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DIRECT TESTIMONY OF JEFF D. MAKHOLM, PH.D

On behalf of

Northern Illinois Gas Company

November 1, 2004

CORRECTED
Nicor Gas Exhibit 4.0

TESTIMONY OF JEFF D. MAKHOLM, PH.D

I. INTRODUCTION

Q. Please state your name, business address and current position.

A. My name is Jeff D. Makholm. I am a Senior Vice President at National Economic Research Associates, Inc. ("NERA") and Co-Chair of NERA's Energy Practice. NERA is a firm of consulting economists with its principal offices in a number of major U.S. and European cities. My business address is 200 Clarendon Street, Boston, Massachusetts, 02116.

Q. Please describe your academic background.

A. I have M.A. and Ph.D. degrees in economics from the University of Wisconsin, Madison, with a major field of Industrial Organization and a minor field of Econometrics/Public Economics. I also have B.A. and M.A. degrees in economics from the University of Wisconsin, Milwaukee. Prior to my latest full-time consulting activities, I was an Adjunct Professor in the Graduate School of Business at Northeastern University in Boston, Massachusetts, teaching courses in microeconomic theory and managerial economics.

Q. Please describe your work experience.

A. My work centers on economic issues involving pricing, regulation and market issues for the natural gas and electricity industries, among others. My consulting work includes the specific issues of competition, rate design, fair rate of return, regulatory rulemaking, incentive ratemaking, load forecasting, least-cost planning, cost measurement, contract obligations and bankruptcy. I have prepared expert testimony and statements, and I have

appeared as an expert witness in many state, federal and United States District Court proceedings, as well as in regulatory and judicial hearings abroad.

I have also directed studies on behalf of utility companies, governments and the World Bank in many countries. In these countries, I have drafted regulations, established tariffs, recommended financing options for major capital projects and advised on industry restructurings. I have also assisted in the privatization of state-owned gas utilities. As part of my international work pertaining to the gas industry, I have conducted formal training sessions for government, industry and regulatory personnel on the subjects of privatization, pricing, finance and regulation of the gas industry.

Regarding rate of return and utility financing questions specifically, I have testified for electric, natural gas, water and telecommunications utility clients before state commissions in Pennsylvania, Oregon, Ohio, North Carolina, Kansas, New Jersey, New York, Maryland, California, Virginia, Rhode Island, New Hampshire, Texas, Indiana, Maine, and Connecticut, as well as before the Federal Energy Regulatory Commission ("FERC"). My current curriculum vitae, which more fully details my educational and consulting experience, is provided as **Exhibit 4.1**.

Q. Does your testimony in this proceeding determine the fair rate of return on common equity on behalf of Nicor Gas Company ("Nicor Gas" or the "Company")?

A. Yes. This return on common equity will be used by the Company to calculate its revenue requirement for its state-regulated natural gas delivery system.

Q. Please summarize your conclusion as to the fair rate of return on equity for Nicor Gas.

A. The fair rate of return on common equity that I recommend and conclude is reasonable for Nicor Gas is **11.37 percent**, as summarized on **Exhibit 4.2** and **4.14**. My recommendation is based on a Discounted Cash Flow ("DCF") analysis of six comparable natural gas distribution utilities.

Q. How do you characterize the nature of your rate of return evidence?

A. One of the most important goals of my rate of return evidence is to minimize the amount of subjectivity in the determination the fair rate of return. I view subjectivity as the principal source of contention in the calculation of the rate of return in utilities' rate cases. This subjectivity has four sources: (1) lack of attention to detail in employing the methods provided by decades of work in the field of theoretical finance; (2) a proliferation of quantitative approaches to determining the cost of capital, under the dubious premise that the use of *more methods*—no matter how shaky the foundation for each—provides better rate of return evidence; (3) insufficient candor on the part of analysts regarding their application of objective, reproducible standards or personal judgment; and finally, (4) subjective adjustments to the results of empirical analyses.

Subjectivity creates a regulatory atmosphere in which it is very difficult, if not impossible, to resolve the contentious issues surrounding the setting of the fair rate of return. Most, if not all, other rate case issues have objective standards (*e.g.*, legal, policy, empirical) upon which to measure the value of evidence presented in rate cases. Only the process of finding the fair rate of return seems immune to measurement by such standards. I have attached, as

Exhibit 4.3, an article that discusses some of the problems associated with rate of return investigations.[1]

To avoid contention, I make every attempt to avoid injecting subjectivity into the calculation of the fair rate of return. I am very careful in my choice of models and data. I also resist performing a multitude of ROE calculations, because I conclude that this approach obscures rather than clarifies. When the use of judgment is unavoidable, I explain the basis for my judgment. Finally, I avoid making subjective "risk" adjustments that do not have a solid and empirically verifiable financial basis. Rate of return analysis suffers widely from a fog of *ad hoc* adjustments that are impossible to verify empirically or theoretically.

As a result, the standards to which I hold my evidence, as well as that of others, are: (1) clarity; (2) theoretical support; (3) empirical objectivity; (4) stability (*i.e.*, not producing widely disparate results); and (5) the ability to reproduce (*i.e.*, allowing others to readily re-compute my results). My evidence for Nicor Gas reflects my desire to hold to these five standards of evidence.

Q. Do you engage in detailed discussions of general economic trends?

A. No. I do not include much discussion of general economic trends (Central Bank policy, etc.) that some other witnesses provide. Such discussions do not inform us regarding what *investors* believe is going to happen in the future. In order to gauge investor expectations,

[1] *See* Jeff D. Makholm, "Rate of Return in a More Progressive Regulatory Rate-Setting Process, or Can We Untie the Gordian Knot?," *NERA Topics*, March 1994. This article is based on a 1993 speech I gave to the National Society of Rate of Return Analysts at their annual forum in Philadelphia.

we must look to the financial models that have become familiar in rate of return proceedings. These models all employ the markets for utility securities as the source of investors' verdicts regarding the cost of capital.

The markets for utility securities provide the only evidence on what investors require as a return on the money they invest in utilities, and the financial models that currently exist put evidence from those markets in its proper context. The utility security markets use general economic information in the most efficient way. It is neither efficient nor appropriate for me to render a verdict on the future of markets when the law requires me to try to reflect what *investors* think. My task should be to combine *investors'* verdicts on the value of utility securities and sound financial models to determine the fair rate of return in the most direct and objective way possible.

Q. How does your evidence in this case reflect your desire to pursue objective, reliable and reproducible results?

A. I pursue these goals in two main ways: (1) I use those financial models and methods that permit the greatest objectivity; and (2) I make use of comparable company groups (also known as "proxy groups") when this approach allows me to draw more reliable conclusions about investors' expectations.

Q. Please discuss how the selection of financial models and methods facilitates the greatest objectivity in finding the fair rate of return.

A. Although much time is devoted to discussions of various techniques for finding the fair rate of return, little discussion is usually devoted to determining whether these techniques are practical in the rate case setting and whether they are capable of limiting the scope for

contention in rate cases. There are two main attributes of financial models that help on both counts: (1) the models should be strictly forward-looking; and (2) the models should offer an objective way of dealing with the uncertainty that is inherent in gauging investors' future expectations.

Q. Why is a forward-looking perspective important?

A. Investors look toward the future when they demand compensation for the use of their money. Therefore, the cost of capital is a forward-looking concept. However, there are few ways to look into the future, particularly from the perspective of what *investors* expect to occur. Those strategies are generally indirect—we look at stock prices or interest rates to gauge these expectations. This indirection is precisely why the field of finance has developed models like the Discounted Cash Flow ("DCF") and Capital Asset Pricing Model ("CAPM"). Those models use the limited types of information we *can observe* to draw conclusions about *unobservable* investor expectations of the future.

A forward focus and the use of valid financial models reduce the types of information that can help determine the cost of capital. Only a limited amount of information, either observed (such as stock prices and interest rates) or produced by disinterested sources (forecasts from widely distributed financial advisory services), fits our needs in the context of the available financial models. The use of this information limits the sources of contention in rate cases, minimizing the role of subjective judgment and restricting the ability to bias the results.

If we abandon a strict forward focus we open the floodgates to a sea of information that: (1) cannot help determine today's investors' expectations; and (2) can be used selectively to

bias rate of return results. With *any* backward-looking method of determining the rate of return, we can greatly alter the results simply by changing the historical time period used in our analysis (*e.g.*, two years, five years, fifty years). Furthermore, we abandon financial theory and therefore have no guide to the proper time. Any period seems as good as any other, and we cannot resolve this matter in the context of a rate case.

Q. Why is it important to use financial theories that allow an objective way of dealing with the uncertainty involved with gauging investors' expectations?

A. Gauging investors' future expectations involves an unavoidable element of uncertainty. There is no direct and reliable way to learn today's cost of capital for the utility in question. Indirect methods use models with simplifying assumptions and require data that may not always be accurate or timely. That is, given a model's simplifying assumptions, the data used may cause us to think that investors are overly ambitious for one company and the reverse for another. The models we use should resolve this uncertainty objectively, because we have little use for a financial model that leaves us with a 250 basis point range containing the cost of capital and no way to choose within it.

This indeed is the practical criterion that separates the usefulness of the two most popular financial theories used in rate cases—the DCF and the CAPM. The DCF renders a cost of capital estimate for each company in a proxy group. Some might seem a bit high and others a bit low, but the individual company results have objective "measures of central tendency," such as means and medians. The CAPM, on the other hand, is the sum of two components: (1) a company-specific risk premium; and (2) a "risk-free" rate applicable to all companies.

One can choose from a variety of risk-free rates (*e.g.*, long-term/short-term) for which theory gives us no unambiguous guide.

Furthermore, because the same risk-free rate applies as an additive term to all companies' cost of equity estimates, no measure of central tendency results. In short, we cannot resolve the question of uncertainty surrounding short-term versus long-term rates by repeated sampling. In the end, the analyst must choose a risk-free rate that drives the results—precisely the type of choice that limits the model's objectivity and effectiveness. Indeed, this limitation is the principal reason that I avoid the CAPM as a primary ROE method.

Q. What specific issues do you address in your testimony?

A. First, I summarize my findings and discuss the meaning of the term "fair rate of return" on equity. Second, I describe the DCF method that constitutes my principal method for determining that return. Third, I present my cost of common equity recommendation for Nicor Gas' regulated natural gas delivery operations. I base my recommendation on a six-company group of natural gas distribution companies, whose levels of risk are comparable to that of Nicor Gas. Fourth, I check the reasonableness of my recommendation using a comparison of allowed returns in other jurisdictions and a CAPM analysis.

II. SUMMARY AND BACKGROUND TO THE DETERMINATION OF A FAIR RATE OF RETURN ON EQUITY

Q. Please summarize your conclusions regarding the fair rate of return on common equity for Nicor Gas' natural gas distribution operations.

A. I recommend a fair rate of return on common equity of **11.37 percent**, as summarized on **Exhibits 4.2** and **4.14**. I base my recommendation on results of a DCF analysis performed on a proxy group of U.S. gas distribution utilities that are comparable to Nicor Gas' gas distribution operations.

A. Background to the Determination of the Fair Rate of Return on Common Equity

Q. What do you mean by "fair rate of return on common equity?"

A. The essence of traditional public utility ratemaking—the "regulatory compact"—has been that utilities like Nicor Gas have been protected by franchise against certain specific and limited types of competition. In return, the utility has accepted the obligation to provide service on just and reasonable terms. The utility has also accepted the duty to reasonably anticipate the future needs of its customers and to make the investments it judges necessary in order to meet those needs as efficiently as possible. Finally, the utility has accepted that prices would be set so as to recoup operating costs plus a reasonable profit. For a public utility, reasonable profit, under the law and in the financial world, has been defined as a rate of return sufficient to attract capital.

The capital attraction—or "opportunity cost"—standard has been key in determining the fair rate of return for public utilities. When investors make their funds available to a utility, they forego the option to use those funds for another purpose (either current consumption or another investment). They also put their funds at some risk. In return for foregoing current consumption and incurring risk, utility investors require a return on their funds. This return

to investors is a cost to the utility—the "*cost of capital*." In order for the utility to compensate its investors adequately for the current consumption foregone and the risk incurred, the utility must be allowed, as a component of its rates for service, a *fair rate of return* that covers its cost of capital.

Q. Does the way you have just defined the concept of fair rate of return on equity comport with its traditional definition?

A. Yes. The United States Supreme Court established the traditional standard for a fair and reasonable return in its *Hope* decision (*Federal Power Commission et al. v. Hope Natural Gas Co.*, 320 U.S. 591 (1944)):

> …the 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 its credit and attract capital*. (Emphasis added.)

This often-quoted passage from the *Hope* decision, besides providing a legal standard for determining the fair rate of return, comports precisely with the opportunity cost standard for determining the fair rate of return that covers the utility's cost of capital.

In an earlier case, *Bluefield Waterworks & Improvement Co. v. Public Service Commission of the State of West Virginia et al.*, 262 U.S. 679, 693 (1923), the Supreme Court defined the proper rate of return as follows:

> A public utility is entitled to such rates as will permit it to earn a return on the value of the property which it employs for the convenience of the public equal to that generally being made at the same time and in the same general part of the country on investments in other business undertakings which are attended by corresponding risks and uncertainties, but it has no constitutional right to profits such as are realized or anticipated in highly profitable enterprises or speculative ventures.

Furthermore, the Supreme Court stated in *Bluefield* that establishing an insufficient return on invested capital denies shareholders the Constitutional right of due process under the Fourteenth Amendment.

> Rates, which are not sufficient to yield a reasonable return on the value of the property used at the time it is being so used to render the service, are unjust, unreasonable, and confiscatory, and their enforcement deprives the public utility company of its property, in violation of the Fourteenth Amendment.

Q. Has the traditional regulatory compact changed over time?

A. The fact that investors still require a return on their invested capital has not changed. However, in this new era, the extent to which utility operations are regulated at all has changed.

Q. Please explain.

A. Deregulation has been implemented in many industries throughout many countries in the past twenty years. The natural gas industry has not been immune to these changes.

Many states have considered how their gas industry can be restructured; a number of states have introduced retail choice. In Illinois, industrial and large commercial customers are able to select a gas supplier, with the local distribution companies ("LDC") providing delivery services under transportation-only rates. For Nicor Gas, customer choice has been permanently available to all customers since July 2002, with the incumbent LDC retaining provider-of-last resort ("POLR") responsibility. Illinois law and regulation continues to be consistent with the traditional regulatory compact insofar as it allows Nicor Gas and other gas utilities the opportunity to recover the opportunity cost of the capital devoted to regulated activities.

Q. Does the traditional concept of fair rate of return apply to all of the capital raised by the utility from investors, or just the common equity component?

A. It applies to all of the capital. This includes a company's common stock equity, preferred stock (if any), and any debt included in the capital structure.

Q. Why, then, does your testimony deal primarily with the fair rate of return on common equity?

A. My testimony focuses on the common equity return component because, among all of the aforementioned investor-provided capital, for Nicor Gas or any other utility, the cost of common equity capital is the element that is not observed directly.

In the abstract, three elements and three returns comprise the overall cost of capital. Each of these six components is needed to develop the overall fair rate of return for a utility. They are: the proportions of debt, preferred stock, and common equity in the capital structure and the individual fair returns pertaining to each.

One can directly observe the proportions of debt, preferred stock and common stock in the capital structure. One can also directly observe the fair returns on debt and preferred stock. Only the fair rate of return on common equity cannot be directly observed. The individual fair rate of return on common equity must be derived indirectly with reference to other market indicators. For this reason, I focus on the determination of the fair rate of return on common stock equity only.

Q. How are the individual fair returns or costs of capital pertaining to debt and preferred stock observed directly in a rate case?

A. Fixed payment obligations accompany both debt and preferred stock: interest on the former, preferred dividends on the latter. Calculating the dollars needed to cover interest or preferred stock dividend payments currently or over the period of time in which the rates in question for a utility will be in effect is not difficult. The *embedded* cost of debt and preferred stock proceeds directly from these calculations.

I highlight the word "embedded" because, for debt and preferred stock, all that we need in a base rate case is the embedded cost of these financial instruments (the payments to investors proceeding from existing agreements accompanying the existing bonds and preferred shares). Thus, parties in rate cases seldom significantly disagree over the embedded cost of debt and preferred stock capital. One can compare the promised interest and preferred dividend payments with the company's proceeds from the sale of those securities. The current market is irrelevant for such embedded cost calculations.

Q. Can a current (as opposed to embedded) cost of debt and preferred stock capital be observed in the market?

A. Yes. Since we know the schedule of interest and preferred stock dividends, and since we know the current market price for these financial instruments (a bond or share of preferred stock), we can observe the current (as opposed to embedded) cost of capital for both types of financing. The current cost of debt and preferred stock capital, reflecting investors' required return, is the discount rate that equates the present value of the known stream of interest (and principal) payments, or preferred dividend payments, with the observed price of those securities.

In other words, a relatively straightforward way to determine the current cost of debt and preferred stock securities is to observe the known market price and the known stream of interest and preferred dividend payments and to calculate the discount rate that equates the two. The derived discount rate is equivalent to the current cost of debt and preferred stock capital.

Q. Can we calculate the current cost of common equity capital in the same way?

A. No. An essential component to that calculation is knowledge of the (fixed) interest and preferred stock dividend payments. Dividend payments on common stock equity are not fixed, nor is their growth rate measured with certainty. They are generally expected to grow as the company in question grows. This growth rate is not observable—the growth rate is embodied in unobservable equity investor expectations regarding the future performance of the company in question. Because this growth rate is not observable, the future stream of dividend payments is not known. There is therefore no known stream of payments that may be used directly to find the discount rate equating the present value of the future stream of dividend payments with the observed common stock price.

Q. How can we estimate the cost of common equity in Nicor Gas' capital structure?

A. One way to estimate the cost of equity capital (generally the most popular method among regulatory commissions) is to determine what stream of common dividends investors expect. This determination entails observing the current dividend and engaging in the difficult task of estimating what investors expect regarding the growth in that dividend. After the growth expected by investors is estimated, the cost of common equity can be calculated by equating the present value of the estimated stream of dividend payments with

the observed common stock price. The calculated cost of capital resulting from this method is entirely dependent on the quality and dependability of the estimates of investor expectations regarding dividend growth. This type of estimation, which I shall later describe in detail as the DCF method, is the method I use to estimate the fair rate of return for Nicor Gas.

B. Estimating the Cost of Equity Capital

Q. How do you determine the fair rate of return on common equity for Nicor Gas that is consistent with the standards you described and that addresses the difficulties inherent in estimating the cost of equity capital?

A. Estimating the cost of capital involves theoretical and empirical components. I focus on both of these aspects of my cost of capital calculation.

The theoretical component relies on the standard financial literature to develop cost of capital methods that are consistent with what we know and observe about the way that financial markets work. All of the cost of capital models that appear in the financial literature result from theoretical investigations. The most important theoretical consideration when determining the cost of capital for Nicor Gas is to employ a method that provides an accurate reflection of the market for the Company's common stock.

The empirical component includes the collection of the data to be used with the theoretical cost of capital methods. The most important empirical consideration is to gather data that are: (1) consistent with the theoretical models employed; (2) timely; and (3) unbiased. It is also important that the calculations made with the empirical data be reliable and stable. In other

words, the resulting cost of capital measure should not be highly sensitive to minor or judgmental changes in the type or source of the data used.

Q. What theoretical method do you use in your evaluation of Nicor Gas' cost of capital?

A. As I mentioned in the previous section, I employ the DCF method. The DCF method makes use of the relationship between the current stock price and the expected future stream of dividends in order to calculate investors' estimated discount rate, or cost of equity. The DCF method has a long history of being used to derive the cost of equity for both regulatory and market investment purposes. It is a sound, reliable, easy-to-understand and easy-to-reproduce method for determining the fair rate of return. Furthermore, it is unique among rate of return determination methods in that the model's results become stable and reliable when it is applied to a group of similar utilities. I have attached, as **Exhibit 4.4**, an article that explains why the DCF method should continue to be the primary method used to set the fair rate of return on common equity in utility rate cases.[2]

III. THE DCF METHOD

A. A Description of the DCF Method

Q. Please describe the DCF method.

A. The DCF method is used to estimate the cost of common stock equity by determining the present value of all future income expected to be received from a share of common stock.

[2] *See* Jeff D. Makholm, "In Defense of the 'Gold Standard,'" *Public Utilities Fortnightly*, May 15, 2003, pp. 12-18.

As such, the DCF method is the common stock equity analogue to the way in which debt and preferred stock equity cost rates are calculated. With the DCF method, the cost of common stock equity is computed as the discount rate that equates a stock's current observed market value with the present value of all future expected returns from holding the common stock (*i.e.*, dividends and capital gains). The prevailing common stock price is assumed to reflect investors' expectations of the value of common stock, including future dividends and price appreciation.

The DCF methodology grew out of Professor Myron J. Gordon's work on stock valuation models, which was first published in complete form in 1962.[3] I adopt the same specification of the DCF model as was used by Commission Staff in Nicor Gas' last rate case.[4]

B. Selection of Comparable Company Group

Q. Do you use a comparable group of natural gas distribution utilities to determine the fair return on equity for Nicor Gas?

A. Yes, I do.

Q. Please explain why comparable groups of companies are useful in this context?

A. When I perform a DCF analysis to determine the fair rate of return on equity, I prefer to use data from multiple firms, even if company-specific data are available. This is because: (1) a group of companies produces a more ***reliable*** and ***objective*** estimate of the current cost of

[3] See: Myron J. Gordon, *The Investment, Financing and Valuation of the Corporation* (Homewood, IL: Richard D. Irwin Inc., 1962; reprint, Westport, CT: Greenwood Press, Publishers, 1982).

capital required by capital markets; (2) the computation of the comparable group's fair rates of return gives substance to the *Hope* decision's finding that a reference should be made to return on *investments with corresponding risks*; and (3) a specific jurisdiction's regulatory process affects investor expectations regarding the company whose fair rate of return is being set. This effect leads to the problem of "*circularity*." Circularity is particularly problematic in states where primary weight is given to the "sustainable dividend growth rate" in determining a company's fair rate of return on equity. This growth rate is a function of the proceeding that supposedly estimates this growth rate. The use of a proxy group will assuage the circularity problem.

Q. Why should circularity be a concern to the regulator?

A. Circular reasoning has long been considered a serious problem in the determination of a fair rate of return for investors. For example, the principle of "fair value" rate regulation (which dominated public utility regulation at both the state and Federal level before the 1940s) gave way to "cost-based" rate regulation in large part because of a problem of circularity. As Professor Bonbright stated: "[a]ny attempt to test the fairness of the rates by reference to a valuation of the properties is an attempt to reason in a circle, or, if you like, to put the cart before the horse."[5] After all, a valuation of the properties will be based on the present value of the cash flows that the property will provide in the future, which, of course, will depend on the rates that can be charged to customers.

(...continued)

[4] Alan S. Pregozen, CFA, Direct Testimony, *Northern Illinois Gas Company*, Docket No. 95-0219, ICC Staff Exhibit 4, Schedule 7, August 1995.

[5] J.C. Bonbright, *Principles of Public Utility Rates*, (New York: Columbia University Press, 1961), p. 164.

Whenever a commission uses a formula for determining a fair return that depends on investors' expectations of future growth, circularity arises because we know that investors' expectations depend on the return that the regulator is expected to allow. The path of supposed causation proceeds in *both directions simultaneously*, which, of course, is the source of circular reasoning. Another example of the circularity problem in the determination of the fair rate of return is the practice of using other public utilities' returns in a "comparable earnings" analysis. If the past earnings of the comparable group are low, it will likely result in a lower awarded rate of return on equity for the company under consideration. This company will, in turn, become part of another comparable group and will contribute to lower rates of return for other companies, creating a cycle from which it is difficult to escape. By the same token, there is a circularity problem inherent in using a sustainable dividend growth formula for calculating the dividend growth in a DCF analysis when the principal components of that growth (*i.e.*, the expected return and the retention ratio) are a function of the rates to be awarded. This practice is an impediment to the objective and impartial determination of a fair rate of return for a regulated utility.

Proxy group DCF calculations are far less likely to depend on the anticipated return granted in this case and, therefore, are far less likely to be susceptible to problems of circularity.

Q. What comparable companies do you employ in your DCF analysis?

A. The six-company natural gas group of comparable companies is listed on **Exhibit 4.5**. **Exhibit 4.6** summarizes the screening process that I used to select my comparable group.

Q. What criteria do you use to determine that the companies you choose are comparable to Nicor Gas?

A. I define what I conclude are the minimum number of criteria that satisfy two basic objectives. The first basic objective is to assemble a group of companies with publicly-traded stock that are representative, on average, of the business risk faced by Nicor Gas' natural gas LDC operations. The second basic objective is to assemble a group of companies with stock price and dividend payment data that could be readily applied to the quarterly DCF model I use in this proceeding. I have used this approach to select comparable companies for a number of years, most often for electric utilities.

Q. What criteria satisfy your first basic objective—that of mirroring the business risk faced by Nicor Gas' investors?

A. Nicor Gas operates a natural gas local distribution utility. Nicor Inc. ("Nicor") is the parent holding company of Nicor Gas. The type of business, in this case a regulated gas distribution utility, helps to define the business risks faced by those who invest in a natural gas LDC and is recognized by investment analysts as a pertinent factor in evaluating the risk of an equity investment.

I select those gas utility companies, which are covered by Value Line, which derive at least 80 percent of operating revenues from regulated utility operations. The average proportion of total operating revenue from regulated utility operations in 2003 for the proxy group was 91.8 percent. Nicor derived 88.3 percent of its operating revenues from regulated natural gas distribution activities. **Exhibit 4.5** provides summary information on the proxy group companies.

Q. What criteria satisfy your second basic objective—to assemble a group of companies with stock price and dividend payment data that can be readily applied to the annual DCF model?

A. I establish two additional criteria to ensure that the data collected from the assembled proxy group companies can be used reliably in a DCF analysis. *First*, I restrict the group to utilities for which no explicit concern was raised in my financial data sources regarding the ability of the company to maintain its existing dividend. Because the DCF model I employ assumes a constant long-term dividend growth rate, it is inappropriate to apply the model to companies where a dividend decrease is expected. Such an expectation will affect the price that investors are willing to pay for the stock of such a company, which will render the use of the periodic, single growth rate DCF model suspect.

Second, I exclude from the analysis any companies that are the known targets of possible takeovers or are involved in mergers. Tender offers associated with takeovers generally affect stock prices in a temporary way unrelated to the overall cost of capital and make the use of those stock prices in a DCF analysis suspect.

Using a proxy group provides a means to estimate the return that investors require for investing in Nicor Gas. Those proxy groups must be selected in a way that ensures that the companies in the proxy groups are comparable in terms of risk to Nicor Gas and have stock price and dividend payment data that meet the requirements of the standard DCF model.

Q. What is the result of applying your criteria?

A. The result of applying the four criteria is that I develop a six-company proxy group, listed on **Exhibit 4.5**. I conclude that this group has a degree of business risk that is comparable to Nicor Gas' utility operations. **Exhibit 4.6** explains the selection of the proxy groups.

Q. Would it be preferable to use different selection criteria (such as bond ratings) or to use a larger proxy group?

A. No. Bond ratings measure the default risk associated with a firm's debt securities, such as its first mortgage bonds.[6] Bond ratings do not necessarily accurately measure the firm's equity risk.

While it might be possible to begin to select a proxy group by using a group of all utilities with a certain bond rating (say, all utilities with A or better rated bonds), it would still be necessary to use a screening process to eliminate: (1) firms that are highly diversified; (2) firms that are involved in mergers; and (3) firms that cannot be used in the standard DCF model (*e.g.*, firms that have recently cut their dividend). Thus, in the end, the sort of analysis that I have used in my testimony would be necessary even if you started with a group of firms that had the same bond rating. In addition, if a comparable group included only companies with the same bond rating, the result would likely be a small group, given consolidation trends in the industry. Further, given that bond ratings measure default risk rather than equity risk, it is not at all clear that you would end up with a group that is more comparable to the risk of Nicor Gas than the groups that I have used in my testimony.

[6] Indeed, a utility's various debt securities (*e.g.*, senior mortgage bonds, subordinated debt, etc.) are likely to have slightly different bond ratings. Further, different bond rating agencies (*e.g.*, Fitch, Moody's, and S&P) will sometimes have different bond ratings for a particular utility's first mortgage (or other) bonds.

I fear that the end result after screening a group of utilities with the same bond rating would be a very small comparable group. It is generally desirable to have a fairly large comparable group, although it is also very important to have comparable groups that accurately reflect the subject utility's risks and that meet the requirements of the DCF model. It would certainly not be appropriate to simply add back companies—perhaps by re-jiggering the selection criteria—in order to obtain a larger group. My comparable group, which was selected using a methodology that I have consistently used for many years, provides the best available basis for estimating the return on equity required by investors in Nicor Gas' common equity.

A. Inputs into the DCF Calculations

Q. Please turn now to your description of the data you use to determine the fair rate of return for Nicor Gas' gas delivery service operations.

A. As I stated previously, it is important to use data that are: (1) consistent with the theoretical DCF method; (2) timely; and (3) unbiased. It is also important that the calculations made with the empirical data be reliable and stable.

The DCF analysis requires three data inputs: (1) current stock prices, P_0; (2) the current annual dividends, D_0; and (3) estimated dividend growth rates, g. I will deal with each of these DCF inputs in turn.

1. Calculation of the Stock Price, P_0

Q. What data do you use for the stock price input, P_0, in your DCF calculations?

A. I use stock prices obtained from *Yahoo! Finance*. It is my normal practice to use stock prices on the latest day consistent with the filing, which in this case was September 17, 2004, because only the latest stock prices are consistent with up-to-date investor expectations.[7] This is because the informative value (with regard to investor expectations) of yesterday's stock prices will be completely superseded by today's stock prices. This is a widely held tenet of efficient markets. If today's stock prices embody all of the expectations regarding the value of those stocks, then yesterday's prices represent "old news." Yesterday's prices, therefore, are useless as a gauge to investors' current expectations.

Q. Do you adjust the observed stock prices?

A. Yes. I perform an "ex-dividend date" adjustment on all of the stock prices to remove the known effect that the next quarterly dividend payment has on the stock price. Failing to remove this effect would make the stock price used inconsistent with the DCF formula.

This adjustment is necessary because of the assumption in all standard DCF models that the next quarterly dividend will be received one full period from the date the stock price is measured. The problem with this assumption is that the next quarterly dividend is usually closer than one full quarter from the day the stock price is observed. This affects the stock price in a known way and must be corrected in order to avoid a downward bias in the calculated result.

Q. What is the ex-dividend date and how can ignoring it bias the DCF calculations downward?

[7] I am very concerned about applying the cost of capital estimation methods that I use in a consistent manner. With regard to the stock price, for example, analysts could use selective stock price averaging to surreptitiously raise or lower a calculated result.

A. The ex-dividend date is the date on which the right to the next dividend no longer accompanies a stock. In other words, if you purchase a share of stock the day before the ex-dividend date, you will receive the next quarterly dividend paid by the Company. If you purchase that share one day later, you will not receive that dividend. Because dividends are an important part of the return to utility shareholders and in view of the relatively high payout ratios involved, the ex-dividend date is an important determinant of the stock price. Utility stock prices, like other stock prices, are observed to drop by an amount approximately equal to the quarterly dividend on the ex-dividend date.[8]

All of the DCF models that I outline in my testimony apply *only on the ex-dividend date*. In other words, all of these models assume that future dividends begin a full period hence. Failure to adjust the stock price observed at an arbitrary date to account for the ex-dividend date will bias the applicable stock price upward (by approximately the amount of the "accrued" portion of the quarterly dividend), and the resulting DCF calculation downward.

Q. Have regulators accepted the ex-dividend date adjustment?

A. Yes. For example, the New York State Public Service Commission has performed such adjustments as a regular component of its determination of the fair rate of return. When it accepted the adjustment for the first time, in a case where I participated as a rate of return witness, the Commission used the following reasoning:

[8] A discussion of the importance of the ex-dividend date appears in most financial texts. See for example: E.F. Brigham, *Financial Management Theory and Practice,* 3rd Edition, (New York: The Dryden Press, 1982), 687. Empirical evidence on this phenomenon can be found in articles written by J.A. Campbell and W. Beranek, "Stock Price Behavior On Ex-Dividend Dates," *Journal of Finance*, 10, 4, (December 1955), 425-429; D. Durand and A.M. May, "The Ex-Dividend Behavior of American Telephone and Telegraph Stock," *Journal of* (continued...)

> The Judge adopted a company proposal, to which staff agreed, which increases the yield component in the DCF calculation to account for the temporary stock price increases as quarterly dividend payment dates approach . . . [The adjustment] is designed to produce the correct yield given the DCF formula. . . . [T]he method has been sufficiently developed on this record to warrant adoption of the adjustment.[9]

Q. Should the adjustment be used in Illinois?

A. Yes. Wherever the DCF model is used, it assumes stock prices are one full period away. If the adjustment is not made, the analysis will always yield an underestimate of the fair rate of return on equity.

Q. How precisely do you make the adjustment in the stock price?

A. I traditionally make the adjustment by removing from the stock price the portion of the dividend that has already accrued. I make this adjustment to the P_0 term before performing the DCF calculations for a proxy group. In cases where I employ a single day's stock price, the adjustment is straightforward. That is, I subtract from the stock price a proportion of the last dividend payment. That proportion is the number of days since the last ex-dividend date, divided by 90 (*i.e.*, a full quarter). I make this adjustment to the P_0 term before performing the DCF calculations, as shown on **Exhibit 4.7**.

2. Calculation of the Dividend, D_1

Q. How do you measure the dividend, D_1?

(...continued)

Finance, 15, 1 (March 1960), 19-31; and E.J. Elton and M.J. Gruber, "Marginal Stockholder Tax Rates and the Clientele Effect," *Review of Economics and Statistics*, (February 1970), 68-74.

A. The DCF model requires that $D_1 = D_0*(1+g)$, where D_0 is equal to the sum of the four most recent dividend payments. Thus, my starting point is to obtain the data for D_0. I obtain the sum of the past four quarterly dividend per share payments from *Value Line Investment Survey*.[10] I use the sum of the four most recent dividend per share payments for each company in the proxy group, which is the D_0 term shown on **Exhibit 4.8**, column (e).

3. Calculation of Growth, *g*

Q. How do you estimate the dividend per share growth term, g?

A. I use three different prospective growth measures to estimate dividend growth from which I then take the simple average. The first is a measure of sustainable growth that examines Value Line projections of the separate components of dividend growth—that is, retained earnings and expected returns to book equity, as well as the possibility of issuing new shares at prices in excess of book values. The second measure is calculated using the forecasts of earnings per share published by *Value Line* in the issues listed above. The third measure uses analysts' estimates of earnings, as summarized by Zacks Investment Research ("Zacks").

Q. Please describe the first method you use to calculate growth for the companies in your comparable group.

(...continued)

[9] State of New York Public Service Commission, (The Brooklyn Union Gas Company) Opinion No. 90-29, October 17, 1990, pp. 21-22.

A. The first method is known as either the "retention growth" or "sustainable growth" method. This method produces a forward-looking, sustainable growth rate by multiplying the fraction of earnings expected to be retained by a company by the expected return on book equity. The sustainable growth method also allows for growth stemming from new issuances of stock at premiums over book value. This is a valid way of estimating future dividend growth, because future growth in the dividend can only occur if: (1) a portion of the expected equity return is reinvested instead of being paid out in the form of dividends; or (2) if new common stock is issued at prices above current book values (causing existing shares to appreciate in value).

I estimate a sustainable growth rate for each company using the following formula:

$$g = B * R + S * V$$

Where:

B	=	expected retention ratio
R	=	expected return on equity
S	=	percent new equity expected
V	=	1 - book to market ratio

This formula for estimating sustainable growth is explained in more detail in **Exhibit 4.9**. This theoretical growth measure shows that investors can expect growth through both retained earnings and the sale of new stock at a premium of book. For all the publicly traded stocks in the comparable company group, investors can currently expect both forms of

(...continued)

[10] Data for the natural gas distribution utilities were taken from *Value Line Investment Survey*, Issue 3 (September 17, 2004). Each Issue 3, updated regularly, provides data for a number of years for U.S. investor-owned natural gas distribution utilities.

growth, as the market-to-book ratio for all is above one. If the $S*V$ term is ignored in the sustainable growth calculation, the resulting formula will not accurately represent investor perceptions of growth. The results of implementing the sustainable growth formula are presented on **Exhibit 4.10**, **Exhibit 4.11**, and **Exhibit 4.12**.

Q. Is the use of forecasts in your second and third methods, which use information provided by Value Line and Zacks, advisable?

A. Yes. The practice of using forecast growth rates provides a good basis for estimating the long-term growth of the utility. Financial analysts exert considerable influence over the many investors who do not possess the resources to make their own forecasts. The accuracy of these forecasts, in the sense of whether they turn out to be correct, is not the issue as long as they reflect widely held expectations. **Exhibit 4.12** summarizes the Value Line and Zack's growth rates. **Exhibit 4.12** also provides the details of the calculation of the Value Line EPS growth rates.

Analysts' forecasts are sometimes criticized on the ground that it is very difficult to forecast growth rates accurately in the short term, let alone in the long term. However, this general objection is irrelevant to a DCF analysis because this method is based upon present investor expectations. Widely distributed forecasts influence both the current stock price and DCF cost of equity, not what the future will actually turn out to be.

Q. Are the five-year annual projected growth rates in earnings published by Value Line and Zacks reasonable indicators of long-term growth?

A. They are reasonable in the context of proceedings in which rate of return is being examined. It would be naïve to assume that the growth rates forecasted by Value Line and those

summarized by Zacks are applicable far into the future. However, there are two strong reasons for employing such forecasts in the present proceeding. First, to the extent that investors employ forecasts like those published by Value Line and Zacks as long-term growth rates, these forecasts accurately reflect the current expectations of long-term growth included in the cost of capital. Second, Value Line and Zacks forecast growth rates might not be substantially different, on average, from what investors believe long-term growth prospects to be, given that the forecast is widely distributed in the financial community. In addition, a study by Brown and Rozeff shows that Value Line analysts make better forecasts than could be obtained by employing historical data only.[11]

Q. Do you use mean averages when calculating growth rates and the cost of equity capital?

A. Yes, I do. Proxy groups are constructed to be representative of the company that is being investigated. There is therefore no reason to prefer the median to the mean average. Simple mean averages are a better—and vastly more widely used—statistical measure where all of the firms in the sample are comparable to the subject company, and there is no basis for not averaging each of these companies equally.

4. Selling and Issuance Cost Adjustment

Q. Do you make any adjustments to your DCF results?

A. Yes. I make an adjustment for selling and issuance costs when calculating the DCF costs in **Exhibit 4.13**.

[11] L.D. Brown and M.S. Rozeff, "The Superiority of Analyst Forecasts As Measures of Expectations: Evidence From Earnings," *Journal of Finance*, 33, 1 (March 1978), 1-16.

Q. Why do you make such an adjustment?

A. The issuance of common equity, as well as long-term debt and preferred stock, involves costs. These costs are often measured as a percentage of the total debt, preferred stock or common equity issuance. Because of issuance costs, the net proceeds of a debt, preferred stock or common equity issuance will always be less than the total purchase price of the securities issued. Unless an adjustment is made to reflect this phenomenon in the fair rate of return—an adjustment consistent with the issuance cost adjustment already made for debt and preferred stock—the resulting fair rate of return calculations will be too low. The same problem with a return that is too low will result if selling and issuance costs are ignored in calculating embedded debt costs.

Q. Is such an adjustment generally made by regulators?

A. Yes. An adjustment to factor out selling costs is made as a traditional part of computing the embedded cost of debt and preferred stock—even though it is often contested where equity is concerned.

Q. Please explain.

A. Basing required returns on net, rather than gross, proceeds is standard regulatory practice when the capital is in the form of debt or preferred stock. It is inconsistent—and the source of improper DCF calculations—to exclude the same type of issuance cost allowance from outstanding common stock balances if those costs were incurred in the issuance of that common stock and were not reflected as a current expense in rates at the time the issuance was made. For long-term debt and preferred stock issuances, these costs are capitalized by calculating a required rate of return on the net proceeds to Nicor Gas. It would be

inconsistent to allow the capitalization and collection of these costs on long-term debt and preferred stock issuances and not to allow the collection of the same kind of costs on common stock issuances.

Q. What is the most common way for regulatory commissions to compensate for issuance costs?

A. The most common way to compensate utilities for necessary issuance costs related to common stock, as well as for preferred stock and long-term debt, is to allow a return *on* these costs for any one year and a return *of* these costs over the life of the issue. For common stock, because the life of the issue is, in essence, perpetual, the return component to recover the return on these costs is permanently a part of the return on equity. The only way these costs will "go away" is if they are paid off as a current expense. Failing to compensate a utility for its issuance costs will assure the under-recovery of its prudently incurred costs of raising capital.

Q. Is there more than one way that a commission can deal with selling and issuance costs?

A. Yes. A commission appropriately can handle these costs in one of three ways. *First*, the commission can allow the company to recover these costs automatically in the year they are incurred as an expense component of the revenue requirement (or the expense could be amortized over a number of years—with a return on the outstanding balance).

Second, a commission can allow the issuance costs to be included in the rate base (like the treatment of interest charges on construction work in progress). This will allow the company to earn a return *on* the costs, as opposed to a return *of* the costs.

Third, the commission can adjust the cost of capital upward over the life of the issue. This adjustment in effect allows the company to earn a return *on* the issuance costs, even though the costs are not in the rate base. The financial result and the revenue requirement are the same as for the second method.

All of these methods would compensate the utility for the actual issuance costs incurred. Utilities like Nicor Gas collect the costs of issuing debt and preferred stock as a part of traditional regulatory practice. There is no basis, in my opinion, for treating common stock issuance costs separately. Therefore, in **Exhibit 4.14**, I make the adjustment consistent with the collection of these costs when computing the DCF results.

Q. How do you make your issuance and selling expense adjustment?

A. It is proper to include an issuance expense return adjustment for the entire equity component of the capital structure.[12] Therefore, I use the conventional form of the issuance expense adjustment:[13]

$$r = \frac{D_1}{P_0 * (1 - f)} + g \qquad \textbf{(3)}$$

Where:

r = required return adjusted for issuance expenses

f = flotation cost percentage

[12] Support for using total common equity appears in: Eugene F. Brigham, *et al.*, "Common Equity Flotation Costs and Rate Making," *Public Utilities Fortnightly*, (May 2, 1985), 28-36.

[13] This formula appears in Roger A. Morin, *Utilities' Cost of Capital*, (Arlington Virginia: Public Utilities Reports, Inc., 1984), 106; and Eugene F. Brigham, *et al.*, "Common Equity Flotation Costs and Rate Making," *Public Utilities Fortnightly*, (May 2, 1985), 28-36.

For the purpose of choosing an appropriate value for f, the flotation cost percentage, I refer to a publication by Victor Borun and Susan Malley as well as information specific to Nicor Gas' most recent public equity issuances.[14] Borun and Malley conclude that total flotation costs for electric utilities are about 5.5 percent. As shown on **Exhibit 4.13**, the average of the last two equity offerings that provided capital that supports Nicor Gas' rate base is 2.86 percent. The average of the two is **4.19 percent**, which I use as the issuance cost percentage for the DCF calculations in this case, according to the formula above.

Q. Please explain why the issuance expense adjustment should be made to total common equity.

A. Investors are entitled to earn the expected cost of capital on their investment. The DCF model illustrates that this expected cost is equal to dividend payments plus capital gains on the value of their shares. The cash paid in by investors is greater than the net proceeds that the company takes in. Therefore, the company must earn a greater return on the smaller net proceeds balance to compensate investors adequately for their expected cost of capital. But the money paid to the investors in any year, the dividend, reflects only a portion of the returns on equity. Retained earnings represent the other portion, or the funds used to finance future growth. If retained earnings do not receive a selling and issuance return adjustment, they will not grow at a rate sufficient to allow for the payments of dividends at investors' expected growth rate in the future and the company will not earn its true cost of capital.

[14] Victor M. Borun and Susan L. Malley "Total Flotation Costs for Electric Company Equity Issues," *Public Utilities Fortnightly*, (February 20, 1986), pp. 33-39.

D. Empirical DCF Calculations for Proxy Group

Q. How do you calculate a DCF cost of common equity for the proxy group?

A. Using the ex-dividend date adjusted stock prices for September 17, 2004, the most recent four actual dividend per share payments, the average of the sustainable growth and forecast earnings growth estimates, and the issuance cost method shown above, I estimate a cost of common equity for the gas proxy group of **11.37 percent** as shown on **Exhibits 4.2** and **4.14**. This is my recommendation for Nicor Gas's required rate of return on common equity.

IV. REASONABLENESS CHECK

A. Recent Allowed Returns on Equity

Q. What check of reasonableness of your return recommendations do you perform?

A. I review the most recent rate of return decisions for gas utilities (from January 2002 through June 30, 2004), as summarized by Regulatory Research Associates.

Q. Please explain how you develop the allowed return on common equity comparison.

A. Page 1 of **Exhibit 4.15** presents the individual state commissions' allowed returns that make up the figure on page 2. Page 2 of that exhibit provides a graph that shows the range of natural gas utilities' returns on equity that have been authorized by regulatory commissions throughout the country between January 2002 and June 30, 2004. My database covers 59 decisions. Page 2 also shows the number of decisions associated with

each allowed return on common equity figure. I have indicated where my recommended return on equity of **11.37 percent** falls within the range of ROEs.

Q. What conclusions do you draw from the information presented on **Exhibit 4.15**?

A. My recommended return is near the 10.92 percent mean of the range of returns authorized by commissions throughout the country over the period January 2002 through June 30, 2004, which suggests that my recommendation is reasonable.

B. CAPM METHOD

Q. Please provide your overall evaluation of the CAPM.

A. Unlike the DCF model, the CAPM is difficult to apply in utility rate cases. The DCF renders a cost of capital estimate for each company in a proxy group. Some might seem a bit high and others a bit low, but the individual company results have objective "measures of central tendency," such as averages.

This is not true for the CAPM. The CAPM is the sum of two components: (1) a risk-free rate applicable to all companies; and (2) a company-specific risk premium (the product of a company-specific beta and a market risk premium). There are a wide variety of risk-free rates from which to choose (*e.g.*, long-term/short-term/average of both). Furthermore, because the same risk-free rate applies as an additive term to all companies' cost of equity estimates, there is no measure of central tendency in the result. In short, we cannot resolve the question of uncertainty surrounding short-term versus long-term rates by repeated sampling.

In the end, the CAPM analyst has to choose a risk-free rate that drives the results—precisely the type of choice that limits the model's objectivity and effectiveness. Indeed, this subjectivity is the principal reason I avoid the CAPM as an ROE method, and have avoided relying on it if it is possible to use a DCF approach instead.

Nevertheless, risk premiums methods are sometimes used to determine the cost of common equity in Illinois and, therefore, I need to make it clear what the concerns are about the use of CAPM to set the cost of common equity for Nicor Gas.

Q. Is there more than one way to calculate the CAPM model?

A. Yes. The CAPM formula itself is rather straightforward. Its components are: (1) the risk free rate of return; (2) the market rate of return; and (3) the beta. Yet despite this algebraic simplicity, experts have applied different methods to obtain each of these components and to compute the required rate of return. The effects of choosing one method over another can be to substantially change the required cost of capital.

Q. Have you calculated a CAPM ROE?

A. Yes, I have. While I believe that the DCF alone should be used in this case (a recommendation that I have consistently made for many years), I have derived CAPM return on equity estimates. My CAPM results for my comparable group and for Nicor are shown on **Exhibit 4.16.** Because CAPM does not have the central tendency properties that DCF has, there is no reason to focus primarily on a comparable group rather than Nicor especially where, as here, Nicor's beta is significantly different from that of the proxy group.

I use a risk-free rate of 4.99 percent, which is the yield on 30-year treasury bonds, as reported in the *Value Line Selection and Outlook* (September 17, 2004, page 2115). I use the most up-to-date Value Line betas for the companies in my comparable group and for Nicor.[15]

Two approaches are used to calculate the appropriate risk premium: (1) I calculate a "top-down" return on the market (the S&P 500) using analysts' estimates; and (2) I use historical Ibbottson and Sinquefield data.

Forward-looking measures of the market risk premium are available. A forward-looking market risk premium can be calculated by subtracting the risk-free rate from the estimated 12.89 percent "top-down" cost of equity capital of the S&P 500. Yahoo! Finance[16] provides a 10.81 percent estimate of the "top-down" estimated five-year earnings growth rate of the S&P 500, and S&P[17] provides a 1.80 percent estimate of the current dividend yield of the S&P 500. Combining these inputs using the standard DCF model provides a forward-looking, top-down DCF cost of common equity for the S&P 500 of 12.89 percent, as shown on **Exhibit 4.17**. This method of estimating the risk premium produces a 11.18 percent result for the proxy group using CAPM. This method produces a 12.89 percent CAPM result for Nicor.

[15] Nicor's beta is higher than that of any firm in my comparable group.

[16] "Yahoo Finance: S&P Growth Estimate, Next 5 Years," available at http://biz.yahoo.com/z/a/v/vz.html (downloaded September 20, 2004.)

[17] "S&P 500 Statistics," available at http://www2.standardandpoors.com/NASApp/cs/ContentServer?pagename=sp/Page/IndicesIndexPg&l=EN&b=4&f=1&s=6&ig=48&i=56&r=1&xcd=500&fd=IndicesMonthEnd_500 (downloaded September 20, 2004).

While Ibbottson and Sinquefield's market risk premium data is a useful source of information on the historical risk premium of large company stocks relative to long-term government bonds, it is backward looking. Moreover, the recent 2000-2003 period has had a severe impact on the equity risk premium, when calculated using historical data. If Ibbottson data for 2000-2003 is used, the counter-intuitive result is a lower equity risk premium. If Ibbottson data for 1926 to 2003 is used, the CAPM result is 10.18 percent. This method produces a 11.62 percent CAPM result for Nicor.

If Ibbottson data for 1926 to 1999 is used, the CAPM result is 11.08 percent. This method produces a 12.77 percent CAPM result for Nicor. I would generally be more skeptical about the backward-looking results produced by using Ibbottson historical data when developing an equity risk premium.

In any event, I use CAPM only as a check on my DCF results.

V. THE CAPITAL STRUCTURE, EMBEDDED COST OF LONG-TERM DEBT, AND OVERALL COST OF CAPITAL

Q. What is the required overall rate of return for a firm?

A. The required rate of return for a firm is the firm's weighted average overall cost of capital ("WACC"). The WACC is the sum of the costs of the component parts of the capital structure, *i.e.*, debt and common equity, weighted by their relative proportions in the capital structure.

On **Exhibit 4.2,** I present the capital structure and the cost of capital components that are appropriate for the companies. The overall cost of capital is **9.34 percent**.

Q. How do you apply your recommended cost of equity in the context of a weighted average overall cost of capital for Nicor Gas?

A. I use the projected actual capital structure ratios that would be applicable for Nicor Gas at the time that new rates would go into effect, as shown on **Exhibit 4.2**.

Q. What is the appropriate capital structure to employ in determining Nicor Gas' overall cost of capital?

A. There are two considerations that are noteworthy in determining the appropriate capital structure. First, since this rate proceeding will set rates to be charged for service in future periods, it is appropriate to base the capital structure components upon the best available estimates for the period of time in which the rates will be in effect. The appropriate capital structure should reflect all known changes, including new security issuances and retirements.

Second, modern financial theory suggests that there is a relatively wide zone of reasonableness for capital structures, with capital structures within that zone producing about the same cost of capital.[18]

Third, a utility's management must be granted a measure of discretion as to the type of capital raised. Having a solid level of financial integrity can provide rate stability and other benefits to customers. Indeed, Nicor Gas' revenues per therm are low compared to that of other gas LDCs in Illinois, which may partly be a function of Nicor Gas' sound financial position. **Exhibit 4.18**, p. 1 of 2 provides a comparison of Nicor Gas' revenues per therm

[18] See Roger Morin, *Utilities' Cost of Capital* (Arlington, VA: PUR, 1984), p. 268.

to other Illinois gas LDCs. **Exhibit 4.18**, p. 2 of 2 provides a comparison of Nicor Gas' "delivery-only" revenues per therm to the Illinois gas LDCs for which cost of gas information was readily available. Further, relative to some other gas delivery utilities, Nicor Gas' financial health may have helped to insulate its customers from the financial turmoil that some other utilities faced in the post-Enron, post-California period.

Q. Do you recommend that the Commission use the projected actual capital structure for the Company as of the date that new rates are expected to go into effect?

A. Yes, I do. The capital structure, as shown on **Exhibit 4.2**, reflects the capitalization that is expected at the time when new rates would go into effect. In Illinois, the projected actual capital structure has consistently been used in setting rates for Nicor Gas.

Q. What issues do you address pertaining to the cost of debt for Nicor Gas?

A. Regulated utilities generally use a mixture of debt and equity (and sometimes preferred stock) to raise capital for their operations. The mixture of debt and equity represents generally a desire on the part of a company's management to minimize the overall cost of capital. The cost of debt, as such, is not generally a contentious aspect of regulated rate cases, as it is customary to use a company's embedded—and hence observable—interest costs on its outstanding long-term debt.

Q. Please summarize your conclusions as to the overall weighted average cost of capital for the Company.

A. I conclude that the overall cost of capital for the Company is **9.34 percent**, as shown on **Exhibit 4.2**.

Q. Does this conclude your direct testimony?

A. Yes, it does.