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VIA HAND DELIVERY

Blanca S. Bayo, Director
Division of Records and Reporting
Betty Easley Conference Center
4075 Esplanade Way
Tallahassee, Florida 32399-0870

Re: Docket No.: 050078-EI

Dear Ms. Bayo:

On behalf of the Florida Industrial Power Users Group (FIPUG), enclosed for filing and distribution is the original and 25 copies of the following:

- Direct Testimony and Exhibits of Philip K. Porter, Ph.D.

Please acknowledge receipt of the above on the extra copy and return the stamped copy to me. Thank you for your assistance.

Sincerely,

Timothy J. Perry

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McWhirter, Reeves, & Davidson, P.A.

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

In re: Petition for Rate Increase by Progress Energy Florida, Inc. ______________________/

Docket No: 050078-EI
Filed: July 13, 2005

DIRECT TESTIMONY AND EXHIBITS

OF

PHILIP K. PORTER, PH.D.

ON BEHALF OF THE FLORIDA INDUSTRIAL POWER USERS GROUP

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DIRECT TESTIMONY OF PHILIP K. PORTER, PH.D.
ON BEHALF OF THE FLORIDA INDUSTRIAL POWER USERS GROUP
DOCKET NO. 050078-EI
JULY 13, 2005

Q: Please state your name, address and occupation.

A: My name is Philip K. Porter. My business address is Department of Economics, University of South Florida, Tampa, FL. I am Professor of Economics and Director of the Center for Economic Policy Analysis. A summary of my research interests and curriculum vitae are attached as Exhibit No. ___ (PKP-1), Appendix A.

Q: What is the purpose of your testimony in this proceeding?

A: I have been asked by the Florida Industrial Power Users Group (FIPUG) to provide testimony regarding past and present financial market conditions as they pertain to Progress Energy Florida (PEF) and to evaluate the testimony of Dr. James H. Vander Weide and Dr. Charles J. Cicchetti in this proceeding.

Q: Please summarize your findings.

A: In today's financial marketplace investors in large, joint-stock companies (ones with capitalization in excess of $5 billion) must anticipate a company's equity will yield between nine-percent and ten-percent annually to induce investment and to retain shareholders. Investors in utilities will require a lower expected return. Dr. Vander Weide's assessment that the market requires 12.3 percent allowed return on equity to induce investment in PEF is excessive. Dr. Vander Weide makes incorrect and inappropriate assumptions in the application of the capital asset pricing model and the discounted cash flow model to arrive at his conclusion. Dr. Cicchetti's idea that a bonus of 50 basis points as a reward for past performance is warranted and will inure to the future benefit of PEF's customers is without foundation and, almost certainly will not benefit electricity consumers. To put the assumptions and findings of Drs. Vander Weide and Cicchetti in perspective I present a reality check based on the expected returns for a competitive enterprise of similar size. The current expected market return for competitive companies is less than 10 percent. When this return is compared to the return required for a less risky regulated utility I find that an appropriate return on equity for PEF is less than 9 percent, 400 basis points less than the company seeks. Based on common equity of $2.55 billion and a tax markup factor of 1.632 this reduces the company's revenue request by $166.6 million per year.

Q: With respect to Dr. Vander Weide's analysis, what factors led to the excessive estimate?

A: Specifically, Dr. Vander Weide assumes an equity risk premium that is too high, a market beta that is too high, an expected growth rate for equity returns that is too high, and an expected yield on A-rated utility bonds that is too high. In addition, he adds an adjustment for flotation without justification and fails to account for the favorable treatment of regulated utilities in the financial markets. The combination of these factors yields an estimate that overstates the required return by more than 33 percent.

Q: How can Dr. Vander Weide be so wrong?

A: Application of the discounted cash flow model (DCF) and the capital asset pricing model (CAPM) require great care lest error, bias, or manipulation render the application invalid. These models share two latent flaws that make careful study and control of the application necessary before information useful in a regulatory proceeding is ascertained. First, neither of these models is particularly accurate and each is subject to manipulation by anyone with a bias. Estimation of the parameters in each of these models is notoriously inaccurate. Precision is often so weak that little confidence can be placed in the point estimates used. Parameter estimates vary widely from one sample to the next. To make this problem worse each of these models is interactive; one parameter estimate is multiplied or divided by another. This compounds the error, increasing it geometrically. For example, in the CAPM model the adjustment for systematic risk is beta times the risk premium. If the estimate of beta is 50 percent too high and the estimate of the risk premium is 50 percent too high, the model overestimates the risk adjustment, not by 100 percent, but by 125 percent.

Second, the models are complex and not easily understood. This gives the estimation process the appearance of a scientific inquiry, but, because of the inherent inaccuracy, defies a basic axiom of scientific modeling, which is to avoid assumptions that increase complexity without increasing accuracy. What complexity does is increase opportunities for error in the model's use. This happens because at each step in the model's implementation a new parameter is estimated or chosen. The more steps in the implementation of a model, the more opportunities there are for error and implausible conclusions. These models come with a powerful accumulation of error and bias that, because of their complexity, the layperson is not equipped to critique. At this level of abstraction a reality check is needed. Recalling fundamental truths about capital markets will help identify the more egregious errors in the use of the models.

Q: Are the reports of the experts biased?

A: One would hope not, but with so much at stake bias is inevitable. I have reviewed the various methods used in this, and in other, rate proceedings. It is my conclusion that there is more than ample latitude in the measurement of the parameters of the models and in the applications of the models to make it possible to come to virtually any finding one might wish. It is not uncommon for the expert witnesses for the utility and those for the various consumer groups to put forth estimates that differ by 400 or 500 basis points. Such differences may occur naturally without deliberate manipulation of a model. However, were there no bias in the selection and presentation of the experts by interested parties, differences of opinion would be randomly distributed so that half the time a rate case is called the expert for the consumer group would identify a fair rate of return higher than that identified by the expert for the utility and the case would immediately settle to everyone's liking. Instead, in virtually 100-percent of the rate cases, the experts hired by consumer groups opine on a fair rate of return that is lower than that offered by the experts hired by the utility, in spite of the fact that they use essentially the same models.

Q: Is the true cost of equity likely to be somewhere in between the estimates of the various experts?

A: Yes, but the difficult question is where. Knowing that each side in an adversarial proceeding presents its best case doesn't help much if the magnitude of exaggeration is unknown. For example, if we know that everyone exaggerates to the same degree, the Commission could split the difference and come close to the true figure. However, in this type of proceeding there is an obvious lower bound to the cost of equity capital, but no apparent upper bound. We know the expected return on equity cannot be less than the bond rate paid by the firm, which is easy to observe. On the upper end, the sky appears to be the limit. Without an upper bound, splitting the difference always favors the utility.

Q: Briefly describe the models.

A: **The Discounted Cash Flow Model:** In the DCF model the basic estimating equation for the equity cost of capital is

$$k = \frac{CF}{PV} + g$$

where k is the cost of capital, CF is the expected dividend or cash flow to be earned by shareholders in the next period, PV is the present market value of the company, and g is the anticipated growth rate of earnings (dividends and asset appreciation).

The original work by J. Williams was published in 1938[1] as a treatise on what determines value for investors. Williams noted that present value is the discounted stream of future cash flows as given by the following equation:

$$PV = \frac{CF_1}{(1+k)^1} + \frac{CF_2}{(1+k)^2} + \frac{CF_3}{(1+k)^3} + \cdots + \frac{CF_T}{(1+k)^T}$$

In this well-respected formulation investors are assumed to have some information that leads them to believe a particular company will yield cash flows to the investor in each of T future time periods. The value of k is the investor's personal discount rate. This is a theory about how investors measure value and is dependent only on the investor's perceptions.

[1] Williams, J.B., *The Theory of Investment Value*, Harvard University Press, Cambridge, Mass., 1938.

To transform this into a cost of capital model several assumptions are made. First, it is noted that investors sell the asset if their present value calculation is less than the market price, driving the price down, and buy the asset if it is greater, driving the price up. Arbitrage thus equates the investor's present value of cash flow with the capital market's valuation of the firm. The same assumption is applied to the investor's discount rate. When investors hold discount rates that are greater than the market rate, they borrow and drive market rates up. When the opposite is true they lend and drive market rates down. Arbitrage thus equates the market cost of capital with the average individual discount rate. Second, it is assumed that the asset yields a cash flow into the indefinite future, and that the rate of growth in the cash flow is constant. That is, $CF_{t+1} = CF_t(1+g)$ for every period t. The model can be more complex, permitting differential growth rates and definite horizons, but these assumptions permit the simple solution for k given by

$$k = \frac{CF}{PV} + g.$$

In this formulation, the cost of equity (formerly the investor's personal discount rate) is to be determined by expectations of future cash flows and of the growth of such flows. Whereas the first formulation by Williams was a personal valuation determined by personal beliefs, this is a market valuation determined by personal beliefs. Since CF and g are both investor expectations they cannot be accurately measured. In fact, no accepted methodology for measuring expectations exists and the expert, in applying this method, is left with a grab bag of possible ways to make such estimates.

The Capital Asset Pricing Model: In the CAPM model the basic estimating equation for the equity cost of capital is

$$k = r_f + \beta \times ERP$$

where r_f is the expected return on a risk free asset, β is the beta for the company, and *ERP* is the expected equity risk premium. This formulation adjusts the cost of equity for a specific firm for systematic risks in the market. Theoretically, unsystematic risk is eliminated by diversification of one's portfolio.

Systematic risk is risk that affects all stocks and typically stems from macroeconomic shocks, like changes in government borrowing or Federal Reserve activity, or from global influences, like energy price shocks. One cannot diversify against this risk, but noticeably it affects some stocks more than others. Beta measures the change in the excess yield on the stock in question as a fraction of the change in the excess yield on all equities. The excess yield is the market yield less the yield that is appropriate for the particular asset given its unsystematic risk. Low values of beta imply that the company's return is not particularly prone to systematic risk. A beta of one means the company's return on equity moves exactly with changes in returns on the market, and a beta greater than one implies this company's return is more volatile than the market. With less systematic volatility the asset is more secure (less risky) than the market as a whole and therefore requires a lower return on equity. With high systematic volatility the opposite is true. Beta is typically measured as the slope of the regression line that fits changes in the firm's equity return to changes in the market's return on a benchmark asset.

The expected equity risk premium is the amount by which investors expect the future return on equities to exceed the return on a risk-free asset. *ERP* is typically measured by the average annual difference in the equity market return for some benchmark portfolio and the risk free asset as calculated over some period.

To apply this formula one must first know the company's beta. This is difficult to ascertain and any estimate is subject to huge error. The vast majority of the regression models that estimate beta explain less than 30 percent of the variation in an asset's yield and the estimated betas are often not significantly different than zero. This means that when one applies the beta to determine *k* in the model, more than two-thirds of what actually determines variations in the equity yield is missing from the model and, further, that the user cannot say with any meaningful level of confidence that there is *any* equity premium to be applied for the firm in question. The problem is compounded by the fact that there is a different beta estimate for every historical set of data and for every benchmark portfolio (market proxy), and because of anomalies in the empirical results, a host of corrections that can, or cannot, be applied.

The following is a list of betas, all applying one or another of a host of adjustments:

- Blume adjusted beta
- Betas for different market proxies
- Levered beta
- Unlevered beta
- Full information beta
- Sum beta
- Vasicek adjusted beta

In addition to betas of each type, these betas differ depending on the time period over which data for the application is chosen. Because the regression fit is so poor these betas can change drastically from one period to the next. Finally, there is a host of commercial sources for beta, including Bloomberg, Compustat, Ibbotson, and Value Line. Exhibit No. ___ (PKP-2), Appendix B shows beta estimates for the same company provided by different companies at the same time and estimates of beta by the same estimator over time.

The second step in the CAPM estimation is to estimate *ERP*, the expected equity risk premium. This is usually the average annual return on some benchmark portfolio, like the S&P500, minus the average annual return on the risk-free asset calculated over an historic period. There are two measures of the average annual return, the geometric average and the arithmetic average. Apparently there is some confusion about which is appropriate. The appropriate measure for the average yield over an historical period is the geometric average.[2] Nonetheless, failing to understand this allows the expert to choose among alternatives.

A second consideration is the time period chosen for analysis. Ibbotson Associates publishes its Valuation Edition each year that contains annual data from 1926. To make high estimates one might use the last 15 years beginning with 1991. To make low estimates one might use the last five years beginning with 2001. It is traditional to use a longer data set. Using all the data avoids the perception of choosing a special data set, but includes the unusual periods of the Great Depression and World War II. Using the past 50 years might be more appropriate, although any differences that work to the perceived advantage of the expert should raise suspicions of bias.

Q: Are there other models that might be used?

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[2] See Appendix C for a discussion of the appropriateness of the geometric mean.

A: Yes. The buildup model is a simple additive model. It breaks the cost of equity into component parts, estimates each of these parts and sums them. A depiction of the model is:

	Risk-free rate
+	Equity risk premium
+	Firm size premium
+	Industry premium
=	Cost of equity

The risk-free rate and the equity rate premium are as discussed above. The firm size premium typically is measured as the long-term return on common equity stocks for firms of a given size minus the same period return for large firms. Size classifications range from micro-capitalization (capitalization less than about $200 million) to large capitalization firms (capitalization more than $5.0 billion). Large-cap firms are defined either as the S&P500, or as firms in the highest 20% of capitalization (NYSE1-2). As PEF is a large-cap stock, size adjustments are not needed.

The industry premium reflects the difference in the return on equities for firms in different industries. For utilities the industry risk premium is negative reflecting the fact that investments in utilities are less risky than investments in other assets. Appraisers typically make qualitative judgments about an industry and adjust their cost of equity accordingly. Because the estimate of the industry premium is subjective, it should be carefully evaluated. Ibbotson Associates attempt to calculate industry premia in an objective way. However, their calculation relies on an estimate of beta and therefore suffers from a lack of precision. For SIC classification 49: Electric, Gas, and Sanitary Services the industry premia calculated through the end of 2001 is –6.92.[3] This is

[3] Ibbotson Associates, *Stocks, Bonds, Bills, and Inflation: Valuation Yearbook 2003, p. 46.*

probably too great, as its use would eliminate most of the equity risk premia. It does, however, indicate that on average the utilities need not pay as high a return on equity as other industries to attract capital.

While each component of the buildup model is subject to measurement error and manipulation, one advantage is that the errors created in this way are only added together. That is, total distortion is the sum of the distorted parts. In the CAPM and DCF models, where component parts are multiplied, errors in each measure are compounded. A second advantage is the transparency of the model, it is easy to understand and therefore more difficult to manipulate. A very simple version of the buildup model provides a reality check on the estimates from the other models.

Q: Please describe how you use the buildup model as a reality check.

A: Before any expert witness testimony is introduced and considered by the Public Service Commission in a rate case it should be vetted for obvious distortion. That is, there should be a sort of smell test. Testimony that challenges the olfactory glands should be ignored. In this case there are obvious upper and lower bounds to what is a fair rate of return on equity and testimony that falls outside these bounds can safely be ignored. To establish such boundaries we must rely only on easily observed data points that were created, without bias, and independent of this procedure and use transparent modeling so that the data and the application can be easily scrutinized.

I consider the following observations to be unbiased and their origin to be independent of this procedure:

1. As far as we are concerned, the future is unknown. The best we can do is make informed guesses about what will be.
2. To be attractive to investors, expected yields on equity must be greater than the observed yield on secure assets. Furthermore, to attract equity capital to any given company, the expected yield on equity must be greater than the existing bond yield for the firm.
3. As of July 1, 2005 the six-month U.S. Treasury Bond yield is 3.37 percent.[4]
4. As of July 1, 2005 Progress Energy sold short-term bonds (eight months to maturity) with an annual yield of 4.002 percent[5] and 30-year A-rated utility bonds were selling that yield 5.0 percent.[6]
5. Companies that are perceived as less risky attract equity investors with lower equity yields than companies that are perceived as more risky.
6. Because of their size (and the attendant longevity), large companies are perceived as less risky than smaller companies and, therefore, can attract equity investors with a lower expected return.
7. Regulated utilities are perceived as less risky than proprietary firms.
8. Progress Energy Florida is a large, regulated utility.

These observations describe the world at the time of observation. Predictions about the future require some method and presumably are based on experience. Exhibit No. ___ (PKP-4), Appendix D presents historic observations on the yields of various assets as presented in Ibbotson Associates, *Stocks, Bonds, Bills, and Inflation: Valuation Yearbook 2004*. I believe every expert in this proceeding uses this data and I submit it as

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[4] This quote was from SmartMoney.com as of 5:00 p.m. EST.
[5] This observation was provided by InvestinginBonds.com
[6] Quote from PiperJaffray online.

unbiased data set. Table D1 presents the annual yield on large capitalized firms and U.S. Treasury Bills for the past 50 years. I chose 50 years (rather than the more extended data set beginning in 1926 from which this data was drawn) to avoid distortions caused by the extraordinary events of the Great Depression and World War II. Summary data from the series beginning in 1926 are also presented.

For the past 50 years large–cap stocks have generated an average annual yield of 10.94 percent. Over the same period short-term U.S. Treasury bills generated an average annual return of 5.28 percent. The average return annual return on large-cap stocks for the past 50 years has averaged 5.66 percentage points more than the average yield on short-term U.S. Treasury bills. For the 79-year period this premium averaged 6.70 percentage points. Including the period of the Great Depression and WWII in the data accounts for the increase in the calculated equity risk premium. Including the devastating stock consequences of the Great Depression lowers the equity return by 0.5 percentage points. The big effect is on the average return on Treasury bills. From 1931 to 1955 the average Treasury bills returned only 0.6%. Such extraordinary times have never been repeated.

We can use the buildup method to create a reality check with only one assumption. Namely, that the premium equity investors demand before they will invest in large-cap stocks is equal to the average premium for the past 50 years. That is, on July 1, 2005 a typical large-cap firm could sell equity if consumers expected the asset to yield

	3.37%	The July 1, 2005 six-month U.S. Treasury bond yield.
+	5.66%	The historical equity risk premia for large-cap stocks.
=	9.03%	

If equity investors require the higher annual equity premia for the 79-year data set, a prospective equity investor would require a yield of 10.07% to induce him or her to invest. Any estimate of the fair rate of return on investment for PEF that exceeds 9.03% begins to smell. Any estimate greater than 10.07% should be rejected out of hand as being totally unreasonable.

Finally, there is also a lower bound on the equity cost of capital given by the yield on Progress Energy's short-term bond issues. No estimate of the cost of equity capital below 4.0 percent or above 10.0% should be given much credence.

Q: Is there any way to corroborate this?

A: Yes. Economics tells us that the value of an asset is the discounted present value of the stream of income it provides. If investors expect to earn a stream of $\$Y$ per year from an investment that extend indefinitely into the future and can earn a return of r from the stock market with the same level of risk, that asset's present value or worth is

$$PV = \frac{\$Y}{r}.$$

For a regulated utility the stream of annual equity earnings is the allowed return on equity times the rate base:

$$\$Y = r_r RB$$

Substituting for $Y and rearranging terms this gives us a simple test. Note that

$$\frac{PV}{RB} = \frac{r_r}{r}.$$

That is, the market value of the regulated firm relative to its rate base is equal to the regulated return on equity relative to the required return on equity.

Compustat publishes market value to book ratios for all publicly traded companies. For the parent company, Progress Energy, this value is $PV/RB = 1.37$. If this value holds for PEF it means the present regulated return on equity is 37 percent higher than that needed to reward equity investors for their contributions to the historic cost of the firm. The present regulated return of 12.0% should be reduced to 8.8%.

There is other evidence that support this conclusion. In 1992 the yield on 10-year Treasury securities averaged 7.01 percent. In 2005 these same securities had an average yield of 4.23 percent.[7] The yield on the risk-free asset that forms the basis of Dr. Vander Weide's CAPM analysis has fallen 278 basis points. Adjusting the regulated rate of 12.0 percent for this decrease to be consistent with past findings by the Commission yields a rate of 9.22 percent. Finally, The Social Security Administration has determined that a real interest yield of 7.0 percent on stock market investments should be used to analyze proposals to privatize Social Security. Consensus forecasts of inflation conducted by the Bureau of Economic Research of the Federal Reserve Bank of Philadelphia during the second quarter of 2005 put expected inflation at 2.5 percent.[8] This yields a return on all stocks of 9.5 percent. Those who argue against privatizing Social Security say this is too high.

Q: You present 10 percent as an upper bound. Why is that?

A: The 10 percent upper bound is what equity investors who recall the 1930s and 1940s and give these times equal weight in their assessment of an equity risk premium would require to make investments in large-cap stocks. Investors who discount the 1930s

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[7] Published by the U.S. Federal Reserve System at http://www.federalreserve.gov/releases/h15/data/b/tcm10y.txt

[8] www.phil.frb.org/files/spf/survq205.html

and 1940s would require less. In addition, this is a publicly regulated utility with considerably less risk than the typical large-cap stock.

Q: Are there other adjustments that should be applied to the reality check model?

A: The fundamental thing we want to do with the reality check model is rule out bad estimates. This is purposefully done in a simple and understandable way so there can be no slight of hand. Adjustments defeat this purpose.

However, if past flotation costs have not been recovered and it is determined that the appropriate way to recover them is through an adjustment to the equity rate of return, some adjustment must be made. In addition, while I hesitate to make a utility industry adjustment I have considered it when I state that 10% is the upper bound for the cost of capital.

Q: What adjustment would be appropriate for a utility?

A: Exhibit No. ___ (PKP-5), Appendix E presents a discussion of company-specific risk of a regulated utility and evidence of the historical treatment of investments in utilities relative to the benchmark S&P500. In general, a regulated utility, and PEF in particular, faces little of the risk that proprietary firms face. First, most of the highly volatile cost changes that equity owners in proprietary firms must absorb are estimated by the Commission and immediately passed through to consumers. Any shortfall is made up with interest. Because the demand for electricity is inelastic, this pass through has little effect on sales and therefore insulates investors. In competitive markets, rising fuel prices, the cost of government mandates, and weather related costs that affect one firm could not be passed along to consumers in the form of higher prices, putting investors at greater risk than if they had invested in a utility.

Second, private firms face risk from demand fluctuations that stem from two sources: changes in the demand for the product of the firm and changes in the market share of competitors. The demand for electricity is little affected by time (except that individual demand is steadily growing) and utilities have a guaranteed market. While there may be some adjustment in demand by industrial customers or in states where there is a declining population base, PEF benefits from a steadily increasing customer base of predominately residential consumers.

Finally, Florida utilities face little financial risk. Rate relief can immediately address equity returns that fall below the lower bound of the accepted range, even if the source of the poor performance is the utility's mistake. When interest rates in the economy are rising, regulators raise rates and allow the utility to earn higher returns. When interest rates are falling, as they have over the past decade, the utility returns above average yields.

Historically, investors in utilities have been content with a return on equity that is 65 to 120 basis points less than the return on the S&P500.

Q: What adjustment is appropriate for flotation costs?

A: Flotation costs may be expensed, added to rate base, or paid for by increasing the required return on equity. We know that past flotation has not been included in rate base. If flotation costs have been expensed or included in rate base no adjustment to the cost of capital should be made. If flotation costs have not been recovered by one of these methods, the appropriate adjustment requires knowing how large these costs are. Estimating flotation cost is a simple accounting procedure and should be presented by PEF. Without knowing what these costs were and how they were accounted for when they were incurred, no adjustment can be made. Present investors are content with the adjustment for flotation as it has been handled historically. Without further evidence we must conclude that past flotation costs have been recovered.

Q: Dr. Vander Weide opines that PEF needs a return on equity of 12.3 percent. How do you reconcile his recommendation with your reality check model?

A: As I mentioned, the estimates forthcoming from the models used are highly responsive to their parameters and there is a great deal of latitude in the selection and estimation process that provide these parameters. Therefore, estimates outside the bounds dictated by common sense are possible if there is significant error or purposeful manipulation. At every step in his analyses Dr. Vander Weide selects parameters, or estimates parameters from chosen data sets, that favor a high estimate of the cost of capital relative to a more prudent choice. The accumulation of these errors amounts to a greatly exaggerated cost of capital.

Q: Please give examples of assumptions employed by Dr. Vander Weide that favor a high estimate of the cost of capital.

A: First, consider Dr. Vander Weide's choice to use a group of proxy companies. He selects "all of the companies in Value Line's group of electric companies that: (1) paid dividends during every quarter of the last two years: (2) did not decrease dividends during any quarter of the past two years; (3) had at least analysts included in the I/B/E/S mean growth forecast; (4) have an investment grade bond rating and a Value Line Safety Rank of 1, 2, or 3; and (5) have not announced a merger."[9]

This is obviously a selected, not random, sample that skews Dr. Vander Weide's results. Recall that the DCF model estimates the cost of capital by the formula $k = \frac{CF_1}{PV} + g$ where $CF_1 = CF(1+g)$. Here g is the growth rate of earnings. It enters the equation twice: once directly as an additive component of the cost of capital and again multiplicatively to determine expected future cash flows based on today's observed cash flow. Obviously, the larger is g the larger is the estimate of the cost of capital. By eliminating companies that decreased dividends even once in the past two years this proxy group will greatly overstate the expected growth rate of earnings for the electric utility industry. Further, because the growth rate enters this equation twice (once additively and once multiplicatively), this assumption significantly biases the result. For a company with a dividend yield of five percent, each 100 basis point increase in the assumed growth rate increases the estimated cost of equity by 105 basis points.

Q: Is there evidence that this proxy group overstates the growth rate that would apply to Progress Energy?

A: Value Line's summary of Progress Energy, authored by Arthur H. Medalie on June 3, 2005 states in bold print, "We look for no earnings gain in 2005."

[9] Direct Testimony of James H. Vander Weide, p. 35.

Q: Does the proxy group affect other models Dr. Vander Weide uses?

A: Yes. In Dr. Vander Weide's application of the CAPM model beta is estimated as the average beta for the proxy group. This value is 0.81. This is significantly higher than the beta for all utilities. In fact, Compustat gives a beta for Progress Energy, Inc. of 0.16. If this is the true beta, Dr. Vander Weide attributes an additional 65 percent of the equity risk premium to PEF than is appropriate. When applied to his assumed risk premium of 7.45 percent, this overstates the true cost of capital by 484 basis points.

Q: Are there other examples of assumptions employed by Dr. Vander Weide that favor a high estimate of the cost of capital?

A: Yes, most of them do. First, the use of arithmetic means to estimate the risk premium rather than the geometric mean adds 200 basis points to the risk premium. Employing his beta of 0.81 this adds 162 basis points to his estimate of the cost of equity. (See Exhibit No. ___ (PKP-3), Appendix C for the proper derivation of the risk premium.) Second, Dr. Vander Weide assumes the risk-free rate is the Blue Chip Forecasted Long-term Treasury bond yield of 5.70%. You can get a home mortgage today for less than that. Presently 10-year Treasury bonds yield 4.09 percent. This assumption increases the estimated cost of capital by 160 basis points. In other applications, Dr. Vander Weide uses an A-rated utility bond yield of 6.94 percent. Currently A-rated utility bonds yield only 5.0 percent, thus adding 194 basis points.

Q: Are there other assumptions made by Dr. Vander Weide that tend to overstate the cost of equity for PEF?

A: Yes. Dr. Vander Weide implicitly assumes that the *projected yields* of his proxy group of utilities are the appropriate basis for the calculation of the *regulated yield* permitted for PEF. However, most utilities earn a return on investment in the upper half of the permitted range, particularly since interests rates have fallen during the past decade. Consider PEF's performance over the past decade presented below.

Progress Energy Florida: Return on Equity

Year	Authorized Return on Equity	Allowed Range of Return on Equity	Realized Return on Equity
1995	12.0%	11% - 13%	12.53%
1996	12.0%	11% - 13%	12.30%
1997	12.0%	11% - 13%	6.50%
1998	12.0%	11% - 13%	12.33%
1999	12.0%	11% - 13%	12.37%
2000	12.0%	11% - 13%	12.74%
2001	12.0%	11% - 13%	13.09%
2002	12.0%	11% - 13%	14.64%
2003	12.0%	11% - 13%	13.43%
2004	12.0%	11% - 13%	13.48%
Geometric Average	12.0%	11% - 13%	12.32%

With the exception of 1997, which involved a major rate case settlement, PEF consistently earns a return on equity greater than the FPSC authorized return. Since utility firms like PEF consistently earn return above the target yield, using their market yields to estimate the target will continuously increase the target yield when the market does not warrant it. Dr. Vander Weide should have used the *regulated yield* on his proxy utilities to account for this phenomenon.

In addition, Dr. Vander Weide includes a return to cover flotation without verifying that any flotation costs were incurred or that what was incurred has not been covered, and fails to adjust any model for the industry premium enjoyed by regulated utilities.

Q: Turning to Dr. Cicchetti's report. He supports Dr. Vander Weide's analysis that the cost of equity to PEF is 12.3 percent. Is this added support?

A: Dr. Cicchetti does not perform any analysis to confirm Dr. Vander Weide's results.

Q: Dr. Cicchetti opines that the superior performance of PEF has saved ratepayers $125 million. Can this be verified?

A: No. In fact, saving of more than this should have been realized by simply repurchasing outstanding debt. Since 1993 utility bond rates have fallen by 300 basis points. Applied to PEF's debt of approximately $10 billion this amounts to an annual saving of $300 million. Dr. Cicchetti's "proprietary model" and his reported findings are not open to scrutiny.

Q: Dr. Cicchetti suggests a 50 basis point addition to the return on equity put forth by Dr. Vander Weide as an incentive to PEF to continue "adding to its good work since the last rate case" and providing a "win/win for customers and shareholders." What do you think of this?

A: Notwithstanding the fact that there is no evidence of superior performance worthy of reward, a bonus for past performance has little incentive effect. The present Commission has only one member that was also a member of the previous Commission that established the present allowed return on equity. To be an effective incentive there has to be some reason for PEF to assume that a future Commission composed of new members would reward exemplary behavior between now and then. A bonus given like this is a win for shareholders made at the expense of customers.

Q: Shouldn't PEF be rewarded for efforts to cut costs?

A: Cutting cost is the reward. Any cost saving goes to shareholders until such time as the Commission reduces rates. This is precisely how it is supposed to be. The decisions of the Commission are designed to mimic what happens in competitive markets. In a competitive market a company that successfully innovates realizes increased profits in the short run. Over time competitors adopt the same innovations and the force of competition lowers prices and eliminates the short-run increase in profits. To perpetuate the increase in profits is to ignore the process of competition.

Q: Will customers benefit from this reward?

A: Not likely. Dr. Cicchetti's quote is "PEF proposes to reduce its current ROE to 12.8%, which would inure to the ratepayer's benefit." (Direct Testimony of Charles J. Cicchetti, Ph.D., p. 10). This is hard to imagine. At present the target ROE is 12 percent with a permitted range of 11 to 13 percent. PEF has earned in excess of 13 percent each of the last four years. Raising the ceiling 80 basis points can hardly inure to the benefit of customers. PEF has already reaped the rewards of falling interest rates and any cost saving for which PEF might be responsible. In a competitive environment these savings would result in lower rates and truly inure to the ratepayer's benefit.

Q: Does this conclude your testimony?
A: Yes it does.

APPENDIX A: VITA
Philip K. Porter

PRESENT POSITION

Professor of Economics, University of South Florida
Director, Center for Economic Policy Analysis

EDUCATION

B.S., Economics, Auburn University, Dec. 1973
M.S., Economics, Auburn University, Mar. 1976
Ph.D., Economics, Texas A&M University, Aug. 1978

PUBLICATIONS IN REFEREED JOURNALS

"Political Equilibrium and the Provision of Public Goods," with John Goodman, Public Choice, Vol. 120, Nos. 3-4: (September 2004), pp. 247-266.

"Is the Criminal Justice System Just?" with J. Goodman, International Review of Law and Economics, Volume 22, Issue 1, (July 2002), pp. 25-39.

"Public and Private Employment over the Business Cycle: A Ratchet Theory of Government Growth," with D. Bellante, Journal of Labor Research, Vol. XIX, No. 4 (Fall 1998), pp. 613-28.

"The Distribution of Earnings and the Rules of the Game," with G. W. Scully, Southern Economic Journal, Vol. 63, No. 1 (July 1996), pp. 149-62.

"Institutional Technology and Economic Growth," with G. W. Scully, Public Choice, Vol. 82, Nos. 1-2, (January 1995), pp. 17-36.

"Agency Costs, Property Rights, and the Evolution of Labor Unions," with D. Bellante, Journal of Labor Research, Vol. 13, No. 3 (Summer 1992), pp. 243-56.

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"The Value of Private Property in Education: Innovation, Production and Employment," with M. L. Davis, Harvard Journal of Law and Public Policy, Vol. 14, No. 2 (Spring 1991), pp. 397-426.

"The Productive Efficiency of U.S. Milk Processing Cooperatives," with G. Ferrier, Journal of Agricultural Economics, Vol. 42, No. 2 (May 1991), pp. 161-73.

"The Reserve Clause in Professional Sports: Legality and Effect on Competitive Balance," with A. Balfour, Labor Law Journal, Vol. 42, No. 1 (January 1991), pp. 8-18.

"A Subjectivist Economic Analysis of Government-Mandated Employee Benefits," with D. Bellante, Harvard Journal of Law and Public Policy, Vol. 13, No. 2 (Spring 1990), pp. 657-686.

"A Test for Pure or Apparent Ideology in Congressional Voting," with M. L. Davis, Public Choice, Vol. 60, No. 2 (February 1989), pp. 101-112.

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"Industrial Policy and the Nature of the Firm," with G. W. Scully and D. Slottje, Zeitschrift fur die gesamte Staatswissenschaft (Journal of Institutional and Theoretical Economics), Vol. 142, No. 1 (March 1986), pp. 79-100.

"A Comprehensive Analysis of Inequality in the Size Distribution of Income for the United States 1952-1981, with D. Slottje, Southern Economic Journal, Vol. 52, No. 2 (October 1985), pp. 412-21.

"Political Economy: Misrepresentation in Washington," with M. L. Greenhut, Review of Regional Economics and Business (October, 1985), pp. 3-9.

"Majority Voting and Pareto Optimality," with J. Goodman, Public Choice, Vol. 46, No. 2 (1985), pp. 173-86.

"Potential Earnings, Post Schooling Investment, and Returns to Human Capital," with G. W. Scully, Economics of Education Review, Vol. 4, No. 2, (1984), p 87-92.

"Measuring Managerial Efficiency: The Case of Baseball," with G. W. Scully, Southern Economic Journal (January 1982), pp. 642-50. Reprinted in Sportometrics, edited by B. L. Goff and R. D. Tollison, Texas A&M University Press, 1990.

"Factor Usage by Consumer-Managed Firms," with S. C. Maurice and R. K. Anderson, Southern Economic Journal, Vol. 47, No. 2 (October 1980), pp. 552-530.

"The Economics of Consumer-Managed Firms," with S. C. Maurice and R. K. Anderson, Southern Economic Journal, Vol. 46, No. 1 (July 1979), pp. 119-30.

PUBLICATIONS IN BOOKS AND PROCEEDINGS

"Mega-Sporting Events as Municipal Investments: A critique of Impact Analysis," in Sports Economics: Current Research, Praeger Publishers, 1999. Reprinted in The Economics of Sport, Edited by A. Zimbalist, The International Library of Critical Writings in Economics, 2001.

"The Political Economy of Privatization," in Restructuring State and Local Services: Ideas, Proposals, and Experiments, edited by A. H. Raphaelson, Westport, CT: Praeger Publishers, 1998.

"The Role of the Fan in Professional Baseball: Attendance and Competitive Balance," in Diamonds Are Forever: The Proceedings of the Thirteenth Annual Middlebury Conference on Economic Issues, Washington: The Brookings Institution (1992), pp. 63-76.

WORK IN PROCESS

"Asymmetric Information in Labor Markets," with B. Kamp
"Vote Production Functions and the Problem of Cycling," with J. Goodman
"Two Part Pricing in Sports: Private and Public Market Effects," with C. Thomas

EXTERNAL GRANTS

"Cooperative Efficiency: An Empirical Analysis," conducted for the United States Department of Agriculture, Bureau of Cooperative Services under Grant DOA #58-319U-9-0324X.

RECENT PROFESSIONAL SERVICE

Board of Editors Journal of Sports Management
Associate Editor: Advances in the Economics of Sport.
Senior Fellow: National Center for Policy Analysis, Dallas, TX and Washington, D.C.
Senior Fellow: Heartland Institute, Chicago Illinois.

AWARDS

Duncan Black Award for the Best Article in Public Choice, 1988.
Annual Research Award, University of South Florida, 1985-86.
Outstanding Professor, Southern Methodist University, 1979.
Outstanding Professor, University of South Florida, 1991.

REFEREE SERVICE

Journal of Sports Management , Journal of Sports Economics, Journal of Political Economy, Economic Inquiry, Southern Economic Journal, Canadian Journal of Agricultural Economics, Social Science Quarterly, Economics of Education Review, Journal of Public Economics, Journal of Labor Research, Journal of Money, Credit, and Banking, National Science Foundation, Heartland Institute.

BOOK REVIEWS

TVA: Fifty Years of Grass-roots Bureaucracy, E. C. Hargrove and P. K. Conkin, ed.; Southern Economic Journal: January 1985

Technological Progress and Industrial Leadership, B. Gold, et al; Southern Economic Journal: July 1985

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Privatization and Economic Efficiency, A. F. Ott and K. Hartley, ed.; Southern Economic Journal: January 1994

Taking Property and Just Compensation, Nicholas Mercuro, ed.; Southern Economic Journal: October 1994

Full House: The Spread of Excellence from Plato to Darwin, Organization and Environment, 2000.

Gangs of America: the Rise of Corporate Power and the Disabling of Democracy, Ted Nance, The Academy of Management Review, October 2004.

MEMBERSHIPS

American Economic Association, Southern Economic Association, Public Choice Society, Omicron Delta Epsilon, Beta Gamma Sigma.

APPENDIX B: VARIATIONS IN BETA

Table B1: Estimates of Beta for Bristol Meyers Squibb Co. by Different Estimators[1]

Commercial Source	Market Proxy	Time Period	Estimated Beta
Bloomberg	S&P 500	5 years	0.62
Compustat	S&P 500	5 years	0.50
Ibbotson	S&P 500	5 years	.050
Value Line	NYSE Composite Series	5 years	1.05

With a perfectly straight face and a reference to back him up an expert could attribute as little as 50 percent of the equity premium to Bristol Meyers or as much as 105 percent.

Table B2: Estimates of Beta for Telecommunications Companies Over Time by the Same Estimator[2]

	Estimate of the Two-year Beta for the Period Ending:				
Company	1992	1993	1994	1995	1996
Alliant Communications	0.76	0.89	0.98	0.73	043
Ameritech	0.71	0.75	0.91	1.05	1.26
Bell Atlantic	0.83	0.92	0.92	1.01	1.17
BellSouth Corp.	0.76	0.84	0.78	0.88	1.21
Frontier Corp.	0.62	0.77	0.94	1.03	0.66
GTE	0.75	0.67	0.67	0.78	1.08

By choosing the year an application of the CAPM model to BellSouth Corp. could attribute as little as 76 percent of the equity premium or as much as 121 percent.

[1] Ibbotson Associates, *Stocks, Bonds, Bills, and Inflation: Valuation Yearbook 2003*, p. 115.
[2] Ibbotson Associates, *Stocks, Bonds, Bills, and Inflation: Valuation Yearbook 2002*, p.95

APPENDIX C: USING GEOMETRIC VERSUS THE ARITHMETIC MEAN TO ESTIMATE THE COST OF EQUITY CAPITAL

When calculating returns from historical data, the arithmetic means overstates the average return. Consider a simple example from history. In 1974 large-cap stocks lost 26.5% of their value but in 1975 the value of these same assets rose 37.2%. Arithmetically, this appears to be a reasonable gain. The two-year average return measured arithmetically is

$$\frac{-26.5\% + 37.2\%}{2} = 5.35\%.$$

Were this the true measure of the return an investment of $100 in large-cap stocks at the beginning of 1974 would be worth $\$100(1.0535)^2 = \$110.99$ at the end of 1975.

But this is not what investors realized in 1974 and 1975. If you had invested $100 at the beginning of 1974 your portfolio, after a 26.5% loss, would have a value of only $73.50 [100(1 - .265)] at the beginning of 1975. Following a 37.2% gain in 1975 your portfolio would be worth $100.84 [73.5(1 + .3720]. In this example the investor lost $26.50 in 1974 and gained $27.34 in 1975. At the end of two years the 1974 portfolio of large-cap stocks gained only $.84 not $10.99. To understand why this happens, note that the base has changed. The loss of $26.50 is used to calculate the percentage loss from a large initial base ($100) while the nearly identical gain of $27.34 is used to calculate the percentage gain from a much smaller base. Hence the gain in percentage terms is larger than the loss.

The geometric mean is $[(1-.265)(1+.372)]^{1/2}-1=.0042$ or 0.42%. A $100 portfolio compounded annually at this return for two years is worth $\$100(1.0042)^2$ = $100.84. The arithmetic mean is appropriate when values are added together to get a total. The geometric mean is appropriate when values are multiplied together to get a product. In this proceeding geometric means should be used to measure past returns where the gains and losses compound.

We wish to know how investors form expectations about future yields. For investors to form expectations based on the arithmetic mean they would have to buy their investments on the first of each year, liquidate them at the end of each year, and record the annual rate of return. Then, after a number of years ignore the value of their portfolio and simply add the recorded annual returns and divide by the number of years. Imagine the investor in 1974-75 trying to convince himself that he had earned more than five percent per year. If scholars used the arithmetic average to measure yields, large-cap stocks during the period 1931 to 1940 would appear to have returned 6.9%. Sophisticated investors do not form their expectations this way.

Even those who report arithmetic means don't use them when calculating historic returns. Within a year investment services report quarterly returns, monthly returns, weekly returns, and daily returns. An interested investor could monitor hourly returns and less. Any of these time periods might contain the information used by an investor to form an expectation about future returns. However, when annual returns on a stock or bond are reported the geometric, not the arithmetic, average of these shorter periods is used. Thus, the annual returns that are reported (and are used as the basis for market analysis) are the geometric averages of shorter period returns. Similarly, the decade-long, half-century, or longer-term geometric average yield is the true measure of return.

APPENDIX D: HISTORIC ANNUAL YIELDS

Table D1: Annual Yields 1955-2004

Year	Large Company Stocks	U.S. Treasury Bills	Annual Equity Premia		Year	Large Company Stocks	U.S. Treasury Bills	Annual Equity Premia
1955	31.56	1.57	29.99		1980	32.42	11.24	21.18
1956	6.56	2.46	4.10		1981	-4.91	14.71	-19.62
1957	-10.78	3.14	-13.92		1982	21.41	10.54	10.87
1958	43.36	1.54	41.82		1983	22.51	8.80	13.71
1959	11.96	2.95	9.01		1984	6.27	9.85	-3.58
1960	0.47	2.66	-2.19		1985	32.16	7.72	24.44
1961	26.89	2.13	24.76		1986	18.47	6.16	12.31
1962	-8.73	2.73	-11.46		1987	5.23	5.47	-0.24
1963	22.80	3.12	19.68		1988	16.81	6.35	10.46
1964	16.48	3.54	12.94		1989	31.49	8.37	23.12
1965	12.45	3.93	8.52		1990	-3.17	7.81	-10.98
1966	-10.06	4.76	-14.82		1991	30.55	5.60	24.95
1967	23.98	4.21	19.77		1992	7.67	3.51	4.16
1968	11.06	5.21	5.85		1993	9.99	2.90	7.09
1969	-8.50	6.58	-15.08		1994	1.31	3.90	-2.59
1970	4.01	6.52	-2.51		1995	37.43	5.60	31.83
1971	14.31	4.39	9.92		1996	23.07	5.21	17.86
1972	18.98	3.84	15.14		1997	33.36	5.26	28.10
1973	-14.66	6.93	-21.59		1998	28.58	4.86	23.72
1974	-26.47	8.00	-34.47		1999	21.04	4.68	16.36
1975	37.20	5.80	31.40		2000	-9.11	5.89	-15.00
1976	23.84	5.08	18.76		2001	-11.88	3.83	-15.71
1977	-7.18	5.12	-12.30		2002	-22.10	1.65	-23.75
1978	6.56	7.18	-0.62		2003	28.70	1.02	27.68
1979	18.44	10.38	8.06		2004	10.87	1.20	9.67
					Geometric Means 1955-2004	10.94	5.28	5.66

For the extended data set (1926-2004) the means and equity premium are given in Table 2.

Table D2: Average Annual Yields 1926-2004

	Large Company Stocks	U.S. Treasury Bills	Annual Equity Premia
Geometric Mean 1926-2004	10.4	3.7	6.7

APPENDIX E: RISK ANALYSIS OF PROGRESS ENERGY FLORIDA

There is substantial evidence that large-cap utilities are less risky than other large-cap stocks, and that Progress Energy Florida is less risky than other utilities.

Industry Risk Premia

Compare the historical returns from investments in the S&P500 and the S&P Utility Stock Index. Table E1 presents historical return on these two asset and was taken from the Direct Testimony of James H. Vander Weide, Ph.D. (Exhibits JVW-5 and JVW-6). For the historical period 1950 through 2004 the average return on the S&P500 was 10.72 percent while that on the S&P Utility Index was 10.07 percent. For the longer period 1937-2004 used by Dr. Vander Weide the average return on the S&P500 was 10.40 percent while that on the S&P Utility Index was 9.19 percent. This difference is called an industry premium and measures the historic difference in the returns on investments in utility stocks relative to the benchmark S&P500.

Investors consider the return on utility stocks to be less risky than all large-cap stocks and are therefore willing to accept a lower return on investments in utilities. For the past 50 years the utility industry premia has been –65 basis points. Over the longer period this premia was –121 basis points. Ibbotson Associates reports an industry premia for SIC Code 49: Electric, Gas, and Sanitary Service of –693 basis points through year-end 2001.

Business Risks for Regulated Electric Utilities

Business owners face risk from both sides of the balance sheet: changes in demand that affect revenues and changes in cost. Changes in demand stem primarily from two sources macroeconomic fluctuations that affect all business to one degree or another and competitive market influences that affect one business vis-à-vis its competitors. Electric utilities are less affected by the macro-economy than most businesses because of the inelastic demand for their product among residential consumers and the derived demand for electricity by industrial users. Table E2 presents a few demand elasticities. Residential demand elasticity for electricity use is one of the lowest for all products. Among expensive items, only other necessities like natural gas, automobiles (in the long run), and medical and legal services have such low elasticities. Industrial electric consumers have a greater response to macro-economic effects than do households. Because their power use is determined by the demand for their products, fluctuations in the final demand for their products causes changes in their electricity demand. However, the derived nature of demand implies that electric demand by industry declines only when the demand for the industry declines. That is electric utility demand is less volatile than industry demand as a whole.

Because utilities are monopolies, competitive market effects on electricity demand are practically non-existent. Only large, industrial consumers have a meaningful opportunity to shop around for alternate sources of energy. Most industrial consumers and all residential and commercial customers have no alternative sources for electricity.

The risk of increasing cost is very real for most businesses but far less so for PEF. Increases in energy costs, in the cost of meeting environmental mandates and post 9-11 security requirements, and in the extraordinary costs of storm damage are all automatically passed on to captured consumers. With low demand elasticities consumers, not shareholders, bear these costs. Contrast this with Florida's citrus industry. If burning old tires and smudge pots is outlawed by the State Environmental Protection Agency, or if labor costs rise because the state mandates a higher minimum wage, competition with Brazilian and California citrus growers does not permit the industry to pass this cost along to consumer in the form of a price increase. Equity owners in Florida's citrus industry suffer from these mandates. Similarly, when a hurricane destroys a citrus grove the owner bears the loss. At present cost recovery clauses that pass costs directly through to customers without the benefit of competition accounts for more than half of PEF revenues. The equity investor in PEF is shielded from the effects of most cost changes.

Costs for labor, including pension and health care costs, are similar for all large U.S. businesses. For the economy as a whole labor cost increases are endogenous, driven by increases in productivity. When one industry lags behind others in increasing labor productivity, labor costs rise for the industry as a whole and if demand for the industry's product is elastic, the industry will suffer. This accounts for the decline in the steel and textile industries in the U.S. but is not a problem for electric utilities.

A final source of risk for business is financial in nature. If interest returns on alternate assets increase relative to the return on investment in the regulated company, investors will sell their shares and make investments elsewhere. This capital flight reduces equity share values. If the cause of the relative decline in equity returns is poor performance by the company, this is a positive effect of the competition for investor capital. A business that performs poorly faces declining returns on equity and does not survive. When the cause of relative rate changes is outside the control of the company, this risk must be borne by investors. In a regulated utility if the return on equity falls below the target range, the utility may call for a rate hearing and the regulatory agency grant a rate increase to restore equity returns. Thus, investors in a regulated utility are free of external financial risk and the internal risk of poor performance.

The opposite should occur when increasing performance or declining interest rates improve the financial performance of the company. Equity yields that exceed the range of permissible returns induce the regulatory commission to lower rates. However, within the range of acceptable yields no action is forthcoming. This gives the regulated utility an advantage that private firms lack. Because expenditures can easily be shifted between accounting periods – for example, by altering the schedule of planned maintenance – regulatory hearings can be delayed when performance exceeds expectations and accelerated when performance falls short of expectations. Because of this, the regulated firm is expected to perform in the upper regions of the allowed return on equity much more often than in the lower regions. The following schedule presents the return on equity for PEF for the past 10 years.

Progress Energy Florida: Return on Equity

Year	Authorized Return on Equity	Allowed Range of Return on Equity	Realized Return on Equity
1995	12.0%	11% - 13%	12.53%
1996	12.0%	11% - 13%	12.30%
1997	12.0%	11% - 13%	6.50%
1998	12.0%	11% - 13%	12.33%
1999	12.0%	11% - 13%	12.37%
2000	12.0%	11% - 13%	12.74%
2001	12.0%	11% - 13%	13.09%
2002	12.0%	11% - 13%	14.64%
2003	12.0%	11% - 13%	13.43%
2004	12.0%	11% - 13%	13.48%

Year	Authorized Return on Equity	Allowed Range of Return on Equity	Realized Return on Equity
Geometric Average	12.0%	11% - 13%	12.32%

During 1997 there was a failure of the nuclear power plant that resulted in an excessive expenditure on fuel. Absent this unexpected event PEF would have averaged 12.99% return on equity when the permissible range was 11%-13%.

Table E1: S&P500 Stock Return vs. S&P Utility Stock Return

Year	S&P 500 Stock Price	S&P500 Stock Dividend Yield	S&P500 Stock Return	S&P Utility Stock Price	Utility Stock Dividend Yield	Utility Stock Return
2004	1,132.52	0.0161		139.79		
2003	895.84	0.0180	28.22%	114.11	0.0508	27.58%
2002	1,140.21	0.0138	-20.05%	142.14	0.0454	-15.18%
2001	1,335.63	0.0116	-13.47%	307.70	0.0287	-17.90%
2000	1,425.59	0.0118	-5.13%	239.17	0.0413	32.78%
1999	1,248.77	0.0130	15.46%	253.52	0.0394	-1.72%
1998	963.35	0.0162	31.25%	228.61	0.0457	15.47%
1997	766.22	0.0195	27.68%	201.14	0.0492	18.58%
1996	614.42	0.0231	27.02%	202.57	0.0454	3.83%
1995	465.25	0.0287	34.93%	153.87	0.0584	37.49%
1994	472.99	0.0269	1.05%	168.70	0.0496	-3.83%
1993	435.23	0.0288	11.56%	159.79	0.0537	10.95%
1992	416.08	0.0290	7.50%	149.70	0.0572	12.46%
1991	325.49	0.0382	31.65%	138.38	0.0607	14.25%
1990	339.97	0.0341	-0.85%	146.04	0.0558	0.33%
1989	285.41	0.0364	22.76%	114.37	0.0699	34.68%
1988	250.48	0.0366	17.61%	106.13	0.0704	14.80%
1987	264.51	0.0317	-2.13%	120.09	0.0588	-5.74%
1986	208.19	0.0390	30.95%	92.06	0.0742	37.87%
1985	171.61	0.0451	25.83%	75.83	0.0860	30.00%
1984	166.39	0.0427	7.41%	68.50	0.0925	19.95%
1983	144.27	0.0479	20.12%	61.89	0.0948	20.16%
1982	117.28	0.0595	28.96%	51.81	0.1074	30.20%
1981	132.97	0.0480	-7.00%	52.01	0.0978	9.40%
1980	110.87	0.0541	25.34%	50.26	0.0953	13.01%

Year	S&P 500 Stock Price	S&P500 Stock Dividend Yield	S&P500 Stock Return	S&P Utility Stock Price	Utility Stock Dividend Yield	Utility Stock Return
1979	99.71	0.0533	16.52%	50.33	0.0893	8.79%
1978	90.25	0.0532	15.80%	52.40	0.0791	3.96%
1977	103.80	0.0399	-9.06%	54.01	0.0714	4.16%
1976	96.86	0.0380	10.96%	46.99	0.0776	22.70%
1975	72.56	0.0507	38.56%	38.19	0.0920	32.24%
1974	96.11	0.0364	-20.86%	48.60	0.0713	-14.29%
1973	118.40	0.0269	-16.14%	60.01	0.0556	-13.45%
1972	103.30	0.0296	17.58%	60.19	0.0542	5.12%
1971	93.49	0.0332	13.81%	63.43	0.0504	-0.07%
1970	90.31	0.0356	7.08%	55.72	0.0561	19.45%
1969	102.00	0.0306	-8.40%	68.65	0.0445	-14.38%
1968	95.04	0.0313	10.45%	68.02	0.0435	5.28%
1967	84.45	0.0351	16.05%	70.63	0.0392	0.22%
1966	93.32	0.0302	-6.48%	74.50	0.0347	-1.72%
1965	86.12	0.0299	11.35%	75.87	0.0315	1.34%
1964	76.45	0.0305	15.70%	67.26	0.0331	16.11%
1963	65.06	0.0331	20.82%	63.35	0.0330	9.47%
1962	69.07	0.0297	-2.84%	62.69	0.0320	4.25%
1961	59.72	0.0328	18.94%	52.73	0.0358	22.47%
1960	58.03	0.0327	6.18%	44.50	0.0403	22.52%
1959	55.62	0.0324	7.57%	43.96	0.0377	5.00%
1958	41.12	0.0448	39.74%	33.30	0.0487	36.88%
1957	45.43	0.0431	-5.18%	32.32	0.0487	7.90%
1956	44.15	0.0424	7.14%	31.55	0.0472	7.16%
1955	35.60	0.0438	28.40%	29.89	0.0461	10.16%
1954	25.46	0.0569	45.52%	25.51	0.0520	22.37%
1953	26.18	0.0545	2.70%	24.41	0.0511	9.62%
1952	24.19	0.0582	14.05%	22.22	0.0550	15.36%
1951	21.21	0.0634	20.39%	20.01	0.0606	17.10%
1950	16.88	0.0665	32.30%	20.20	0.0554	4.60%
1949	15.36	0.0620	16.10%	16.54	0.0570	27.83%
1948	14.83	0.0571	9.28%	16.53	0.0535	5.41%
1947	15.21	0.0449	1.99%	19.21	0.0354	-10.41%
1946	18.02	0.0356	-12.03%	21.34	0.0298	-7.00%
1945	13.49	0.0460	38.18%	13.91	0.0448	57.89%
1944	11.85	0.0495	18.79%	12.10	0.0569	20.65%
1943	10.09	0.0554	22.98%	9.22	0.0621	37.45%
1942	8.93	0.0788	20.87%	8.54	0.0940	17.36%
1941	10.55	0.0638	-8.98%	13.25	0.0717	-28.38%
1940	12.30	0.0458	-9.65%	16.97	0.0540	-16.52%
1939	12.50	0.0349	1.89%	16.05	0.0553	11.26%
1938	11.31	0.0784	18.36%	14.30	0.0730	19.54%

Year	S&P 500 Stock Price	S&P500 Stock Dividend Yield	S&P500 Stock Return	S&P Utility Stock Price	Utility Stock Dividend Yield	Utility Stock Return
1937	17.59	0.0434	-31.36%	24.34	0.0432	-36.93%
Geometric Mean 1937-2003			10.40%			9.19%
Geometric Mean 1955-2003			10.72%			10.07%

Table E2: Estimates of the Elasticity of Demand[1]

Product	Demand Elasticity
Salt	0.10
Matches	0.10
Toothpicks	0.10
Airline travel, short-run	0.10
Residential natural gas, short-run	0.10
Gasoline, short-run	0.20
Automobiles, long-run	0.20
Coffee	0.25
Residential electricity	0.39
Legal services, short-run	0.40
Tobacco products, short-run	0.45
Residential natural gas, long-run	0.50
Fish (cod) consumed at home	0.50
Physician services	0.60
Taxi, short-run	0.60
Gasoline, long-run	0.70
Movies	0.90
Shellfish, consumed at home	0.90
Tires, short-run	0.90
Oysters, consumed at home	1.10
Private education	1.10
Housing, owner occupied, long-run	1.20
Tires, long-run	1.20

[1] Source of product elasticities: Mackinac Center for Public Policy at http://www.mackinac.org. Source of electricity elasticities: Electric Power Research Institute, "Residential End-Use Energy Consumption: A Survey of Conditional Demand Estimates," Palo Alto, 1989.

Product	Demand Elasticity
Radio and television receivers	1.20
Automobiles, short-run	1.35
Restaurant meals	2.30
Airline travel, long-run	2.40
Fresh green peas	2.80
Foreign travel, long-run	4.00
Chevrolet automobiles	4.00
Fresh tomatoes	4.60

CERTIFICATE OF SERVICE

I HEREBY CERTIFY that a true and correct copy of the foregoing Direct Testimony and Exhibits of Philip K. Porter, Ph.D. has been furnished by hand delivery (*), e-mail and U.S. Mail this 13th day of July 2005 to the following:

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