

**BEFORE THE NORTH DAKOTA PUBLIC SERVICE COMMISSION OF
THE STATE OF NORTH DAKOTA**

In the Matter of the Application of Montana-Dakota Utilities Co.

For Authority to Increase Rates for
Gas Distribution Service in North Dakota

Case No. PU-15-90

**DIRECT TESTIMONY OF
AARON L. ROTHSCHILD**

**ON BEHALF OF THE
NORTH DAKOTA PUBLIC SERVICE COMMISSION**

August 7, 2015

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I. STATEMENT OF QUALIFICATIONS

Q. PLEASE STATE YOUR NAME AND ADDRESS.

A. My name is Aaron L. Rothschild and my address is 15 Lake Road, Ridgefield, CT 06877.

Q. WHAT IS YOUR OCCUPATION?

A. I am a financial consultant specializing in cost of capital.

Q. WHAT IS YOUR EDUCATION AND EXPERIENCE?

A. I have a B.A. (1994) degree from Clark University in mathematics and an M.B.A. (1996) from Vanderbilt University. I provided financial analysis in the telecom industry in the United States and Asia Pacific from 1996 to 2001 and I have prepared rate of return testimonies since 2002. See Appendix A for my resume.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. I am testifying on behalf of the staff of the North Dakota Public Service Commission to provide my recommendations to the Commission in the Montana-Dakota utilities Co. ("Montana-Dakota" or the "Company") rate proceedings regarding their gas utility's 1) cost of equity, 2) capital structure, and 3) overall cost of capital.

II. SUMMARY OF CONCLUSIONS

Q. PLEASE SUMMARIZE YOUR TESTIMONY.

A. I recommend the following for the Company:

- An overall cost of capital of 6.90%.
- A cost of equity of 8.62%.

- 1 • The Company’s requested capital structure containing 41.135% long-term
- 2 debt, 8.108% short-term debt, 1.242% preferred equity and 49.515% common
- 3 equity be used to set rates.¹
- 4 • The following cost rates requested by the Company be used to set rates:
- 5 ○ Short-term debt: 1.631%
- 6 ○ Long-term debt: 5.949%
- 7 ○ Preferred stock: 4.579%

8 The derivation of my 8.62% cost of equity recommendation is summarized on my
9 Schedule ALR 2 and based on a Discounted Cash Flow (“DCF”) result of between 8.32%
10 and 8.92%. I used a non-constant DCF Method as a check. I will explain below that the
11 current capital markets indicate that a 8.62% return on equity for investing in a regulated
12 utility is conservative and arguably high.

13 Company witness, Dr. Stephen J. Gaske recommends a cost of equity of 10.00%
14 and an overall cost of capital of 7.588%.² He claims 10% cost of equity recommendation
15 is justified because Montana-Dakota is riskier than the typical proxy company.³ The
16 median results of his primary approach (three DCF analyses) are between 8.99% and
17 9.12%.⁴

18 Dr. Gaske’s claim that Montana-Dakota’s gas distribution operations require a
19 return above his mean results is unjustified. The Proxy Group of 9 natural gas companies
20 Dr. Gaske uses to calculate his equity receive an average of 40% of revenues from riskier

¹ Dr. Gaske’s Direct testimony, Table 1, page 4

² Ibid.

³ Ibid. page 30, lines 7-10

⁴ Ibid. Table 2, page 34

1 non-regulated operations. See Table 4 below. As explained below, research cited by Dr.
 2 Gaske regarding firm size and risk further supports Montana-Dakota should receive a
 3 return no higher than the return required by the Proxy Group.

4 Dr. Gaske uses unsustainable growth in his benchmark market DCF analysis.
 5 This error leads to a result that is considerably higher than published figures by sources
 6 on which he relies on in his direct testimony, such as Ibbotson Associates. The result of
 7 his benchmark risk premium analysis of small company stocks has almost no relation to
 8 returns required by Montana-Dakota.

9 Table 1 below shows that Dr. Gaske's cost of equity recommendation for
 10 Montana-Dakota is above Ibbotson Associates'⁵ long-term market prediction for the
 11 overall market. Regulated utilities are less risky than the overall market, which is
 12 consistent with the average Proxy Group Value Line beta of 0.78.⁶ My cost of equity
 13 recommendation of 8.62% is lower than Ibbotson Associates' predictions consistent with
 14 a Proxy Group of companies in a lower risk category. Charles Schwab's recent long-
 15 term market return expectation for the overall market is 8.10%.

	Nominal	Real*	Reative Market Risk
Gaske -Recommendation	10.00%	8.20%	0.78
Ibbotson - Long-term market predictions	9.47%	7.67%	1.00
Rothschild - Recommendation	8.62%	6.82%	0.78
Charles Schwab - Long-term Market Returns	8.10%	6.30%	1.00

Source: Schedule ALR 11

*1.8% Inflation Expectation

⁵ Dr. Gaske sources Ibbotson Associates research his Direct testimony extensively

⁶ The beta of the overall market is 1.0 by definition. A beta below 1 for the Proxy Group indicates that it is lower risk than overall market.

1 **III CAPITAL STRUCTURE, COST OF DEBT AND OVERALL RATE OF RETURN**

2 **Q. WHAT IS THE COMPANY’S REQUESTED CAPITAL STRUCTURE?**

3 A. The Company is requesting its test period capital structure consisting of 41.315% long-
4 term debt, 8.108% short-term debt, 49.515% common equity, and a preferred stock of
5 1.242%.⁷

6 **Q. IS THE COMPANY’S REQUESTED CAPITAL STRUCTURE APPROPRIATE**
7 **FOR MONTANA-DAKOTA?**

8 A. Yes. The Company’s requested capital structure is reasonable to use for rate making
9 purposes because it reflects the capital structure ratios of the Proxy Group used to
10 calculate the cost of equity. As shown in Table 2below, the average common equity ratio
11 for the Proxy group is 47.98%, which is in range of the Company’s request that includes
12 49.52% common equity.

	Long-Term Debt	Short-Term Debt	Preferred Stock	Common Equity
Montana-Dakota's Request (1)	41.14%	8.11%	1.24%	49.52%
Proxy Group (2)	41.74%	10.17%	0.11%	47.98%

(1) Dr. Gaske's Direct testimony, page 4, table 1

13 (2) Schedule ALR 6, page 1

14 **Q. WHAT CAPITAL STRUCTURE HAVE YOU USED TO COMPUTE THE**
15 **OVERALL COST OF CAPITAL FOR THE COMPANY?**

⁷ Dr. Gaske’s Direct testimony, Table 1, page 4

1 A. As shown in Schedule ALR 1, page 2, I used the Company's requested capital structure
 2 ratios of 49.515% common equity⁸, 8.108 % short-term debt, 41.135% long-term debt
 3 and 1.242% of preferred stock to compute the cost of capital for Montana-Dakota.

4 **Q. WHAT DID YOU USE FOR THE COST OF DEBT?**

5 A. I used the Company's proposed cost of long-term debt of 5.949%⁹ and its cost of short-
 6 term debt of 1.631%¹⁰.

7 **Q. PLEASE SUMMARIZE YOUR RECOMMENDATIONS.**

8 A. My overall recommendations for the Company's capital structure and rate of return are
 9 provided in Table 2:

TABLE 2			
Montana-Dakota Utilities CO.			
Overall Cost of Capital			
Company Requested Capital Structure			
	Ratios	Cost Rate	Weighted Cost Rate
Long-Term Debt	41.135%	5.949%	2.45%
Short-Term Debt	8.108%	1.631%	0.13%
Preferred Stock	1.242%	4.579%	0.06%
Common Equity*	<u>49.515%</u>	8.620%	<u>4.27%</u>
	100.0%		6.90%

10 Source: Schedule ALR 1

11

⁸ Includes 0.16% of preferred stock

⁹ Dr.Gaske Direct testimony, page 4 table 1

¹⁰ Ibid. page 22 line 5

1 **IV. COST OF EQUITY IN TODAY'S FINANCIAL MARKET**

2 **Q. HOW DOES YOUR COST OF EQUITY RECOMMENDATION RELATE TO**
3 **THE CURRENT FINANCIAL MARKET?**

4 A. The current capital markets indicate that an 8.62% return on equity for investing in a
5 regulated utility is conservative and arguably high. Equity investors are paying a higher
6 price for earnings than the historical average, and they expect low volatility (low
7 volatility means low risk) which indicates a lower cost of equity than the historical
8 average.

9 Market data in the following three areas shows that stock markets are expensive
10 (as indicated by price-to-earnings ratio), volatility expectations are low, interest rates
11 remain low by historical standards, and utility stocks remain strong by historical
12 standards as measured by the price-to-earnings ratio, historical and forecasted.

13 1. **STOCKS ARE EXPENSIVE.** As the S&P 500, Dow Jones Industrial Average
14 and other stock indices make new highs, investors are paying more for the same
15 earnings, including for utility stocks, than average indicating that the cost of
16 equity is lower than average.

17 2. **VOLATILITY.** The standard deviation in returns is a proxy for risk in portfolio
18 theory. As indicated by the VIX Index,¹¹ otherwise known as the “Fear Index”,
19 investors expect stock price volatility to be considerably lower than average.

20 3. **INTEREST RATES.** Long-term U.S. Treasury yields are near historic lows (See
21 Chart 9 in “Interest Rates” section of my testimony below). Federal Reserve Chair

¹¹ The VIX is a measure of the implied volatility of S&P 500 index options representing the market's expectation of stock market volatility over the next 30 day period. It is quoted in percentage points and then annualized. For a more detailed explanation, please see the next page of my testimony.

1 Janet Yellen said on May 22, 2015 that when the Federal Reserve starts to raise
2 interest rates “the pace of normalization will be gradual” and objectives will be
3 met by “proceeding cautiously”.¹² Market data indicates that investor expectations
4 are consistent with Ms. Yellen’s comments.¹³

5 I will discuss each of these three areas in more detail later in my
6 testimony. In addition, I will show how allowed returns have trended over time in
7 relation to market data.

8
9 **Q. HOW DOES YOUR SUMMARY OF THE CURRENT FINANCIAL MARKET**
10 **RELATE TO YOUR APPROACH TO CALCULATING MONTANA-DAKOTA’S**
11 **COST OF EQUITY?**

12 A. My role is to determine a return on equity (“ROE”) consistent with observable market
13 data. Because the cost of equity is not a published figure like a bond yield, some
14 interpretation is required to determine the appropriate market based ROE. We should use
15 the information in current market prices as our best guide to the cost of equity.

16 **Q. ARE YOU AWARE OF STUDIES THAT HAVE SHOWN THE CHALLENGES**
17 **OF FORECASTING FINANCIAL MARKETS?**

18 A. Yes. A Duke University study demonstrated U.S. financial executives were over
19 confident in their ability to predict financial markets. The Chief Financial Officers
20 (“CFOs”) in the study estimated the returns of Standard and Poor’s Index over the
21 following year. The 80% confidence interval provided by the CFOs contained only 33%

¹² <http://www.federalreserve.gov/newsevents/speech/yellen20150522a.htm>

¹³ “Fed Hones Tricky Message as It Nears Boosting Rates, Wall Street Journal, June 14, 2015

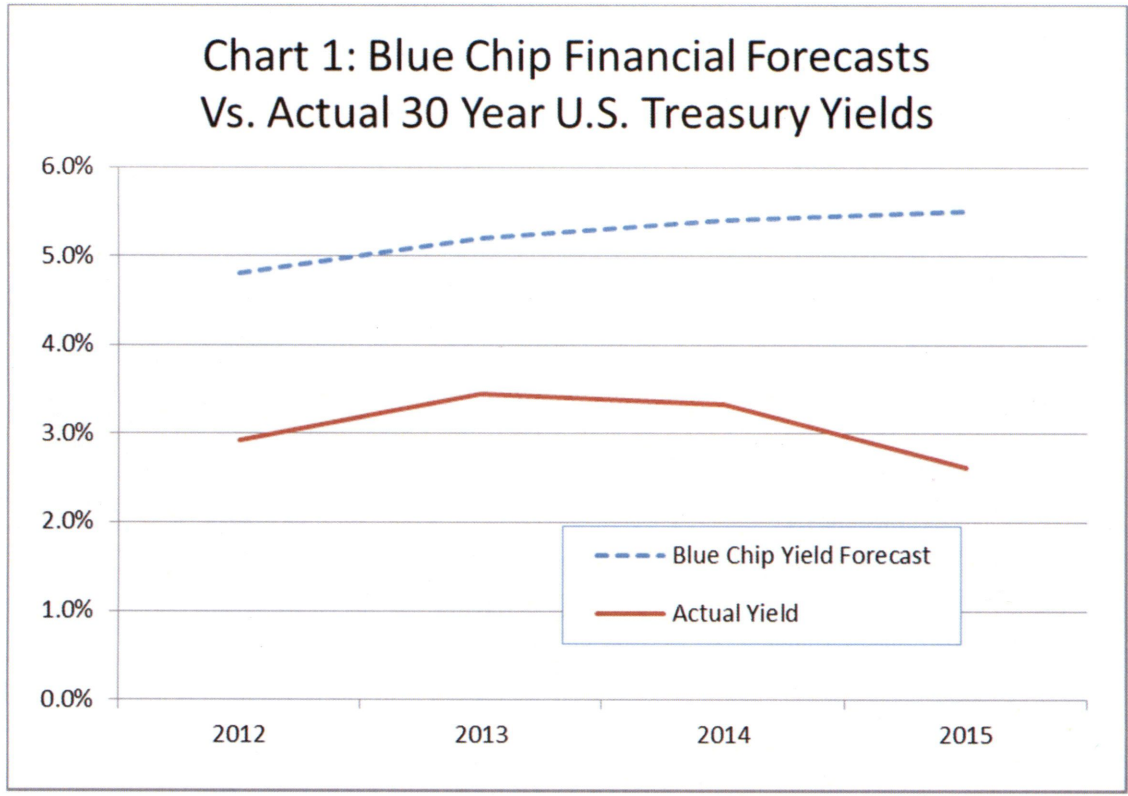
1 of the realized returns.¹⁴ The correlation between their estimates and true value was
2 slightly less than zero.

3 An additional study conducted by McKinsey and Company to determine the
4 accuracy of analysts' earnings forecasts found they were overly optimistic, slow to revise
5 their forecasts and prone to making increasingly inaccurate forecasts during economic
6 downturns. And as indicated by P/E ratios investors' expectations were more
7 conservative.¹⁵

8 As shown in the Chart 1 below, Blue Chip Financial Forecast's 2010 yield
9 projections were higher than actuals. 30-year U.S. Treasury yields were forecasted to be
10 5.5% in 2015. However, they have averaged under 3% for the year and are 3.10% as of
11 June 30, 2015.

¹⁴ Itzhak Ben-David, John R. Graham, Campbell R. Harvey, *Managerial Miscalibration*, July 2010.

¹⁵ Marc H. Goedhart, Rishi Raj and Abhishek Saxena, *Equity Analysts: Still too bullish*, Spring 2010.



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Source: MDU-4-3(a), Attachment 5

STOCKS ARE EXPENSIVE

Q. WHAT, IF ANYTHING, DOES THE STOCK MARKET DATA INDICATE WITH REGARD TO THE COST OF EQUITY?

A. A rise in stock prices to all-time highs does not necessarily indicate a decrease in the cost of equity, as expectations regarding earnings could be increasing at a faster rate. However, at the time of filing this testimony there is evidence to suggest that as investors are bidding up stock prices, they are in turn, paying an increased amount for the same earnings.

1 **Q. WHAT EVIDENCE DO YOU HAVE THAT SUPPORTS THAT STOCKS ARE**
2 **EXPENSIVE?**

3 A. The amount investors are willing to pay for earnings is a common measure of whether
4 stocks are expensive. As shown below, the price-to-earnings ratio and the Shiller ratio for
5 the S&P 500 are high by historical measures and have been increasing lately.

6 **Q. PLEASE DEFINE THE SHILLER RATIO.**

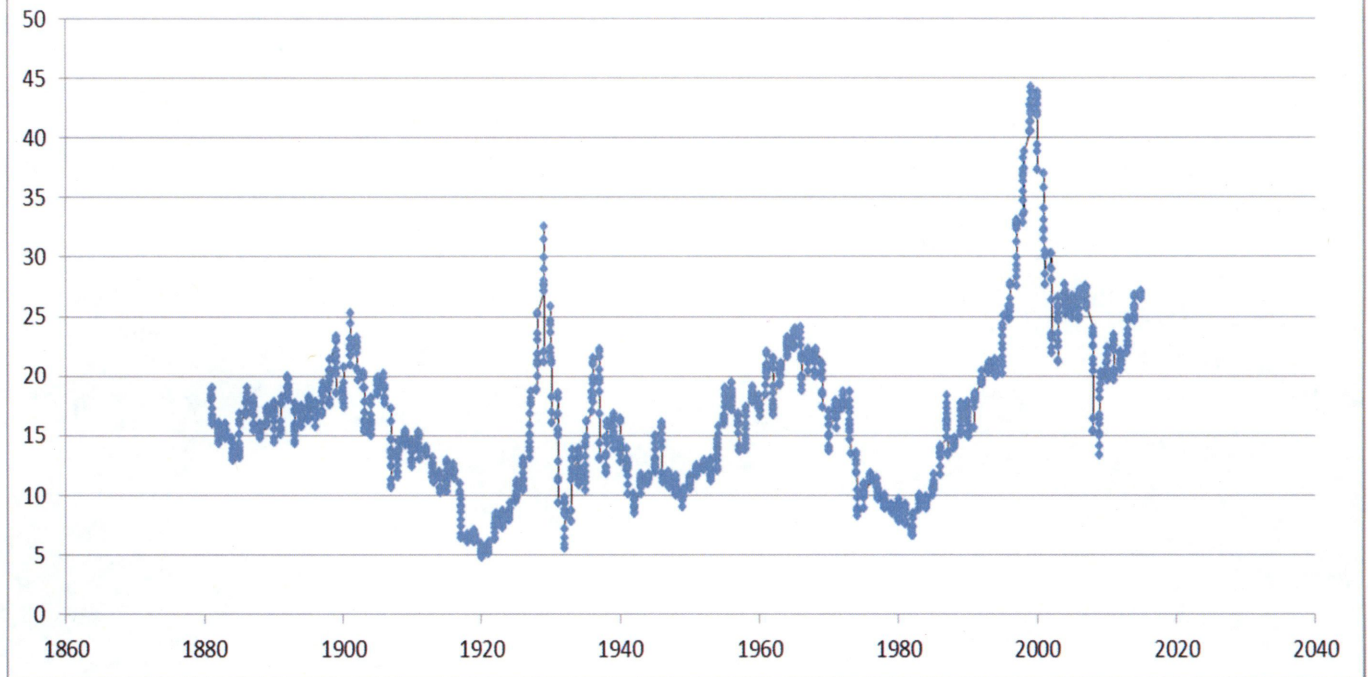
7 A. The Shiller ratio is the price-to-earnings ratio based on average inflation-adjusted
8 earnings from the previous 10 years. The Shiller ratio is known as the cyclically adjusted
9 price to earnings ratio. A recent Wall Street Journal article stated the Shiller ratio is “one
10 of the most widely followed ways of measuring stock valuations.”¹⁶

11 **Q. WHAT DO THE CURRENT AND CYCLICALLY ADJUSTED PRICE-TO-**
12 **EARNINGS RATIOS INDICATE?**

13 A. The current price-to-earnings ratio of the S&P 500 is 20.67 and the Shiller Ratio is 26.63.
14 The long-term average since 1881 is 16.6 (See Chart 2 below), which indicates that
15 stocks are expensive, investors are willing to pay more for the same earnings and thus the
16 cost of equity is lower than average.

¹⁶ “Stock Prices: Is ‘Quite High’ Too High?, Wall Street Journal, May 15, 2015

**Chart 2: Cyclically Adjusted Price Earnings Ratio
1881 - 2015**



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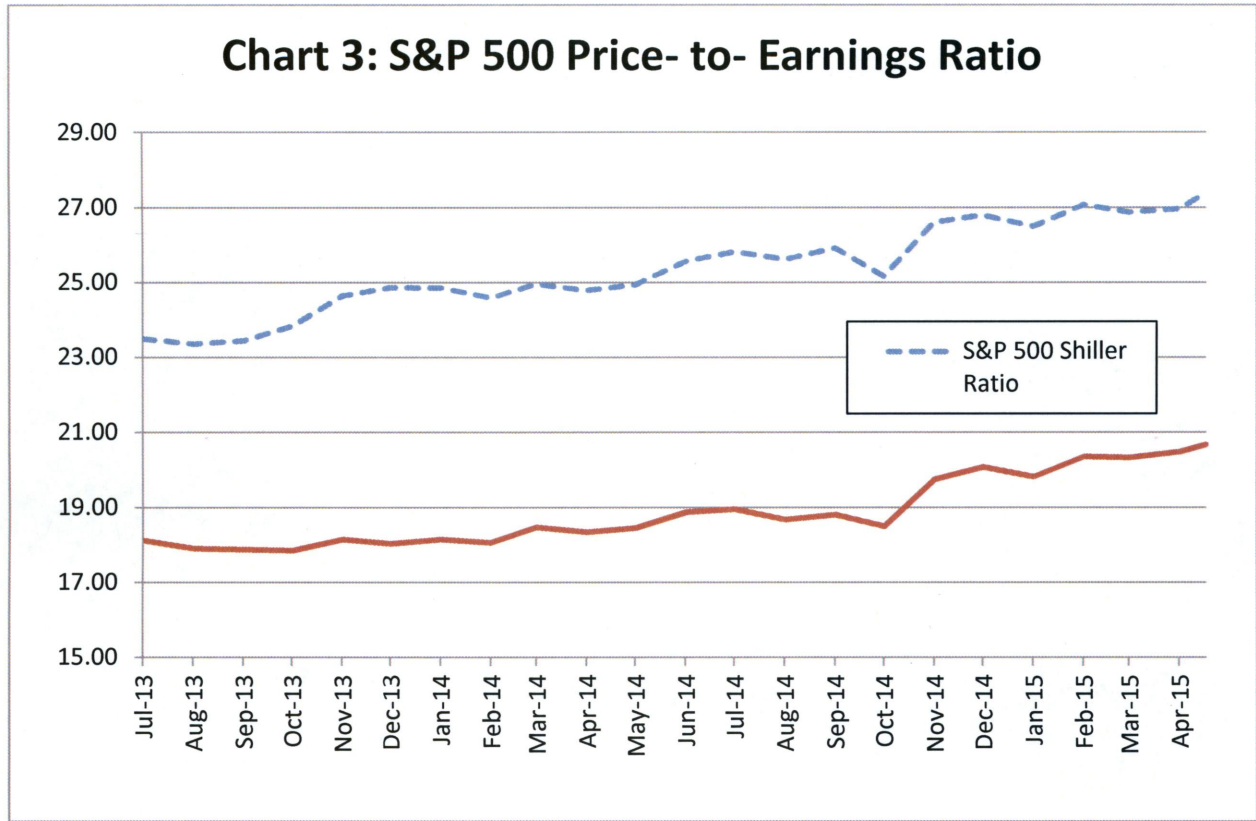
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As shown in Chart 3 below, the price-to-earnings ratios (as measured by the Shiller-ratio and the current price-to-earnings ratio) have been increasing as major stock market indices, including the S&P 500 and Dow Jones Industrial Average, have been reaching new highs.

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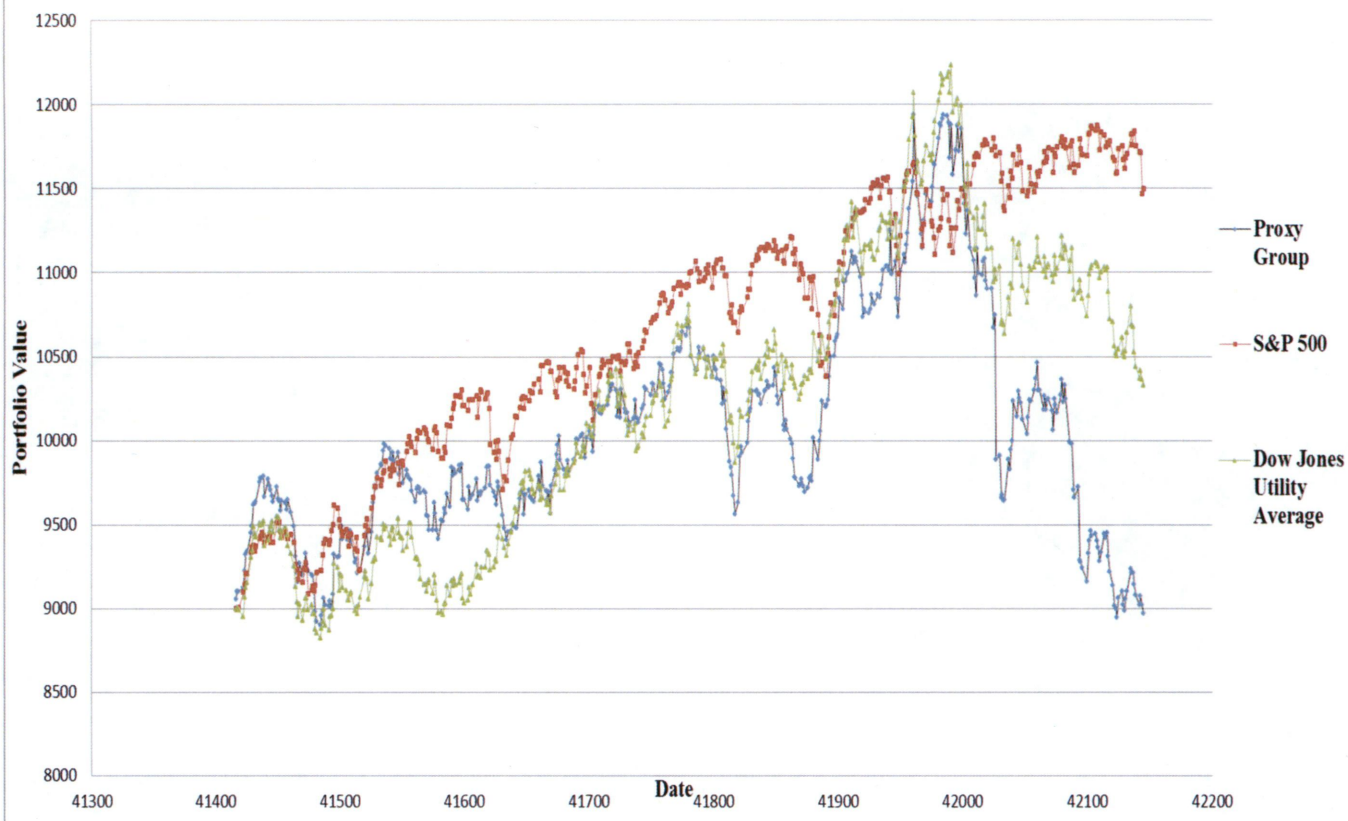
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4 **Q. WHAT DOES THE MARKET DATA INDICATE REGARDING UTILTY STOCK**
5 **VALUES?**

6 A. Chart 4 below shows the relative performance of investing the same dollar amount
7 (\$9,000)¹⁷ in the Proxy group (Proxy Group Dr. Gaske and I used to calculate our cost of
8 equity recommendations), S&P 500, and the Dow Jones Utility Average.

¹⁷ I arbitrarily assigned a \$1,000 investment in each of the 9 companies in the Gas Group and thus a total of \$9,000 for the S&P 500 and Dow Jones Utility Average for consistency. The relative performance shown in chart 4 would not be impacted by the size of the investment.

Chart 4: Relative Performance of Proxy Group, S&P 500 & Dow Jones Utility Ave
July 2013 - June 2015



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The price-to-earnings ratio of utility stocks remain high by historical measures. The

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forward price-to-earnings ratio for utilities stocks is 15.2 and has averaged 14.1 over the

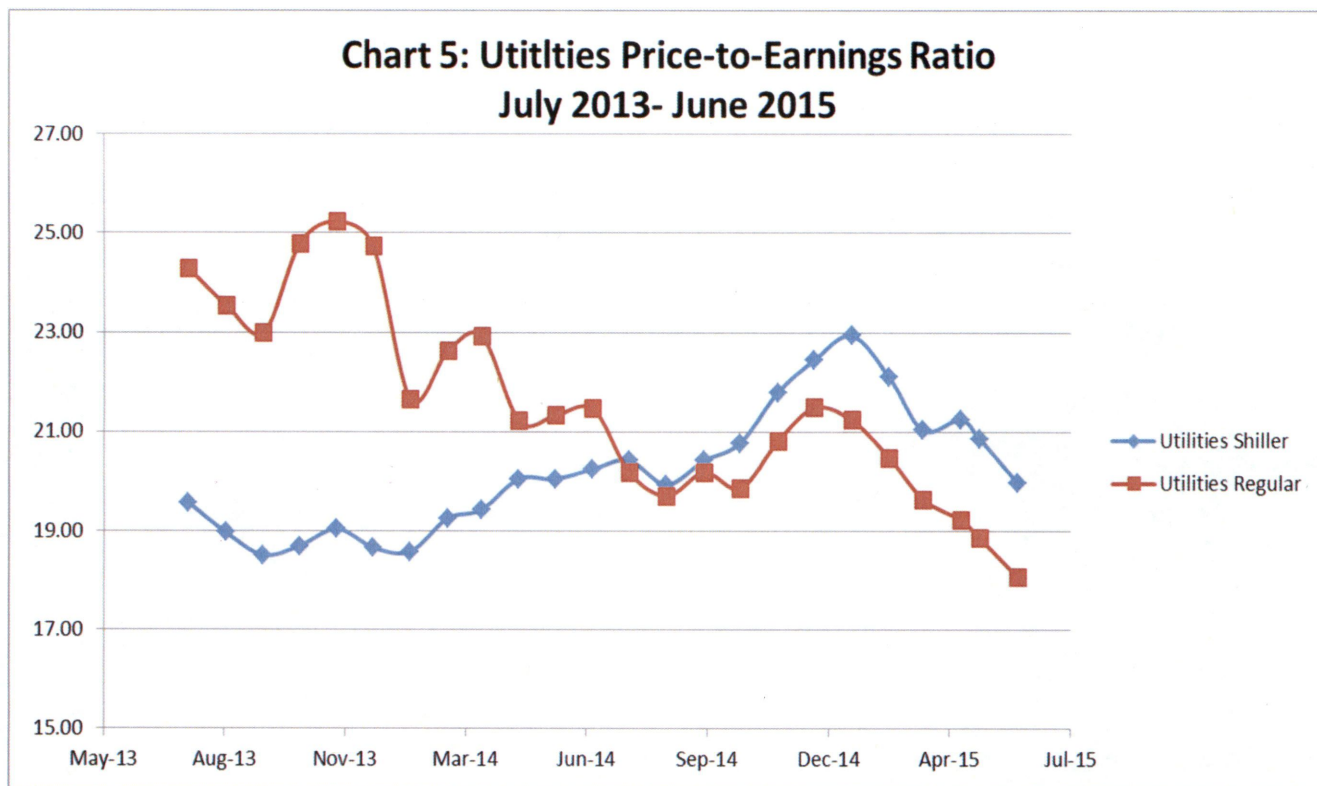
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past 15 years.¹⁸ As shown in Chart 5 below, the cyclically adjusted price-to-earnings ratio

5

has increased over the past couple of years.

¹⁸ Guide to the Markets, U.S. 3Q 2015, J.P. Morgan Asset Management



1

2

Chart 5 also indicates that investors currently pay a higher cyclically adjusted price-to-earnings ratio (Shiller ratio) than in 2014, when allowed returns were falling below 10% nationally. See Chart 10 below.

3

4

5 **VOLATILITY IS DOWN**

6

Q. WHAT IS YOUR BASIS FOR CLAIMING THAT INVESTORS VIEW THE MARKETS AS LESS RISKY?

7

8

A. I use market data published by the Chicago Board of Options Exchange (“CBOE”) to determine investors’ volatility expectations because volatility, uncertainty, and risk are synonymous.

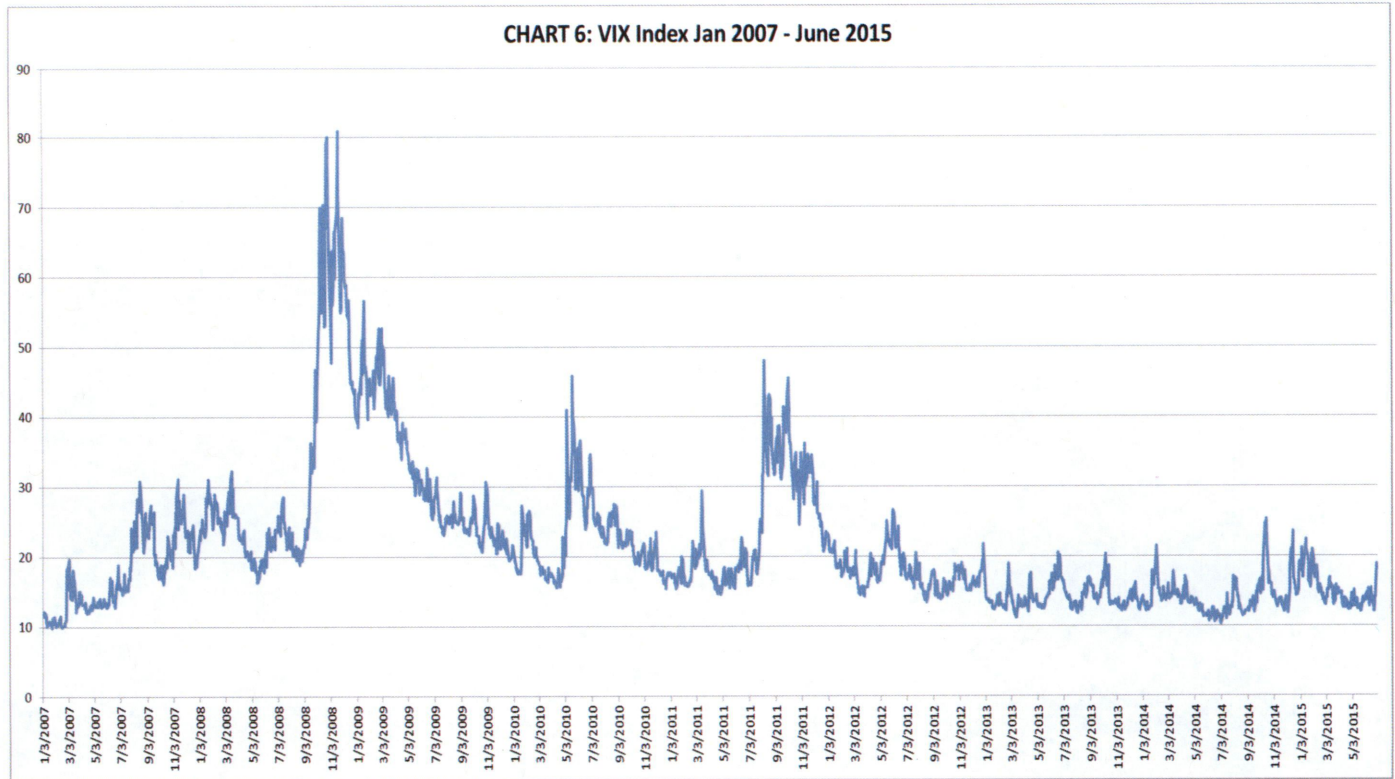
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1 The CBOE’s Market Volatility Index (“VIX”) is based on options on the S&P
2 500 Index and reflects the market consensus expected volatility in the S&P 500 over the
3 next 30 days on an annual basis. It is sometimes known as the “fear index.”

4 VIX index data is more direct route than monitoring world events, expert
5 forecasts and surveys. Using market data has not only proven to be more accurate than
6 forecasts and interpretations, but is also aligned with the principle that the cost of capital
7 is a market-based concept.

8 **Q. WHAT IS THE CURRENT MARKET PRICE OF THE VIX AND HOW DOES IT**
9 **COMPARE TO PRICES DURING THE GREAT RECESSION?**

10 **A.** As of June 30, 2015, the VIX index was trading at 18.23, indicating that investors expect
11 an annualized change of 18.23% over the next 30 days. June 30th was at the height of
12 uncertainties regarding the Greek credit crisis. After the negotiations resumed with
13 between Greece and its creditors the VIX index fell to 13.23 by July 15, 2015 and 12.12
14 by July 31, 2015. At the height of the financial crisis in 2008, the VIX index was trading
15 at over 80, indicating that investors expected an annualized change of over 80% over the
16 same 30 day period. As can readily be seen in the chart below, the VIX index is
17 significantly lower than it was during the financial crisis and is nearing pre-crisis levels.



1

2 **Q. IS THERE MARKET DATA AVAILABLE THAT SHOWS THE MARKET**
 3 **EXPECTATION FOR VOLATILITY OVER A LONGER PERIOD THAN 30**
 4 **DAYS?**

5 **A.** Yes. A volatility index, under the ticker symbol “VXV,” is based on the same
 6 methodology as the VIX but structured to measure the markets expectation of 3-month
 7 volatility.

8 **Q. DOES VXV ALSO INDICATE THAT INVESTORS’ VOLITILITY**
 9 **EXPECTATIONS ARE DOWN?**

10 **A.** Yes. As of June 30, 2015, the VXV was trading at 18.47 indicating investors expect an
 11 annualized change of 18.47% over the next 90 days on an annual basis. June 30th was at
 12 the height of uncertainties regarding the Greek credit crisis. After the negotiations

1 resumed with between Greece and its creditors the VXV index fell to 15.60 by July 15,
2 2015 and 15.13 by July 31, 2015. This is down from a high of over 60 during the
3 financial crisis in 2008 and near historic lows since the index was initiated.

4 **Q. WHAT, IF ANYTHING, DOES A LOW VIX INDEX INDICATE WITH REGARD**
5 **TO THE COST OF EQUITY?**

6 A. Studies have shown that there is a positive correlation between the equity risk premium
7 and the expected volatility as indicated by the VIX index.¹⁹ As the VIX decreases,
8 investors view the market as less risky and therefore generally demand a lower premium
9 to purchase equities over U.S. Treasuries or other lower risk investment. This indicates a
10 lower cost of equity.

11 **INTEREST RATES**

12 **Q. DO INVESTORS EXPECT U.S. GOVERNMENT BOND YIELDS TO STAY AT**
13 **THESE LOW LEVELS?**

14 A. Yes. The yields on short-term U.S. Treasuries are still being kept at near zero by the
15 United States Government and yields on long-term U.S. government bonds have been
16 decreasing in recent months. The market data is consistent with recent comments made
17 by Federal Reserve Chairman Janet Yellen who stated at a presentation on May 22, 2015
18 regarding raising interest rates, “After we begin raising the federal funds rate, I anticipate
19 that the pace of normalization is likely to be gradual.”²⁰ Fed-funds futures indicate that

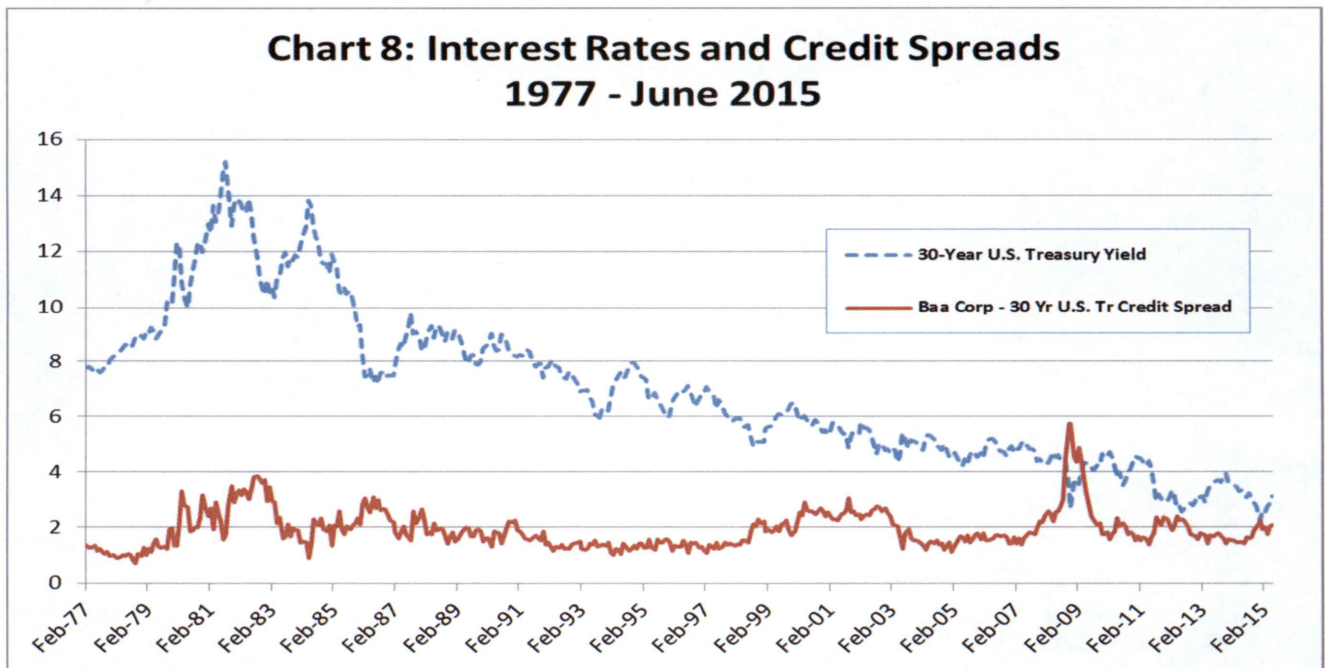
¹⁹ Aswath Damodaran, *Equity Risk Premiums (ERP): Determinates, Estimation and Implications* – The 2014 Edition (paper updated, March 2015). Pages 98-101.

²⁰ <http://www.federalreserve.gov/newsevents/speech/yellen20150522a.htm>

1 investors believe there is 31% chance that the Federal Reserve will increase rates in
2 September 2015²¹ and the market expects rates to be increased more gradually than
3 published Federal Reserve projections.²²

4 **Q. WHAT DO LOW U.S. TREASURY YIELDS MEAN FOR THE COST OF**
5 **EQUITY?**

6 A. Historical market data shows that low interest rates indicate a low cost of equity. Chart 8
7 below shows that as interest rates decrease the credit spread between Baa rated corporate
8 bonds and U.S Treasuries has remained relatively stable (except for the great recession).
9 This chart indicates that the cost of equity decreases as interest rates decrease because the
10 extra yield investors demand to purchase Baa Corporate bonds, and equities, is over a
11 lower “risk free” rate of return.

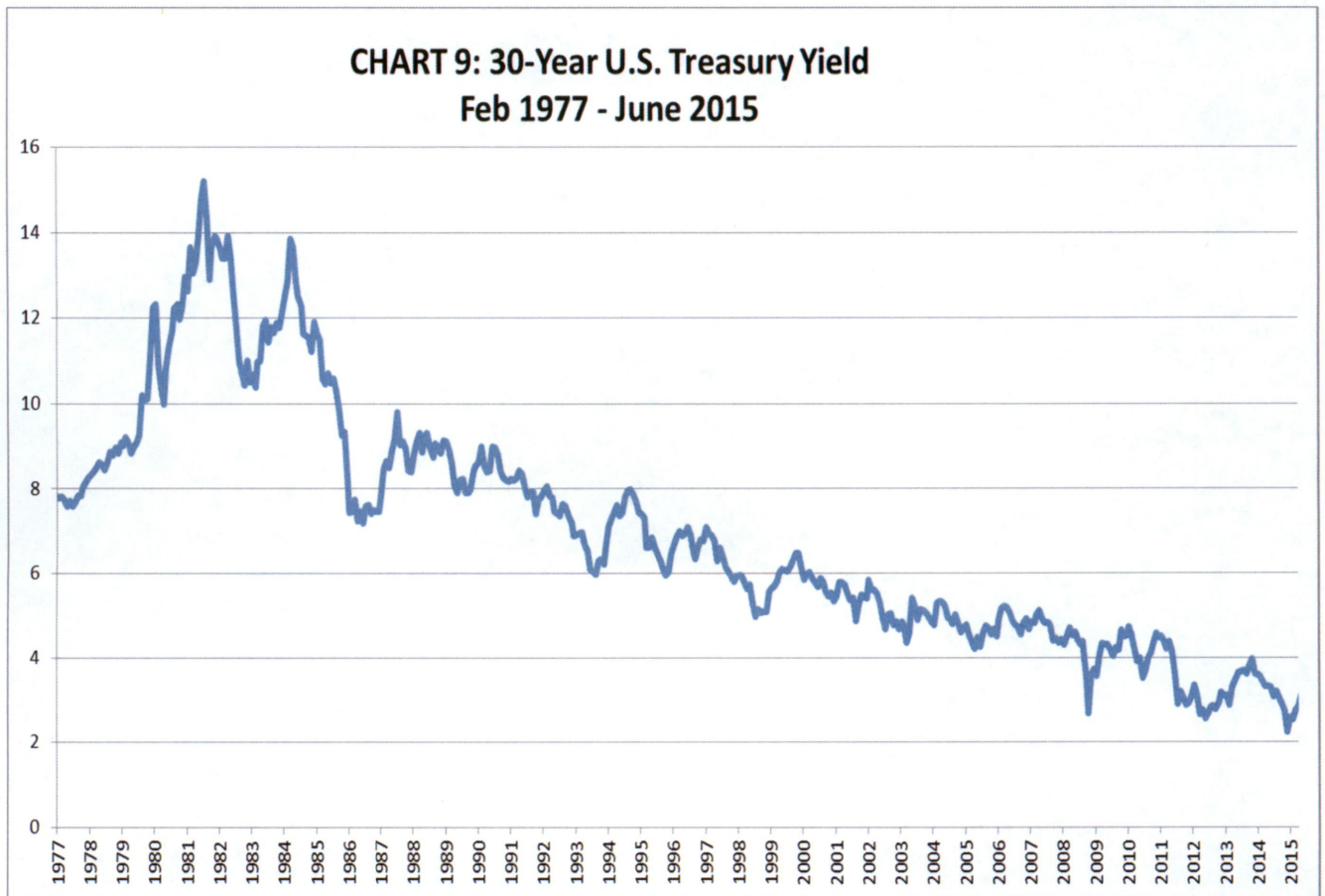


²¹ “U.S Stocks Ease on Rate Worries” Wall Street Journal June 5, 2015.

²² “Fed Hones Tricky Message as It Nears Boosting Rates, June 14, 2015

1 **Q. CAN YOU PLEASE PUT THE CURRENT INTEREST RATE ON 30-YEAR U.S.**
2 **TREASURY BONDS INTO HISTORICAL PERSPECTIVE?**

3 A. The following graph shows that, as of June 2015 the yield on 30-year Treasury bonds is
4 low by historical standards. The rate has been in a long-term downward trend since the
5 very early 1980's when the annual yield peaked just below 14%. As shown in the chart
6 below, yields on 30-year U.S. Treasury Bonds have increased from about 2.9% in April
7 2013 to nearly 4.0% by the end of 2013 and has fallen to under 2.8% in May 2015 and
8 just over 3% in June 2015. As of July 31, 2015 the yield has fallen below 3%.



9
10 **Q. DO YOU KNOW WHAT INTEREST RATES WILL BE IN THE FUTURE?**

1 A. No. Although Janet Yellen has indicated that it may be appropriate to start raising the
2 federal funds rate this year, she emphasized the uncertainty surrounding forecasting the
3 economy and the financial markets in a recent speech in Providence Rhode Island,
4 stating:

5 I am describing the outlook that I see as most likely, but based on many years of
6 making economic projections, I can assure you that any specific projections I
7 write down will turn out to be wrong, perhaps markedly so.

8 Many economists and forecasters will continue to be quoted in the press even regarding
9 developments that are unpredictable. The Nobel Laureate Economist Daniel Kahneman
10 stated the following regarding forecasting:

11 It is wise to take admissions of uncertainty seriously, but declarations of high
12 confidence mainly tell you that an individual has constructed a coherent story in
13 his mind, not necessarily that the story is true.²³

14 Daniel Kanheman found that the trading industry is based on an “allusion of
15 skill.” His research showed no correlation between the performances of advisors from
16 year to year indicating that the results resembled what you would expect from a “dice
17 rolling contest, not a game of skill,” stating:

18 The evidence from more than fifty years of research is conclusive: for a large
19 majority of fund managers, the selection of stocks is more like rolling dice than
20 like playing poker.²⁴

21 Montana-Dakota’s cost of capital is based on the current capital markets and we
22 should not fall into the trap of giving weight to forecasts over market data. Such
23 forecasts have been found to be inaccurate (See Chart 1 that compares the 2010 Blue
24 Chip Financial Forecasts 30 U.S. Treasury Yield projections to actuals). In addition, the

²³ Daniel Kahneman, *Thinking Fast and Slow* (New York: Farrar, Straus and Gigoux, 2011): 212.

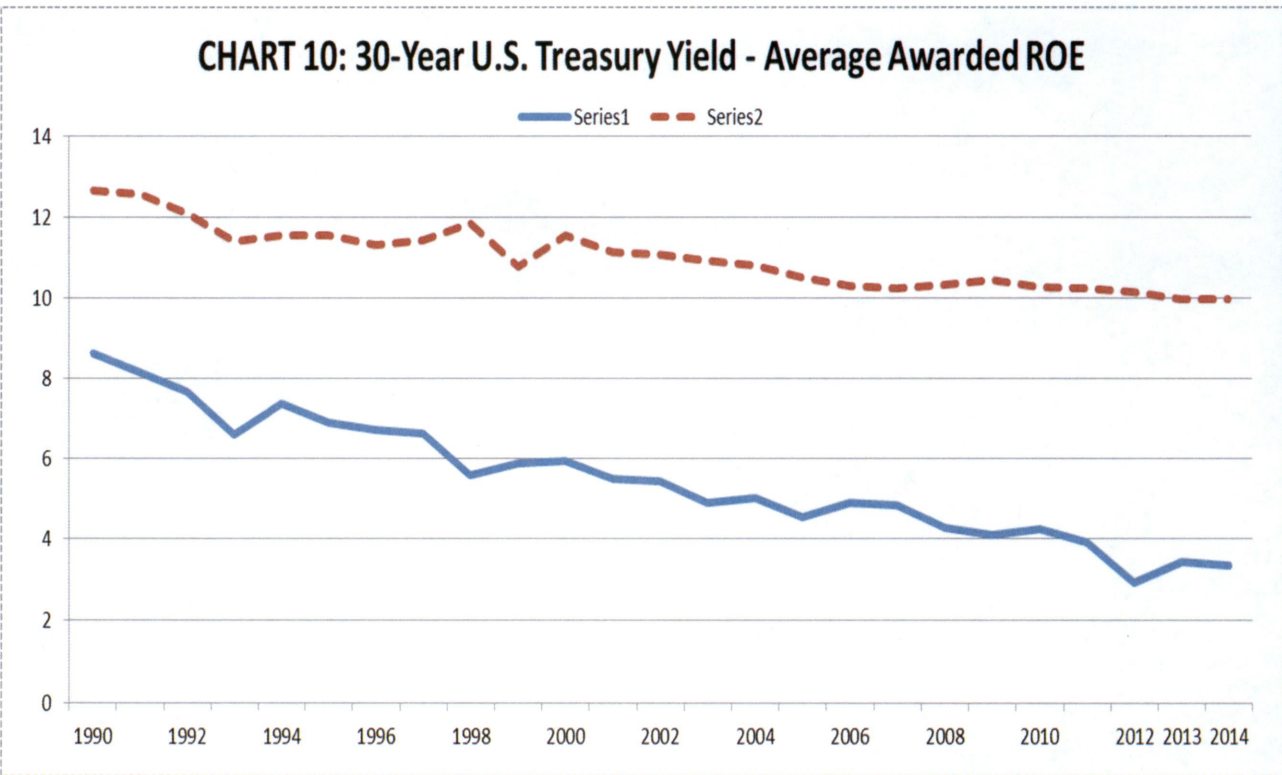
²⁴ *Ibid*: 215

1 utilization of these forecasts violate rate making principles; namely that the cost of equity
2 should be market based.

3 **Q. HAVE UTILITY COMMISSIONS FOLLOWED THE DOWNWARD TREND IN**
4 **INTEREST RATES WITH AN ASSOCIATED DOWNWARD TREND IN**
5 **AUTHORIZED RETURNS?**

6 A. Yes, but not in proportion. The following graph shows the relationship between the
7 average allowed return on common equity awarded to regulated electric utility companies
8 and the interest rate on long-term U. S. Treasury bonds. Even with the increase in interest
9 rates in 2014, the spread between average allowed returns in 10-year U.S. Treasury
10 Yields is 744 basis points.²⁵

11



12

²⁵ 9.98% Average Allowed Electric ROE in 2014 – 2.54% Average Yield on 10 Year U.S. Treasury bond in 2014.

1 **Q. HAVE SOME PUBLIC UTILITY COMMISSIONS ISSUED DETERMINATIONS**
2 **WHERE A COMPANY'S RETURN ON EQUITY IS LESS THAN THE**
3 **AVERAGE AWARD OF ABOUT 10%?**

4 A. Yes. Because we have been speaking about an average as well as an average that is
5 declining, a number of Commissions have obviously made determinations of companies'
6 cost of equity at below 10%, including the Montana Public Service Commission's May
7 20, 2015 order allowing return of 9.50%²⁶ for Montana-Dakota Utilities Co.'s Montana
8 operations.

9 Chart 10 above demonstrates that allowed returns trended in the same general
10 direction as long-term interest rates until about 2006, but once the average allowed return
11 reached about 10%, the average stopped tracking the 30-year U.S. Treasury Yields. Even
12 though interest rates continued to drop since 2005, average allowed returns are just
13 starting to drop below 10%. The Ibbotson SBBI 2013 Classic Yearbook states:

14 The average target return on equity that regulators granted utilities
15 dropped to 9.9% during the second quarter, its lowest level in at least 20
16 years. Even with this drop, the spread between these allowed returns and
17 the 10-year U.S. Treasury yield remains at all-time highs near 800 basis
18 points.²⁷

19 The 9.50% allowed return on May 20, 2015 is 715 basis points (9.5% -
20 2.35%) above the current 10-year U.S. Treasury yield of 2.35%²⁸ indicating that
21 an allowed return of over 9.0% is likely high by the measure chosen by Ibbotson
22 Associates.

²⁶ Order No. 7373c, DOCKET NO. D2014.8.72

²⁷ Ibbotson SBBI 2013 Classic Yearbook, page 28.

²⁸ July 17, 2015, Yahoo Finance

1 **Q. FROM YOUR EXPERIENCE IN UTILITY REGULATION, WHY DO YOU**
2 **THINK THE AVERAGE ALLOWED RETURN HAS JUST RECENTLY**
3 **DROPPED BELOW 10%?**

4 A. While no reasons are provided to explain the significant lag between the actual decrease
5 in the cost of equity in the markets and the average return to regulated utilities allowed by
6 public utility commissions, as company witnesses often contend, there is a persistent
7 disbelief that interest rates could stay as low as they have for as long as they have. The
8 end result is that, on average, allowed returns have been artificially kept higher than
9 necessary. As discussed earlier, although interest rates have increased in 2013, spreads
10 between allowed returns and interest rates are still near historical highs. As quoted
11 earlier, the Fed Chairman indicated “the pace of normalization is likely to be gradual”
12 and it is possible the low interest rate environment will remain for some time.

13

14 **V. COST OF EQUITY CALCULATION**

15 **a. DISCOUNTED CASH FLOW**

16 **Q. WHICH COMPANIES DID YOU INCLUDE IN YOUR COMPARABLE GROUP**
17 **OF UTILITY COMPANIES TO DETERMINE YOUR COST OF EQUITY**
18 **RECOMMENDATION?**

19 A. I included the same nine U.S. gas utility companies, (referred to as “Proxy Group” in my
20 testimony) used by Company Witness Dr. Gaske as shown on schedule 3 of his direct
21 testimony.

1 **Q. HOW DID YOU ARRIVE AT YOUR COST OF EQUITY**
2 **RECOMMENDATIONS?**

3 A. I used the constant growth form of the Discounted Cash Flow (“DCF”) method that
4 determines growth based on the sustainable retention growth procedure. I used a non-
5 constant DCF method as a check. Later in my testimony I explain the theory behind the
6 DCF method and why it is the best way to determine investor expected returns.

7 **Q. WHAT IS THE DISCOUNTED CASH FLOW METHOD?**

8 A. The Discounted Cash Flow, or DCF method is an approach to determining the cost of
9 equity which recognizes that investors purchase common stock to receive future cash
10 payments. These payments come from: (a) current and future dividends; and (b)
11 proceeds from selling stock. A rational investor will buy stock to receive dividends and
12 to ultimately sell the stock to another investor at a gain. The price the new owner is
13 willing to pay for stock is related to the future flow of dividends and the future expected
14 selling price. The value of the stock is the discounted value of all future dividends until
15 the stock is sold plus the value of proceeds from the sale of the stock. For example, if the
16 cost of equity is 9% and the dividend is \$1 per share, then the \$1 dividend paid out next
17 year is today worth $\$1/[\$1+.09]$ which equals \$0.92 reflecting the discounted present
18 value.

19 **Q. HAVE INVESTORS ALWAYS USED THE DCF METHOD?**

20 A. While investors who buy stock have always done so for future cash flow, the DCF
21 approach first appeared in the 1937 Harvard Ph.D. thesis of John Burr Williams titled *The*
22 *Theory of Investment Value*. “Williams’ model for valuing a security calls for the

1 investor to make a long-run projection of a company's future dividend payments ...²⁹

2 The Williams DCF model separately discounts each and every future expected cash flow.

3 Its accuracy is therefore unaffected by non-constant growth rates. Myron Gordon and Eli

4 Shapiro who helped to make this method widely used, referred to Williams' work in their

5 paper published in 1956 "Equipment Analysis: The Required Rate of Profit."

6 **Q. HOW DID INVESTORS EVALUATE STOCKS BEFORE WILLIAMS**
7 **INTRODUCED THE DCF METHOD?**

8 A. Before the DCF method, investors used methods such as P/E ratios (or its reciprocal the
9 E/P ratio, or earnings yield), or dividend yield (D/P). While these methods are still used
10 today, knowledgeable investors are aware that they are very incomplete and provide only
11 rough guidelines to investment value.

12 The appropriate P/E ratio for a company with high growth prospects can be much
13 higher than for a company with meager growth opportunities. Therefore, P/E ratios alone
14 do not predict the total return an investor expects to earn from purchasing stock in that
15 company. Similarly, the D/P analysis cannot distinguish important differences between
16 companies with similar D/P ratios but vastly different prospects for future dividend
17 payments. By concentrating on both current dividends and future expected dividend
18 payments, the Williams or non-constant DCF model filled in the major gaps in the P/E

²⁹ P. BERNSTEIN, *Capital Ideas: The Improbable Origins of Modern Wall Street* (The Free Press, © 1992).

1 ratio and D/P methods. I will discuss the use of the non-constant growth form of the
2 DCF model in detail later in my testimony.³⁰

3 **CONSTANT GROWTH FORM OF THE DCF MODEL**

4 **Q. WHAT IS THE CONSTANT GROWTH FORM OF THE DCF MODEL?**

5 A. The constant growth form of the DCF model is a form of the DCF method that can be
6 used in determining the cost of equity when investors can reasonably expect that growth
7 of retained earnings and dividends will be constant.

8 **Q. WHAT ARE RETAINED EARNINGS?**

9 A. Retained earnings are funds that a company keeps to grow and invest in business or pay
10 off debt.

11 **Q. WHY DO INVESTORS LOOK AT THE GROWTH OF RETAINED EARNINGS?**

12 A. Retained earnings show investors whether the company is growing which, in turn, is a
13 measure of the future indicator of the value of a company's stock.

14 **Q. PLEASE DESCRIBE THE CONSTANT GROWTH MODEL.**

15 A. The constant growth model is described by this equation $k = D/P + g$, where:³¹

16 k= cost of equity;

17 D=Dividend rate; and

18 P=Market price of stock.

³⁰ I use the result of my non-constant growth method as a check on my constant growth DCF result. See Schedule ALR 2 for the results of both of these methods.

³¹ M. GORDON, *Cost of Capital to a Public Utility*, at 32-33 (MSU Public Utility Studies 1974).

1 In the above equation:

2

3 g =the growth rate, where $g= br + sv$;

4 b =the earnings retention rate;

5 r =rate of return on common equity investment;

6 v =the fraction of funds raised by the sale of stock that increases the book value of
7 the existing shareholders' common equity; and

8 s =the rate of continuous new stock financing.

9 The constant growth model is therefore correctly recognized to be:

10

11 $k=D/P + (br +sv)$

12 **Q. WHAT OTHER FACTORS IMPACT THE USE OF THE CONSTANT GROWTH**
13 **FORM OF THE DCF MODEL?**

14 A. Sufficient care must be taken to assure that the growth rate “g” is representative of the
15 constant sustainable growth required for the answer from the constant growth form of the
16 DCF model to be meaningful. In order to obtain a creditable constant growth DCF result
17 the mathematical relationship between earnings, dividends, book value and stock price
18 must be respected.

19 For example, suppose one is faced with a situation where Value Line forecasts are
20 being used as a source for inputs and Value Line projects different growth rates for
21 earnings per share and dividends per share. Under such conditions, the earnings per share
22 growth rate does not provide a reasonable proxy for earnings per share growth, and
23 dividends per share and stock price growth as well. Consider the following:

1 1. It is the lower dividend growth rate that makes it possible for more
2 earnings to be retained, which in turn makes the earnings per share growth rate
3 higher than it would be if dividends had in fact been modeled by Value Line to
4 keep pace with earnings per share growth.

5 2. The lower dividend growth rate than both the earnings per share growth
6 rate and the stock price growth rate means that the dividend yield will be going
7 down. Yet, the constant growth form of the DCF model has no mechanism to
8 account for the lower dividend yield investors would get if the Value Line
9 projections were correct.

10 Using an earnings per share growth rate in the constant growth form of the DCF
11 model will therefore result in an overstatement of the cost of equity whenever the
12 earnings per share growth rate that has been modeled by the analyst was derived along
13 with an expectation of a lower dividend growth rate. This is because under these
14 conditions, the dividend yield portion of the constant growth form of the equation will be
15 overstated.

16 The basic difference between the use of an analysts earnings per share growth rate
17 in the constant growth DCF formula and using the “br” (b=the earnings retention rate X
18 the rate of return on common equity investment) approach is that the “br” form if
19 properly applied eliminates the mathematical error caused by an inconsistency between
20 the expectations for earnings per share growth and dividends per share growth. Because
21 of the elimination of mathematical problems in the constant growth form due to
22 inconsistencies between the earnings per share and dividends per share growth rate, the

1 accuracy of the results of a properly applied “br” approach will be superior and often
2 materially superior to the answer obtained from other approaches to the constant growth
3 form of the DCF model. This is not to say that even a properly applied “br” approach
4 will be perfect. The self-correcting nature of a properly applied “br” to forecasted
5 differences in earnings per share and dividends per share growth rates is a big help in
6 mitigating the resultant computational error but should not be viewed as the perfect way
7 to quantify the impact of expected non-constant growth rates.

8 **Q. HOW CAN INACCURACIES IN THE DCF RESULT, CAUSED BY**
9 **FORECASTED DIFFERENCES BETWEEN THE EPS GROWTH RATE AND**
10 **THE DIVIDENDS PER SHARE GROWTH RATE, BE ELIMINATED?**

11 A. One way to correct such a problem is to reject the constant growth DCF model in favor of
12 the non-constant growth DCF model. The non-constant growth DCF model separately
13 discounts the anticipated cash flow in each subsequent year so that changes in the
14 dividend payout ratio and anticipated changes in the earned return on book equity can
15 both be quantified in a way that retains mathematical accuracy. The simplest way to
16 avoid adding this extra complexity in a way that, especially for regulated public utilities,
17 will generally retain mostly all of the accuracy obtainable from the non-constant growth
18 model is to quantify growth by using “br” + “sv,” in which:

- 19 1. The retention rate “b” is the earnings retention ratio computed to be
20 consistent with the dividend rate used in the D/P term of the constant growth DCF
21 formula, and

1 2. It is recognized that at any point in time, the price investors are willing to
2 pay for a company's stock relates to what earnings are expected at that time. The
3 only relevant estimate of the return on equity "r" that should be used in the DCF
4 formula is the one that investors expect to be on average earned at the time of the
5 quantification of the stock price used in the DCF formula.

6 By following these two relatively simple guidelines, the accuracy of the DCF
7 method will in most cases be highly dependent on the estimate for the value of the future
8 expected return on book equity, "r."

9 **Q. ARE YOU AWARE OF CLAIMS THAT A PROBLEM WITH THE "BR"**
10 **APPROACH TO THE CONSTANT GROWTH DCF MODEL IS THAT IT**
11 **RELIES ON THE VALUE OF THE FUTURE EXPECTED RETURN ON BOOK**
12 **EQUITY "r" TO ESTIMATE WHAT THE EARNED RETURN ON EQUITY**
13 **SHOULD BE?**

14 **A. Yes. There are multiple reasons why this concern is unfounded:**

15 1. The constant growth form of the equation using br is:

$$k = D/P + (br + sv).$$

17 In this equation, k is the variable for the cost of equity, and r is the future
18 expected return on equity. The cost of equity, "k," is not the same variable as the
19 future expected earned return on equity, "r." In fact, there often is a large
20 difference between the two.

1 2. The correct value to use for “r” is the return on book equity expected by
2 investors as of the time the stock price and dividend data is used to quantify the
3 D/P term in the equation. Therefore, even if future events occur that may change
4 what investors expect for “r”, the computation of the cost of equity “k” remains
5 correct as of the time the computation was made.

6 3. The ability of a commission decision to influence future cash flow
7 expectations is not unique to the retention growth approach to the DCF method.
8 The five-year analysts’ earnings per share growth rate is a computation that is
9 directly influenced by what earnings per share will be in five years. A change in
10 what analysts expect will be the allowed return on equity for earnings generated
11 five years from now will change not only the expected earnings per share five
12 years from now, but will also change the five year earnings per share growth rate.

13 **Q. CAN CHANGES IN THE OVERALL EARNED RETURN IMPACT GROWTH**
14 **ABOVE AND BEYOND WHATEVER GROWTH RESULTS FROM EARNINGS**
15 **RETENTION?**

16 A. Yes, but one-time changes in EPS caused by a perceived change in the future expected
17 earned returns are unsustainable. The new perceived earned return on book equity should
18 be part of the computation, but the one-time growth spurt to get there is no more
19 indicative of the sustainable growth required in the constant growth DCF formula than
20 the temporary negative growth that occurs when a company has a bad year.

21 **Q. HOW HAVE YOU IMPLEMENTED THE CONSTANT GROWTH FORM OF**
22 **THE DCF MODEL IN THIS CASE?**

1 A. I have applied the constant growth form of the DCF model by staying true to the
2 mathematically derived “ $k=D/P + (br + sv)$ ” form of the DCF model. I have also taken
3 care to fully allocate all future expected earnings to either future cash flow in the form of
4 dividends (“D”) or to retained earnings (the retention rate, “b”). This extra accuracy is
5 obtained only when the retention rate “b” is derived from the values used for “D” and “r”
6 rather than independently.

7 This DCF method was applied to a Proxy Group of 9 U.S. gas utilities used by
8 Company witness Dr. Gaske.

9 **Q. PLEASE EXPLAIN HOW YOU OBTAINED THE VALUES TO INPUT INTO**
10 **THE CONSTANT GROWTH FORM OF THE DCF METHOD.**

11 A. The DCF model generally calls for the use of the dividend expected over the next year.
12 A reasonable way to estimate next year’s dividend rate is to increase the quarterly
13 dividend rate by $\frac{1}{2}$ of the current actual quarterly dividend rate. This is a good
14 approximation of the rate that would be obtained if the full prior year’s dividend were
15 escalated by the entire growth rate.³²

³² For example, assume a company paid a dividend of \$0.50 in the first quarter a year ago, and has a dividend growth rate of 4 % per year. This dividend growth rate equals $(1.04)^4 - 1 = 0.00985$ % per quarter. Thus, the dividend is \$.5049 in the second quarter, \$.5099 in the third quarter, and \$0.5149 in the fourth quarter.

If that 4 % per annum growth continues into the following year, then the dividend would be \$0.5199 in the 1st quarter, \$0.5251 in the 2nd quarter, \$0.5303 in the 3rd quarter, and \$0.5355 in the 4th quarter. Thus, the total dividends for the following year equal \$2.111 ($0.5199 + 0.5251 + 0.5303 + 0.5355$). I computed the dividend yield by taking the current quarter (the \$0.5149 in the 4th quarter in this example), and multiplying it by 4 to get an annual rate of \$2.06. I then escalated this \$2.06 by $\frac{1}{2}$ the 4 % growth rate, which means it is increased by 2 %. $\$2.06 \times 1.02 = \2.101 , which is within one cent of the \$2.111 obtained in the example.³²

1 I obtained the stock price “P” used in my DCF analysis from the closing prices of
2 the stocks on June 30, 2015. I also obtained an average stock price for the 12 months
3 ending June 30, 2015 by averaging the high and low stock prices for the year.

4 I based the value of the future expected return on equity, “r”, on the average
5 return on book equity expected by Value Line. I also made a computation that was based
6 on a review of both the earned return on equity consistent with analysts’ consensus
7 earnings growth rate expectations and on the actual earned returns on equity. For a stable
8 industry such as utility companies, investors will look at typical actual earned returns on
9 equity as one meaningful input into what can be expected for future earned returns on
10 book equity. See Schedule ALR 4, page 1.

11 This return on book equity expectation used in the DCF method to compute
12 growth must *not* be confused with the cost of equity. Since the stock prices for the
13 comparative companies are considerably higher than their book value, the return
14 investors expect to receive on their market price investment is considerably less than
15 whatever is the anticipated return on book value. If the market price is low, the cost of
16 equity will be higher than the future expected return on book equity, and if the market
17 price is high, then the return on book equity will be less than the cost of equity.

18 In addition to growing through the retention of earnings, utility companies also
19 grow by selling new common stock. I quantified this growth caused by the sale of new
20 common stock above book value by multiplying the amount that the actual market-to-
21 book ratio exceeds 1.0 by the compound annual growth rate of stock that Value Line

1 forecasts. The results of that computation are shown on line 4 of Schedules ALR 4, page
2 1.

3 Pure financial theory tends to prefer concentrating on the results from the most
4 current price because investors cannot purchase stock at historical prices. Others are
5 concerned about the potential distortion of using just a spot price. I present both so the
6 Commission can use the perspective it feels is most appropriate. As shown on Schedule
7 ALR 2, my DCF method, applied to the Proxy group, the DCF result based on the year-
8 end stock price and the DCF result based on average prices for the year ending June 30,
9 2015 is 8.32% and as of June 30, 2015 the result is 8.92%. Schedule ALR 4, page 1
10 shows more of the specifics of how I implemented the constant growth form of the DCF
11 model for the Proxy group.

12 **Q. PLEASE EXPLAIN HOW YOU DETERMINED WHAT VALUE TO USE FOR**
13 **“R” WHEN COMPUTING GROWTH IN YOUR CONSTANT GROWTH FORM**
14 **OF THE DCF MODEL.**

15 A. The inputs I considered are shown in Footnote [A] of Schedule ALR 4, page 1. The value
16 of “r” that is appropriate to use in the DCF formula is the value anticipated by investors
17 to be maintained on average in the future. This schedule shows that the average future
18 return on equity forecast by Value Line on average for the Proxy group for 2018-2020 is
19 11.06%. The same footnote also shows that the future expected return on equity derived
20 from the Zacks consensus forecast is 10.26%, and that the actual returns on equity earned
21 on average by the Proxy Group were 10.74% in 2012, 10.09% in 2013 and 10.19% in
22 2014. Based on the combination of the forecast return on equity derived from the Zacks

1 consensus, the recent historical actual earned returns and Value Line's forecast, I made
2 the DCF growth computation using a 11% value of "r".

3 **Q. WHAT COST OF EQUITY IS INDICATED BY THE CONSTANT GROWTH**
4 **FORM OF THE DCF METHOD THAT YOU RELY ON FOR YOUR**
5 **RECOMMENDATION?**

6 A. The result of my DCF analysis using the Constant Growth form of the DCF indicates a
7 cost of equity range of between 8.32% and 8.92% for the Proxy group.³³ Since these
8 DCF findings use analysts' forecasts to derive sustainable growth in the Retention
9 Growth DCF method and relies on analysts' forecasts of dividend growth and book value
10 growth in the non-constant form of the DCF method, the results should be considered as
11 conservatively high.

12 It should be noted that the results I have obtained are not as influenced by over-
13 optimistic analysts' forecasts as would have been the case if I had merely used analysts'
14 five year earnings growth rate forecasts as a proxy for long-term growth. This is because
15 the DCF methods I use compute sustainable growth rates rather than growth rates that
16 exaggerate the growth rate due to end-point distortion.

17 c. **NON-CONSTANT GROWTH FORM OF THE DCF MODEL**

18 **Q. WHAT IS THE NON-CONSTANT GROWTH FORM OF THE DCF MODEL?**

19 A. The non-constant growth form of the DCF model is a method that accounts for growth
20 rates that change over time.

³³ Schedule ALR 2

1 **Q. EARLIER YOU STATE THAT YOU USED THE NON-CONSTANT GROWTH**
2 **FORM OF THE DCF MODEL AS A CHECK. PLEASE EXPLAIN HOW YOU**
3 **DID THAT.**

4 A. The non-constant growth form of the DCF model determines the return on investment
5 expected by investors based on an estimate of each separate annual cash flow the investor
6 expects to receive. For the purpose of this computation, I relied on Value Line's detailed
7 annual forecasts to arrive at the specific non-constant growth expectations that an
8 investor who trusts Value Line would expect. This implementation is shown on schedule
9 ALR 4, page 2. The first cash flow entry is the cash outflow an investor would
10 experience when buying a share of stock at the market price. The subsequent years of
11 cash flow are equal to the dividends per share that Value Line forecasts. For the
12 intermediate years of the forecast period in which Value Line does not provide a specific
13 dividend, the annual dividends were obtained by estimating that dividend growth would
14 persist at a compound annual rate. The cash flow at the end of the forecast period
15 consists of both the last year's dividend forecast by Value Line and the proceeds from the
16 sale of the stock. The stock price used to determine the proceeds from selling the stock
17 was obtained by estimating the stock price would grow at the same rate Value Line
18 forecasts book value to grow.

19 **Q. WHY DID YOU USE BOOK VALUE GROWTH TO PROVIDE THE ESTIMATE**
20 **OF THE FUTURE STOCK PRICE?**

21 A. For any given earned return on book equity, earnings are directly proportional to the book
22 value. Furthermore, book value growth is the net result after the company produces

1 earnings, pays a dividend and also perhaps either sells new common stock at market price
2 or repurchases its own common stock at market price.

3 Once these cash flows are entered into an Excel spreadsheet, the compound
4 annual return an investor would achieve as a result of making this investment was
5 obtained by using the Internal Rate of Return (IRR) function built into the spreadsheet.
6 As shown on Schedule ALR 4, page 2 this multi-stage DCF model produced an average
7 indicated cost of equity of 8.23% for the Proxy Group.

8 **Q. YOUR NON-CONSTANT GROWTH DCF MODEL USES ANNUAL EXPECTED**
9 **CASH FLOWS. SINCE DIVIDENDS ARE PAID QUARTERLY RATHER THAN**
10 **ANNUALLY, HOW DOES THIS SIMPLIFICATION IMPACT YOUR RESULTS?**

11 A. I used the annual model because it is easier to both input the data and for observers to
12 visualize what is happening. By modeling cash flows to be annual rather than when they
13 actually are expected to occur causes a small overstatement of the cost of equity.

14 **Q. WHY IS IT A SMALL OVERSTATEMENT IF YOU HAVE MODELED**
15 **DIVIDENDS TO BE RECEIVED SOME MONTHS AFTER INVESTORS**
16 **ACTUALLY EXPECT TO GET THEM?**

17 A. The process of changing from an annual model to a quarterly model would require two
18 changes, not just one. A quarterly model would show dividends being paid sooner and
19 would also show earnings being available sooner. A company that receives their earnings
20 sooner, rather than at the end of the year, has the opportunity to compound them. Since
21 revenues and therefore earnings are essentially received every day, a company that is
22 supposed to earn an annual rate of 9.00% on equity would only have to earn 8.62% if the

1 return were compounded daily.³⁴ This reduction from 9.00% to 8.62% would then be
2 partially offset by the impact of the quarterly dividend payment to bring the result of
3 switching from the simplifying annual model closer to, but still a bit below, 9.00%.

4 **Q. BY USING CASH FLOW EXPECTATIONS AS THE VALUATION**
5 **PARAMETER, DOES THE NON-CONSTANT DCF MODEL STILL RELY ON**
6 **EARNINGS?**

7 A. It relies on an expectation of future cash flows. Future cash flows come from dividends
8 during the time the stock is owned and the proceeds from the sale of the stock once it is
9 sold. Since earnings impact both dividends and stock price, the non-constant DCF model
10 still relies on earnings

11 Every dollar of earnings is used for the benefit of stockholders, either in the form
12 of a dividend payment or earnings reinvested for future growth in earnings and/or
13 dividends. Earnings paid out as a dividend have a different value to investors than
14 earnings retained in the business. Recognizing this difference and properly considering it
15 in the quantification process is a major strength of the DCF model, and is why the non-
16 constant DCF model is as I have set forth an improvement over either the P/E ratio or
17 D/P methods.

18 **Q. WHY IS THERE A DIFFERENCE TO INVESTORS IN THE VALUE OF**
19 **EARNINGS PAID OUT AS A DIVIDEND COMPARED TO THE VALUE OF**
20 **EARNINGS RETAINED IN THE BUSINESS?**

³⁴ $(1+.0862/365)^{365}=1.09=9.00\%$.

1 A. The return on earnings retained in the business depends upon the opportunities available
2 to that company. If a regulated utility reinvests earnings in needed used and useful utility
3 assets, then those reinvested earnings earn at whatever return is consistent with the
4 ratemaking procedures allowed and the skill of management.

5 When an investor receives a dividend, he can either reinvest it in the same or
6 another company or use it for other things, such as paying down debt or paying living
7 expenses. Although an investor could theoretically use the proceeds from any dividend
8 payments to simply buy more stock in the same company, when an investor increases his
9 investment in a company by purchasing more stock the transaction occurs at market
10 price. However, when the same investor sees his investment in a company increase
11 because earnings are retained rather than paid as a dividend, the reinvestment occurs at
12 book value. Stated within the context of the DCF terminology: earnings retained in the
13 business earn at the future expected return on book equity “r,” and dividends used to
14 purchase new stock earn at the rate “k.” When the market price exceeds book value (that
15 is, the market-to-book ratio exceeds 1.0), retained earnings are worth more than earnings
16 paid out as a dividend because “r” will be higher than “k.” Conversely, when the market
17 price is below book value, “k” will be higher than “r,” meaning that earnings paid out as
18 a dividend earn a higher rate than retained earnings.

19 **Q. IF RETAINED EARNINGS WERE MORE VALUABLE WHEN THE MARKET-**
20 **TO-BOOK RATIO IS ABOVE 1.0, WHY WOULD A COMPANY WITH A**
21 **MARKET-TO-BOOK RATIO ABOVE 1.0 PAY A DIVIDEND RATHER THAN**
22 **RETAIN ALL OF THE EARNINGS?**

1 A. Retained earnings are only more valuable than dividends if there are sufficient
2 opportunities to profitably reinvest those earnings. Regulated utility companies are only
3 allowed to earn the cost of capital on assets that are used and useful in providing safe and
4 adequate utility service. Investing in assets that are not needed may not produce any
5 return at all.

6 Opportunities for unregulated companies to reinvest funds are limited by the
7 demands of the business. How many new computer chips can Intel profitably develop at
8 the same time?

9 **Q. IS THE DCF METHOD STILL VALID WHEN MARKET-TO-BOOK RATIOS**
10 **ARE DIFFERENT THAN ONE?**

11 A. Yes. It is old methods like the P/E ratio whose accuracy deteriorates as the market-to-
12 book ratio varies from unity. The DCF model is specifically designed to recognize the
13 difference in the value of earnings paid out as a dividend and retained earnings, a
14 properly applied DCF model maintains its accuracy irrespective of the market-to-book
15 ratio.

16 **Q. HAVE YOU SEEN WITNESSES IN PUBLIC UTILITY RATE PROCEEDINGS**
17 **CLAIM THAT THE DCF METHOD LOSES ITS ACCURACY AS THE**
18 **MARKET-TO-BOOK RATIO VARIES FROM 1.0?**

19 A. Yes. However, such statements are unwarranted. The basis for and the very
20 development of the DCF model is to provide a mathematical model that produces a
21 reliable result irrespective of the market to book ratio. It is the older, more basic,

1 Earnings to Price ratio method that the DCF method replaced which suffers from the
2 problem of needing a market to book ratio of 1.0 to work.

3 **Q. UNDER THE NON-CONSTANT DCF MODEL, IS IT NECESSARY FOR**
4 **EARNINGS AND DIVIDENDS TO GROW AT A CONSTANT RATE FOR THE**
5 **MODEL TO BE ABLE TO ACCURATELY DETERMINE THE COST OF**
6 **EQUITY?**

7 A. No. Because the non-constant form of the DCF model separately discounts each and
8 every future expected cash flow, it does *not* rely on any assumptions of constant growth.
9 The dividend yield can be different from period to period, and growth can bounce around
10 in any imaginable pattern without harming the accuracy of the answer obtained from
11 quantifying those expectations. When the non-constant DCF model is correctly used, the
12 answer obtained is as accurate as the estimates of future cash flow.

13 **Q. IS THE NON-CONSTANT FORM OF THE DCF MODEL GENERALLY USED**
14 **IN UTILITY RATE PROCEEDINGS?**

15 A. Both forms are used, but the constant growth formula is more common (often referred to
16 as the Gordon model).³⁵

17 **Q. HOW DID YOUR USE OF THE NON-CONSTANT GROWTH FORM OF THE**
18 **DCF MODEL CONFIRM YOUR RECOMMEND ROE.**

³⁵ The constant growth model is generally recognized as first having been used in a utility rate proceeding by Dr. Myron Gordon. He demonstrated that it was possible to simplify the Williams DCF model for application to public utility companies.

1 A. By using the non-constant growth form of the DCF, the ROE for the Proxy group was
2 between 7.59%³⁶(Median) and 8.23%³⁷(Mean). These results are directly derived from
3 the Value Line forecasts of future cash flows and earnings projections.

4 d. **EQUITY FINANCING COSTS**

5 **Q. HAVE YOU DETERMINED THE AMOUNT OF FINANCING COSTS TO BE**
6 **INCLUDED IN THE COST OF EQUITY COMPUTATION?**

7 A. The common stock of gas companies is currently selling at a market price that is
8 approximately 100% above book value.³⁸ As a result, when a gas company sells new
9 common stock, the effect is for the book value per share to increase. This makes selling
10 new common stock a net profit center rather than a contributor to costs. Therefore, it is
11 not necessary at this time to add any common equity financing cost allowance.

12 **VIII. ADDITIONAL COMMENTS ON DR. GASKE'S TESTIMONY**

13 **Q. PLEASE SUMMARIZE MONTANA-DAKOTA'S REQUESTED RATE OF**
14 **RETURN.**

15 A. Montana-Dakota's Witness Dr. Gaske testifies that an allowed return of 7.588%,
16 including a 10% return on common equity, "represents the cost of capital for Montana-
17 Dakota at this time".³⁹ Montana-Dakota's requested rate of return is summarized in Table
18 1 on page 4 of Dr. Gaske's Direct Testimony. The Company is requesting a capital
19 structure consisting of 41.135% long-term debt, 8.108% short-term debt, 1.242%

³⁶ Schedule ALR 4, Page 2

³⁷ Ibid.

³⁸ Schedule ALR 3, page 1

³⁹ Dr. Gaske's Direct Testimony, page 4

1 preferred stock, and 49.515% common equity. Dr. Gaske recommends senior cost rates of
2 5.949% for long-term debt, 1.631% for short-term debt, and 4.579% for preferred stock.⁴⁰

3 **Q. PLEASE SUMMARIZE THE TESTIMONY OF DR. GASKE.**

4 A. Dr. Gaske’s “primary approach” involves applying three DCF analyses to a proxy group
5 of nine gas distribution companies. These approaches provide equity cost rate estimates
6 of between 7.60% and 10.53% with median results between 8.99% and 9.12%. He uses
7 two risk premium analyses and a market DCF analysis of the S&P 500 as “benchmarks to
8 assess the reasonableness of his DCF results”.

9 Below are the results of Dr. Gaske’s four cost of equity methods apply to the
10 Proxy Group.

Method	Cost of Equity- Median
Retention Growth DCF	9.12%
Basic DCF	8.99%
Blended Growth Rate DCF	9.00%

11
12 Dr. Gaske performed three additional cost of equity analyses to test the
13 reasonableness of the DCF analyses that he applied to the Proxy Group.

Method	Cost of Equity
Risk Premium- Large Company Stocks	10.13%
Risk Premium- Small Company Stocks	18.53%
Market DCF (S&P 500)	12.72%

⁴⁰ Ibid, page 4

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Dr. Gaske states that his 10% cost of equity recommendation is justified because the “overall risks of Montana-Dakota’s North Dakota natural gas distribution operations are at or near the top of the range relative to those of the proxy companies”⁴¹. He claims the sources of this risk are: (1) Montana-Dakota’s small size, (2) exposure to a relatively undiversified local economy, (3) elevated capital expenditures to accommodate customer growth and support reliability. His recommendations assume that the Company’s rate stabilization mechanism proposal will be approved. He claims that the results of his risk premium analyses and market DCF analysis on the S&P 500 “suggest that the DCF results generally are low relative to current market benchmarks”.⁴²

Q. WHAT IS YOUR OVERALL REACTION TO DR. GASKE’S TESTIMONY?

A. Dr. Gaske’s 10% cost of equity recommendation is excessive. The main points of disagreement regarding determining the Company’s cost of capital are: (1) Montana-Dakota’s overall risks relative to the proxy group, (2) the growth rate component of his DCF analyses, due to its over reliance on equity analyst forecasts, (3) the measurement and magnitude of the equity risk premium used in his risk premium analyses, (4) level of current and historical cost of equity market benchmarks.

1. Montana-Dakota’s overall risks relative to the Proxy Group

Q. DO YOU AGREE WITH DR. GASKE’S CLAIM THAT MONTANA-DAKOTA’S OVERALL RISKS ARE HIGHER THAN THE PROXY GROUP?

⁴¹ Dr. Gaske’s Direct Testimony, page 33
⁴² Ibid., page 35

1 A. No. As an overview, Table 4 below shows that 40% of the revenues from the companies
 2 in the proxy group are from non-regulated operations such as energy services, wholesale
 3 electricity and other businesses that are riskier than regulated natural gas distribution
 4 operations. With so much non-regulated operations, the proxy group is likely in a higher
 5 risk category than Montana-Dakota and therefore the cost of equity (ROE) used to set
 6 rates for Montana-Dakota consumers should be no higher than median results from cost
 7 of equity models based on the Proxy Group.

Table 4: Proxy Group Revenue Analysis
2014 Revenues - Percentage From Regulated and Non Regulated Operations

		<u>Regulated</u>	<u>Non-Regulated</u>
AGL Resources	GAS	70%	30%
Atmos Energy Corp	ATO	62%	38%
Laclede Group	LG	90%	10%
NJ Resource Corp.	NJR	22%	78%
N.W. Nat'l Gas	NWN	97%	3%
Piedmont Nat'l Gas	PNY	81%	19%
South Jersey Inds.	SJI	54%	46%
Southwest Gas	SWX	65%	35%
WGL Holdings	WGL	51%	49%
Proxy Group Average		60%	40%

8 Source: Schedule ALR 8

9 **Q. PLEASE COMMENT ON DR. GAKE'S CLAIM THAT MONTANA-DAKOTA'S**
 10 **SMALL SIZE INCREASES ITS OVERALL RISK.**

11 A. Dr. Gaske claims that Ibbotson Associates research supports a higher cost of equity for
 12 Montana Dakota because of its small size. He states "According to Ibbotson Associates,

1 companies in the same size range as Montana-Dakota's North Dakota natural gas
 2 distribution operations have... an expected return of 18.53 percent."⁴³

3 Ibbotson Associates size premium analysis does not apply to Montana-Dakota's
 4 cost of equity.

5 Ibbotson Associates states "... Small stocks tend to outperform large stocks in
 6 general, but not for the most-liquid stocks. For the most-liquid stocks... the pattern is
 7 reversed".⁴⁴ As shown in Table 5 below MDU Resources is more liquid than the proxy
 8 group as measured by turnover rate. Ibbotson measures liquidity in the same way.

9

	Shares Traded Ave 3 month Volume	Number of Shares Outstanding	Turnover Rate
PROXY GROUP			
AGL Resou: GAS	734,722	119,940,000	0.61%
Atmos Ener ATO	461,644	101,020,000	0.46%
Laclede Gro LG	256,917	43,320,000	0.59%
NJ Resourc: NJR	390,581	85,580,000	0.46%
N.W. Nat'l C: NWN	128,819	27,330,000	0.47%
Piedmont N: PNY	313,617	79,000,000	0.40%
South Jerse SJI	286,956	68,200,000	0.42%
Southwest C: SWX	167,427	46,840,000	0.36%
WGL Holdin WGL	225,603	49,730,000	0.45%
Proxy Group Average Turnover Rate			0.47%
MDU Resou: MDU	1,004,420	194,770,000	0.52%

10 Source: Yahoo Finance

⁴³ Dr. Gaske's Direct Testimony, page 25, lines 14-19

⁴⁴ Ibbotson SBBI 2015 Classic Yearbook, page 125

1 In response to a data request asking if liquidity “could be a factor in the supposed size
2 premium” Dr. Gaske responded “Yes.”⁴⁵ Professor Aswath Damodaran from New York
3 University states the following regarding the supposed “small cap premium”:

4 Even if you believe that small cap companies are more exposed to market risk
5 than large cap ones, this is an extremely sloppy and lazy way of dealing with that
6 risk, since risk ultimately has to come from something fundamental (and size is
7 not a fundamental factor).⁴⁶
8

9 Montana-Dakota’s parent MDU Resources, Inc. has a market capitalization of
10 over \$3.5 billion as of July 15, 2015, a mid-cap stock based on Ibbotson Associates
11 company size classification.⁴⁷ The Ibbotson Associates analysis does not include small
12 companies that are subsidiaries of larger companies.⁴⁸ As a subsidiary, Montana-Dakota
13 does not have the risk profile of a small company because it has access to the resources of
14 its parent, MDU Resources, Inc.
15

16 **Q. DOES THE PUBLIC UTILITIES FORTNIGHTLY ARTICLE SITED BY DR.**
17 **GASKE DOCUMENT THAT SMALL UTILITIES WITH SMALL**
18 **CAPITLAIZATIONS HAVE HIGHER RETURNS?**

19 A. No. This paper does not conduct an analysis to determine if Ibbotson’s finding regarding
20 the return of small firms applies to utility companies. It states “... a consensus has not be
21 formed on why small stock behave as they do.” And the possible obstacles for smaller
22 companies “imply a higher investor return”.

⁴⁵ Data Request Quesiton 4.5c

⁴⁶Aswath Damodaran, Equity Risk Premiums (ERP): Determinates, Estimation and Implications – The 2015 Edition (paper updated, March 2015). Page 42

⁴⁷ “companies within this mid-cap range have market capitalizations at or below \$10,105,622,000 but greater than \$2,552,441,000.” Ibbotson SBBI 2015 Classic Yearbook, page 107

⁴⁸ Data Request Question 4.5e

1 **A. IS MONTANA-DAKOTA RISKIER THAN THE AVERAGE COMPANY IN THE**
2 **PROXY GROUP?**

3 Q. No. The Proxy Group, with 40% of revenues from non-regulated operations, likely
4 represents a higher risk category than Montana-Dakota. The cost of equity calculation
5 based on the Proxy Group is likely higher than Montana-Dakota's true cost of equity.

6 **DCF Method**

7 **Q. DOES DR. GASKE CONSIDER THE DCF METHOD HIS PRIMARY METHOD**
8 **FOR DETERMINING THE COST OF EQUITY?**

9 A. Yes. His primary approach relies on the following three DCF analyses: 1) Retention
10 Growth DCF Analysis, 2) Basic DCF Analysis, 3) Blended Growth Rate Analysis.

11 **Q. WHAT FORMULA DOES DR. GASKE USE IN HIS DCF ANALYSES?**

12 A. $K = \frac{D_0(1+0.625g)}{P} + g$
13

14 Where K= the cost of capital, or total return that investors expect to receive;

15 P= the current market price of the stock;

16 D₀= the current annual dividend rate; and

17 g= the future annual growth rate that investors expect.

18 **Q. DOES DR. GASKE PROPERLY APPLY THE SIMPLIFIED OR CONSTANT**
19 **DCF METHOD?**

20 A. His Retention Growth Analysis is a properly applied DCF method. I agree with Dr.
21 Gaske that the growth rate component of a single stage DCF analysis should be based on
22 retention growth. Dr. Gaske states the following on page 21, lines 2-6 of his direct
23 testimony:

1 While companies may have either accelerating or decelerating growth rates for
2 extend periods of time, the retention growth rates expected to be in effect three to
3 five years in the future generally represent a minimum “cruising speed” that
4 companies can be expected to maintain indefinitely.
5

6 Dr. Gaske’s Basic DCF Analysis is inappropriate because the growth component
7 is based on analysts’ earnings growth forecasts, which can be unsustainable. As Dr. Gaske
8 himself says, companies “can have either accelerating or decelerating growth rates for
9 extend periods of time”⁴⁹.

10 Dr. Gaske’s Blended Growth Rate Analysis is inappropriate because, like his
11 Basic DCF Analysis, the growth rate component uses analysts’ earnings growth forecasts.
12 However, in his Blended Analysis method he does give a one-half weighting to the
13 appropriate retention growth rates.

14 It is only a DCF method if the dividend yield is computed properly, and the
15 growth rate used is derived from a careful study of what future sustainable growth in cash
16 flow is anticipated by investors.

17 **Q. HOW DID DR. GASKE CALCULATE HIS GROWTH RATE FOR HIS**
18 **RETENTION GROWTH DCF METHOD?**

19 A. On page 21, lines 8-12 of Dr. Gaske’s testimony he explains that he calculates the
20 percentage of earnings retained and reinvested in the company by using Value Line’s
21 projected earnings per share and projected dividends per share to calculate the percentage
22 of earnings retained and reinvested in the company. For example, on page 3 of schedule 4
23 Dr. Gaske shows that AGL Resources, Inc. (“AGL”) has a retention growth rate of
24 44.19%. Value Line forecasts AGL will earn \$4.30 per share (EPS) between 2017-2019
25 and pay out \$2.40 in dividends per share (EPS). AGL will retain \$1.90 (\$4.30-\$2.40) to

⁴⁹ Dr. Gaske’s Direct Testimony, page 21

1 reinvest in the company for a retention rate of 44.19% (\$1.90/\$4.30). He multiplies this
2 44.19% retention rate by the Value Line projected return on book equity (ROE) of 12%
3 to get a retention growth rate of 5.3% he calculates the retention growth for all nine
4 companies in the proxy group in the same way to get an average retention growth rate of
5 5.05%.

6 **Q. HOW DID DR. GASKE CALCULATE HIS GROWTH RATE FOR HIS BASIC**
7 **DCF ANALYSIS?**

8 A. The growth rate component for Dr. Gaske's basic DCF analysis is based on analysts'
9 earnings growth forecasts published by Zacks the average earnings growth estimate
10 published by Zacks for the nine companies in the proxy group is 5.12%.⁵⁰

11
12 **Q. PLEASE SUMMARIZE WHY A FUTURE ORIENTED "B X R" METHOD IS**
13 **SUPERIOR TO A FIVE-YEAR EARNINGS PER SHARE GROWTH RATE**
14 **FORECAST IN PROVIDING A LONG-TERM SUSTAINABLE GROWTH RATE.**

15 A. The primary cause of sustainable earnings growth is the retention of earnings. A
16 company is able to create higher future earnings by retaining a portion of the prior year's
17 earnings in the business and purchasing new business assets with those retained earnings.
18 There are many factors that can cause short-term swings in earnings growth rates, but the
19 long-term sustainable growth is caused by retaining earnings and reinvesting those
20 earnings. Factors that cause short-term swings include anything that causes a company to
21 earn a return on book equity at a rate different from the long-term sustainable rate.
22 Assume, for example, that a particular utility company is regulated so that it is provided
23 with a reasonable opportunity to earn 9.0% on its equity. If the company should

⁵⁰ Dr. Gaske Direct Testimony, page 22 lines 11-13

1 experience an event such as the loss of several key customers, or unfavorable weather
2 conditions which cause it to earn only 6.0% on equity in a given year, the drop of 9%
3 earned return on equity to a 6% earned return on equity would be concurrent with a very
4 large drop in earnings per share. In fact, if accompany did not issue any new shares of
5 stock during the year, a drop form a 9% earned return on book equity to a 6% earned
6 return on book equity would result in a 33.3% decline in earnings per share over the
7 period.⁵¹ However, such a drop in earnings would not be any indication of what is a
8 long-term sustainable earnings per share growth rate. If the drop were caused by weather
9 conditions, the drop in earnings would be immediately offset once normal weather
10 conditions return. If the drop were from the loss of some key customers, the company
11 would replace the lost earnings by filing for a rate increase to bring revenues up to the
12 level required for the company to be given a reasonable opportunity to recover its cost of
13 equity.

14 For the above reasons, changes in earnings per share growth rates that are caused
15 by non-recurring changes in the earned return on book equity are inconsistent with long-
16 term sustainable growth, but changes in earnings per share because of the reinvestment of
17 additional assets is a cause of sustainable earnings growth. The “b x r” term in the DCF
18 equation computes sustainable growth because it measures only the growth which a
19 company can expect to achieve when its earned return on book equity “r” remains in
20 equilibrium. If analysts have sufficient data to be able to forecast varying values of “r” in
21 future years, then a complex, or multi-stage DCF method must be used to accurately
22 quantify the effect. Averaging growth rates over sub-periods, such as averaging growth

⁵¹ By definition, earned return on equity is earnings divided by book value. Therefore, whatever level of earnings is required to produce earnings of 6% of book would have to be 33.3% lower that the level of earnings required to produce a return on book equity of 9%.

1 over the first five years with a growth rate expected over the subsequent period, will not
2 provide an appropriate representation of the cash flows expected by investors in the
3 future and, therefore, will not provide an acceptable method of quantifying the cost of
4 equity using the DCF method. The choices are either a constant growth DCF, in which
5 one “b x r” derived growth rate should be used, or a complex DCF method in which the
6 cash flow anticipated in each future year is separately estimated. Dr. Gaske has done
7 neither.

8 **Q. WHY ARE ANALYSTS FIVE-YEAR CONSENSUS GROWTH RATES NOT**
9 **INDICATIVE OF LONG-TERM SUSTAINABLE GROWTH RATES?**

10 A. Analysts’ five-year earnings per share growth rates are earnings per share growth rates
11 that measure earnings growth from the most currently completed fiscal year to projected
12 earnings five years into the future. These growth rates are not indicative of future
13 sustainable growth rates in part because the sources of cash flow to an investor are
14 dividends and stock price appreciation. While both stock price and dividends are
15 impacted in the long-run by the level of earnings a company is capable of achieving,
16 earnings growth over a period as short as five years is rarely in synchronization with the
17 cash flow growth from increases in dividends and stock prices. For example, if a
18 company experiences a year in which investors perceive that earnings temporarily dipped
19 below normal trend levels, stock prices generally do not decline at the same percentage
20 that earnings decline, and dividends are usually not cut just because of a temporary
21 decline in a company’s earnings. Unless both the stock price and dividends mirror every
22 down swing in earnings, they cannot be expected to recover at the same growth rate that
23 earnings recover. Therefore, growth rates such as five-year projected growth in earnings

1 per share are not indicative of long-term sustainable growth rates in cash flow. As a
2 result, they are inapplicable for direct use in the simplified DCF method.

3 **Q. IS THE USE OF FIVE-YEAR EARNINGS PER SHARE GROWTH RATES IN**
4 **THE DCF MODEL ALSO IMPROPER?**

5 A. A raw, unadjusted, five-year earnings per share growth rate is usually a poor proxy for
6 either short-term or long-term cash flow that an investor expects to receive. When
7 implementing the DCF method, the time value of money is considered by equating the
8 current stock price of a company to present value of the future cash flows that an investor
9 expects to receive over the entire time that he or she owns the stock. The discount rate
10 required to make the future cash flow stream, on a net present value basis, equal to the
11 current stock price is the cost of equity. The only two sources of cash flow to an investor
12 are dividends and the net proceeds from the sale of stock at whatever time in the future
13 the investor finally sells. Therefore, the DCF method is discounting future cash flows
14 that investors expect to receive from dividends and from the eventual sale of the stock.
15 Five-year earnings growth rate forecasts are especially poor indicators of cash flow
16 growth even over the five years being measured by the five-year earnings per share
17 growth rate number.

18 **Q. WHY IS A FIVE-YEAR EARNINGS PER SHARE GROWTH RATE A POOR**
19 **INDICATOR OF THE FIVE-YEAR CASH FLOW EXPECTATION FROM**
20 **DIVIDENDS?**

21 A. The board of directors changes dividend rates based upon long-term earnings
22 expectations combined with the capital needs of a company. Most companies do not cut
23 the dividend simply because a company has a year in which earnings were below

1 sustainable trends, and similarly they do not increase dividends simply because earnings
2 for one year happened to be above long-term sustainable trends. Therefore, over any give
3 five-year period, earnings growth is frequently very different from dividend growth. In
4 order for earnings growth to equal dividend growth, at a minimum, earnings per share in
5 the first year of the five-year earnings growth rate period would have to be exactly on the
6 long-term earnings trend line expected by investors. Since earnings in most years are
7 with above or below the trend line, the earnings per share growth rate over most five-year
8 periods is different from what is expected for earnings growth.

9 **Q. WHY IS THE FIVE-YEAR EARNINGS PER SHARE GROWTH RATE A POOR**
10 **INDICATION OF FUTURE STOCK PRICE GROWTH?**

11 A. If a company happens to experience a year in which earnings decline below what
12 investors believe are consistent with the long-term trend, then the stock price does not
13 drop anywhere near as much as earnings drop. Similarly, if a company happens to
14 experience a year in which earnings are higher than the investor-perceived long-term
15 sustainable trend, then the stock price will not increase as much as earnings. In other
16 words, the P/E (price/earnings) ratio of a company will increase after a year in which
17 investors believe earnings are below sustainable levels, and the P/E ratio will decline in a
18 year in which investors believe earnings are higher than expected. Since it is stock price
19 that is one of the important cash flow sources to an investor, a five-year earnings growth
20 rate is a poor indicator of cash flow both because it is a poor indicator of stock price
21 growth over the five years being examined and is equally a poor predictor of dividend
22 growth over the period.

1 **Q. ARE YOU SAYING THAT ANALYSTS' CONSENSUS EARNINGS PER SHARE**
2 **GROWTH RATES ARE USELESS AS AN AID TO PROJECTING THE**
3 **FUTURE?**

4 A. No. Analysts' EPS growth rates are, however, very dangerous if used in a simplified
5 DCF without proper interpretation. While they are not useful if used in their "raw" form,
6 they can be useful in computing estimates of what earned return on equity investors
7 expect will be sustained in the future, and as such, are useful in developing long-term
8 sustainable growth rates.

9

10 **Q. PLEASE SUMMARIZE DR. GASKE'S DCF METHOD ON THE S&P 500.**

11 A. Dr. Gaske performed a market DCF analysis on the S&P 500 as a "benchmark of
12 reasonableness" with a result of 12.72%. In this analysis he adds analysts' earnings per
13 share (EPS) growth estimate⁵² (Bloomberg Professional Services) to a dividend as he did
14 in his Basic DCF Analysis mentioned above. This analysis is not a retention growth
15 analysis.

16 **Q. PLEASE RESPOND TO DR. GASKE'S MARKET BASED DCF METHOD ON**
17 **THE S&P 500.**

18 A. In response to Data Request Question 4.11 Dr. Gaske reports that "Bloomberg does not
19 make any statements about the appropriateness of the Best Long-Term Growth for use in
20 a DCF analysis." As explained above, a growth rate based on analyst earnings per share
21 forecasts is often unsustainable and can overstate the cost of equity. Dr. Gaske states that
22 retention growth rates "generally represent a minimum 'cruising speed' that companies

⁵² Expected annual increase in operating earnings...In general, these forecasts refer to a period of between three to five years. Data Request Question 4.11

1 can be expected to maintain indefinitely”⁵³. Dr. Gaske did not perform a retention
2 growth DCF analysis because “...retention growth rate forecasts are not available in a
3 downloadable manner”⁵⁴.

4 Dr. Gaske’s market based DCF Analysis on the S&P 500 uses unsustainable
5 growth rate forecasts and likely overstates the market required cost of equity for the S&P
6 500. As shown in Table 1, overall market return projections by Ibbotson Associates and
7 Charles Schwab are 9.47%⁵⁵ and 8.10% respectively.

8 **Risk Premium Analysis**

9 **Q. PLEASE SUMMARIZE DR. GASKE’S RIKS PREMIUM ANALYSIS.**

10 A. On pages 24-26 of his Direct testimony, Dr. Gaske explains that he conducted his risk
11 premium analyses to provide general guidance on equity investor return expectations. He
12 states that it is riskier to invest in stocks than bonds and investors therefore require a
13 higher returns to invest in stocks. He states that investors are influenced by past
14 experience and he uses historical data to estimate the additional return investors currently
15 demand to purchase stocks over bonds. He conducts a risk premium analysis for large
16 company stock and for smaller company stocks.

17 **Large company stock risk premium analysis:**

18 He uses the average historical difference between annual returns of large company stocks
19 and high rated long-term corporate bonds between 1926-2013 of 580 basis points as his
20 risk premium. He adds this figure (580 basis points or 5.80%) to the average yield of

⁵³ Dr. Gaske’s Direct Testimony, page 21, lines 5-6

⁵⁴ Dr. Gaske’s response to Data Request Question 4.8

⁵⁵ Ibbotson SBBI 2015 Classic Yearbook, page 158

1 Moody's corporate bonds between June 2014 through November 2014 (4.33%) for a
2 result of 10.13%.

3 **Smaller company stock risk premium analysis:**

4 He uses the average historical difference between annual returns of smaller company
5 stocks and Aaa rated long-term Corporate bonds between 1926-2013 of 1,460 basis
6 points as his risk premium. He adds this figure (1,460 basis points or 1,460%) to the
7 average yield of Moody's corporate bonds rated corporate bonds between June 2014
8 through November 2014 (4.33%) for a result of 18.53%.

9 **Q. PLEASE COMMENT ON DR. GASKE'S RISK PREMIUM ANALYSES.**

10 A. Dr. Gaske's risk premium analyses overstate the historical risk premium because he uses
11 an arithmetic average return. The Ibbotson SBBI® 2015 Classic Yearbook shows that
12 investors actually earned a compounded annual return of 10.1%. The arithmetic mean
13 return of 12.1% is possibly valuable to stock brokers and fund managers attempting to
14 predict future bonuses, but not for calculating the cost of equity. A Dow Jones Newswire
15 article stated:

16 Some financial advisers rely too heavily on a formula known as the arithmetic
17 average, which can be misleading when investing for the long term. Financial
18 advisers who use this formula may be overstating your potential profit and
19 leading you to take risks you might otherwise avoid...⁵⁶

20
21 Ibbotson Associates states the following regarding Geometric vs. Single-Period
22 Expected Return (Arithmetic average):

⁵⁶ Kaja Whitehouse, To Financial Advisors and Fuzzy Math, Dow Jones Newswires October 8, 2003

1 ...over long periods, investors are not concerned with simple averages of return,
2 rather they are concerned with the accumulation of wealth. We use forecasted
3 long-term geometric mean as the measure of reward because investors who plan
4 on repeatedly reinvesting in the same strategy over an indefinite period would
5 seek the highest rate of growth for the portfolios as measured by geometric
6 mean.⁵⁷

7
8 **Q. WHAT IS THE RESULT OF DR. GASKE'S RISK PREMIUM ANALYSIS FOR**
9 **LARGE COMPANY STOCKS USING THE GEOMETRIC MEAN?**

10 A. The historical difference between annual returns of large company stocks and high rated
11 long-term corporate bonds between 1926-2013 based on the geometric mean is 400 basis
12 points (10.1%⁵⁸ - 6.1%⁵⁹). Adding geometric mean (400 basis points or 4.00%) to the
13 average yield of Moody's corporate bonds between June 2014 through November 2014
14 (4.33%) produces a result of 8.33% or 180 basis (8.13% - 10.13%) lower than Dr.
15 Gaske's result.

16 **Q. ARE HISTORICAL RETURNS ON SMALL COMPANY STOCKS A GOOD**
17 **INDICATOR OF MONTANA-DAKOTA'S COST OF EQUITY?**

18 A. No. As stated above, Montana-Dakota's parent MDU Resources, Inc. has a market
19 capitalization of over \$3.5 billion as of July 15, 2015, a mid-cap stock based on Ibbotson
20 Associates company size classification.⁶⁰ The Ibbotson Associates analysis does not
21 include small companies that are subsidiaries of larger companies like Montana-Dakota.⁶¹
22 As a subsidiary, Montana-Dakota does not have the risk profile the small companies in

⁵⁷ Ibbotson SBBI 2015 Classic Yearbook, page 149

⁵⁸ Compounded annual return (geometric average) of large company stocks between 1926-2014, Ibbotson SBBI 2015 Classic Yearbook, page 257

⁵⁹ Compounded annual return (geometric average) of long-term corporate bonds between 1926-2014, Ibbotson SBBI 2015 Classic Yearbook, page 269

⁶⁰ "companies within this mid-cap range have market capitalizations at or below \$10,105,622,000 but greater than \$2,552,441,000." Ibbotson SBBI 2015 Classic Yearbook, page 107

⁶¹ Data Request Question 4.5e

1 the Ibbotson Associates analysis because it has access to the resources of its parent, MDU
2 Resources, Inc. Even if we assume Montana-Dakota were a stand-alone small company
3 the stock that is used to raise equity capital has higher liquidity than the Proxy Group.
4 According to Dr. Gaske's source, Ibbotson Associates, liquidity negates any small size
5 premium.

6
7 **Q. PLEASE SUMMARIZE YOUR ANALYSIS OF DR. GASKE'S TESTIMONY.**

8 A. Dr. Gaske's cost of equity recommendation of 10.0% is excessive primarily because he
9 uses a cost of equity result from the upper end of the range of his DCF results. The
10 median results of Dr. Gaske's DCF method are between 8.99% and 9.04%. His
11 benchmark analyses (market DCF and risk premium analyses) overstate the cost of equity
12 required by the broader market. A properly applied risk premium analysis, using
13 compounded annual returns, results in an 8.33% required return for the broader market
14 indicating that Dr. Gaske's 10.0% for a regulated utility such as Montana-Dakota is
15 excessive.

16 Dr. Gaske's claim that Montana-Dakota is riskier than the Proxy Group is
17 unjustified. The Proxy Group receives an average of 40% of its revenues from riskier
18 non-regulated businesses such as energy services and wholesale electricity. As a
19 subsidiary, Montana-Dakota does not have the risk profile of a small company because it
20 has access to the resources of its parent, MDU Resources, Inc. which has common equity
21 that is more liquid than the average company in the Proxy Group.

22 IX. CONCLUSION

23 **Q. PLEASE SUMMARIZE YOUR RECOMMENDATIONS IN THIS CASE.**

1 A. Based on the evidence presented in my testimony I conclude that the cost of equity
2 allowed for the Company should be 8.62% and an overall cost of capital of 6.90% based
3 on the Company's requested capital structure. See Table 3 below.

4

	Ratios	Cost Rate	Weighted Cost Rate
Long-Term Debt	41.135%	5.949%	2.45%
Short-Term Debt	8.108%	1.631%	0.13%
Preferred Stock	1.242%	4.579%	0.06%
Common Equity*	<u>49.515%</u>	8.620%	<u>4.27%</u>
	100.0%		6.90%

5 Source: Schedule ALR 1

6 **Q. DOES THIS CONCLUDE YOUR TESTIMONY?**

7 A. Yes.

Schedule ALR 10

Blue Chip Financial Forecasts - December 2010

	2012	2013	2014	2015
Federal Funds Rate	1.4%	2.9%	3.5%	3.8%
Treasury Bill, 3 Month	1.5%	2.9%	3.6%	3.7%
Treasury Note Yield, 10 Year	3.8%	4.5%	4.9%	5.0%
Treasury Note Yield, 30 Year	4.8%	5.2%	5.4%	5.5%
Corporate Baa Bond Yield	6.4%	6.8%	7.1%	7.2%

Source: MDU-4-3(a), Attachment 5

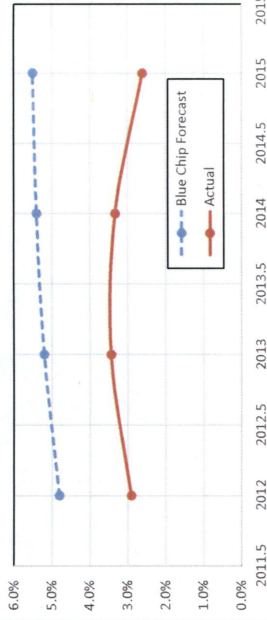
Actual

	2012	2013	2014	2015*
Federal Funds Rate	0.14%	0.11%	0.09%	0.11%
Treasury Bill, 3 Month	0.09%	0.06%	0.03%	0.02%
Treasury Note Yield, 10 Year	1.88%	2.47%	2.65%	2.11%
Treasury Note Yield, 30 Year	2.92%	3.45%	3.34%	2.62%
Corporate Baa Bond Yield	4.94%	5.10%	4.85%	4.57%

* January-May 2015 Average

Source: Federal Reserve

Blue Chip Financial Forecasts
Vs. Actual 30 Year U.S. Treasury Yields



Blue Chip Financial Forecasts - December 2011

	2013	2014	2015
Federal Funds Rate	0.5%	1.8%	2.8%
Treasury Bill, 3 Month	0.5%	1.7%	2.8%
Treasury Note Yield, 10 Year	3.2%	4.0%	4.6%
Treasury Note Yield, 30 Year	4.2%	4.8%	4.6%
Corporate Baa Bond Yield	5.7%	6.4%	6.8%

Source: MDU-4-3(a), Attachment 4

Blue Chip Financial Forecasts - December 2012

	2014	2015
Federal Funds Rate	0.3%	1.1%
Treasury Bill, 3 Month	0.3%	1.1%
Treasury Note Yield, 10 Year	2.6%	3.4%
Treasury Note Yield, 30 Year	3.6%	4.3%
Corporate Baa Bond Yield	5.3%	5.9%

Source: MDU-4-3(a), Attachment 3

APPENDIX A

RESUME OF AARON LLOYD ROTHSCHILD

CONSULTING, EXPERT TESTIMONY, COMPLEX SYSTEMS SCIENCE AND FINANCIAL ANALYSIS IN REGULATED UTILITY INDUSTRIES

- Recognized Subject Matter Expert with extensive experience providing financial analysis to technical and legal professionals in regulated industries, including electric, gas, water, and telecommunications
- Specialty provider of “rate of return” testimonies to state governments for utility rate hearings, assisting attorneys on all phases of rate case proceedings, including cross examination and financial modeling
- Represented consumer advocates in multiple jurisdictions; repeatedly reduced utility cost of equity approvals under 10% for first time in decades by applying innovative financial models
- Consumer Advocate role as business development manager for Competitive Local Exchange Carrier (CLEC) during implementation of Telecommunications Act of 1996
- Investment evaluation in Asia-Pacific for MCI’s telecom business expansion

PROFESSIONAL EXPERIENCE

New England Complex Systems Institute (www.necsi.edu), Cambridge, MA 2014-Present

Research Director, Utility Regulation

- Developing financial mechanisms and regulatory models to improve the allocation of resources, drive innovation and optimize the effectiveness of policy goals in the energy and utility sectors.

Rothschild Financial Consulting (www.rothschildfinancial.com), Ridgefield, CT 2001-Present

Consultant

- Provide expert financial testimonies to state governments and consumer advocate groups in support of utility rate regulation
- Collaborate closely with client to prepare cross examination questions
- Prepare interrogatories and analysis reports of opposing witness testimony; write direct and surrebuttal testimony; attend hearings and submit to cross-examinations
- Designing financing mechanism for renewable generation projects that aligns interests of consumers and investors by reducing cost of capital (Panelist at NARUC/NASUCA Annual Meeting 2011)
- Provided investment analysis for Wall Street investment bank Chapman Spira

360 Networks, Hong Kong 2001

Senior Manager

- Investment evaluation of \$1B Japan-U.S. undersea cable, Intra Asia cable network expansion plans, cable landing stations, and partnership negotiations in Korea, Japan and other markets

Dantis, Chicago, IL 2000

Director

- Raised \$100M from venture capital firm through valuation negotiations and internal strategic analysis

MCI, Chicago, Tokyo, Hong Kong 1996-2000

Senior Manager

- Head of Business Development for Japan Operations - \$80M national fiber optic network expansion
- Business Development and Strategic Planning manager in U.S. and Hong Kong

EDUCATION

MBA, Finance from Vanderbilt University, 1996 BA, Mathematics from Clark University, 1994