BEFORE THE PUBLIC UTILITIES COMMISSION

OF THE STATE OF SOUTH DAKOTA

IN RE:	)	
	)	**Docket No. NG07-___**
NORTHWESTERN CORPORATION	)	
d/b/a NorthWestern Energy	)	

PREFILED DIRECT TESTIMONY OF PAUL J. EVANS ON BEHALF OF NORTHWESTERN ENERGY

Q. Please state your name and business address.

A. Paul J. Evans. 125 S. Dakota Avenue, Sioux Falls, South Dakota 57104.

Q. By whom are you employed and in what capacity?

A. I am employed by NorthWestern Energy (NorthWestern or NWE) as the Treasurer.

Q. How long have you been employed in your current position?

A. I have been employed in my current position since June 2004.

Q. What are your responsibilities and duties in your current position?

A. I am responsible for the areas of cash management, corporate finance, insurance, credit, commodity risk management, rating agency and banking relationships.

Q. Please state your educational background and experience.

A. I have 16 years of experience within the fields of corporate finance, treasury, tax, audit and accounting. I have a Master of International Management from

Thunderbird School of Global Management. I have a BBA from Stephen F. Austin State University with a major in Accounting. I also have my CPA certificate.

Q. What is the purpose of your testimony?

A. My testimony will discuss the capital structure, cost of debt, and cost of equity requested by NorthWestern in this proceeding. As a part of deriving the overall cost of capital, I am using the rate of return on common equity recommended by Dr. Michael Vilbert from The Brattle Group. I am also proposing to use the consolidated capital structure of NorthWestern Corporation and the cost of debt related to the South Dakota Gas Utility operations. Statement G – Rate of Return (Page 1) shows the components used in developing the required overall cost of capital.

Q. What are your conclusions?

A. The following is a summary of my conclusions regarding the overall cost of capital for the Gas Utility in South Dakota:

- The capital structure recommended is 48.54% debt and 51.46% equity;
- The cost of debt is 6.60%;
- The cost of equity is 11.25%;
- The rate of return is 8.99%;
- Allowing the Gas Utility to fully recover its cost of providing service will improve its financial performance and credit ratings, which over time should reduce capital costs and the rates paid by gas consumers.

This summary is shown on Statement G – Rate of Return (Page 1).

Q. Please explain the capitalization methodology that you have presented in this case.

A. The Company is proposing to use the consolidated capital structure of NorthWestern Corporation for the test year, which is calculated to be 48.54% debt and 51.46% equity. The Company believes using the consolidated capital structure will provide the best proxy of capitalization when comparing itself to other gas utility companies. The Company also looked at the ratio of its South Dakota Gas Utility debt to its South Dakota Gas Utility rate base and calculated the ratio to be 51.0% debt and 49.0% equity. Furthermore, the Company looked at the South Dakota Gas Utility book capitalization, comprised of the South Dakota Gas Utility debt and the book equity allocated to the South Dakota Gas Utility, and calculated the ratio to be 48.0% debt and 52.0% equity. Given that the consolidated capital structure is within the range of rate base and book capitalization, we believe that the consolidated capital structure is an accurate representation of the South Dakota Gas Utility capital structure.

Q. How did you determine the cost of debt?

For the long-term debt existing as of December 31, 2006, I determined all debt and capital lease obligations that are directly secured by assets of the combined Electric and Natural Gas Utilities in South Dakota and Nebraska. Because these obligations are linked to specific physical assets, it is straightforward to allocate them appropriately to NorthWestern's South Dakota and Nebraska utilities (see Statement G – Debt Capital (Page 2)). Since this is a gas rate case, I then excluded all pollution control bonds from the list of debt used to determine the gas utility's cost of debt. I also excluded the capital lease on a vehicle used

solely for the electric utility business. To derive the annual cost of long-term debt, I added the annual interest cost and the annual amortization of debt discount and issuance expense associated with each debt component (see Statement G – Debt Capital). By dividing the total annual cost of long-term debt by the long-term debt balance, I determined a cost of long-term debt of 6.60%.

Q. How did you determine the cost of equity?

A. NorthWestern has relied on the analyses performed by Dr. Michael J. Vilbert of The Brattle Group, which are explained in his prepared direct testimony. Dr. Vilbert states that, in order to attract capital, NorthWestern must offer expected returns to investors that are consistent with returns provided by enterprises with similar business and risk characteristics. I concur with Dr. Vilbert's recommendation for a 11.25% cost of equity for the Gas Utility in South Dakota.

Q. How did you determine the overall cost of capital required for the gas utility in South Dakota?

A. The overall cost of capital required for the Gas Utility in South Dakota is derived from the cost of long-term debt and cost of equity appropriate for the utility weighted by the percentage of debt and equity in the proposed consolidated capital structure. The balances and relative proportions for each component of the capital structure and the calculation of the weighted average cost of capital are shown on Statement G – Rate of Return (Page 1). As indicated on the statement, the weighted average cost of capital is 8.99%.

Q. Does this complete your prepared direct testimony?

A. Yes, it does.

AFFIDAVIT

STATE OF SOUTH DAKOTA)
) ss
COUNTY OF MINNEHAHA)

I, Paul J. Evans, being first duly sworn on oath, do depose and state that I have read this document and am familiar with the contents thereof and the same are true to the best of my knowledge and belief.

FURTHER THE AFFIANT SAYETH NOT.

Paul J. Evans

Subscribed and sworn to before me this 1st day of May, 2007.

Notary Public in and for the State of South Dakota

MCE 9-13-2012

BEFORE THE PUBLIC UTILITIES COMMISSION

OF THE STATE OF SOUTH DAKOTA

IN RE:	)	
	)	Docket No. NG07-___
NORTHWESTERN CORPORATION	)	
d/b/a NorthWestern Energy	)	

PREFILED DIRECT TESTIMONY OF

MICHAEL J. VILBERT

ON BEHALF OF

NORTHWESTERN CORPORATION

CONCERNING

COST OF EQUITY

FOR

NORTHWESTERN CORPORATION'S

SOUTH DAKOTA GAS UTILITY

APRIL 26, 2007

TABLE OF CONTENTS

Section **Page #**

I. INTRODUCTION AND SUMMARY 1

II. COST OF CAPITAL THEORY 6

A. THE COST OF CAPITAL AND RISK 6

B. BUSINESS RISK & FINANCIAL RISK: CAPITAL STRUCTURE AND THE COST OF EQUITY. 9

C. IMPLICATIONS FOR ANALYSIS 9

III. COST OF CAPITAL METHODOLOGY 12

A. SAMPLE SELECTION CRITERIA 13

B. CAPITAL STRUCTURE & THE COST OF DEBT 13
1. Market-Value Capital Structure 13
2. Market Costs of Debt and Preferred Equity 15
3. Risk-Free Interest Rate Forecast 15

C. COST OF EQUITY METHODS 16
1. The Risk Positioning Approach 17
2. Discounted Cash Flow Method 21

IV. COST OF CAPITAL ESTIMATES 24

A. COMPANY BACKGROUND 24

B. SAMPLE SELECTION 24
1. The Gas LDC Sub-Sample 27
2. Relative Risk of the Sample and NorthWestern's SD Gas Utility 28

C. COST OF CAPITAL AND COST OF EQUITY ESTIMATES 30

V. CONCLUSIONS 33

APPENDIX A: RESUME

APPENDIX B: SELECTING THE GAS LDC SAMPLE AND USE OF MARKET VALUES

I. INTRODUCTION AND SUMMARY

Q1. Please state your name and address for the record.

A1. My name is Michael J. Vilbert. My business address is The Brattle Group, 44 Brattle Street, Cambridge, MA 02138, USA.

Q2. Please describe your job and your educational experience.

A2. I am a Principal of The Brattle Group, ("Brattle"), an economic, environmental and management consulting firm with offices in Cambridge, Washington, London, San Francisco and Brussels. My work concentrates on financial and regulatory economics. I hold a B.S. from the U.S. Air Force Academy and a Ph.D. in finance from the Wharton School of Business at the University of Pennsylvania.

Q3. What is the purpose of your testimony in this proceeding?

A3. I have been asked by NorthWestern Energy Corp. ("NorthWestern" or the "Company") to estimate the cost of equity that the Public Utilities Commission of the State of South Dakota (the "Commission") should allow NorthWestern an opportunity to earn on the equity financed portion of its South Dakota gas utility assets, which provide retail gas distribution service in South Dakota.

To accomplish this task, I estimate the overall cost of capital for a sample of regulated natural gas local distribution companies ("LDCs") using the discounted cash flow ("DCF") and risk positioning models. I then evaluate the relative business and financial risk of NorthWestern's South Dakota natural gas operations ("NorthWestern's SD operations") to the gas LDC sample. These comparisons are important in determining my recommended cost of equity for a regulatory capital structure with 51.5 percent equity, which is the percent equity in the Company's proposed capital structure in this proceeding.

Q4. Please summarize the parts of your background and experience that are particularly relevant to your testimony on these matters.

A4. Brattle's specialties include financial economics, regulatory economics, and the gas and electric industries. I have worked in the areas of cost of capital, investment risk and related matters for many industries, regulated and unregulated alike, in many forums. I have testified or filed cost of capital testimony before the Federal Energy Regulatory Commission, the Arizona Corporation Commission, the Pennsylvania Public Utility Commission, the Public Service Commission of West Virginia, the Tennessee Regulatory Authority, the Canadian National Energy Board, Alberta Energy and Utilities Board, the Ontario Energy Board, and the Labrador & Newfoundland Board of Commissioners of Public Utilities. I have not previously testified before this Commission. Appendix A contains more information on my professional qualifications.

Q5. What is your conclusion on the market-determined cost of equity for NorthWestern's SD operations based upon the results from the sample of regulated companies you selected?

A5. The best point estimate of the cost of equity for NorthWestern's SD gas distribution operations is 11¼ percent for a capital structure with 51.5 percent equity. However, it is more correct to say that the sample results indicate a range of 10¾ to 11¾ percent for the estimated cost of equity. This point estimate is about ½ percent lower than the risk-positioning results for the sub-sample and almost 1 percent higher than the multistage DCF estimate for the sub-sample.

Note, I specify a plus or minus ½ percent range for the return on equity and specify the point estimate to the nearest ¼ percent because I do not believe that it is possible to estimate the cost of equity more precisely than that.

Q6. How is your testimony organized?

A6. The *Sections II and III* of the testimony cover the theory underlying the cost of equity estimation models. Those familiar with cost of capital theory can skip directly to *Section*

IV, which discusses the implementation of the models in this proceeding. *Section V* provides the conclusions.

Specifically, *Section II* formally defines the cost of capital and touches on the principles relating to the cost of capital and capital structure for a business. *Section III* presents the methods used to estimate the cost of capital for the benchmark samples and their associated numerical analyses, and explains the basis of my conclusions for the benchmark sample's returns on equity and overall cost of capital. *Section IV* presents the results of these methods applied to the benchmark sample group, and presents the cost of equity implied by the results. *Appendix B* discusses sample selection and the determination of the market-value capital structures as well as the costs of debt and preferred stock. My conclusions on the cost of equity for the equity financed portion of NorthWestern's South Dakota gas utility assets are presented in *Section V*.

Q7. Please summarize how you approached this task.

A7. I selected a sample of nine regulated natural gas LDCs with business risk comparable to that of NorthWestern's SD gas LDC operations. My analyses consider cost of capital evidence from the risk positioning and discounted cash flow models, but I rely primarily on the results from the risk positioning model because I do not believe that the DCF method is completely reliable at this time for this industry.

Specifically, I estimate the cost of equity for each sample company using both cost-of-equity estimation methods. For each estimate, I combine this value with the sample company's market costs of debt and preferred stock to estimate each firm's overall cost of capital, i.e. its after-tax weighted-average cost of capital ("ATWACC"), using each company's market value capital structure as the weights. For each method of estimating the return on equity, I then report a sample average ATWACC and the estimated cost of equity at a capital structure with same percentage of equity as filed by NorthWestern for its SD operations. I thus present the cost of equity that is consistent with each sample's

market information on the cost of capital and the regulatory capital structure of NorthWestern's SD operations. (By "regulatory capital structure," I mean the capital structure that NorthWestern utilizes in its applications.[1])

This method automatically avoids problems that can arise when an analyst focuses separately on the individual components of the overall cost of capital (i.e., the cost of equity and the appropriate capital structure). The danger with that approach is that the estimated cost of equity from the sample may correspond to a very different level of financial risk than would exist at the regulated company's capital structure. The result could be an inconsistency between the allowed return on equity and the financial risk inherent in the regulatory capital structure.

Q8. Why do you believe that the DCF model is less reliable for this industry at this time than the risk positioning model?

A8. Results for the DCF model depend critically on the estimate of the dividend growth rate. A one percent error in the estimate of the growth rate results in a greater than one percent error in the cost of equity estimates. In the recent past, the gas LDC industry could have been characterized as being relatively stable, but that is much less true today. There have been a number of mergers and acquisitions that has resulted in a consolidation within the industry. There are now fewer "pure play" gas LDC companies available to include in a sample. Gas prices have increased dramatically and have been much more volatile lately. Although most of the companies in the gas LDC sample have fuel cost adjustment clauses, the increased volatility of gas prices has increased the uncertainty of the industry's earnings going forward. This uncertainty in earnings is also reflected in the accounting restatements by companies in the industry due to efforts to report accurately the value of inventories. Currently, average forecast growth rates for the sample are lower than they were just a few months ago, but *Value Line's* forecast betas have changed

[1] In the analyses I use the capital structure that is based upon the long-term sources of capital, i.e., long-term debt, preferred equity and common equity. I do not use short-term debt because long-term assets are not generally financed with short-term debt.

very little. Because of these concerns, I report results for a sub-sample which consists of sample companies which have no significant data issues. Estimates from this group are likely to be the most reliable.

Q9. What are the results for the DCF model?

A9. As reported below, the DCF model results display a greater spread and are more variable and therefore less reliable than those based upon the risk positioning model. For example, the simple DCF model results range from a low of 6.5 percent to a high of 10.1 percent before any consideration of differences in financial risk. Results for the more reliable multistage model are less variable, and range from 7.4 to 9.8 percent. (See Table No. MJV-6, Panel A for the simple DCF and Panel B for the multistage DCF) After adjusting for financial risk, the sample average for the multistage DCF model is 9.7 percent for the full sample and 10.3 percent for the more reliable subsample. The corresponding DCF results for the less reliable simple DCF model are 9.1 percent for the full sample and 9.4 for the sub-sample. (Table No. MJV-8, Panels A and B)

Although I do not believe that the DCF results are completely reliable for the reasons stated above, I provide results using the DCF method because it is a method that has been used extensively in the past. In addition, the results from the DCF model serve as a check on the results from the equity risk positioning approach.

Q10. What were the results for the risk positioning model?

A10. The sample average risk positioning results adjusted for differences in financial risk range from a low of 11.1 percent to a high of 11.4 percent for the full sample and 11.5 to 11.8 percent for the more reliable sub-sample when using the long-term risk free rate. (See Table No. MJV-12, Panel A for the full sample and Panel B for the sub-sample.) I also report results for the risk positioning model based upon the short-term risk-free rate, but I do not rely on those estimates in this proceeding.

Q11. You mentioned the importance of considering financial risk when evaluating the results of the models. Please explain how you adjust for financial risk.

A11. Both the DCF and the risk positioning models rely on market data to estimate the cost of equity for the sample companies. That cost of equity estimate captures both the business risk and the financial risk of the assets. Business risk is the risk that the company would have if it were financed entirely with equity. Financial risk is the additional risk carried by the equity holders when debt is used to finance some of the assets. The more debt that is used by a company, the riskier the company's equity becomes. As explained in more detail below, the procedures I use consider both the business risk and the financial risk of the sample companies in comparison to NorthWestern's SD gas operations in determining my recommended cost of equity.

II. COST OF CAPITAL THEORY

A. THE COST OF CAPITAL AND RISK

Q12. Please formally define the "Cost of Capital."

A12. The cost of capital can be defined as *the expected rate of return in capital markets on alternative investments of equivalent risk.* In other words, it is the rate of return investors require based on the risk-return alternatives available in competitive capital markets. The cost of capital is a type of opportunity cost: it represents the rate of return that investors could expect to earn elsewhere without bearing more risk. "Expected" is used in the statistical sense: the mean of the distribution of possible outcomes. The terms "expect" and "expected" in this testimony, as in the definition of the cost of capital itself, refer to the probability-weighted average over all possible outcomes.

The definition of the cost of capital recognizes a tradeoff between risk and return that is known as the "security market risk-return line," or "security market line" for short. This line is depicted in Figure 1. The higher the risk, the higher is the cost of capital. A

version of Figure 1 applies for all investments. However, for different types of securities, the location of the line may depend on corporate and personal tax rates.

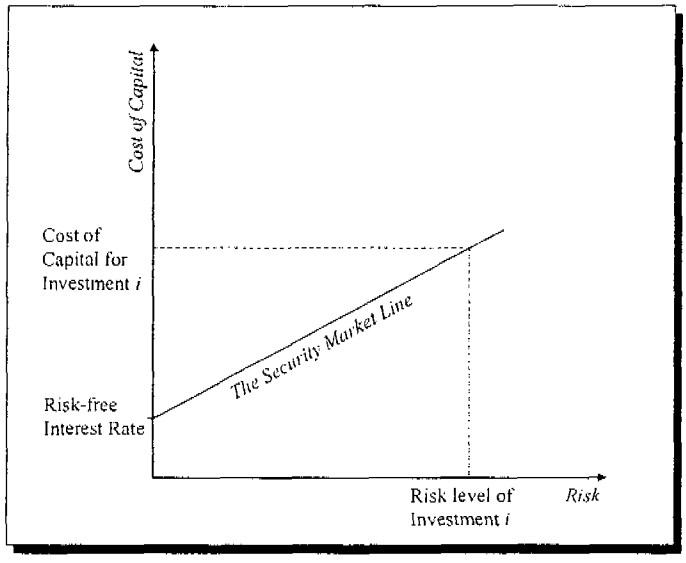

Figure 1: The Security Market Line

Q13. Why is the cost of capital relevant in rate regulation?

A13. It has become routine in U.S. rate regulation to accept the "cost of capital" as the right expected rate of return on utility investment.[2] That practice is normally viewed as consistent with the U.S. Supreme Court's opinions in *Bluefield Waterworks & Improvement Co. v. Public Service Commission*, 262 U.S. 678 (1923), and *Federal Power Commission v. Hope Natural Gas*, 320 U.S. 591 (1944).

From an economic perspective, rate levels that give investors a fair opportunity to earn the cost of capital are the lowest levels that compensate investors for the risks they bear. Over the long run, an expected return above the cost of capital makes customers overpay for service. Regulatory commissions normally try to prevent such outcomes, unless there are offsetting benefits (e.g., from incentive regulation that reduces future cost). At the

[2] A formal link between the cost of capital as defined by financial economics and the right expected rate of return for utilities is established by Stewart C. Myers, "Application of Finance Theory to Public Utility Rate Cases," *The Bell Journal of Economics and Management Science*, 3:58-97 (Spring 1972).

same time, an expected return below the cost of capital shortchanges investors. In the long run, such a return denies the company the ability to attract capital, to maintain its financial integrity, and to expect a return commensurate with that of other enterprises attended by corresponding risks and uncertainties.

More important for customers, however, are the economic issues an inadequate return raises for them. In the short run, deviations of the expected rate of return on the rate base from the cost of capital create a "zero-sum game"-- investors gain if customers are overcharged, and customers gain if investors are shortchanged. In the long run, however, inadequate returns are likely to cost customers -- and society generally -- far more than is gained in the short run. Inadequate returns lead to inadequate investment, whether for maintenance or for new plant and equipment. The costs of an undercapitalized industry can be far greater than the short-run gains from shortfalls in the cost of capital. Moreover, in capital-intensive industries (such as the electric utility or the gas distribution industries), systems that take a long time to decay cannot be fixed overnight. Thus, it is in the customers' interest not only to make sure the return investors expect does not exceed the cost of capital, but also to make sure that it does not fall short of the cost of capital, either.

Of course, the cost of capital cannot be estimated with perfect certainty, and other aspects of the way the revenue requirement is set may mean investors expect to earn more or less than the cost of capital even if the allowed rate of return equals the cost of capital exactly. However, a Commission that sets rates so investors expect to earn the cost of capital on average treats both customers and investors fairly, and acts in the long-run interests of both groups.

B. Business Risk & Financial Risk: Capital Structure and the Cost of Equity

Q14. Please explain briefly the difference between business risk and financial risk.

A14. Business risk is the risk of a company from its line of business if it used no debt financing. When a firm uses debt to finance its assets, the business risk of the assets is shared between the debt holders and the equity holders, but the equity holders bear more of the risk because debt holders have a prior claim on the company's cash flows. Equity holders are residual claimants, which simply means that equity holders get paid last. Therefore, the goal of selecting a sample is to choose companies whose business risk is comparable to the regulated company in the proceeding.

Q15. Please explain why it is necessary to report the cost of equity adjusted for capital structure.

A15. Briefly, rate regulation in North America tends to focus on the components of the overall cost of capital, and in particular, on what the "right" cost of equity and capital structure should be. Frequently, there is no consideration of whether the financial risks of the sample companies differ among themselves or differ from the regulated company. The cost of equity estimated using the standard models reflects both the business and financial risk of the sample companies. However, the overall cost of capital depends primarily on the business the firm is in, while the costs of the debt and equity components depend not only on the business risk but also on the distribution of revenues between debt and equity. The overall cost of capital is thus the more basic concept.

C. Implications for Analysis

Q16. Please explain the implications of the relationship between capital structure and the cost of equity on your testimony.

A16. The risk equity holders carry, and therefore the cost of equity, depends on the capital structure. As leverage increases, financial risk increases, and hence the required return on equity increases. An approach that estimates the cost of equity for each of the sample

firms without explicit consideration of the market value capital structure (i.e., the financial risk) underlying those costs risks material errors. The costs of equity of the sample companies at their actual market-value capital structures do not necessarily correspond to the financial risk faced by equity holders in the regulated company, and thus could lead to an unfair rate of return. I avoid this problem by calculating each sample company's ATWACC using its market value capital structure. Using the sample's average overall cost of capital as an estimate for the cost of capital of NorthWestern's SD operations, I then determine the corresponding return on equity at NorthWestern's filed regulatory capital structure. This procedure ensures that the capital structure and estimated cost of equity are consistent for the regulated company.

Q17. To assess the magnitude of financial risk for a rate regulated company, should you use the market-value or the book-value capital structure?

A17. The academic literature supports the view that the market-value capital structure is the relevant quantity for analyzing the cost of equity evidence, which is based on market information.

Q18. Is the use of market values to calculate the impact of capital structure on the risk of equity incompatible with use of a book-value rate base for a regulated company?

A18. No, no more than it is incompatible to use market-based cost of equity estimation methods (such as DCF or the risk positioning model) with a book value rate base. That is, the cost of capital is the fair rate of return on regulatory assets for both investors and customers. Most regulatory jurisdictions in North America measure the rate base using the net book value of assets, not current replacement value or historical cost trended for inflation, but the jurisdictions still apply market-derived measures of the cost of equity to that net book value rate base.

The issue here is "what level of risk is reflected in that cost of equity estimate?" The equity risk level depends on the sample company's market-value capital structure, not its book-value capital structure. *That risk level would be different if the sample company's*

market-value capital structure exactly equaled its book-value capital structure, so the estimated cost of equity would be different, too.

Q19. Please sum up the implications of this section.

A19. The market risk and, therefore, the cost of equity depend directly on the market-value capital structure of the company or asset in question. It therefore is impossible to compare validly the measured costs of equity of different companies without taking capital structure into account. Capital structure and the cost of equity are inextricably linked, and any effort to treat the two as separate and distinct questions violates basic financial principles.

Q20. How should a cost of capital analyst implement this principle?

A20. Analysts should treat the market-value weighted average of the cost of equity and the after-tax current cost of debt, or the "ATWACC" for short,[3] as constant for a particular line of business for companies not in financial distress or with unusual capital structures. Sample evidence should be analyzed to determine the sample's average ATWACC, which can be compared across different firms or industries. The economically appropriate cost of equity for a regulated firm is the quantity that, when applied to the *regulatory* capital structure, produces the same ATWACC. That value is the cost of equity that the sample would have, estimation problems aside, if the sample's market-value capital structure had been equal to the regulatory capital structure in question.

[3] This quantity typically is called the "weighted-average cost of capital" or "WACC" in finance textbooks. The textbook WACC equals the *market*-value weighted average of the cost of equity and the *after-tax*, *current* cost of debt. However, rate regulation in North America has a legacy of working with another weighted-average cost of capital, the *book*-value weighted average of the cost of equity and the *before-tax*, *embedded* cost of debt. Accordingly, in regulatory settings it's useful to refer to the textbook WACC as the "ATWACC," or "after-tax weighted-average cost of capital." I follow that practice here.

Q21. Can you provide a simple example of the calculation of the cost of equity consistent with the market-determined estimate of the sample's average overall cost of capital?

A21. Yes. Consider the following equation to calculate the ATWACC:[4]

$$ATWACC = r_D \times D \times (1 - T_C) + r_E \times E \quad (1)$$

where r_D = market cost of debt,
r_E = market cost of equity,
T_C = corporate income tax rate,
D = percentage of debt in the capital structure, and
E = percentage of equity in capital structure.

The cost of equity consistent with overall cost of capital estimate (ATWACC), the market cost of debt and equity, the marginal corporate income tax rate and the amount of debt and equity in the capital structure can be determined by solving equation (1) for r_E.

III. COST OF CAPITAL METHODOLOGY

Q22. How is this section of your testimony organized?

A22. As noted in Section II, I estimate the cost of capital using a sample of comparable risk companies. This section first outlines the steps involved in selecting a benchmark sample, in determining the market-value capital structure, and in estimating the sample companies' costs of debt. It then turns to the procedures for estimating the costs of equity and describes the two cost of equity estimation methodologies used in this testimony, the DCF method and the risk positioning approach. These are the foundations of my cost of capital calculations, which I present in the following section and which I use to derive my recommended cost of equity for NorthWestern's SD regulated gas assets at their regulatory capital structure.

[4] Note that this equation assumes that only debt and equity are in the capital structure, but it is simple to add preferred equity to the equation.

A. Sample Selection Criteria

Q23. What is the goal of your sample selection procedures?

A23. The overall cost of capital for a part of a company depends on the risk of the business in which the part is engaged, not on the overall risk of the parent company on a consolidated basis. According to financial theory, the overall risk of a diversified company equals the market-value-weighted average of the risks of its components.

Estimating the cost of equity for NorthWestern's SD regulated gas distribution assets is the subject of this proceeding. The ideal comparative sample for NorthWestern's SD operations would be a number of companies that are publicly traded "pure plays" in the natural gas distribution business. "Pure play" is an investment term referring to companies with operations only in one line of business. Publicly traded firms, firms whose shares are freely traded on stock exchanges, are ideal because the best way to infer the cost of capital is to examine evidence from capital markets on companies in the given line of business.

In addition to providing a sample of comparable business risk, a good sample should provide reliable cost of capital estimates. For this reason, I apply a set of criteria that are intended to screen out companies that have characteristics which may bias the cost of equity estimates. The details are in Appendix B.

B. Capital Structure & the Cost of Debt

1. Market-Value Capital Structure

Q24. What capital structure information do you require?

A24. For reasons discussed above, explicit evaluation of the market-value capital structures of the sample companies is vital for a correct interpretation of the market evidence on the return on equity. This requires estimates of the market values of common equity, preferred equity and debt, and the current market costs of preferred equity and debt.

Q25. Please describe how you calculate the market values of common equity, preferred equity and debt.

A25. I estimate the market value capital structure for each sample company by estimating the market values of common equity, preferred equity and debt from the most recent publicly available data. The details are in Appendix B.

Briefly, the market value of common equity is the price per share times the number of shares outstanding. For the risk positioning approach, I use the last five trading days of each year to calculate the market value of equity for the year. I then calculate the average capital structure over the corresponding five-year period used to estimate the "beta" risk measures for the sample companies.[5] This procedure matches the estimated beta to the degree of financial risk present during its estimation period. In the DCF analyses, I use the average stock price over the 15 trading days ending on the day that the earnings growth rate forecasts are obtained from Bloomberg.[6]

The market value of debt is estimated at its book value adjusted by the difference between the "Estimated Fair (market) Value" and the "carrying cost" of long-term debt reported in each company's 10-K.[7] The market value of preferred stock for the samples is set equal to its book value because the market values and book values do not differ much and because the percent of preferred stock in the capital structures of the sample companies is relatively small compared to the debt and common equity components.

[5] *Value Line* uses five years of historical data to estimate its forecasted betas.

[6] Forecasts were obtained on April 9, 2007 for all companies in the benchmark gas LDC sample.

[7] The book value of debt from Bloomberg includes all interest-bearing financial obligations that are not current and includes capitalized leases and mandatory redeemable preferred and trust preferred securities in accordance with FASB 150 effective June 2003. See Bloomberg definition of long-term debt for additional detail.

2. Market Costs of Debt and Preferred Equity

Q26. How do you estimate the current market cost of debt?

A26. The market cost of debt for each company in the DCF analysis is the current yield reported by Bloomberg for its index of public utility company bonds corresponding to the sample company's current debt rating as classified by S&P. The risk positioning analysis, on the other hand, uses the current yield of a utility bond that corresponds to the five-year average debt rating of each company so as to match consistently the horizon of information used by *Value Line* to estimate company betas.

Q27. How do you estimate the market cost of preferred equity?

A27. For each company with preferred stock, the cost of preferred equity for each company is set equal to the yield on an index of preferred stock as reported in the Mergent Bond Record corresponding to the S&P rating of that company's debt.

3. Risk-Free Interest Rate Forecast

Q28. How do you obtain the forecasts of the risk-free interest rates over the period the utility rates set here are to be in effect?

A28. I obtain these forecast rates using data provided by Bloomberg. In particular, I use the reported government debt yields from the "constant maturity series". This information is displayed in Panels A and B of Table No. MJV-9.

Q29. What values do you use for the short-term and long-term risk-free interest rates?

A29. I use a value of 3.8 percent for the short-term risk-free interest rate and a value of 4.9 percent for the long-term risk-free interest rate as the benchmark interest rates in the equity risk premium analyses. These forecasts are constructed by using historical yield curve data to find the long-run average implied term premia on government securities, and combining these with recent yield curve data. Details of their calculation can be found in the Workpapers to Table No. MJV-9.

C. Cost of Equity Methods

Q30. How do you estimate the cost of equity for your sample companies?

A30. Recall the definition of the cost of capital from the outset of my testimony: *the expected rate of return in capital markets on alternative investments of equivalent risk.* My cost of capital estimation procedures address three key points implied by the definition:

1. Since the cost of capital is an expected rate of return, it cannot be directly observed; it must be inferred from available evidence.

2. Since the cost of capital is determined in capital markets (e.g., the New York Stock Exchange), data from capital markets provide the best evidence from which to infer it.

3. Since the cost of capital depends on the return offered by alternative investments of equivalent risk, measures of the risks that matter in capital markets are part of the evidence that needs to be examined.

Q31. How does the above definition help in cost of capital estimation?

A31. The definition of the cost of capital recognizes a tradeoff between risk and expected return - the security market line - plotted earlier in Figure 1. Cost of capital estimation methods take one of two approaches: (1) they try to identify a comparable-risk sample of companies and to estimate the cost of capital directly; or (2) they establish the location of the security market line and estimate the relative risk of the security, which jointly determine the cost of capital. In terms of Figure 1, the first approach focuses directly on the vertical axis, while the second focuses both on the security's position on the horizontal axis and on the position of the security market line.

The first type of approach is more direct, but ignores the wealth of information available on securities not thought to be of precisely comparable risk. The "discounted cash flow" or "DCF" model is an example. The second type of approach, sometimes known as "equity risk premium approach," requires an extra step, but as a result can make use of information on all securities, not just a very limited subset. The Capital Asset Pricing Model ("CAPM") is an example. While both approaches can work equally well if

conditions are right, one may be preferable to the other under other circumstances. In particular, approaches that rely on the entire security market line are less sensitive to deviations from the assumptions that underlie the model, all else equal. I examine both DCF and risk positioning approach evidence for the sample.

1. The Risk Positioning Approach

Q32. Please explain the risk positioning method.

A32. The risk positioning method estimates the cost of equity as the sum of a current interest rate and a company specific risk premium. It is therefore sometimes also known as the "risk premium" approach. This approach may sometimes be applied informally. For example, an analyst or Commission may check the spread between interest rates and what is believed to be a reasonable estimate of the cost of capital at one time, and then apply that spread to changed interest rates to get a new estimate of the cost of capital at another time.

More formal applications of the risk positioning approach take full advantage of the security market line depicted in Figure 1 - they use information on all securities to identify the security market line and derive the cost of capital for the individual security based on that security's relative risk. This reliance on the entire security market line makes the method less vulnerable to the kinds of problems that arise for the DCF method, which relies on one stock at a time. The risk positioning approach is widely used and underlies most of the current research published in academic journals on the nature, determinants and magnitude of the cost of capital.

Q33. How are the "more formal" applications of risk positioning approach implemented?

A33. The first step is to specify the current values of the benchmarks that determine the security market line. The second is to determine the security's or investment's relative risk. The third is to specify exactly how the benchmarks combine to produce the security market line, so the company's cost of capital can be calculated based on its relative risk.

All of these elements and how they relate are usefully formulated in the framework of the CAPM.

a) The Capital Asset Pricing Model

Q34. Please start with the CAPM, by describing the model.

A34. As noted above, modern models of capital market equilibrium express the cost of equity as the sum of a risk-free rate and a market risk premium. The CAPM is the longest-standing and most widely used of these theories. The CAPM states that the cost of capital for an investment, *s*, (e.g., a particular common stock) is given by the following equation:

$$k_s = r_f + \beta_s \times MRP \qquad (2)$$

where k_s is the cost of capital for investment *s*; r_f is the risk-free rate, β_s is the beta risk measure for the investment *s*; and *MRP* is the market risk premium.

The CAPM relies on the empirical fact that investors price risky securities to offer a higher expected rate of return than safe securities do. It says that the security market line starts at the risk-free interest rate (that is the return on a zero-risk security, the y-axis intercept in Figure 1, equals the risk-free interest rate). Further, it says that the risk premium over the risk-free rate equals the product of beta and the risk premium on a value-weighted portfolio of all investments, which by definition has average risk.

b) The Empirical Capital Asset Pricing Model

Q35. What other equity risk premium model do you use?

A35. Empirical research has long shown that the CAPM tends to overstate the actual sensitivity of the cost of capital to beta: low-beta stocks tend to have higher risk premia than predicted by the CAPM and high-beta stocks tend to have lower risk premia than predicted. A number of variations on the original CAPM theory have been proposed to

explain this finding, but this finding can also be used to estimate the cost of capital directly, using beta to measure relative risk without simultaneously relying on the CAPM.

The second model makes use of these empirical findings. It estimates the cost of capital with the equation, where α is the "alpha" adjustment of the risk-return line, a constant,

$$k_s = r_f + \alpha + \beta_s \times (MRP - \alpha) \quad (3)$$

and the other symbols are defined as above. I label this model the Empirical Capital Asset Pricing Model, or "ECAPM." The alpha adjustment has the effect of increasing the intercept but reducing the slope of the security market line in Figure 1 which results in a security market line that more closely matches the results of empirical tests.

Q36. Why is it appropriate for you to use the empirical CAPM?

A36. The CAPM has not generally performed well as an empirical model, but its shortcomings are directly addressed by the ECAPM. Specifically, the ECAPM recognizes the consistent empirical observation that the CAPM underestimates (overestimates) the cost of capital for low (high) beta stocks. In other words, the ECAPM is based on recognizing that the actual slope of the risk-return tradeoff is flatter than predicted and the intercept higher based upon repeated empirical tests of the CAPM. The alpha parameter (α) in the ECAPM adjusts for this fact. The difference between the CAPM and the type of relationship identified in the empirical studies is depicted in Figure 2.

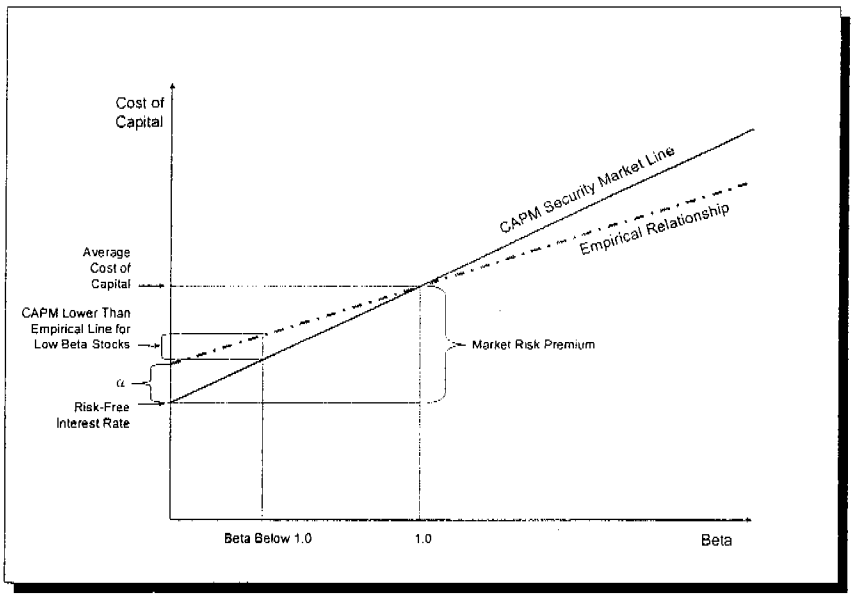

Figure 2: The Empirical Security Market Line

Research supports values for α of one to seven percent when using a short-term interest rate. I use baseline values of α of two percent for the short-term risk-free rate and 0.5 percent for the long-term risk-free rate. I also conduct sensitivity tests for different values of α. For the short-term risk-free rate I use values for α of one, two and three percent. For the long-term risk-free rate, the corresponding α values are zero, 0.5 and 1.5 percent. These values are lower than would be justified by the magnitude of the misestimation in the tests of the CAPM. I use lower values of α when using the long-term risk-free rate because use of a long-term risk-free rate incorporates some of the desired effect of using the ECAPM. That is, the long-term risk-free rate version of the security market line has a higher intercept and a flatter slope than the short-term risk-free version which is the version that has been extensively tested. Thus, it is likely that I do not need to make the same degree of adjustment when I use the long-term risk-free rate.

2. Discounted Cash Flow Method

Q37. Please describe the discounted cash flow approach.

A37. The DCF model takes the first approach to cost of capital estimation, i.e., to attempt to estimate the cost of capital in one step. The method assumes that the market price of a stock is equal to the present value of the dividends that its owners expect to receive. The method also assumes that this present value can be calculated by the standard formula for the present value of a cash flow stream:

$$P = \frac{D_1}{(1+k)} + \frac{D_2}{(1+k)^2} + \frac{D_3}{(1+k)^3} + \cdots + \frac{D_T}{(1+k)^T} \quad (4)$$

where "P" is the market price of the stock; "D_t" is the dividend cash flow expected at the end of period t; "k" is the cost of capital; and "T" is the last period in which a dividend cash flow is to be received. The formula just says that the stock price is equal to the sum of the expected future dividends, each discounted for the time and risk between now and the time the dividend is expected to be received.

Most DCF applications go even further, and make very strong (i.e., unrealistic) assumptions that yield a simplification of the standard formula, which then can be rearranged to estimate the cost of capital. Specifically, if investors expect a dividend stream that will grow *forever* at a steady rate, the market price of the stock will be given by a very simple formula,

$$P = \frac{D_1}{(k-g)} \quad (5)$$

where "D_1" is the dividend expected at the end of the first period, "g" is the perpetual growth rate, and "P" and "k" are the market price and the cost of capital, as before. Equation (5) is a simplified version of equation (4) that can be solved to yield the well known "DCF formula" for the cost of capital:

$$k = \frac{D_1}{P} + g$$
$$= \frac{D_0 \times (1+g)}{P} + g \qquad (6)$$

where "D_0" is the current dividend, which investors expect to increase at rate g by the end of the next period, and the other symbols are defined as before. Equation (6) says that if equation (5) holds, the cost of capital equals the expected dividend yield plus the (perpetual) expected future growth rate of dividends. I refer to this as the simple DCF model. Of course, the "simple" model is simple because it relies on very strong (i.e., very unrealistic) assumptions.

Q38. Are there other versions of the DCF models besides the "simple" one?

A38. Yes. The constant growth rate DCF model requires that dividends and earnings grow at the same rate for companies that earn their cost of capital on average.[8] It is inconsistent with the theory on which the model is based to have different growth rates in earnings and dividends over the period when growth is assumed to be constant. If the growth in dividends and earnings were expected to vary over some number of years before settling down into a constant growth period, then it would be appropriate to estimate a multistage DCF model. In the multistage model, earnings and dividends can grow at different rates, but must grow at the same rate in the final, constant growth rate period. A difference between forecasted dividend and earnings rates therefore is a signal that the facts do not fit the assumptions of the simple DCF model.

So, I consider a variant of the DCF model that relies on slightly less strong assumptions in that it allows for varying dividend growth rates in the near term before assuming a

[8] Why must the two growth rates be equal in a steady-growth DCF model? Think of earnings as divided between reinvestment, which funds future growth, and dividends. If dividends grow faster than earnings, there is less investment and slower growth each year. Sooner or later dividends will equal earnings. At that point, growth is zero because nothing is being reinvested (dividends are constant). If dividends grow slower than earnings, each year a bigger fraction of earnings are reinvested. That makes for ever faster growth. Both scenarios contradict the steady-growth assumption. So if you observe a company with different expectations for dividend and earnings growth, you know the company's stock price and its dividend growth forecast are inconsistent with the assumptions of the steady-growth DCF model.

perpetual growth rate beginning in year eleven. I use the forecast growth of GDP as the forecast of the long-term growth rate, i.e. year eleven on. This is a variant of the "multistage" DCF method.

Q39. What are the merits of the DCF approach?

A39. The DCF approach is conceptually sound if its assumptions are met, but can run into difficulty in practice because those assumptions are so strong, and hence so unlikely to correspond to reality. Two conditions are well known to be necessary for the DCF approach to yield a reliable estimate of the cost of capital: the variant of the present value formula that is used must actually match the variations in investor expectations for the growth of dividends, and the growth rate(s) used in that formula must match current investor expectations. Less frequently noted conditions may also create problems.

Q40. Do you agree that estimating the "right" dividend growth rate is the most difficult part for the implementation of the DCF approach?

A40. Yes. Finding the right growth rate(s) is the usual "hard part" of a DCF application. The original approach to estimation of g relied on average historical growth rates in observable variables, such as dividends or earnings, or on the "sustainable growth" approach, which estimates g as the average book rate of return times the fraction of earnings retained within the firm. But it is highly unlikely that these historical averages over periods with widely varying rates of inflation and costs of capital will equal current growth rate expectations. Although there has been relatively less turmoil in the natural gas LDC line of business, there have been a number of mergers and acquisitions in the industry. In addition, the price of natural gas has increased dramatically and has been much more volatile lately. Although most of the sample companies have fuel cost adjustment clauses, the increased volatility of gas prices has increased the uncertainty of the industry's earnings going forward. This uncertainty is also reflected in the accounting restatements in recent years as well as more involvement in non-regulated or non-gas activities. Therefore, because the underlying forecasts of earnings growth rates are less