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European Regulators' WACC Decisions Risk Undermining Investment Decisions

By James Grayburn and Tomas Haug

Energy Regulation Insights

From the Editor

The allowed rate of return is one of the most important yet contentious aspects of setting regulated companies' allowed revenues. To be able to attract capital at an efficient cost, it is important that regulators adopt an objective approach to setting the allowed return. Where regulators do not adopt objective methods, financing costs can increase, or capital investment tail off, with eventual increases in customer bills or poorer levels of service.

In this *Energy Regulation Insights*, James Grayburn and Tomas Haug discuss the decline in European regulators' decisions on allowed cost of equity on the back of declining sovereign yields following the global financial crisis. They show that the decline in the allowed cost of equity reflects at least in part a failure by European regulators to consider the interactions between the different elements of the CAPM formula. They then provide evidence from the US where, in line with financial theory, US regulators have increased the ERP when bond rates are lower than normal, and so regulated returns have been relatively constant in the face of falling sovereign yields.

Richard Hern, Director

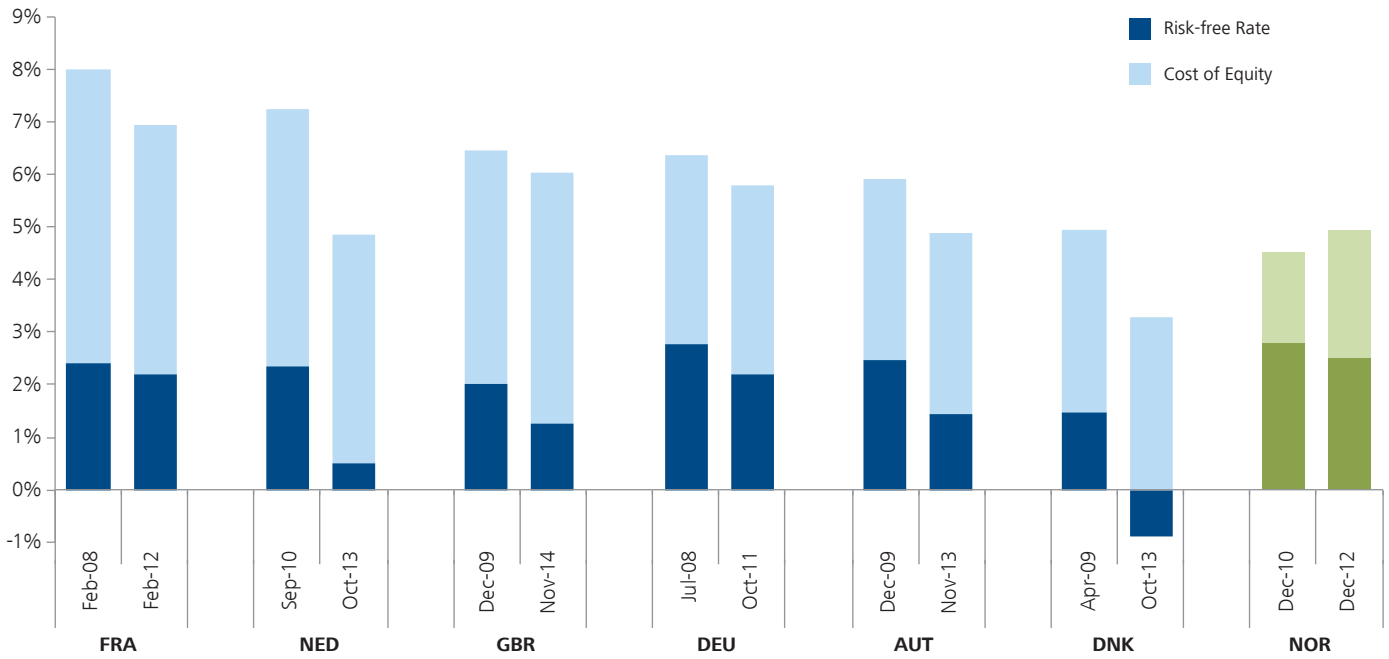
Introduction

Over the past few years we have observed a trend by European utility regulators to set lower allowed rates of return for regulated companies. Our analysis of recent decisions shows that the lower allowed returns reflect at least in part a flaw in regulators' approach to setting the cost of equity rather than a decline in equity financing costs per se. At the current time of increased investment needs (e.g. in order to connect new sources of generation, roll-out smart meters, and replace ageing assets) there is a risk that regulators' decisions are undermining the incentive to invest.[1] A publication last year by Eurelectric, the industry body for electricity distribution networks, provides some early empirical evidence of declining investment levels by networks in response to falling allowed returns on equity.[2]

European regulators have set lower cost of equity allowances in the context of declining sovereign yields

In recent European regulatory decisions, the decline in the allowed cost of equity is a direct result of declining sovereign yields. For example, in GB, the Competition Commission determined a total market return, which is equal to the risk free rate plus equity risk premium (ERP), of 6.5% for Northern Ireland Electricity, down from 7% at the previous review. The decline in its estimate of the total market return is explained by its historically low assumption for the real risk free rate of 1.5%.[3] Ofgem, the GB energy regulator, followed suit determining a cost of equity of 6.0% for the current electricity

Figure 1. **European Regulators' Allowed Returns on Equity Have Declined**



distribution network price control (RIIO-ED1), down from 6.7% at the last review in 2010.[4] The pattern is repeated in other European energy markets. As shown in Figure 1, in France, Netherlands, Austria, and Denmark the allowed cost of equity has fallen on the back of declining sovereign yields.

There are a few notable exceptions to this general pattern. For example, in Norway the allowed cost of equity has increased marginally.[5]

Do declining sovereign yields really lead to a reduction in required returns to equity holders, as many (but not all) regulators have assumed? We show that the answer is no.

European regulators generally rely on the Capital Asset Pricing Model (CAPM) to set the allowed rate of return on equity

European regulators generally rely on the Capital Asset Pricing Model (CAPM) to set the allowed rate of return on equity. Although the CAPM is well supported by academic research, the selection of its input data–the risk-free rate, the equity risk premium (ERP), and beta estimate–requires careful consideration and must be theoretically justified. One such choice concerns the time frame over which the parameters are estimated. Our concern with European regulators' decisions is that regulators have estimated the risk-free rate and EPR for different time periods, which leads to a predictable downward bias.

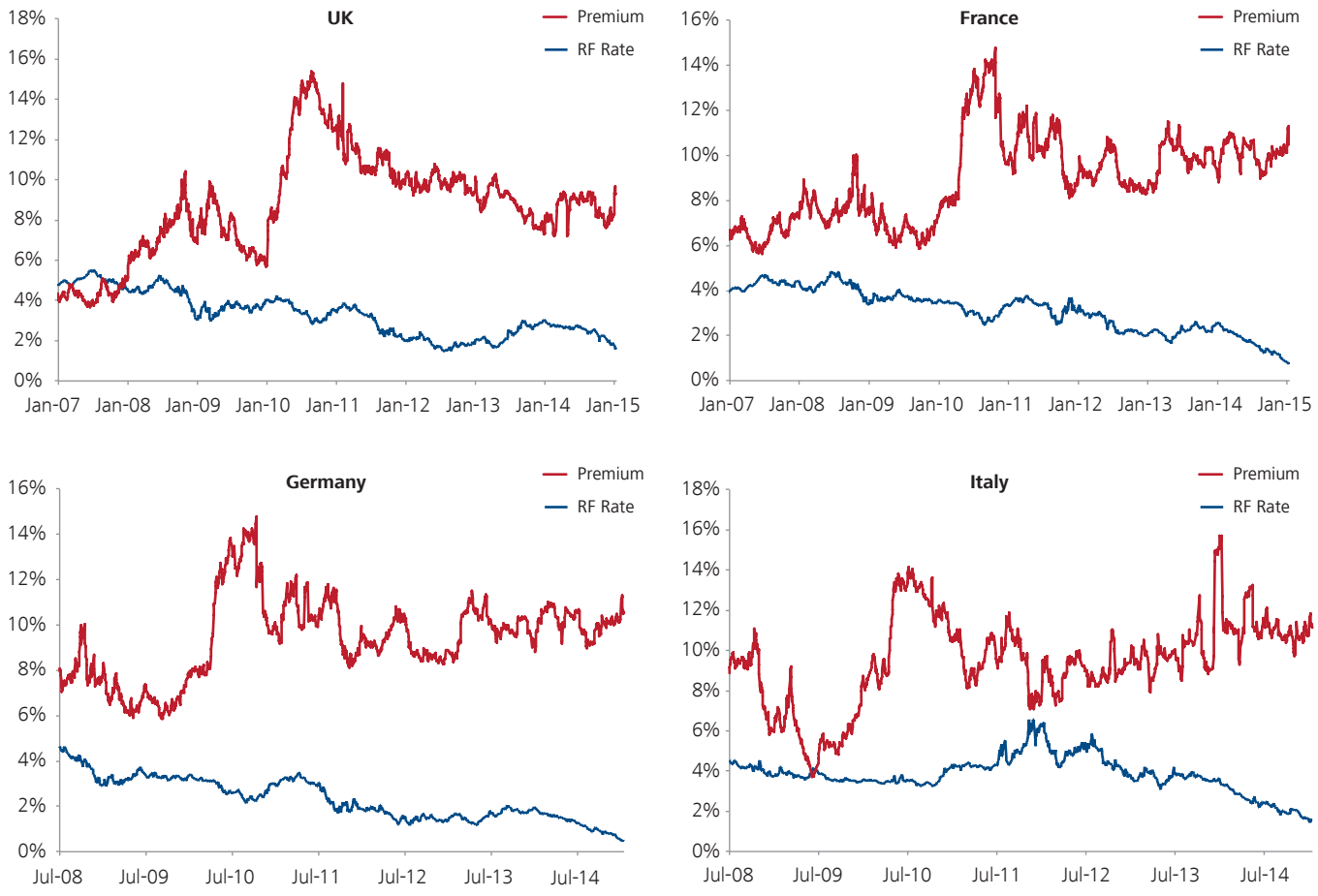
Theoretical Literature and Empirical Research Shows that Risk-Free Rate and ERP Move in Opposite Directions

The theoretical literature explains why we should expect an inverse relationship between the risk-free rate and ERP. In times of heightened market volatility investors dispose of risky assets such as equity, which increases the required return for holding stocks and hence the ERP, and use the proceeds to buy risk-free assets such as government bonds, which reduces the yield of risk free assets ("flight to quality").[6] Hence, using recent low sovereign yields as the proxy for the risk-free rate combined with (relatively low) long run historical estimates of the ERP introduces a downward bias. Empirically, a number of studies have suggested that the total market return (the risk-free rate plus the ERP) exhibits a stable mean implying that over long timeframes the ERP and risk-free rate have moved point-by-point in opposite directions.[7]

Our own empirical analysis of the relationship over the most recent period is consistent with the longer-run empirical evidence. Figure 2 shows that the decline in sovereign yields during the global financial crisis has been broadly accompanied by an increase in the forward looking ERP, where the ERP is derived based on forward looking dividend growth models (DGM).[8]

The implication of the negative relationship is that regulators should use long-run historical averages for both risk-free rate and ERP. Alternatively, if the regulator uses current sovereign yields as a proxy for risk-free rate, it should use a current forward-looking ERP estimate or make an upward adjustment to the historical average ERP.

Figure 2. **The Recent Decline in Sovereign Yields (the Proxy for Risk-Free Rate) Have Been Offset by an Increase in the Forward-Looking ERP**



Source: NERA analysis of Bloomberg data.
Note: The correlation between the ERP and risk-free rate for the countries cited, and time periods, falls in range of 0.3 to 0.6.

Table 1: **European Regulators Have Adopted Inconsistent Time-Periods for setting CAPM Parameters Thereby Understating the Cost of Equity**

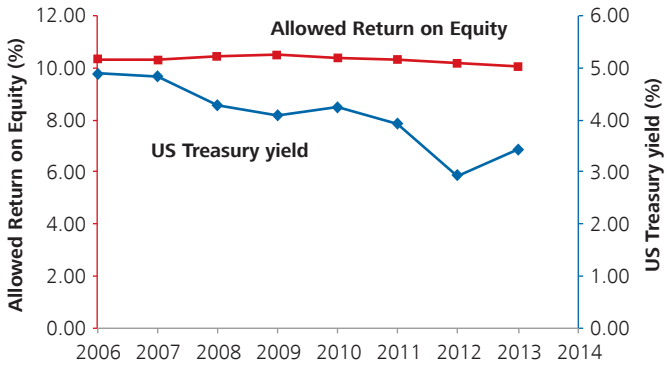
	Austria	Netherlands	Great Britain	Denmark	France	Norway	Germany
Risk-free Rate (Averaging period)	5 years	3 years	"Long- and short-term"	6 months	1-2 years	"Long-term"	"Short-term"
Market Risk Premium	>110 years	>110 years	"Long-term"	>110 years	>110 years	"Long-term"	>110 years
Consistency	X	X	X	X	X	✓	X

The empirical evidence does not show that the negative relationship between the ERP and the risk-free rate holds on a one-to-one basis for all periods of time. Indeed there are periods of time where we can observe a positive relationship.[9] However, such evidence does not undermine our point that regulators should adopt a consistent time period in estimating both parameters: any covariance (even at times of positive co-variance) between the ERP and the risk-free rate means that the combination of, say, a short-run risk-free rate and long-run ERP would result in a biased estimate of the total market return. Moreover, the most recent market evidence (as set out in the figure above) supports the notion that the decline in the risk-free rate has been offset by an increase in the forward-looking ERP, meaning that regulators drawing on current sovereign debt costs combined with long run estimates of the ERP will understate the cost of equity.

US Regulatory Decisions Have Recognised the Need for a Higher ERP When Bond Yields Are Low

As set out in a recent NERA Insights Paper, US state regulators account for the inverse relationship between the risk-free rate and ERP by allowing a higher ERP when bond yields are low.[10] Contrary to the trend in European regulatory decisions, US state regulators' cost of equity decisions have been relatively stable during the financial crisis. For its part, the Federal Energy Regulatory Commission (FERC) has explicitly acknowledged that the "current low treasury bond rate environment creates a need to adjust the CAPM results, consistent with the financial theory that the equity risk premium exceeds the long-term average when long-term US Treasury bond rates are lower than average, and vice versa."[11]

Figure 3. **Allowed Return on Equity Has Been Constant in the Face of Falling Treasury Yields**



Source: NERA Insight Paper

Conclusions

The challenge facing regulators (and regulated companies) is to find a way of estimating the cost of capital that complies with the overall aim of regulation – the final answer should be sufficient to compensate investors for the risk they bear and attract capital into long-run irreversible investment, but not so high as to encourage unnecessary investment.

Recent falls in allowed rates of return on equity in Europe at least in part reflect a flaw in regulators' approaches to applying the CAPM methodology: combining low current risk-free rates with long-run averages for the ERP which produces downwardly biased estimates. Recent empirical research by Eurelectric provides an early sign of falling investment in energy networks as a potential consequence of this bias.

Endnotes

1 According to EU, European electricity network utilities will have to invest more than €1,000 billion in their networks up until 2050. Source: European Commission (December 2011) Impact Assessment Energy Roadmap 2050, SEC(2011) 1565 final.

2 Eurelectric (May 2014) Electricity Distribution Investments: What Regulatory Framework Do We Need?

3 CC (2014): "Northern Ireland Electricity Limited Price Determination – A reference under Article 15 of the Electricity (Northern Ireland) Order 1992", Final determination, p. 13-38. Link: https://assets.digital.cabinet-office.gov.uk/media/535a5768ed915d0fdb000003/NIE_Final_determination.pdf

4 Source: Ofgem (2014) RIIO-ED1: Final determinations for the slow-track electricity distribution companies. Link: https://www.ofgem.gov.uk/ofgem-publications/92249/riio-ed1finaldeterminationoverview-updatedfrontcover.pdf

5 NVE (December 2012): "Endringer i forskrift om kontroll av nettvirksomheten – Oppsummering av horingsuttalelser og endelig forskriftstekst", p35.

6 See for example: (1) Campbell, J. Y. and Cochrane, J.H. (1999) By force of habit: A consumption-based explanation of aggregate of stock market behaviour, Journal of Political Economy, 107, 205-51; (2) Wright, S. et al. (September 2006): "Report on the Cost of Capital – provided to Ofgem"; Smithers & Co Ltd; (3) Harris, Robert, and Marston, Felicia (1999) "The Market Risk Premium: Expectational Estimates Using Analysts' Forecasts", Darden Business School Working Paper No 99-08; (4) Maddox, F., D. Pippert and R. Sullivan (1995), "An Empirical Study of ex ante Risk Premiums for the Electric Utility Industry," Financial Management, 89-95

7 Siegel, J. J. (1998) Stocks for the Long Run McGraw Hill, Second Edition. The finding of a stable real return is also supported by others, e.g. Dimson, E., Marsh, P., and Staunton, M. (2001) Triumph of the Optimists

8 The forward looking ERP is defined as the difference between the market return and the risk-free rate, where the market return for a particular country's market is the internal rate of return weighted by the market capitalisation of each index member. The internal rate of return comes from Bloomberg's Dividend Discount Model, which derives the rate of return such that the present value of analysts' consensus of dividend forecasts equals the current market price. The risk-free rate is the yield on a local ten-year treasury security. Source: Bloomberg

9 See for example: Partington, G. and McKenzie, M (2013) Review of AER's Overall Approach to the Risk Free Rate and Market Risk Premium

10 NERA (13 June 2014) The Decoupling of Treasury Yields and the Cost of Equity for Public Utilities.

11 United States of America Federal Energy Regulatory Commission (28 January 2014): "Order accepting tariff filing subject to condition and denying waiver", Docket No. ER14-500-000, p36.

Contributors

James Grayburn is an Associate Director in NERA's Energy Team
Tel: +44 20 7659 8572; Email: james.grayburn@nera.com

Tomas Haug is an Associate Director in NERA's Energy Team
Tel: +49 30 700 1506 10; Email: tomas.haug@nera.com

NERA
ECONOMIC CONSULTING

NERA Contacts

EUROPE

Dr. Richard Hern
Director
Marble Arch House
66 Seymour Street
London W1H 5BT, UK
Tel: +44 20 7659 8582
Fax: +44 20 7659 8501

Unter den Linden 16
10117 Berlin
Germany
Tel: +49 30 700 1506 01
richard.hern@nera.com

NORTH AMERICA

Dr. Jeff D. Makholm
Senior Vice President
200 Clarendon Street
11th Floor
Boston, MA 02116
Tel: +1 617 927 4540
Fax: +1 617 927 4501
jeff.makholm@nera.com

AUSTRALIA/NEW ZEALAND

James Mellsop
Director
Level 18
151 Queen Street
Auckland 1010
New Zealand
Tel: +64 9 928 3290
Fax: +64 9 928 3289
james.mellsop@nera.com

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