

**WHEN “WHAT GOES UP” DOES NOT COME DOWN:
RECENT TRENDS IN UTILITY RETURNS**

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February 15, 2017

I. Executive Summary

- *Returns on Equity (ROEs) granted to regulated utilities are near an all-time high relative to interest rates.*
- *Yet, the risks faced by regulated utilities are at an all-time low.*
- *Returns achieved by regulated utilities are equal to or greater than the returns of much riskier enterprises.*
- *Utilities could attract necessary capital at much lower awarded ROEs. Excessive ROEs encourage overbuilding and harm utility customers.*
- *Policymakers should reassess the ROEs being granted to utilities, and should be skeptical of requests for additional alternate rate-setting mechanisms without significant ROE reductions.*

II. Overview

Awarded and achieved utility ROEs have been much higher than necessary to induce appropriate investment in recent years. Utility ROEs have failed to track either the utilities’ level of regulatory risk or general economic indicators. This trend can drive inefficient investment decisions by utilities and inflates rates for utility customers.

The risks faced by most utilities today are significantly lower than over the last three or four decades.² For example, utilities are generally not attempting to place capital-intensive coal and nuclear plants in rates today, as natural-gas-fired generation has emerged as the preferred plant technology. Natural gas plants have a lower up-front capital cost, so they carry significantly less financial risk in a regulatory review than an expensive coal or nuclear plant.³

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² A view shared by the rating agency Moody’s Investor Service (Sector-in-Depth Analysis, March 2015): “Across the US, we continue to see regulators approving mechanisms that allow for more timely recovery of costs, a material credit positive. These mechanisms, which keep utilities’ business risk profile low compared to most industrial corporate sectors, include: formulaic rate structures; special purpose trackers or riders; decoupling programs (which delink volumes from revenue); the use of future test years or other pre-approval arrangements. We also see a sustained increase in the frequency of rate case filings.”

³ https://www.eia.gov/forecasts/capitalcost/pdf/updated_capcost.pdf

The risks and uncertainty associated with transitioning to retail competition—such as the potential for stranded utility generation investment—have largely been settled, further reducing utilities’ risk. Rate riders, interim “cost recovery factors,” and other features that allow a utility to increase its rates without a full rate review have also proliferated over the past two decades, allowing accelerated capital recovery and substantially reducing regulatory lag in the ratemaking process. Over time, these and other factors have materially reduced risk for regulated utilities, making high risk premiums unnecessary to attract capital or induce investment.

Yet, ROEs for regulated utilities are higher than ever relative to US Treasuries. ROEs have not been significantly reduced to recognize the lower risk faced by regulated utilities today, or even general economic trends. Utility ROEs have not fallen at nearly the same rate as interest rates. One cause of this “stickiness” in regulated utility ROEs (compared to interest rates) is the peer-group methodology used by most ROE witnesses and often adopted by regulators. This approach is inherently backward-looking, and when each utility’s ROE is based on the ROEs granted to the utility’s peers, inflated utility ROEs are self-perpetuating. Further, as Public Utilities Fortnightly observed in its 2016 Annual Rate Case Survey, the trend of sustained, unnecessarily high ROEs for utilities is also a product of utility scare tactics in regulatory proceedings, where risk-averse regulators are led to believe that appropriately reducing ROEs will deter necessary investment—despite robust evidence to the contrary.⁴ As a result of these and other factors, utilities are receiving premium ROEs today compared to other industries.

The “risk premium” being granted to utility shareholders is now higher than it has ever been over the last 35 years. Excessive utility ROEs are detrimental to utility customers and the economy as a whole. From a societal standpoint, granting ROEs that are higher than necessary to attract investment creates an inefficient allocation of capital, diverting available funds away from more efficient investments. From the utility customer perspective, if a utility’s awarded and/or achieved ROE is higher than necessary to attract capital, customers pay higher rates without receiving any corresponding benefit. Inflated ROEs also encourage utilities to make inefficient investment decisions so that they can earn a return on additional capital, harming both society and customers. As one observer has aptly noted, “When allowed equity returns exceed the true cost of equity, utilities have an artificial incentive to expand utility facilities upon which they can earn that extra return, including favoring themselves over others in resource procurement.”⁵ This compounds the excess earnings for utilities and further increases rates for customers. In addition, the combination of low debt costs and high utility ROEs in recent years has encouraged a type of arbitrage known as “back-leveraging” or “double-leveraging,” where a utility parent or holding company borrows money at a low rate to use as equity at the utility level. This common strategy of translating low cost debt at the parent into equity returns at the utility increases returns for shareholders even beyond the premium levels authorized by regulators.⁶

⁴ Cross, P., “2016 Annual Rate Case Survey,” Public Utilities Fortnightly (Nov. 2016).

⁵ See Huntoon, S., “Nice Work If You Can Get It,” Public Utilities Fortnightly (Aug. 2016).

⁶ Notably, “back-leveraging” also creates significant risk for utility customers by increasing the financial stakes of a default, which could compromise the utility’s financial integrity and impede appropriate investment to maintain reliability.

Importantly, an excessive utility ROE has more than a dollar-for-dollar impact on customer rates because rates are grossed up to cover federal income tax liability on utility earnings. Take, for example, a utility with a total rate base (total investment) of \$1 billion, and a capital structure of 40% equity, 60% debt, which is common. A one percent increase in this utility's ROE would not just translate to a rate increase of \$4 million, but to **\$6.2 million** because the return would be grossed up to cover corporate federal income tax liability (roughly 35%) on the additional earnings.⁷ Investor-owned utilities in Texas have an aggregate rate base of approximately \$25 billion.⁸ Historically, a typical utility risk premium would be in the range of 450 basis points above Treasuries (in other words, if 30-year treasury bonds yield 3%, the utility ROE would have been 7.5%). However, risk premiums have been on the order of 650 basis points over the last several years, with Treasury bonds at 3% and utility ROEs at 9.5%. In Texas, this 200 basis point differential means, all else being equal, rates could have been reduced by approximately \$300 - \$350 million⁹ annually without adversely impacting investment in utility infrastructure.

As a result of all these factors, utilities have been very profitable investment vehicles in the current economic climate,¹⁰ and investors are eager to provide capital for utility infrastructure. Even if utilities do not achieve their allowed ROE, they have been successful in achieving a return in excess of their cost of capital.¹¹ Thus, there is no shortage of interest from both traditional utilities and non-traditional players such as pension funds, sovereign wealth funds, and private equity groups to invest in utility projects. This is, generally speaking, because the actual cost of capital required for investment is much lower than the ROEs being granted in the utility sector. A recent analysis concluded that most utility investors are looking for an annual rate of return around 7.5%,¹² while awarded utility ROEs have continued to be around 10%.¹³ The result is a risk-adjusted rate of return that is superior to competing investments, and

⁷ \$1 billion rate base * 40% equity in capital structure * 1% increase = \$4 million. Tax gross-up is \$4 million/(1-0.35) = \$6.2 million.

⁸ See Tietjen, D., "Alternative Ratemaking: Is It Time For A Shock To The Rate-Setting System?," presented to Gulf Coast Power Association, November 21, 2016. This figure does not include transmission investments held by municipally owned utilities or electric cooperatives, which are also included in the postage stamp transmission rates in ERCOT. Rate base equals net plant in service of \$33 billion from Mr. Tietjen's presentation, less ADFIT of \$8 billion, taken from each utility's earnings monitoring reports in the following docket: <http://bit.ly/2ibTVke>.

⁹ \$25 billion * 40% equity * 2%/(1-0.35) = \$308 million. Non-ERCOT utilities typically have approximately 50% equity in their capital structure, not the 40% used in Transmission and Distribution utilities in ERCOT, so the actual amount would be in excess of \$308 million.

¹⁰ Hyman, L. and Tilles, W., "Don't Cry for Utility Shareholders, America," Public Utilities Fortnightly at 65 (Oct. 2016).

¹¹ The cost of capital is set by the market, not regulators.

¹² Hyman, L. and Tilles, W., "Don't Cry for Utility Shareholders, America," Public Utilities Fortnightly at 65 (Oct. 2016).

¹³ See Cross, P., "2016 Annual Rate Case Survey," Public Utilities Fortnightly (Nov. 2016); see also Huntoon, S., "Nice Work If You Can Get It," Public Utilities Fortnightly (Aug. 2016) at n. 8, citing recent FERC-issues ROEs in the 10% range for New England utilities.

higher than necessary to induce investment. The keen interest of numerous investors in recent utility mergers and acquisitions at premium prices is another sign of this phenomenon.¹⁴

The evidence showing that awarded utility ROEs far exceed the levels that actual risk factors and general economic trends would support is substantial, and mounting. As one author on this topic has stated, “[r]egulated utilities are less risky than competitive industries, and therefore are supposed to produce a lower total return over time. But instead the opposite is happening.”¹⁵

Mounting evidence indicates that awarded ROEs and actual utility earnings are too high, and that it is time to reevaluate the status quo and reduce utility ROEs to reflect actual risk and economic factors.

III. Current utility ROEs are higher than risk factors and economic trends support.

Rates of return for regulated utilities must achieve two competing goals: (1) they must allow the utility to attract enough capital to make the investments needed to provide reliable, continuous service, and (2) they must protect customers against monopoly pricing by ensuring that rates replicate what a competitive market would produce. A seminal scholar on utility regulation, James Bonbright, famously described the rate-setting process as follows:

Regulation, it is said, is a substitute for competition. Hence its objective should be to compel a regulated enterprise, despite its possession of complete or partial monopoly, to charge rates approximating those which it would charge if free from regulation but subject to the market forces of competition. In short, regulation should be not only a substitute for competition, but a closely imitative substitute.¹⁶

If a utility’s awarded ROE is too low relative to its risk profile, the utility will not be able to attract capital, which will result in underinvestment. If a utility’s awarded ROE is too high, customers will pay more than necessary to incentivize appropriate investment, and the utility will be encouraged to pursue inefficient investments and to “gold plate” infrastructure to inflate its returns. The overall economy is also harmed in these conditions because capital is inefficiently diverted from other potential investments.

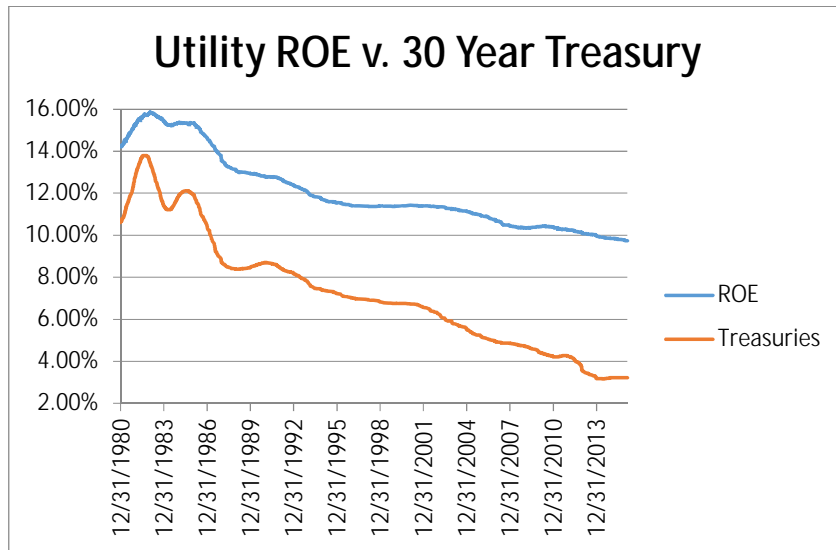
With this context, a historical comparison of the returns earned on “risk-free” investments (represented here by thirty-year Treasury yields) and the ROEs granted to regulated utilities strongly suggests that utility ROEs are not appropriately tracking either the risk level of utility investments or general economic trends. As shown in Figure 1, both utility ROEs and Treasuries have fallen since the early 1980s, but the gap has widened because utility ROEs have not declined nearly as quickly as Treasury yields—particularly over the last ten years:

¹⁴ “Recent acquisition activity has been a little troubling, with above-average premiums being paid and, consequently, a more debt-financed profile to the transactions.” Standard & Poors Ratings Service, “Industry Top Trends 2016,” December 2015 at 22.

¹⁵ Huntoon, S., “Nice Work If You Can Get It,” Public Utilities Fortnightly (Aug. 2016).

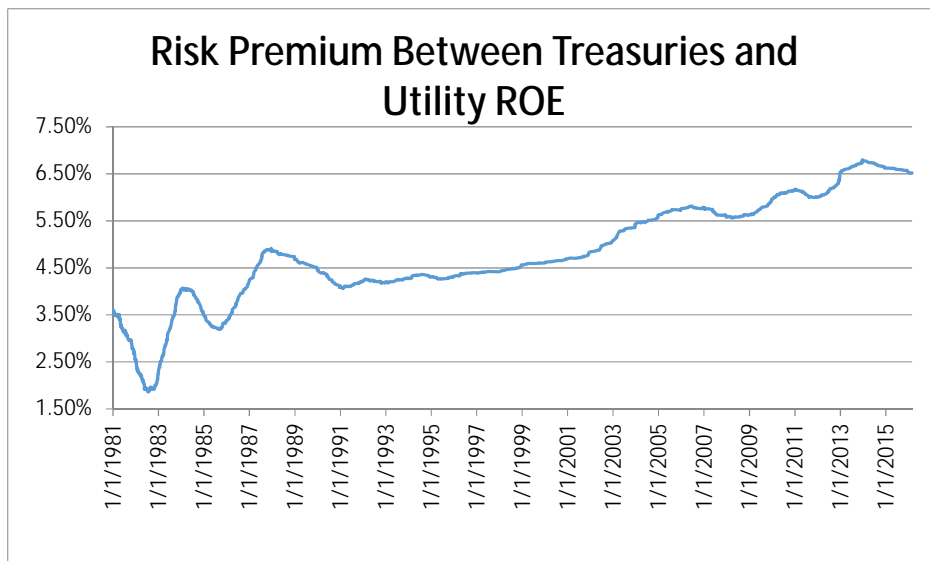
¹⁶ Bonbright, J., Principles of Public Utility Rates at 3 (1966).

Figure 1: Comparison of Utility Allowed ROEs to 30-Year Treasury Yields¹⁷



This gap between utility ROEs and returns on “risk-free” investments represents a “risk premium.” Risk premiums should compensate utility shareholders for the increased risk they bear relative to simply holding a theoretically risk-free asset—the 30-year Treasury bond in this case. As utility risk declines, the difference between utility ROEs and risk-free interest rates should become smaller—but the opposite is happening. The figure below focuses solely on the risk premium:

Figure 2: Comparison of Risk Premiums



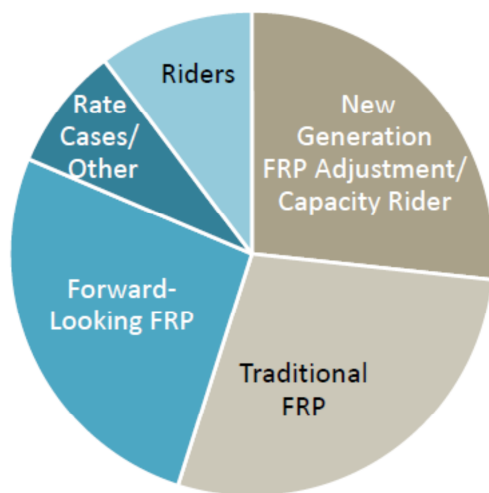
¹⁷ Data is smoothed to be the 12-month moving average for both utility ROEs and Treasuries. Data is from SNL Financial and Bloomberg (see Direct Testimony of Robert Hevert in Docket 45414, Exhibit RBH-8, and Exhibit 1 to March 10, 2015 Moody’s Sector-in-Depth Analysis for Electric Power).

As the chart above illustrates, the average risk premium over 1980-2016 was about 4.5%, or 450 basis points. Until the year 2000, risk premiums for utility investments had never exceeded 500 basis points. *Since that time, the gap has steadily increased and stands at approximately 650 basis points today.* If investing in utilities were riskier today than in the past, this result might be appropriate—but the opposite is true, as discussed below. Risk in the utility sector has declined over the last few decades, yet ROEs have not been reduced to reflect this lower risk, or even to track the general decline in expected yields from “risk-free” investments. This strongly suggests that the ROEs being granted to regulated utilities should be reevaluated.

IV. Texas: A Case Study

The utility business in Texas has become significantly less risky over the last two decades. From an investor’s viewpoint, “risk” in the utility business includes anything that delays or prevents the investor from earning a return on invested capital. Among other factors, traditional utility risks include the potential that regulators may exclude an investment from rates (*e.g.*, for imprudence in the construction of generating plant), significant delay between the time an investment is made and the time when it is reflected in rates (also called “regulatory lag”),¹⁸ and factors that influence utility revenues such as fluctuations in weather and load growth. Nationally, utilities have been successful in minimizing regulatory lag over the past decade through “alternative” rate mechanisms like future test years, formula rate plans, various riders to collect specific costs, and other forms of piecemeal (or “single-item”) ratemaking. The chart below was created by a large multi-jurisdictional utility to show investors how little it relies on traditional rate cases compared to alternate ratemaking mechanisms to recover capital:

Figure 3: Illustrative Recovery of Incremental Utility Capital¹⁹



¹⁸ Regulatory lag is a complex issue, as it can both hurt and help investors depending on the circumstances. If a utility is over-earning, regulatory lag benefits shareholders by increasing the time it takes to adjust rates downward. When a utility is under-earning, regulatory lag can delay setting rates that reflect the utility’s actual revenue requirement.

¹⁹ Entergy Presentation to Investors, February 26, 2016 at 13.
http://files.shareholder.com/downloads/ETR/3875534036x0x877819/1D8DC9CC-7551-4A2F-8658-7DDB4147F73A/Handout_-_Investor_Meetings_Feb_26.pdf.

In Texas, there has been a profound trend of declining risk in the utility business over the last 15 years. Regulatory lag has been materially reduced (if not almost completely eliminated) for utilities—inside and outside of ERCOT—through the myriad of riders and cost-recovery factors that are now granted. Utilities can now increase rates without a full rate case to reflect: (1) transmission investment through Transmission Cost of Service (TCOS) and Transmission Cost Recovery Factor (TCRF) updates,²⁰ (2) distribution investment through Distribution Cost Recovery Factor (DCRF) updates,²¹ (3) purchased power contracts through the Purchased Power Cost Recovery Factor (PCRf),²² (4) changes in fuel costs through the Fuel Factor,²³ and (4) costs of complying with energy efficiency mandates through the energy efficiency cost recovery factor (EECRF).²⁴ Many of these updates can be filed at the utility’s discretion, which means utilities can selectively file only when they believe a rate increase is supported. Some of these mechanisms fail to account for potential reductions in related cost drivers, such as deferred federal income taxes (a reduction to rate base) and load growth. Given that these mechanisms largely eliminate risk and can actually *increase* a utility’s earned return, it is indisputable that utilities in Texas face much less regulatory lag or risk than they did in the 1980s or 1990s.

In ERCOT, generation service is now competitive and is no longer provided by rate-regulated utilities. Compared to generation investment, transmission and distribution investment carries a much lower risk of being excluded from rates because: (1) the investments are more granular and gradual, and (2) the utility has significantly less discretion in defining the type of technology and size of the investment. This is particularly true in ERCOT, given that ERCOT independently studies and pre-approves the need for new, large transmission facilities.²⁵ Outside of ERCOT, utilities still retain some risk and regulatory lag associated with generation investment, but the shorter lead time and lower capital cost for natural gas-fired generation (which has been the leading technology for new utility generation) reduces the impact of regulatory lag and imprudence risk. When combined with the myriad rate riders discussed above, it is hard to dispute that regulatory risk has declined significantly for both ERCOT and non-ERCOT utilities.

Yet, utility ROEs have not declined as ratemaking theory, market factors, and risk analyses would predict. Instead, the risk premiums reflected in utility ROEs have caused regulated utility stocks to closely track the Dow Jones Industrial Average (DJIA), which is comprised of enterprises that are traditionally much riskier than the utility sector. Utilities have historically been “low-beta” stocks, meaning that they are inherently less risky and, accordingly, have traditionally had lower equity returns than the DJIA. But in the recent past, utility stocks

²⁰ PUC Subst. R. 25.192 and 25.193 (ERCOT) and 25.239 (non-ERCOT).

²¹ PUC Subst. R. 25.234 (both ERCOT and non-ERCOT).

²² PUC Subst. R. 25.238 (non-ERCOT).

²³ PUC Subst. R. 25.235 (non-ERCOT)

²⁴ PUC Subst. R. 25.181 (both ERCOT and non-ERCOT).

²⁵ By rule, the PUCT gives “great weight” to ERCOT’s need determination. *See* PUC Subst. R. 25.101(b)(3)(ii).

have actually had *higher* returns than the DJIA, strongly indicating that utility ROEs are far above appropriate risk premium levels.²⁶

These high risk premiums for utilities allowing equity investor returns equivalent or superior than what is available in the markets generally, but for *a lower level or risk*. This runs completely counter to rationale economics or market theory. As one observer colorfully put it, “. . . if you want actionable [investment] intelligence up front, here it is: invest in regulated utilities.”²⁷

As discussed below, a large part of the problem appears to be the feedback loop created when ROEs in regulated utility rate cases are set based on the historical ROEs awarded to *other* utilities. This approach makes it difficult to implement a significant change when economic conditions or regulatory changes would merit significant reductions in ROEs. Regulators are understandably hesitant to reduce ROEs relative to what other jurisdictions are awarding for fear of deterring investment, and utilities have been successful in appealing to this conservatism to keep ROEs higher than they should be. However, the data shows that it is imperative to overcome this collective action problem and broadly reevaluate whether regulated ROEs are at appropriate levels.

V. Time to Reassess

The foregoing discussion begs the question: why have utilities continued to receive inflated ROEs in spite of all these compelling factors? The primary drivers behind the “stickiness” of utility ROEs appear to be: (1) the method by which regulated utility ROEs have traditionally been established (the “peer-group” method mentioned previously), and (2) strategic utility appeals to the risk aversion of regulators when it comes to investment and reliability.

Regulators are responsible for making sure customers receive reliable electricity service from their monopoly provider—an issue that is keenly important to the public and policymakers. Because of this, regulators are understandably sensitive to arguments that reducing utility ROEs will decrease investment below an acceptable level, harm a utility’s credit profile, or compromise reliability. In recent years, utilities appear to have been particularly successful in persuading regulators that any reduction in ROEs will have unacceptable consequences, despite extensive countervailing data. For example, utilities will often describe an ROE reduction as “credit negative” to deter regulators from pursuing such a reduction. Of course, it is always “credit positive” to grant utilities higher ROEs and “credit negative” to lower ROEs; this says nothing about appropriate return levels. Rebalancing must occur at some point, and reducing ROEs will not harm investment incentives if the reductions appropriately reflect the overall economic climate or the specific risks faced by a utility. Similarly, in its 2016 Annual Rate Case Survey, Public Utilities Fortnightly described a recent case where Michigan regulators set aside extensive record evidence and the Administrative Law Judge’s ROE recommendation based on the utility’s unsubstantiated claim that investors would view Michigan as a “volatile” regulatory

²⁶ Some analyses show that utility stocks have outperformed industrial stocks since 2004. See Huntoon, S., “Nice Work If You Can Get It,” Public Utilities Fortnightly (Aug. 2016).

²⁷ See Huntoon, S., “Nice Work If You Can Get It,” Public Utilities Fortnightly (Aug. 2016); Hyman, L. and Tilles, W., “Don’t Cry for Utility Shareholders, America,” Public Utilities Fortnightly at 65 (Oct. 2016).

environment if its ROE were set at 10%.²⁸ *It cannot be the case that utility ROEs must only go up and never down, irrespective of industry risk or prevailing economic trends.* Again, this claim of “volatility” was a successful scare tactic that resulted in an excessive awarded ROE.

Structural features of the ratemaking process can also make it difficult to reduce utility earnings to reflect lower risk profiles or overall market trends. As one industry analyst recently noted, “Utility rates also tend to be downward sticky. It is easier for a utility to initiate and prosecute rate increase than for consumer advocates to initiate and prosecute rate decreases, with an imbalance in information being one obvious reason why.”²⁹ Utilities have a natural incentive to file a rate case when they believe a rate increase will be approved, but not when rates would be reduced. Many of the largest regulated utilities in Texas have not had a rate case in many years. For example, Oncor, the state’s single largest utility, has not had a rate case in more than five years and still has an awarded ROE of 10.25%.³⁰ ROEs are still being set in Texas in excess of 9.5%.³¹

Critically, as noted above, the “peer group” method of setting ROEs can create a feedback loop that perpetuates inflated ROEs. The most commonly accepted starting point for setting a utility’s ROE is through a peer group analysis, where a survey is conducted of the ROEs for utility companies are claimed to be “peers” of the utility in question. This methodology effectively creates an echo chamber, where past regulatory decisions inform future ROEs and undue conservatism is reinforced—often in the face of contrary market data. As the data discussed above indicates, the ROEs that would be justified by objective market data appears to be in conflict with current awarded ROEs. This indicates that “peer group” ROE methodologies should be revisited to better account for changes in utility risk and other economic factors, rather than relying almost exclusively on the returns that have been awarded in the past.

In fairness, utilities offer a number of arguments to support the current risk premiums in awarded ROEs. For one, utilities argue that the reduction in risk-free ROE yields is an aberration, and utility ROEs should be set based on longer periods or on a lagging/historical basis. While this theory could justify a temporary increase in the observed risk premiums for utility ROEs over one or two years, the trend has far outlasted the limits of this justification. The US has overwhelmingly been a low-interest rate environment since late 2008, and there are a number of structural reasons why these relatively low interest rates may continue.^{32,33} Yet, utility

²⁸ Cross, P., “2016 Annual Rate Case Survey,” Public Utilities Fortnightly (Nov. 2016).

²⁹ Huntoon, S., “Nice Work If You Can Get It,” Public Utilities Fortnightly (Aug. 2016).

³⁰ *Application of Oncor Electric Delivery Company, LLC for Authority to Change Rates*, Docket No. 38929, Final Order at Finding of Fact No. 32 (Aug. 29, 2011).

³¹ *See, e.g., Year-end 2015 PUC Earnings Reports for Electric Utilities*, Project No. 45636, Staff Memorandum (Oct. 21, 2016).

³² Rates for treasury bonds increased immediately following the recent election, but this increase is small (only an increase of about 45-50 basis points) relative to the drop in interest rates over the last decade, which has been hundreds of basis points. These interest rate increases are from historical lows – current treasury yields are at the same level as the beginning of 2016. Some investors are already seeing the Treasuries market as oversold and are recommending bond purchases instead. *See* <http://www.wsj.com/articles/government-bond-sell-off-continues-on-trumps-economic-plans-1479114743> and <http://www.wsj.com/articles/the-trump-trade-is-getting-out-of-hand-buy-some-bonds-1479143922>.

ROEs have not been reduced to appropriately track this reduction over the past *eight years*. Utilities also argue that high risk premiums are correlated with low Treasury rates;³⁴ however, this argument confuses causation with correlation. The historical trend of risk premiums rising as Treasury rates fall is simply a reflection of the “stickiness” of high utility returns relative to interest rates, for the reasons discussed previously, and is not some independent economic principle that regulators should pursue. Utility ROE witnesses will also claim that unique utility business risks or size/scale issues support higher ROEs for particular utilities, but the reality is that there are no persuasive arguments for sustaining high risk premiums when risk in the utility business in Texas has been significantly reduced by legislative and regulatory changes, or when other comparably risky enterprises are earning lower returns in general. Notably, Moody’s Investor Service has even concluded that reducing utility ROEs would not harm the credit profile of utilities in general because of the lower business risk and the many credit-positive cost recovery mechanisms that have been adopted.³⁵ This perspective from an independent bond rating agency reinforces the other substantial data demonstrating that reducing utility ROEs will not harm their ability to attract investment, and is a strong signal that the status quo should be holistically reexamined.

VI. Conclusion

The ROEs awarded to and achieved by regulated utilities are higher than needed to attract appropriate levels of investment. Customers and the economy in general would be well-served by a comprehensive reexamination of utility ROEs in light of relevant risk factors and economic trends. This includes reexamining the application of “peer-group” based ROE analyses, as well critical analysis of utility claims regarding the allegedly adverse impacts of reducing ROEs. Certainly, utility requests for “alternative” or “streamlined” ratemaking should be met with a rigorous analysis of the impacts that existing and proposed mechanisms have in shifting risk from the utility to its customers, and those impacts should translate to lower ROEs. In the world of utility ROEs, “what goes up” should also come down when risk factors and overall economic circumstances overwhelmingly support a lower level of returns.

³³ Structural reasons for low rates include the aging of the US population, persistent excess savings in the rest of the world, and lower productivity growth. See <http://voxeu.org/article/causes-and-consequences-persistently-low-interest-rates> and https://www.allianz.com/v_1453369613000/media/economic_research/publications/working_papers/en/WPrealzinse.pdf.

³⁴ A utility ROE witness has made this argument in recent rate cases in Texas.

³⁵ Moody’s Investor Service, Sector-in-Depth Analysis, March 2015.