BEFORE THE NEBRASKA PUBLIC SERVICE COMMISSION

IN THE MATTER OF THE APPLICATION)	
OF BLACK HILLS NEBRASKA GAS, LLC,)	
D/B/A BLACK HILLS ENERGY, RAPID)	Docket No. NG-109
CITY, SOUTH DAKOTA SEEKING)	
APPROVAL OF A GENERAL RATE)	
INCREASE)	

DIRECT TESTIMONY AND EXHIBITS OF

S. KEITH BERRY, PHD

ON BEHALF OF

THE NEBRASKA PUBLIC ADVOCATE

September 14, 2020

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1   **I.   INTRODUCTION**

2   **Q.   PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.**

3   A.   My name is S. Keith Berry and my business address is 7 Redtail Point, Little Rock, AR

4   72211.

5   **Q.   BY WHOM ARE YOU EMPLOYED?**

6   A.   My academic affiliation is Professor Emeritus of Economics and Business at Hendrix

7   College in Conway, Arkansas. I am also a principal in the firm of Economic and Financial

8   Consulting Group, Inc.

9   **Q.   ON WHOSE BEHALF ARE YOU TESTIFYING?**

10   A.   I am testifying on behalf of the Nebraska Public Advocate.

11   **II.   STATEMENT OF QUALIFICATIONS**

12   **Q.   PLEASE SUMMARIZE YOUR EDUCATIONAL BACKGROUND.**

13   A.   I received my BA in mathematics from Hendrix College and my PhD in economics from

14   Vanderbilt University. I was an instructor in statistics at Vanderbilt in 1976–77 and was an

15   instructor/assistant professor at Hendrix College in 1977–79. In July 1979, I joined the

16   Staff of the Arkansas Public Service Commission (AC) as Manager of the Finance Section.

17   The primary responsibility of that section was the preparation and presentation of

18   testimony concerning the cost of capital in utility rate cases. I assumed the duties of

19   Manager of both the Finance and Rate Sections of the AC in July 1980. I was promoted to

20   Director of Research and Policy Development in September 1986. Beginning in September

21   1989, I returned to teaching at Hendrix College.

1 **Q. PLEASE SUMMARIZE YOUR PROFESSIONAL QUALIFICATIONS.**

2 I have submitted testimony in more than 70 proceedings before public service commissions

3 or other regulatory agencies. My publications include articles in the *American Economic*

4 *Review*, *Journal of Regulatory Economics*, *Land Economics*, the *Energy Journal*

5 (coauthor), the *Journal of Economics and Business*, *The Quarterly Review of Economics*

6 *and Business*, *The Financial Review*, the *Eastern Economic Journal*, *Managerial and*

7 *Decision Economics*, *Public Choice*, and the *Review of Industrial Organization*. I have

8 made presentations concerning utility regulation and the cost of capital at the National

9 Association of Regulatory Utility Commissioners (NARUC) Advanced Studies Program,

10 the Eastern NARUC Utility Rate Seminar, the Western NARUC Utility Rate Seminar, the

11 National Conference of Regulatory Utility Commission Engineers, and the Annual

12 Conference of the Institute of Public Utilities. While on the Staff of the Arkansas

13 Commission, I served on the NARUC Subcommittee on Electricity and the Research

14 Advisory Committee of the National Regulatory Research Institute (Deputy Chairman,

15 1988–89).

16 **Q. HAVE YOU INCLUDED A MORE DETAILED DESCRIPTION OF YOUR**

17 **QUALIFICATIONS?**

18 A. Yes. A copy of my curriculum vitae is provided in Exhibit SKB-1.

19 **Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE FEDERAL OR PUBLIC**

20 **UTILITY OR PUBLIC SERVICE COMMISSIONS?**

1 A.   Yes. I have testified several times before the Federal Energy Regulatory Commission and

2   the Securities and Exchange Commission. I have also testified before the commissions of

3   Arizona, Arkansas, Connecticut, Illinois, Kansas, Maryland, and Oklahoma.

4   **III.   PURPOSE OF TESTIMONY**

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

6 A.   The purpose of my Direct Testimony is to make recommendations concerning the cost of

7   equity, the cost of debt, the capital structure and the overall cost of capital for Black Hills

8   Nebraska Gas, LLC ("Black Hills" or "Company"). I will also rebut the analysis and

9   conclusions of Black Hills witness Adrian McKenzie concerning those same issues.

10 Q.   **PLEASE SUMMARIZE YOUR RECOMMENDATIONS.**

11 A.   I recommend an 8.97% cost of equity for Black Hills and recommend a 3.91% cost of long-

12   term debt. For the capital structure, I recommend a 50%/50% long-term debt/common

13   equity ratio. My overall cost of capital recommendation is 6.44%.

14   **IV.   SUMMARY OF BLACK HILLS'S COST OF EQUITY**

15 Q.   **PLEASE SUMMARIZE YOUR DIRECT TESTIMONY CONCERNING BLACK**

16   **HILLS'S COST OF EQUITY.**

17 A.   I apply three methods for estimating Black Hills's cost of equity.

18   First, I apply the Discounted Cash Flow (DCF) method using three separate growth

19   rates, which are discussed later.

1   Second, I apply the Capital Asset Pricing Model (CAPM) method in which the DCF

2   study that is used to identify the expected return on a fully diversified equity portfolio

3   includes a GDP-based second stage.

4   Third, I apply the Risk Premium (RP) method. Under that method, regulatory

5   decisions that include a determination of the cost of equity as of various dates are compared

6   to the yield on utility bonds from six months earlier, the pattern of that spread over time is

7   used to identify the present difference between utility bond yield and utility equity costs,

8   and that premium is added to the current utility bond yield to infer the present cost of

9   equity. I apply this method using state-determined ROEs from 1980 forward.

10   **V.   FINANCIAL AND ECONOMIC TENETS**

11   **Q.   PLEASE DISCUSS THE FINANCIAL AND ECONOMIC TENETS THAT**

12   **FRAMED YOUR ESTIMATION OF BLACK HILLS'S COST OF EQUITY.**

13   A.   As an economist with considerable experience participating in federal and state regulatory

14   proceedings, I understand that the legal "just and reasonable" standard has been interpreted

15   to require that cost-based rates, like those at issue here, include an allowance for the cost

16   of the common equity that is invested in the assets used to provide service—that is, the

17   return that common equity investors require to be induced to permit their equity to be

18   invested in those assets. The cost of, or required return on, equity is a valid cost just as

19   other more explicit expenses incurred by the utility in the provision of utility service to

20   ratepayers. The difficulty with estimating the cost of equity is that it is nowhere explicitly

21   stated in a utility's accounts and must be inferred from market data.

22   If the return allowed by the regulatory authority is set higher than the return that

23   investors require, monopoly profits will inure to the benefit of the shareholders, at the

7

1   expense of customers. Particularly in the context of Black Hills's rates, an allowed return

2   that materially exceeds the cost-based (i.e., investor-required) return would exploit

3   consumers and, thus, be unjust and unreasonable. On the other hand, if the return is set

4   materially too low, the financial position of the shareholders will be eroded, and the utility

5   will be unable to adequately attract necessary capital. When the allowed return on equity

6   is set equal to the cost of equity, stockholders will be given the opportunity to earn a fair

7   return on equity, which will also afford the utility the opportunity to viably attract capital.

8   Moreover, when the allowed return on equity equals the current cost of equity, price

9   signals to consumers and consumers' consumption decisions will reflect the economic

10   costs to society of utility service, including the equity cost component of the costs of any

11   additional investments thereby necessitated. In that sense, an allowed return based on the

12   cost of equity is economically efficient. On the other hand, if the allowed return on equity

13   departs from the cost of equity, the utility will have the incentive to make inefficient

14   investments, which regulators may not be able to identify and prevent. For example, if the

15   allowed ROE is set above the cost of equity, a utility may make decisions that are

16   inefficiently capital intensive. From the perspective of balancing the interests of ratepayers

17   and shareholders, and simulating the competitive market model, an allowed return on

18   equity for Black Hills is unjust and not reasonable if it materially exceeds the cost of equity.

19   **VI.   DISCOUNTED CASH FLOW ANALYSIS**

20   **Q.   PLEASE DISCUSS YOUR APPLICATION OF THE DCF METHOD TO**

21   **ESTIMATE BLACK HILLS COST OF EQUITY.**

22   A.   The concept of a return to capital is closely associated with time: a reward to the suppliers

23   of capital for deferring consumption. Calculations of the embedded costs of debt are

1   relatively straightforward since those costs are fixed and contractual in nature. The cost of

2   equity, in contrast, is not spelled out in a contractual manner and is more difficult to

3   calculate. However, it can be inferred through an appropriate examination of current stock

4   market data and widely disseminated financial information.

5   Rational investors in common stock are primarily concerned with the cash flows

6   that they expect to receive from ownership of the stock. For the individual investor, those

7   cash flows consist of expected future dividends as well as capital gains or losses expected

8   from selling the stock at some future point in time. However, for investors in aggregate

9   (across ownership changes) expected cash flows are comprised of future dividends only.

10   There is no conceptual difference between these two interpretations of cash flow.

11   The market price of the common stock embodies investors' expectations about that

12   stream of future dividends. However, a dividend expected to be received in the future is

13   not valued as highly by investors as that same dividend received today. The investor

14   implicitly imputes a discount to future dividends. Also, the further in the future the

15   dividend is expected to be received, the greater is the discount.

16   This value, or market price, that investors impute to that share of common stock is

17   the present value of the stream of dividends expected to be received by them. These future

18   dividends are discounted by an amount determined by the discount rate, or cost of equity.

19   This relationship is characterized in Equation (1) below where P_0 represents the current

20   share price, D_i represents the dividend expected to be received at the end of period "i," and

21   "k" is the discount rate, or cost of equity:

22   (1) $P_0 = D_1/(1+k) + D_2/(1+k)^2 + D_3/(1+k)^3 + \ldots$

1   In this form, without further simplifying and reasonable assumptions, Equation (1) is

2   mathematically intractable. However, if we assume that investors expect future dividends

3   to increase at a constant rate of growth, g, then Equation (1) can be expressed in this way:

4   (2) $P_0 = D_1/(1+k) + D_1(1+g)/(1+k)^2 + D_1(1+g)^2/(1+k)^3 + \ldots$

5   Equation (2) can then be solved for P_0 as

6   (3) $P_0 = D_1/(k-g)$, for $k > g$.

7   Equation (3) demonstrates that this constant growth DCF method is a market-based

8   approach. Any changes in investors' discount rate, expected growth rate in dividends, or

9   dividends expected one period hence are actually captured by changes in the market price

10   of the stock. For example, other things being equal, if the cost of equity decreases, investors

11   will bid the market price up.

12   The constant growth DCF model shown in Equation (3) can be reexpressed as

13   (4) $k = D_1/P_0 + g$,

14   which implies that the cost of equity is simply the sum of the expected dividend yield and

15   the anticipated growth rate. Because of the quarterly nature of dividend payments, I have

16   defined $D_1/P_0 = (D_0/P_0)(1 + g/2)$, as does FERC, where D_0 is the current annualized

17   dividend. Thus, the final form of the DCF equation is

18   (5) $k = D_0(1 + g/2)/P_0 + g$.

19   **Q.   HOW DID YOU DETERMINE YOUR PROXY GROUP.**

20   A.   I used the same proxy group of nine companies as was utilized by Mr. McKenzie:

21   1) Atmos Energy Corp

22   2) Chesapeake Utilities

23   3) New Jersey Resources

24   4) NiSource, Inc.

25   5) Northwest Natural Holding Co.

26   6) ONE Gas, Inc.

1   7)   South Jersey Industries

2   8)   Southwest Gas

3   9)   Spire, Inc.

4   It is my opinion that this proxy group is reasonable for Black Hills for purposes of this

5   case.

6   **Q.**   **HOW DID YOU DETERMINE THE DCF STOCK PRICE FOR EACH OF THESE**

7   **COMPANIES?**

8   A.   In the DCF model, it is important to utilize a price term that is fairly current since a current

9   price embodies all the information currently available to investors and will implicitly

10   embody a current estimate of investors' required return on equity. However, that price

11   should be averaged in an appropriate manner so as to eliminate the influence of random

12   fluctuations in price. In order to minimize the possibility of an aberrant price, I utilized an

13   average price over a recent time period. I used the average of the daily closing prices for

14   the six-month period February 1, 2020, through July 31, 2020.

15   **Q.**   **HOW DID YOU DETERMINE THE UNADJUSTED DIVIDEND YIELDS FOR**

16   **THE PROXY COMPANIES?**

17   A.   I divided the annual dividend by the above-discussed average stock price to obtain the

18   Unadjusted Dividend Yield for each company in the proxy group

19   **Q.**   **HOW DID YOU DETERMINE THE GROWTH RATE IN YOUR DCF MODEL?**

20   A.   It is important for the analyst to ascertain investors' expectations about future sustainable

21   long-term growth in dividends per share in order to properly implement the DCF method.

22   Keep in mind that it is not what the analyst believes future growth will be but rather what

1   investors believe about future long-term sustainable growth. Those expectations are the

2   ones that influence the stock price. Further, if sustainable, growth in book value per share

3   (BPS), earnings per share (EPS), and dividends per share (DPS) will be equivalent over the

4   long term.

5   I utilized recent editions of *Value Line Investment Survey*, a well-respected and

6   widely disseminated source of information about companies, to develop my array of data

7   for inferring investors' growth expectations.

8   I employed three separate estimates of investor-expected growth:

9   (1)   g1—The weighted average of the near-term expected growth rate, from Yahoo

10   Finance, and long-term expected growth rate, with weights of two-thirds and

11   one-third, respectively

12   (2)   g2—Average of the expected 10-year EPS and DPS annual growth for the years

13   2014 to 2024 as reported in *Value Line*

14   (3)   g3—The "br+vs" method of estimating the long-term sustainable growth rate

15   in Book Value Per Share

16   For "g1," the near-term growth rate was the IBES "5-year" expected rate of growth

17   in earnings per share. The long-term growth rate was equal to the average of the long-term

18   nominal GDP growth estimates from the US Energy Information Administration, and the

19   Social Security Administration. This long-term average estimate of 4.16% is shown in

20   Exhibit SKB-2.

21   **Q.   PLEASE DISUSS THE 'BR+VS" METHOD FOR ESTIMATING INVESTOR-**

22   **EXPECTED GROWTH.**

23   A.   The expression "br + vs" is a measure of long-term, sustainable, expected growth in BVPS,

24   based on two fundamental sources of BVPS growth: earnings retention ("br") and accretion

1   (or dilution) of BVPS due to the issuance of new common stock ("vs"). Since the DCF

2   formula relies on investor-expected growth in DPS, and since long-term growth is

3   ultimately derived from, and equal to, long-term growth in BVPS, this approach is useful

4   in gauging investors' long-term dividend-growth expectations.

5   The "br" component implicitly considers factors that cause sustainable growth in

6   DPS, EPS, and BVPS due to earnings retention, where "b," the expected retention ratio, is

7   multiplied times "r," the expected return on equity. A simple example, assuming no stock

8   issuance, should clarify the working of this component. Assume that a company has an

9   initial BVPS of $20; "r" is equal to 10%, and "b" is equal to 40%. Investors expect this

10   hypothetical utility to earn 10% x $20 = $2.00 per share. Of this amount, 40%, or $.80 per

11   share, is retained, and 60%, or $1.20 per share, will be paid out in dividends. The BVPS

12   will grow to $20.80 in the next period because of earnings retention. This calculation

13   represents a growth in BVPS of ($20.80-$20)/$20 = 4%. EPS in the next period will be

14   10% x $20.80, which represents growth in EPS of 4%. DPS in the next period are 60% x

15   $2.08 = $1.248, which also represents growth of 4%. DPS, EPS, and BVPS all grow at the

16   long-term, sustainable growth rate of 4%.

17   At this juncture, it is important to point out that "r," the *expected* return on equity

18   is not necessarily equal to "k," the *required* return on equity. That investor-expected return

19   on equity, "r," may be greater or less than "k," the investor required return on equity. In

20   particular, if "r" is greater (less) than "k," the stock-market price-to-book value ratio is

21   greater (less) than one. It is only when r = k that the price-to-book ratio is equal to one.

22   Another fundamental factor that determines sustainable growth in BVPS, EPS, and

23   DPS is represented by the "vs" term. This second determinant of growth in BVPS is caused

1   by the issuance of new common stock. If new stock is issued at a price below book BVPS,

2   dilution decreases the BVPS, and the investor-expected growth rate is thereby decreased.

3   Conversely, if new stock is issued at a price above BVPS, accretion occurs, and the growth

4   rate is correspondingly increased. This factor is significant to investor expectations if the

5   price-to-book value is significantly greater than one and if the firm is expected to issue

6   common stock in the future (as reflected in *Value Line*). In this case, those two conditions

7   are met with regard to the Risk Comparable sample. This factor is discussed extensively in

8   *Cost of Capital to a Public Utility* by Myron Gordon, who provided a major impetus for

9   the use of the DCF method in utility rate proceedings.

10   For each firm, "vs" was calculated as $n^*(P/B - 1)$ where n^* is the expected annual

11   rate of growth in common shares outstanding, P is the average of the closing stock prices

12   for the period February 2020–July 2020, and B is the BVPS at the end of calendar year

13   2019 (as reported in *Value Line*).

14   It is my opinion that, taken together, these three growth rates provide a reasonable

15   basis upon which to infer the investor-expected growth rate in the DCF method.

16   **Q.   HOW DID YOU DETERMINE THE ADJUSTED DIVIDEND YIELD?**

17   A.   The Adjusted Dividend Yields for each growth rate were calculated using the equation:

18   Unadjusted Dividend Yield x (1 + (Growth Rate/2)) = Adjusted Dividend Yield. The

19   Adjusted Dividend Yield represents the dividend expected in the next year in the context

20   of the DCF formula.

21   **Q.   HOW DID YOU DETERMINE THE DCF COST OF EQUITY FOR EACH**

22   **COMPANY?**

1 A.   The Adjusted Dividend Yield and Composite Growth Rate were added together to obtain

2   each company's DCF cost of equity.

3 Q.   **WHAT ARE YOUR COST-OF-EQUITY DCF RESULTS, USING THESE THREE**

4   **GROWTH-RATE ESTIMATES, AND THE ADJUSTED DIVIDEND YIELDS FOR**

5   **EACH COMPANY IN THE RISK COMPARABLE SAMPLE?**

6 A.   Those results are shown in Exhibit SKB-3 for k1 through k3, which correspond to growth

7   rates g1 through g3, respectively. As shown there, the average DCF cost of equity is 8.86%.

8   **VII.   CAPITAL ASSET PRICING MODEL (CAPM)**

9 Q.   **PLEASE DESCRIBE THE CAPM.**

10 A.   The CAPM is a market-based model that assumes that investors own a company's stock in

11   a well-diversified portfolio. That is, all diversified risk is eliminated, and only non-

12   diversifiable risk remains. That risk encompasses company stock risk associated with

13   general movements in market stock prices.

14   The formula for the CAPM is

15               $k = r_f + \beta(r_m - r_f),$

16   where k is the cost of equity, β is the Beta coefficient, r_m is the expected return on the

17   market as a whole, and r_f is the risk-free rate. The expected return can be estimated either

18   using a backward-looking approach, a forward-looking approach, or a survey of academics

19   and investment professionals. The risk-free rate is represented by a proxy, typically the

20   yield on 30-year US Treasury bonds. The term $(r_m - r_f)$ represents the Market Risk

21   Premium. The Beta coefficient represents the variability of a Company's stock price

22   relative to the overall stock market volatility. For example, a Company with a Beta

1   coefficient of 0.70 means that that Company's stock price, on average, moves up or down

2   70% of the degree to which the overall stock market moves up or down. Betas are published

3   by a number of commercial sources, including *Value Line*.

4 **Q.   HOW DID YOU APPLY THE CAPM MODEL FOR PURPOSES OF THIS CASE?**

5 A.   I used much of the same data as did Company witness Mr. McKenzie with four exceptions.

6   First, for the risk-free rate, I used the six-month average yield on 30-year US

7   Treasury bonds for the period February 2020 through July 2020 from the Federal Reserve

8   Board.

9   Second, I modified his Projected Short-Term Growth of 9.3% to include just Zack's

10   and IBES growth rates, which resulted in a short-term growth rate of 8.9%. *Value Line's*

11   growth rates are generally inflated.

12   Third, I also used a component for long-term growth in the calculations for growth.

13   Mr. McKenzie exclusively used short-term growth rates to develop his Projected Growth

14   Rate of 9.3%. It is unreasonable to assume that investors would expect the stock market,

15   in general, to grow over the long-term at a rate more than two times the GDP growth rate

16   of the US economy. I have included a GDP growth rate component weighted at one-third,

17   with short-term growth weighted at two-thirds.

18   Fourth, I did not include any size adjustments. I will discuss that later.

19   Regarding the third exception, as practitioner Roger Morin states, "It is useful to

20   remember that eventually all company growth rates, especially utility services growth rates,

21   converge to a level consistent with the growth rate of the aggregate economy."[1] His

22   statement means that, if short-term growth rates are greater than the long-term projected

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[1] Roger Morin, New Regulatory Finance, Public Utilities Reports, Inc., 2006 at 308.

1   growth rate in the economy, using a DCF model with just short-term growth rates will

2   overestimate the expected future return in the entire market.

3   **Q.**   **DOES THE CAPM METHOD REQUIRE THAT THE ESTIMATED EQUITY**

4   **PORTFOLIO RETURN BE AN ESTIMATE OF <u>LONG-TERM</u> RETURNS?**

5   A.   Yes, or at minimum, that the term of the equity portfolio return corresponds to the term of

6   the instrument used to identify the risk-free rate. In this case, all witnesses have used the

7   yield on 30-year US Treasury bonds to identify the risk-free rate, and all witnesses purport

8   to use a long-term estimate of the equity portfolio return.

9   **Q.**   **DOES EXAMINATION OF THE DCF FORMULA SUPPORT THE**

10   **PROPOSITION THAT THE DCF GROWTH RATE MUST ACCOUNT FOR THE**

11   **LONG TERM?**

12   A.   Yes. As discussed earlier, the market price of the common stock embodies investors'

13   expectations about the stream of future dividends. However, a typical investor may be

14   expecting to sell the common stock in five years at the expected market price.

15   This particular relationship is characterized in Equation (6) below where P_0

16   represents the current share price, D_i represents the dividend expected to be received at the

17   end of period "i," "k" is the discount rate, or cost of equity, and P_5 is the expected market

18   price of the common stock in five years:

19   (6) $P_0 = D_1/(1+k) + D_2/(1+k)^2 + D_3/(1+k)^3 + D_4/(1+k)^4 + D_5/(1+k)^5 + P_5/(1+k)^5$

20   The investor expects the market price in five years to be

21   (7) $P_5 = D_6/(1+k) + D_7/(1+k)^2 + D_8/(1+k)^3 + \ldots$

22   Eq. (7) can be substituted into Eq. (6) to produce this equation:

1   (8) $P_0 = D_1/(1+k) + D_2/(1+k)^2 + D_3/(1+k)^3 + D_4/(1+k)^4 + D_5/(1+k)^5 + D_6/(1+k)^6 +$

2    $D_7/(1+k)^7 + D_8/(1+k)^8 + \ldots$

3   If we assume that investors expect future dividends to increase at a constant rate of growth,

4   g, Equation (8) can be expressed as

5   (9) $P_0 = D_1/(1+k) + D_1(1+g)/(1+k)^2 + D_1(1+g)^2/(1+k)^3 + \ldots$,

6   which can be solved for P_0 as

7   (10) $P_0 = D_1/(k-g)$, for k > g.

8   This equation can be re-arranged as

9   (11) $k = D_1/P_0 + g$,

10   which is the same as the basic DCF equation. This demonstrates that even if an investor

11   has a short-run (five-year) horizon and expects to sell the shares in five years, the same

12   basic DCF model applies.

13   It is my view that a broad representative market index cannot sustain high short-

14   term growth rates in perpetuity, notwithstanding updating of the index's components.

15   **Q.   IS THERE A HISTORICAL BASIS FOR THAT VIEW?**

16   A.   Yes. The S&P 500 index was established on March 4, 1957.[2] Yale economist Robert Shiller

17   (author of *Irrational Exuberance* and winner of the Nobel Prize) maintains a website that

18   shows how associated S&P 500 earnings per share have grown since then. Using his data

19   and the 62-year period from May 1957 to May 2019, I have computed the index's

20   geometric-average annual rates of growth in dividends and earnings, which are 5.76% and

21   6.11%, respectively. Over this same period, nominal US GDP grew at a geometric-average

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[2] *See* Caroline Valetkevitch, *Key Dates And Milestones In The S&P 500's History*,
https://www.reuters.com/article/us-usa-stocks-sp-timeline-idUSBRE9450WL20130506

1   rate of growth of 6.34%. Thus, S&P 500 earnings grew at rates below that of US GDP,

2   notwithstanding the many changes in S&P 500 index composition over that period. This

3   similarity is to be expected, as is the fact that S&P 500 earnings growth has been somewhat

4   slower than GDP growth. And there is every reason to expect (and to infer that investors

5   expect) continuation in the future of this pattern of long-term S&P 500 earnings growth

6   falling below long-term GDP growth.

7   **Q.   PLEASE ELABORATE. WHY DO YOU SAY THAT S&P 500 EARNINGS**

8   **GROWTH IS EXPECTED TO BE LESS THAN LONG-TERM GDP GROWTH?**

9   A.   The growth rate of an economy-wide index cannot sustainably exceed the rate of growth

10   in the underlying economy. Moreover, substitutions of S&P 500 index members are always

11   accompanied by adjustment of the index "divisor" such that the index value before and

12   after the substitution is held constant. This adjustment means that, in effect, when the index

13   removes a declining company and replaces it with a rising company, a fraction of all other

14   companies in the index is sold so as to compensate for the difference in growth expectations

15   and market value between the removed and replacement company. Consequently,

16   membership substitution does not increase the earnings growth associated with an index-

17   mirroring portfolio. On the other hand, much of the economy's growth occurs through

18   companies that are too small to be represented in the S&P 500 index, which is limited to

19   exchange-traded companies with the largest market capitalization. And investors whose

20   portfolios are limited to S&P 500 companies will not realize through their portfolios any

21   of the growth of such small companies. Both of these points are recognized in the academic

22   literature and in investment community publications. *See* Bradford Cornell, *Economic*

23   *Growth and Equity Investing*, Financial Analysts Journal, p. 63 (Jan./Feb. 2010); David

1   Sharp et al., *Long-Term Capital Market Assumptions 2015: Estimates and the Thinking*

2   *Behind the Numbers 25*, J.P. Morgan Asset Management (October 2014), available at

3   https://am.jpmorgan.com/gi/getdoc/1413613727995, at 25 ("it is almost a truism that

4   aggregate earnings must grow at the same pace as the overall economy in the very long

5   run; otherwise, profits would eventually outstrip the size of the entire economy or dwindle

6   to an insignificant share of it. But not all of this earnings growth accrues to existing

7   shareholders. On the contrary, a large portion of economic growth comes from the birth of

8   new enterprises.").

9   Further, a number of studies demonstrate that short-term EPS growth forecasts by

10 Wall Street securities analysts are overly optimistic and upwardly biased.[3] This bias results

11 in an inflated CAPM market risk premium and an inflated CAPM estimate when just short-

12 term EPS forecasts are used. Consequently, short-run analyst growth projections should

13 not be used for estimating long-term EPS or DPS growth.

14   Additionally, the first five years of EPS projections account for a small portion of

15 the value of a stock. For example, assuming an investor long-term horizon of 25 years, a

16 discount rate of 10% per year, a 10% annual growth in DPS in the first five years, and a

17 5% annual growth in DPS the following 20 years, only 28% of a stock's value is based on

18 the first five years. Over 70% of a stock valuation is determined in the following 20 years.

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[3] The studies that demonstrate analysts' long-term EPS forecasts are overly-optimistic and upwardly biased include: R.D. Harris, "The Accuracy, Bias, and Efficiency of Analysts' Long Run Earnings Growth Forecasts," *Journal of Business Finance & Accounting*, pp. 725-55 (June/July 1999); P. DeChow, A. Hutton, and R. Sloan, "The Relation Between Analysts' Forecasts of Long-Term Earnings Growth and Stock Price Performance Following Equity Offerings," *Contemporary Accounting Research* (2000); K. Chan, L., Karceski, J., & Lakonishok, J., "The Level and Persistence of Growth Rates," *Journal of Finance,* pp. 643−684, (2003); M. Lacina, B. Lee, and Z. Xu, *Advances in Business and Management Forecasting (Vol. 8),* Kenneth D. Lawrence, Ronald K. Klimberg (ed.), Emerald Group Publishing Limited, pp.77-101; M. Goedhart, R. Raj, and A. Saxena, "Equity Analysts: Still Too Bullish," *McKinsey on Finance*, pp. 14-17, (Spring 2010).

1   A short-term growth rate, such as IBES, captures just a part of the valuation of a stock, and

2   is not appropriate for DCF purposes.

3 **Q.   IS THERE EVIDENCE THAT INVESTORS SHARE THE EXPECTATION THAT**

4 **LONG-TERM GROWTH OF A BROAD EQUITY PORTFOLIO WILL BE**

5 **CONSTRAINED BY THE GROWTH RATE OF THE OVERALL ECONOMY?**

6 A.   Yes. That evidence includes a statement by Warren Buffet. Many investors pay close

7   attention to his views. Moreover, through his large share of Berkshire Hathaway, which in

8   turn owns 90% of Berkshire Hathaway Energy (whose subsidiaries include MidAmerican

9   Energy Company, PacifiCorp, NV Energy, Kern River Gas Transmission Company, and

10   AltaLink), Mr. Buffet is a very substantial investor (probably the single largest individual

11   investor) in US electric utilities and gas pipelines. In a *Fortune* magazine article, Mr. Buffet

12   stated,

13   When you begin to expect the growth of a component factor to forever
14   outpace that of the aggregate, you get into certain mathematical problems.
15   In my opinion, you have to be wildly optimistic to believe that corporate
16   profits, as a percent of GDP can, for any sustained period, hold much above
17   6%. One thing keeping the percentage down will be competition, which is
18   alive and well. In addition, there is a public-policy point: If corporate
19   investors, in aggregate, are going to eat an ever-growing portion of the
20   American economic pie, some other group will have to settle for a smaller
21   portion. That would justifiably raise political problems—and in my view a
22   major reslicing of the pie just isn't going to happen.[4]

23   I think Mr. Buffet makes two very important points here. First, mathematically,

24   corporate profits cannot sustainably increase at a faster rate than the economy. The same

25   thing applies as well to the S&P 500. Second, competition will keep profits from increasing

26   that fast. In a dynamic capitalist economy, such as the US, generally, unsustainable

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[4] Warren Buffet, "Mr. Buffet on the Stock Market," Fortune magazine, November 22, 1999.

1   increases in profits encourage entry into profitable industries, which in turn decreases

2   profits to a competitive, and sustainable, level.

3   A Federal Reserve Economic Data (FRED) data series[5] supports Mr. Buffet's

4   observation. It shows that from 1930 through the present, US corporate profits as a share

5   of GDP (after accounting for tax, inventory, and capital consumption) have *never* exceeded

6   6%. While they are currently 5.2%, and thus near the high end of their historical range, that

7   fact makes it less likely, not more likely, that corporate investors will receive a larger share

8   of economic growth going forward.

9 **Q.   DOES   THE   ACADEMIC   LITERATURE   ADDRESS   THE   ISSUE   OF**

10   **SUSTAINABLE PORTFOLIO GROWTH?**

11 A.   Yes, it does. Messrs. Brealey and Meyers provide an example where they conclude that a

12   constant growth of 20 percent is silly because "[n]o firm can continue growing at 20 percent

13   per year forever, except possibly under extreme inflationary conditions.[6]

14   Messrs. Pinto, Henry, Robinson, and Stow state,

15   The Gordon growth model form of the DDM [i.e., the one stage constant
16   growth form of the Dividend Discount Model, aka DCF] is most appropriate
17   for companies with earnings expected to grow at a rate comparable to or
18   lower than the economy's nominal growth rate. Businesses growing at
19   much higher rates than the economy often grow at lower rates in maturity,
20   and the horizon in using the Gordon growth model is the entire future stream
21   of dividends.

22   To determine whether the company's growth rate qualifies it as a candidate
23   for the Gordon growth model, an estimate of the economy's nominal growth

---

[5] The series bears the long title "Shares of gross domestic income: Corporate profits with inventory valuation and capital consumption adjustments, domestic industries: Profits after tax with inventory valuation and capital consumption adjustments" and is available at https://fred.stlouisfed.org/series/A449RE1A156NBEA.
[6] Richard Brealey and Stewart C. Myers, Principles of Corporate Finance (2000) at 69.

1 rate is needed. This growth rate is usually measured by the growth in gross

2 domestic product (GDP).[7]

3 Note that the target audience for this textbook was aspiring and existing Certified

4 Financial Analysts, who certainly have influence over the investment advisory community.

5 **Q.** **IF LONG-TERM GROWTH RATES ARE NOT USED IN THE CAPM MODEL,**

6 **DOES THAT CREATE A MISMATCH WITH ANOTHER COMPONENT OF THE**

7 **CAPM MODEL?**

8 A. Yes, it does. The risk-free rate in the CAPM Model is the 30-year US Treasury bond yield.

9 That long-term bond yield is used because common stocks have a long-term horizon.

10 However, it is a mismatch to use a long-term bond yield as the risk-free rate yet exclude

11 long-term growth rates in the calculation of the market rate of return.

12 **Q.** **DOES MR. MCKENZIE'S CAPM ANALYSIS HAVE THAT MISMATCH?**

13 A. Yes, it does.

14 With the adjustments discussed above, my CAPM result is 8.81%, as shown in

15 Exhibit SKB-4.

16 **VIII.   RISK PREMIUM RESULTS**

17 **Q.** **HOW DID YOU DETEMINE YOUR RISK PREMIUM RESULT?**

18 A. The Risk Premium (RP) method is based on the simple idea that since investors in stocks

19 take greater risk than investors in bonds, the former expect to earn a return on a stock

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[7] Jerald A. Pinto, Elaine Henry, Thomas R. Robinson, and John D. Stow, :Equity Asset Valuation," CFA Institute Investment Series (2d. ed.) John Wiley & Sons, 2010, at 98.

1   investment that reflects a premium over and above the return they expect to earn on a bond

2   investment. The RP method uses the following equation:

3   (12) $k = \text{Bond Yield} + RP$,

4   where k is the cost of equity, Bond Yield is the current yield on utility bonds, and RP is the

5   risk premium, comparing required utility returns with utility bond yields. The bond yield

6   can be a projected or contemporaneous utility bond yield. RP is not assumed to be constant

7   but changes over time. Some evidence exists supporting an inverse correlation between

8   bond yields and risk premiums.

9   Multiple approaches have been advanced to determine the equity risk premium for

10   a utility. For example, a risk premium can be developed directly, by conducting a risk

11   premium analysis for the company at issue, or indirectly, by conducting a risk premium

12   analysis for the market as a whole and then adjusting that result to reflect the risk of the

13   company at issue. Another approach for the utility context is to examine the risk premium

14   implied in the returns on equity allowed by regulatory commissions for utilities over some

15   period relative to the contemporaneous level of interest rates.

16   The RP variable is not stable through time and may be dependent on interest rates

17   and the overall volatility of interest rates. I have done research on this issue, which was

18   published in *Managerial and Decision Economics.*[8] In that article, I demonstrate that there

19   is an inverse relationship between the risk premium and the current level of utility bond

20   yields as well as a positive relationship between the risk premium and investor-perceived

21   volatility in utility bond yields.

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[8] S. Keith Berry, "Interest Rate Risk and Utility Risk Premia During 1982-93." *Managerial and Decision Economics*. (1998).

1   Focusing on the inverse relationship between the risk premium and the current level

2   of utility bond yields, in my article, I estimated the following regression equation for RP:

3   (13) $RP = .07722 - .48392R_B$

4   Recent utility Baa/BBB bond yields have averaged 3.56% for the period February

5   2020 through July 2020. Substitution of this into data into the above Eq. (13) produces an

6   RP of 6.000%. Substitution of this RP and $R_B = 3.56\%$ into the above Eq. (13) produces a

7   risk premium cost of equity of 9.56%.

8   I also updated Mr. McKenzie's risk premium analysis shown in his Exhibit AMM-

9   8. I made two modifications. First, I performed a regression analysis of the risk premium

10   on the bond yield from six months earlier. This analysis reflects the fact that the data used

11   in formulating the state-allowed ROE is approximately six months earlier than the date of

12   the order. For consistency, the bond yield should be from the same period.

13   Second, I made an adjustment to the risk premium to reflect the fact that the

14   regression was based on A-rated bond yields, but the risk premium calculation used Baa-

15   rated bond yields. All those calculations are shown in Exhibit SKB-5, pages 1 and 2, and

16   indicate a risk premium estimate of 9.18%.

17   The average of these two risk premium estimates is 9.37%

18   **IX.**   **COST OF EQUITY RECOMMENDATION**

19   **Q.**   **WHAT IS YOUR COST OF EQUITY RECOMMENDATION FOR BLACK**

20   **HILLS?**

21   A.   My three cost of equity estimates for the DCF, CAPM, and RP models are shown in the

22   following table.

1

Table 1: Black Hills Cost of Equity

Method	Cost of Equity Estimate
DCF	8.86%
CAPM	8.81%
Risk Premium	9.37%

2   Giving greater weight to the DCF method (50%) and lesser weight to the CAPM and RP

3   methods (25% each), my recommended cost of equity for Black Hills is 8.97%. My

4   recommended range is 8.2% to 9.6%.

5   **X.   COST OF LONG-TERM DEBT RECOMMENDATION**

6 **Q.**   **HOW DID YOU DEVELOP YOUR RECOMMENDED COST OF LONG-TERM**

7   **DEBT?**

8 **A.**   I started with the Company's recommended cost of long-term debt of 4.11%, shown in

9   MCC-1, Schedule G-1. I then included in those calculations the debt costs of a $400 million

10   note issued and sold on June 17, 2020. The all-in debt cost of that note is 2.63% (see Exhibit

11   SKB-6, which is Response to PA-291).

12   The revised cost of long-term debt is 3.91%, as shown in Exhibit SKB-7, which is

13   my recommended cost of long-term debt for Black Hills in this case.

14   **XI.   OVERALL COST OF CAPITAL**

15 **Q.**   **DO YOU AGREE WITH THE COMPANY'S PROPOSED 50%/50% COMMON**

16   **EQUITY TO LONG-TERM DEBT RATIO?**

17 **A.**   Yes, I do. Given the 2019 year-end common equity values for the gas proxy group (shown

18   in Exhibit AMM-12) and Black Hills's recent common equity ratios (shown in MCC-1,

1   Statement G), it is my opinion that the 50%/50% common equity/long-term debt ratio is

2   reasonable.

3   **Q.   GIVEN THAT CAPITAL STRUCTURE, WHAT IS YOUR RECOMMENDED**

4   **OVERALL COST OF CAPITAL FOR BLACK HILLS?**

5   A.   My overall cost of capital recommendation for Black Hills is shown in the following table

6   and in Exhibit SKB-8.

7   <p align="center">Table 2: Black Hills Overall Cost of Capital</p>

Component	Proportion	Cost	Weighted Cost
Common Equity	50%	8.97%	4.49%
Long-Term Debt	50%	3.91%	1.96%

8   **OVERALL COST OF CAPITAL   6.44%**

9   **XII.   REBUTTAL OF BHNG WITNESS MCKENZIE**

10   **Q.   DO YOU AGREE WITH BLACK HILLS WITNESS MCKENZIE'S**

11   **RECOMMENDATIONS CONCERNING BLACK HILLS'S COST OF EQUITY?**

12   A.   No, I do not.

13   **A. Mr. McKenzie's Use of the Midpoint to Estimate Cost of Equity is Flawed**

14   **Q.   IS IT APPROPRIATE TO USE THE MIDPOINT IN CALCULATING BLACK**

15   **HILLS'S COST OF EQUITY?**

16   A.   No, it is not. The *midpoint* is derived by adding the highest and lowest points of a data

17   sample together and dividing by two. The *median* is the value separating the higher half

18   from the lower half of a data sample. The arithmetic *average* simply adds up the

19   observation values and divides that sum by the number of observations. The midpoint is

1   inherently inferior to the median and arithmetic average as a measure of central tendency

2   because the midpoint basically depends upon only two observations, the highest point and

3   the lowest point of the proxy group, and ignores all other observations in the proxy group.

4   For example, if there are 30 observations in the proxy group, 28 of them are

5   completely ignored when using the midpoint. The midpoint is strongly influenced by

6   severely skewed distributions. For example, if we wanted to measure the central tendency

7   of wealth distribution in the United States, we might have a highest point of $142 billion

8   or $86 billion or $76 billion, depending on whether Jeff Bezos, Bill Gates, or Warren Buffet

9   happened to be included in the sample (and depending on the outcome of the pending Bezos

10   divorce) and a lowest point of zero. The midpoint of the distribution would then be $71

11   billion, $43 billion, or $38 billion, respectively (i.e., each of the above figures added to a

12   lower-bound wealth of $0 and divided by two). It would be unreasonable to maintain that

13   any of these figures fairly represent typical wealth in the United States. In contrast, the

14   median and arithmetic average are meaningfully representative because they would

15   emphasize the central tendency of the proxy group.

16   **B. Mr. McKenzie's DCF Analysis is Flawed**

17   **Q.   IS MR. MCKENZIE'S DCF ANALYSIS FLAWED (MCKENZIE DIRECT, PP. 36-**

18   **41 AND EXHIBIT NOS. AMM-4 AND AMM-5)?**

19   A.   Yes, it is flawed for several reasons. First, Mr. McKenzie used *Value Line* growth rates,

20   which are inflated. Second, he strictly relied upon short-term growth rates without

21   consideration of long-term growth rates. I previously discussed the importance of using

22   long-term growth rates in the DCF model. Third, he considered midpoints in his DCF

23   analysis, which is inappropriate as I previously discussed. Fourth, he erroneously excluded

1   so-called low-end outliers from his analysis. In doing so, he compared those low-end

2   results with projected utility bond yields. Using projected bond yield is completely wrong.

3   Those projections are speculative. In particular, he removed Northwest Natural's cost of

4   equity of 6.3% (using IBES growth). The recent Moody's Baa utility bond yield averages

5   3.56%. That alleged low-end outlier is 270 basis points higher than 3.56% and,

6   consequently, is not an unreasonable estimate. It should not be eliminated.

7   If these corrections are made to Mr. McKenzie's DCF analysis, the result is 8.9%,

8   which is slightly below my DCF estimate.

9   **C. Mr. McKenzie's CAPM Analysis is Flawed**

10 **Q.**   **ARE THERE FLAWS IN MR. MCKENZIE'S CAPM ANALYSIS (MCKENZIE**

11   **DIRECT, PP. 41-45 AND EXHIBIT NO. AMM-6)?**

12 A.   Yes, there are. First, he included *Value Line* short-term growth rates in his calculations of

13   Projected Short-Term Growth. *Value Line's* growth rates are generally inflated.

14   Second, he failed to include a component for long-term growth in the calculations

15   for growth. Mr. McKenzie exclusively used short-term growth rates to develop his

16   Projected Growth Rate of 9.3%. It is unreasonable to assume that investors would expect

17   the stock market, in general, to grow over the long-term at a rate more than two times the

18   GDP growth rate of the US economy. I have included a GDP growth rate component

19   weighted at one-third, with short-term growth weighted at two-thirds. I discussed this

20   previously.

21   Third, he included size adjustments in his CAPM analysis. I will discuss this

22   presently.

1 **Q.   MR. MCKENZIE MAKES SIZE ADJUSTMENTS IN HIS CAPM ANALYSIS. DO**

2   **YOU AGREE WITH THOSE SIZE ADJUSTMENTS?**

3 A.   No, I do not. They constitute selective "cherry picking" of adjustments made by Duff &

4   Phelps to the basic CAPM model. Duff & Phelps recommends *two* concurrent adjustments

5   to the basic model: the "size adjustment" referenced by Mr. McKenzie *and* a sector-specific

6   "industry premium adjustment." In the Duff & Phelps supporting literature, both

7   adjustments are discussed together, as they go hand-in-hand. As applied to the electric

8   utility stocks used as proxies in Commission proceedings, the "size adjustment" generally

9   produces an upward adjustment because most of those stocks are relatively small compared

10   to the "large cap" stocks that make up the S&P 500. But for the same stocks, the "industry

11   premium adjustment" produces a downward adjustment, consistent with Duff & Phelps's

12   observation that "[d]iscount rates [i.e., the cost of equity, as in the Discounted Cash Flow

13   method] for utility companies were in a tighter range and lower than for many other sectors.

14   This reflects the stable nature of the cash flows and lower risk usually associated with the

15   utility sector due to the lack of discretionary spend."[9] The Duff & Phelps size adjustments

16   are intended to apply to stocks generically and then be offset as to the utility sector through

17   application of the industry premium adjustment. Mr. McKenzie omits the latter.

18   The argument for the size adjustment is that differences in investors' required rates

19   of return that are related to firm size are not fully captured by beta. Much of the empirical

20   work was developed by Rolf. W. Banz,[10] who stated,

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[9] Duff & Phelps, *Cost of Capital in Goodwill Impairment Reviews: Practical Application* at 4 (2011).
[10] Rolf W. Banz, "The Relationship Between Return and Market Value of Common Stocks," *Journal of Financial Economics* (1981) 3-18.

1   It is not possible to determine conclusively whether market values *per se*
2   matters or whether it is only a proxy for unknown true additional factors
3   correlated with market value.[11]

4   The "factors" commonly identified by researchers to explain the tendency of

5   average smaller companies to have higher costs of equity than predicted by their betas are

6   (1) Difficulties of external financing;

7   (2) Lack of liquidity;

8   (3) Smaller companies possessing fewer resources to adjust to competition and

9   avoid distress in economic slowdowns; and

10   (4) Survivorship bias (the historic data represents the experienced growth rates only

11   of those small companies that survived).

12   It is important to note that due to the nature of regulation, those relatively small

13   companies that are regulated utilities do not face the pressures referenced in factors (1)

14   through (3). They sell to captive customers and have regulatory and economic "moats"

15   protecting them from competition. For that reason and because they can obtain rate

16   increases from regulators (on application or through automatically adjusting fuel clauses

17   and other forms of formula rates), small utilities generally do not face difficulties in

18   obtaining external financing or have liquidity issues. For the same reasons, small utilities

19   do not face the same distress during economic slowdowns as do competitive-sector firms.

20   An empirical study of the size effect and utility stocks concluded that

21   The fact that the two samples show different, though weak, results indicates
22   that utility and industrial stocks do not share the same characteristics. First,
23   given firm size, utility stocks are consistently less risky than industrial
24   stocks. Second, industrial betas tend to decrease with firm size but utility
25   betas do not. These findings may be attributed to the fact that all public

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[11] Rolf W. Banz, "The Relationship Between Return and Market Value of Common Stocks," *Journal of Financial Economics* (1981), page 4.

1   utilities operate in an environment with regional monopolistic power and

2   regulated financial structure. As a result, the business and financial risks

3   are very similar among the utilities regardless of their sizes. Therefore,

4   utility betas would not necessarily be expected to be related to firm size.[12]

5   These findings imply that a size adjustment is not appropriate for CAPM results

6   applied to utilities.

7   The "size adjustment" is not generally accepted among leading academic experts.

8   For example, Aswath Damodaran opposes the Small Cap Premium for these reasons:[13]

9   (1) On closer scrutiny, the historical data, which has been used as the basis of the

10   argument, is yielding more ambiguous results and leading us to question the

11   original judgment that there is a small cap premium.

12   (2) The forward-looking risk premiums, where we look at the market pricing of

13   stocks to get a measure of what investors are demanding as expected returns,

14   are yielding no premiums for small cap stocks.

15   (3) If the justification is intuitive, i.e., that smaller firms are riskier than larger

16   firms, much of that additional risk is either diversifiable, better adjusted for in

17   the expected cash flows (instead of the discount rate), or double counted.

18   Professor Damodaran also notes the "January effect" for small stocks:

19   One of the most puzzling aspects of the small cap premium is that almost
20   all of it is earned in one month of the year, January, and removing that
21   month makes it disappear. … If your argument for the small cap premium
22   is that small cap stocks are riskier, you now have the onus of explaining
23   why that risk shows up only in the first month of the year. [14]

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[12] Annie Wong, "Utility Stocks and the Size Effect: An Empirical Analysis, 33 *J. Midwest Financial Association* 95 (1993).
[13] Aswath Damodaran, "The Small Cap Premium: Where is the Beef," Musings on Markets, April 11, 2015.
[14] Aswath Damodaran, *The Small Cap Premium: Where is the Beef: Musings on Markets*, April 11, 2015.

1   Also, note that Mr. McKenzie uses *Value Line* betas in his CAPM analysis. *Value*

2   *Line* measures a raw beta based on a regression of the monthly returns of the individual

3   companies, relative to the NYSE average, over a five-year period. *Value Line* then adjusts

4   the raw beta through what is generally called the "Blume" adjustment, to account for the

5   long-term tendency of most companies' betas to converge on the market beta of one over

6   long periods of time. This adjustment means that for the proxy companies used for SERI,

7   the raw beta is increased, by giving the raw historical beta estimate two-thirds weight and

8   giving the market beta of one one-third weight.

9   Whereas the base CAPM incorporates *Value Line* adjusted betas, the size

10   adjustment is based on unadjusted or "raw" betas found in the Ibbotson SBBI Market

11   Report produced by Morningstar (now, Duff & Phelps). The Ibbotson raw betas are

12   produced by a regression study of the monthly returns on the stock market index that are

13   in excess of a 30-day US Treasury yield over the period of 1926 through the most recent

14   period. Unlike *Value Line*, Ibbotson does *not* adjust betas for the long-term tendency of

15   betas to converge on the market beta of one over time.

16   Mr. McKenzie's CAPM approach therefore, includes a base CAPM analysis that

17   reflects beta factors to measure risk and return, which are not compatible with the beta

18   factor used to measure the size premium adjustment.

19   Accordingly, combining the Duff & Phelps size adjustment with the other

20   components of Mr. McKenzie's CAPM model means summing (a) an adjustment meant to

21   raise small companies' indicated risk premium up to an historical norm with (b) a predicted

22   risk premium that already exceeds the historical norm. This approach improperly combines

1   incompatible elements of differing methodologies and produces an excessive equity cost

2   estimate.

3   Duff & Phelps itself advises against mismatching:

4   Note that significant differences can exist among beta estimates for
5   the same stock published by different financial reporting services.
6   *One of the implications of this is that a valuation analyst should*
7   *try to use betas for guideline companies used in a valuation from*
8   *the same source* . . . . This helps to avoid "an apples-and-oranges"
9   mixture of betas calculated using different methodologies.[15]

10   Duff & Phelps concludes that "[t]he overall goal is to look for the best beta estimate,

11   reflecting the expected risk of the guideline companies, and ideally derived using the *same*

12   data sets, methodologies, and time periods."[16] Thus, the Duff & Phelps size adjustment

13   should not be added to indicated returns calculated using Blume-adjusted betas.

14 **Q.   BASED ON ALL THE ABOVE, DO YOU AGREE WITH MR. MCKENZIE THAT**

15 **A SIZE ADJUSTMENT IS APPROPRIATE FOR HIS CAPM ANALYSIS?**

16 A.   No, I do not.

17   **D.   Mr. McKenzie's ECAPM Analysis is Flawed**

18 **Q.   DO YOU AGREE WITH MR. MCKENZIE'S EMPIRICAL CAPITAL ASSET**

19 **PRICING MODEL (ECAPM) ANALYSIS (MCKENZIE DIRECT, PP. 45-48 AND**

20 **EXHIBIT NO. AMM-7)?**

21 A.   No, I do not. Mr. McKenzie asserts that an ECAPM analysis can help correct for claimed

22   deficiencies in the CAPM analysis by adjusting the intercept line of the security market

23   line and reducing the slope. He asserts that this modification in the intercept and slope of

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[15] Duff & Phelps, *2015 Valuation Handbook* at 5 (emphasis added).
[16] *Id.* at 6 (emphasis in original).

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1   the security market line has the effect of producing a more reliable estimate of the expected

2   return relative to risk for securities because a standard CAPM analysis will understate the

3   required return for companies with betas less than 1 and overstate the required return for

4   companies with betas greater than 1.

5   The ECAPM is not based on an economic theory; rather, it is based on an empirical

6   regression comparing certain returns predicted by certain CAPM models to certain

7   historical observed returns.

8   If the ECAPM regression uses *Value Line* betas and/or yields on long-term

9   treasuries, as does Mr. McKenzie's, it is likely to involve double counting for at least two

10   reasons. *Value Line* already adjusts betas for low-beta companies upward and high-beta

11   companies downward through the "Blume" adjustment that I discussed earlier. Also, Dr.

12   Morin concedes that "the use of a long-term risk-free rate rather than a short-term risk-free

13   rate already incorporates some of the desired effect of using the ECAPM."[17]

14   Both of these methods have the effect of increasing return estimates for companies

15   with betas less than 1, and reducing return estimates for companies with betas greater than

16   1.

17   For example, using *Value Line* betas within a standard CAPM analysis increases

18   the intercept from the risk-free rate up to the risk-free rate plus 35% of the market risk

19   premium. From there, the slope of the line decreases from a raw beta estimate multiplied

20   by the market-risk free premium to only 67% of the observed beta estimate by the market

21   risk premium. Thus, using the *Value Line* Blume adjustment of betas in the standard CAPM

22   model increases the intercept point and reduces the slope of the security market line.

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[17] Morin, *New Regulatory Finance* (2006), page 190.

1   Using an ECAPM with an observed (non-Blume-adjusted) beta estimate

2   accomplishes nearly the same thing. Specifically, the ECAPM with an observed beta will

3   increase the intercept point to the risk-free rate plus 25% of the market risk premium and

4   change the slope of the line from the observed beta multiplied by the market risk premium

5   to 75% of the raw beta multiplied by the market risk premium. The impact on the intercept

6   point and the slope of the security market line are very comparable using a standard CAPM

7   with *Value Line* Blume-adjusted betas or an ECAPM using observed betas. Relatedly,

8   applying an ECAPM adjustment to already-adjusted *Value Line* betas has a substantially

9   greater impact on the CAPM return estimate for companies with betas less than 1 and a

10   substantially reduced CAPM return estimate for companies with betas greater than 1.

11   For these reasons, an ECAPM analysis should not be employed in combination with

12   *Value Line* adjusted betas. An ECAPM model applied to *Value Line* adjusted betas does

13   not produce an economically logical return estimate for a given level of investment risk.

14   **E.   Mr. McKenzie's Risk Premium Analysis is Flawed**

15 **Q. DO YOU AGREE WITH MR. MCKENZIE'S RISK PREMIUM ANALYSIS**

16   **(MCKENZIE DIRECT, PP. 48-51 AND EXHIBIT NO. AMM-8)?**

17   No, I do not. As I discussed earlier, I updated Mr. McKenzie's risk premium

18   analysis shown in his Exhibit AMM-8. I made two modifications. First, I performed a

19   regression analysis of the risk premium on the bond yield from six months earlier. This

20   reflects the fact that the data used in formulating the state allowed ROE is approximately

21   six months earlier than the date of the order. For consistency the bond yield should be from

22   the same period approximately six months earlier.

1   Second, I made an adjustment to the risk premium to reflect the fact that the

2   regression was based on A-rated bond yields, but the risk premium calculation used Baa-

3   rated bond yields. All those calculations are shown in Exhibit SKB-5, pages 1 and 2, and

4   indicate a risk premium estimate of 9.18%.

5   **F.   Mr. McKenzie's Expected Earnings Analysis is Flawed**

6   **Q.   DO YOU AGREE WITH MR. MCKENZIE'S EXPECTED EARNINGS (E/B)**

7   **ANALYSIS (MCKENZIE DIRECT, PP. 52-54 AND EXHIBIT NO. AMM-9)?**

8   A.   No, I do not. I recommend that the E/B model not be used.

9   **Q.   WHAT IS THE MAIN REASON YOU RECOMMEND AGAINST USING AN E/B**

10   **MODEL?**

11 A.   At any given time, the cost of equity to regulated utilities is the profit level that they must

12   provide to current equity investors in order to attract capital from those investors, who

13   exchange present cash for a stake in future earnings and dividends. This capital attraction

14   cost of equity is the investment return necessary to compensate for the time value of that

15   deferral and for the risk that future dividends and stock appreciation may fall short of

16   expectations. Because investors shop for investment opportunities, they will purchase a

17   stock if, but only if, given its current market price, the return they expect from making that

18   investment now is comparable to the return they could expect to realize by instead making

19   a present investment in a different stock that bears a comparable level of risk. Investors

20   therefore care about a utility stock's earnings and dividend stream relative to the *market*

21   *price* that *they* must pay to acquire rights to share in those earnings and dividends. But that

22   is not what the E/B model measures. Rather, it measures how much the *proxy companies*

1   expect to earn relative to their own *book value* equity. Current investors have no

2   opportunity to buy into utility ownership at a book value/share price. They must pay the

3   current market price. The E/B ratios of gas utility stocks therefore do not indicate the

4   current risk-comparable return opportunities that are presently available to equity

5   investors.

6   **Q.   DOES THE EXPECTED EARNINGS MODEL PRODUCE A MARKET-BASED**

7   **INDICATION OF THE COST OF EQUITY?**

8   A.   No. Unlike the DCF, CAPM, and RP methods, the E/B method is not market-based. The

9   DCF method centers on dividend yields, which represent the market price at which stocks

10   are actually exchanged in the financial market, divided into actual dividends declared by

11   corporate boards that are competing for capital in that market. The CAPM method centers

12   on betas, which represent the relative movement of proxy company stock prices and broad-

13   portfolio stock prices in that same market. The RP method centers on bond yields, which

14   represent interest rates divided by the market price of bonds.

15   **Q.   HAS THE FEDERAL ENERGY REGULATORY COMMISSION (FERC)**

16   **PREVIOUSLY DETERMINED THAT E/B RATIOS ARE NOT MARKET-BASED**

17   **AND THEREFORE SHOULD NOT BE USED TO ESTIMATE INVESTORS'**

18   **REQUIRED RETURN?**

19   A.   Yes. The FERC rejected the use of E/B ratios as representing the cost of equity in Order

20   No. 420.[18] The FERC found that "[a]ccounting rates of return are not reliable measures of

21   the current cost of capital, since they do not reflect the current market prices that are

---

[18] *Generic Determination of Rate of Return on Common Equity for Public Utilities,* Order No. 420, FERC Stats. &
Regs. ¶ 30,644 at 31,336.

1   determined in competitive capital markets" (*Id*. at 31,367). The FERC stood by that finding

2   for almost 30 years, until the subsequently-vacated Opinion No. 531. For example, in

3   Opinion No. 314, the Commission stated,

4   O&R's proposal would, in effect, set the allowed rate of return on common
5   equity at the rate of return investors expect O&R to earn on common equity
6   (r), rather than the market cost of common equity (k)…O&R's circular
7   approach to a rate of return determination would perpetuate whatever level
8   of earnings is currently anticipated by investors… The cost of capital
9   standard endorsed by this Commission avoids this self-perpetuating cycle
10   by setting the allowed rate of return on common equity at the rate of return
11   investors require on their investment.[19]

12   **Q.   HAS THE USE OF E/B RATIOS TO ESTIMATE INVESTORS' COST OF EQUITY**

13   **BEEN REJECTED BY THE ACADEMIC COMMUNITY?**

14   A.   Yes, it has. In an article in *The Journal of Finance*, Alexander Robichek notes,

15   Several significant problems are encountered in applying the "comparable
16   earnings" approach.

17   First, comparison of rates of return with other regulated companies leads to
18   circularity. If all regulatory commissions looked merely at each other, no
19   deviations of any magnitude would occur even if economic conditions were
20   to warrant a change.

21   Second, comparisons of rates of earnings on book value between regulated
22   and non-regulated companies are easily challenged on at least two grounds:
23   (1) Lack of comparability of investment risk; and (2) Differences in
24   accounting practices between regulated and non-regulated companies often
25   make rate of return comparisons meaningless.[20]

26   Dr. Roger Morin concedes that

27   Accounting rates of return are not opportunity costs in the economic sense,
28   but reflect the average returns earned on past investments, and hence reflect
29   past regulatory actions. The denominator of accounting return, book equity,
30   is a historical cost-based concept, which is insensitive to changes in investor
31   return requirements. Only stock market price is sensitive to a change in

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[19] *Orange and Rockland Utilities, Inc.,* Opinion No. 314, 44 FERC ¶61,253 at 61,952 (1988) ("Opinion No. 314").
[20] Alexander Robichek, "Regulation and Modern Finance Theory," *The Journal of Finance*, Vol. XXXIII, No. 3, Jun, 1978, p. 700.

1   investor requirements. Investors can only purchase new shares of common
2   stock at current market prices and not at book value.

3   More simply, the Comparable Earnings standard ignores capital markets….
4   Another conceptual anomaly is that when the utility's current book value of
5   return is compared to that of firms of comparable risk, it is assumed that
6   there is a fundamental theoretical relationship between accounting returns
7   and risk. But no such relationship exists in financial theory… Another
8   blemish of the Comparable Earnings method is that comparisons of book
9   rates of return among companies are computationally misleading because
10   of differences among companies in their accounting procedures.[21]

11   In discussing the differences between accounting rates of return (as in the E/B

12   Method) and economic rates of return (as in the DCF and CAPM Methods), Fisher and

13   McGowan state in *The American Economic Review,*

14   Thus, the economic rate of return is the only correct measure of the profit
15   rate for purposes of economic analysis. Accounting rates of return are useful
16   only insofar as they yield information as to economic rates of return.[22]

17   In *Financial Management*, Brigham, Shome, and Vinson flatly state,

18   Previously, the standard approach in cost of equity studies was the
19   comparable earnings method…This procedure has now been thoroughly
20   discredited (see Robichek[15]), and it has been replaced by three market-
21   oriented (as opposed to accounting-oriented) approaches: (i) the DCF
22   method, (ii) the bond-yield-plus-risk-premium method, and (iii) the CAPM,
23   which is a specific version of the bond-yield-plus-risk-premium approach.[23]

24 **Q.**   **IS THE "EXPECTED EARNINGS" MODEL SIMILAR TO THE METHOD**

25   **REJECTED BY LEADING ECONOMISTS?**

26 A.   Yes. The "Expected Earnings" is an accounting-based model very similar to the

27   "Comparable Earnings" method referenced in the above quotations. The only difference is

28   that the Comparable Earnings method considers actual earnings divided by actual book

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[21] Roger A. Morin, *New Regulatory Finance*, Public Utilities Reports, 2006, page 393.

[22] Franklin M. Fischer and John J. McGowan, "On the Misuse of Accounting Rates of Return to Infer Monopoly Profits," *The American Economic Review*, March, 1983, page 82.

[23] Eugene F. Brigham, Dilip K. Shome, and Steve R. Vinson, "The Risk Premium Approach to Measuring a Utility's Cost of Equity," *Financial Management*, Spring 1985, page 34.

1   equity, while the E/B method considers projected earnings divided by projected book

2   equity. However, the academic rejection of reference to historical E/B ratios was based on

3   the fallacy of dividing earnings by book equity, not on any difference between actual and

4   projected versions of that ratio. In fact, reliance on projections rather than actual data makes

5   the E/B ratio method even worse, as projections of utility companies' earnings are (a)

6   speculative and (b) influenced by predictions of the future ROEs that may be allowed by

7   this Commission and other regulators and thus potentially influenced by one source's

8   predictions as to the outcome of the very litigation in which they are applied with no

9   accounting for the market response to those predictions.

10   **Q.   DO YOU BELIEVE THAT ONLY MARKET-BASED METHODS SHOULD BE**

11   **USED TO ESTIMATE THE COST OF EQUITY?**

12   A.   Yes.

13   **Q.   PLEASE ELABORATE.**

14   A.   For clarity, I think we should distinguish two separate aspects of what "market-based"

15   means in this context. The first aspect relates to the underlying purpose of the exercise—

16   what we are trying to estimate when we reference the "cost" of equity. As I stated earlier,

17   the "cost" of equity to regulated utilities at any given time means the return that they must

18   provide at that time in order to attract capital in capital markets. Accordingly, unless a

19   method is market-based in the sense that it is attempting to estimate the return requirements

20   of investors then participating in equity markets, it is fundamentally misdirected. The

21   second aspect is one of technique—what information is used to produce that estimate. In

22   principle, one could use a non-market-based technique to estimate the return that is

1   required by investors then participating in equity markets. For example, one could poll a

2   representative sample of investors and ask them what return they require. But talk is cheap,

3   and there would be no good reason to rely on what investors *say* they require when market-

4   based information will reveal what return investors actually accept. The E/B method is not

5   market-based in either sense and is, therefore, doubly wrong as a method for estimating the

6   cost of equity.

7   **Q.   DO E/B RATIOS IDENTIFY "OPPORTUNITY COSTS" FOR INVESTORS?**

8   A.   No. Although Mr. McKenzie asserted that the E/B method is tied to the concept of

9   "opportunity costs," that is simply not the case. An opportunity cost must reflect what a

10   current investor can expect to currently earn from current investment opportunities. A

11   current investor can earn that return only by purchasing a security in the market at its

12   current market price. In particular, current investors have no opportunity to acquire stock

13   at its book value. The accounting return to the utility and the economic return that the

14   investor expects to receive are simply not the same.

15   Consider the following simplified example. Assume that, initially, Utility XYZ has

16   a book value of $50 per share, an equivalent market price of $50 per share, and earnings

17   and expected earnings of $4 per share. All earnings are paid out as dividends. At that initial

18   point, an investor would expect to earn 8% ($4/$50) per share. Over time, assume that

19   investors' expectations change such that they now expect to earn $8 per share, all expected

20   to be paid out in dividends. As a result of that expectation, the market price is bid up to

21    $100 per share. Investors that had previously bought the stock at $50 (or at some amount

22   less than $100), can then sell the stock at a substantial profit should they so choose.

23   However, those historical capital gains are not our concern here. Current investors or

1   potential investors would have to pay $100 per share in the market. They would expect to

2   receive $8 in dividends for each share of common stock and would obtain those dividends

3   by purchasing the stock in the market for $100 per share. The expected return for that

4   current investor is $8/$100 = 8%. The current investor cannot expect to obtain shares of

5   the stock for $50 and thereby earn $8/$50 = 16% on the investment.[24] That scenario is

6   simply impossible. Yet, that is what the E/B method assumes will happen. The actual

7   opportunity cost for the investor remains at 8%, not 16% as the E/B method presumes.

8   **Q.   DOES THE EXPECTED EARNINGS METHOD SYSTEMATICALLY OVER-**

9   **ESTIMATE THE COST OF EQUITY?**

10   A.   It does so when proxy companies' market-to-book ratios exceed one, as they do currently

11   and will do for the foreseeable future. When the market price-to-book ratio is greater than

12   one, the rate of return investors expect [the company] to earn on [book] common equity is

13   greater than the rate of return investors require from their investment in [the company's]

14   common stock. This excess can be proved by rearranging the terms of the equation that

15   underlies a longstanding and well-accepted version of the DCF method. This formula looks

16   to expected returns/book value as a means of determining the growth rate, not the cost of

17   equity, in the DCF method. That DCF formula is

18   (14) $K_e = D/M + br$,

19   where K_e is the cost of equity, D/M is the dividend yield, and br is the earnings retention

20   growth rate.[25] The term "b" is the ratio of retained earnings to total earnings, which is

---

[24] Although the investor might like to partake of that.
[25] This formula is sometimes presented in a more complex form, $K_e = D/M + sv + br$, in which "sv" is the external accretion growth rate, found by multiplying the rate of increase in shares "s" by the rate of increase in market price

1   multiplied by the term "r," the expected return on book equity. (For clarity, I have used

2   "M"—meaning market price per share, the numerator of the M/B ratio—to represent price.

3   "P" is sometimes conventional in this context, but either label means the same thing.) Note

4   that K_e, the market-based cost of equity, is not equal to r, the accounting based return on

5   book equity. In fact, it can be shown, using this formula, that $r > K_e$ if M > B. The algebra

6   involves the fact that "D" (dividends per share) equals the payout ratio (that is, one minus

7   the retention ratio) multiplied by earnings per share, which in turn equals earnings per book

8   equity multiplied by book equity per share:

9   (15) $K_e = D/M + br = [(1-b)rB]/M + br$

10   This equation can be re-arranged as

11   (16) $B/M = (K_e - br) / (r - br)$,

12   or reciprocally as

13   (17) $M/B = (r - br) / (K_e - br)$,

14   which means that where M > B, $r > K_e$. That means the E/B ratio "r" will exceed the cost
15   of equity when M/B exceeds one.

16   Conversely, where M < B, the E/B ratio "r" will fall below the cost of equity. That

17   was the case for many utilities in the early 1980s. In my view, placing weight on E/B ratios

18   only when they increase the allowed ROE would not strike a fair balance between

19   shareholders and ratepayers. But that is the result that Mr. McKenzie advocates.

"v." For simplicity, I am assuming a constant share count so that "s" and "sv" are both zero, and the "sv" term drops out.

1   The E/B ratios used in his model are not representative of *utility* E/B ratios. Rather,

2   the utilized E/B ratios are those of publicly-traded proxy companies, which in almost every

3   instance are parent-level holding companies that are not themselves operating gas utilities.

4   Those holding companies' earnings and E/B ratios are substantially tied to non-utility lines

5   of business, which makes their E/B ratios even less meaningful as an indicator of utilities'

6   cost of equity.

7 **Q.**   **DO HOLDING COMPANY OR OPERATING COMPANY E/B RATIOS**

8   **NECESSARILY ALIGN WITH THE EQUITY RETURN ON RATE BASE**

9   **ALLOWED BY REGULATORS?**

10 **A.**   Value Line E/B projections are for publicly-traded companies (parent-level, which almost

11   universally means a holding company) rather than operating-utility-level entities. The

12   parent-level expected E/B ratios reported in *Value Line* commonly exceed the allowed

13   ROEs of the associated, subsidiary operating companies.

14 **Q.**   **WHAT ARE SOME REASONS THAT THE EXPECTED E/B RATIOS**

15   **REPORTED IN VALUE LINE MIGHT EXCEED THE SUBSIDIARY**

16   **OPERATING COMPANIES' ALLOWED ROES?**

17 **A.**   First, the parent-level entities covered by *Value Line* commonly derive substantial income

18   from non-utility operations, including both non-electric operations and non-utility electric

19   operations, such as merchant generation. Compared to utilities, such operations commonly

20   generate higher levels of revenue per book value investment. The resources that drive their

21   revenues, such as human resources, customer relationships, brands, and proprietary

22   business processes, are commonly accounted for through expenses rather than assets—

1   what I will call "intangible assets." The effect of these conservative accounting conventions

2   is to understate (in economic terms) the "B" that forms the divisor of modern firms' E/B

3   ratios.[26] Consider Apple and Microsoft, each of which has recently possessed the highest

4   market capitalization of any company. Apple's projected E/B ratio in a recent *Value Line*

5   report was 41%. Similarly, Microsoft's projected E/B ratio in the August 9, 2019, *Value*

6   *Line* reports is 37.5% higher M/B ratios. Although the non-utility businesses of utility

7   parent companies are not centered on intangible assets to the same extent as Apple and

8   Microsoft, they do generate revenues in ways that do not depend on heavy investment in

9   book value assets.

10   Another cause is mismatches between operating companies' accounting book

11   equity and their rate-base-implied common equity, caused by accounting and depreciation

12   adjustments to rate base. The rate-base-implied common equity often exceeds accounting-

13   based book common equity. If that occurs, the operating company's achieved and expected

14   E/B ratio can exceed the allowed ROE. The reality is that, semantics aside, the two "book"

15   values are very different; treating them as if they were identical involves a substantial

16   mismatch.

17   **Q.   HAS MR. MCKENZIE IDENTIFIED ANY REGULATOR WHO HAS USED**

18   ***VALUE LINE* E/B FORECASTS TO SET ALLOWED RETURNS, OR HAS HE**

19   **CITED ANY ACADEMIC SCHOLAR OR JOURNAL THAT HAS**

20   **RECOMMENDED THIS APPROACH?**

21   A.   No, he has not.

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[26] *See* Lev, Baruch and Feng Gu, *The End of Accounting and the Path Forward for Investors and Managers* (Wiley, 2016).

46

1 **Q.   IS THE E/B METHOD UNDERMINED BY CIRCULARITY?**

2 A.   Yes, it is.

3   Because the Expected Earnings method never brings market data into the analysis,

4   it does not lead to convergence in estimating the cost of equity in the regulatory rate of

5   return paradigm because of circularity. If expected returns/book value, greater than the cost

6   of equity, are used to set the allowed ROE, the future earned ROE and future expected

7   return will likely be higher than the cost of equity. This continues *ad infinitum*. If expected

8   returns less than the cost of equity are used to set the allowed ROE, the future earned ROE

9   and future expected return will likely be smaller than the cost of equity. This situation

10   continues *ad infinitum*. Nowhere does the expected return converge to the cost of equity.

11   Using *Value Line* projected ROEs as a significant input into authorized ROEs

12   would provide the utilities the opportunity to earn those excessive ROEs, a self-fulfilling

13   prophecy.

14   Moreover, use of *Value Line* projected E/B ratios is also circular in a second sense:

15   using projected E/B ratios that exceed past or forecast authorized ROEs would tend to

16   provide their subsidiary utilities the opportunity to recover those above-cost E/B rates of

17   return, a self-fulfilling prophecy.

18 **Q.   PLEASE SUMMARIZE YOUR REBUTTAL AS TO "EXPECTED EARNINGS."**

19 A.   Reference to expected earnings on book equity distorts and inflates the estimation of

20   investors' required return on market-priced equity. Accordingly, E/B analysis should be

21   disregarded or at the very most should be given much less weight than market-based

22   models.

1 **G.   Mr. McKenzie's Use of Non-Utility Benchmarks is Flawed**

2 **Q.   DO YOU AGREE WITH MR. MCKENZIE'S USE OF NON-UTILITY**

3 **BENCHMARKS (MCKENZIE DIRECT, PP. 59-62 AND EXHIBIT NO. AMM-11)?**

4 A.   No, I do not for several reasons. First, those non-utility companies (NUC) are simply not

5   comparable to a regulated utility company such as Black Hills. Regulated utilities are not

6   exposed to competitive forces as are NUC. Those competitive forces can cause severe

7   volatility in a company's stock prices and earnings and can ultimately lead to bankruptcy.

8   If an NUC is not earning enough, it has no state regulator to which it can apply for price

9   increases. In sharp contrast, a regulated utility has a monopoly in a defined service territory

10   and can apply for rate increases.

11   Second, Mr. McKenzie's DCF analysis suffers from the same infirmities as I

12   mentioned above in response to his DCF analysis applied to Black Hills. First, McKenzie

13   used *Value Line* growth rates, which are inflated. Second, Mr. McKenzie strictly relied

14   upon short-term growth rates without consideration of long-term growth rates. I previously

15   discussed the importance of using long-term growth rates in the DCF model. Third, he

16   considered midpoints in his DCF analysis, which is inappropriate as I previously discussed.

17   Fourth, he erroneously excluded so-called low-end outliers from his analysis. In doing so,

18   he compared those low-end results with projected utility bond yields. Using projected bond

19   yield is completely wrong. Those projections are speculative.

20   Mr. McKenzie's benchmarking should be given no weight by the Commission.

1   **H.   Mr. McKenzie's Flotation Cost Analysis is Flawed**

2   **Q.   DO YOU AGREE WITH MR. MCKENZIE'S FLOTATION COST ANALYSIS (PP.**

3   **54-59 AND EXHIBIT NO. AMM-10)?**

4   A.   No, I do not. While a flotation allowance may be appropriate in cases where the utility

5   regularly issues common stock, that is not the case here. The last time that Black Hills

6   Corp. (the parent of Black Hills) issued common stock was November 19, 2015 (Exhibit

7   AMM-10). Additionally, *Value Line* projects a small annual increase in shares outstanding

8   of 0.5%.

9   Also, in Docket No. BG-0067 this Commission rejected inclusion of a flotation

10   adjustment in the cost of equity.

11   *I.   Other Miscellaneous Responses to Mr. McKenzie*

12   Q.   MR. MCKENZIE ALLEGES THAT BECAUSE BLACK HILLS DOES NOT HAVE A

13   REVENUE DECOUPLING MECHANISM OR WEATHER NORMALIZATION

14   CLAUSE, THAT IT SHOULD BE CONSIDERED RISKIER THAN OTHER GAS

15   UTILITIES, (MCKENZIE DIRECT, P. 10). DO YOU AGREE?

16   A.   No, I do not. Black Hills has a robust infrastructure adjustment rider, which places it in

17   approximately the same risk as the proxy group.

18   Q.   MR. MCKENZIE CLAIMS THAT BECAUSE OF THE COVID PANDEMIC,

19   REQUIRED RETURNS FOR COMMON STOCKS HAVE MOVED SHARPLY

20   HIGHER. (MCKENZIE DIRECT, PP. 18-21). DO YOU AGREE?

1 A. Not completely. His claim may be true in general for the stock market, but is not necessarily

2   true for utility stocks. Because of the protected monopoly status of utilities, those stocks

3   have not been significantly impacted. Mr. McKenzie has provided no specific evidence on

4   those alleged impacts on utility stocks. Further, market-based models, such as the DCF,

5   CAPM, and Risk Premium models will appropriately capture any of those alleged effects

6   in their cost of equity estimates.

7 Q. THROUGHOUT HIS ANALYSIS MR. MCKENZIE USES PROJECTED INTEREST

8   RATES IN DEVELOPING HIS COST OF EQUITY ESTIMATES. (EXHIBIT AMM-6,

9   PAGE 2, EXHIBIT AMM-7, PAGE 2, EXHIBIT AMM-8, PAGE 2). IS THAT

10   APPROPRIATE?

11 A. No, it is not. Those forecasts are speculative and should not be used as a basis for setting

12   the cost of equity. Additionally, the Federal Reserve recently announced a change in policy

13   that will likely keep interest rates low for the foreseeable future. The previous Fed policy

14   was to keep inflation at or below 2%, with 2% representing a ceiling. The new Fed policy

15   is to keep the average inflation rate, over a period of time, at 2%. This means that the Fed

16   will be able to use its discretion to keep interest rates low even if that means that there will

17   be a period of above 2% inflation.

18   **XIII. Conclusions**

19 **Q. PLEASE SUMMARIZE YOUR CONCLUSIONS.**

20 A. I recommend an 8.97% cost of equity for Black Hills and a 3.91% cost of long-term debt.

21   For the capital structure, I recommend a 50%/50% long-term debt/common equity ratio.

22   My overall cost of capital recommendation is 6.44%.

1   **Q.   DOES THAT CONCLUDE YOUR DIRECT TESTIMONY?**

2   A.   Yes, it does.

BEFORE THE NEBRASKA PUBLIC SERVICE COMMISSION

|		
IN THE MATTER OF THE	)	
APPLICATION OF BLACK HILLS	)	Application No. NG-109
NEBRASKA GAS, LLC d/b/a	)	
BLACK HILLS ENERGY, RAPID CITY,	)	**AFFIDAVIT OF WITNESS**
SOUTH DAKOTA, SEEKING	)	
APPROVAL OF A GENERAL RATE	)	
INCREASE.	)	

STATE OF _Arkansas_)
) ss.
COUNTY OF _Pulaski_)

I, ___S. Keith Berry___, being first duly sworn on oath, depose and state that I am the witness identified in the foregoing prepared testimony filed in the above-captioned action and I am familiar with its contents, and that the facts set forth therein are true to the best of my knowledge, information, and belief.

S. Keith Berry

SUBSCRIBED and sworn to before me this _3_ day of _September_, 2020.

(SEAL)
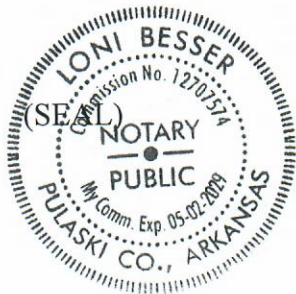
Loni Besser
Notary Public

My Commission Expires: _5·2·2029_

S. KEITH BERRY

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CURRENT POSITIONS

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Hendrix College

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Economic & Financial Consulting Group, Inc., 1990-Present
Conway, AR 72032

Co-Chair, Return on Equity Work Group
Organization of MISO States

EDUCATION

Ph.D., Economics
Vanderbilt University, 1979

B.A., Mathematics
Hendrix College, 1973

PREVIOUS POSITIONS

Professor of Economics and Business
Hendrix College, 2002-2014

Director, Center for Entrepreneurial Studies
Hendrix College, 2001-2007

*Chair, Department of Economics and Business –*Supervisor of five faculty
Hendrix College, 2003-05

Associate Professor of Economics and Business
Hendrix College, 1994-2002

Assistant Professor of Economics and Business

Exhibit SKB-1

Hendrix College, 1989-1994

Director of Research and Policy Development-Supervisor of six policy analysts
Arkansas Public Service Commission, Little Rock, AR, 1986-1989

Manager of Rates and Finance Sections-Supervisor of six rate and financial analysts
Arkansas Public Service Commission, Little Rock, AR, 1979-1986

Instructor/Assistant Professor of Economics and Business
Hendrix College, Conway, AR, 1977-1979

Instructor
Vanderbilt University, 1976-77

CURRENT AND PAST CONSULTING ACTIVITIES WITH THE ARKANSAS PUBLIC SERVICE COMMISSION

I have been retained as a consultant and expert witness by the Arkansas Public Service Commission continuously since 1990. In that capacity, I have advised the Arkansas Commission, and filed testimony on behalf of the Arkansas Commission, on the following subjects:

(1)   Regional Transmission Organizations;
(2)   Independent Coordinator of Transmission;
(3)   Locational marginal pricing;
(4)   Resource Planning;
(5)   Mergers;
(6)   National Interest Electric Transmission Corridors;
(7)   Transmission Planning;
(8)   Standard Market Design;
(9)   Demand Side Resources;
(10)   System Pooling Agreements;
(11)   Stranded Costs;
(11)   FERC Rulemaking on Transmission Issues;
(13)   Fuel Adjustment Clauses;
(14)   Interruptible Rates;
(15)   Avoided Cost Pricing;
(16)   Nuclear decommissioning rates;
(17)   Retail electric utility rate cases;
(18)   Gas Distribution utility rate cases;
(19)   Independent Transmission Companies;
(20)   Cost of capital;
(21)   Depreciation expense reflected in formula rates;

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(22)   Plant cancellation costs reflected in formula rates;
(23)   Utility mergers;
(24)   Nuclear plant purchases;
(25)   Interruptible rates.

TECHNICAL ASSISTANCE PROVIDED

Technical assistance on cost of capital issues provided to District of Columbia Public Service Commission and Staff, Formal Case No. 1087, Pepco Electric Rate Case, 2011-12.

Technical assistance on cost of capital issues provided to District of Columbia Public Service Commission and Staff, Formal Case No. 1093, Washington Gas Light Company Rate Case, 2012.

Technical assistance on cost of capital issues provided to District of Columbia Public Service Commission and Staff, Formal Case No. 1103, Pepco, 2013-14.

Technical assistance on cost of capital issues provided to District of Columbia Public Service Commission and Staff, Formal Case No. 1137, Washington Gas Light, 2016.

Technical assistance on cost of capital issues provided to District of Columbia Public Service Commission and Staff, Formal Case No. 1139, Pepco, 2016-17.

TESTIMONY OR REPORTS PRESENTED TO COMMISSIONS, COURTS OR   AGENCIES

Federal Energy Regulatory Commission, Docket No. EL17-41, EL18-142, and EL18-204. Testimony concerning the cost of capital of System Energy Resources, Inc. January, 2019, August, 2019, December, 2019, February, 2020, June, 2020, and August, 2020.

Federal Energy Regulatory Commission, Docket No. EL14-12 and EL15-45. Testimony concerning the cost of capital for the MISO transmission owners. February, 2019 and April, 2019.

Federal Energy Regulatory Commission, Docket No. EL17-41. Affidavit concerning the cost of capital of System Energy Resources, Inc. January, 2017.

Federal Energy Regulatory Commission, Docket No. EL09-61-004. Testimony concerning bandwidth payments in the Entergy System Agreement. January-February, 2017.

Federal Energy Regulatory Commission, Docket No. EL01-88. Testimony concerning adjustments

Exhibit SKB-1

to 2005 bandwidth payments in the Entergy System Agreement. April, 2016.

Federal Energy Regulatory Commission, Docket No. EL10-65. Testimony concerning retroactive adjustments to bandwidth payments in the Entergy System Agreement. July-August, 2015.

Federal Energy Regulatory Commission, Docket No. EL13-432-000. Testimony concerning allocations of benefits from the Union Pacific-Entergy Settlement, June-July, 2014.

Federal Energy Regulatory Commission, Docket No. EL09-61-000. Testimony concerning calculations of Load Responsibility Ratios in the Entergy System Agreement, February-March, 2013.

Arizona Corporation Commission, Docket No. E-01933A-12-0291, Testimony concerning the cost of capital of Tucson Electric Power, December, 2012.

Federal Energy Regulatory Commission, Docket No. EL12-1384-000, Testimony concerning inclusion of cancelled production costs on Entergy's bandwidth calculations. October, 2012.

U.S. District Court for the Middle District of Louisiana, Civil Action No.09-100-RET-CN, United States of America et al. v. Louisiana Generating, LLC. Expert Report concerning the financial integration between Louisiana Generating, LLC and NRG Energy, August, 2012

Federal Energy Regulatory Commission, Docket No. EL12-1384-000. Affidavit concerning impact of cancelled production costs on Entergy's bandwidth calculations. May, 2012.

Federal Energy Regulatory Commission, Docket No. EL12-1384-000. Affidavit concerning impact of cancelled production costs on Entergy's bandwidth calculations. April, 2012.

Federal Energy Regulatory Commission, Docket No. EL01-88-000. Affidavit concerning increase in EAI bandwidth payments for seven months in the year 2005. January, 2012.

Missouri Public Service Commission, Case No. HR-2011-0241. Testimony concerning the cost of capital of Veolia Energy Kansas City, Inc., September, 2011.

North Dakota Public Service Commission, Case Nos. PU-10-6576 and PU11-55. Testimony concerning cost of capital of Northern States Power Minnesota operating in North Dakota, August, 2011.

Federal Energy Regulatory Commission, Docket No. EL11-57-000. Affidavit concerning impact of cancelled production costs on Entergy's bandwidth calculations. August, 2011.

Federal Energy Regulatory Commission, Docket No. ER10-2001. Testimony concerning depreciation expense used in bandwidth calculations. April, 2011.

Exhibit SKB-1

Federal Energy Regulatory Commission, Docket No. EL10-55-000. Testimony concerning depreciation expense used in bandwidth calculations. October, 2010.

Federal Energy Regulatory Commission, Docket No. EL09-1224-000. Testimony concerning 2009 bandwidth calculations for Entergy Operating Companies. January and February, 2010.

Connecticut Department of Public Utility Control. Participation in task force that performed a Management Audit of the Connecticut Light & Power Company, May, 2009.

Federal Energy Regulatory Commission, Docket No. ER09-636-000. Affidavit concerning Entergy Arkansas notice of intent to withdraw from the Entergy System Agreement, April, 2009.

Federal Energy Regulatory Commission, Docket No. EL08-51-000. Testimony concerning recovery of Spindletop regulatory asset in 2008 bandwidth remedy. February, 2009.

Federal Energy Regulatory Commission, Docket No. ER08-1056-000. Testimony concerning inclusion of certain Evangeline gas costs in 2008 bandwidth calculations for Entergy, January, 2009.

Federal Energy Regulatory Commission, Docket No. ER08-1056-000. Affidavit on 2008 bandwidth remedy on Entergy System. July 2008.

Federal Energy Regulatory Commission, Docket No. ER07-956-000. Testimony concerning Entergy System Agreement 2007 bandwidth effects of imprudence and depreciation, February-March, 2008.

Federal Energy Regulatory Commission, Docket No. EC07-70-000. Affidavit concerning Entergy acquisition of Calcasieu Power, LLC.

Maryland Public Service Commission, Case No. 9062. Testimony concerning the cost of capital of Chesapeake Utilities Corporation, August, 2006.

Federal Energy Regulatory Commission, Docket No. EL06-76-000. Affidavit in Complaint by APSC concerning production costs on the Entergy System, April, 2006.

Federal Energy Regulatory Commission, Docket No. ER03-583-000, et al. Testimony concerning purchased power agreements on Entergy System, November, 2003.

Federal Energy Regulatory Commission, Docket No. ER03-753-000. Testimony concerning unit power rate schedule on Entergy System, November, 2003.

Federal Energy Regulatory Commission, Docket No. EL01-88-000.
Testimony opposing production cost equalization on the Entergy System, March, 2003, April, 2003, and July, 2003.

Exhibit SKB-1

Securities and Exchange Commission, File No. 70-9785, Affidavit concerning issues associated with
exempt wholesale generators for American Electric Power, September, 2002.

Federal Energy Regulatory Commission, Docket No. EL01-88-000.
Affidavit opposing production cost equalization on the Entergy System, July, 2001.

Federal Energy Regulatory Commission, Docket Nos. EL00-66-000 et al.
Affidavit concerning production cost equalization on the Entergy System, May, 2001.

State of Arkansas General Assembly, Testimony concerning HB 1411 regarding funding of the
White River Navigation Project, January, 2001.

Federal Energy Regulatory Commission, Docket Nos. EL00-66-000 et al.
Testimony concerning modification of Entergy System Agreement to accommodate
deregulation and interruptible rates, December, 2000, January, 2001, and February, 2001.

Federal Energy Regulatory Commission, Docket Nos. EL98-40-000 et al.
Testimony concerning the merger of American Electric Power and Central and South West,
May, 1999 and June, 1999.

Federal Energy Regulatory Commission, Docket No. EC99-18-000
Affidavit concerning the proposed acquisition of Pilgrim Nuclear Unit by Entergy
Corporation, January, 1999.

Securities and Exchange Commission, File No. 70-9049
Affidavit concerning financial risk of diversification of Entergy Corporation, October, 1998.

Arkansas Public Service Commission, Docket No. 98-081-TF
Testimony concerning off-peak rates, March, 1998.

"Report on the Cost of Equity of New York Power Authority," December, 1997.

State of Arkansas General Assembly
Economic Policy Analysis of Telecommunications Reform Act of 1997, January, 1997.

Securities and Exchange Commission, File No. 70-8725
Affidavit concerning financial risk of diversification of Southern Company, October, 1996
and January, 1997.

Federal Energy Regulatory Commission, Docket No. ER95-53-000
Testimony concerning the equalization of nuclear decommissioning costs of Entergy,
October, 1996.

Exhibit SKB-1

Securities and Exchange Commission, File No. 70-8809
> Affidavit concerning financial risk of diversification of Central and Southwest. May, 1996.

"Report on the Cost of Equity of New York Power Authority," January, 1996.

Federal Energy Regulatory Commission, Docket No. ER95-1042-000
> Testimony concerning the cost of capital and nuclear decommissioning of System Energy Resources, October, 1995.

Federal Energy Regulatory Commission, Docket No. ER95-53-000
> Affidavit concerning nuclear decommissioning cost equalization on the Entergy System. June, 1995.

"Report on the Development of Electric Utility and Railroad Comparable Samples for the Tax Division of the Arkansas Public Service Commission," February, 1995.

Federal Energy Regulatory Commission, Docket No. EL94-13-000
> Testimony concerning the merger of Entergy and Gulf States Utilities. October, 1994.

Arkansas Public Service Commission, Docket No. 94-355-U
> Testimony concerning the cost of capital of Louisiana-Nevada Transit. October, 1994.

Oklahoma Corporation Commission, PUD 940000354
> Testimony concerning the cost of capital of Arkansas Louisiana Gas Co. July, 1994.

Arkansas Public Service Commission, Docket No. 94-175-U
> Testimony concerning the cost of capital of Arkansas Louisiana Gas Co. June, 1994.

Securities and Exchange Commission, File No. 70-8339
> Affidavit concerning the merger of Central and Southwest and El Paso Electric. April, 1994.

Federal Energy Regulatory Commission, Docket Nos. EC94-7-000 and ER94-898-000
> Testimony concerning the merger of Central and Southwest and El Paso Electric. February, 1994.

Arkansas Public Service Commission, Docket No. 93-081-U
> Testimony concerning the cost of debt of Arkansas Louisiana Gas Co. October, 1993.

Federal Energy Regulatory Commission, Docket Nos. EC92-21-000 and ER92-806-00
> Testimony concerning the merger of Entergy and Gulf States Utilities. March, 1993.

Federal Energy Regulatory Commission, Docket Nos. ER92-341-000, EL92-35-000, and EL92-36-000

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Testimony concerning the cost of capital of System Energy Resources. December, 1992.

Securities and Exchange Commission, File No. 70-8059
Affidavit concerning the merger of Entergy and Gulf States Utilities. November, 1992.

Oklahoma Corporation Commission, PUD 0001317
Testimony concerning the cost of capital and a weather normalization adjustment clause for Arkansas Louisiana Gas Co. May, 1992.

Kansas Corporation Commission, Docket No. 181,200-U
Testimony concerning the cost of capital and a weather normalization adjustment clause for Arkansas Louisiana Gas Co. May, 1992.

Arkansas Public Service Commission, Docket No. 92-032-U
Testimony concerning a weather normalization adjustment clause for Arkansas Louisiana Gas Co. February, 1992.

Arkansas Public Service Commission, Docket No. 89-143-C
Testimony concerning franchise fee or tax on AT&T in the City of Little Rock. January, 1992.

Federal Energy Regulatory Commission, Docket No. EL90-48-000
Testimony concerning the spin-off of a coal unit on the Entergy System. January, 1992.

Arkansas State Banking Commission
Economic and Financial Report on the Feasibility of the Proposed First Community Bank, Conway, Arkansas (prepared by Economic & Financial Consulting Group, Inc.), May, 1991

Arkansas Public Service Commission, Docket No. 90-133-U
Testimony concerning non-traffic sensitive costs on telephone systems. November, 1990.

Federal Energy Regulatory Commission, Docket Nos. ER89-678-000 and EL90-16-000
Testimony concerning the cost of capital and nuclear decommissioning of System Energy Resources. November, 1990

Arkansas Public Service Commission, Docket No. 90-004-U
Testimony concerning the capital structure of Arkansas Western Gas Co. October, 1990.

Arkansas Public Service Commission, Docket No. 88-115-TF
Testimony concerning phase-in plan for Arkansas Power and Light Co. September, 1988.

Arkansas Public Service Commission, Docket No. 87-201-U
Testimony concerning the cost of capital of GTE Southwest, Inc. August, 1988.

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Arkansas Public Service Commission, Docket No. 87-166-TF
> Testimony concerning nuclear decommissioning trust fund of Arkansas Power and Light Co. January, 1988.

Arkansas Public Service Commission, Docket No. 87-070-U
> Testimony concerning the cost of capital of Arkansas Louisiana Gas Co. September, 1987.

Arkansas Public Service Commission, Docket No. 87-071-U
> Testimony concerning the cost of capital of Arkansas Energy Resources. August, 1987.

Federal Energy Regulatory Commission, Docket Nos. EL86-58-000 and EL86-59-000
> Testimony concerning the cost of capital of System Energy Resources, Inc. and Middle South Services. March, 1987

Arkansas Public Service Commission, Docket No. 87-028-U
> Testimony concerning a preferred stock issuance by Arkla. March, 1987.

Arkansas Public Service Commission, Docket No. 84-165-U
> Testimony concerning the cost of capital of Southwestern Bell. February, 1987.

Arkansas Public Service Commission, Docket No. 86-243-TF
> Testimony concerning incentive rates   for Arkansas Power and Light Co. January, 1987.

Securities and Exchange Commission, File No. 70-7299
> Affidavit concerning a preferred stock issuance by System Energy Resources. December, 1986.

Arkansas Public Service Commission, Docket No. 86-175-TF
> Testimony concerning incentive rates for Arkansas Power and Light Co. September, 1986.

Arkansas Public Service Commission, Docket No. 86-147-TF
> Testimony concerning a tax adjustment rider for Arkansas Power and Light Co. August, 1986.

Arkansas Public Service Commission, Docket No. 86-112-TF
> Testimony concerning seasonally differentiated rates of Arkansas Power and Light Co. June, 1986.

Arkansas Public Service Commission, Docket No. 86-090-U
> Testimony concerning gas transportation policy. June, 1986.

Arkansas Public Service Commission, Docket No. 85-299-U
> Testimony concerning cost allocations between customer classes on Arkansas Power and

Exhibit SKB-1

Light Co. February, 1986.

Arkansas Public Service Commission, Docket No. 84-249-U
Testimony concerning the cost of capital, incentive rates, and phase-in plan for Arkansas Power and Light Co. May, 1985.

Arkansas Public Service Commission, Docket No. 85-104-TF
Testimony concerning interruptible incentive rates for Arkansas Power and Light Co. May, 1985.

Arkansas Public Service Commission, Docket No. 85-043-U
Testimony concerning a rate freeze for Arkansas Louisiana Gas Co. February, 1985.

Arkansas Public Service Commission, Docket No. 84-084-U
Testimony concerning cost allocations and phase-in plan for Arkansas Electric Cooperative Corporation. September, 1984.

Arkansas Public Service Commission, Docket No. 84-199-U
Testimony concerning the cost of capital, rate design, and class cost allocations for Arkansas Power and Light Co. September, 1984.

Arkansas Public Service Commission, Docket No. F-007
Testimony concerning fuel and gas adjustment clauses. May, 1984.

Arkansas Public Service Commission, Docket No. 83-161-U
Testimony concerning the cost of capital and replacement cost pricing for Arkansas Louisiana Gas Co. March 1984.

Arkansas Public Service Commission, Docket No. 83-253-U
Testimony concerning the cost of capital of AT&T. January, 1984.

Arkansas Public Service Commission, Docket No. 83-153-U
Testimony concerning the cost of capital of Allied Telephone Co. December, 1983.

Arkansas Public Service Commission, Docket No. 83-206-U
Testimony concerning a rate reduction for Arkansas Power and Light. December, 1983

Arkansas Public Service Commission, Docket No. 83-045-U
Testimony concerning the cost of capital and customer stock purchase plan on Southwestern Bell. September, 1983.

Arkansas Public Service Commission, Docket No. 81-104-AP-2
Testimony concerning nuclear fuel negative salvage costs of Arkansas Power and Light Co. July, 1983.

Exhibit SKB-1

Arkansas Public Service Commission, Docket No. 82-314-U
    Testimony concerning the cost of capital and customer stock purchase plan on Arkansas Power and Light Co. April, 1983.

Federal Energy Regulatory Commission, RM-80-36-000
    Comments concerning a generic rate of return. December, 1982.

Illinois Commerce Commission, Docket No. 82-0152
    Testimony concerning the cost of capital of Illinois Power Co. July, 1982.

Arkansas Public Service Commission, Docket No. 81-260-U
    Testimony concerning the rate of return of Arkansas Electric Cooperative Corporation. June, 1982.

Arkansas Public Service Commission, Docket No. 82-037-U
    Testimony concerning the cost of capital for Southwestern Bell. May, 1982.

Arkansas Public Service Commission, Docket No. 81-349-U
    Testimony concerning the cost of capital of Associated Natural Gas Co. April, 1982.

Arkansas Public Service Commission, Docket No. TD-80-06
    Testimony concerning overall capitalization rate. November, 1981.

Arkansas Public Service Commission, Docket No. 81-161-U
    Testimony concerning the cost of capital of Oklahoma Gas and Electric. October, 1981.

Arkansas Public Service Commission, Docket No. 81-144-U
    Testimony concerning the cost of capital and nuclear decommissioning trust funds for Arkansas Power and Light Co. September, 1981.

Arkansas Public Service Commission, Docket No. U-3136
    Testimony concerning the cost of capital of Southwestern Electric Power Co. April, 1981.

Arkansas Public Service Commission, Docket No. U-3117
    Testimony concerning an econometric model for directory assistance for Southwestern Bell Co. April, 1981.

Arkansas Public Service Commission, Docket No. U-3071
    Testimony concerning the rate of return and an econometric model of demand for Arkansas Electric Cooperative Corp. July, 1980.

Arkansas Public Service Commission, Docket No. U-3089
    Testimony concerning the rate of return of North Arkansas Telephone Cooperative. July,

Exhibit SKB-1

1980.

Arkansas Public Service Commission, Docket No. U-3096
Testimony concerning the cost of capital of United Telephone Co. March, 1980.

Arkansas Public Service Commission, Docket No. U-3052
Testimony concerning the cost of capital of Associated Natural Gas Co. March, 1980.

Arkansas Public Service Commission, Docket No. U-3036
Testimony concerning the cost of capital of United Telephone Co. November, 1979.

HONORS AND AWARDS

Wincott Visiting Research Fellowship
University of Buckingham, United Kingdom, Fall, 1997

Earhart Fellowship (with Nicholas Georgescu-Roegen)
Vanderbilt University, 1975-1976

Graduate School Assistantship
Vanderbilt University, 1973-1976

Mosley Economics Award
Hendrix College, 1973

Hogan Math Award
Hendrix College, 1972

Alpha Chi (scholastic),
 Hendrix College

Rensselaer Math and Science Award, 1968

PUBLICATIONS

"A Comparison of Pay-as-Bid and Market Clearing Price Bidding Processes in Electric Utility Auctions," *Managerial and Decision Economics*, *35*, 2014, pp.258-263.

"Sub-Optimal Generation Portfolio Variance with Rate of Return Regulation," *Technology and Investment, 1*, 2010, pp. 114-17.

Exhibit SKB-1

"Firm Incentives for Invention Prizes With Multiple Winners," *Eastern Economic Journal*, *32*, 2006, pp. 83-95.

"Generation Search Costs and Ramsey Pricing in a Partially Deregulated Electric Utility Industry," *Journal of Economics and Business*, *54*, 2002, pp. 331-343.

"Substitution Between Bundled and Unbundled Products After Deregulation in Electricity Generation," *Eastern Economic Journal*, *26*, 2000, pp. 455-68.

"Stranded Costs, Access Charges, and Ramsey Pricing in the U.S. Electric Utility Industry," *The Quarterly Review of Economics and Finance*, *40*, 2000, pp. 503-17.

"Excess Returns in Electric Utility Mergers During Transition to Competition," *Journal of Regulatory Economics*, *18*, 2000, pp.175-88.

"Interest Rate Risk and Utility Risk Premia During 1982-93," *Managerial and Decision Economics*, *19*, 1998, pp. 127-35.

"Asymmetric Demand Information in Regulation," *Studies in Economics and Finance*, *18*, 1998, pp. 129-41.

"Utility Mergers and the Cost of Capital," *Journal of Financial and Strategic Decisions*, *11*, 1998, pp.73-82.

"Interest Rate Risk and Utility Bond and Dividend Yields," *Advances in Investment Analysis and Portfolio Management*, Volume III, 1995, pp. 183-191.

"Rent-Seeking With Multiple Winners," *Public Choice*, *8*, 1993, pp. 437-43.

"A Risk-Adjusted Approach for Assessing Factors that Determine Utilities' Allowed Returns on Equity," (with Timothy Mason), *The Review of Industrial Organization*, *8*, 1993, pp. 113-23.

"Ramsey Pricing in the Presence of Risk," *Managerial and Decision Economics*, March-April, 1992, pp. 111-17.

"The Impact of Consumers on the Dissipation of Rents," *Eastern Economic Journal*, July-September, 1991, pp. 345-49.

"Expected Rate Minimization and Excess Capacity in Regulated Utilities," *The Quarterly Review of Economics and Business*, Volume 30, Number 3, Fall 1990, pp. 85-95.

"Flotation Cost Allowance Methodologies: A Synthesis Using Present Value Analysis," *The Financial Review*, Volume 25, Number 3, August, 1990, pp.487-500.

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"The Allocation of Risk Between Stockholders and Ratepayers in Regulated Utilities," *Land Economics*, Volume 64, Number 2, May, 1988, pp. 114-24.

"Rate-of-Return Regulation and Demand Uncertainty with a Symmetric Regulatory Constraint," *The American Economist*, Fall, 1987, pp. 8-12.

"The Relevance of Quasi Rationality in Competitive Markets: Comment," *American Economic Review*, Volume 77, Number 3, June, 1987, pp. 496-8.

"The Ratepayer and Stockholder under Alternative Regulatory Policies: Comment," *Land Economics*, Volume 63, Number 2, May, 1987, pp. 201-5.

"The Impact of Nuclear Power Plant Construction Activity on the Electric Utility Industry's Cost of Capital," (with Samuel Loudenslager), *The Energy Journal*, Volume 8, Number 2, April, 1987, pp. 63-75.

"When is Excess Capacity Desirable?" *New Regulatory and Management Strategies in a Changing Market Environment*, Institute of Public Utilities, 1987, pp. 358-371.

"Random Pseudo-Disturbance Generators in a Stochastic Simulation of an Econometric Model,"(with Cliff Huang), *Journal of Statistical Computation and Simulation*, Vol.22, Nos. 3 and 4, pp. 285-302.

"The Quarterly Cost of Equity: Implications for Setting the Annual Return on Equity," *Electric Ratemaking*, Volume 2, Number 2, April/May, 1983, pp.8-10.

Book Review of *Issues in Public-Utility Pricing and Regulation*, edited by Michael A. Crew, Lexington. Mass.: D.C. Heath & Co., 1980, in *Southern Economic Journal*, Volume 48, Number 4, April, 1982, pp. 1112-3.

"The Discounted Cash Flow Formula: Validation and Estimation," *Proceedings of the Second NARUC Biennial Regulatory Information Conference*, pp.397-400.

PRESENTATIONS

"Offer Curve Behavior for Merchant Plants in Electric Utility Regional Transmission Organizations", 2005 Southern Economics Association Meetings, Washington, D.C.

"Deans, Teams, and Faculty Dreams: Cooperation in Hard Work," Speaker, Session at 57th Annual Meeting of the American Conference of Academic Deans, New Orleans, January, 2001.

Exhibit SKB-1

"Changes in Risk in Electric Utility Mergers During Transition to Competition", 1999 Southern Economic Association Convention.

"Stranded Cost in the U.S. Electric Utility Industry: Last Gasp of Ramsey Pricing?" Discussion Paper, Wincott Series, University of Buckingham, United Kingdom, December, 1997.

"Interest Rate Risk and Utility Risk Premia During 1982-93," 1994 Southern Economic Association Convention.

"Interest Rate Risk and Utility Bond and Dividend Yields," 1992 Western Economic Association Convention.

"Scaling Up Nuclear Decommissioning Costs," NARUC Advanced Regulatory Studies Program, Williamsburg, VA, 1992.

"Assessing Factors That Determine Utilities' Allowed Returns on Equity: A Risk-Adjusted Institutional Approach," (with Timothy Mason), 1989 Southern Economic Association Convention.

"The Grand Gulf Experience," Sixty-Fifth National Conference of Regulatory Utility Commission Engineers, Hot Springs, AR, 1987.

"Some Fundamental Principles in the Determination of a Utility's Cost of Capital," Seventh Annual Western Utility Rate Seminar, Salt Lake City, Utah, 1987.

"A Critique of Various Phase-in Plans," NARUC Advanced Regulatory Studies Program, Williamsburg, VA, 1986.

"Principles in the Determination of a Utility's Cost of Capital," Thirteenth Annual Eastern NARUC Utility Rate Seminar, Ft. Lauderdale, Florida, 1985.

"Nuclear Unit Construction and Electric Utilities' Cost of Capital," Western Economic Association Convention, 1984.

"Current Issues in Utility Regulation," Fifth Annual Seminar Series, Hendrix College, 1984.

"The Economics of Two-Part Rate Structures for Regulated Utilities," Midwest Economics Association Convention, 1981.

COLLEGIATE SERVICE

Chair, Department of Economics and Business. While Chair I led the Department in the development of an International Business Minor. This will be a precursor to an International

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Business Major. 2003-05

Director, Center for Entrepreneurial Studies, Hendrix College.   I obtained $200,000 in external funding for the Center's start-up. The Center brought Secretary of Commerce Don Evans, former Secretary of HUD Jack Kemp, and former Council of Economic Advisors Chair Dr. Glenn Hubbard to speak to the Hendrix campus. Additionally, the Center sponsored a number of Business Roundtables where local businesspeople spoke to Hendrix students. In 2004, the Center provided supervision for a Hendrix Team that was a semi-finalist in the Arkansas Governor's Business Plan Competition. 2001-2007.

Faculty Advisor, Phi Beta Lambda, the Collegiate Division of Future Business Leaders of America, 2002-2005

Chair, Committee on Curriculum, Hendrix College, 1998-2002. Responsible for development of new General Education Requirements as Hendrix moved from a trimester calendar to a semester calendar

Member of Search Committee for Provost for Hendrix College, 2002

Member of Faculty Committee that assisted in the writing of a $3.9 million grant to Hendrix College from the Robert & Ruby Priddy Charitable Trust, 2002

Hendrix College Alumni Association Board of Governors Awards Committee, 1999-2000

Chair, Committee on Student Life, Hendrix College, 1995-96

OTHER EXPERIENCE

Presentation on China Odyssey III at Conway Rotary Club, November, 2007.

Faculty leadership on China Odyssey III trip to China for Hendrix students. The focus of the Odyssey was entrepreneurship in China. May, 2007.

"Symposium on Business and the Liberal Arts: Integrating Professional and Liberal Education," Sponsored by the Council of Independent Colleges, Chicago, IL, May, 2007.

Member, eSTEM Public Charter Schools, Inc. Board of Directors, Little Rock, AR, 2007-2013

Discussant at 2005 American Economics Association/TPUG Session.

Chair, Finance Committee, Trinity United Methodist Church, 2005-06, Little Rock, AR.

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Reviewer for *Quarterly Review of Economics and Finance, Eastern Economic Journal, Journal of Economic Surveys, Contemporary Economic Policy, Economics and Politics, Land Economics*, *The American Economist, Managerial and Decision Economics, International Journal of Energy Systems*, *Journal of Economics and Business,* and *IEEE PES Transactions on Power Systems*

Blue Ribbon Panel, advice to Frueauff Foundation concerning modification of its investment objectives, 2003

Discussant at 2001 Southern Economics Association Convention

"Report on the Economic Feasibility of the White River Navigation Project," February, 2000

Member, Board of the Arkansas Policy Foundation, 1999-2012

"The Democratization of Capitalism on Wall Street," *Log Cabin Democrat*, Conway, Arkansas, June 7, 1999

Panelist on Governor's Economic Summit, Roundtable on Tax and Regulatory Policy, June 9-10, 1998, Little Rock, AR

"Taxes and Savings in Arkansas," Murphy Commission Report, May, 1998

"Feasibility Analysis of the Formation of a Local Electric Utility in Batesville and Independence County," with Mike Hughes and W.W. Elrod,II, April, 1998

Discussant at 1999 Southern Economics Association Convention

Discussant at 1996 Western Economics Association Convention

Discussant at 1994 Southern Economics Association Convention

Discussant at 1993 Southern Economics Association Convention

Participant on judges' panel for selection of outstanding Arkansas businesses and executives in 1988 for *Arkansas Business*

Lecturer, Business Leaders Day, 1988, University of Arkansas, Fayetteville, Arkansas

Research Advisory Committee, National Regulatory Research Institute, 1986-1989, Deputy Chairman (1988-1989)

Subcommittee on Electricity, National Association of Regulatory Utility Commissioners, 1987-1989

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Subcommittee on Economics, National Association of Regulatory Utility Commissioners, 1979-1987

Long-Term U.S. Nominal GDP Growth Estimates   Exhibit SKB-2

Source	Year Beginning	Nominal GDP ($ Billion)	Year Ending	Nominal GDP ($ Billion)	Annual GDP Growth
EIA	2024	$26,283	2050	$77,376	4.24%
SSA	2024	$26,441	2074	$195,169	4.08%
				Average	**4.16%**

Sources: U.S. Energy Information Administration/Annual Energy Outlook 2020, January 29, 2020, Table A20
              Social Security Administration, 2020 OASDI Trustees Report, Table VI.G4, Intermediate

Exhibit SKB-3

BHNG DCF COST OF EQUITY

Company	Price (1)	Dividends (2)	Short-Term Average of IBES and Zacks (3)	Long-Term GDP Growth (4)	Unadjusted Div Yield (5)	g1 (6)=(3)*2/3+(4)/3	Adjusted Div. Yield With g1 (7)=(5)*(1+(6)/2)	k1 (8)=(6)+(7)	g2 (9)	Adjusted Div Yield With g2 (10)=(5)*(1+(9)/2)	k2 (11)=(9)+(10)	g3 (12)	Adjusted Div Yield With g3 (13)=(5)*(1+(12)/2)	k3 (14)=(12)+(13)
Atmos Energy	$103.29	$2.30	7.15%	4.16%	2.23%	6.15%	2.30%	8.45%	7.32%	2.31%	9.63%	9.07%	2.33%	11.40%
Chesapeake Utilities	$88.20	$1.76	6.50%	4.16%	2.00%	5.72%	2.05%	7.77%	8.14%	2.08%	10.22%	11.76%	2.11%	13.87%
New Jersey Resources	$34.07	$1.25	7.00%	4.16%	3.67%	6.05%	3.78%	9.83%	3.82%	3.74%	7.56%	5.72%	3.77%	9.49%
NISource	$25.11	$0.84	4.65%	4.16%	3.35%	4.49%	3.42%	7.91%	1.93%	3.38%	5.30%	3.06%	3.40%	6.45%
Northwest Natural	$62.02	$1.91	4.40%	4.16%	3.08%	4.32%	3.15%	7.47%	2.79%	3.12%	5.91%	3.89%	3.14%	7.03%
ONE Gas	$81.58	$2.16	5.25%	4.16%	2.65%	4.89%	2.71%	7.60%	10.73%	2.79%	13.52%	4.30%	2.70%	7.00%
South Jersey Industries	$26.54	$1.18	6.55%	4.16%	4.45%	5.75%	4.57%	10.33%	4.30%	4.54%	8.84%	4.94%	4.56%	9.50%
Southwest Gas	$71.14	$2.28	7.10%	4.16%	3.21%	6.12%	3.30%	9.42%	6.64%	3.31%	9.95%	5.51%	3.29%	8.80%
Spire	$72.46	$2.49	4.95%	4.16%	3.44%	4.69%	3.52%	8.20%	6.82%	3.55%	10.37%	3.23%	3.49%	6.72%

						Arithmetic Average	8.55%		Arithmetic Average	9.03%		Arithmetic Average	8.92%	
						Median	8.20%		Median	9.63%		Median	8.80%	
						Average	**8.38%**		**Average**	**9.33%**		Average	**8.86%**	

OVERALL AVERAGE   8.86%

BHNG CAPM ANALYSIS   Exhibit SKB-4

Company	Div Yield (1)	Short Term Growth (2)	Long Term Growth (3)	Weighted Average Growth (4)=(2)*2/3+(3)/3	Market Cost of Equity (5)=(1)+(4)	Risk Free Rate (6)	Beta (7)	CAPM Cost of Equity (8)=(6)+(7)*((5)-(6))
Atmos Energy	3.10%	8.90%	4.16%	7.32%	10.42%	1.48%	0.8	8.63%
Chesapeake Utilities	3.10%	8.90%	4.16%	7.32%	10.42%	1.48%	0.75	8.19%
New Jersey Resources	3.10%	8.90%	4.16%	7.32%	10.42%	1.48%	0.9	9.53%
NISource	3.10%	8.90%	4.16%	7.32%	10.42%	1.48%	0.85	9.08%
Northwest Natural	3.10%	8.90%	4.16%	7.32%	10.42%	1.48%	0.8	8.63%
ONE Gas	3.10%	8.90%	4.16%	7.32%	10.42%	1.48%	0.8	8.63%
South Jersey Industries	3.10%	8.90%	4.16%	7.32%	10.42%	1.48%	0.95	9.97%
Southwest Gas	3.10%	8.90%	4.16%	7.32%	10.42%	1.48%	0.9	9.53%
Spire	3.10%	8.90%	4.16%	7.32%	10.42%	1.48%	0.8	8.63%

Arithmetic Average	8.98%
Median	8.63%
Average	**8.81%**

Risk Premium Regression Results

SUMMARY OUTPUT

Regression Statistics

Multiple R	0.89666507
R Square	0.804008249
Adjusted R Squ	0.802727257
Standard Error	0.007240211
Observations	155

ANOVA

	df	SS	MS	F	Significance F
Regression	1	0.032901565	0.03290157	627.6451	5.1495E-56
Residual	153	0.00802036	5.2421E-05		
Total	*154*	*0.040921925*			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.071805381	0.001511455	47.5074418	1.69E-93	0.068819364	0.074791398	0.0688194	0.074791398
X Variable 1	-0.43937016	0.017537734	-25.0528461	5.15E-56	-0.474017539	-0.404722782	-0.4740175	-0.40472278

BHNG Risk Premium

Exhibit No. SKB-5
Page 2 of 2

Current Equity Risk Premium

(a)	Avg. Yield over Study Period	7.95%
(b)	Single-A Utility Bond Yield	3.13%
	Change in Bond Yield	-4.82%
(c)	Risk Premium/Interest Rate Relationship	-0.4394
	Adjustment to Average Risk Premium	2.12%
(a)	Average Risk Premium over Study Period	3.69%
	Adjusted Risk Premium	**5.81%**

Implied Cost of Equity

(b)	Baa Utility Bond Yield	3.56%
	Adjusted Equity Risk Premium	5.62%
	Risk Premium Cost of Equity	**9.18%**

(a)	#REF!
(b)	Average bond yield for six-months ending Apr. 2020 based on data from Moody's Investors Service at www.credittrends.com.
(c)	#REF!

BLACK HILLS NEBRASKA GAS, LLC
NEBRASKA GAS RATE REVIEW
APPLICATION NO. NG-109
RESPONSE TO PUBLIC ADVOCATE
DATA REQUEST NO. PA-291

DATE OF REQUEST: 08/12/20
DATE RESPONSE DUE: 08/21/20
REQUESTOR: **Public Advocate**
ANSWERED BY: **Christianne Curran**
WITNESS: **Robert Amdor**
DATE RESPONDED: 08/21/20
SUBJECT: **Cost of Debt**

REQUEST: **PA-291.** On June 12, 2020, Black Hills Corp announced pricing of a $400 million debt offering. What is the average interest rate on this debt offering over its 10-year term?

RESPONSE:

The $400 million Note due 2030 carries an all-in cost of debt of 2.63%. The all-in cost includes expenses related to the issuance of the debt like deferred financing costs and amortization of the discount. The Company will be updating its cost of capital in rebuttal testimony to reflect the issuance of the Note.

ATTACHMENTS: None.

BHNG COST OF LONG-TERM DEBT   Exhibit SKB-7

FOR THE TEST YEAR ENDING DECEMBER 31, 2020

(a)	(b)	(c)	(d)	(e) = (f) ÷ (d) Price Per Unit	(f) Net Proceeds Amount	(g)	(h) Yield to Maturity	(i) Financing Costs	(j) (Gain)/Loss on Reacquired Debt	(k) = (h)+(i)+(j) Cost of Money	(l) Principal Outstanding	(m) = (k) x (l) Annual Cost
Title	Issue	Maturity	Amount Issued			Coupon/Interest Rate						
BHC $525M Notes Due 2023	11/19/13	11/30/23	525,000,000	0.9953	522,532,500	4.25%	4.31%	0.09%	0.00%	4.40%	525,000,000	23,100,000
BHC $300M Notes Due 2026	1/13/16	1/15/26	300,000,000	0.9970	299,091,000	3.95%	3.99%	0.10%	0.00%	4.08%	300,000,000	12,240,000
BHC $300M Notes Due 2046	8/19/16	9/15/46	300,000,000	0.9946	298,365,000	4.20%	4.23%	0.04%	0.10%	4.37%	300,000,000	13,110,000
BHC $400M Notes Due 2027	8/19/16	1/15/27	400,000,000	0.9995	399,796,000	3.15%	3.16%	0.79%	0.20%	4.15%	400,000,000	16,600,000
BHC $400M Notes Dues 2033	8/17/18	5/1/33	400,000,000	0.9954	398,172,000	4.35%	4.39%	0.08%	0.04%	4.51%	400,000,000	18,040,000
BHC $400M Notes Due 2029	10/3/19	10/15/29	400,000,000	0.9966	398,624,000	3.05%	3.09%	0.09%	0.00%	3.18%	400,000,000	12,720,000
BHC $300M Notes Due 2049	10/3/19	10/15/49	300,000,000	0.9981	299,415,000	3.88%	3.89%	0.04%	0.06%	3.99%	300,000,000	11,970,000
BHC $400M Notes Due 2030	6/17/20	6/15/30	400,000,000		396,000,000	2.50%					400,000,000	10,520,000
Long-Term Debt											$ 3,025,000,000	$ 118,300,000
Weighted Average Cost of BHC Debt												**3.91%**
Debt Allocated to Black Hills Nebraska Gas											374,520,000	14,643,732

Note: Annual cost for $400M Note due in 2030 calculated as 2.63% times $400M

BHNG Overall Cost of Capital   Exhibit No. SKB-8

Component	Proportion	Cost	Weighted Cost
Common Equity	50.00%	8.97%	4.49%
Long-Term Debt	50.00%	3.91%	1.96%

Overall Cost of Capital   **6.44%**