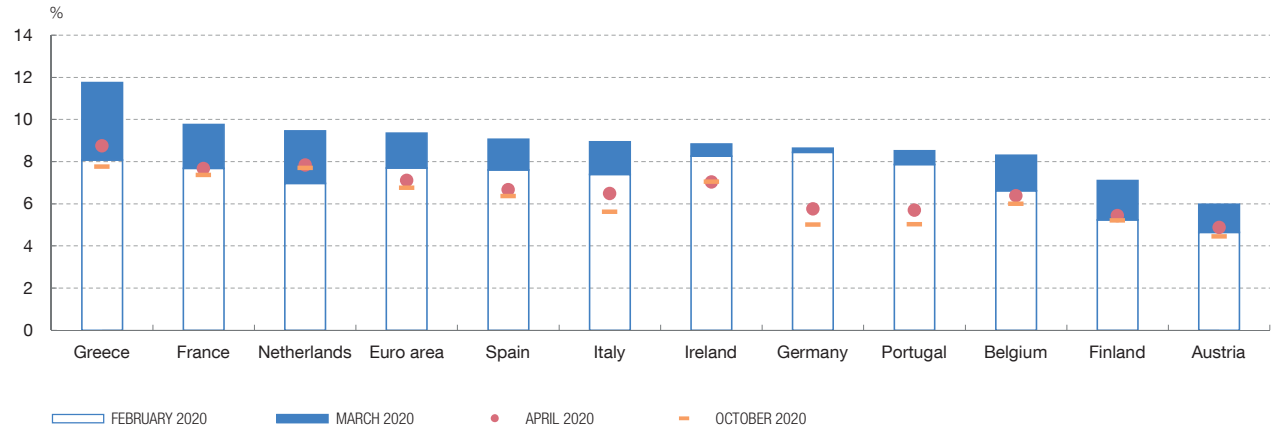
6 The analysis focuses on the following sample of 11 countries: Germany, Austria, Belgium, Spain, Finland, France, Greece, the Netherlands, Ireland, Italy and Portugal. Estimates were also made for the euro area.

7 Some countries, including Germany and Portugal (and to a lesser extent Italy, Ireland and Spain), show substantially lower COE values in October than those observed in February.

Chart 3

THE COST OF EQUITY SINCE FEBRUARY 2020

The cost of bank equity increased markedly in March 2020 and declined in the subsequent months.



SOURCE: Banco de España calculations based on data from Datastream and Consensus Economics.

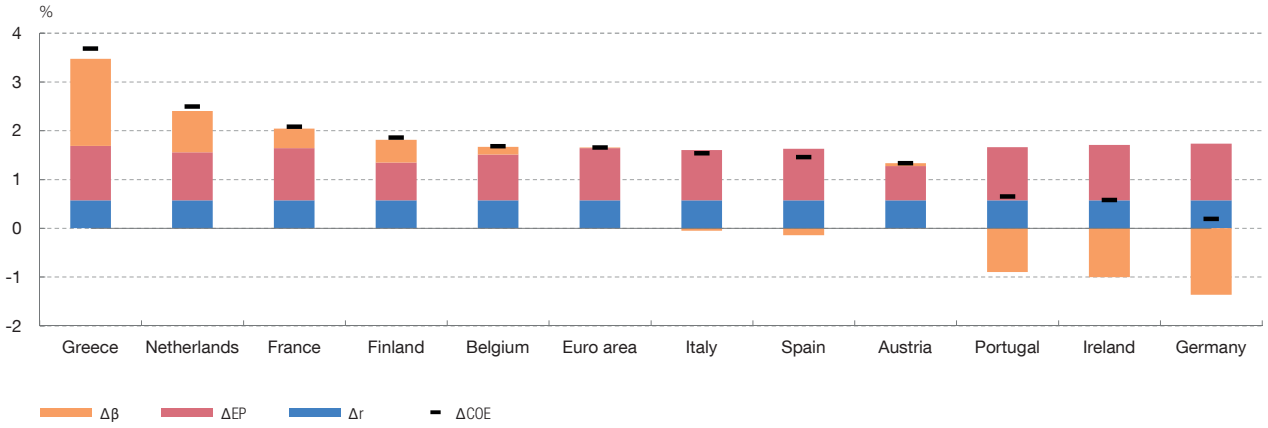
Equation [1] serves to break down changes in COE into determining factors. Using Equation [1], Charts 4 and 5 illustrate this breakdown for the COE change in March 2020 and between March and October 2020, respectively. Movements in the risk premium were the predominant factor for all countries, both in the increases observed in March and the subsequent declines. The beta parameter (β) had a more uneven impact and was the determinant behind the differences observed between the countries. In fact, the countries whose banking sectors recorded sharper COE increases in March showed a greater correlation with the Euro Stoxx, which in turn tended to lift the value of their β parameters. Shifts in the risk-free interest rate had less influence on the changes. Specifically, in March 2020 the upturn in the market risk premium led the COE to rise by around 1 pp, while the increase in the risk-free interest rate meant an additional 60 bp rise. The parameter β generated a marked COE increase in Greece and the Netherlands (of 1.8 pp and 0.8 pp, respectively), while contributing to a decline in COE in Germany, Ireland and Portugal (of 1.4 pp, 1.0 pp and 0.9 pp, respectively). In the other countries, β made a more modest contribution. This indicates that the banking indices of some countries had a more pronounced response to the pandemic shock than the broader market, while those of other countries had a more moderate response.

Between March and October 2020, the decline in the risk premium led to a marked decrease in the COE, of around 2.5 pp, with the drop in the risk-free rate contributing to an additional 40 bp decrease. The measures implemented by authorities in response to the pandemic appear to be behind this movement. β contributed to considerable COE increases in the Netherlands and Ireland (the former continued the trend observed in March, this time with an increase of 1.9 pp, whereas the latter reversed its trend, rising 1.7 pp compared to a drop of 1.0 pp in March). Conversely,

Chart 4

BREAKDOWN OF THE CHANGE IN COST OF EQUITY BETWEEN FEBRUARY AND MARCH 2020

The increase in the risk premium was the driving factor behind the rise in the cost of bank equity in March 2020. The risk-free interest rate contributed in the same direction, but to a lesser extent. The beta had an uneven effect across the countries.

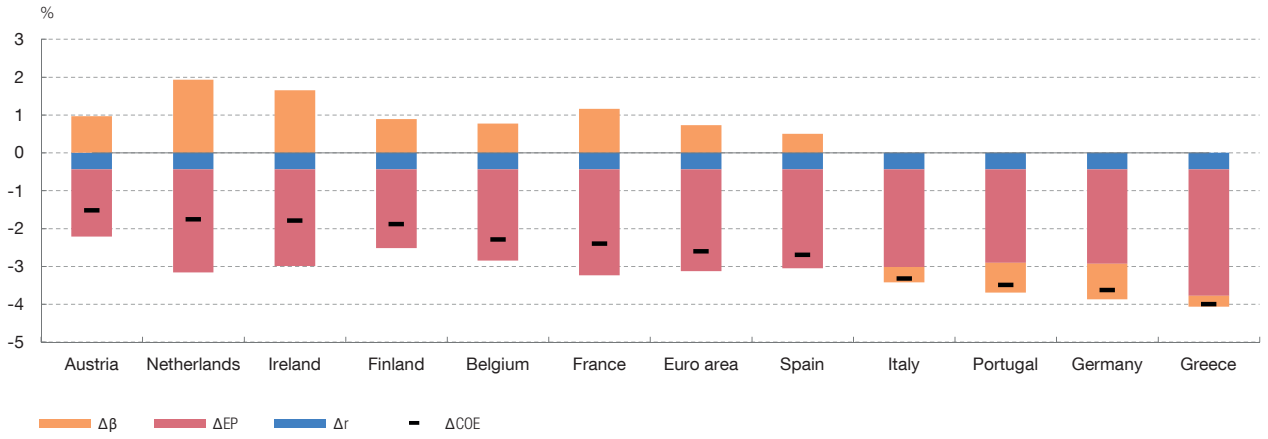


SOURCE: Banco de España calculations based on data from Datastream and Consensus Economics.

Chart 5

BREAKDOWN OF THE CHANGE IN COST OF EQUITY BETWEEN MARCH AND OCTOBER 2020

The decline in the risk premium was the driving factor behind the drop in the cost of bank equity between March and October 2020. The risk-free interest rate contributed in the same direction, but to a lesser extent. The beta had an uneven effect across the countries.



SOURCE: Banco de España calculations based on data from Datastream and Consensus Economics.

β made a negative contribution to COE in Germany and Portugal (continuing the trend of March, on this occasion with declines of 0.9 pp and 0.8 pp, respectively).

In short, the increase in the cost of bank equity in March 2020, at the outbreak of the pandemic, and its subsequent correction owed essentially to changes in the risk

premium, while the component associated with the banking sector (the beta) had, on average, a smaller impact but was the determinant behind the differences observed between the euro area countries.

17.11.2020.

ANNEX
Dividend discount model

Under the dividend discount model used, the current price of a risky asset, Pt, is given by:

$$P_t = E_t \sum_{k=1}^{\infty} \frac{D_{t+k}}{\rho_{t+k}} \quad [1]$$

where D_{t+k} and ρ_{t+k} are, respectively, the dividend and the discount factor in the period t+k, and E_t represents the statistical expectation for the sum of future flows, evaluated in the period t. The discount factor can, in turn, be broken down into the risk-free interest rate plus the risk premium:

$$\rho_{t+k} = 1 + r^f_{t+k} + EP_{t+k} = (1 + r^f_t + EP_t)^k$$

Assuming that the dividends grow at a rate g [$E_t [D_{t+k}] = D_t (1+g)^k$], by replacing [1] and regrouping, we obtain:

$$EP_t = \frac{D_t}{P_t}(1+g) + g - r^f_t \quad [2]$$

Fuller and Hsia[8] argue that the assumption that dividends grow at a fixed rate is restrictive and unrealistic. To relax this premise, they propose assuming that dividends initially grow at a rate of g_0, which declines linearly to the equilibrium value g after the period 2H, as shown in Chart A.1. In this case, Equation (2) is as follows:

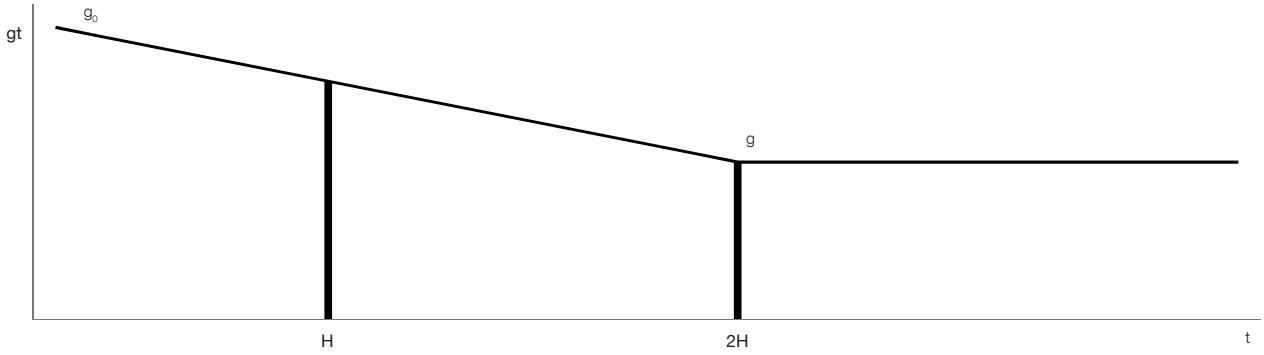
$$EP_t = \frac{D_t}{P_t}[(1+g+H(g_0-g)] + g - r^f_t \quad [3]$$

This article uses Equation (3) to calculate the market's general risk premium, taking the Euro Stoxx as a reference. The initial dividend growth forecasts (g_0) were obtained from investors' forecasts supplied by I/B/E/S (Institutional Broker's Estimate System), while the long-term dividend growth forecast (g) was obtained from the long-term economic growth forecasts of Consensus Economics. The average dividend growth adjustment period (H) was taken as equal to five years, and for the risk-free interest rate (r^f_t), the interest rate of the inflation-linked bond issued by the French government was used, in both cases following the same approximation as the ECB's *Economic Bulletin,* Issue 1/2016.

8 R. J. Fuller and C.-C. Hsia (1984), "A simplified common stock valuation model", *Financial Analysts Journal,* Vol. 40, No 5, pp. 49-56.

Chart A.1

TIME VARIATION OF THE DIVIDEND GROWTH RATE ASSUMED UNDER THE H-MODEL DEVISED BY FULLER AND HSIA



SOURCE: Banco de España calculations.

So as to factor in possible changes to the value of beta over time, when projecting the Euro Stoxx risk premium on national banking sectors, this coefficient is calculated from one-year rolling windows based on daily data.