STATE OF NEW JERSEY
BOARD OF PUBLIC UTILITIES

In the Matter of the Petition of Public Service Electric and Gas Company for Approval of the Next Phase of the Gas System Modernization Program and Associated Cost Recovery Mechanism ("GSMP II")	))))))	BPU Docket No. GR17070776

DIRECT TESTIMONY OF KEVIN W. O'DONNELL, CFA
ON BEHALF OF THE
DIVISION OF RATE COUNSEL

STEFANIE A. BRAND, ESQ.
DIRECTOR, DIVISION OF RATE COUNSEL

DIVISION OF RATE COUNSEL
140 East Front Street-4th Floor
P. O. Box 003
Trenton, New Jersey 08625
Phone: 609-984-1460
Email: njratepayer@rpa.state.nj.us

Dated: January 19, 2018

Table of Contents

I. INTRODUCTION

Q. PLEASE STATE YOUR NAME, POSITION, AND BUSINESS ADDRESS FOR THE RECORD.

A. My name is Kevin W. O'Donnell. I am President of Nova Energy Consultants, Inc. My business address is 1350 Maynard Rd., Suite 101, Cary, North Carolina 27511.

Q. ON WHOSE BEHALF ARE YOU PRESENTING TESTIMONY IN THIS PROCEEDING?

A. I am testifying on behalf of the New Jersey Division of Rate Counsel ("Rate Counsel"), which represents consumers before the New Jersey Board of Public Utilities ("Board", "BPU").

Q. PLEASE SUMMARIZE YOUR EDUCATIONAL BACKGROUND AND RELEVANT EMPLOYMENT EXPERIENCE.

A. I have a Bachelor of Science in Civil Engineering from North Carolina State University and a Master of Business Administration from the Florida State University. I earned the designation of Chartered Financial Analyst (CFA) in 1988. I have worked in utility regulation since September 1984, when I joined the Public Staff of the North Carolina Utilities Commission (NCUC). I left the NCUC Public Staff in 1991 and have worked continuously in utility consulting since that time, first with Booth & Associates, Inc. (until 1994), then as Director of Retail Rates for the North Carolina Electric Membership Corporation (1994-1995), and since then in my own consulting firm. I have been accepted as an expert witness on rate of return, cost of capital, capital structure, cost of service, rate design, and other regulatory issues in general rate cases, fuel cost proceedings, and other proceedings before the North Carolina Utilities Commission, the South Carolina Public Service Commission, the Wisconsin Public Service Commission, the Virginia State Commerce Commission, the Minnesota Public Service Commission, the New Jersey Board of Public Utilities, the Colorado Public Utilities Commission, the District of Columbia Public Service Commission, and the Florida Public Service Commission. In 1996, I testified before the U.S. House of Representatives'

Committee on Commerce and Subcommittee on Energy and Power, concerning competition within the electric utility industry. Additional details regarding my education and work experience are set forth in Appendix A to my answering testimony.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS PROCEEDING?

A. The purpose of my testimony in this proceeding is to present my findings and recommendations to the Commission as to the proper rate of return to allow Public Service Electric and Gas ("PSE&G" or "Company") in the current proceeding involving the second phase of the Company's Gas System Modernization Plan (GSMP II).

Q. WHAT RATE OF RETURN DID PSE&G RECOMMEND THAT THE COMMISSION GRANT THE COMPANY IN THIS PROCEEDING?

A. Through the direct testimony of PSE&G witness Mr. Stephen Swetz, the Company is seeking an overall rate of return of 6.99%. That return is based on a proposed capital structure of 51.20% common equity, 48.1848% long-term debt, and 0.6152% customer deposits. The requested return on equity is 9.75%. Mr. Swetz states in his testimony the basis for the requested capital structure and cost rates:

> The Company's initial cost of capital for the Program will be based on the ROE, long-term debt rate and capital structure approved in the Solar 4 All Extension II filing in Docket No. EO16050412, which was the latest new program approved for the Company by the Board on November 30, 2016. Any change in the WACC authorized by the Board in a subsequent base rate case will be reflected in the subsequent monthly revenue requirement calculations. [1]

[1] Swetz prefiled direct testimony, p. 3, l. 3-8

Q. DO YOU AGREE WITH PSE&G'S REQUEST?

A. No. I disagree with PSE&G's requested return on equity as well as its requested capital structure. I find both requests to be excessive, unreasonable, and not indicative of current market conditions.

Q. PLEASE SUMMARIZE YOUR PRIMARY RECOMMENDATIONS IN THIS CASE.

A. My recommendations in this case are as follows:

- the return on equity recommended by Company Witness Mr. Stephen Swetz for PSE&G is simply out-of-touch with current market conditions and economic realities;
- the proper return on equity, based on current capital market conditions, for PSE&G in this proceeding is 9.0%;
- the proper capital structure to use in this proceeding is 50.00% common equity; 0.6152% customer deposits; and 49.3848% long-term debt;
- for ratemaking purposes, the proper cost of long-term debt is 4.05% and is 0.1100% for customer deposits; and
- the overall rate of return that should be granted PSE&G in this case is 6.5008%, based on a 9.0% ROE.

II. OVERVIEW

Q. PLEASE EXPLAIN PSE&G's PROPOSED GAS SYSTEM MODERNIZATION PROGRAM.

A. The filing made by PSE&G in this docket is the continuation of the Company's ongoing Gas System Modernization Program ("GMSP"), which the Board approved on November 16, 2015. If approved by the Board, GSMP II is the second phase of the Company's GSMP and will occur over a five-year period from 2019 through 2024. The GSMP II plan will replace cast iron ("CI") mains and unprotected steel ("US") mains and services as well as the abandonment of district regulators associated with this cast iron and unprotected steel plant. Additional work in the GSMP II plan involves the rehabilitation of large diameter elevated pressure cast iron, the upgrade of utilization pressure portions of the system to elevated pressure, and the replacement of some portions of protected steel and plastic mains.

GSMP II is estimated to take place over five years with a proposed total investment of $2.68 billion investment. PSE&G has estimated that its proposed acceleration of PSE&G would take 30 years to replace all cast iron main and unprotected steel in its distribution system.[2]

In the current application, GSMP II has requested authority to the pace of replacement to 20 years.[3]

Q. PLEASE EXPLAIN THE PROPOSED COST RECOVERY OF GSMP II.

A. GSMP II will involve twice a year base rate changes filings with the Board that will have a minimum plant investment of 10% of the total program investment. The

[2]Petition, p. 3
[3] "Id"

first GSMP II filing is anticipated not to occur until December 31, 2019 for an estimate rate effective date of June 1, 2020. "Preliminary" filings will then take place in June and December of each year. [4] Updated filings will be due September 15 and March 15, respectively, that would update data through the end of August and February with rate effective dates on Dec. 1 and the following June 1.[5]

Q. WHAT WAS THE BOARD APPROVED ROE IN THE 2015 GMSP CASE?

A. The 2015 case involved a settlement proceeding in which the Board approved a 9.75% ROE and a 51.21% equity ratio in the capital structure. While Mr. Swetz cited the November, 2016 Solar 4 All Extension case as the reasoning for his recommended ROE and capital structure in this case, the reality is that the requested ROE and capital structure is exactly what the Company sought two years ago in the first GSMP case.

Q. HOW HAVE THE FINANCIAL MARKETS CHANGED SINCE THE COMMISSION'S ORDER IN THE INITIAL GSMP CASE IN NOVEMBER, 2015 AS WELL AS SINCE THE FINAL ORDER IN THE SOLAR 4 ALL EXTENSION CASE CITED BY MR. SWETZ?

A. Interest rates have fallen over the past two years while the stock market has skyrocketed. Ignoring the realities of the current financial marketplace can result in stockholders obtaining a financial windfall at the expense of PSE&G's captive ratepayers in New Jersey.

Q. PLEASE PROVIDE EVIDENCE THAT INTEREST RATES HAVE FALLEN OVER THE PAST TWO YEARS.

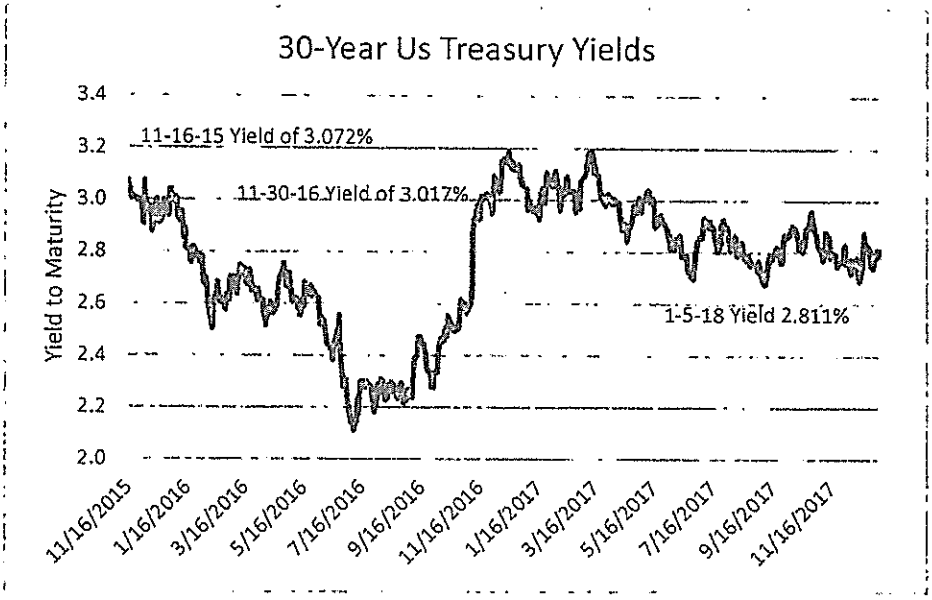
A. In Chart 1 below, I have provided the change in the 30-year US Treasury bonds since the Board's final order in the initial GSMP case in November, 2015 through

[4] Petition, p. 11

[5] "Id"

the most recently available information. This timeframe includes the Nov. 30, 2016 yields that occurred during the Solar 4 All Extension case cited by Mr. Swetz.

Chart 1: Yield on 30-Year US Treasury Bonds

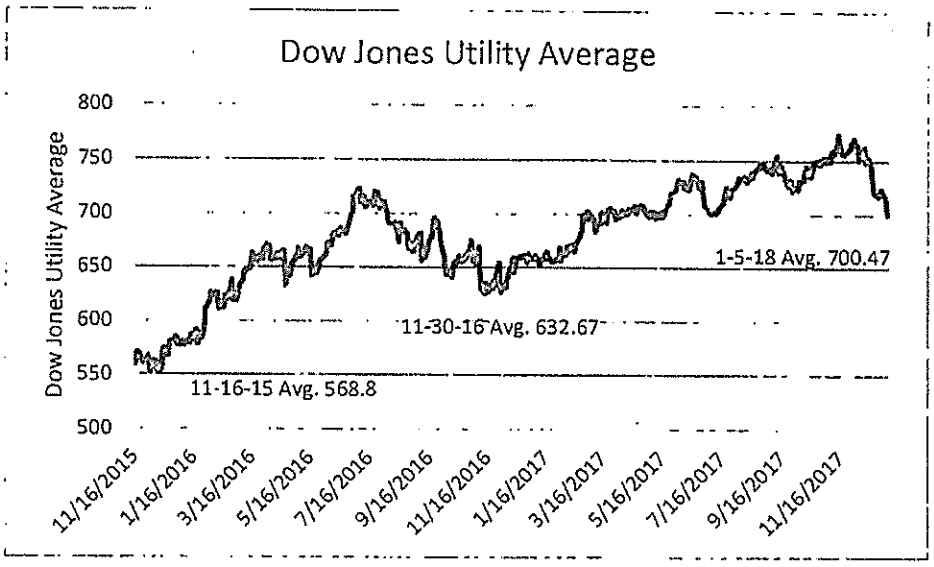


Source for raw data: US Federal Reserve [finance.yahoo.com as of January 5, 2018]

As can be seen in the above graph, the yield on 30-year US Treasury bonds has fallen more than 20 basis points since both the initial GSMP case in November, 2015 as well as the Solar 4 All Extension case in November, 2016.

Equity investors have recognized the lower cost investment environment and have driven up the Dow Jones Utility Average to new heights. Chart 2 below shows the strength of the utility sector over the past two years.

Chart 2: Dow Jones Utility Average



Source for raw data: US Federal Reserve (finance.yahoo.com as of January 5, 2018)

The strength of the utility markets over the past two years cannot be understated. Since Nov. 16, 2015, the Dow Jones Utility average has risen 23% with 11% of that increase coming since Nov. 30, 2016. Failing to recognize the decrease in long-term interest rates and the tremendous jump in utility prices will result in the economy of New Jersey being harmed by unnecessarily high and punitive utility rates.

Q. DIDN'T THE FEDERAL RESERVE JUST RAISE INTEREST RATES?

A. Yes, on Dec. 13, 2017, the Federal Reserve increased the Federal Funds rates from 1.25% to 1.5%. [6]

[6] http://money.cnn.com/2017/12/13/news/economy/federal-reserve-december-rate-hike/index.html

Q: DOES THIS MEAN THAT THE COST OF CAPITAL HAS INCREASED FOR COMPANIES LIKE PSE&G GAS?

A: No. The interest rate increase represents only the interest rate at which banks borrow short-term money.

In announcing its decision to hike the federal funds rate by only 0.25%, the Federal Reserve noted the tame inflationary period by stating:

> On a 12-month basis, both overall inflation and inflation for items other than food and energy have declined this year and are running below 2 percent. Market-based measures of inflation compensation remain low; survey-based measures of longer-term inflation expectations are little changed, on balance.[7]

The interest rate hike does not filter immediately through other instruments. As an example, on December 13, 2017, the 30-year Treasury bonds ended the day trading at a yield of 2.734% whereas, on January 5, 2018, the yield had increased only to 2.811%. [8] Short-term interest rates are ticking slightly upward but long-term rates are stubbornly flat. This situation is known as a flattening of the yield curve and, often times, is a harbinger of slow economic times ahead. If the economy does slow, the Federal Reserve may re-visit its decision to slightly increase short-term rates.

[7] Federal Reserve issues FOMC statement, December 13, 2017

[8] Source for raw data: US Federal Reserve [finance.yahoo.com as of January 5, 2018]

III. ECONOMIC AND REGULATORY POLICY GUIDELINES FOR A FAIR RATE OF RETURN

Q. PLEASE BRIEFLY DESCRIBE THE ECONOMIC AND REGULATORY POLICY CONSIDERATIONS YOU HAVE TAKEN INTO ACCOUNT IN DEVELOPING YOUR RECOMMENDATION CONCERNING THE FAIR RATE OF RETURN THAT PUBLIC SERVICE COMPANIES SHOULD BE ALLOWED THE OPPORTUNITY TO EARN.

A. The theory of utility regulation assumes that public utilities perform functions that are natural monopolies. Historically, it was believed or assumed that it was more efficient for a single firm to provide a particular utility service than multiple firms. Even though deregulation for the procurement of natural gas and generation of electric power and energy is spreading, as is the development of renewable energy production, delivery of these products to end-use customers will most likely continue to be considered a natural monopoly for the foreseeable future. This is because regulatory authorities regulate the service areas in which regulated utilities provide service, particularly but not necessarily limited to distribution. On this basis, state legislatures or commissions establish exclusive franchised territories to public utilities or determine territorial boundaries where disputes arise, in order for these utilities to provide services more efficiently and at the lowest reasonable cost. In exchange for the protection within its monopoly service area, the utility is obligated to provide adequate service at fair, regulated rates.

This naturally raises the question - what constitutes a just and reasonable rate? The generally accepted answer is that a prudently managed utility should be allowed to charge prices that allow the utility the opportunity to recover the reasonable and prudent costs of providing utility service and the opportunity to earn a fair rate of return on invested capital. This just and reasonable rate of return on capital should allow the utility, under prudent management, to provide adequate service and attract capital to meet future expansion needs in its service area. Since public utilities are

capital-intensive businesses, the cost of capital is a crucial issue for utility companies, their customers, and regulators. If the allowed rate of return is set too high, then consumers are burdened with excessive costs, current investors receive a windfall, and the utility has an incentive to overinvest. If the return is set too low, adequate service is jeopardized because the utility will not be able to raise new or working capital on reasonable terms.

Since every equity investor faces a risk-return tradeoff, the issue of risk is an important element in determining the fair rate of return for a utility.

Regulatory law and policy recognize that utilities compete with other firms in the market for investor capital. In the often-cited case of *Federal Power Commission v. Hope Natural Gas Company*, 320 U.S. 591 (1944), the U.S. Supreme Court recognized that utilities compete with other firms in the market for investor capital. Historically, this case has provided legal and policy guidance concerning the return which public utilities should be allowed to earn.

In *Hope Natural Gas*, the U.S. Supreme Court stated that the return to equity owners (or shareholders) of a regulated public utility should be "commensurate" to returns on investments in *other* enterprises whose "*risks* correspond" to those of the utility being examined:

> [T]he return to the equity owner should be commensurate with returns on investments in other enterprises having corresponding risks. That return, moreover, should be sufficient to assure confidence in the financial integrity of the enterprise so as to maintain credit and attract capital. (320 U.S. at 603)

Because every equity investor faces a risk-return tradeoff, the issue of risk is an important element in determining the fair rate of return for a utility.

IV. CURRENT COST OF COMMON EQUITY

A. Overview of Cost of Equity Analyses

Q. PLEASE EXPLAIN HOW THE ISSUE OF DETERMINING AN APPROPRIATE RETURN ON A UTILITY'S COMMON EQUITY INVESTMENT FITS INTO A REGULATORY AUTHORITY'S DETERMINATION OF JUST AND REASONABLE RATES FOR THE UTILITY.

A. In New Jersey, as in virtually all regulatory jurisdictions, a utility's rates generally must be "just and reasonable." Thus, regulation recognizes that utilities are entitled to an opportunity to recover the reasonable and prudent costs of providing service, and the opportunity to earn a fair rate of return on the capital invested in the utility's facilities, such as gas distribution equipment, buildings, vehicles, and similar long-lived capital assets.

Q. HOW DOES THE MANNER IN WHICH UTILITIES OBTAIN CAPITAL FUNDING RELATE TO THE COMMISSION'S DETERMINATION OF THE APPROPRIATE COST OF CAPITAL FOR A SPECIFIC UTILITY?

A. Utilities obtain capital funding through a combination of borrowing (debt financing) and issuing stock (equity financing). Unless in the very rare event a company's borrowing is determined to be imprudent, the determination of ratepayer reimbursement for debt financing is generally uncontroversial, as the amount is simply the principal and interest repaid by the company to bondholders.

In contrast, the determination of the allowed ROE is where disputes often arise. The allowed ROE is the amount that is determined to be appropriate for the utility's common stockholders to earn on the capital that they invest in the utility when they buy its stock. If the regulatory authority sets the ROE too low, the stockholders will not have the opportunity to earn a fair return and this may either cause existing

shareholders to sell their shares or deter new investors from buying shares. If, on the other hand, the regulatory authority sets the ROE too high, the ratepayers will pay too much. Because ratepayers cannot choose a different utility due to the monopolistic service territory restrictions, countervailing competitive market forces are absent and the resulting rates will be unjust and unreasonable to the ratepayer.

Q. HOW IS THE ESTIMATED SHARE PRICE USED IN DETERMINING THE LEVEL OF A UTILITY'S ALLOWED EARNINGS?

A. The required equity return, which is based on the market value of a utility's stock, is combined with the cost of debt to produce the Company's "overall rate of return", which is then applied to the net book value of the utility's investment, otherwise known as the rate base. Under this procedure, the market price of a stock is used only to determine the return that investors expect from that stock. That expectation is then applied to the book value of the utility's investment to identify the level of earnings that regulation should allow the utility the opportunity to earn.

Q. WHAT IS THE "COMPARABLE EARNINGS" TEST AND HOW DOES THAT FACTOR IN TO DETERMINING THE APPROPRIATE RETURN ON EQUITY?

A. The "comparable earnings" standard, i.e., that the earnings must be "commensurate with the returns on investments in other enterprises having corresponding risks," is derived from the Supreme Court's ruling in the *Hope Natural Gas* case to which I earlier referred. In my opinion, enterprises of "corresponding" or comparable risk are companies that are engaged in the same activities as PSE&G and are also regulated like PSE&G.

Q. HOW DO REGULATORY AUTHORITIES GO ABOUT DETERMINING A JUST AND REASONABLE RATE OF RETURN ON EQUITY FOR A UTILITY COMPANY?

A. Regulatory commissions and boards, as well as financial industry analysts, institutional investors, and individual investors, use different analytical models and methodologies to estimate/calculate reasonable rates of return on equity. Among the measures used are Discounted Cash Flow ("DCF") analysis, the Capital Asset Pricing Model (CAPM), and Comparable Earnings Analysis. I believe the most useful methodology is the DCF Analysis, but I am also presenting the CAPM and the Comparable Earnings Model as checks for my DCF results.

Q. CAN YOU EXPLAIN WHY REGULATORY AUTHORITIES AND FINANCIAL ANALYSTS NEED TO USE THESE METHODOLOGIES TO DERIVE A COMPANY'S ESTIMATED RATE OF RETURN ON EQUITY?

A. Yes. There is no direct, observable way to determine the rate of return required by equity investors in any company or group of companies. As a result, investors must make do with indications from market data and analysts' predictions to estimate the appropriate price of a share. The principal and most reliable methodology for obtaining these indications is the Discounted Cash Flow procedure. Other procedures, primarily the CAPM and the risk premium ("RP") approach, are much less reliable than the DCF procedure.

Q. PLEASE EXPLAIN WHY YOU BELIEVE THE DCF MODEL IS SUPERIOR TO THE CAPM AND RISK PREMIUM APPROACHES.

A. The DCF is a pure investor-driven model that incorporates current investor expectations based on daily and ongoing market prices. When a situation develops in a company that affects its earnings and/or perceived risk level, the price of the stock adjusts immediately. Since the stock price is a major component in the DCF model, the change in risk level and/or earnings expectations is captured in the investor return requirement with either an upward or downward movement to account for the change in the company.

The comparable earnings model is based on earned returns from book equity, not market equity. There is no direct and immediate stockholder input into the comparable earnings model and, as such, lacks a clear and unmistaken link to stockholder expectations.

Furthermore, the CAPM is, essentially, a risk premium model. As such, the CAPM suffers, to a degree, from the same problem of the comparable earnings model in that there is not a direct and immediate link from stock market prices to the CAPM result. The beta in the CAPM can reflect changes in the ROE, but the delay can, sometimes, make the CAPM results meaningless.

B. Selection of Proxy Companies

Q. DID YOU PEFORM AN ANALYSIS DIRECTLY ON PUBLIC SERVICE ELECTRIC AND GAS?

A. I was not able to perform a DCF analysis directly on PSE&G since it is a subsidiary of Public Service Enterprise Group and not separately tracked by analysts. However, since Public Service Enterprise Group is publicly traded, I was able to perform a rate of return analysis on the parent company. As the owner of PSE&G, Public Service Enterprise Group provides useful information that is directly applicable to its subsidiary, PSE&G.

Q. PLEASE DESCRIBE HOW YOU SELECTED YOUR PROXY GROUPS FOR ESTIMATING PSE&G'S RETURN ON EQUITY.

A. Public Service Enterprise Group owns both electric and gas operations, but this GSMP II case deals directly with the revenue requirement for the gas utility operations of PSE&G. As a result, I developed two groups of comparable companies. The first comparable group involved combination utilities that operate electric and gas operations. The second comparable group was strictly a gas utility comparable group.

For the combination group, I developed criteria to include only companies that were similar in risk to Public Service Enterprise Group. My first criterion for this group was to include only utilities followed by Value Line that had both electric and gas operations. Secondly, I screened companies for the S&P Global Market Intelligence's Quality Ranking (SPGMI), which is a measure of growth and stability of earnings and dividends. Since Public Service Enterprise Group has a SPGMI rating of B+, I included only companies that operated gas and electric companies that also had a SPGMI rating of A-, B+, or B. My last criterion was that none of the companies in the comparable group could be involved in a merger.

The number of available gas-only utilities needed to develop a reasonably reliable comparable group is dwindling. Just in the past two years, two gas utilities, AGL Resources and Piedmont Natural Gas, have been acquired by large electric utility holding companies. These acquisitions make sense for the electric utilities as they desire to grow their source of regulated earnings while, at the same time, control their future main source of fuel (natural gas), which expects to be the predominant fuel choice of electric utilities for many years to come. In addition to the above-stated utilities, WGL Holdings is also seeking to be acquired by a larger gas holding company, AltaGas[9]. As a result of this ongoing merger, I excluded WGL from my comparable group.

As for my comparable selection criteria for natural gas utilities, I included companies with the following criteria: companies that were listed as "Gas Utilities" by the Value Line Investment Survey; companies that had a SPGMI rating of A-, B+, or B; and companies that were not involved in ongoing mergers.

[9] Petition, FC 1142 before the Public Service Commission of the District of Columbia

C. Discounted Cash Flow (DCF) Model

Q. PLEASE EXPLAIN THE DISCOUNTED CASH FLOW MODEL.

A. The DCF method is a widely used method for estimating an investor's required return on a firm's common equity. In my thirty-three years of experience, first with the Public Staff of the North Carolina Utilities Commission and later as a consultant, I have seen the DCF method used much more often than any other method for estimating the appropriate return on common equity. Witnesses from utilities, consumer advocates and other intervenors have used the DCF method, either by itself or in conjunction with other methods such as the Comparable Earnings Method or the CAPM, in their analyses.

The DCF method is based on the concept that the price which the investor is willing to pay for a stock is the discounted present value (i.e. its present worth) of what the investor *expects* to receive in the future as a result of purchasing that stock. This return to the investor is in the form of future dividends and price appreciation. However, price appreciation is only realized when the investor sells the stock, and a subsequent purchaser presumably is also focused on dividend growth following his or her purchase of the stock. Mathematically, the relationship is:

Let D = dividends per share in the initial future period
g = expected growth rate in dividends
k = cost of equity capital
P = price of asset (or present value of a future stream of dividends)

$$\text{then } P = \frac{D}{(1+k)} + \frac{D(1+g)}{(1+k)^2} + \frac{D(1+g)}{(1+k)^3} + \ldots\ldots + \frac{D(1+g)}{(1+k)^t}$$

This equation represents the amount (P) an investor will be willing to pay *today* for a share of common equity with a given dividend stream over (t) periods.

Reducing the formula to an infinite geometric series, we have:

$$\frac{D}{}$$

$$P = k-g$$

Solving for k yields:

$$k = \frac{D}{P} + g$$

Q. DO INVESTORS IN UTILITY COMMON STOCKS REALLY USE THE DCF MODEL IN MAKING INVESTMENT DECISIONS?

A. Yes, I believe that to be so. There are three primary reasons for my conclusion. First, there is much literature that supports the fact that, while emotional or so-called "irrational" behavior in the short term may affect (and has affected) share prices, over the long term a company's financial fundamentals drives the market.[10] Second, analysts give great weight to earnings, dividend, and book value growth in formulating their recommendations to clients. Finally, even a casual search on the internet produces hundreds of pages discussing the definition of the DCF methodology and how to apply it for investment decisions, from which I infer that general investor interest in DCF analysis is significant and widespread.

Thus, in today's investment environment, a stock investor will likely calculate the amount of funds he/she will receive in the future relative to the initial investment. These future funds include the current dividend yield, as well as the amount of funds that the investor can expect in the future from the growth in the dividend. The

[10] See, for example, "Valuation: Measuring and Managing the Value of Companies," 4th Edition, McKinsey & Company Inc., Tim Koller, Marc Goedhart, David Wessels ("Provided that a company's share price eventually returns to its intrinsic value in the long run, managers would benefit from using a discounted-cash-flow approach for strategic decisions. What should matter is the long-term behavior of the share price of a company, not whether it is undervalued by 5 or 10 percent at any given time." http://www.mckinsey.com/business-functions/strategy-and-corporate-finance/our-insights/do-fundamentalsor-emotionsdrive-the-stock-market (accessed March 2, 2016). See also, for example, http://www.businessinsider.com/what-drives-the-stock-market-2012-8 (Accessed March 2, 2016).

combination of the current dividend yield and the future growth in dividends is the basic tenet of the DCF model.

Q. IS THE DCF FORMULA EASY TO UNDERSTAND?

A. Yes. While the DCF formula stated above may appear complicated, it is intuitively a very simple model to understand. To determine the total rate of return one expects from investing in a particular equity security, the investor adds the dividend yield, which he or she expects to receive in the future, to the expected growth in dividends over time. If the regulatory authority sets the rate at a fair level, the utility will be able to attract capital at a reasonable cost, without forcing the utility's customers to pay more than necessary to attract needed capital.

Q. CAN YOU GIVE AN EXAMPLE?

A. Yes. For example, if investors expect a current dividend yield (D/P) of 5%, and also expect that dividends will grow (g) at 4%, then the Constant Growth DCF model indicates that investors would buy the utility's common stock if it provided a return on equity (k) of 9%, where k = (D/P) + g.

Q PLEASE EXPLAIN HOW YOU DEVELOPED THE DIVIDEND YIELD RANGES DISCUSSED ABOVE.

A. I developed the dividend yield range for the two comparable groups and Public Service Enterprise Group by averaging each Company's Value Line forecasted 12-month dividend yield over the above-stated 13-week, and 4-week periods as well as examining the most recent forecasted 12-month dividend yield reported by Value Line for each company. I averaged the dividend yield over multiple time periods in order to minimize the possibility of an isolated event skewing the DCF results.

Q. HOW DID YOU DERIVE THE EXPECTED GROWTH RATE?

A. I used several methods in determining the growth in dividends that investors expect. The first method I used was an analysis commonly referred to as the "plowback

ratio" method. If a company is earning a rate of return (r) on its common equity, and it retains a percentage of these earnings (b), then each year the earnings per share ("EPS") are expected to increase by the product (br) of its earnings per share in the previous year. Therefore, br is a good measure of growth in dividends per share. For example, if a company earns 10% on its equity and retains 50% (the other 50% being paid out in dividends), then the expected growth rate in earnings and dividends is 5% (50% of 10%). To calculate a plowback for the comparable group, I used the following formula:

$$g = \frac{br(2015) + br(2016) + br(2017E) + br(2020E\text{-}2022E\ Avg)}{4}$$

The plowback estimates for all companies in the comparable group can be obtained from The Value Line Investment Survey under the title "percent retained to common equity." Schedule KWO-2 lists the plowback ratios for each company in the two comparable groups as well as Public Service Enterprise Group.

A key component in the DCF Method is the expected growth in dividends. In analyzing the proper dividend growth rate to use in the DCF Method, the analyst must consider how dividends are created. Since over the long term dividends cannot be paid out without a corporation first earning the funds paid out, earnings growth is a key element in analyzing what if any growth can be expected in dividends. Similarly, what remains in a corporation after it pays its dividend is reinvested, or "plowed back", into a corporation in order to generate future growth. As a result, book value growth is another element that, in my opinion, must be considered in analyzing a corporation's expected dividend growth. To analyze the expected growth in dividends, I believe the analyst should first examine the historical record of past earnings, dividends, and book value. Hence, the second method I used to estimate the expected growth rate was to analyze the historical 10-year and 5-year historical compound annual rates of change for earnings per share (EPS), dividends

per share (DPS), and book value per share (BPS) as reported by Value Line for each of the relevant corporations.

Value Line is the most recognized investment publication in the industry and, as such, is used by professional money managers, financial analysts, and individual investors worldwide. A prudent investor tries to examine all aspects of an enterprise's performance when making a capital investment decision. As such, it is only practical to examine historical growth rates for the corporation for which the analysis is being performed. The historical growth rates for the comparable groups and Public Service Enterprise Group can be seen in Schedule KWO-1.

Some analysts do not present historical growth rates in their DCF analyses. I believe analysts that do not present such available data fail to completely inform the respective regulatory bodies of the full extent of information on which investors base their expectations.

The third method I used was the Value Line forecasted compound annual rates of change for earnings per share, dividends per share, and book value per share.

The fourth method I used was the forecasted rate of change for earnings per share as recorded by CFRA Equity Research.

The last method was another forecasted earnings growth rate as supplied to Charles Schwab & Co. This forecasted rate of change is not a forecast supplied by Charles Schwab & Co. but is, instead, a compilation of forecasts by industry analysts.

The details of my constant growth DCF analysis can be seen in Schedule KWO-1, p. 1 of 2 for the combination utility group and Public Service Enterprise Group. The results for the gas utility group can be seen in Schedule KWO-1, p. 2 of 2.

Q. SHOULD THE RESULTS REFLECTED IN SCHEDULE KWO-1 BE VIEWED IN LIGHT OF FUNDAMENTAL DEVELOPMENTS IN THE NATURAL GAS UTILITY INDUSTRY THAT HAVE OCCURRED DURING THE PAST EIGHT YEARS?

A. Yes. As the Commission is well aware, natural gas prices have plummeted since 2008. As a result of the drastically lower natural gas prices, electric utilities across the country are planning to meet their future electric load requirements through the use of natural gas. Distribution utilities that derive profits from the delivery of natural gas are now in high demand. As stated previously, AGL Resources and Piedmont Natural Gas were recently purchased by their neighboring electric utilities at sizable premiums. WGL Holdings is also currently involved in merger proceedings. Remaining gas utilities are achieving solid growth as natural gas is in high demand across the country.

Q. WHAT IS THE INVESTOR RETURN REQUIREMENT FROM THE DCF ANALYSIS?

A. As can be seen on Schedule KWO-1, the dividend yield for the three time-frames are fairly tight for the two comparable groups as well as that of Public Service Enterprise Group: 3.4% to 3.5% for the combination utility group; 3.4% to 3.6% for Public Service Enterprise Group; and 2.6% to 2.8% for the natural gas utility comparable group.

The combination utility group has grown at a solid and steady pace. Over the past 10-years, the combination utility group has grown in the range of approximately 3.0% to 4.0%. The forecasted growth rates for the combination utility group are higher than the historical growth rates for the combination utility comparable group and are in the range of 4.0% to 6.0%. Based on these results, I believe the proper growth rate range to use in the DCF model for the combination utility group is 4.0% to 6.0%. The low-end of this range is equal to the high end of the range for the

historical results whereas the high end of the range is slightly above the highest forecasted growth rate range for the comparable group.

Public Service Enterprise Group has fared well over the past 10 years in comparison to other gas utilities as well as combination electric and gas utilities. In the 5-year growth rate range, however, the Company has not fared as well. The forecasted growth rates are disappointing for investors in Public Service Electric & Gas as these growth rates show only a very slight increase in earnings. Due to this investor expectation and the results as shown in Schedule KWO-1, I believe the expected growth for Public Service Enterprise Group to use in the DCF model is in the range of 3.0% to 5.0%, which is in the middle of the range between historical and forecasted growth rates.

In terms of the proper dividend growth rate to employ for the gas utility comparable group in the DCF analysis, it is appropriate to examine the recent history of earnings and dividend growth to assess and provide the best estimate of the dividend growth that investors expect in the future. An examination of the 10-year and 5-year historical growth rates for the gas utility comparable group show a change in the earnings and dividend growth rates. For the 10-year history, earnings, dividends, and book value for the gas utility comparable group have grown relatively in lockstep in the range of 4.9% to 5.7%. However, over the past 5 years, dividends have grown faster than earnings. Over both the 10-year and 5-year historical periods, book value has grown faster than earnings and dividends. This result is evidence of the investment in natural gas distribution facilities around the country that has resulted from the shift to natural gas and away from more carbon-intensive commodities such as coal. Over the past 10 years, the gas utility's comparable group growth in earnings, dividends, and book value has ranged from approximately 4.5% to 6.5%.

The forecast of the gas utility comparable group's growth rates is consistent with the understanding that natural gas is growing in prominence in the energy industry around the country. The forecasted growth rates for the gas utility comparable group ranges from 4.25% to 6.25% for the gas utility comparable group. In addition to the above forecasted Value Line growth rates, the average plowback growth rate for the gas utility comparable group is 3.9%.

Based on the above-stated results, I believe the proper growth rate range for the gas utility comparable group to use in the DCF model is 4.25% to 6.25%. This range is right on-target with the forecasted range of results for the gas utility comparable group and gives weight to the relatively strong historical results of the group.

Q. SHOULD ONLY EARNINGS GROWTH RATES IN THE DCF METHODOLOGY BE USED? IF NOT, WHAT DID YOU DO TO MITIGATE THIS PROBLEM?

A. No. Since the DCF formula is dependent on future dividend growth, it would be inaccurate to use only earnings growth rates in the DCF. Doing so produces unrealistically high return on equity numbers that cannot be sustained in real life. To mitigate this problem, I have presented EPS, DPS, and BPS figures to the Commission and systematically explained my rationale for arriving at the above stated growth rates. I believe it is incumbent upon every analyst presenting testimony in this case to present such a robust analysis to the Commission.

Q. WHAT IS THE DCF RANGE THAT YOUR ANALYSES PRODUCED?

A. Combining the dividend yields of the comparable groups and Public Service Enterprise Group produces the results as stated below:

Table 1: DCF Results

Comparable Group	Forecasted Div. Yld		Exp Growth Rate Range		DCF Results	
	Low	High	Low	High	Low	High
Combination Group	3.40%	3.50%	4.00%	6.00%	7.40%	9.50%
Public Service Enterprise Group	3.40%	3.60%	3.00%	5.00%	6.40%	8.60%
Gas Utility	2.60%	2.80%	4.25%	6.25%	6.85%	9.05%

Q. FOR APPLICATION IN THIS CASE, WHAT DO YOU CONCLUDE IS THE DCF RESULT FOR PSE&G TO BE USED IN THE GSMP II?

A. The DCF results as found in Table 1 above show a relatively wide range of results for the combination utility group, Public Service Electric & Gas, and the gas utility group. I believe the range of results from the DCF model is 8.0% to 9.0%, which is right in the middle of the above-stated results.

D. Comparable Earnings Analysis

Q. PLEASE EXPLAIN HOW YOU PERFORMED THE COMPARABLE EARNINGS ANALYSIS?

A. Schedule KWO-3 presents a list of the earned returns on equity of the combination utility group, Public Service Enterprise Group, and the gas utility comparable group over the period of 2015 through 2022. I picked this range to provide the Commission with at least two historical returns and five years of forecasted returns. As can be seen in Schedule KWO-3, the range of results are summarized as follows:

Table 2: Earned Returns on Equity

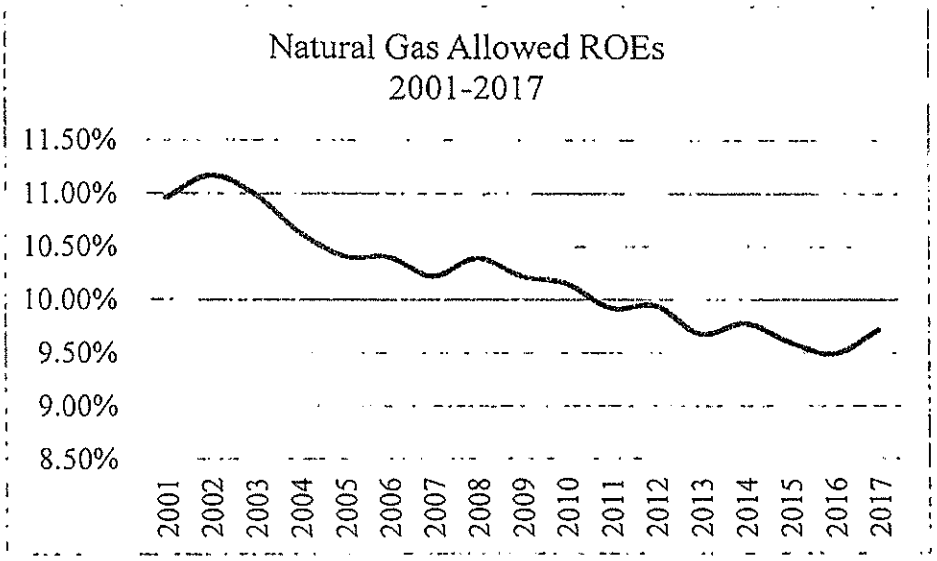
Comparable Group	% Return on Common Equity	
	Low	High
Combination Utility	10.1%	11.0%
PS Enterprise Group	10.5%	12.9%
Gas Utility	9.3%	10.7%

Q. DO YOU HAVE ANOTHER COMPARABLE EARNINGS METHODOLOGY TO PRESENT IN THIS CASE?

A. Yes. It is important to understand what state regulatory commissions across the country are allowing for earned ROEs. Allowed ROEs are widely known and discussed in the financial community and investors take these regulatory decisions into account when they set prices in the open market for which they are willing to purchase the stock of a regulated utility.

As this Commission is likely aware, regulated ROEs have trended down over the past 10 years. In Chart 3 below, I have provided a chart that shows the ROEs allowed for natural gas utilities by state regulators across the United States from 2007 through 2016.

Chart 3: Allowed ROEs 2001 - 2017



Source for raw data: Regulatory Research Associates as accessed through SNL.com accessed by Jan. 5, 2018

Q. WHAT CONCLUSIONS DO YOU DRAW FROM THE COMPARABLE EARNINGS ANALYSIS?

A. Public Service Enterprise Group, the combination utility group, and the gas utility group all have similar earned returns on equity as shown in Table 2 above.

Regulators across the United States have continued to recognize the decrease in capital cost and, as found in Chart 3 above, steadily reduced the allowed returns of utilities over the past 10 years.

Based on the above-stated findings, I believe the proper rate of return using a comparable earnings analysis is in the range of 9.00% to 11.00%. This lower end of this range recognizes the unmistakable downward trend of the average allowed

ROE allowed by state regulators for gas utilities dating back to 2001 and the high end of the range recognizes high forecasted earned returns on equity.

E. Capital Asset Pricing Model (CAPM)

Q. HAVE YOU PREVIOUSLY PRESENTED THE CAPM IN COST OF EQUITY TESTIMONIES?

A. Yes, but I have not given it much weight. I have long maintained the application of the CAPM can lead one to erroneous results when applied in an inaccurate manner, such as when "forecasted" risk premiums or "forecasted" interest rates are employed. For this reason, I have historically not used the CAPM in cost of equity analyses. However, I do recognize the Federal Energy Regulatory Commission ("FERC") has recently expressed an interest in reviewing additional models in the cost of equity analysis. As a result of the FERC, I am adding the CAPM in my analysis to supplement my DCF analysis as well as my Comparable Earnings analysis.

Q. PLEASE EXPLAIN THE CAPITAL ASSET PRICING MODEL.

A. The CAPM is a risk premium model that determines a firm's ROE relative to the overall market return on equity. The formula for the CAPM is as follows:

$$ROE = Rf + Beta\ [E(RM) - Rf]$$

where ROE is the return on equity;
Rf is the risk-free rate;
Beta is the risk of the studied company relative to the overall market; and
E(RM) is the expected return on the market.

To be specific, the CAPM is a measure of firm-specific risk, known as unsystematic risk and measured by beta, as well as overall market risk, otherwise known as systematic risk and measured by the expected return on the market.

The CAPM calculates ROE based on a company's risk and can be restated as follows:

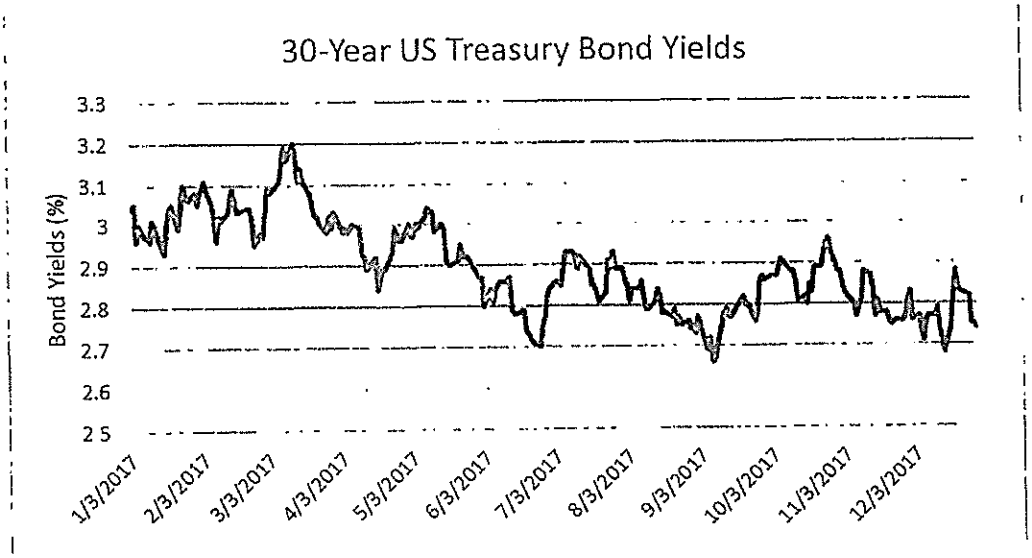
ROE = Rf + (Beta * Risk Premium)

where Risk Premium represents the adjusted company-specific risk of the company.

Q. HOW IS THE RISK-FREE RATE MEASURED?

A. The risk-free rate is designated as the yield on United States government bonds, but the term of those bonds is often debated by investment professionals. In my analysis for this case, I have developed risk premiums relative to the 30-year US Treasury bonds. Chart 4 below provides the yield on 30-year US Treasuries dating through 2017. As you can see from the chart, 30-year yields have been falling through 2017.

Chart 4: Historic Yields on 30-Year US Treasury Bonds



Source for raw data: United States Department of Treasury, https://www.treasury.gov/resource-center/data-chart-center/interest-rates/Pages/TextView.aspx?data=yieldYear&year=2017

As can be seen in this chart, current yields have continued to fall over the past year. These low yields continue to be impacted by the quantitative easing of the Federal Reserve. As of Jan. 5, 2018, the yield of 30-year US Treasury bonds was 2.81%.

Q. IS THE CURRENT LEVEL OF INTEREST RATES EXPECTED TO CHANGE MATERIALLY IN THE FORESEEABLE FUTURE?

A. No. Economic forecasters as well as the Federal Reserve all believe that the current interest rate environment is expected to remain relatively stable for many years to come. In fact, in June 16, 2016, Bloomberg published an article entitled "Yellen Says Forces Holding Down Rates May Be Long Lasting." The key takeaway from the article is the following statement:

> In a press conference after the Fed held policy steady, Yellen spoke of a sense that rates may be depressed by "factors that are not going to be rapidly disappearing, but will be part of the new normal.". [11]

The statement above adds more evidence to the long-term forecast of lower financing costs for years into the future.

Q. HOW IS BETA MEASURED IN THE CAPM?

A. Beta is a statistical calculation of a company's stock price movement relative to the overall stock movement. A company whose stock price is less volatile than the overall market will have a beta less than 1.0. A company whose stock price is more volatile than the overall market will have a beta more than 1.0. Since utilities are generally conservative equity investments, utility betas are almost always less than 1.0.

Q. WHAT IS THE CURRENT MARKET RISK PREMIUM APPROPRIATE FOR USE IN THE CAPM?

[11] https://www.bloomberg.com/news/articles/2016-06-15/yellen-seems-to-sign-on-to-summers-view-of-lingering-low-rates

A. The development of the current market risk premium is, undoubtedly, the most controversial aspect of the CAPM calculations. To gauge the historical risk premium, I turned to the Ibbotson database published by Morningstar. The long-term geometric and arithmetic returns for both equities and fixed income securities and the resulting risk premiums are as follows:

Table 3: Equity Risk Premium Calculations

Asset Class	Geometric Mean	Arithmetic Mean
Large Company Stocks	10.10%	12.10%
Long-Term Govt. Bonds	5.50%	5.90%
Resulting Risk Premium	4.60%	6.20%

Source: Ibbotson® SBBI®, 2014 Classic Yearbook: Market Results for Stocks, Bonds, Bills, and Inflation, 1926–2013 (Chicago: Morningstar, 2014).

Q. WHAT MARKET RETURNS ARE WELL-KNOWN PROFESSIONAL INVESTORS EXPECTING FOR THE FORESEEABLE FUTURE?

A. On January 14, 2016, Morningstar.com published an article entitled "What Market Experts are Saying About Future Returns".[12] By future returns, these market experts are discussing total market returns, and not just the equity risk premium. Below are some of the market return forecasts from this article:

John Bogle, Founder of Vanguard Group
6% nominal (non-inflation adjusted) equity returns during the next decade

Josh Peters, Morningstar Director of Equity-Income Strategy and Morningstar Dividend Investor Editor

[12] http://news.morningstar.com/articlenet/article.aspx?id=736083

6-7% (nominal 4-5%) returns for the S&P 500 over the next few decades

Matt Coffina, Morningstar Equity Strategist and Morningstar Stock Investor Editor
6% to 8% over the long-run

Morningstar Investment Management
4.5% 10-year nominal returns for US stocks

Charles Schwab
6.3% nominal returns for US large caps (the S&P 500) during the next 10 years

Vanguard
Nominal equity market returns of 6% to 8% during the next decade

The above-stated equity returns are consistently in the 6% to 8% range. When the current yield of 2.74%, which is the one-year average of 30-year US Treasuries, is deducted from this expected return, the resulting equity risk premium is between 3.26% and 5.26%.

Q. WHAT IS YOUR CONCLUSION AS TO THE ESTIMATED EQUITY RISK PREMIUM FOR USE IN THE CAPM?

A. Using historical data as well as ex ante (forecasts) data, the evidence suggests the equity risk premium is clearly within the range of 4% to 6%.

Q. HOW DID YOU DETERMINE THE BETA YOU USED IN THE CAPM?

A. I used the Value Line derived beta that I found in the most recent Value Line editions for each company in the comparable groups as well as Public Service Enterprise Group, the parent holding company of PSE&G.

Q. WHAT WERE YOUR CAPM RESULTS?

A. The actual calculations for the CAPM can be seen in Schedule KWO-4. The yield on 30-year US Treasury yields (Rf) has ranged from 2.66% to 3.20% in the past year. The Betas for the two comparable groups and for Public Service Enterprise Group are all consistent and in the range of 0.69 to 0.76 (Beta). Combining the 30-year US Treasury yields of 2.66% to 3.20% with the product of the Beta multiplied

by the equity risk premium ([E(RM)-Rf]) show a consistent range of 5.4% to 7.4% for the combination group and Public Service Enterprise Group as compared to a range of 5.7% to 7.7% for the gas utility comparable group. Based on this range of results for the CAPM, I find the proper ROE derived from the CAPM is in the range of 5.5% to 7.5%. The low end of this range (5.5%) is slightly above the low end of the range for the combination utility group and Public Service Enterprise Group while the high end of the range (7.5%) is slightly below the top end of the CAPM results for the gas utility group.

V. RETURN ON EQUITY RECOMMENDATIONS

Q. PLEASE SUMMARIZE THE RESULTS OF YOUR ROE ANALYSIS IN THIS CASE.

A. The table below lists the results of my DCF analysis and the comparable earnings analysis.

Table 4: ROE Method Results

Model	Range	
	Low	High
DCF	8.00%	9.00%
Comparable Earnings	9.00%	11.00%
CAPM	5.50%	7.50%

Q. WHAT IS YOUR PRIMARY RETURN ON EQUITY RECOMMENDATION IN THIS PROCEEDING?

A. My primary recommendation in this case is for the Commission to grant PSE&G a return on equity of 9.0%. As noted previously, the DCF model is, without a doubt, the best investor return requirement model in use today. As a result, I have placed more weight on the results of this model. My recommendation of 9.0% is at the upper range of the DCF results, is at the low end of the range for the Comparable Earnings model, and is well above the CAPM results.

Q. WOULD YOU PLEASE PROVIDE THE REASONS FOR YOUR RECOMMENDATIONS?

A. In making these recommendations, I recognize the strength of the stock market over the past two years and recommend an ROE at the very top of my DCF results which, in my opinion, is the most indicative model for investor expectations for earned returns of PSE&G and similar utilities.

As the Commission is aware, interest rates remain quite low relative to historic levels. Individuals seeking an income stream see utility dividends as good alternatives at the present time with the lack of adequate fixed income (bond) opportunities. As a result, utility stock prices have soared in the past five years. When stock prices increase, dividend *yields* decrease even though the dollar amount of the dividend remains the same or even increases. Hence, over the past two years, the increase in utility stock prices has driven dividend yields of utility stocks downward. Thus, we cannot ignore the current low cost of capital environment. If a utility's rates are set too high, the economy in its service territory will suffer and stockholders will receive a windfall at the expense of captive ratepayers.

Q. HOW DOES YOUR RECOMMENDATION OF 9.0% COMPARE TO WHAT ANALYSTS ARE EXPECTING FOR FUTURE MARKET RETURNS?

A. In Appendix B, I have attached an article entitled "Kiss 10% Market Returns Goodbye" that was published by Market Watch of the Wall Street Journal on Nov. 4, 2012 which is well worth reading in its entirety. In particular, I point to the comment by Roger Ibbotson, Emeritus Professor of the practice of finance at Yale University School of Management, found on the first page of the article, which provides his prediction that for the next 25 years returns will not exceed 8% which he considers to be a "great return":

> "Starting in 1926, the return on the large cap market has been 9.8%, but this was during a period when inflation rates are higher than they are today, and risk-less rates were higher than they are today," said Ibbotson, a Yale professor who also currently serves as chairman

> and chief investment officer at Zebra Capital Management. "You have to knock it all down a couple of percent, because we really are in a risk-less rate environment where the rates are close to zero."
>
> For the next quarter century or more, Ibbotson said he would "not predict more than an 8% return on the market but that's not bad. That's a great return."[13]

This Market Watch article also cites legendary investor Jack Bogle, the founder of the Vanguard Group, who also expects long-term future market returns to be in the range of 6% to 8%. [14]

In a September 7, 2014 article entitled "Raising Expectations for Lower Returns" as published in the Wall Street Journal Reports, the featured investment officer, Gary Miller, echoes the same sentiments of Mr. Bogle and Dr. Ibbotson in that market returns will average about 6% over the next 10-20 years.[15]

Q. PLEASE DESCRIBE CURRENT ECONOMIC CONDITIONS AND THE GENERAL STATE OF EQUITY MARKETS.

A. Overall, the United States economy is strong. The U.S. Gross Domestic Product ("GDP") is hovering right around a three percent (3%) growth rate, which implies slow and steady growth. Unemployment has fallen as more Americans are bouncing back from the financial meltdown of 2008.

Proving direct causal links between macroeconomic conditions and stock market prices is difficult due to the complexity of the world's now linked economies. Stock prices rise and fall based on future corporate earnings reports, intrinsic values, investor risk tolerances and a large number of other factors. It is thought, however,

[13] https://www.marketwatch.com/story/kiss-10-market-returns-goodbye-2012-11-03

[14] "Id"

[15] https://www.wsj.com/articles/advisers-at-frontier-favor-funds-with-low-costs-flexible-managers-1410120102

that because during an economic expansion the prices of commodities such as oil and steel rise as a result of competition for those commodities due to increased construction activity and consumption, the reverse might also be true; that is, extremely low oil prices are an indicator of the same or increased production in a slowing economy.

Q. HOW WILL EXPECTED LOWER STOCK MARKET RETURNS AFFECT ROEs SET BY STATE UTILITY REGULATORS ACROSS THE COUNTRY?

A. It is important to note that stock market returns and rate base returns as set by state regulators, are two different items. Stocks go up and down with, sometimes, little influence from state regulators. However, there is no doubt that state regulators have noticed the tremendous increase in the stock market and correspondingly lower debt costs over the past six years and have lowered the allowed rate of return granted to utilities over this time period.

If market returns are in the single-digits for years to come and the U.S. economy continues its present slow expansion in the years ahead, allowed returns on equity for regulated utilities should either decrease or stay roughly at current levels for the foreseeable future.

VI. CAPITAL STRUCTURE

Q. WHAT IS A CAPITAL STRUCTURE AND HOW WILL IT IMPACT THE REVENUES THAT PSE&G GAS OR ANY OTHER UTILITY IS SEEKING IN A RATE CASE?

A. The term "capital structure" refers to the relative percentage of debt, equity, and other financial components that are used to finance a company's investments. For simplicity, there are three financing methods. The first method is to finance an investment with common equity, which essentially represents ownership in a

company and its investments. Returns on common equity, which in part take the form of dividends to stockholders, are not tax deductible which, on a pre-tax basis alone, makes this form of financing about 40% more expensive than debt financing. The second form of corporate financing is preferred stock, which is normally used to a much smaller degree in capital structures. Dividend payments associated with preferred stock are not tax deductible. Corporate debt is the third major form of financing used in the corporate world. There are two basic types of corporate debt: long-term and short-term. Long-term debt is generally understood to be debt that matures in a period of more than one year. Short-term debt is debt that matures in a year or less. Both long-term debt and short-term debt represent liabilities on the company's books that must be repaid prior to any common stockholders or preferred stockholders receiving a return on their investment

Q. HOW IS A UTILITY'S TOTAL RETURN CALCULATED?

A. A utility's total return is developed by multiplying the component percentages of its capital structure represented by the percentage ratios of the various forms of capital financing relative to the total financing on the company's books by the cost rates associated with each form of capital and then totaling the results over all of the capital components. When these percentage ratios are applied to various cost rates, a total after-tax rate of return is developed. Because the utility must pay dividends associated with common equity and preferred stock with after-tax funds, the post-tax returns are then converted to pre-tax returns by grossing up the common equity and preferred stock dividends for taxes. The final pre-tax return is then multiplied by the Company's rate base in order to develop the amount of money that customers must pay to the utility for return on investment and tax payments associated with that investment.

Q. HOW DOES CAPITAL STRUCTURE IMPACT THIS CALCULATION?

A. Costs to consumers are greater when the utility finances a higher proportion of its rate base investment with common equity and preferred stock versus long-term

debt. However, long-term debt, which is first in line for repayment, imposes a contractual obligation to make fixed payments on a pre-established schedule, as opposed to common equity where no similar obligations exist.

Q. WHY SHOULD THE BOARD BE CONCERNED ABOUT HOW PSE&G FINANCES ITS RATE BASE INVESTMENT?

A. There are two reasons that the Board should be concerned about how PSE&G finances its rate base investment. First, PSE&G's cost of common equity is higher than the cost of long-term debt, meaning that an equity percentage above an optimal level will translate into higher costs to PSE&G's customers without any corresponding improvement in quality of service. Long-term debt is a financial promise made by the company and is carried as a liability on the company's books. Common stock is ownership in the company. Due to the nature of this investment, common stockholders require higher rates of return to compensate them for the extra risk involved in owning part of the company versus having a more senior claim against the company's assets.

The second reason the Board should be concerned about PSE&G's capital structure is due to the tax treatment of debt versus common equity. Public corporations, such as PSE&G, can deduct payments associated with debt financing. Corporations are not, however, allowed to deduct common stock dividend payments for tax purposes. All dividend payments must be made with after-tax funds, which are more expensive than pre-tax funds. Because the regulatory process allows utilities to recover reasonable and prudent expenses, including taxes, rates must be set so that the utility pays all its taxes and has enough left over to pay its common stock dividend. If a utility is allowed to use a capital structure for ratemaking purposes that is top-heavy in common stock, customers will be forced to pay the associated income tax burden, resulting in unjust, unreasonable, and unnecessarily high rates. Setting rates through the use of capital structure that is top-heavy in common equity violates the fundamental principles of utility regulation that rates must be just and

reasonable and only high enough to support the utility's provision of safe, adequate, and reliable service at a fair price.

Q. HOW IS SETTING A CAPITAL STRUCTURE FOR A RATE-REGULATED NATURAL GAS UTILITY COMPANY DIFFERENT THAN SETTING A CAPITAL STRUCTURE FOR A NON-REGULATED COMPANY THAT OPERATES IN A COMPETITIVE ENVIRONMENT?

A. Unregulated companies in competitive markets must carefully weigh the risk of using lower cost debt that can be used to leverage profits versus the use of the more expensive common equity that dilutes profits. Such a capital sourcing decision is based, in large part, on the competitive nature of the business in which the entity operates.

In the case of a rate-regulated utility with a licensed service territory that has little-to-no competition in its service territory, there is a strong incentive for the company to use common equity to build assets that can be placed in rate base. The utility is guaranteed the opportunity to earn its allowed rate of return on plant investment and, as such, can maximize profits by building plant and receiving favorable regulatory treatment from state regulators. In essence, normal competitive markets serve to lower capital costs through efficient capital cost decisions whereas electric utility rate regulation can act as an incentive for plant investment.

Q. PLEASE EXPLAIN HOW ONGOING CONSTRUCTION NEEDS ARE IMPACTING UTILITIES AND THEIR CUSTOMERS.

A. Utilities finance construction with three primary sources of capital: retained earnings; common equity issuances; and long-term debt issuances. Financing construction with retained earnings is preferable to the utility because using funds from ongoing operations does not dilute common equity (as would an equity issuance) and does not add debt leverage to the utility's balance sheet. However, in most cases, financing a large asset with only retained earnings may not be

possible due to sheer size of the plant investment. As a result, energy utilities undergoing large construction projects often issue common equity or long-term debt to finance these projects.

Selecting the ratio of equity to debt is important. Entities in more competitive markets have a profit motive that provides an incentive for such entities to select the most efficient capitalization ratio. However, utilities operating in exclusive, rate-regulated service territories have an incentive to maximize the amount of common equity in their capital structure so as to increase rates and, correspondingly, the utility profit. Rate-regulated utilities should only be allowed to recover in rates a revenue requirement derived from a capitalization ratio that allows the utility to provide reliable service at the least cost. Finding the right balance between debt and equity is critical.

Q. PLEASE EXPLAIN THE RAMIFICATIONS OF RATES BEING SET AT AN UNBALANCED DEBT/EQUITY LEVEL.

A. If a utility issues too much common equity and not enough debt for a certain project, the consuming public pays higher rates to support a capital structure that is neither prudent nor reasonable. It is also important to recognize how rate levels affect economic development. A utility with high rates will, all else being equal, cause its service territory to lose out on economic development opportunities.

If, on the other hand, the utility incurs too much debt, the utility's capitalization ratios presents excess financial risk to the capital markets, thereby driving up the costs required by the markets to compensate them for the added risk. In this case, the consumer would also lose because the cost it must pay the utility for accessing the capital markets is higher than it would pay using a less debt-leveraged capital structure.

One role of regulation is to balance the needs of the capital markets, including utility stockholders, with the needs of ratepayers. Too much equity or too much debt can harm both the stockholders of the corporation as well as the consuming public. Careful study of the risks and costs of various capitalization ratios is important.

Q. HAVE YOU REVIEWED THE CAPITAL STRUCTURE REQUESTED BY THE COMPANY IN THIS PROCEEDING?

A. Yes, I have.

Q. WHAT CAPITAL STRUCTURE IS PSE&G SEEKING IN THIS CASE?

A. According to the pre-filed Direct testimony of Company Witness Mr. Swetz in this proceeding, PSE&G is seeking approval of the following capital structure:

Table 5: PSE&G Requested Capital Structure

Component	Capital Structure Ratio (%)
Long-term Debt	48.18480%
Customer Deposits	0.61520%
Common Equity	51.20000%
Total Capitalization	100.00000%

Q. WHAT IS THE AVERAGE COMMON EQUITY RATIO OF THE COMPANIES IN YOUR COMPARABLE GROUPS?

A. Tables 6 and 7 below shows the average common equity ratio of each company in the natural gas proxy group, Public Service Enterprise Group, and the combination utility group.

Table 6: Combination Group Equity Ratios

Combo Utility Comparable Group	
Company	2016 Equity Ratio
Alliant Energy	47.2%
Avista	48.8%
Ameren	51.3%
Black Hills	33.5%
CMS Energy	32.6%
Centerpoint	31.5%
Consolidated Edison	49.2%
DTE	44.4%
Duke Energy	47.4%
Entergy	35.5%
Exelon	44.5%
Fortis	36.2%
MGE Energy	65.4%
PG&E	52.1%
PPL Corp	36.0%
Southern	35.7%
Vectren	52.7%
Xcel	43.7%
Average	43.8%
PSEG	54.7%

Table 7: Natural Gas Utility Equity Ratios

Company	2016 Equity Ratio
Atmos Energy	61.3%
New Jersey Resources	52.3%
Nicor	40.2%
NW Natural Gas	55.6%
South Jersey Industries	61.5%
Southwest Gas	51.8%
Spire	49.1%
UGI Corp	43.1%
Average	51.9%

As can be seen in the table above, the average common equity ratio in the combination utility group is 43.8%, which is much lower than the average equity ratio for Public Service Enterprise Group, which has an equity ratio of 54.7%, and the gas utility comparable group, which has an average equity ratio of 51.9%.

Q. WHAT IS THE AVERAGE COMMON EQUITY RATIO GRANTED BY UTIILTY REGULATORS ACROSS THE UNITED STATES IN 2017?

A. The average common equity ratio granted by regulators in 2017 to electric and natural gas utilities was 49.1%.[16]

Q. PLEASE SUMMARIZE YOUR FINDINGS IN REGARD TO THE REQUESTED EQUITY RATO IN THIS CASE RELATIVE TO THE EQUITY RATIO OF OTHER GAS UTILITIES.

[16] Regulatory Research Associates, accessed through SNL.com on January 5, 2018

A. Table 8 below provides a summary of how PSE&G's request in this case compared to the following equity ratios: the equity ratio requested by Mr. Swetz; the equity ratio of combination gas and electric utility holding companies group; the equity ratio of the Public Service Enterprise Group; the average equity ratio of the gas utilities group; and the average allowed equity ratio by state regulators across the country in 2017.

Table 8: Common Equity Comparison

PSE&G Request	51.2%
Combination Group Average	43.8%
Gas Utility Comparable Group	51.9%
Public Service Enterprise Group	54.7%
2017 Average Regulatory Eq Ratio	49.1%

Q. GIVEN THE ABOVE, DO YOU BELIEVE THAT THE CAPITAL STRUCTURE BEING PROPOSED BY PSE&G GAS IN THIS CASE IS APPROPRIATE FOR RATEMAKING PURPOSES?

A. No. The GSMP II plan is an automatic rate increase rider for the Company that involves little risk of cost recovery. PSE&G is a combination electric and gas utility. When the Company enters the marketplace for debt financing, it competes with utilities that have lower equity ratios, as evidenced by the average common equity ratio of 43.8% for the combination group as noted in Table 8 above. In addition, the average common equity ratio granted by state regulators in 2017 was 49.1%. Since GSMP II is a cost recovery mechanism that markedly limits the risk of PSE&G, corresponding lower financial risk should be reflected in a lower common equity ratio in the capital structure used for ratemaking purposes in this case. As a result, my recommendation is that the Board use a 50% common equity ratio in the capital structure. My specific recommendation is found in the table below.

Table 9: O'Donnell Recommended Capital Structure and Associated Cost Rates

Component	Capital Structure Ratio (%)	Cost Rate (%)	Wgtd. Cost Rate (%)
Long-term Debt	49.3848%	4.0500%	2.0001%
Customer Deposits	0.6152%	0.1100%	0.0007%
Common Equity	50.0000%	9.0000%	4.5000%
Total Capitalization	100.0000%		6.5008%

My recommendation of a 50% common equity ratio is higher than average allowed common equity ratio set by state regulators in 2017 and is much higher than the average common equity ratio of the combination utility group.

VII. SUMMARY

Q. PLEASE SUMMARIZE YOUR TESTIMONY.

A. PSE&G's requested 9.75% ROE for the GSMP II is excessive, unnecessary, and burdensome on the ratepayers of New Jersey. My specific recommendations in this case are as follows:

- Mr. Swetz's recommended rate of return is unreasonable, unnecessary, and excessive;
- the Company's capital structure for ratemaking purposes does not reflect the very low risk of the Company's investments in GSMP II plant and equipment;
- the Company's allowed return on equity should be set at 9.0% to reflect the cost of capital in current market conditions;
- the capital structure used for ratemaking purposes should consist of 50.0% common equity; 0.6152% customer deposits; and 49.3848% long-term debt;

- the overall rate of return PSE&G should be allowed in this case is 6.5008%.

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes. However, I reserve the right to supplement my direct testimony in response to relevant new information presented subsequent to the filing date.

Combination Utility Group

Company	DCF Results														
	13 Wk. Avg. Dividend Yield	4 Wk. Avg. Dividend Yield	Current Dividend Yield	Value Line									Plowback Growth Rate	CFRA Forecasted EPS	Schwab Forecasted EPS
				10 Year			5 Year			Forecasted					
				EPS	DPS	BPS	EPS	DPS	BPS	EPS	DPS	BPS			
Alliant Energy	2.9%	2.9%	2.9%	5.0%	7.5%	4.0%	6.5%	6.5%	4.5%	6.0%	4.5%	4.0%	3.5%	6.0%	7.1%
Ameren	3.0%	3.0%	3.1%	-1.5%	-4.0%	-1.0%	-1.5%	1.5%	-2.5%	6.0%	4.5%	4.0%		6.0%	7.2%
Avista	2.8%	2.9%	2.9%	6.5%	9.5%	4.0%	3.5%	6.5%	4.5%	4.0%	4.0%	3.5%	2.6%	6.6%	—
Black Hills	3.0%	3.3%	3.2%	3.5%	2.5%	2.5%	11.0%	2.5%	1.5%	7.5%	5.0%	5.5%	4.4%	5.0%	3.4%
CMS Energy	2.9%	2.9%	3.0%	8.5%	—	3.0%	8.5%	11.5%	4.5%	6.5%	6.5%	6.5%	5.1%	8.0%	7.4%
Centerpoint	3.8%	3.9%	4.0%	3.0%	8.0%	7.5%	1.0%	5.0%	2.0%	6.0%	3.5%	2.0%	3.0%	9.0%	7.7%
Consolidated Edison	3.3%	3.2%	3.3%	3.5%	1.5%	4.0%	2.5%	2.0%	3.5%	2.5%	3.0%	3.5%	2.9%	4.0%	2.9%
DTE	3.2%	3.2%	3.3%	5.5%	3.5%	4.0%	6.0%	5.5%	4.0%	6.0%	7.0%	4.5%	3.9%	4.0%	5.2%
Duke Energy	4.1%	4.2%	4.3%	3.5%	—	-0.5%	0.5%	2.5%	3.0%	4.5%	4.5%	1.5%	1.4%	3.0%	3.2%
Entergy	4.3%	4.3%	4.4%	3.0%	5.0%	3.0%	-2.0%	1.0%	1.0%	-2.5%	2.0%	0.5%	5.5%	nmf	-5.4%
Exelon	3.3%	3.3%	3.4%	-4.0%	-2.0%	7.0%	-11.5%	-10.0%	6.0%	8.5%	5.5%	4.0%	3.9%	2.0%	1.0%
Fortis	3.7%	3.7%	3.8%	4.0%	9.0%	9.5%	2.0%	5.0%	8.0%	10.5%	6.0%	5.0%	3.2%	na	5.5%
MGE Energy	2.0%	2.0%	2.1%	6.0%	2.5%	6.0%	6.0%	3.0%	5.5%	6.5%	4.5%	5.0%	5.1%	3.7%	—
PG&E	3.8%	4.1%	nil	1.0%	8.0%	5.0%	-2.0%	1.0%	3.5%	9.5%	7.5%	5.0%	2.8%	2.0%	2.1%
PPL Corp	4.5%	4.8%	5.1%	2.0%	4.5%	3.0%	4.5%	1.5%	—	nmf	3.0%	nmf	5.6%	nmf	0.0%
Southern	4.6%	4.7%	4.8%	3.0%	4.0%	5.0%	3.0%	3.5%	4.0%	3.5%	3.5%	3.0%	3.0%	3.0%	3.2%
Vectren	2.6%	2.7%	2.8%	4.0%	2.5%	3.0%	6.0%	2.5%	3.0%	6.5%	5.5%	5.5%	4.4%	6.0%	---
Xcel	3.0%	3.0%	3.0%	5.0%	4.0%	4.5%	6.0%	5.0%	4.5%	4.5%	6.0%	4.0%	4.0%	6.0%	6.0%
Average	3.4%	3.4%	3.5%	3.4%	4.1%	4.1%	2.8%	3.1%	3.6%	5.6%	4.8%	3.9%	3.8%	5.0%	3.8%
Public Service Enterprise Group	3.6%	3.4%	3.5%	6.0%	3.5%	7.5%	-0.5%	3.0%	6.0%	1.0%	5.0%	3.0%	4.9%	1.0%	1.4%

Source: Value Line Investment Survey, Oct. 27, 2017, Nov. 17, 2017; Dec. 15, 2017

Gas Utility Group

Company	DCF Results													
	13 Wk. Avg. Dividend Yield	4 Wk. Avg Dividend Yield	Current Dividend Yield	Value Line									Plowback Growth Rate	CFRA Forecasted EPS	Schwab Forecasted EPS
				10 Year			5 Year			Forecasted					
				EPS	DPS	BPS	EPS	DPS	BPS	EPS	DPS	BPS			
Atmos Energy	2.2%	2.2%	2.2%	6.0%	2.5%	5.0%	8.0%	3.5%	5.5%	6.0%	6.5%	3.5%	5.1%	7.0%	6.5%
New Jersey Resources	2.5%	2.6%	2.8%	7.5%	7.5%	7.5%	8.0%	6.5%	7.5%	2.0%	3.5%	6.0%	4.8%	7.0%	NA
NiSource	2.6%	2.7%	2.8%	-1.5%	-1.0%	-2.0%	2.5%	-2.0%	-3.5%	5.5%	6.5%	-1.5%	2.2%	7.0%	7.7%
NW Natural Gas	2.9%	2.9%	3.1%	—	3.5%	3.0%	-4.5%	2.0%	2.0%	7.0%	1.0%	2.0%	1.5%	4.0%	—
South Jersey Industries	3.4%	3.5%	3.6%	4.0%	9.0%	8.0%	1.5%	8.5%	9.0%	5.5%	4.0%	6.0%	2.1%	7.0%	6.6%
Southwest Gas	2.5%	2.5%	2.5%	6.5%	7.0%	5.5%	6.5%	10.0%	5.5%	8.0%	7.5%	7.0%	4.4%	8.0%	—
Spire	2.8%	2.9%	3.0%	4.0%	3.5%	7.5%	4.0%	4.0%	9.0%	6.0%	5.0%	4.5%	3.7%	4.0%	4.5%
UGI Corp	2.1%	2.1%	2.1%	7.5%	7.0%	11.0%	4.0%	8.5%	9.0%	6.5%	4.0%	7.0%	7.5%	5.0%	6.2%
Average	2.6%	2.7%	2.8%	4.9%	4.9%	5.7%	3.8%	5.1%	5.6%	6.1%	4.8%	4.3%	3.9%	6.1%	6.3%

Source. The Value Line Investment Survey. Dec. 1, 2017.

Combination Utility
Plowback Ratios

Company	% Retained to Common Equity				
	2015	2016	2017E	2020E/2022E	Average
Alliant Energy	3.6%	2.8%	3.5%	4.0%	3.5%
Avista	2.3%	3.0%	2.0%	3.0%	2.6%
Ameren	2.3%	3.3%	3.5%	4.0%	3.3%
Black Hills	3.8%	3.3%	5.5%	5.0%	4.4%
CMS Energy	5.2%	4.8%	5.0%	5.5%	5.1%
Centerpoint	1.1%	nmf	4.0%	4.0%	3.0%
Consolidated Edison	3.5%	3 0%	2.5%	2.5%	2.9%
DTE	3.4%	3.7%	5.0%	3.5%	3.9%
Duke	1.5%	0.6%	1.5%	2.0%	1.4%
Entergy	4.8%	7.7%	6.5%	3.0%	5.5%
Exelon	4.5%	1.9%	4.5%	4.5%	3.9%
Fortis	4.5%	2.1%	3.0%	3.0%	3.2%
MGE Energy	4.5%	4.7%	4.5%	6.5%	5.1%
PG&E	0.7%	2.8%	4.0%	3.5%	2.8%
PPL	6.0%	8.8%	3.0%	4.5%	5.6%
Southern Company	3.1%	2.5%	3.0%	3.5%	3.0%
Vectren	4.2%	4.4%	4.0%	5.0%	4.4%
Xcel	4.3%	4.0%	4.0%	3.5%	4.0%
Public Service Enterprise Group	6.8%	4.6%	4.5%	3.5%	4.9%

Source: Value Line Investment Survey, Oct. 27, 2017; Nov. 17, 2017; Dec. 15, 2017

Natural Gas Utility Comparable Group
Plowback Ratios

Company	% Retained to Common Equity				
	2015	2016	2017E	2020E/2022E	Average
Atmos Energy	4.9%	5.1%	5.0%	5.5%	5.1%
New Jersey Resources	7.0%	4.8%	1.8%	5.5%	4.8%
NiSource	nmf	3.0%	1.0%	2.5%	2.2%
NW Natural Gas	0.6%	0.9%	1.0%	3.5%	1.5%
South Jersey Industries	2.8%	1.6%	0.5%	3.5%	2.1%
Southwest Gas	4.0%	4.1%	4.5%	5.0%	4.4%
Spire	3.7%	3.3%	3.3%	4.5%	3.7%
UGI Corp	7.4%	7.0%	7.5%	8.0%	7.5%
Average					3.9%

Source: The Value Line Investment Survey, Dec. 1, 2017; Nov. 17, 2017

Combination Utility Group
Earned Returns on Equity

Company	% Return on Common Equity			
	2015	2016	2017E	2020E/2022E
Alliant Energy	10.2%	9.7%	10.0%	12.0%
Avista	7.7%	8.3%	7.0%	8.5%
Ameren	8.3%	9.2%	9.5%	10.0%
Black Hills	8.8%	8.7%	11.0%	10.5%
CMS Energy	13.3%	13.0%	13.5%	13.5%
Centerpoint	13.4%	12.5%	16.5%	16.5%
Consolidated Edison	9.1%	8.3%	8.5%	8.5%
DTE	9.1%	9.6%	11.5%	10.5%
Duke Energy	7.2%	6.2%	7.0%	8 5%
Entergy	11.2%	15.2%	14.0%	10.0%
Exelon	8.8%	6.5%	9.0%	9.5%
Fortis	7.4%	4.5%	8.0%	8.5%
MGE Energy	10.3%	10.4%	10.5%	12 0%
PG&E	5.9%	7.9%	10.0%	10 0%
PPL Corp	16.2%	19.2%	13.0%	13.5%
Southern Company	12.6%	11.0%	12.5%	13.0%
Vectren	11.7%	12.0%	12.0%	12.0%
Xcel	10.0%	10.2%	10.5%	10.5%
Average	10.1%	10.1%	10.8%	11.0%
Public Service Enterprise Group	12.9%	10.9%	11.5%	10.5%

Source: Value Line Investment Survey, Oct. 27, 2017; Nov. 17, 2017; Dec. 15, 2017

Natural Gas Utility Comparable Group
Earned Returns on Equity

Company	% Return on Common Equity			
	2015	2016	2017E	2020E/2022E
Atmos Energy	9.9%	10.1%	10.0%	11 5%
New Jersey Resources	13.9%	11.8%	12.0%	11.5%
NiSource	5.2%	8.1%	7.0%	11.5%
NW Natural Gas	6.9%	6.9%	7.5%	10.0%
South Jersey Industries	9.5%	8.0%	7.0%	9.5%
Southwest Gas	8.7%	9.1%	10.0%	10.0%
Spire	8.7%	8.2%	8.1%	9.5%
UGI Corp	13.1%	12.6%	13.0%	12.0%
Average	9.5%	9.4%	9.3%	10.7%

Source: The Value Line Investment Survey, Dec. 1, 2017.

PSEG
GSMP II
CAPM Results

Combination Utility Group

	Risk-Free Rate	Beta	Equity Risk Premium	Equity Cost Rate
Treasury - Maximum	3.20%	0.69	4.0%	6.0%
Treasury - Average	2.89%	0.69	4.0%	5.7%
Treasury - Minimum	2.66%	0.69	4.0%	5.4%

	Risk-Free Rate	Beta	Equity Risk Premium	Equity Cost Rate
Treasury - Maximum	3.20%	0.69	6.0%	7.4%
Treasury - Average	2.89%	0 69	6 0%	7.0%
Treasury - Minimum	2.66%	0 69	6.0%	6.8%

Public Service Enterprise Group

	Risk-Free Rate	Beta	Equity Risk Premium	Equity Cost Rate
Treasury - Maximum	3.20%	0.70	4.0%	6.0%
Treasury - Average	2.89%	0 70	4.0%	5.7%
Treasury - Minimum	2.66%	0.70	4.0%	5.5%

	Risk-Free Rate	Beta	Equity Risk Premium	Equity Cost Rate
Treasury - Maximum	3.20%	0.70	6.0%	7 4%
Treasury - Average	2 89%	0.70	6.0%	7 1%
Treasury - Minimum	2.66%	0.70	6.0%	6.9%

Gas Utility Comparable Group

	Risk-Free Rate	Beta	Equity Risk Premium	Equity Cost Rate
Treasury - Maximum	3.20%	0.76	4.0%	6.2%
Treasury - Average	2.89%	0.76	4.0%	5.9%
Treasury - Minimum	2.66%	0.76	4.0%	5.7%

	Risk-Free Rate	Beta	Equity Risk Premlum	Equity Cost Rate
Treasury - Maximum	3.20%	0.76	6.0%	7.7%
Treasury - Average	2.89%	0.76	6.0%	7.4%
Treasury - Minimum	2.66%	0.76	6.0%	7.2%

Appendix A

Regulatory Cases of Kevin W. O'Donnell, CFA
Nova Energy Consultants, Inc.

Year	Name of Applicant	State Jusrisdiction	Docket No.	Client/ Employer	Case Issues
1985	Public Service Company of NC	NC	G-5, Sub 200	Public Staff of NCUC	Return on equity, capital structure
1985	Piedmont Natural Gas Company	NC	G-9, Sub 251	Public Staff of NCUC	Return on equity, capital structure
1986	General Telephone of the South	NC	P-19, Sub 207	Public Staff of NCUC	Return on equity, capital structure
1987	Public Service Company of NC	NC	G-5, Sub 207	Public Staff of NCUC	Return on equity, capital structure
1988	Piedmont Natural Gas Company	NC	G-9, Sub 278	Public Staff of NCUC	Return on equity, capital structure
1989	Public Service Company of NC	NC	G-5, Sub 246	Public Staff of NCUC	Return on equity, capital structure
1990	North Carolina Power	NC	E-22, Sub 314	Public Staff of NCUC	Return on equity, capital structure
1991	Duke Energy	NC	E-7, Sub 487	Public Staff of NCUC	Return on equity, capital structure
1992	North Carolina Natural Gas	NC	G-21, Sub 306	Public Staff of NCUC	Natural gas expansion fund
1992	North Carolina Natural Gas	NC	G-21, Sub 307	Public Staff of NCUC	Natural gas expansion fund
1995	Penn & Southern Gas Company	NC	G-3, Sub 186	Public Staff of NCUC	Return on equity, capital structure
1995	North Carolina Natural Gas	NC	G-21, Sub 334	Carolina Utility Customers Assoc.	Return on equity, capital structure, rate design, cost of service
1995	Carolina Power & Light Company	NC	E-2, Sub 680	Carolina Utility Customers Assoc.	Fuel adjustment proceeding
1995	Duke Power	NC	E-7, Sub 559	Carolina Utility Customers Assoc.	Fuel adjustment proceeding
1996	Piedmont Natural Gas Company	NC	G-9, Sub 378	Carolina Utility Customers Assoc.	Return on equity, capital structure, rate design, cost of service
1996	Piedmont Natural Gas Company	NC	G-9, Sub 382	Carolina Utility Customers Assoc.	Return on equity, capital structure, rate design, cost of service
1996	Public Service Company of NC	NC	G-5, Sub 356	Carolina Utility Customers Assoc.	Return on equity, capital structure, rate design, cost of service
1996	Cardinal Extension Company	NC	G-39, Sub 0	Carolina Utility Customers Assoc.	Capital structure, cost of capital
1997	Public Service Company of NC	NC	G-5, Sub 327	Carolina Utility Customers Assoc.	Return on equity, capital structure, rate design, cost of service
1998	Public Service Company of NC	NC	G-5, Sub 386	Carolina Utility Customers Assoc.	Return on equity, capital structure, rate design, cost of service
1998	Public Service Company of NC	NC	G-5, Sub 386	Carolina Utility Customers Assoc.	Natural gas transporation rates
1999	Public Service Company of NC/SCANA	NC	G-5, Sub 400	Carolina Utility Customers Assoc.	Merger case
1999	Public Service Company of NC/SCANA	NC	G-43	Carolina Utility Customers Assoc.	Merger Case
1999	Carolina Power & Light Company	NC	E-2, Sub 753	Carolina Utility Customers Assoc.	Holding company application
1999	Carolina Power & Light Company	NC	G-21, Sub 387	Carolina Utility Customers Assoc.	Holding company application
1999	Carolina Power & Light Company	NC	P-708, Sub 5	Carolina Utility Customers Assoc.	Holding company application
2000	Piedmont Natural Gas Company	NC	G-9, Sub 428	Carolina Utility Customers Assoc.	Return on equity, capital structure, rate design, cost of service
2000	NUI Corporation	NC	G-3, Sub 224	Carolina Utility Customers Assoc.	Holding company application
2000	NUI Corporation/Virginia Gas Compan	NC	G-3, Sub 232	Carolina Utility Customers Assoc.	Merger application
2001	Duke Power	NC	E-7, Sub 685	Carolina Utility Customers Assoc.	Emission allowances and environmental compliance costs
2001	NUI Corporation	NC	G-3, Sub 235	Carolina Utility Customers Assoc.	Tariff change request.
2001	Carolina Power & Light Company/Prog	NC	E-2, Sub 778	Carolina Utility Customers Assoc.	Asset transfer case
2001	Duke Power	NC	E-7, Sub 694	Carolina Utility Customers Assoc.	Restructuring application
2002	Piedmont Natural Gas Company	NC	G-9, Sub 461	Carolina Utility Customers Assoc.	Return on equity, capital structure, rate design, cost of service
2002	Cardinal Pipeline Company	NC	G-39, Sub 4	Carolina Utility Customers Assoc.	Cost of capital, capital structure
2002	South Carolina Public Service Commiss	SC	2002-63-G	South Carolina Energy Users Committee	Rate of return, accounting, rate design, cost of service
2003	Piedmont Natural Gas/North Carolina P	NC	G-9, Sub 470	Carolina Utility Customers Assoc.	Merger application
2003	Piedmont Natural Gas/North Carolina P	NC	G-9, Sub 430	Carolina Utility Customers Assoc.	Merger application
2003	Piedmont Natural Gas/North Carolina P	NC	E-2, Sub 825	Carolina Utility Customers Assoc.	Merger application
2003	Carolina Power & Light Company	NC	E-2, Sub 833	Carolina Utility Customers Assoc.	Fuel case
2004	South Carolina Electric & Gas	SC	2004-178-E	South Carolina Energy Users Committee	Return on equity, capital structure, rate design, cost of service
2005	Carolina Power & Light Company	NC	E-2, Sub 868	Carolina Utility Customers Assoc.	Fuel case

Regulatory Cases of Kevin W. O'Donnell, CFA
Nova Energy Consultants, Inc.

Year	Name of Applicant	State Jusrisdiction	Docket No.	Client/ Employer	Case Issues
2005	Piedmont Natural Gas Company	NC	G-9, Sub 499	Carolina Utility Customers Assoc.	Return on equity, capital structure, rate design, cost of service
2005	South Carolina Electric & Gas	SC	2005-2-E	South Carolina Energy Users Committee	Fuel application
2005	Carolina Power & Light Company	SC	2006-1-E	South Carolina Energy Users Committee	Fuel application
2006	IRP in North Carolina	NC	E-100, Sub 103	Carolina Utility Customers Assoc.	Submitted rebuttal testimony in investigation of IRP in NC.
2006	Piedmont Natural Gas Company	NC	G-9, Sub 519	Carolina Utility Customers Assoc.	Creditworthiness Issue
2006	Public Service Company of NC	NC	G-5, Sub 481	Carolina Utility Customers Assoc.	Return on equity, capital structure, rate design, cost of service
2006	Duke Power	NC	E-7, 751	Carolina Utility Customers Assoc.	App to share net revenues from certain wholesale pwr trans
2006	South Carolina Electric & Gas	SC	2006-192-E	South Carolina Energy Users Committee	Fuel application
2007	Duke Power	NC	E-7, Sub 790	Carolina Utility Customers Assoc.	Application to construct generation
2007	South Carolina Electric & Gas	SC	2007-229-E	South Carolina Energy Users Committee	Rate of return, accounting, rate design, cost of service
2008	South Carolina Electric & Gas	SC	2008-196-E	South Carolina Energy Users Committee	Base load review act proceeding
2009	Western Carolina University	NC	E-35, Sub 37	Western Carolina University	Rate of return, accounting, rate design, cost of service
2009	Duke Power	NC	E-7, Sub 909	Carolina Utility Customers Assoc.	Cost of service, rate design, return on equity, capital structure
2009	South Carolina Electric & Gas	SC	2009-261-E	South Carolina Energy Users Committee	DSM/EE rate filing
2009	Duke Power	SC	2009-226-E	South Carolina Energy Users Committee	Return on equity, capital structure, rate design, cost of service
2009	Tampa Electric	FL	080317-EI	Florida Retail Federation	Return on equity, capital structure
2010	Duke Power	SC	2010-3-E	South Carolina Energy Users Committee	Fuel application - assisted in settlement
2010	South Carolina Electric & Gas	SC	2009-489-E	South Carolina Energy Users Committee	Return on equity, capital structure, rate design, cost of service
2010	Virginia Power	VA	PUE-2010-00006	Mead Westvaco	Rate design
2011	Duke Energy	SC	2011-20-E	South Carolina Energy Users Committee	Nuclear construction financing
2011	Northern States Power	MN	E002/GR-10-971	Xcel Large Industrials	Return on equity, capital structure
2011	Virginia Power	VA	PUE-2011-0027	Mead Westvaco	Capital structure, revenue requirement
2011	Duke Energy	NC	E-7, Sub 989	Carolina Utility Customers Assoc.	Accounting, cost of service, rate design, ROE, capital structure
2011	Duke Energy	SC	2011-271-E	South Carolina Energy Users Committee	Accounting, cost of service, rate design, ROE, capital structure
2011	Dominion Virginia Power	VA	PUE-2011-00073	Mead Westvaco	Rate design
2012	Town of Smithfield/Partners Equity Gri	NC	ES-160, Sub 0	Partners Equity Group	Rate design, asset valuation
2012	Florida Power & Light	FL	120015-EI	Floridx Office of Public Counsel	Capital structure
2012	South Carolina Electric & Gas	SC	2012-218-E	South Carolina Energy Users Committee	Accounting, cost of service, rate design, ROE, capital structure
2013	Progress Energy Carolinas	NC	E-2, Sub 1023	Carolina Utility Customers Assoc.	Accounting, cost of service, rate design, ROE, capital structure
2013	Duke Energy Carolinas	NC	E-7, Sub 1026	Carolina Utility Customers Assoc.	Rate design
2013	Jersey Central Power & Light	NJ	BPU ER12111052	Gerdau Ameristeel	Return on equity, capital structure
2013	Duke Energy Carolinas	SC	2013-59-E	South Carolina Energy Users Committee	Accounting, cost of service, rate design, ROE, capital structure
2013	Tampa Electric	FL	130040-EI	Florida Office of Public Counsel	Capital structure and financial integrity
2013	Piedmont Natural Gas	NC	G-9, Sub 631	Carolina Utility Customers Assoc.	Accounting, cost of service, rate design, ROE, capital structure
2014	Dominion Virginia Power	VA	PUE-2014-00033	Mead Westvaco	Recoverable fuel costs, hedging strategies
2014	Public Service Company of Colorado	CO	14AL-0660E	Colorado Healthcare Electric Coordinating Council	Return on equity, capital structure
2015	WEC Acquisition of Integrys	WI	9400-YO-100	Staff of Wisconsin Public Service Commission	Acquistion analysis
2015	Dominion Virginia Power	VA	PUE-2015-00027	Federal Executive Agencies	Return on equity
2015	South Carolina Electric & Gas	SC	2015-103-E	South Carolina Energy Users Committee	Return on equity
2015	Western Carolina University	NC	E-35, Sub 45	Western Carolina University	Accounting, cost of service, rate design, ROE, capital structure
2016	Sandpiper Energy	MD	9410	Maryland Office of People's Counsel	Return on equity, capital structure
2016	Washington Gas Light	DC	FC 1137	Washington, DC Office of People's Counsel	Return on equity, capital structure

Regulatory Cases of Kevin W. O'Donnell, CFA
Nova Energy Consultants, Inc.

Year	Name of Applicant	State Jusrisdiction	Docket No.	Client/ Employer	Case Issues
2016	Florida Power & Light	FL	160021-EI	Florida Office of Public Counsel	Capital Structure
2016	Jersey Central Power & Light	NJ	EM15060733	NJ Division of Rate Counsel	Asset valuation
2016	Rockland Electric Company	NJ	ER16050428	NJ Division of Rate Counsel	Rate design
2016	Dominon NC Power	NC	E-22, Sub 532	Carolina Utility Customers Assoc.	Accounting, cost of service, rate design, ROE, capital structure
2017	Potomac Electric Power	DC	FC 1139	Healthcare Council of the National Capitol Area (HCNCA)	ROE and capital structure
2017	Columbia Gas of Maryland	MD	FC 9447	Maryland Office of People's Counsel	ROE and capital structure
2017	Washington Gas Light	DC	FC 1142	Washington, DC Office of People's Counsel	Merger analysis
2017	Duke Energy Progress	NC	E-2, Sub 1142	Carolina Utility Customers Assoc.	Accounting, cost of service, rate design, ROE, capital structure

Kevin W. O'Donnell, CFA

Nova Energy Consultants, Inc. (Nova)

1350-101 SE Maynard Rd.

Cary, NC

919-461-0270

919-461-0570 (fax)

kodonnell@novaenergyconsultants.com

Kevin W. O'Donnell, is the founder of Nova Energy Consultants, Inc. in Cary, NC. Mr. O'Donnell's academic credentials include a B.S. in Civil Engineering - Construction Option from North Carolina State University as well as a MBA in Finance from Florida State University. Mr. O'Donnell is also a Chartered Financial Analyst (CFA).

Mr. O'Donnell has over thirty-two years of experience working in the electric, natural gas, and water/sewer industries. He is very active in municipal power projects and has assisted numerous southeastern U.S. municipalities cut their wholesale cost of power by as much as 67%. On Dec. 12, 1998, ***The Wilson Daily Times*** made the following statement about O'Donnell.

> **Although we were skeptical of O'Donnell's efforts at first, he has shown that he can deliver on promises to cut electrical rates.**

As of the start of 2015, Mr. O'Donnell has completed over 25 wholesale power projects for municipal and university-owned electric systems throughout North and South Carolina. In May of 1996 Mr. O'Donnell testified before the U.S. House of Representatives, Committee on Commerce, Subcommittee on Energy and Power regarding the restructuring of the electric utility industry.

Mr. O'Donnell has appeared as an expert witness in over 85 regulatory proceedings before the North Carolina Utilities Commission, the South Carolina Public Service Commission, the Virginia Corporation Commission, the Minnesota Public Service Commission, the New Jersey Board of Public Utilities, the Colorado Public Service Commission, the Wisconsin Public Service Commission, the Maryland Public Service Commission, the District of Columbia Public Service Commission, and the Florida Public Service Commission. His area of expertise has included rate design, cost of service, rate of return, capital structure, asset valuation analyses, fuel adjustments, merger transactions, holding company applications, as well as numerous other accounting, financial, and utility rate-related issues.

Mr. O'Donnell is the author of the following two articles: "Aggregating Municipal Loads: The Future is Today" which was published in the Oct. 1, 1995 edition of *Public Utilities Fortnightly;* and "Worth the Wait, But Still at Risk" which was published in the May 1, 2000 edition of *Public Utilities Fortnightly.* Mr. O'Donnell is also the co-author of "Small Towns, Big Rate Cuts" which was published in the January, 1997 edition of *Energy Buyers Guide.* All of these articles discuss how rural electric systems can use the wholesale power markets to procure wholesale power supplies.

Appendix B

CHUCK JAFFE Archives Email alerts

Nov 4, 2012, 9:01 a.m. EST

Kiss 10% market returns goodbye

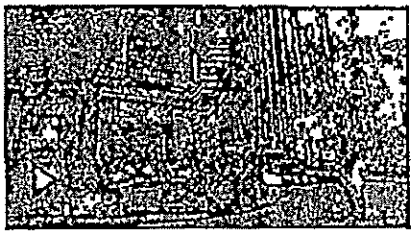
Commentary: A growing number of experts say investors should no longer expect the double-digit returns of the past

Stories You Might Like

- Greek prime minister warns of euro exit
- Stocks will not love you back
- Heavy rain, winds seen for Sandy-hit areas

By Chuck Jaffe, MarketWatch

BOSTON (MarketWatch) — As the market recently observed the 25th anniversary of the single worst day in its history — the Market Crash of 1987 — most investing experts warned that investors should expect similar crashes and free-falls in the future.



Jaffe: Surprising investing lessons from Sandy

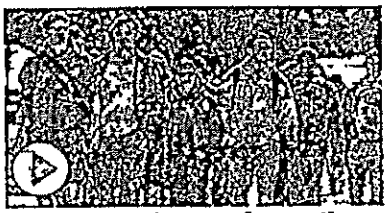
Taking a market time out is better than short-term trading strategies, Chuck Jaffe discovered during the Sandy-imposed markets break. He discusses on Markets Hub. Photo: Getty Images

Lost amid those headlines, however, was an arguably more dangerous prospect for regular investors: namely, that many market experts say the kinds of historic returns they've come to expect are gone for the foreseeable future.

Ask most investors what they expect to get from the stock market and the answer is typically 10%. That's a homage to an old study by Roger Ibbotson and Rex Sinquefeld that showed several generations of investors that stocks average that level of return — albeit before any transaction costs — over time.

No matter how much the market has bounced around — through periods where a 10% return lagged behind the overall market badly and downturns when a double-digit gain felt like a fairy tale — investors have had the sense that if they can stick with the market long enough, they will come away with that 10% gain.

The problem is that the experts, including Ibbotson himself, don't believe it.



New ways to pay for college

Some families are forgoing pricey student loans in favor of alternative strategies. Photo: AP

"Starting in 1926, the return on the large-cap market has been 9.8%, but this was during a period when inflation rates are higher than they are today, and risk-less rates were higher than they are today," said Ibbotson, a Yale professor who also currently serves as chairman and chief investment officer at Zebra Capital Management. "You have to knock it all down by a couple of percent, because we really are in a risk-less rate environment where the rates are close to zero."

For the next quarter-century or more,

Most Popular

1. 10 things walk-in clinics won't tell you
2. PAUL B. FARRELL — 9 scenarios and all lead to stock plunge
3. CHUCK JAFFE — Kiss 10% market returns goodbye
4. Greek prime minister warns of euro exit
5. INDICATIONS — Stock futures steady ahead of U.S. election

Map of the Market

CREDIT CARDS, CREDIT SCORES AND MORE
- **Why prepaid cards aren't for everyone**
- **5 best credit cards for vacation travel**
- **How to fire your bank**
- **The credit cards with the best travel rewards**

MORE CONSUMER ADVICE
- **Payday loans could spur costly debt cycle**
- **Goodbye new-car discounts, hello perks**
- **Insurance you don't need: skip this, buy that**
- **What it costs to lose your smartphone**
- **How to switch elite status to another airline**
- **Want to get out of jury duty? Here's how**
- **8 tips for finding cheap airfares**
- **What car mechanics don't want you to know**
- **What not to say when pulled over by a cop**

SCAM ALERTS
- **Smartphones hike your risk of ID fraud**
- **How to spot debt collection scams**
- **Watch for ATM skimming**

Ibbotson said he would "not predict more than an 8% return on the market, but that's not bad. That's a great return."

Likewise, Vanguard Group founder Jack Bogle — who, like Ibbotson, appeared on my radio show this month — said the current market, which he called the "most challenging he has ever seen" is going to deliver smaller returns than what experienced, adult investors have in their heads. He pegged the return in the 6% to 8% range for stocks going forward, also citing low yields and low inflation as key reasons to alter long-term expectations.

Of course, a lot of investors would be thrilled to get 8% from the market these days, a far sight better than the returns they have earned over the last decade. But if history has not been suspended — and the experts don't think it has been, they just believe returns will be lower — the lowered expectations do significantly change long-term financial and investment planning.

Consider someone who starts investing in their 20s and has a long life ahead of them. A 10% market return would double their market return every 7.2 years, compared with a 9-year time frame when the return is just 8%.

If their initial investment was $10,000, it would be $160,000 in 36 years if it compounds at 10% annually. It would be half that amount over the same time period if the return is 8%. (See How to Make the Most of Compound Returns.)

The challenge is that inflation is still in the 2% to 3% range, and investors can't get to where they want to be with a less than 2% Treasury bond, combined with a 6% to 8% stock market, said Jeffrey Coons, president of the mutual fund firm Manning & Napier. "You combine those together and you never really get to those numbers you use in your retirement calculators, or that a pension plan would use for its actuarial assumptions. Those absolute returns really are the issue."

Aside from changing the assumptions they plug into those calculators — a move that makes the ultimate outcomes look significantly more bleak and doubtful — experts are split over what investors should do as a response to this less fruitful environment.

Average long-term investors have always tried to capture the long-term trends; it's why low-cost indexing has delivered so strongly over time.

Now, however, those indexes are poised to return less, which Coons suggested could pull investors away "from buying the whole stock market and bond market and focusing on individual investments that are priced to give you better returns."

Ibbotson had other ideas, namely to get a realistic handle on spending needs, and to save more.

"We've been talking about these lower returns for a few years now," Ibbotson said, noting that the stock market's volatility and lack of strong returns over a decade has scared off a lot of investors. "But I don't know that most people have responded. They haven't changed their expectations, or increased their savings or tried to figure out if they will really have enough if the market isn't as good over the next 25 years as it was for the last 75."

"One way or another, however, I think most people have to change their behavior, change their equation. That's the only way this turns out over the coming decades the way people expect and hope for." ¤

Chuck Jaffe is a senior MarketWatch columnist. His work appears in many U.S. newspapers.