

Decisions on the Allowed Rate of Return Must Reflect Current Market Conditions, Not Simple Equations, Says German Court

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Regulatory Cost of Equity Determination Overturned

On 22 March 2018, the appellate court of Düsseldorf confirmed what economists would find hard to dispute: regulators must always consider current market conditions when setting the cost of equity and cannot simply mechanically update a formula used previously, even if it worked well in the past. In economics, expected returns emerge from preferences, which—unlike the laws of nature—are not fixed. The global financial crisis has shifted the behaviour and risk aversion of institutions and investors. As a result, the backward-looking method used by several European regulators in the past now gives downwardly biased results.

In its verdict on 22 March 2018, the Düsseldorf court overturned a determination by the German Federal Network Agency (Bundesnetzagentur) from 5 October 2016 on the cost of equity for electricity and gas network operators for the forthcoming regulatory period. The court's decision could have far-reaching consequences for the regulated cost of equity in Germany and beyond.

Until this case, the Federal Network Agency, like some other continental European regulatory agencies, relied upon historical data to set the allowed rate of return. This practice is based on the premise that historical data on stock and bond markets are a reliable guide to the future.

The court ruled that mechanically updating an established method relying solely on historic data, as the German regulator had done, resulted in an unlawfully low cost of equity. The court ruled that such an approach was not justifiable under current market conditions, and that the regulator was wrong to ignore them.²

German Federal Network Agency's Approach to Setting the Equity Risk Premium

Under the new regulatory regime for energy networks, the German regulator developed a specific method of setting the parameters of the Capital Asset Pricing Model (CAPM), in order to define an allowed cost of equity. In the CAPM, the average cost of equity is the sum of a "Risk-Free Rate" and an "Equity Risk Premium". To calculate the cost of equity for any specific company, the Equity Risk Premium is scaled by "Beta", a measure of that company's relative riskiness, before adding the Risk-Free Rate.

In 2008, the regulator derived the Equity Risk Premium as the average of historic returns in excess of government bond yields (the Risk-Free Rate), using data from 1900 to the present, for a number of countries. This method gave an Equity Risk Premium of 4.55%.³ In 2011, the Federal Network Agency considered updating the parameters of the 2008 formula, which would have reduced the Equity Risk Premium to 4.4%. However, in its final decision, the regulator returned the Equity Risk Premium to 4.55% in light of capital market conditions and Germany's shift towards renewables.⁴ In 2016, despite extraordinary conditions prevailing in capital markets, the German regulator mechanically updated the 2008 formula once again, but refrained from making any balancing adjustments. This approach resulted in a much lower Equity Risk Premium of 3.8%.⁵

The Traditional Method Relied Upon by European Regulators

Regulatory determinations of the cost of equity need to offer a rate of return that will attract capital from investors over the next regulatory period. That rate must be comparable with the rate offered by other sectors of the economy. Thus, the allowed rate of return should reflect investors' expectations of future capital market conditions. To estimate these expectations, however, regulators typically rely on historical data. It is common practice in continental Europe to estimate the Equity Risk Premium from stock and bond market data over a period covering more than 100 years. The German Federal Network Agency's approach is no exception. This method is based on the assumption that stock market booms and busts average out in the long-run, and that the observed average reflects future expectations. Following this logic, European regulators calculate the expected Equity Risk Premium as the long-term average of yearly differences between stock market returns and respective government bond yields (so-called "excess returns").

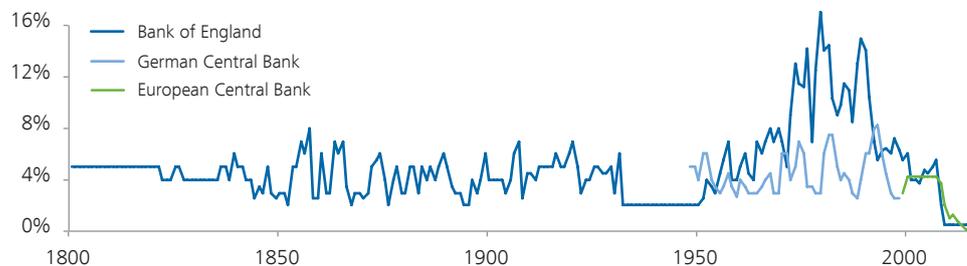
The annual publications by Dimson, Marsh, and Staunton (DMS) have become the main source for historical data on excess returns that European regulators, including the German Federal Network Agency, rely upon. The staff barely scrutinised the DMS data to check for stability and consistency, though they are increasingly at odds with other estimates of the Equity Risk Premium, especially those based on recent data and forward-looking methods.

Unprecedented Capital Market Conditions

The drastic decline in interest rates and the ultra-expansive monetary policy pursued by central banks in reaction to the global financial crisis has caused lasting changes in capital markets. These changes represent a new era characterised by the following features:

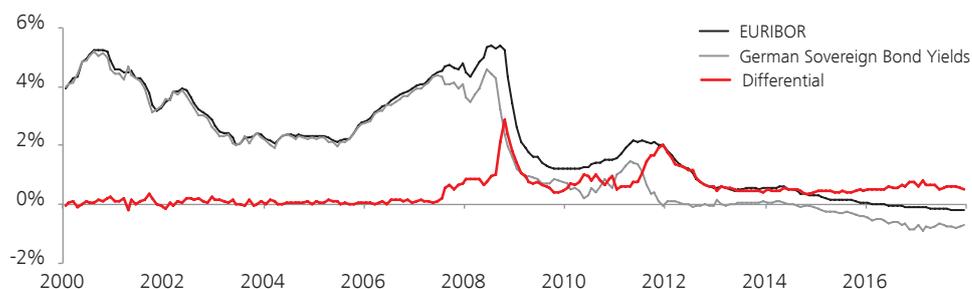
- **Unprecedented and low yields on government debt (“sovereign bond yields”):** Negative nominal interest rates, as now seen in Germany and Switzerland, were inconceivable prior to the financial crisis.
- **Strong price appreciation of fixed-income instruments due to falling interest rates:** This development, referred to as the “Golden Age of Bonds”, is historically unprecedented and cannot be expected to repeat itself given that nominal interest rates are at or near their lower bound, i.e., zero (see Figure 1).
- **Re-evaluation of risks:** Assets traded almost at the Risk-Free Rate before the financial crisis now feature significant risk premiums as evidenced by the emergence of a spread between interbank rates and sovereign bond yields (see Figure 2). Even highly solvent businesses can only take on debt at significant spreads above the Risk-Free Rate.
- **Increase of risk premiums across all asset classes:** Central bank interventions on bond markets did not lower expected stock yields to the same extent as bond yields, so stock yields rose relative to the Risk-Free Rate, therefore raising the Equity Risk Premium. Mainstream views before the crisis would not have supported Equity Risk Premiums exceeding 6%, as currently observed (see Figure 3).

Figure 1: Central Bank Policy Rates



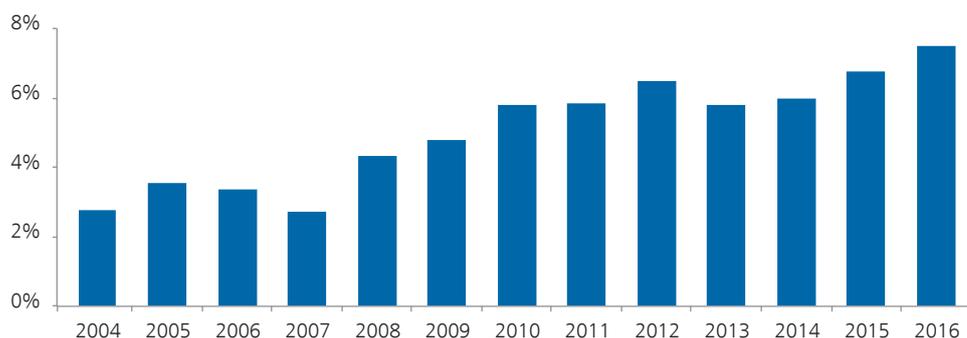
Source: NERA analysis based on Deutsche Bundesbank data and Hills et al. (2010)⁵

Figure 2: Interest Rate Differential (EURIBOR—German Sovereign Bond Yields)



Source: NERA analysis based on Deutsche Bundesbank data.

Figure 3: **Expected Equity Risk Premium**



Source: NERA analysis based on Deutsche Bundesbank data.⁷

The Purely Backward-Looking Equity Risk Premium Has Served Its Time

Using more than 100 years of historic data on the Equity Risk Premium, and combining it with recent Risk-Free Rates (as many regulators have done), no longer reflects today's expectations of future yields, the court found:

- **Historical excess returns underestimate the expected Equity Risk Premium:** Due to the increase in risk premiums (see Figures 2 and 3), historical excess returns underestimate the current Equity Risk Premium. The assumption of a time-constant Equity Risk Premium, as advanced by the German regulator, is no longer credible.
- **Historical excess returns biased by singular market development:** The court ruled that bond price appreciation (i.e., the "Golden Age of Bonds") upwardly biased the (risk-free) returns on bonds, and so downwardly biased the historical Equity Risk Premium published by DMS. According to the court, this singular and unrepeatable market development explained the decrease of the regulatory Equity Risk Premium to 3.8% in the decision it was reviewing. However, given that current interest rates cannot fall any lower, investors will not expect bond price appreciation to continue.

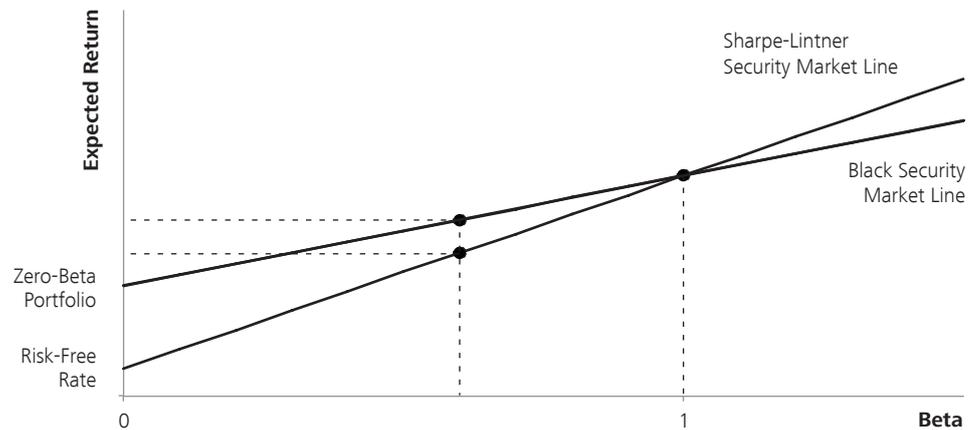
Alternative Approaches Are Readily Available and Necessary

The purely backward-looking method can—and therefore should—be complemented by alternative methods that consider current market conditions. The German court identified the failure to consider alternative approaches as a key shortcoming in the decision being reviewed. The court considered the following three alternative approaches:

- **Total market return approach:** This approach has been developed in UK regulatory practice and does not rely on the assumption of a constant Equity Risk Premium.⁸ Instead, this approach assumes expected total returns are stable over time. As long as central bank interventions in bond markets do not (or only partially) spill over into expected stock returns, Risk-Free Rates and the Equity Risk Premium will move in opposite directions. The total market return approach captures such developments and hence better reflects current conditions in equity markets.

- **Forward-looking models:** Models such as the Dividend Growth Model (DGM) derive the Equity Risk Premium from prevailing stock prices and published forecasts of future dividends. The DGM is favoured in the United States over the CAPM, because it offers less scope for dispute over the results. Such models have shown a significant increase in the Equity Risk Premium in Europe since the financial crisis.
- **Zero-Beta CAPM:** The Sharpe-Lintner variant of CAPM commonly used by regulators assumes that market participants can lend and borrow at the Risk-Free Rate if they want. That rate provides a second point, along with the total market return, which defines the trade-off between risk and expected return available to investors. Since the financial crisis, this assumption no longer holds for private entities, as evidenced by the spread between sovereign debt yields and the rate at which banks borrow and lend. The Zero-Beta CAPM developed by Fischer Black⁹ replaces the Risk-Free Rate with a portfolio of shares that has a “Beta” of zero. For shares with less-than-average riskiness (like energy networks), the resulting trade-off has a higher expected return for each level of risk (see Figure 4).

Figure 4: **Black CAPM**



Note: NERA illustration.

International Benchmarks

Backward-looking methods of deriving the Equity Risk Premium were (and still are) in vogue among European regulatory agencies, although recent determinations saw increasing use of adjustments, mostly ad-hoc and poorly documented. The general trend can be described as follows:

- Consistency and stability frequently served as justifications to dismiss alternative methods.
- In many instances, purely relying on backward-looking methods would have resulted in inadequate (i.e., low) Equity Risk Premiums and regulatory cost of capital determinations. Some regulators took counteractive measures, e.g., by holding the Equity Risk Premium constant based on earlier determinations.

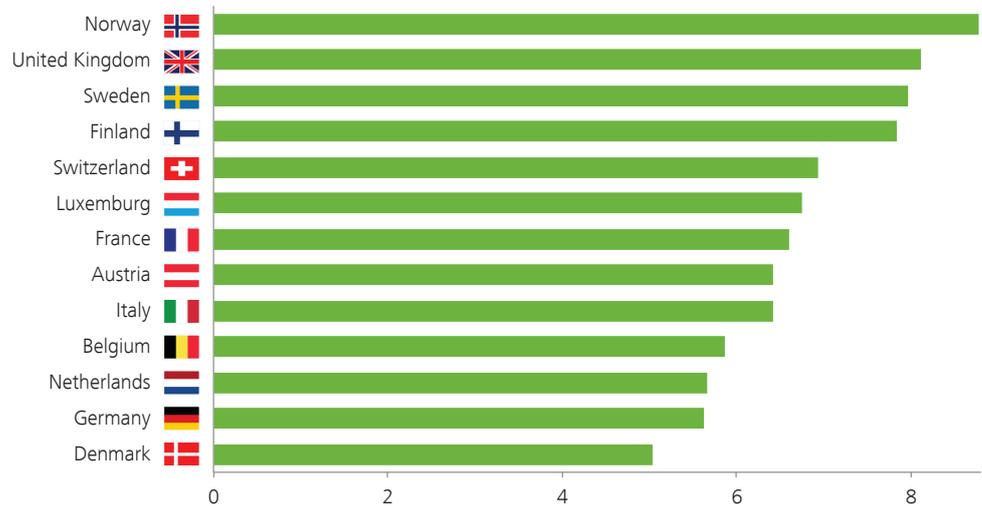
- There are a few exceptions to this general trend. For instance, the Italian and British regulatory agencies have applied the total market return approach and Scandinavian regulators also considered alternative forward-looking approaches. As a result, they have allowed some of the highest Equity Risk Premiums and/or Costs of Equity in Europe.

Figure 5: **Regulatory Equity Risk Premiums (%)**¹⁰



Source: NERA analysis of international regulatory decisions for energy networks.

Figure 6: **Regulatory Cost of Equity (% , nominal, post-tax, 60% gearing)**¹¹



Source: NERA analysis of international regulatory decisions for energy networks.

Lessons Taken from the Court Ruling of 22 March 2018

As the appellate court of Düsseldorf made clear in its ruling on 22 March 2018, relying on a mechanically-implemented update of a purely backward-looking formula to determine the Equity Risk Premium is an inadequate procedure because it fails to reflect the current market conditions. Regulators must always consider current market conditions when setting the cost of equity, and cannot simply apply a single fixed formula, even if it worked in the past. Alternative methods are readily available. Their widespread adoption, however, still depends on some external stimulus, such as new financial or legal constraints. The German court's decision adds another reason to adopt forward-looking methods of setting the cost of equity for regulated businesses.

Notes

- ¹ The authors would like to thank Maximilian Czernin, James Grayburn, and Richard Hern for comments and support.
- ² Press statement of the Higher Regional Court Düsseldorf in German language available at http://www.olg-duesseldorf.nrw.de/behoerde/presse/Presse_aktuell/20180322_PM_Bundesnetzagentur/index.php.
- ³ Bundesnetzagentur decision BK4-08-068, 7 July 2008.
- ⁴ Bundesnetzagentur decision BK4-11-304, 31 October 2011.
- ⁵ Bundesnetzagentur decisions BK4-16-160 and BK4-16-161, 5 October 2016.
- ⁶ Sally Hills, Ryland Thomas, and Nicholas Dimsdale, "The UK Recession in Context—What Do Three Centuries of Data Tell Us?" *Bank of England Quarterly Bulletin* 2010 Q4, 13 December 2010.
- ⁷ Deutsche Bundesbank, Monatsbericht April 2016—Bewertungsniveau am Aktienmarkt—Theoretische Grundlagen und Weiterentwicklung von Kennzahlen, 15 April 2016.
- ⁸ Stephen Wright, Robin Mason, and David Miles, "A Study into Certain Aspects of the Cost of Capital for Regulated Utilities in the U.K.," UK Economic Regulators and the Office of Fair Trading, 13 February 2003.
- ⁹ Fischer Black, "Capital Market Equilibrium with Restricted Borrowing", *The Journal of Business*, Vol. 45, No. 3, July 1972, pp. 444–455.
- ¹⁰ The chart shows average over gas distribution, gas transport, electricity distribution, and electricity transmission for each country. Not all network types exist in each country. The value for Germany is taken from the repealed decision.
- ¹¹ The chart shows average over gas distribution, gas transport, electricity distribution, and electricity transmission for each country. Not all network types exist in each country. The value for Germany is taken from the repealed decision.

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