

GETTING REAL ABOUT RETURNS

A reality check for setting the
allowed return

2020

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A REALITY CHECK FOR SETTING THE ALLOWED RETURN

As often is the case with economic theories, when applied to the real world things can quickly get complicated. Although the concept of cost of capital is straightforward enough, the actual analysis is often challenging and can involve a lot of uncertainty. This in turn often leads to considerable complexity and sometimes a seemingly unfathomable amount of detailed analysis based on financial market data.

Despite the ever-increasing level of sophistication in the analysis employed by all sides in the regulatory debate, extensive disagreement persists as to what is the appropriate rate of return that regulated utilities should be allowed. This is largely due to the fact that, although there is general consensus that the WACC has fallen over the last decade, the debate on the extent of the decrease in the regulated sectors and what level of return is now reasonable is unresolved.

Companies and investors argue that regulators have got it wrong because the level is now set too low, while public bodies and consumer representatives argue that the regulator has got it wrong because the level is still set higher than necessary -an extra cost that consumers have to pay. The regulator, as always, must strike the right balance between short-term customer protection in the form of lower bills and long-term customer protection through ensuring continued investment.

Has the theory of the WACC been taken too far in determining the appropriate rate of return for regulated companies?

This short paper seeks to carry out a few simple reality checks to find out if, in pursuing the exact level of the WACC informed by traditional methods and the latest capital market data, currently allowed returns have become decoupled from the underlying business fundamentals. In particular, we focus on the cost of equity and discuss:

EXEC SUMMARY

The Weighted Average Cost of Capital (WACC) features prominently in regulatory price controls. It is the tool of choice (often the only one) to set a reasonable level of return on the capital invested in regulated UK utilities such as water companies.

According to economic theory, the cost of capital represents the opportunity cost for investors committing funds to regulated assets and needs to be remunerated as such. Consumers suffer if the cost of capital is miscalculated: any higher than the opportunity cost and there is consumer detriment because prices will exceed costs; any lower, there is detriment because investors will be unwilling to put up capital, leading to underinvestment and a threat to the future provision of reliable services.

Sounds simple enough? In practice, it is anything but.

- whether regulators' estimate of the cost of equity based on financial market data may have led to implausible conclusions about the appropriate rate of return on equity (ROE)
- how an alternative form of cross-check, such as underlying profitability, could be used instead to ensure that the allowed rate of return stays connected to the fundamentals of the business while bearing in mind returns in the wider equity market.

WHY DO REGULATORS BELIEVE THE COST OF EQUITY HAS FALLEN OVER TIME?

Since the Global Financial Crisis (GFC), expansionary monetary policies have led to lower interest rates both in the short-term money market and in the long-term bond market. The cost of debt has thus dropped substantially, both on government bonds (which are often used by regulators as a proxy for the risk-free rate) and on certain high quality investment-grade corporate bonds (e.g. those issued by regulated companies). This had raised challenges from public bodies (e.g. the National Audit Office and the Treasury Select Committee) which are mindful that regulators' *ex ante* fixed cost-of-debt allowance set at the height of the GFC led to windfall gains for regulated companies that some considered to be excessive.

The debate quickly shifted from the cost of debt to the cost of capital as a whole, including the cost of equity. Once the case had been laid out that there had been a windfall gain on debt allowances, the logical next step became 'this must apply to the cost of equity as well'.

The problem is that the cost of equity is unobservable, as we discuss later. As a consequence, there is a range of approaches to estimate its cost, all with high margins of error. Different methods may be considered perfectly legitimate on their own, but the resulting estimates can vary significantly. Therefore, if there is a reasonable hypothesis that the cost of equity has decreased over time, one can easily find corroborating evidence.

Indeed, regulators in the UK have presented various types of evidence to support a lower cost of equity, including forward-looking discount rates implied from the market valuation of equity assets that appear high on some metrics, lower macro-economic growth forecasts and so on.

But none of these arguments provide proof that expected returns will be lower in the future. For example:

- Forward-looking market-implied discount rates (e.g. estimated from Dividend Discount Models, or DDM) vary significantly over time. They sometimes suggest a decline in the expected ROE; other times, an increase.
- High valuation metrics may be due to a host of causes that no one can be sure will be sustained.
- Lower growth prospects for the real economy may already be reflected in share valuations.

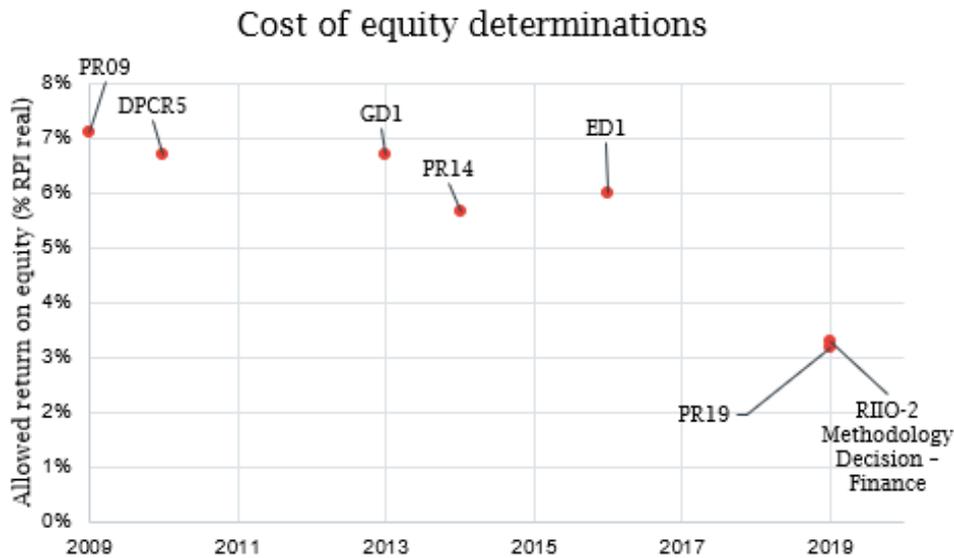
In fact, the only statistic on stock market ROE that can be observed with certainty is past realised returns. As we show later, while proponents of a lower ROE have been making their case for much of the last decade, the equity returns achieved in various markets has matched, if not beaten, the long-run average during that time.

Figure 1 below shows the resulting sudden change of approach to the allowed equity returns in PR19 and RII0-2, compared to previous Ofwat and Ofgem price controls.

Regulated companies argue that such large declines are unjustified and that the evidence presented by the regulators is one-sided, while regulators argue firmly that the estimates are based on robust methods and the most up-to-date data.

So how can we assess who is right?

FIGURE 1 REGULATORY DETERMINATIONS ON THE COSTS OF EQUITY



Source: Regulatory decision documents

Note: Timings reflect the time of the final determinations, except for RIIO2.

DOES A LOWER RISK-FREE RATE MEAN A LOWER COST OF EQUITY?

The truth is, there is no clear answer to this question. This is because the cost of equity is a notoriously complex concept in finance, both in theory and in practice.

The cost of debt can be observed with precision, because the future cashflow and current market value of the debt are both well-defined: the internal rate of return that discounts all future cashflows into the current market value is the cost of debt.

Such certainty does not exist - and will never exist - with equity because future cashflows are uncertain. All that can be observed is the current market value. Investors therefore have to make their own assumptions about future cashflows. Any implied cost of equity based on market value is necessarily driven directly by the associated cashflow assumptions. This is the biggest challenge in estimating the cost of equity using forward-looking market-implied methods such as the DDM mentioned earlier. Because the assumptions behind market-clearing equity prices are not observable, the implied market cost of equity is equally unobservable. Not even with hindsight.

A fall in interest rates caused by quantitative easing could be consistent with a lower expected ROE, all else being equal, while a decline caused by investor switching from equities to bonds due to heightened risk aversion could be consistent with a higher expected ROE, all else being equal. But in reality, all else is not

always equal. Often both forces are at play in varying degrees, which makes direct inference of the cost of equity uncertain.

This inherent uncertainty and circularity leads to the popular practice of indirect estimation of the cost of equity, independent of future cashflows. One of the widely-used methods is the Capital Asset Pricing Model (CAPM). The CAPM model assumes that investors hold well-diversified portfolios and that the required return on an asset depends on its correlation with the return of the market portfolio, combined with the required return on the market portfolio and the required return on a risk-free asset.

The CAPM method is a reasonable way of estimating the cost of equity and is endorsed by academics and practitioners alike. However, although the risk-free rate (RFR) is based on government bond yields and so is straightforward to calculate, the required return on the market portfolio (sometimes referred to as the Total Market Return, or TMR) is a parameter that cannot be observed and therefore requires indirect estimation. In going about this task, researchers face the same challenges as explained above for the cost of equity for individual companies.

UK regulators have recently lowered their estimates for the TMR by one percentage point. The reduction is mainly due to new interpretation of the historical data and a reconsideration of how best to convert past nominal returns into real returns, given that methods of estimating inflation have varied enormously over time. The exercise undertaken by the regulators includes a re-evaluation of inflation levels during the Second World War.

To be clear, this re-evaluation is not driven by an actual change in returns over the last few years. Long-term realised equity returns, on which UK regulators rely as primary evidence to estimate the TMR, show no drop in the past decade compared to the historical average.

FIGURE 2 REAL EQUITY RETURNS IN DIFFERENT PERIODS (GEOMETRIC MEAN)

	1900 - 2019	2010 - 2019
UK	5.5%	5.8%
US	6.5%	10.6%
Europe Index	5.2%	7.6%
World Index	4.3%	4.3%

Source: Credit Suisse Global Investment Returns Yearbook 2020

As Figure 2 illustrates, the geometric mean annual return in real terms in the UK for the last 10 years has been higher than in the past 120 years of the equity market. The same applies to the US and Europe, while real returns in the developed world in general have marked time over the past decade.

We note that this does not mean the cost of equity in the future will be higher or lower. Moreover, a decade's worth of realised return data cannot be relied upon to estimate the TMR due to its inherent volatility. However, the key point here is that the data itself did not strongly point regulators in the direction of lower allowed returns. To arrive at a lower estimate of the TMR, they have had to change their interpretation of the data, both new and historical.

It is sometimes unclear if the regulators are arguing that the cost of equity has fallen in the past decade or that they have previously overestimated it. Earlier discussions with the regulators focused on the drop in the RFR, market-implied expected returns and weaker economic growth, while the focus more recently has been on the reinterpretation of relatively stable historical inflation rates.

Because the underlying TMR is not observable, this change in approach led some companies and investors to speculate that the regulators, in concluding that the estimated TMR was 1 percentage point lower, had been guided by their understanding of the recent evidence.

Whether or not this view is justified is moot. But it seems that the most honest answer to the question whether a lower RFR automatically leads to a lower cost of equity is: 'we do not know for certain because we cannot observe the cost of equity.'

This brings us to cross-checks, which regulators often carry out to ensure that their estimates of the cost of equity are within a reasonable range. There are various cross-checks available for this purpose and we do not attempt to cover all of them here.

In this paper, we propose a different approach to cross-check if the allowed rate of return is in line with business fundamentals.

AN ALTERNATIVE CROSS-CHECK – PROFITABILITY METRICS OF BENCHMARKS

Although the forward-looking cost of equity (expected ROE) cannot be observed, we can observe two forms of out-turn:

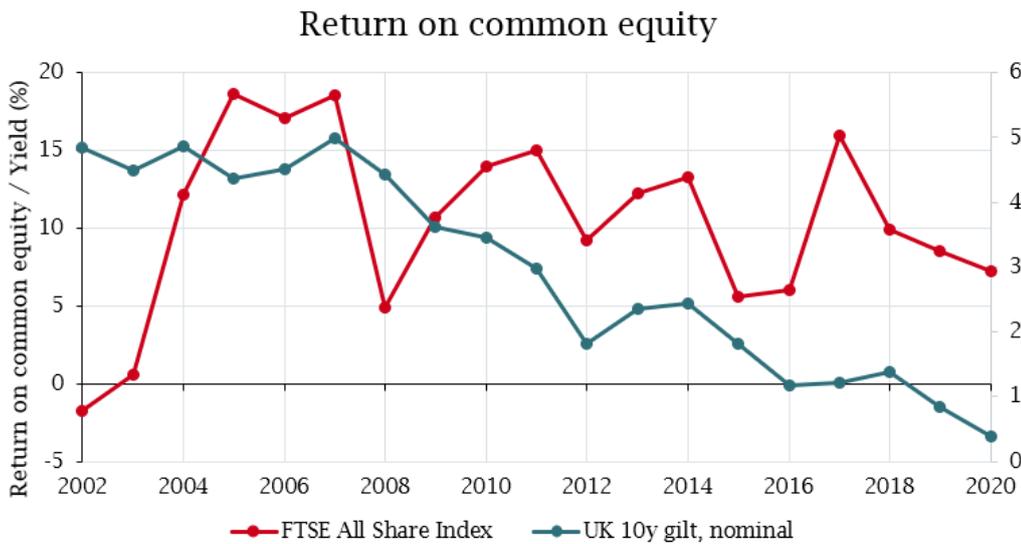
- realised ROE (including the return from dividend and capital appreciation due to valuation changes in the financial market)
- accounting profitability of the underlying business owned by the equity holder.

The former is essentially what the regulators rely on to establish the long-run average explained above for the market as a whole. This is largely determined by valuations and so is subject to overall conditions in the capital market.

The latter, however, is based on the fundamentals of the companies, which are more likely to be driven by demand for the product, level of competition, etc. It is this metric that we recommend as an alternative cross-check, because it is directly comparable to what the regulator is setting – an allowed level of profitability for the business.

Below, we show the profitability of the entire UK equity market going back as far as data is available on Bloomberg, including the current low RFR period. The accounting measure we use is return on common equity, which is defined by net income after tax divided by the book value of the equity.

FIGURE 3 ROE OF FTSE ALLSHARE COMPANIES COMPARED WITH THE RFR



Source: Bloomberg Data

Note: Return on equity is shown on the left axis and Gilt yield is shown on the right axis.

The chart shows fluctuating levels of profitability over the period, but without any discernible falling trend. For comparison, we note that the UK gilt yield (shown on the right axis) has declined significantly during the same period.

It is hard to see any relation between the average profitability of UK-quoted companies and the RFR, including in the period since the GFC when interest rates have been extremely low.

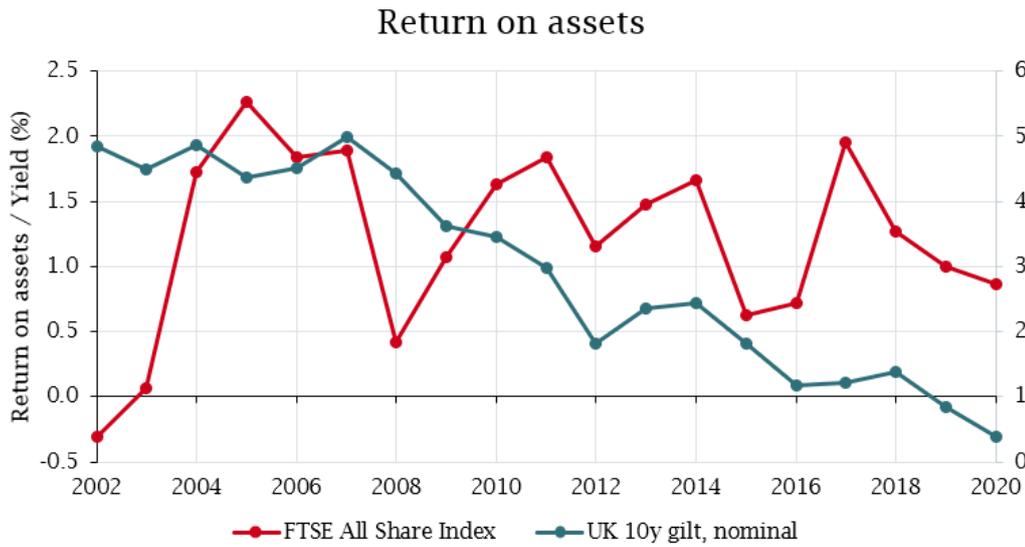
One plausible interpretation of the ROE evidence is that the underlying cost of equity (for a given gearing level) may have fallen but companies have responded to the fall in interest rates by borrowing more, resulting in an offsetting increase in the cost of equity adjusted for gearing.

To test this interpretation, we looked into two other profitability gauges, namely return on assets (ROA) and return on capital (ROC)¹. If the above interpretation is true, one would expect that ROA and/or ROC would follow the downward trend of interest rates.

Figure 4 shows the chart for ROA.

¹ Return on capital is defined as operating income / capital invested. This is slightly different from return on capital employed (which is not available on Bloomberg for the FTSE index).

FIGURE 4 ROA OF FTSE ALLSHARE COMPANIES COMPARED WITH THE RFR



Source: Bloomberg data
Note: Return on assets is shown on the left axis and Gilt yield is shown on the right axis.

Figure 5 shows the chart for ROC.

FIGURE 5 ROC OF FTSE ALLSHARE COMPANIES COMPARED WITH THE RFR



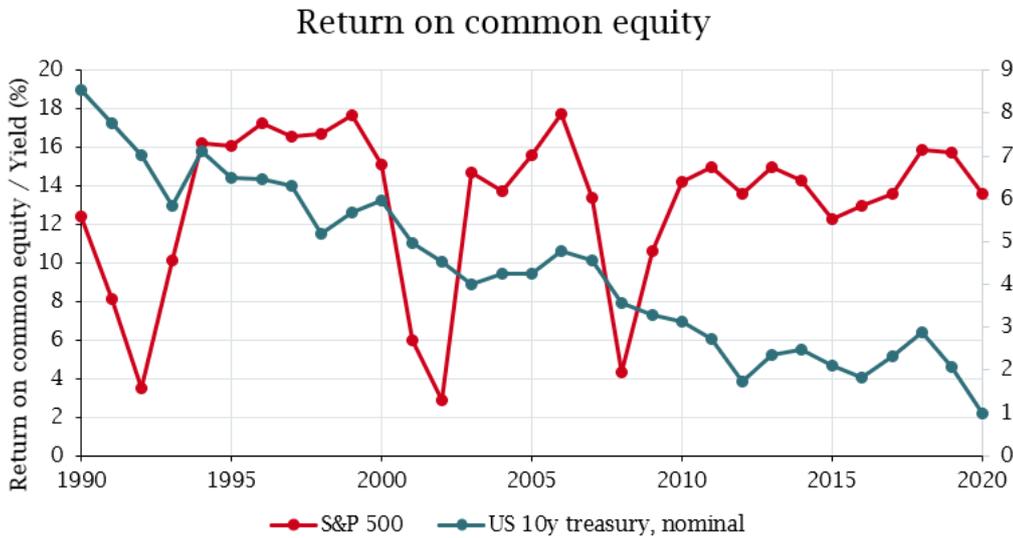
Source: Bloomberg data
Note: Return on capital is shown on the left axis and Gilt yield is shown on the right axis.

As the charts show, there is no clear downward trend in either measure. So the above hypothesis that firms increased gearing in response to the fall in interest rates, thereby keeping the return on equity stable, is not borne out by the evidence.

The charts for ROA and ROC support the previous conclusion, namely that there is no discernible relationship over this period between profitability and interest rates.

This finding, although it might appear surprising, is not confined to the UK. Other major equity markets display similar patterns. Figure 6 shows the profitability of equity capital in the US using Bloomberg's data on the S&P 500 dating back to 1990.

FIGURE 6 ROE OF US S&P 500 VERSUS 10-YEAR TREASURY BOND YIELD

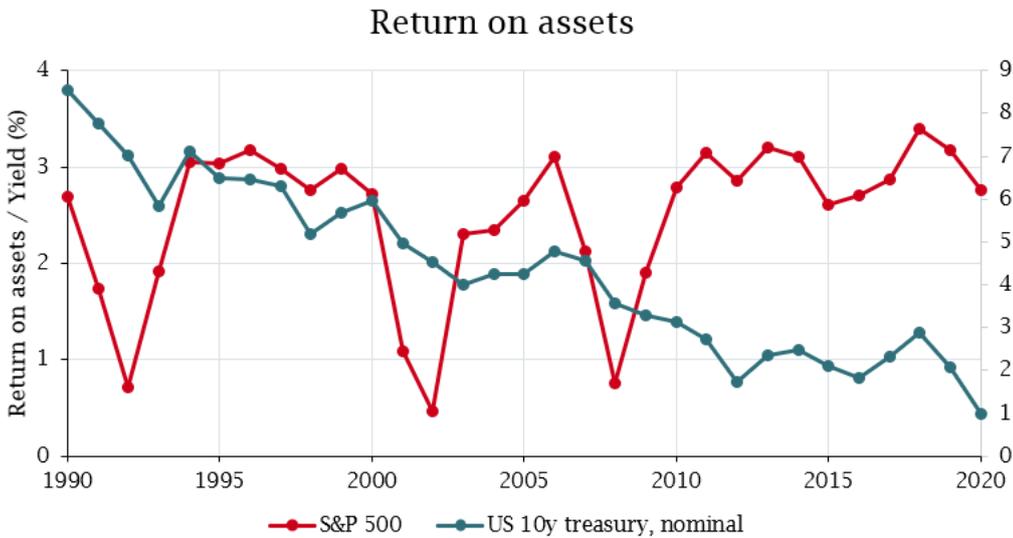


Source: Bloomberg data

Note: Return on equity is shown on the left axis and Treasury bond yield is shown on the right axis.

Figure 7 shows the ROA for the US market.

FIGURE 7 ROA OF US S&P 500 EQUITY VERSUS 10-YEAR TREASURY BOND YIELD

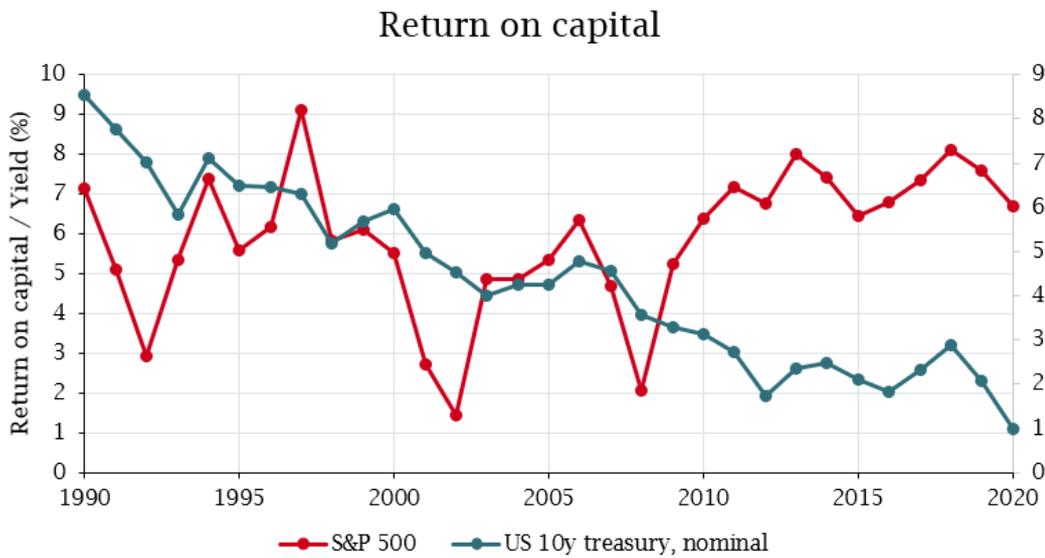


Source: Bloomberg data

Note: Return on assets is shown on the left axis and Treasury bond yield is shown on the right axis.

Finally, Figure 8 shows the ROC for the US market.

FIGURE 8 ROC OF US S&P 500 VERSUS 10-YEAR TREASURY BOND YIELD



Source: Bloomberg data

Note: Return on capital is shown on the left axis and Treasury bond yield is shown on the right axis.

The absolute levels of these metrics are less relevant for this discussion, as each of them measures different aspects of profitability and they may not all be directly comparable. However, what appears evident from the charts is that the accounting profitability of the businesses underlying the stock markets, although volatile at times, has not followed the secular downtrend of interest rates. The descriptive analysis in these charts, though striking, would benefit from further detailed work, including an econometric study of profitability set against interest rates and other macro-economic factors.

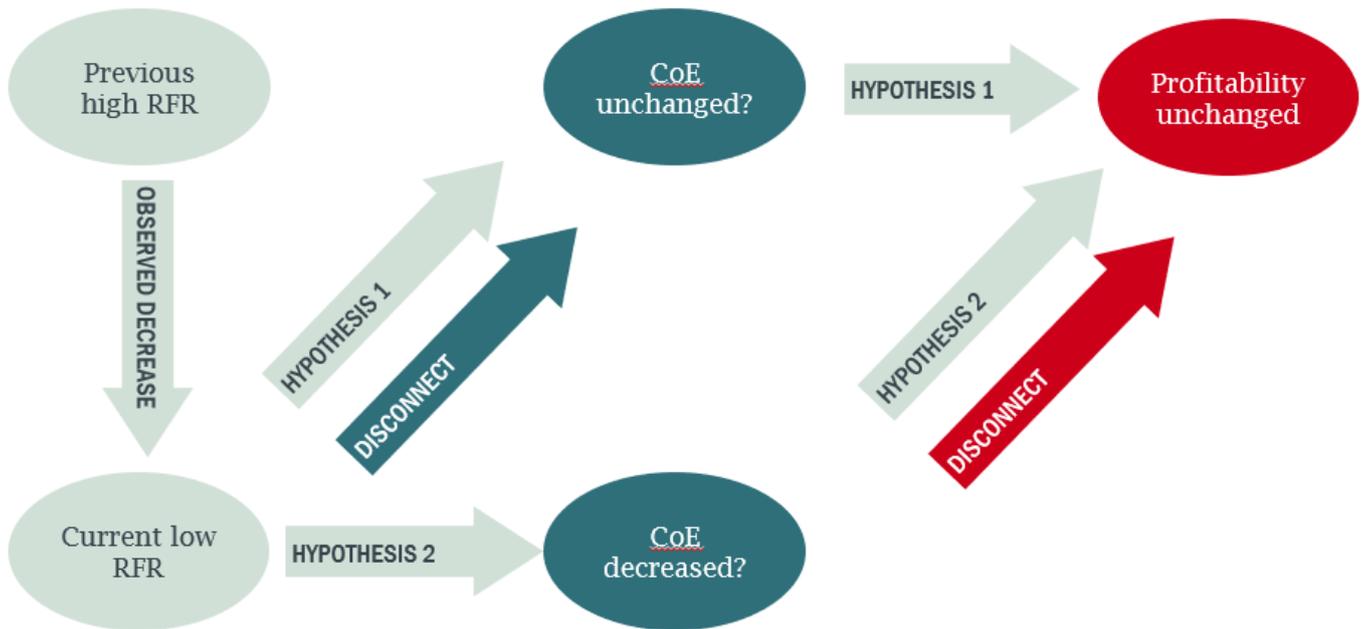
What could explain the finding from this analysis? There are two, not mutually exclusive, hypotheses:

- First, the cost of equity has been relatively stable, regardless of the trend in the risk-free rate. So, in this case there is no relationship between the RFR and the cost of equity. Some academics seem to support this thesis.²
- Or, second, the cost of equity has decreased with the interest rate but there has been no corresponding reduction in profitability. In other words, there is no relationship between profitability and the cost of equity, or at least not over the timeframe shown here.

² See website of Prof A. Damodaran from NYU (<http://pages.stern.nyu.edu/~adamodar/>) who compiles TMR data for various countries on an annual basis, using DGM method.

See also ECB quarterly bulletin on cost of equity for eurozone countries, April 2018.

FIGURE 9 THE DISCONNECT BETWEEN PROFITABILITY AND RFR



Source: Frontier Economics analysis

Hypothesis 1 has already been discussed at length in the previous section, and our conclusion was that it may or may not be true. We do not know for certain.

Hypothesis 2, however, is slightly more intriguing. To understand this better, it may be worth emphasising further the distinction between the profitability of a company and the return on equity for an investor in such a company.

- A company's profitability is the fundamental basis of investment. It is normally driven by supply and demand in the business sector in which the company operates, its competitive advantage in the market and its financial performance. It rarely depends on capital market conditions, apart from financing costs.
- The return on equity for an investor depends on the expected profitability of the company but also other factors such as capital market conditions and investor risk appetite that determine the cost of equity. These in turn influence current equity valuations.

If the cost of equity falls in tandem with interest rates but profitability does not, this increases the market value of the assets, resulting in the realised ROE exceeding the cost of equity for the seller of the equity. The new owner (who has bought the assets at a higher price that reflects the fact that profitability outstrips the cost of equity) will now earn an ROE equal to the cost of equity, even if the business maintains the higher level of profitability as above.

The above logic has led regulators to use metrics that measure market value relative to the regulatory asset value, such as the market-to-asset ratio (MAR), to check if the expected regulatory return exceeds the true cost of equity. The general conclusion has been that because the MAR is higher than one for the three traded water companies, the regulatory return can be considered to be greater than the cost of capital.

However, the evidence above shows that, under hypothesis 2, the profitability of all firms on average on the stock market would be higher than the cost of equity, thus leading to a relatively high ratio of market value to book value for all of the equity assets. In that context, by singling out the regulated utilities, the regulators would be effectively forcing profitability in these sectors to converge to a lower cost of equity, therefore deviating from the majority of the stock market. Whether this is the right thing to do could depend on the underlying cause of the disconnect between profitability and the cost of equity in the wider market.

But what are the potential reasons why trends in profitability might deviate from trends in the cost of equity?

- **Degree of market competition.** If the markets in which the listed companies operate are contestable, then new entrants will come in until the returns are equal to the cost of equity, which will lead to lower profits. However, if markets are monopolised then a reduction in the cost of equity should result in a lower marginal cost and potentially higher profits.
- **Pricing and customer-switching dynamics.** Even contestable markets may experience long time lags between changes in financing costs and changes in profitability, for example markets characterised by long-term fixed price contracts.
- **Scarce resources.** In some markets, monopoly rents could be derived from scarce resources such as land, raw materials, IP, etc. A decline in interest rates can increase the value of these resources, boosting the profitability of the companies that own them.
- **Cyclical factors.** Even in competitive markets the level of profitability will not equal the cost of equity every year, as the annual variation in profitability in the charts above illustrates. In addition to the short-term economic cycles shown in the charts there may be other longer-term cycles that affect particular sectors.

It would seem that hypothesis 2 could be linked to a lack of contestability and/or some longer-term cyclical effect that applies to much of the wider equity market. In this case, a utility regulator may have reasons to allow a level of profitability disconnected from the wider market, although it needs to be confident that the factors driving overall corporate earnings do not also apply to the utility sector. Otherwise we would be back to hypothesis 1.

So what can we conclude from this discussion?

When setting allowed returns, the regulators can aim:

- for equity investors to earn a total ROE that matches the prevailing market-clearing discount rate (cost of equity); or
- for the regulated business to earn a risk-adjusted level of profitability comparable to companies in the wider market.

These two have hitherto been simply assumed to be the same, or at least to converge over time. But, in light of the evidence against this assumption set out above, we believe regulators now have to distinguish between the more carefully.

- If hypothesis 1 is true, regulators need to reconsider the validity of finance models that link falling interest rates to a lower cost of equity.
- If hypothesis 2 is true, regulators need to study the various reasons why the profitability of globally listed companies can systematically diverge from the cost of equity, in order to show how these reasons apply to the regulated utility sectors.

At the moment, there is a growing trend for UK regulators to mechanistically follow the theory that allowed returns must be set equal to the WACC. However, as regulators' estimates of the WACC fall in conjunction with interest rates, the profitability of the underlying utility businesses is likely to decline - a phenomenon not visible to date in the wider equity market.

This paper is not suggesting that allowed returns for regulated utilities should be set according to accounting profitability observed among listed firms. Nor are we advocating abandoning attempts to estimate the WACC.

What the paper suggests is that, in the current low interest environment, regulators need to be careful not to slavishly follow lower WACC estimates in setting allowed returns, because there may not be a sound basis to do so. We recommend that regulators carry out a robust study of whether the disconnection between profitability in the wider equity market and lower interest rates can be satisfactorily explained. Potential analysis could include, but is not limited to:

- more detailed investigation of the trends in market profitability (e.g. using econometric methods)
- research into the profitability and competitive dynamics of different markets and their subsectors to understand if there are plausible reasons for hypothesis 2
- an assessment of the cost and benefit of allowing the trend in regulated rates of return to diverge from the trend in returns for the average listed company.

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