

# Equity Risk Premium

March 11, 2025

# Methodology for Calculating Equity Risk Premium

# General Approaches to Determining Equity Risk Premium

In valuation practice, there are typically two approaches used to determine the equity risk premium:

- ▶ **Historical Data Approach:** The equity risk premium is calculated using historical stock and bond market data as the difference between the historical returns on a stock index and a government bond.
- ▶ **Implied Equity Risk Premium Approach:** The equity risk premium is calculated using current stock (or stock index) prices and forecasted dividends or cash flows for this stock (or stock index). The calculation is based on the concept of the stock (or stock index) price being equal to the sum of discounted forecasted dividends or cash flows for this stock (or stock index). The implied cost of equity and, subsequently, the implied equity risk premium is derived from this equation.

The equity risk premium calculated using historical data is an older approach and does not account for future investors' expectations. On the contrary, the implied equity risk premium reflects expectations about future returns as of the specific date of calculation.

# Our Approach to Equity Risk Premium Estimation

To estimate the cost of equity appropriate for the companies located in the Czech Republic or other comparable country, we calculate the equity risk premium using the implied equity risk premium approach.

Data of publicly traded European companies headquartered in European countries with an investment-grade credit rating, Aaa rating excluded, is used. Countries with credit rating ranging from Aa1 to Baa3 are thus considered. The companies, for which necessary data for calculation of the implied equity risk premium (e.g. current stock prices, necessary forecasts and other items entering the cash flow calculation) are not available, are excluded. The companies, for which meaningful cash flows cannot be estimated (e.g. companies having negative forecasted profit in the final year of projections), are also excluded.

To estimate the equity risk premium, first, the implied risk premium for each selected company is computed. The companies with the negative implied risk premium or premium above 20% are excluded.

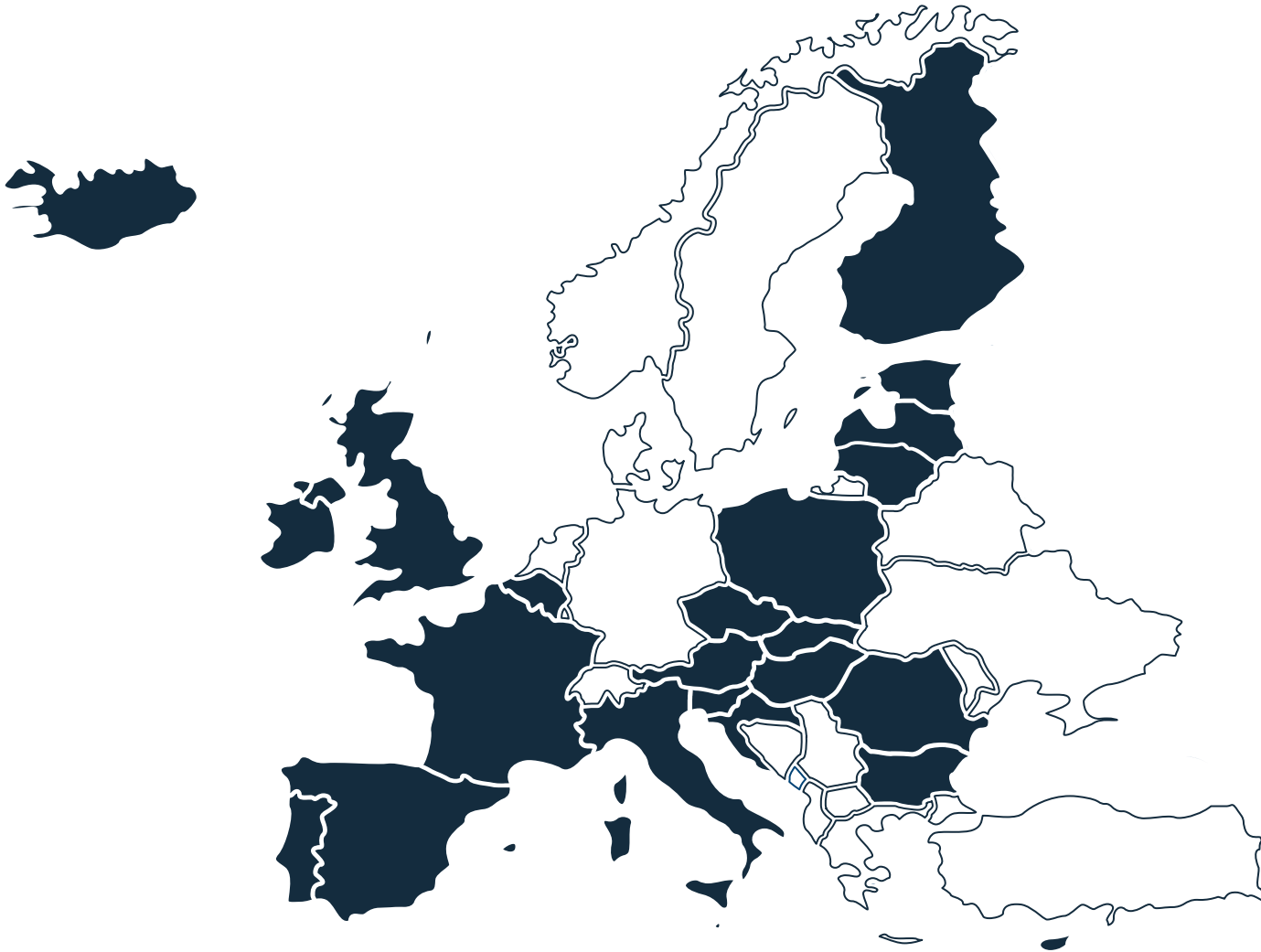
Subsequently, the companies are ranked by market capitalization and divided into two equally-sized groups (in terms of the number of companies): large companies and medium companies. For each group, the market-weighted equity risk premium is calculated.

Finally, the resulting equity risk premium for both groups (large companies and medium companies) is determined as the arithmetic average of the premiums calculated over the last three months.

# Individual Steps in Equity Risk Premium Calculation



## Step 1: Selection of Companies



Publicly traded European companies headquartered in European countries with credit ratings from Aa1 to Baa3

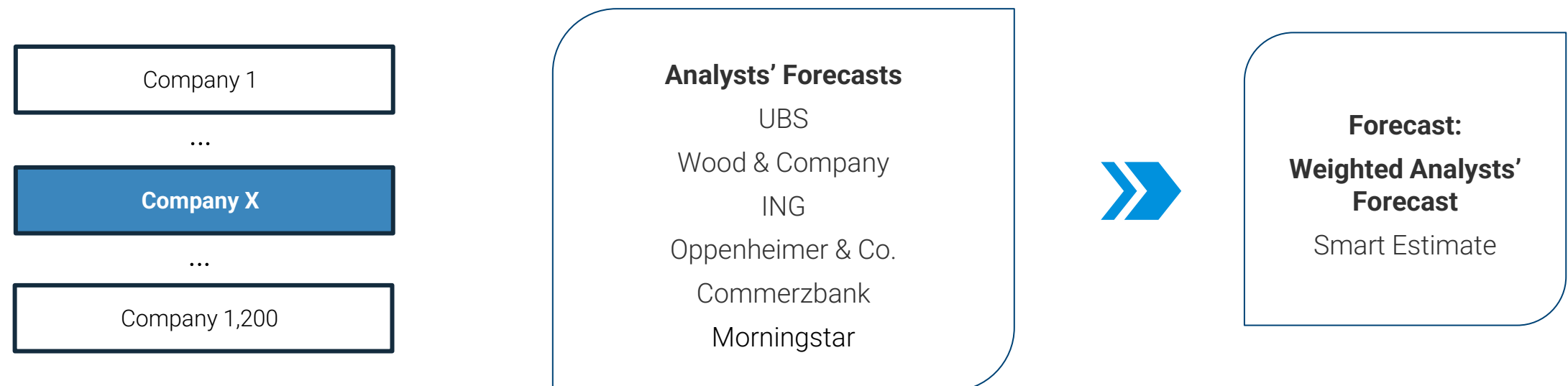
Exclusion of companies for which expected future cash flows cannot be estimated or those with outlier values of implied risk premium

Sample of ca 1,200 publicly traded companies in total

## Step 2: Building Expected Future Cash Flows for Each Company

Expected future cash flows are derived from analysts' forecasts published in the LSEG Workspace platform, which retrieves this data from the I/B/E/S database. For the purpose of expected future cash flows estimation, Smart Estimate forecasts are employed. These represent a weighted analysts' forecast, with a greater weight assigned to the forecasts of those analysts whose forecasts have historically been more accurate, as well as to the more recent forecasts.

For companies in the financial sector, cash flows are modelled using the Dividend Discount (DD) model. For other non-financial companies, cash flows are modelled using the Discounted Free Cash Flow to Equity (FCFE) model. Cash flows of each company are modelled in the currency corresponding to the company's headquarters (e.g., Czech koruna for the companies headquartered in the Czech Republic, euro for the companies headquartered in Austria).



## Step 2: Building Expected Future Cash Flows in the DD Model (1)

Expected future cash flows are modelled in three phases:

- a) The explicit period (3 years), utilizing analysts' forecasts;
- b) The stabilization period (2 years); and
- c) The residual period.

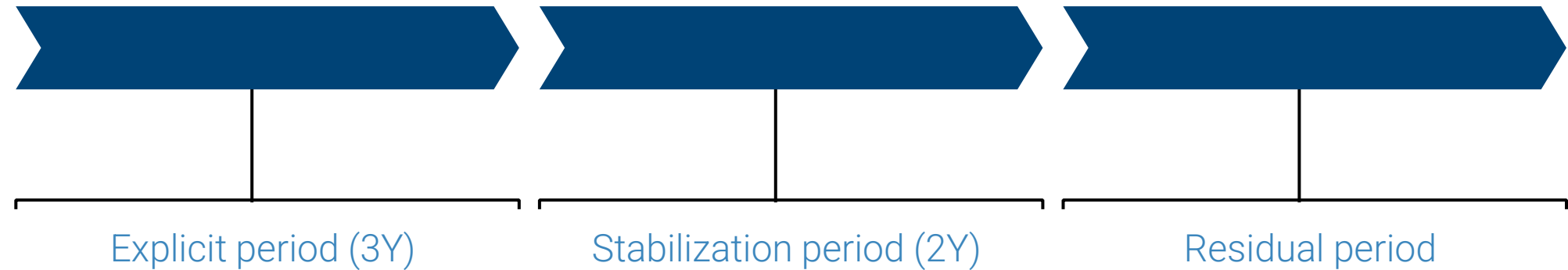
In the DD model, the expected future cash flows of individual companies are determined as follows:

- ▶ In the explicit period of the DD model (3 years), future cash flows of individual companies are modelled as the product of the forecasted net income and the payout ratio (the sum of dividends and share buybacks) converging from the current payout ratio to a stable payout ratio. The stable payout ratio is calculated as  $1 - \frac{\text{Long-Term Growth}}{ROE}$  using long-term inflation<sup>1</sup> and the 5-year average historical return on equity (ROE). Forecasted net income is based on analysts' forecasts (Smart Estimate). If analysts' forecasts are not available for the entire explicit period (3 years), the net income in a respective year is estimated using the year-on-year growth of net income that is assumed to converge from the growth calculated from the last available net income forecast to the stable growth rate corresponding to the long-term inflation.
- ▶ In the stabilization period of the DD model (2 years), future cash flows of individual companies are modelled using a year-on-year growth of net income converging from the forecasted net income growth to the stable growth rate corresponding to the long-term inflation and the payout ratio converging from the current payout ratio to the stable payout ratio achieved in the last year of the stabilization period (year 5).
- ▶ In the residual period of the DD model, the Gordon formula assuming the stable growth rate corresponding to the long-term inflation is applied.

<sup>1</sup> Forecasts of the International Monetary Fund (IMF) in year 5 are employed, if available. For each company, inflation is considered according to the country in which the company is headquartered.



## Step 2: Building Expected Future Cash Flows in the DD Model (2)



Net income

×

Payout ratio

=

**Expected future  
dividends and  
share buybacks**

**Dividends  
and share  
buybacks  
Year 1**

**Dividends  
and share  
buybacks  
Year 2**

**Dividends  
and share  
buybacks  
Year 3**



**Dividends and  
share buybacks  
Year 6 and beyond**

## Step 2: Building Expected Future Cash Flows in the FCFE Model (1)

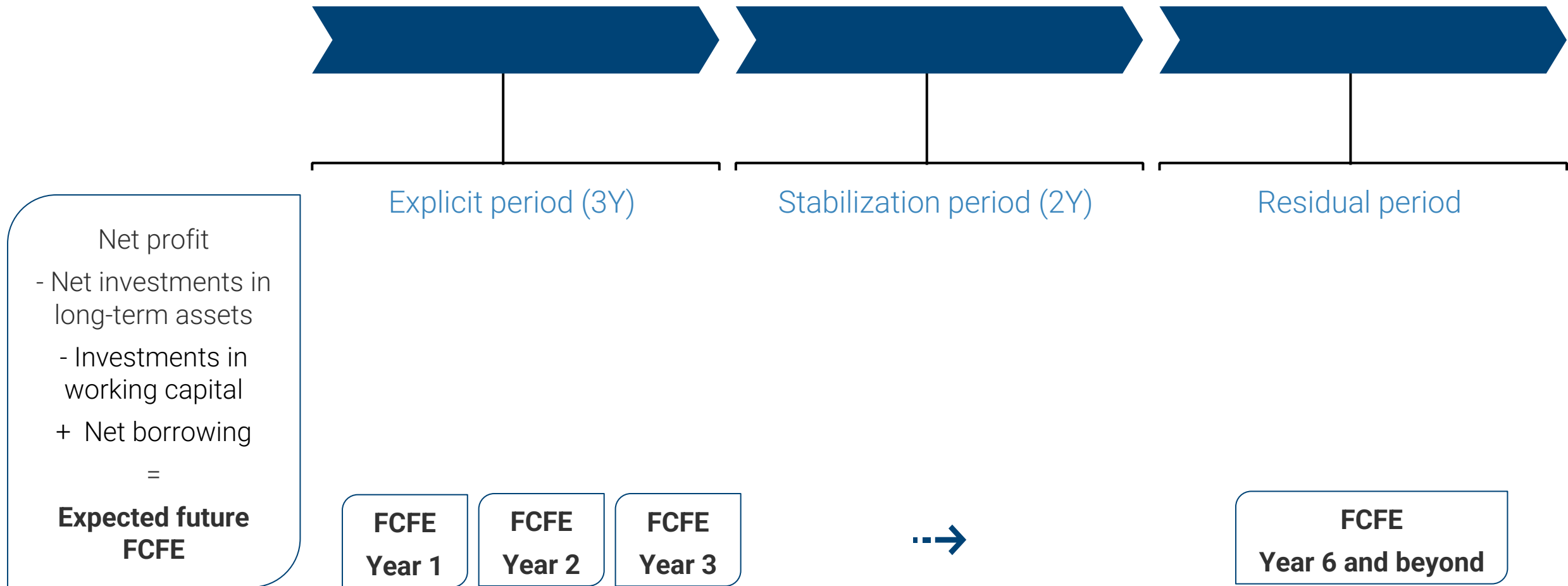
Expected future cash flows are modelled in three phases:

- a) The explicit period (3 years), utilizing analysts' forecasts;
- b) The stabilization period (2 years); and
- c) The residual period.

In the FCFE model, the expected future cash flows of individual companies are determined as follows:

- ▶ In the explicit period of the FCFE model (3 years), future cash flows of individual companies are modelled based on forecasted net income, forecasted investments (CAPEX), forecasted depreciation, investments in working capital (assumed to correspond to the 5-year historical average of working capital to revenues ratio), and net borrowing (estimated using forecasted investments in the long-term assets and working capital and capital structure). If forecasts of net income, investments, or depreciation are not available for the entire explicit period (3 years), their convergence from the last available forecasted value to the stabilized level described in the next point is assumed.
- ▶ In the stabilization period of the FCFE model (2 years), future cash flows of individual companies are modelled using a year-on-year growth of net income converging from the forecasted net income growth to the stable growth rate corresponding to the long-term inflation, investments converging from the forecasted investments to revenues ratio to the stable level corresponding to 5-year average of historical investments to revenues ratios, depreciation converging from the forecasted depreciation to investments ratio to the stable level of depreciation to investments derived based on the 5-year average historical depreciation period and the long-term inflation, investments in working capital (assumed to correspond to the 5-year historical average of working capital to revenues ratio), and net borrowing (estimated using the forecasted investments in the long-term assets and working capital and capital structure).
- ▶ In the residual period of the FCFE model, the Gordon formula assuming the stable growth rate corresponding to the long-term inflation is applied.

## Step 2: Building Expected Future Cash Flows in the FCFE Model (2)



## Step 3: Calculation of the Implied Risk Premium for Each Company in the DD Model



$$\begin{array}{c}
 \text{Market Capitalization} \\
 \text{of the} \\
 \text{Company}
 \end{array}
 =
 \frac{\text{Dividends and share buybacks}_{Y_1}}{(1 + \text{CoE})^1}
 +
 \frac{\text{Dividends and share buybacks}_{Y_2}}{(1 + \text{CoE})^2}
 + \dots +
 \frac{\text{Dividends and share buybacks}_{Y_6}}{(1 + \text{CoE})^5 (\text{CoE} - g)}$$



**Calculation of the Implied Cost of Equity (CoE)**

The example above serves only for illustrative purposes. The exact length of the discounting period varies depending on the company's fiscal year and the month for which the implied risk premium is being estimated. For discounting purposes, the end-of-period convention is used.

## Step 3: Calculation of the Implied Risk Premium for Each Company in the FCFE Model



$$\begin{array}{c}
 \text{Market Capitalization and Preferred Shares of the Company} \\
 = \\
 \frac{\text{FCFE}_{Y_1}}{(1 + \text{CoE})^1} + \frac{\text{FCFE}_{Y_2}}{(1 + \text{CoE})^2} + \dots + \frac{\text{FCFE}_{Y_6}}{(1 + \text{CoE})^5 (\text{CoE} - g)}
 \end{array}$$

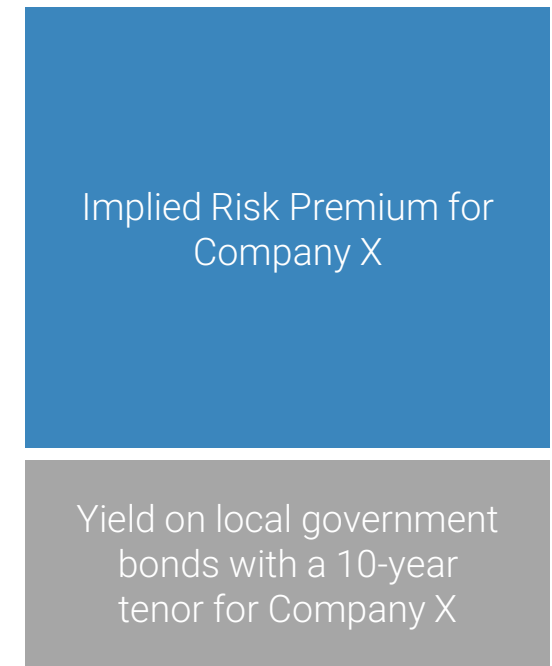
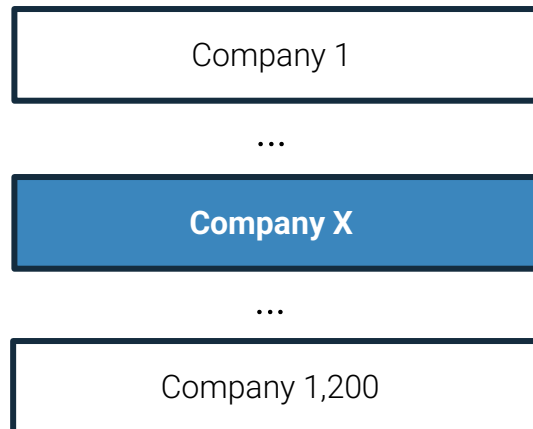


**Calculation of the Implied Cost of Equity (CoE)**

The example above serves only for illustrative purposes. The exact length of the discounting period varies depending on the company's fiscal year and the month for which the implied risk premium is being estimated. For discounting purposes, the end-of-period convention is used.

## Step 3: Calculation of the Implied Risk Premium for Each Company

The implied risk premium for a company is calculated as the difference between the implied cost of equity for that company and the yield to maturity on local government bonds with a 10-year tenor.




## Step 4: Determination of the Equity Risk Premium

For each group of large and medium companies, the market-weighted average of risk premiums (weighted by market capitalization) is calculated. The market-weighted average is rounded to one decimal place.

The equity risk premium is then determined as the average of risk premiums calculated over the last 3 months, rounded to one decimal place (e.g., the equity risk premium as of December 31, 2023 is calculated as the average of risk premiums calculated as of October 31, 2023, November 30, 2023, and December 31, 2023).





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