

Exhibit No.: _____
Issue: Fair Rate of Return
Witness: Frank J. Hanley
Type of Exhibit: Direct
Sponsoring Party: Missouri Gas Energy
Case No.: GR-2009-_____
Date Testimony Prepared: _____

MISSOURI PUBLIC SERVICE COMMISSION

FILED²
NOV 09 2009
Missouri Public
Service Commission

MISSOURI GAS ENERGY
CASE NO. GR-2009-_____

DIRECT TESTIMONY OF

FRANK J. HANLEY, PRESIDENT
AUS CONSULTANTS - UTILITY SERVICES

MARCH 2009

MGE Exhibit No. 13
Case No(s). GR-2009-0355
Date 10-26-09 Rptr KF

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MISSOURI PUBLIC SERVICE COMMISSION

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DIRECT TESTIMONY OF

FRANK J. HANLEY, PRESIDENT
AUS CONSULTANTS - UTILITY SERVICES

MARCH 2009

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Appendix A – Professional Qualifications of Frank J. Hanley

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I. INTRODUCTION

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Q. PLEASE STATE YOUR NAME, OCCUPATION AND BUSINESS ADDRESS.

A. My name is Frank J. Hanley and I am Principal and Director of AUS Consultants.
My business address is 155 Gaither Drive, Suite A, Mount. Laurel, New Jersey
08054.

Q. PLEASE SUMMARIZE YOUR EDUCATIONAL BACKGROUND AND PROFESSIONAL EXPERIENCE.

A. I have testified as an expert witness on rate of return and related financial issues
before 33 state public utility commissions including the Missouri Public Service
Commission ("the Commission"), the District of Columbia Public Service
Commission, the Public Services Commission of the Territory of the U.S. Virgin
Islands, and the Federal Energy Regulatory Commission. I have also testified before
local and county regulatory bodies, an arbitration panel, a U.S. Bankruptcy Court,
the U.S. Tax Court and a state district court. I have appeared on behalf of investor-
owned companies, municipalities, and state public utility commissions. The details
of these appearances, as well as my educational background, are shown in Appendix
A supplementing this testimony.

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1 **Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?**

2 A. The purpose of my testimony is to provide evidence on behalf of Missouri Gas
3 Energy ("MGE" or "the Company") in the form of a study of the fair rate of return
4 which it should be afforded an opportunity to earn on its rate base.
5

6 **Q. WHAT IS YOUR RECOMMENDED FAIR RATE OF RETURN AND ITS**
7 **COMPONENT COSTS?**

8 A. It is 8.434% and it is based upon a hypothetical capital structure comprised of
9 52.00% total debt and 48.00% common equity capital. The details are summarized
10 as follows:
11

<u>Type of Capital</u>	<u>Ratios</u>	<u>Cost Rate</u>	<u>Weighted Cost Rate</u>
Long-Term Debt	41.06%	6.080%	2.496%
Short-Term Debt	<u>10.94</u>	4.920	0.538
Total Debt	52.00%		
Common Equity	<u>48.00%</u>	11.250%	<u>5.400%</u>
Total	<u>100.00%</u>		<u>8.434%</u>

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1 The foregoing is my recommendation. In the Commission's Report and Order in the
2 most recent MGE rate case, Case No. GR-2006-0422 dated March 22, 2007 the
3 Commission decided to utilize the capital structure of Southern Union Company
4 ("SUG") to establish the allowed fair rate of return. I present only as an alternative
5 (albeit improper) a fair rate of return utilizing SUG's capital structure and
6 component costs which is 9.752% as follows:

7
8 Based on Southern Union Company's Capital Structure
9 at December 31, 2008

10
11

<u>Type of Capital</u>	<u>Ratios</u>	<u>Cost Rate</u>	<u>Weighted Cost Rate</u>
12 Long-Term Debt	56.16%	6.258%	3.514%
13 Short-Term Debt	3.26	5.920	0.193
14 Preferred Equity	1.92	7.758	0.149
15 Common Equity	<u>38.66</u>	15.250	<u>5.896</u>
16			
17 Total	<u>100.00%</u>		<u>9.752%</u>

18
19
20

21
22 **Q. HAVE YOU CAUSED TO BE PREPARED A SERIES OF DOCUMENTS**
23 **WHICH SUPPORTS YOUR RECOMMENDATION?**

24 **A.** Yes, they have been marked for identification as Schedules FJH-1 through FJH-20
25 and are attached to my testimony.

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II. EXECUTIVE SUMMARY

3

Q. PLEASE SUMMARIZE YOUR TESTIMONY.

4

A. MGE is somewhat more risky than the average gas distribution company ("LDC") due to its smaller size. MGE is a division of SUG. Consequently, MGE has no common stock which is traded. For reasons which I discuss in detail infra, SUG is in no way representative of a gas distribution company and thus, its capital structure and related component capital costs are unrelated to an LDC. Consequently, I observed market evidence of common equity cost rate of a proxy group of nine similar risk LDCs for insight into a capital structure and related ratios as well as the component costs of debt and common equity capital appropriate for use in establishing a fair rate of return for MGE. The use of other firms of comparable risk as proxies is consistent with the principles of fair rate of return established in the Hope¹ and Bluefield² cases and adds reliability to the exercise of informed expert judgment in arriving at a recommendation of common equity cost rate. I also evaluate and rely upon the market data of a proxy group of similar risk LDCs and adjust those results for the risk differential vis-à-vis MGE attributable to MGE's

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¹ Federal Power Commission v. Hope Natural Gas Co., 320 U.S. 591 (1944).

² Bluefield Water Works Improvement Co. v. Public Serv. Comm'n, 262 U.S. 679 (1922).

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1 smaller size. The proxy group consists of nine LDCs. The bases of selection of the
2 companies in the proxy group are described infra. While the proxy group is
3 reasonably comparable to MGE, it is necessary, however, to adjust for the added
4 business risk attributable to MGE's smaller size as it is not possible to compile a
5 proxy group precisely comparable to MGE. A proxy group which is similar in risk is
6 not the same as identical in risk. Consequently, an adjustment is necessary in order
7 for the proxy group's cost rate to be applicable to MGE. In forming my opinions, as
8 indicated in my testimony, I have utilized information and statements contained in
9 published treatises and periodicals and other facts of the type reasonably relied on by
10 experts in the field.

11
12 In arriving at my recommendation of common equity cost rate(s) of 11.25%, based
13 on the proxy group and a hypothetical common equity ratio of 48.00%, I utilize four
14 well-tested market-based cost of common equity models, namely the Discounted
15 Cash Flow Model ("DCF"), the Risk Premium Model ("RPM"), the Capital Asset
16 Pricing Model ("CAPM"), and the Comparable Earnings Model ("CEM") applied to
17 the proxy group. As an alternative, which I do not recommend, I apply the same four
18 models to SUG using SUG's market data and capital structure which includes
19 38.66% common equity and arrive at a common equity cost rate of 15.25%. All four

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1 of the cost of common equity models are market-based, because they are predicated
2 upon the Efficient Market Hypothesis ("EMH"). The prudence of relying upon
3 multiple market-based models in arriving at a conclusion of common equity cost rate
4 is affirmed in the financial literature. In this instance, I place no reliance upon the
5 results of my CEM analysis based on the proxy group because it is an extreme high-
6 side-outlier when compared to the results derived from application of the DCF, RPM
7 and CAPM models. At the same time, however, the financial literature encourages
8 reliance upon multiple models as no single cost of common equity estimation model
9 is so theoretically superior or precise that it should be used to the exclusion of all
10 other models. Therefore, I rely upon the results of the remaining three models, the
11 DCF, RPM, and CAPM in reaching my recommended common equity cost rate for
12 my primary recommendation which is 11.25% based upon the proxy group of nine
13 LDCs. I also use the average capital structure of this group which includes
14 approximately 48.00% common equity capital as the basis for the hypothetical
15 capital structure applicable to MGE.

16
17 SUG's capital structure represents its collective operations, has what Standard &
18 Poor's ("S&P") considered an "aggressive" level of financial risk and for the reasons
19 explained in detail infra is not at all representative of how an LDC is financed.

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1 Consequently, if SUG's capital structure is utilized, it must be in conjunction with
2 SUG's capital costs, including the cost of common equity capital.

3

4 I have also taken into account that MGE has Straight Fixed Variable rate design
5 ("SFV") for its residential customer class. Consequently, it is important to ascertain
6 to what extent the proxy LDCs have similar mechanisms in place, i.e., those that
7 decouple the impact of weather and/or declining per customer usage on their
8 operating margins and hence earnings per share ("EPS"). I determined, based on the
9 data shown on Schedule FJH-3, that approximately 84.5% on average of the proxy
10 group's revenues are partially or fully decoupled. Consequently, a common equity
11 cost rate derived from my proxy group of nine LDCs (the basis of selection will be
12 described infra) is reflective of a similar level of risk reduction for MGE as a result
13 of its SFV rate design. Thus there is a quid pro quo vis-à-vis the proxy group of nine
14 LDCs and no adjustment to common equity cost rate derived from the proxy group is
15 needed as a result of MGE's SFV rate design.

16

17

III. GENERAL PRINCIPLES

18 **Q. WHAT GENERAL PRINCIPLES HAVE YOU CONSIDERED IN ARRIVING**
19 **AT YOUR RECOMMENDED COMMON EQUITY COST RATE?**

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1 A. In unregulated industries where the total price of a delivered product or service is not
2 regulated, competition is the principal determinant in establishing the price.
3 Traditionally, in the case of public utilities, regulation acts as a substitute for the
4 competition of the marketplace. Analyses based on companies whose securities are
5 actively traded are therefore imperative when estimating common equity cost rate.
6 The common equity cost rate determined should be adequate to fulfill investors'
7 requirements and assure that the utility will be able to fulfill its obligations to its
8 customers. A utility's obligation to serve requires a level of earnings sufficient to
9 maintain the integrity of presently invested capital and permit the attraction of
10 needed new capital at a reasonable cost in competition with all other comparable-risk
11 seekers of capital. These standards for a fair rate of return have been established by
12 the U.S. Supreme Court in the Hope and Bluefield cases cited supra.

13

14

IV. BUSINESS RISK

15 Q. **PLEASE DEFINE BUSINESS RISK.**

16 A. Business risk is a collective term encompassing all of the diversifiable risks of an
17 enterprise except financial risk.

18 Q. **IS BUSINESS RISK IMPORTANT TO THE DETERMINATION OF A FAIR**
19 **RATE OF RETURN?**

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1 A. Yes. Business risk is important to the determination of a fair rate of return because
2 the greater the level of risk, the greater the rate of return demanded by investors
3 consistent with the basic financial precept of risk and return.

4

5 **Q. DOES THE SIZE OF AN ENTERPRISE AFFECT THE LEVEL OF**
6 **BUSINESS RISK PERCEIVED BY INVESTORS?**

7 A. Yes. It is well-established in the financial literature, and well noted by investors, that
8 the size of an enterprise affects the level of its business risk. I have included
9 information on size and risk which is shown on pages 2 through 17 of Schedule FJH-
10 1.

11

12 **Q. PLEASE EXPLAIN WHY SIZE HAS A BEARING ON BUSINESS RISK.**

13 A. Smaller companies are less capable of coping with significant events which affect
14 sales, revenues and earnings.

15

16 The loss of revenues from a few larger customers, for example, would have a greater
17 effect on a small company than on a much larger company with a larger customer
18 base. Consequently, size is an important factor which affects business risk and hence
19 common equity cost rate.

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1 Q. WHAT DOES THIS MEAN FOR MGE?

2 A. MGE's cost of capital must reflect the impact of the Company's size on common
3 equity cost rate because MGE is smaller than the average company in the proxy
4 group based upon market capitalization as shown below:

5		Market	
6		Capitalization	
7		of Common	
8		Equity	
9		<u>Investment (1)</u>	<u>Times Greater</u>
10		(\$ Millions)	<u>Than MGE (1)</u>
11			
12			
13	Proxy Group of Nine Value Line LDCs	1,588.999	2.3x
14	Southern Union Company	1,725.432	5.8
15			
16			

17 (1) From Schedule FJH-1, page 3.

18 As shown above, the proxy group is 2.3 times larger than MGE's estimated market
19 capitalization of \$681.129 million (based upon the market-to-book ratio of the proxy
20 group of 174.7%), while SUG is 5.8 times larger than MGE's estimated market
21 capitalization of \$298.652 million (based upon SUG's market-to-book ratio of
22 76.6%), as shown on page 4 of Schedule FJH-1. In each instance, I assumed that if
23 MGE's common stock were traded, it would trade at the average market/book ratio
24 of the proxy group or SUG on February 13, 2009. SUG's market/book ratio
25 differential vis-à-vis the proxy group of LDCs is yet additional evidence of why
26 SUG is not a proper proxy to use in establishing a fair rate of return for MGE, both

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1 as to capital structure and the cost rates for each component of same. The details are
2 shown on pages 3 and 4 of Schedule FJH-1.
3

4 **Q. WHAT OTHER EVIDENCE EXISTS THAT SUPPORTS THE POSITION**
5 **THAT SIZE IMPACTS RISK?**

6 A. Conventional wisdom, supported by the financial literature and actual returns over
7 time, confirms that smaller companies tend to be more risky causing investors to
8 expect greater returns to compensate them for that greater risk. Moreover, Eugene
9 F. Fama and Kenneth R. French, distinguished professors of Finance, Graduate
10 School of Business at the University of Chicago and Tuck School of Business of
11 Dartmouth College, respectively, developed an improved capital asset pricing model.
12 Their "three-factor" model is discussed in their paper entitled, "The Capital Asset
13 Pricing Model: Theory and Evidence" which was published in The Journal of
14 Economic Perspectives, Volume 18, Number 3 – Summer 2004 – at pages 25-46.
15 Their model includes company size as one of the critical three factors.
16

17 **Q. CAN YOU PROVIDE ANOTHER EXAMPLE FROM THE FINANCIAL**
18 **LITERATURE WHICH AFFIRMS A RELATIONSHIP BETWEEN SIZE**
19 **AND RISK AND HENCE COMMON EQUITY COST RATE?**

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1 A. Yes. Brigham³ states:

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A number of researchers have observed that portfolios of small-firms have earned consistently higher average returns than those of large-firms stocks; this is called the "small-firm effect." *On the surface, it would seem to be advantageous to the small firms to provide average returns in the stock market that are higher than those of larger firms. In reality, it is bad news for the small firm; what the small-firm effect means is that the capital market demands higher returns on stocks of small firms than on otherwise similar stocks of the large firms.* (Emphasis added)

In addition, as shown on page 6 of Schedule FJH-1, Morningstar states:

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Q. HAVE YOU ESTIMATED THE IMPACT OF MGE'S SMALLER SIZE VIS-À-VIS THE PROXY GROUP AND SUG ON ITS COMMON EQUITY COST RATE?

A. Yes.

Q. WHAT IS THAT IMPACT?

A. Based on my analyses, an upward adjustment is necessary to be made to the common equity cost rate derived from the proxy group to account for MGE's smaller size.

³ Eugene F. Brigham, Fundamentals of Financial Management, Fifth Edition, The Dryden Press, 1989, p. 623.

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1 corporate sectors. The Business Risk/Financial Risk matrix is shown in Table 1 on
2 page 11 of Schedule FJH-2. In Table 2, shown on page 12 of the schedule, S&P
3 shows its financial metrics for utilities. Notwithstanding the table of financial
4 metrics, S&P states on page 12, "Note that even after we assign a company a
5 business risk and financial risk, the committee does not arrive by rote at a rating
6 based on the matrix. The matrix is a guide – it is not intended to convey precision in
7 the ratings process or reduce the decision to plotting intersections on a graph."

8

9 **Q. CAN BOND RATINGS BE USED AS A MEASURE OF INVESTMENT**
10 **RISK?**

11 **A.** Yes, bond ratings are a good measure of investment risk.

12

13 **Q. PLEASE EXPLAIN.**

14 **A.** Similar bond ratings reflect similar combined business and financial risks. Although
15 the specific business or financial risks may differ between companies, the same bond
16 rating indicates that the combined risks are similar because the bond rating reflects a
17 company's diversifiable business and financial risks. Risk distinctions within a bond
18 rating category are recognized by a plus or minus. For example, within the A
19 category, a S&P rating can be A+, A, or A-. Similarly, Moody's ratings within the A

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1 category are distinguished by rating gradations of A1, A2 and A3. Moreover,
2 additional risk distinction is reflected by S&P in the assignment of a business risk
3 profile of which there are five, as shown in Table 1 on Schedule FJH-2, page 11.
4 S&P expressly states that the bond rating process encompasses a qualitative analysis
5 of business and financial risks (see pages 3 through 9 of Schedule FJH-2). Although
6 there is no perfect proxy by which one can differentiate common equity risk between
7 companies, the bond rating provides excellent insight because it is the result of a
8 thorough and comprehensive analysis of all diversifiable investment risks.

9
10 **VI. IMPROPRIETY OF USING SUG AS A PROXY FOR MGE**

11 **Q. YOU PREVIOUSLY STATED THAT IT WAS IMPROPER TO UTILIZE**
12 **SUG AS A PROXY TO ESTABLISH A FAIR RATE OF RETURN FOR MGE.**
13 **PLEASE EXPLAIN WHY.**

14 **A.** SUG is not an LDC. In order to demonstrate how inappropriate it would be to utilize
15 SUG's capital structure and its cost of capital in establishing a fair rate of return
16 applicable to MGE, I have prepared Schedule FJH-4, which consists of 11 pages.
17 On page 1, I have shown on a comparative basis, the Standard Industrial
18 Classification code ("S.I.C.") and its related description as well as the percentage of
19 total operating income derived from LDC operations and the percentage of gas

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1 distribution assets to total assets for each of the nine companies in my proxy group
2 of LDCs and for SUG.

3 **Q. WHAT CONCLUSIONS DO YOU REACH FROM THIS?**

4 A. It is clear that SUG is considered primarily a natural gas transmission company,
5 while MGE itself and the companies in the proxy group are clearly considered gas
6 distribution companies. It is even more evident by the percentages of net operating
7 income derived from gas distribution operations and the percentage of total assets
8 devoted to gas distribution operations. The average company in the proxy group had
9 78.39% and 87.00% of its net operating income and total assets devoted to natural
10 gas distribution operations, respectively. In extreme contrast, SUG derived only
11 13.39% of its operating income from its gas distribution operations and just 14.02%
12 of its assets were devoted to its gas distribution operations. On pages 3 through 5 of
13 Schedule FJH-4, I have shown the most recent ranking by S&P of U.S. natural gas
14 distributors and integrated gas companies. It should be noted that SUG is not listed
15 in this grouping, either as a gas distributor or an integrated gas company. Also, at
16 pages 8 through 10, I have shown S&P's RatingsDirect which contains issuer
17 ranking of U.S. midstream energy companies as of the same date. Please note that
18 on page 9 of Schedule FJH-4 (original page 3) that SUG is listed thereon, i.e., as a
19 U.S. Midstream Energy Company. In addition, another indication as shown on page

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1 1 of Schedule FJH-4, is that the average and median beta (a measure of volatility to
2 the whole market) of the proxy group is 0.70, while SUG's beta is much higher at
3 1.10, indicating an entirely different and more risky profile than an LDC.

4

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VII. PROXY GROUP

6 **Q. YOU PREVIOUSLY MENTIONED THAT YOU ALSO OBSERVE THE**
7 **MARKET DATA FOR A PROXY GROUP OF NINE LDCS IN ORDER TO**
8 **GAIN INSIGHT INTO CAPITAL STRUCTURE, DEBT AND COMMON**
9 **EQUITY COST RATES FOR MGE. PLEASE EXPLAIN HOW YOU**
10 **SELECTED THE PROXY GROUP.**

11 **A.** The basis of selection was to include those LDCs which 1) are included in the Value
12 Line Natural Gas Utility Group (Standard Edition); 2) have Value Line five-year
13 projections of growth rate in EPS; 3) have a Value Line beta; 4) have not cut or
14 omitted their cash common stock dividends during the five calendar years ending
15 2008 or through the time of the preparation of this testimony; 5) derived 60% or
16 greater of both net operating income and assets from regulated gas operations; and 6)
17 at the time of the preparation of this testimony, had not publicly announced their
18 involvement in any merger or acquisition activity. Nine companies met all of the
19 foregoing criteria and their financial profile is summarized in Schedule FJH-5.

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2 **Q. PLEASE DESCRIBE SCHEDULE FJH-5.**

3 A. Schedule FJH-5 consists of four pages. Page 1 contains average comparative and
4 financial statistics for the years 2004 through 2008. Page 2 contains notes relevant
5 to page 1, as well as the selection criteria of the nine individual companies in the
6 proxy group as discussed supra and the identity of each company. Page 3 contains
7 the capital structure ratios based upon total capital employed 2004 through 2008 and
8 average for the five years. Page 4 contains the same total capital ratios by quarter for
9 the five calendar quarters ending with the fourth quarter 2008, i.e., December 31,
10 2008 and the average of all five quarters. I believe the most meaningful period to
11 use is the most recent five quarters ending December 31, 2008. The data are shown
12 by quarter and average for the five quarters then ended on page 4 of Schedule FJH-5.
13 As shown, the average is 40.84% long-term debt, 10.86% short-term debt, 0.25%
14 preferred stock and 48.00% common equity. Since the percentage of preferred stock
15 is almost nil, it is reasonable to assume a total debt ratio of 52.00% and a common
16 equity ratio of 48.00%.

17

18

VIII. SUG FINANCIAL DATA

19 **Q. PLEASE DISCUSS SCHEDULE FJH-6 .**

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1 A. Schedule FJH-6 contains five-year financial summary data for SUG and is shown
2 only for informational purposes. As discussed supra, I offer a cost of capital
3 conclusion based on SUG as an alternative only because it was utilized by the
4 Commission in its Report and Order issued March 23, 2007 in Case No. GR-2006-
5 0422. For the reasons discussed supra, there is no basis upon which investors could
6 in any way consider SUG as a price regulated LDC or a proxy for one. Thus, they
7 would not rely upon it to establish a fair rate of return for MGE.

8

9 Q. **IN ADDITION TO THE REASONS YOU HAVE SPECIFIED SUPRA, IS**
10 **THERE A BASIC FINANCIAL PRECEPT WHICH CONFIRMS THAT**
11 **INVESTORS WOULD NOT LOOK TO SUG FOR INSIGHT AS TO**
12 **CAPITAL STRUCTURE AND COST OF CAPITAL AS PROXY FOR MGE?**

13 A. Yes. There is an abundance of financial literature which indicates that the risk
14 relates to where capital is invested. In the instant matter, it is in MGE's rate base.
15 Since MGE has no stock which is traded, investors would look to similar risk
16 enterprises to see how MGE should be financed as well as for an indication of its
17 cost of capital. For example, Schedule FJH-7, which consists of five pages, is an
18 excerpt from Principles of Corporate Finance, Fifth Edition, by Richard A. Brealey

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1 and Stewart C. Myers. In discussing capital budgeting and risk at pages 3 and 4 of 5,
2 the authors state:

3
4 *But the company cost of capital rule can also get a firm into trouble if*
5 *the new projects are more or less risky than its existing business.*
6 *Each project should be evaluated at its own opportunity cost of*
7 *capital.* This is a clear implication of the value-additivity principle
8 introduced in Chapter 7. For a firm composed of assets A and B, the
9 firm value is $\text{Firm Value} = \text{PV}(\text{AB}) = \text{PV}(\text{A}) + \text{PV}(\text{B})$ = sum of
10 separate asset values. Here $\text{PV}(\text{A})$ and $\text{PV}(\text{B})$ are valued just as if
11 they were mini-firms in which stockholders could invest directly ...If
12 the firm considers investing in a third project C, it should also value C
13 as if C were a mini-firm. That is, the firm should discount the cash
14 flows of C at the expected rate of return that investors would demand
15 to make a separate investment in C. *The true cost of capital depends*
16 *on the use to which the capital is put.* (Emphasis in original text)
17

18 **Q. SINCE MGE IS A DIVISION OF SUG, DO YOU HAVE AN EXAMPLE**
19 **FROM THE FINANCIAL LITERATURE WHICH AFFIRMS THE ABOVE**
20 **PROPOSITION SET FORTH BY BREALEY AND MYERS?**

21 **A.** Yes. I have prepared Schedule FJH-8, which consists of 5 pages. It is an excerpt
22 from Intermediate Financial Management by Eugene F. Brigham and Philip R.
23 Daves. In discussing the divisional cost of capital, they make it quite clear that
24 divisions with different risks require different rates of return which are
25 commensurate with their individual risks. In the example set forth on page 3 of
26 Schedule FJH-8 between the bakery division and the café division of Starlight

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1 Sandwich Shops, an analogy can be made to SUG, wherein the bakery division
2 would equate to MGE and SUG's other operations would equate to the more risky
3 chain of cafes. In discussing the example of Huron Steel Company at pages 3
4 through 5 regarding companies that use debt financing, the authors state:

5 When debt financing is used, the division's cost of equity must be
6 combined with the division's cost of debt and target capital structure to
7 obtain the division's overall cost of capital.
8
9

10 **Q. HOW DOES THIS RELATE TO MGE?**

11 A. Since MGE has no debt of its own outstanding, its debt cost as well as its equity cost
12 must relate to its risk. That level of risk is best estimated by observing a group of
13 similar risk enterprises, namely a proxy group of LDCs such as my proxy group of
14 nine LDCs. That is why the capital structure, and related ratios assumed for MGE,
15 as well as the cost rates of the component parts of such capital structure, should be
16 derived from that proxy group of nine LDCs.
17

18 **Q. SINCE YOU RECOMMEND A 52.00% TOTAL DEBT RATIO FOR MGE,**
19 **HOW DO YOU DETERMINE THE RELATIVE PROPORTIONS OF LONG-**
20 **AND SHORT-TERM DEBT?**

21 A. I reviewed the capital structure of each company in the proxy group for the five
22 quarters ending December 2008 and observed that short-term debt was utilized by

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1 most every company in the proxy group all of the time. Thus, it is appropriate to
2 include short-term debt in the capital structure. I relied upon the average of the
3 capital structure ratios for the proxy group for those five quarters and utilized the
4 average of those ratios as shown in Note 1 on Schedule FJH-1, page 1. As shown,
5 long-term debt on average over the five quarters was 78.96% of total debt, while
6 short-term debt represented 21.04% of total debt. Applying those percentages to the
7 52.00% total debt ratio resulted in a long-term debt ratio of 41.06% and a short-term
8 debt ratio of 10.94%. I believe those ratios represent a proper balance between long-
9 and short-term debt.

10
11 On page 1 of Schedule FJH-1, I have also shown SUG's capital structure and related
12 ratios which are 56.16% long-term debt, 3.26% short-term debt, 1.92% preferred
13 equity and 38.66% common equity. Those ratios are not indicative of a company
14 whose principal business is gas distribution and should not be utilized to determine a
15 fair rate of return for MGE.

16
17 **IX. DEBT COST RATES**

18 **Q. PLEASE EXPLAIN THE BASIS OF THE LONG-TERM DEBT COST RATE**
19 **OF 6.08 % WHICH YOU RECOMMEND FOR MGE BASED UPON YOUR**

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1 **PROXY GROUP.**

2 A. The basis of my long-term debt cost rate of 6.08% is contained in Schedule FJH-9,
3 which consists of ten pages. Page 1 contains a summary of the basis of the cost rate.
4 Pages 2 through 10 contain the basis of the composite long-term debt interest cost
5 rate for each company in the proxy group of nine LDCs. The calculations were
6 made based on the information contained in the 2008 annual Form 10-K to the SEC.
7 As shown on page 1, the composite interest cost rate for the proxy group was 5.93%.
8 By definition, the composite interest cost rates do not represent the full cost of
9 raising long-term debt capital. There are always issuance costs associated with
10 raising the capital. Because the information is not available to calculate an effective
11 cost rate which includes issuance costs for the companies in the group, I have
12 included an estimated increment of 0.15%, or 15 basis points, which in my
13 experience is a reasonable estimate. Consequently, the composite effective cost rate
14 of long-term debt capital is 6.08% based upon the average inherent cost of 5.93%
15 plus an allowance of 0.15% for issuance costs. I believe the cost rate of 6.08% is
16 reasonable for use in a cost of capital determination.

17

18 **Q. ALTHOUGH YOU SHOW AN OVERALL COST OF CAPITAL BASED ON**
19 **SUG ONLY AS AN ALTERNATIVE, WHAT IS SUG'S LONG-TERM DEBT**

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1 **COST RATE?**

2 A. It is 6.258% at December 31, 2008 as shown on Schedule FJH-1, page 1. It was
3 provided to me by SUG and it reflects the effect of costs associated with issuance.

4

5 **Q. HOW DID YOU ESTIMATE THE SHORT-TERM DEBT COST RATE OF**
6 **4.92% FOR THE PROXY GROUP WHICH YOU UTILIZE IN YOUR**
7 **OVERALL COST OF CAPITAL DETERMINATION?**

8 A. The precise basis of the cost of raising short-term debt capital for each of the proxy
9 companies is not available. Based upon a general review of the market, it seems that
10 with a proxy group average bond rating of Moody's Baa1, that a rate equivalent to
11 250 basis points over a three-month LIBOR rate plus an up front fee of 100 basis
12 points is appropriate. Consequently, I use an average for the forecast rates for the
13 three-month LIBOR from Blue Chip Financial Forecasts for the six quarters ended
14 with the second quarter of 2010 derived from page 7 of Schedule FJH-15 of 1.42%
15 plus 350 basis points (1.42% + 2.50% + 1.00%) for a forward-looking short-term
16 debt cost rate of 4.92%.

17

18 **Q. HOW DID YOU ESTIMATE A SHORT-TERM DEBT COST RATE FOR**
19 **SUG?**

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1 A. I utilized the same approach as with the proxy group described supra. However,
2 since SUG's bond rating is Moody's Baa3 and S&P BBB-, the bottom of investment
3 grade, its cost will be greater than that for the proxy group. Recent market evidence
4 points to 350 basis points over the three-month LIBOR rate plus a 100 basis points
5 up front fee. This equates to a forward-looking short-term debt cost rate for SUG of
6 5.92% as explained in Note 6 on page 1 of Schedule FJH-1.

7

8

X. COMMON EQUITY COST RATE MODELS

9

A. The Efficient Market Hypothesis (EMH)

10 Q. ARE THE MODELS YOU UTILIZE TO ESTIMATE COMMON EQUITY
11 COST RATES MARKET-BASED?

12 A. Yes. The DCF model is market-based as current market prices are employed. The
13 Risk Premium Model ("RPM") is market-based as the current and expected bond
14 ratings and yields reflect the market's assessment of risk. To the extent betas are
15 used to determine equity risk premium, the market's assessment is reflected because
16 betas are derived from regression analyses of market prices. Also, actual market risk
17 premia are employed in my application of the RPM. The Capital Asset Pricing
18 Model ("CAPM") model is market-based for much the same reason as the RPM
19 except that the yield on U.S. Government Treasury Bonds is used in lieu of

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1 company-specific bond yields. My application of the Comparable Earnings Model
2 ("CEM") is also market-based because the selection process of comparable risk
3 domestic, non-price regulated, companies is based upon statistics which result from
4 regression analyses of market prices. All of the models are, therefore, based upon
5 the EMH.

6
7 **Q. PLEASE DESCRIBE THE CONCEPTUAL BASIS OF THE EMH.**

8 A. The EMH is the cornerstone of modern investment theory. It was pioneered by
9 Eugene F. Fama⁴ in 1970. An efficient market is one in which security prices at all
10 times reflect all the relevant information at that time. An efficient market implies
11 that prices adjust instantaneously to the arrival of new information and that the prices
12 therefore reflect the intrinsic fundamental economic value of a security.⁵

13
14 The essential components of the EMH are:

- 15
16 1) Investors are rational and will invest in assets which provide the highest
17 expected return for a particular level of risk.
18
19 2) Current market prices reflect all publicly available information.

⁴ Fama, Eugene F., "Efficient Capital Markets: A Review of Theory and Empirical Work", Journal of Finance, May 1970, pp. 383-417.

⁵ Morin, Roger A., "New Regulatory Finance", Public Utilities Reports, Inc., 2006, pp. 279-281.

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- 1
2 3) Returns are independent in that today's market returns are unrelated to
3 yesterday's returns as that information has already been processed.
4
5 4) The markets follow a random walk, i.e., the probability distribution of
6 expected returns approximates the normal bell curve.
7
8

9 Brealey and Myers⁶ state:
10

11 When economists say that the security market is 'efficient', they
12 are not talking about whether the filing is up to date or whether
13 desktops are tidy. They mean that information is widely and
14 cheaply available to investors and that all relevant and
15 ascertainable information is already reflected in security prices.
16
17

18 There are three forms of the EMH, namely:
19

- 20 1) The "weak" form asserts that all past market prices and data are fully
21 reflected in securities prices. In other words, technical analysis cannot enable
22 an investor to "outperform the market".
23
24 2) The "semistrong" form asserts that all publicly available information is fully
25 reflected in securities prices. In other words, fundamental analysis cannot
26 enable an investor to "outperform the market".
27
28 3) The "strong" form asserts that all information, both public and private, is
29 fully reflected in securities prices. In other words, even insider information
30 cannot enable an investor to "outperform the market".
31

⁶ Brealey, R.A. and Myers, S.C., "Principles of Corporate Finance". McGraw-Hill Publications, Inc., 1996, pp. 323-324.

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The "semistrong" form is generally held as true because the illegal use of insider information can enable an investor to "beat the market" and earn excessive returns, thereby disproving the "strong" form.

5

6

Q. PLEASE EXPLAIN THE APPLICABILITY OF THE EMH TO YOUR DETERMINATION OF COMMON EQUITY COST RATE.

7

8

A. Common sense affirms the conceptual basis of the EMH as described above. In practical terms, this means that market prices paid for securities reflect all relevant information available to investors and that no degree of sophistication and/or analysis can enable investors to consistently outperform the market. Consequently, it confirms that all perceived risks are taken into account by investors in the prices they pay which reflect information inexpensively or freely available such as bond ratings; analyses of the rating agencies and financial analysts, and the various methodologies employed to determine common equity cost rate as discussed in the academic and financial literature. Thus, in an attempt to emulate investors' actions, it is necessary to take into account the results of multiple cost of common equity models.

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1 Q. IS THERE SPECIFIC SUPPORT IN THE ACADEMIC AND FINANCIAL
2 LITERATURE FOR THE NEED TO RELY UPON MULTIPLE COST OF
3 COMMON EQUITY MODELS IN ARRIVING AT A RECOMMENDED
4 COMMON EQUITY COST RATE?

5 A. Yes. For example, Phillips⁷ states:

6 Since regulation establishes a level of authorized earnings which,
7 in turn, implicitly influences dividends per share, estimation of the
8 growth rate from such data is an inherently circular process. *For*
9 *these reasons, the DCF model 'suggests a degree of precision*
10 *which is in fact not present' and leaves 'wide room for controversy*
11 *and argument about the level of k'. (Emphasis added) (p. 396)*
12

13 * * *

14 *Despite the difficulty of measuring relative risk, the comparable*
15 *earnings standard is no harder to apply than is the market-*
16 *determined standard. The DCF method, to illustrate, requires a*
17 *subjective determination of the growth rate the market is*
18 *contemplating. Moreover, as Leventhal has argued: 'Unless the*
19 *utility is permitted to earn a return comparable to that available*
20 *elsewhere on similar risk, it will not be able in the long run to*
21 *attract capital'. (Emphasis added) (p. 398)*
22

23
24 Also, Morin⁸ states:

⁷ Charles F. Phillips, Jr., The Regulation of Public Utilities – Theory and Practice, 1993, Public Utility Reports, Inc., Arlington, VA, p. 396, 398.

⁸ Roger A. Morin, Regulatory Finance – Utilities' Cost of Capital, 1994, Public Utilities Reports, Inc., Arlington, VA, pp. 231-232, 239-240.

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Each methodology requires the exercise of considerable judgment on the reasonableness of the assumptions underlying the methodology and on the reasonableness of the proxies used to validate a theory. *The inability of the DCF model to account for changes in relative market valuation, discussed below, is a vivid example of the potential shortcomings of the DCF model when applied to a given company.* Similarly, the inability of the CAPM to account for variables that affect security returns other than beta tarnishes its use. (Emphasis added)

No one individual method provides the necessary level of precision for determining a fair return, but each method provides useful evidence to facilitate the exercise of an informed judgment. Reliance on any single method or preset formula is inappropriate when dealing with investor expectations because of possible measurement difficulties and vagaries in individual companies' market data. (Emphasis added) (Morin, p. 428)

* * *

The financial literature supports the use of multiple methods. Professor Eugene Brigham, a widely respected scholar and finance academician, asserts:¹(footnote omitted)

Three methods typically are used: (1) the Capital Asset Pricing Model (CAPM), (2) the discounted cash flow (DCF) method, and (3) the bond-yield-plus-risk-premium approach. These methods are not mutually exclusive – no method dominates the others, and all are subject to error when used in practice. Therefore, when faced with the task of estimating a company's cost of equity, we generally use all three methods and then choose among them on the basis of our confidence in the data used for each in the specific case at hand. (Morin, p. 430)

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1 Another prominent finance scholar, Professor Stewart Myers, in an
2 early pioneering article on regulatory finance, stated:^{2(footnote omitted)}
3
4

5 Use more than one model when you can. Because estimating
6 the opportunity cost of capital is difficult, only a fool throws
7 away useful information. That means you should not use any
8 one model or measure mechanically and exclusively. Beta is
9 helpful as one tool in a kit, to be used in parallel with DCF
10 models or other techniques for interpreting capital market data.
11 (Morin, p. 430)
12
13

14 Reliance on multiple tests recognizes that no single methodology
15 produces a precise definitive estimate of the cost of equity. As
16 stated in Bonbright, Danielsen, and Kamerschen (1988), '*no single*
17 *or group test or technique is conclusive.*' Only a fool discards
18 relevant evidence. (Emphasis in original) (Morin, p. 430)
19

20 * * *

21
22 While it is certainly appropriate to use the DCF methodology to
23 estimate the cost of equity, there is no proof that the DCF produces
24 a more accurate estimate of the cost of equity than other
25 methodologies. Sole reliance on the DCF model ignores the
26 capital market evidence and financial theory formalized in the
27 CAPM and other risk premium methods. The DCF model is one of
28 many tools to be employed in conjunction with other methods to
29 estimate the cost of equity. *It is not a superior methodology that*
30 *supplants other financial theory and market evidence. The broad*
31 *usage of the DCF methodology in regulatory proceedings in*
32 *contrast to its virtual disappearance in academic textbooks does*
33 *not make it superior to other methods. The same is true of the Risk*
34 *Premium and CAPM methodologies.* (Emphasis added) (Morin, p.
35 431)
36
37

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1 Thus, the EMH requires the assumption that investors rely upon multiple cost of
2 common equity estimation models.

3
4
5

B. Discounted Cash Flow Model (DCF)

6

1. Theoretical Basis

7 **Q. WHAT IS THE THEORETICAL BASIS OF THE DCF MODEL?**

8 A. DCF theory is based upon finding the present value of an expected future stream of
9 net cash flows during the investment holding period discounted at the cost of capital,
10 or the capitalization rate. The theory suggests that an investor buys a stock for an
11 expected total return rate to be derived from cash flows in the form of dividends
12 received plus appreciation in market price, i.e., the expected growth rate. Thus, the
13 dividend yield on market price plus a growth rate equals the capitalization rate. The
14 capitalization rate is the total return rate expected by investors.

15

16 **Q. PLEASE COMMENT ON THE APPLICABILITY OF THE DCF MODEL IN**
17 **ESTABLISHING THE COST RATE OF COMMON EQUITY CAPITAL.**

18 A. As discussed supra, it is necessary to determine a common equity cost rate
19 applicable to MGE which is based upon the proxy group which have been adjusted
20 upward to reflect MGE's greater business risk attributable to its smaller size. My

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1 assumption is that, aside from the size effect for MGE's smaller size which is not
2 reflected in common equity cost rate derived from the proxy group (or SUG as an
3 alternative), that the bond rating would be the equivalent of the average of Baa1 of
4 the proxy group.

5
6 The DCF model has a tendency to mis-specify investors' required return rate when
7 the market value of common stock differs significantly from its book value, as will
8 be discussed infra in detail. Market values and book values of common stocks are
9 seldom at unity. For example, the average market values of the proxy group have
10 been in excess of their book values. So has MGE's, but much less so. As shown on
11 page 4 of Schedule FJH-1, on February 13, 2009, the common stocks of the nine
12 companies in the proxy group sold, on average, at 174.7% of their book values,
13 while SUG's common stock sold below its book value, i.e., at just 76.6% of its book
14 value.

15
16 A market-based DCF cost rate will result in a total annual dollar return on book
17 common equity equal to the total annual dollar return expected by investors only
18 when market and book values are equal. A DCF cost rate produces an investor-
19 required return on the market value or price paid. The application of a market value

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1 cost rate applied to a lower book value results in a lower dollar return than required
2 by investors. There are many macroeconomic factors which influence market
3 values. Regulatory actions can influence market values but cannot control them
4 according to Bonbright (infra), which is affirmed by common sense.

5
6 **2. Applicability of a Market-Based Common Equity**
7 **Cost Rate to a Book Value Rate Base**

8 **Q. ARE THE MARKET PRICES OF PUBLIC UTILITIES' STOCKS**
9 **INFLUENCED BY FACTORS WHICH ARE BEYOND THE INFLUENCE**
10 **OF THE REGULATORY PROCESS?**

11 **A. Yes. For example, Phillips⁹ states:**

12
13 *Many question the assumption that market price should equal book*
14 *value, believing that 'the earnings of utilities should be sufficiently*
15 *high to achieve market-to-book ratios which are consistent with*
16 *those prevailing for stocks of unregulated companies.' (Emphasis*
17 *added)*

18
19
20 In addition, Bonbright¹⁰ states:

21
22

⁹ Id., p. 395.

¹⁰ James C. Bonbright, Albert L. Danielsen and David R. Kamerschen, Principles of Public Utility Rates, 1998, Public Utilities Reports, Inc., Arlington, VA, p. 334.

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1 *In the first place, commissions cannot forecast, except within wide*
2 *limits, the effect their rate orders will have on the market prices of*
3 *the stocks of the companies they regulate. In the second place,*
4 *whatever the initial market prices may be, they are sure to change*
5 *not only with the changing prospects for earnings, but with the*
6 *changing outlook of an inherently volatile stock market. In short,*
7 *market prices are beyond the control, though not beyond the*
8 *influence of rate regulation. (Emphasis added)*
9

10
11 **Q. ASSUMING THAT MARKET PRICES ARE BEYOND THE CONTROL OF**
12 **RATE REGULATION, DOES A DCF COST RATE REFLECT INVESTORS'**
13 **REQUIRED RATE OF RETURN WHEN APPLIED TO A BOOK VALUE**
14 **WHICH DIFFERS FROM ITS MARKET VALUE?**

15 **A.** No. Under the DCF model, the rate of return investors require is related to the price
16 paid for a stock. Thus, market price is the basis upon which investors formulate their
17 required rate of return. A regulated utility (under the traditional rate base/rate of
18 return paradigm) is limited to earning on its net book value (depreciated original
19 cost) rate base. Market values diverge from book values for many reasons unrelated
20 to allowed and/or achieved rates of earnings on book common equity ("ROEs").
21 Thus, when market values depart from book values, a market-based DCF cost rate
22 applied to the book value of common equity will not reflect investors' expected
23 common equity cost rate based on market prices. This is true because there are
24 many macroeconomic factors which influence the demand for, and hence the market

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1 prices of, common stocks in addition to company-specific earnings per share
2 ("EPS") and dividends per share ("DPS"). Consequently, a market-based DCF cost
3 rate applied to the book value per share will either overstate investors' required
4 common equity cost rate when market value is less than book value or understate
5 investors' required common equity cost rate when market value is above book value.
6 In the late 1970's and early 1980's, when interest rates were extraordinarily high and
7 the market-to-book ratios of utilities were below unity, the DCF model overstated
8 investors' required common equity cost rate.

9
10 In recent years, as well as currently, with relatively low interest rates and utility
11 market-to-book ratios consistently averaging well above one, the DCF model
12 typically understates investors' required common equity cost rate. Those conditions
13 emphasize the need to rely upon multiple cost of common equity models consistent
14 with the EMH as discussed supra.

15
16 **Q. HOW DOES A MARKET-BASED DCF COST RATE EITHER**
17 **UNDERSTATE OR OVERSTATE INVESTORS' REQUIRED RATE OF**
18 **RETURN?**

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1 A. The problem of understatement or overstatement of cost rate arises when a market-
2 based DCF cost rate is applied to a book value per share of common equity which is
3 less or greater than the market value, respectively. The examples on Schedule FJH-
4 10 show how a significantly different book value results in either an understatement
5 or overstatement of investors' required return rate which is based on market price,
6 which is their investment. The hypothetical illustration on Schedule FJH-10
7 demonstrates that the expected market-based rate of return is either under-achieved
8 or over-achieved. In the first hypothetical example (refer to columns 1 and 2),
9 market price is 80% in excess of its book value and investors expect a total return
10 rate of 10.00% on market price, based on a growth rate of 6.50% and a dividend
11 yield of 3.50%. It is shown that when the 10.00% return rate is applied to the book
12 value, which is only 55.54% of the market value, or \$13.33, the opportunity for total
13 annual return is only \$1.333 on book value (10.00% x \$13.33) and not \$2.40
14 (10.00% return on \$24 market value). With an annual dividend of \$0.84, there is an
15 opportunity to earn only \$0.493 in growth which is just 2.05% on the \$24 market
16 price in contrast to the 6.50% growth rate expected by investors and subsumed in the
17 market price paid. Conversely, if market value is less than book value (refer to
18 columns 1 and 3 of Schedule FJH-10), a market-based DCF cost rate when applied

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1 to a greater book value will result in an overstatement of investors' required rate of
2 return on market price.

3

4 **Q. HAVE ANY REGULATORY BODIES ADDRESSED THIS SITUATION?**

5 **A.** Yes. Several examples of state regulatory commissions which have expressly
6 addressed this problem are as follows:

7

8 The Pennsylvania Public Utility Commission has recognized this tendency by
9 utilizing an adjusted DCF cost rate. It did so in re: Aqua Pennsylvania Water
10 Company (R-00038805) in its Order entered August 8, 2004 and also in
11 Pennsylvania Power & Light Company (R-00049255) in its Order entered December
12 22, 2004. In that Order, the PA PUC stated:

13

14 We find it reasonable that a financial risk adjustment, as proposed by
15 PPL, is necessary to compensate PPL for the mismatched application
16 of a market-based cost of common equity to a book value common
17 equity ratio. *The adjustment is necessary because the DCF method*
18 *produces the investor-required return based on the current market*
19 *price, not the return on the book value capitalization.* (Emphasis
20 added)

21

22

23

* * *

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1 The Indiana Utility Regulatory Commission (IURC) has recognized the tendency
2 of the DCF model to understate the cost of equity when market value exceeds
3 book value¹¹ when it stated:

4 In determining a common equity cost rate, we must again recognize
5 the tendency of the traditional DCF model, . . . to understate the cost
6 of common equity. As the Commission stated in Indiana-Mich.
7 Power Co. (BPU 8/24/90), Cause No. 38728, 116 PUR 4th 1, 17-18,
8 *"the unadjusted DCF result is almost always well below what any*
9 *informed financial analyst would regard as defensible, and*
10 *therefore, requires an upward adjustment based largely on the*
11 *expert witness's judgement."* (Emphasis added)
12
13

14 The Iowa Utilities Board (IUB) has recognized the tendency of the DCF model to
15 understate investors' expected cost of common equity capital when market values are
16 significantly above their book values. In its June 17, 1994 Final Decision and Order
17 in Re U.S. West Communications, Docket No. RPU-93-9 the IUB stated:¹²

18 While the Board has relied in the past on the DCF model, in *Iowa*
19 *Electric Light and Power Company*, Docket No. RPU-89-9, "Final
20 Decision and Order" (October 15, 1990), the Board stated: "[T]he DCF
21 model may understate the return on equity in some circumstances.
22 This is particularly true when the market is relatively volatile and the
23 company in question has a market-to-book ratio in excess of one."
24 Those conditions exist in this case and the Board will not rely on the
25

¹¹ Re: Indiana-American Water Company, Inc., Cause No. 39595, 150 PUR4th at 167-168.

¹² Re: U.S. West Communications, Inc., Docket No. RPU-93-9, 152 PUR4th at 459.

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1 DCF return. (Consumer Advocate Ex. 367, See Tr. 2208, 2250, 2277,
2 2283-2284). *The DCF approach underestimates the cost of equity*
3 *needed to assure capital attraction during this time of market*
4 *uncertainty and volatility. The board will, therefore, give preference*
5 *to the risk premium approach. (Emphasis added)*
6

7 **3. Application of the DCF Model**

8 **a. Dividend Yield**

9 **Q. WHAT ARE THE RESULTS OF YOUR APPLICATION OF THE DCF**
10 **MODEL?**

11 A. As shown on Schedule FJH-11, the DCF cost rates range from 7.93% to 11.62% and
12 average 9.82% for the nine companies in the proxy group. I rely upon the median
13 cost rate of the group which is also 9.82%.

14
15 **Q. WHAT ARE THE BASES FOR THE UNADJUSTED DIVIDEND YIELDS**
16 **SHOWN IN COLUMN 1 OF SCHEDULE FJH-11?**

17 A. The recent volatility of the stock market confirms that spot prices should not be
18 relied on exclusively. Conversely, reliance on too long a historical period would not
19 be representative of the future. Consequently, I rely on an average of recent spot
20 dividend yield at February 13, 2009 and an average of dividend yields for December
21 2008 and January 2009 as shown by company/group on Schedule FJH-12.

22

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b. Discrete Adjustment of Dividend Yield

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**Q. PLEASE EXPLAIN THE ADJUSTMENTS FOR DISCRETE GROWTH IN
DIVIDENDS AS SHOWN IN COLUMN 2 OF SCHEDULE FJH-11.**

**A. Due to the fact that dividends are paid quarterly, or periodically, as opposed to
continuously (daily), an adjustment must be made. This is often referred to as the
discrete, or the Gordon Periodic, version of the DCF model.**

Since companies tend to increase their quarterly dividend at different times of the
year, a reasonable assumption is to reflect one-half the annual dividend growth rate
in the D_1 expression, or $D_{1/2}$. This is a conservative approach so as not to overstate
the dividend yield which should be representative of the next twelve-month period.
Therefore, the actual average dividend yields in Column 1 on Schedule FJH-11,
have been adjusted upward to reflect one-half the growth rates in Column 4 on the
same Schedule. The resultant average adjusted dividend yield for the proxy group
is 4.06% and the median adjusted dividend yield is 3.72% as shown in Column 3 of
Schedule FJH-11. SUG's adjusted dividend yield is 4.69%. The details of the
unadjusted dividend yields by company for the proxy group and SUG are shown on
Schedule FJH-12.

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c. DCF Growth Rates

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**Q. PLEASE EXPLAIN THE BASIS OF THE GROWTH RATES WHICH YOU
USE IN YOUR APPLICATION OF THE DCF MODEL, AS SHOWN IN
COLUMN 4 OF SCHEDULE FJH-11.**

A. It is shown on Schedule FJH-13 that, on average, individuals own about 48% of the common shares of the companies in the proxy group, while the median is about 42%, and only about 25% of the shares of SUG. I believe that individual investors are very likely to rely on information provided by securities analysts whose forecasts provide meaningful insight into prospective growth in per share value than reliance on historical accounting measures of growth. Analysts' forecasts, which incorporate historical information, are readily available from Value Line and other sources such as Reuters. The Reuters estimates are readily available on the internet. In many instances the Reuters estimate is the mean of a number of estimates. While investors are influenced by short-term earnings growth such as forecasts for the next 12 months, I believe that they are much more influenced by longer term five-year forecasts. The use of five-year forecasts (the longest period available) is more consistent with the long-term investment horizon implicit in common stocks than single 12 month growth rates. EPS growth rate expectations, although they do not fully account for changes in market value, are the most significant of all accounting

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1 measures of value. It should be clear, even to the casual market observer, that the
2 market reacts favorably when EPS expectations are met or exceeded and unfavorably
3 when they are not.

4
5 In view of the foregoing, I rely upon the average projected long-term growth rate in
6 EPS from Value Line and Reuters as shown on page 1 of Schedule FJH-14 by
7 company and group as well as for SUG. I considered all of the growth rates from a
8 low of 3.75% to a high of 7.90% for the proxy group and included them in the
9 calculation of DCF cost rates as shown in column 4 on Schedule FJH-11 as well as
10 SUG's growth rate of 9.05%. Pages 2 through 11 of Schedule FJH-14 contain the
11 most recent Value Line Investment Survey for all nine companies in the proxy group
12 and SUG.

13
14 **4. Conclusion of DCF Cost Rate**

15 **Q. PLEASE SUMMARIZE YOUR CONCLUSION OF DCF COST RATE FOR**
16 **THE PROXY GROUP, AND SUG AS AN ALTERNATIVE.**

17 **A.** The DCF cost rates are shown in column 5 on Schedule FJH-11. As can be seen, for
18 the proxy group they range from 7.93% to 11.62%. The average and median for the
19 group is 9.82% and I rely upon the median. Also shown in Column 5 is SUG's DCF

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1 cost rate of 13.74%.

2

3

C. The Risk Premium Model (RPM)

4

1. Theoretical Basis

5

Q. PLEASE DESCRIBE THE THEORETICAL BASIS OF THE RPM.

6

A. The RPM is based upon the theory that the cost of common equity capital is greater than the prospective company-specific cost rate for long-term debt capital. In other words, it is the expected cost rate for long-term debt capital plus a premium to compensate common shareholders for the added risk of being unsecured and last-in-line in any claim on the corporation's assets and earnings.

11

12

Q. COULD IT BE SAID THAT THE RPM IS ANOTHER FORM OF THE CAPM?

13

14

A. Yes, but there is a very significant distinction between the two models. The RPM and CAPM both add a "risk premium" to an interest rate. However, the beta approach to the determination of an equity risk premium in the RPM should not be confused with the CAPM. Beta is a measure of systematic, non-diversifiable, market risk which is usually a much smaller percentage of total investment risk, the sum of both diversifiable and non-diversifiable risks. Diversifiable, i.e., unsystematic or

19

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1 company-specific, risks are reflected in the RPM because the prospective company-
2 specific long-term bond yield is the result of a bond rating process which includes an
3 assessment of all diversifiable business and financial risks. This reality is verifiable
4 by reading S&P's description of its bond rating process which is contained in
5 Schedule FJH-2, pages 3 through 9. In contrast, the use of a U.S. Government
6 Security as the risk-free rate of return in the CAPM, by definition, reflects no
7 diversifiable, company-specific risk. Clearly, the RPM and CAPM are two separate
8 and distinct cost of common equity models, a fact recognized in the financial
9 literature.

10

11 **Q. PLEASE DESCRIBE YOUR RPM ANALYSIS.**

12 **A.** It is shown in Schedule FJH-15. As can be gleaned from page 1, I have estimated the
13 projected bond yield on Moody's A rated utility bonds to be 6.49%, while the actual
14 for the month of January 2009 was 6.39%. The average bond rating for the proxy
15 group is Moody's Baa1 and an adjustment is required to be made in order to be
16 reflective of its Baa1 rating as shown on page 1 of Schedule FJH-15 on line 4. The
17 sum of the prospective bond yield and equity risk premium equals the RPM-derived
18 common equity cost rate applicable to each.

19

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2. Bond Yields

1

2 **Q. PLEASE EXPLAIN THE BASIS OF THE EXPECTED BOND YIELDS OF**
3 **6.89% APPLICABLE TO THE PROXY GROUP AND 7.09% APPLICABLE**
4 **TO SUG SHOWN ON LINE 5, PAGE 1 OF SCHEDULE FJH-15.**

5 **A.** Because the cost of common equity is prospective as is the ratemaking process, the
6 prospective yield on similarly-rated long-term debt is most appropriate. The
7 Moody's and S&P bond ratings for the proxy group and SUG are shown on
8 Schedule FJH-15, page 2. I relied upon the consensus forecasts of approximately 50
9 economists of the expected yields on Moody's Aaa rated corporate bonds for the six
10 calendar quarters ending with the second calendar quarter of 2010 as derived from
11 the February 1, 2009 Blue Chip Financial Forecasts as shown on page 7 of Schedule
12 FJH-15. As shown on line 1, page 1 of Schedule FJH-15, the average expected yield
13 on Moody's Aaa rated corporate bonds is 5.08%. It is necessary to adjust that
14 average yield of 5.08% upward in order to be equivalent to the average Moody's
15 Baa1 bond rating yield of the proxy group and to the Baa3 bond rating yield of SUG,
16 which is accomplished through the adjustments on lines 2 and 4 of Schedule FJH-15,
17 page 1, and explained in Notes 2 through 4 on the same page. Accordingly, the
18 average prospective yield on Moody's Baa1 and Baa3 rated public utility bonds are
19 6.89% and 7.09%, respectively as shown on line 5, page 1 of Schedule FJH-15.

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1

2 **Q. HOW WOULD YOU CHARACTERIZE THE PROJECTED YIELD ON**
3 **BAA3 RATED UTILITY BONDS OF 7.09% GIVEN CURRENT MARKET**
4 **CONDITIONS?**

5 **A.** It is quite low based on current market conditions. The yield differentials currently
6 between utility bonds rated A and those rated Baa is 155 basis points as shown on
7 page 4 of Schedule FJH-15. In contrast, it is shown on Schedule FJH-17 that the
8 average yield differential for the period January 2004 through January 2009 was just
9 37 basis points. For the reasons discussed infra in the "Estimation of Equity Risk
10 Premium" section as well as in the "Conclusion of Common Equity Cost Rate"
11 section of this testimony, and in Notes 3 and 4 on page 1 of Schedule FJH-15, it is
12 more appropriate to rely upon a normalized yield differential of just 60 basis points
13 between utility bonds rated Baa and those rated A.

14

15 **3. Estimation of the Equity Risk Premium**

16 **Q. PLEASE EXPLAIN THE BASIS OF THE EQUITY RISK PREMIUM**
17 **WHICH YOU HAVE DETERMINED TO BE APPLICABLE TO THE**
18 **PROXY GROUP AND SUG.**

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1 A. I evaluated the results of two different historical equity risk premium studies, as well
2 as Value Line's forecasted total annual return on the market over the prospective
3 yield on Aaa rated corporate bonds. These analyses are summarized on page 5 of
4 Schedule FJH-15. As shown on line 3 of page 5, the average equity risk premiums
5 based on both studies are 5.47% applicable to the proxy group and 7.41% applicable
6 to SUG. The 5.47% is the average of the arithmetic mean historical and the
7 projected market equity risk premiums allocated to the proxy group by the use of the
8 median beta of the proxy group of 0.70 in order to indicate its equity risk premium in
9 addition to that based upon the mean of holding period returns of the S&P Utility
10 Index for the period 1928 through 2007 over the mean yield on Baa rated public
11 utility bonds over the same period. Similar calculations for SUG, using its beta of
12 1.10% and the long-term holding period equity risk premium of the S&P Utility
13 Index over Baa rated utility bonds indicates a 7.41% risk premium applicable to
14 SUG.

15
16 Q. **PLEASE EXPLAIN THE BASIS OF THE EQUITY RISK PREMIUMS**
17 **APPLICABLE TO THE PROXY GROUP, AND SUG AS AN**
18 **ALTERNATIVE, AS SHOWN ON LINE 1, PAGE 5, SCHEDULE FJH-15.**

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1 A. Equity risk premiums determined through the application of beta are meaningful
2 because the betas were derived from regression analyses of the market prices of
3 common stocks. The market prices of those common stocks reflect investors'
4 expectations over a long-term future investment horizon. Consequently, beta is a
5 meaningful measure of prospective risk relative to the market as a whole and is thus
6 a logical means by which to allocate a relative share of total market equity risk
7 premium to a specific company or proxy group.

8 **Q. WHAT AVERAGE TOTAL MARKET EQUITY RISK PREMIUM DID YOU**
9 **UTILIZE?**

10 A. I utilized 9.71%, as shown on page 6, line 7 of Schedule FJH-15, which is based
11 upon a weighting of 80% to the long-term average historical equity risk premium of
12 6.20% and 20% to the forecasted market equity risk premium of 23.77%, as shown
13 on page 6, lines 3 and 6, respectively, of Schedule FJH-15.

14
15 To derive the historical market equity risk premium of 6.20%, I used the most
16 recent Morningstar data on holding period returns for the S&P 500 Composite
17 Index and the average historical yield on Moody's Aaa and Aa corporate bonds
18 covering the period 1926-2007. The use of holding period returns over a very long
19 period of time is useful in the application of the beta approach.

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1

2 **Q. IS THERE SUPPORT IN THE FINANCIAL LITERATURE FOR THIS**
3 **APPROACH?**

4 A. Yes. Morningstar, in its Valuation Edition – 2008 Yearbook provides sound
5 reasoning why the use of a long-term historical time period is appropriate to
6 estimate the expected equity risk premium. Morningstar demonstrates empirically
7 through tests of serial correlation that equity risk premia are random. Morningstar
8 also explains why the arbitrary use of shorter time periods distorts the results of
9 estimated long-term average market equity risk premia. Moreover, the arbitrary use
10 of shorter time periods is contrary to the long-term randomness of equity risk
11 premia. Consequently, the use of the long-term average equity risk premium
12 provides stability in contrast to the volatility associated with the arbitrary use of
13 shorter historical time periods.

14 **Q. ARE THERE OTHER REASONS THAT SUPPORT THIS APPROACH?**

15 A. Yes. The use of a long-term average is consistent with the long-term investment
16 horizon implicit in the cost of common equity capital, as exemplified by the
17 premise of infinity in the standard DCF model used in rate regulation.
18 Morningstar's full explanation of why the use of the long-term average equity risk
19 premium is appropriate is provided at pages 5 through 8 of Schedule FJH-16.

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2 **Q. WHAT DO YOU CONCLUDE FROM THIS?**

3 A. In view of the foregoing and all of Morningstar's comments contained in Schedule
4 FJH-16, it is clear that the arbitrary selection of shorter historical periods would be
5 highly suspect. Such periods would likely contain the 1987 stock market crash, the
6 collapse of the Soviet Union, the two wars with Iraq, extraordinary inflation rates
7 and other significant events. Therefore, the use of shorter historical time periods is
8 unlikely to be representative of the amount of change which could occur over a long
9 period of time in the future (the presumed long-term holding period for common
10 stocks as is implicit in the various cost of common equity models). Thus, the use of
11 a very long past period to estimate the equity risk premium is consistent with the
12 long-term investment horizon for utilities' common stocks and is critical to proper
13 estimation of the long-term future.

14 **Q. WHAT MEAN SHOULD BE USED?**

15 A. The arithmetic mean of those long-term historical total return rates on the market as
16 a whole is the appropriate mean for use in estimating the cost of capital because it
17 provides essential insight into the potential variance of expected returns. A full
18 explanation by Morningstar as to why the arithmetic mean must be used when

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1 discounting future cash flows for estimating the cost of capital is contained in pages
2 2 through 4 of Schedule FJH-16.

3
4 Historical total returns and equity risk premium spreads differ in size and direction
5 over time. It is precisely for this reason that the arithmetic mean is important. It is
6 the arithmetic mean which provides insight into the variance and standard deviation
7 of returns. It is the prospect for, and degree of, variance which provides the insight
8 required by investors to estimate risk when contemplating making an investment.
9 Insight into the variance can only be obtained by the use of the arithmetic mean of
10 historical returns. Absent valuable insight into the potential variance of returns,
11 there can be no meaningful evaluation of prospective risk. If investors relied upon
12 the geometric mean of historical returns, they would have no insight into the
13 potential variance of future returns because the geometric mean relates the change
14 over many periods to a constant rate of change, thereby obviating the year-to-year
15 fluctuations, or variance, critical to risk analysis.

16
17 The basis of the historical market equity risk premium of 6.20% is detailed in lines
18 1 through 3, page 6, Schedule FJH-15.

19

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1 **Q. WHY DO YOU ALSO CONSIDER GIVING SOME WEIGHT TO A**
2 **FORECASTED EQUITY RISK PREMIUM?**

3 **A.** The long-term historical arithmetic average market equity risk premium is the most
4 likely to be experienced over a long-term prospective period. Also, a prospective
5 element is contained in the use of beta because beta is derived from market prices
6 which reflect expectations of the future and is utilized in conjunction with the
7 prospective yields on Baa1 and Baa3 rated public utility bonds. Consequently, it is
8 also appropriate to view the potential for market price appreciation in the current
9 market environment. Such a period of up to about five years, based upon Value
10 Line's forecasted market appreciation and dividend yield on its market universe, is
11 something that investors would certainly be aware of, especially since approximately
12 48% of investors in the proxy group are individuals, who are likely to rely upon
13 Value Line as discussed supra. Because the potential for growth in the DCF model
14 is market price appreciation, when estimating the equity risk premium by use of the
15 RPM model, it is also appropriate to take the potential for market price appreciation
16 into account to some degree.

17

18 **Q. YOU STATED SUPRA THAT YOU GIVE 20% WEIGHT TO THE**
19 **FORECASTED MARKET EQUITY RISK PREMIUM AND 80% WEIGHT**

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1 **TO THE LONG-TERM HISTORICAL AVERAGE. PLEASE EXPLAIN**
2 **WHY.**

3 A. Because the cost of capital is expectational, it is clear that investors' expectations are
4 influenced by, among other things, forecasts of future performance of the market as
5 well as for specific companies and industries.

6 **Q. CAN YOU PROVIDE AN EXAMPLE?**

7 A. Yes. The recent financial crisis has resulted in a substantial decline in market values
8 with a concurrent flight to safety, i.e., greater investment in U.S. government
9 securities and better quality debt such as that rated Aaa and/or Aa in the corporate
10 and utility sectors. On Schedule FJH-17, I have shown the yield differentials
11 (spreads) between Moody's A and Baa rated utility bonds from January 2004
12 through January 2009. As can be seen, the spread averaged 37 basis points which is
13 a norm in contrast to the recent spread of 155 basis points discussed supra and
14 attributable to the current international financial crisis due to investors' flight to
15 safety. As a result, currently the cost of debt capital is higher and so therefore, is the
16 cost of common equity capital.

17 **Q. WHAT IS THE IMPACT OF THIS FOR PURPOSES OF YOUR**
18 **TESTIMONY?**

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1 A. The potential for market price appreciation is now so great (148% as indicated in
2 Note 1 on page 3 of Schedule FJH-18 that, while some weight must be given to it,
3 the weight must be tempered so that when combined with the long-term historical
4 average a realistic prospect for long-term growth is obtained as opposed to the huge
5 potential which exists for market speculators that invest on a short-term basis.
6 Keeping in mind that for ratemaking purposes, a long-term investment horizon is
7 assumed. Consequently, I believe that weight such as 20% must be given to the
8 projected potential for market price appreciation because exclusive reliance upon
9 historical data will not properly reflect the significant increase in risk which has
10 effected both debt and common equity capital.

11

12 **Q. DO YOU HAVE ANY SUPPORT FOR THIS APPROACH?**

13 A. Yes. For example, Roger Ibbotson, the founder of Ibbotson Associates, which is a
14 wholly-owned subsidiary of Morningstar, Inc. and Professor of Finance at the Yale
15 School of Management, recently stated that reliance upon historical statistics such as
16 standard deviation are not reflective of current and prospective risk.

17

18 **Q. PLEASE ELABORATE.**

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1 A. In a conference call interview with Paul D. Kaplan of Morningstar on December 17,
2 2008¹³, the following interchange occurred between Kaplan and Professor Ibbotson:

3 **Kaplan:** Dr. Ibbotson, is the economy fundamentally unstable or
4 does it self-stabilize? It is curious that economists of every stripe
5 right now are calling for aggressive government action regardless of
6 what theory they normally subscribe to.

7
8 **Ibbotson:** The economy has lots of self-stabilizing features, and it
9 has other features that are destabilizing. Most of the time the
10 economy is stabilizing, but certainly, I won't argue that the situation
11 is stable now; instead, we have discontinuities here of an extreme
12 sort.

13
14 But there are also behavioral aspects of this. *I think the risks are*
15 *definitely much higher than you might think of just looking at*
16 *standard deviation, not only from the mathematical aspects of other*
17 *measures of risk, but also from the way people react when they have*
18 *the bad result. People often have the bad result at the same time*
19 *they are losing their human capital income. They're losing all of*
20 *their wealth at the same time, so they tend to be much more risk-*
21 *averse than standard economics would show them to be. There is a*
22 *lot of risk, and there's more risk than we think. (Emphasis added)*

23
24 * * *

25
26 **Kaplan:** Our readers are getting a lot of questions from their clients
27 about what they should do. What kinds of things should advisors be
28 discussing with their clients?

29
30 **Ibbotson:** *I would be saying that when markets pull out of*
31 *calamities, they often have their highest returns. We had the highest*
32 *return ever in 1933 in the midst of a severe depression. You get the*
33 *extreme pullout when things start to get a bit better. The markets in*
34 *general move ahead of what's actually happening in the economy.*

¹³ Morningstar Advisor, February 2, 2009.

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1 *The risk premium on stocks has gone way up because of the fact that*
2 *investors now recognize that there is much more risk in the market*
3 *than they had recognized.* Stocks may not be done dropping,
4 especially in light of what's happened to the financial system, and I
5 don't know when it's going to start to straighten out, but ultimately,
6 in the long run, stocks are a good investment. (Emphasis added)
7

8 **Q. WHAT DOES THIS MEAN FOR PURPOSES OF THIS CASE?**

9 The foregoing affirms that currently and prospectively, there is much greater risk to
10 investors and that they require an equity risk premium commensurate with that
11 greater risk which certainly exceeds an equity risk premium based solely on
12 historical indicators. Consequently, I utilize a weighted market equity risk premium
13 of 9.71% is shown on line 7, page 6 of Schedule FJH-15 and explained in Note 5 on
14 the same page.

15
16 Application of the median beta of the proxy group of 0.70 and SUG's beta of 1.10
17 on line 8 to the weighted average (80% historical and 20% forecast) market equity
18 risk premium of 9.71% on line 7 results in equity risk premiums of 6.80% for the
19 proxy group and 10.69% for SUG as shown on line 9, page 6 of Schedule FJH-15
20 and on line 1, page 5 of Schedule FJH-15.

21

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1 **Q. PLEASE DESCRIBE THE DERIVATION OF THE EQUITY RISK**
2 **PREMIUM OF 4.13% SHOWN FOR THE PROXY GROUP AND SUG ON**
3 **PAGE 5, LINE 2 OF SCHEDULE FJH-15.**

4 A. For the reasons described supra by Morningstar, I caused to be performed an
5 analysis of the arithmetic mean of long-term historical holding period returns
6 applicable to public utilities, i.e., the S&P Public Utility Index for the period 1928-
7 2007, relative to the arithmetic mean yield on Moody's Baa rated public utility
8 bonds for the same period. The use of long-term averages provides a good basis for
9 estimating future expectations as all types of events are included, even "unusual"
10 ones. As noted supra, the average equity risk premium was 4.13% over the yield on
11 Baa rated utility bonds, as shown on line 3, page 5 of Schedule FJH-15.

12

13 **Q. WHAT IS YOUR CONCLUSION OF THE EQUITY RISK PREMIUM**
14 **APPLICABLE TO THE PROXY GROUP, AND SUG EMPLOYED AS AN**
15 **ALTERNATIVE?**

16 A. The resultant equity risk premiums are 5.47% applicable to the proxy group and
17 7.41% applicable to SUG as shown on page 1, line 6 and page 5, line 3 of Schedule
18 FJH-15, which is the average of lines 1 and 2 on page 5.

19

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4. Conclusion of RPM Cost Rate

1

2 **Q. WHAT ARE THE RESULTANT RPM COST RATES APPLICABLE TO THE**
3 **PROXY GROUP AND SUG?**

4 **A.** As shown on Schedule FJH-15, page 1, line 7, they are 12.36% applicable to the
5 proxy group and 14.50% applicable to SUG. Had I relied upon the actual January
6 average yield on A rated public utility bonds of 6.39% (which is just 10 basis points
7 lower than the forecasted yield of 6.49%), the cost rates would have been 12.26% for
8 the proxy group and 14.40% for SUG.

9

10 **D. The Capital Asset Pricing Model (CAPM)**

11

1. Theoretical Basis

12 **Q. IS THE CAPM WIDELY USED BY INVESTORS TO ESTIMATE**
13 **COMMON EQUITY COST RATE?**

14 **A.** Yes. As noted supra, the financial literature is replete with the need to rely upon
15 multiple methods and those methods include the CAPM.

16

17 Eugene F. Brigham and Phillip R. Daves¹⁴ state:

¹⁴ Eugene F. Brigham and Phillip R. Daves, Intermediate Financial Management, Ninth Edition, Thomson/South-Western, 2007, pp. 332-333.

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1 *Recent surveys found that the CAPM approach is by far the most*
2 *widely used method. Although most firms use more than one method,*
3 *almost 74 percent of respondents in one survey, and 85 percent in the*
4 *other, use the CAPM. This is in sharp contrast to a 1982 survey,*
5 *which found that only 30% of respondents used the CAPM.*
6 *Approximately 16% now use the DCF approach, down from 31% in*
7 *1982. The bond-yield-plus-risk-premium is used primarily by*
8 *companies that are not publicly traded. (Emphasis added)*
9

10 **Q. PLEASE EXPLAIN THE THEORETICAL BASIS OF THE CAPM.**

11 **A.** The CAPM defines risk as the covariability of a security's returns with the market's
12 returns. This covariability is measured by beta (" β "), an index measure of an
13 individual security's variability relative to the market. A beta less than 1.0 indicates
14 lower variability than the market and a beta greater than 1.0 indicates greater
15 variability than the market.

16
17 The CAPM assumes that all non-market, or unsystematic, risk can be eliminated
18 through diversification. The risk that cannot be eliminated through diversification
19 is called market, or systematic, risk. The model presumes that investors require
20 compensation for risks that cannot be eliminated through diversification.
21 Systematic risks are caused by socioeconomic events that affect the returns on all
22 assets. In essence, the model is applied by adding a risk-free rate of return to a
23 market risk premium. This market risk premium is adjusted proportionally to

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1 reflect the systematic risk of the individual security relative to the market as
2 measured by beta.

3

4 The **traditional CAPM** is expressed as:

5
$$R_S = R_F + \beta(R_M - R_F)$$

6 Where R_S = Return rate on the common stock

7 R_F = Risk-free rate of return

8 R_M = Return rate on the market as a whole

9 β = Adjusted beta (volatility of the security
10 relative to the market as a whole)
11

12

13 Numerous tests of the CAPM have confirmed its validity. These tests have
14 measured the extent to which security returns and betas are related as predicted by
15 the CAPM.

16

17 The **empirical CAPM ("ECAPM")**, discussed by Morin, reflects the reality that the
18 empirical Security Market Line ("SML") described by the traditional CAPM is not

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1 as steeply sloped as the predicted SML. An empirical study by Morin¹⁵ indicates
2 that the ECAPM should be expressed as:

$$K = R_F + 0.25(R_M - R_F) + 0.75\beta(R_M - R_F)^{16}$$

3
4
5 Morin¹⁷ further states:

6 Some have argued that the use of the ECAPM is inconsistent
7 with the use of adjusted betas, such as those supplied by Value
8 Line and Bloomberg. This is because the reason for using the
9 ECAPM is to allow for the tendency of betas to regress toward
10 the mean value of 1.00 over time, and, since Value Line betas are
11 already adjusted for such trend, an ECAPM analysis results in
12 double-counting. This argument is erroneous. Fundamentally,
13 the ECAPM is not an adjustment, increase or decrease, in beta.
14 This is obvious from the fact that the expected return on high
15 beta securities is actually lower than that produced by the CAPM
16 estimate. The ECAPM is a formal recognition that the observed
17 risk-return tradeoff is flatter than predicted by the CAPM based
18 on myriad empirical evidence. The ECAPM and the use of
19 adjusted betas comprised two separate features of asset pricing.
20 Even if a company's beta is estimated accurately, the CAPM still
21 understates the return for low-beta stocks. Even if the ECAPM is

¹⁵ Typical of the empirical evidence on the validity of the CAPM is a study by Morin (1989) who found that the relationship between the expected return on a security and beta over the period 1926-1984 was given by:

$$\text{Return} = 0.0829 + 0.0520 \beta$$

Given that the risk-free rate over the estimation period was approximately 6% and that the market risk premium was 8% during the period of study, the intercept of the observed relationship between return and beta exceeds the risk-free rate by about 2%, or ¼ of 8%, and that the slope of the relationship is close to ¼ of 8%. Therefore, the empirical evidence suggests that the expected return on a security is related to its risk by the following approximation:

$$K = R_F + x(R_M - R_F) + (1 - x)\beta(R_M - R_F)$$

Where x is a fraction to be determined empirically. The value of x that best explains the observed relationship $\text{Return} = 0.0829 + 0.0520 \beta$ is between 0.25 and 0.30. If $x = 0.25$, the equation becomes:

$$K = R_F + 0.25(R_M - R_F) + 0.75\beta(R_M - R_F)$$

¹⁶ Id., at pp. 189-190.

¹⁷ Id., at p. 191.

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1 used, the return for low-beta securities is understated if the betas
2 are understated. Referring back to Figure 6-1, the ECAPM is a
3 return (vertical axis) adjustment and not a beta (horizontal axis)
4 adjustment. Both adjustments are necessary.
5
6

7 Therefore, the ECAPM is a return adjustment, i.e., a y-axis adjustment and does not
8 increase the adjusted beta, which is an x-axis adjustment that accounts for regression
9 bias.
10

11 As a result of the foregoing, I apply both versions of the model (CAPM and
12 ECAPM) which are contained in Schedule FJH-18.
13

14 **2. Risk-Free Rate of Return**

15 **Q. PLEASE DESCRIBE YOUR SELECTION OF A RISK-FREE RATE OF**
16 **RETURN.**

17 **A. My applications of the CAPM and the ECAPM reflect a risk-free rate of 3.38%. It is**
18 based upon the average consensus forecast of the reporting economists in the
19 February 1, 2009 issue of Blue Chip Financial Forecasts for the yields on 30-year
20 U.S. Treasury Notes for the six quarters ending with the second calendar quarter
21 2010 as shown in Note 2 on page 3, Schedule FJH-18.
22

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1 Q. IS THE AVERAGE PROSPECTIVE YIELD ON 30-YEAR U.S. TREASURY
2 NOTES APPROPRIATE FOR USE AS THE RISK-FREE RATE?

3 A. Yes. The yield on 30-year T-Notes is almost risk-free and its term is consistent with
4 the long-term cost of capital to public utilities measured by the yields on public
5 utility bonds and more closely matches the long-term investment horizon inherent in
6 utilities' common stocks. Moreover, it is consistent with the long-term investment
7 horizon, which is presumed to be infinite, in the standard DCF model employed in
8 proceedings such as these. In addition, Morningstar¹⁸ states:

9
10 A common choice for the nominal riskless rate is the yield on a U.S.
11 Treasury Security. The ability of the U.S. government to create
12 money to fulfill its debt obligations under virtually any scenario
13 makes U.S. Treasury securities practically default-free. While
14 interest rate changes cause government obligations to fluctuate in
15 price, investors face essentially no default risk as to either coupon
16 payment or return of principal.

17 * * *

18
19
20 The horizon of the chosen Treasury security should match the
21 horizon of whatever is being valued. *When valuing a business that is*
22 *being treated as a going concern, the appropriate Treasury yield*
23 *should be that of a long-term Treasury bond.* Note that the horizon
24 is a function of the investment, not the investor. If an investor plans
25 to hold stock in a company for only five years, the yield on a five-

¹⁸ Stocks, Bonds, Bills and Inflation: 2008 Yearbook – Valuation Edition, Morningstar, Inc., Chicago, IL, p. 59.

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1 year Treasury note would not be appropriate since the company will
2 continue to exist beyond those five years. (Emphasis added)
3
4

5 In summary, the average expected yield on 30-year Treasury Notes is the appropriate
6 proxy for the risk-free rate in the CAPM because it is almost risk-free and has a
7 long-term investment horizon consistent with utilities' common stocks (not
8 individual investors) and is thus consistent with the long-term investment horizon
9 (which is actually assumed to be infinity) in the standard DCF model.
10

11 **3. Market Equity Risk Premium**

12 **Q. PLEASE EXPLAIN THE BASIS FOR YOUR ESTIMATION OF THE**
13 **EXPECTED MARKET EQUITY RISK PREMIUM.**

14 **A.** I estimate investors' expected total return rate which is based on the same weighting
15 of forecasted and long-term historical return rates for the same reasons discussed
16 supra regarding the equity risk premium position of my RPM analysis, i.e., 80%
17 weighting to historical and 20% to forecasted, from which I subtract the risk-free
18 rate. The result is a market equity risk premium of 10.77%, which must be allocated
19 to the proxy group and SUG. I make the allocations of the market equity risk
20 premium through the use of the median beta of the proxy group of 0.70 and SUG's
21 beta of 1.10.

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1
2 The basis of the projected market equity risk premium is explained in detail in Note
3 1 on page 3, Schedule FJH-18. The 3-5 year total market appreciation projection,
4 when converted to an annual rate plus the market's average dividend yield equals a
5 forecasted total annual return rate of 28.85%. The long-term historical total annual
6 arithmetic mean return rate of 12.30% on the market is from Table 2-1 on page 28
7 of Stocks, Bonds, Bills and Inflation: Valuation Edition – 2008 Yearbook
8 (Morningstar, Inc.). The relevant risk-free rate was deducted from the total market
9 return rate. For example, from the Value Line projected total market return of
10 28.85%, the forecasted average risk-free (income return) rate of 3.38% was
11 deducted indicating a forecasted market risk premium of 25.47% which was given
12 20% weight for the reasons discussed supra. From the arithmetic mean long-term
13 historical total return rate of 12.30% the long-term historical income return rate on
14 long-term U.S. Government Securities of 5.20% was deducted indicating an
15 historical equity risk premium of 7.10% which was given 80% weight for the
16 reasons discussed supra. Thus, the weighted market risk premium is 10.77%.

17
18 **4. Conclusion of CAPM Cost Rate**

19 **Q. WHAT ARE THE RESULTS OF YOUR APPLICATIONS OF THE CAPM**

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1 **AND ECAPM?**

2 A. They are shown on page 1 of Schedule FJH-18. The average of the median CAPM
3 and ECAPM cost rates applicable to the proxy group is 11.33% and for SUG, it is
4 15.10%.

5

6 **E. CEM Analysis**

7 **1. Theoretical Basis**

8 **Q. PLEASE DESCRIBE THE THEORETICAL BASIS OF THE CEM.**

9 A. The comparable earnings standard recognizes the fundamental economic concept of
10 opportunity cost. This concept states that the cost of using any resource – land, labor
11 and/or capital – for a specific purpose is the return that could have been earned in the
12 next best alternative use. The opportunity cost to an investor in a utility's common
13 stock is what that capital would yield in an alternative investment of similar risk.
14 The opportunity cost principle is consistent with one of the fundamental principles of
15 utility price regulation, i.e., it is intended to act as a surrogate for the competition of
16 the marketplace.

17

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1 The problem in using returns on book equity (the ROEs) of non-price regulated
2 companies is determining whether such companies are similar in risk to the price-
3 regulated utility.

4 **Q. PLEASE EXPLAIN.**

5 A. The ROEs of other similar price-regulated firms should not be relied upon because
6 they reflect the results of regulatory awards which may not be indicative of what
7 could have been earned in a competitive market. Moreover, to use such returns as a
8 primary method to establish a cost of equity would be an exercise in circularity.
9 Consequently, application of the CEM is most appropriately implemented by
10 examining the ROEs of similar risk, domestic, non-price regulated firms.

11

12 In a more competitive environment for energy utilities, the concept of observing the
13 rates of earnings on book equity, or net worth, of comparable non-price regulated
14 firms has greater relevance than ever despite a long regulatory history for the use of
15 the comparable earnings method. Moreover, the use of ROEs of comparable non-
16 price regulated firms is appropriate because:

17

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- 1 1) Under the rate base/rate of return paradigm, the rate of return (including the
2 rate of return on common equity) is applied to a rate base measured at
3 original (i.e., book) cost;
- 4 2) As discussed supra, many socioeconomic factors influence market prices
5 other than company-specific EPS and/or DPS. Thus, when market values
6 differ from their book values, market-based DCF cost rates either understate
7 or overstate the rates of earnings required on book equity (i.e., the common
8 equity financed portion of an original cost rate base); and
- 9 3) As also discussed supra, regulatory decisions can influence, but cannot
10 control market prices.

11
12 **2. Application of the CEM**

13 **Q. HOW DID YOU APPROACH YOUR CEM ANALYSIS?**

14 **A.** My CEM analysis is set forth in Schedule FJH-19. Page 1 contains the relevant data
15 for the domestic, non-price regulated, companies which are assumed comparable in
16 total risk to the proxy group of nine LDCs. Page 2 contains data for the domestic
17 non-price regulated companies which are comparable in total risk to SUG. Page 3
18 contains the notes to pages 1 and 2.

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1 It is critical to the application of the CEM to select proxy groups of non-price
2 regulated companies which are similar in total risk to the proxy group of nine LDCs
3 and SUG. In each instance, the proxy group of comparable non-price regulated
4 firms should be broad-based in order to obviate individual company-specific
5 aberrations. Utilities should be eliminated to avoid circularity since the rates of
6 return on their book common equity are substantially influenced by the rate
7 determinations of their respective regulatory commissions, many of which are the
8 result of negotiated settlements and are not truly market-based cost rates.

9
10 **3. Selection of Market-Based Companies of Similar Risk**

11 **Q. IS YOUR APPLICATION OF THE CEM MARKET-BASED?**

12 A. Yes. My application of the CEM is market-based because the selection of the
13 comparable non-price regulated firms is based upon statistics derived from the
14 market prices paid by investors. Specifically, I rely upon the betas and related
15 statistics derived from Value Line regression analyses of weekly market prices over
16 the most recent 260 weeks (five years). The bases of selection resulted in proxy
17 groups of non-price regulated firms comparable to the utility proxy group and SUG.
18 The average company in the proxy groups of non-price regulated companies is
19 comparable to the average company in the utility proxy group and SUG,

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1 respectively. Total risk is the sum of non-diversifiable market risk and diversifiable
2 company-specific risks.

3 **Q. WHAT CRITERIA DID YOU USE IN THE SELECTION OF THE NON-**
4 **PRICE REGULATED FIRMS?**

5 **A. My criteria are as follows:**

6

- 7 1) They must be covered by Value Line Investment Survey (Standard Edition).
8 2) They must be domestic, non-price regulated companies, i.e., non-utilities.
9 3) Their betas must lie within plus or minus two standard deviations of the
10 average unadjusted beta of the utility proxy group and SUG, respectively.
11 4) The residual standard errors of the regressions must lie within plus or minus
12 two standard deviations of the average residual standard error of the
13 regression for the utility proxy group and SUG, respectively.

14 Betas are a measure of market, or systematic, risk. The standard errors of the
15 regressions were used to measure each firm's company-specific risk (diversifiable,
16 unsystematic risk). The standard errors of the regressions measure the extent to
17 which events specific to a company affect its stock price. Because market prices
18 reflect in investors' perceptions of total risk, all risk which is not systematic market risk
19 (beta) is reflected in the standard error of the regression which is a measure of total

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1 non-systematic risk which is diversifiable. In essence, companies which have
2 similar betas and similar standard errors of the regressions have similar total
3 investment risk, i.e., the sum of non-diversifiable market risk and diversifiable
4 company-specific risk. The betas and standard errors result from regression analyses
5 of market prices which reflect all perceived risks consistent with the EMH.
6 Consequently, the use of those regression statistics results in proxy groups of non-
7 price regulated domestic firms which are similar in total investment risk to the utility
8 proxy group and SUG, respectively. The use of two standard deviations captures
9 95.50% of the distribution of unadjusted betas and standard errors thereby assuring
10 comparability of total risk.

11

12 **Q. PLEASE DISCUSS THE RESULTS OF YOUR CEM ANALYSES.**

13 A. After assuring comparability through the use of betas and standard errors as
14 discussed supra, I reviewed Value Line's five-year projected ROEs for the
15 companies in each group. I then performed a test (Student's T-Statistic) to assure
16 that I would not rely upon any ROE(s) that were statistical outliers. There were no
17 statistical outliers in the non-price regulated companies similar to the utility proxy
18 group and only one in the group comparable to SUG as indicated by Note 6 on page
19 3 of Schedule FJH-19.

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1
2 The median projected ROEs are 22.00% based upon the group comparable to the
3 utility proxy group and 15.50% based upon the group comparable to SUG. The
4 CEM cost rate of 22.00% is on the high side and so far outside the range of common
5 equity cost rates indicated for the proxy group of nine LDCs through use of the DCF,
6 RPM and CAPM/ECAPM models, i.e., 9.82% - 12.36% as shown on Schedule FJH-
7 1, page 1, that it is not meaningful and therefore is not included in my determination
8 of the 11.25% common equity cost rate applicable to MGE. In contrast, the median
9 ROE of 15.50% of the non-price regulated companies comparable to SUG is barely
10 beyond the range of SUG's cost rates based on DCF, RPM and CAPM/ECAPM
11 models, i.e., 13.74% - 15.10%. Consequently, the CEM result based on SUG of
12 15.50% is included in my conclusion of common equity cost rate applicable to SUG
13 if the Commission is again going to rely, albeit erroneously, on SUG to establish a
14 rate of return applicable to MGE's rate base.

15
16 In view of the foregoing, I have excluded the CEM analysis result from the
17 formulation of my recommended common equity cost rate based upon the proxy
18 group of nine LDCs of 11.25%, but have included it in the formulation of my

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1 alternative common equity cost rate of 15.25% based on SUG and applicable to
2 SUG's common equity ratio of 38.66%.

3

4

XI. CONCLUSION OF COMMON EQUITY COST RATE

5

A. Conclusion of Common Equity Cost Rate

6

Must be Based on the Application of Multiple Models

7

8

**Q. PLEASE SUMMARIZE WHY THE CONCLUSION OF COMMON EQUITY
9 COST RATE MUST BE BASED UPON MULTIPLE COST OF COMMON
10 EQUITY MODELS.**

11

A. As discussed supra, the EMH and common sense mandate the use of multiple
12 market-based cost of common equity models. All of the models which I have
13 utilized are market-based.

14

15

1) The DCF Model utilizes market prices paid by investors.

16

2) The RPM utilizes the expected market yield on company-specific long-term
17 debt and the equity risk premium based upon an expectation of the market
18 equity risk premium.

19

20

3) The CAPM and ECAPM utilize total market returns, and betas which result
21 from each individual stock's market price movement relative to the market.

22

23

4) The CEM is based upon the selection of comparable risk, non-price regulated
24 domestic companies selected through the use of statistics derived from
25 regression analyses of market prices paid by investors. Although in this

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1 instance, the CEM result is not meaningful related to the utility proxy but
2 rather only when related to SUG for the reasons discussed supra.
3
4

5 **B. Basis of Recommended Common Equity Cost Rate**

6 **Q. WHAT IS THE BASIS OF YOUR RECOMMENDED COMMON EQUITY**
7 **COST RATE OF 11.25% THROUGH RELIANCE UPON THE UTILITY**
8 **PROXY GROUP OF NINE LDCS?**

9 **A.** I recommend a common equity cost rate of 11.25% which is applicable to a common
10 equity ratio of 48.00%, a ratio based upon the average ratio maintained by the proxy
11 group during the five calendar quarters ending December 31, 2008 as discussed
12 supra. The 11.25% recommended common equity cost rate is based upon the
13 midpoint of the lowest and highest cost rates of 9.82% and 12.36% derived from
14 application of the DCF, RP, and CAPM/ECAPM, namely 11.09% based on the
15 proxy group of nine LDCs. The average cost rate based upon the cost rates derived
16 from the application of all three methods is 11.17%. The cost rate of 11.09% is the
17 midpoint of a relatively tight range of cost rates, i.e., 9.82% - 12.36% as can be
18 determined by reference to Page 1 of Schedule FJH-1 at Lines 1 through 3 which is
19 then adjusted upward by 0.15% in recognition of MGE's smaller size vis-à-vis the
20 proxy group resulting in a cost rate of 11.24%, which I round to 11.25%.

21

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1 Also shown on page 1 of Schedule FJH-1, is the alternative if the Commission again
2 chooses to rely upon SUG. SUG's cost rates range from 13.74% - 15.50%, the
3 midpoint of which is 14.62% before a necessary adjustment to recognize MGE's
4 smaller size. As noted, I relied upon the midpoint of each range, namely 11.09%
5 based on the proxy group and 14.62% based on SUG.

6
7 As discussed supra, it is necessary to make an adjustment for MGE's small size vis-
8 à-vis the proxy group and SUG if the Commission chooses to utilize SUG as a proxy
9 for MGE. Accordingly, a conservative upward adjustment of 0.15%, or 15 basis
10 points, is made to the proxy group cost rate for that reason and it is shown on Line 6,
11 page 1 of Schedule FJH-1. Because SUG is so much larger than MGE, a size
12 adjustment of 0.65%, albeit also conservative as discussed supra, is required.

13
14 As a result of the foregoing, the indicated common equity cost rates are as follows:
15 11.24% based upon the utility proxy group of nine LDCs and its capital structure
16 consisting of 48.00% common equity which I have rounded to 11.25%. Also, a cost
17 rate of 15.27%, which I round to 15.25% that is based upon SUG and related to
18 SUG's common equity ratio of 38.66%. It would be incorrect to apply a common
19 equity cost rate derived from the proxy group of LDCs with a 48.00% common

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1 equity ratio to SUG and its 38.66% common equity ratio because SUG is, for the
2 most part, involved in more risky business activities, has a lower bond rating than
3 the proxy group of LDCs (and MGE if viewed on a stand-alone basis).
4 Consequently, if SUG and its capital structure is utilized as a proxy for MGE, SUG's
5 cost rates must be utilized which results in a much higher overall fair rate of return
6 of 9.752% (versus 8.434% based upon the proxy group of nine LDCs) as shown on
7 page 1 of Schedule FJH-1.

8
9 **XII. REALITY CHECK**

10
11 **Q. HAVE YOU PERFORMED A REALITY CHECK TO AFFIRM THAT A**
12 **COMMON EQUITY COST RATE OF 11.25% IS REASONABLE?**

13 **A.** Yes, I have. It is based upon the data on Schedule FJH-20, which contains a
14 summary of regulatory awards made to gas distribution companies during the period
15 January 1, 2008 through February 2009, and the application of common sense, given
16 the dramatic adverse change in the economy and the financial markets attributable to
17 the global financial crisis. As shown, the average authorized ROE in Commission
18 decided (litigated) cases was 10.42% relative to an average common equity ratio of
19 48.89%. Keep in mind that cases decided during this period were based upon data,
20 including market data, for periods well prior thereto. Consequently, the dramatic

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1 increase in capital costs which have occurred since the fall of 2008, and are likely to
2 continue for some time to come, as a result of the global financial crisis are not
3 reflected in those regulatory awards which averaged 10.42%. As shown in Schedule
4 FJH-17 and discussed supra regarding the financial crisis and investors' concurrent
5 flight to safety, yields on U.S. Treasury securities and higher rated corporate and
6 utility bonds have declined dramatically at the expense of a plummeting and more
7 costly stock market and dramatically higher yields on utility bonds rated in the Baa
8 category. For example, the historical average spread between A and Baa rated utility
9 bonds of 0.37% (Schedule FJH-17) has increased by about 120 basis points and has
10 ranged between 1.50% - 1.80% in recent months as also gleaned from the data on
11 Schedule FJH-17. If debt capital costs more, so does the cost rate of common equity
12 capital. As a result of the global financial crisis, investors now recognize that a much
13 greater level of risk exists. This reality is expressed profoundly and yet succinctly by
14 Professor Roger Ibbotson, supra. Consequently, I believe that my recommended
15 common equity cost rate of 11.25% is proper and realistically conservative.
16

17 **Q. DOES THAT CONCLUDE YOUR DIRECT TESTIMONY?**

18 **A. Yes, it does.**

APPENDIX A

PROFESSIONAL QUALIFICATIONS

OF

FRANK J. HANLEY, CRRA
PRINCIPAL & DIRECTOR
AUS CONSULTANTS

PROFESSIONAL QUALIFICATIONS OF FRANK J. HANLEY

EDUCATIONAL BACKGROUND

I am a graduate of Drexel University where I received a Bachelor of Science Degree from the College of Business Administration. The principal courses required for this Degree include accounting, economics, finance and other related courses. I am also Certified by the Society of Utility and Regulatory Financial Analysts, formerly the National Society of Rate of Return Analysts, as a Rate of Return Analyst (CRRRA).

PROFESSIONAL EXPERIENCE

In 1959, I was employed by American Water Works Service Company, Inc., which is a wholly-owned subsidiary of American Water Works Company, Inc., the largest investor-owned water works operation in the United States. I was assigned to its Treasury Department in Philadelphia until 1961. During that period of time, I was heavily involved in the development of cash flow projections and negotiations with banks for the establishment of lines of credit for all of the operating and subholding companies in the system, which normally aggregated more than \$100 million per year.

In 1961, I was assigned to its Accounting Department where I remained until 1963. During that two-year period, I became intimately familiar with all aspects of a service company accounting system, the nature of the services performed, and the methods of allocating costs. In 1963, I was reassigned to its Treasury Department as a Financial Analyst. My duties consisted of those previously performed, as well as the expanded responsibilities of assisting in the preparation of testimony and exhibits to be presented to various public utility commissions in regard to fair rate of

return and other financial matters. I also designed and recommended financing programs for many of American's operating subsidiaries and negotiated sales of long-term debt securities and preferred stock on their behalf either directly with institutional investors or through investment bankers. I was elected Assistant Treasurer of a number of operating subsidiaries in the Fall of 1967, just prior to accepting employment with the Communications and Technical Services Division of the Philco-Ford Corporation located in Fort Washington, Pennsylvania. While in the employ of the Philco-Ford organization, as a Senior Financial Analyst, I had responsibility for the pricing negotiations and analysis of acceptable rates of return to the corporation for all types of contract proposals with various agencies of the U.S. Government and foreign governments.

In the Summer of 1969, I accepted a position with the Financial Division of The Philadelphia National Bank. I was elected Financial Planning Officer of the bank in December 1970. While employed with The Philadelphia National Bank, my responsibilities included preparation of the annual and five-year profit plans. In the compilation of these plans, I had to perform detailed analyses and measure the various levels of profitability for each organizational unit. I also assisted correspondent banks in matters of recapitalization and merger, made recommendations and studies for their use before the various regulatory bodies having jurisdiction over them.

In September 1971, I joined AUS Consultants - Utility Services Group as Vice President. I was elected Senior Vice President in May 1975. I was elected President in September 1989. As a result of a reorganization of AUS Consultants by practice effective January 1, 2007, I am currently a Principal & Director of AUS Consultants.

EXPERT WITNESS QUALIFICATIONS

I have offered testimony as an expert witness on the subjects of fair rate of return and utility financial matters in more than 300 various cases and dockets before the following agencies and courts: before the Alaska Public Utilities Commission and its successor the Regulatory Commission of Alaska, the Arizona Corporation Commission, the Arkansas Public Service Commission, the California Public Utilities Commission, the Public Utilities Control Authority of Connecticut, the Delaware Public Service Commission, the District of Columbia Public Service Commission, the Florida Public Service Commission, Hawaii Public Utilities Commission, the Idaho Public Utilities Commission, the Illinois Commerce Commission, the Indiana Public Utility Regulatory Commission, the Iowa Utilities Board, the Public Service Commission of Kentucky, the Maryland Public Service Commission, the Massachusetts Department of Public Utilities, the Michigan Public Service Commission, the Minnesota Public Utilities Commission, the Missouri Public Service Commission, Nevada Public Utilities Commission, the New Jersey Board of Public Utilities, the New Mexico State Corporation Commission, the Public Service Commission of the State of New York, the North Carolina Utilities Commission, the Ohio Public Utilities Commission, the Oklahoma Corporation Commission, the Pennsylvania Public Utility Commission, the Rhode Island Public Utilities Commission, the Tennessee Public Service Commission, the Public Service Board of the State of Vermont, the Virginia State Corporation Commission, the Public Services Commission of the Territory of the U.S. Virgin Islands, the Washington Utilities and Transportation Commission, the Public Service Commission of West Virginia, the Wisconsin Public Service Commission, the Federal Power Commission and its

successor the Federal Energy Regulatory Commission. I have testified before the New Jersey Division of Tax Appeals and the United States Bankruptcy Court - Middle District of Pennsylvania with regard to the economic valuation of utility property. Also, I have testified before the U.S. Tax Court in Washington D.C. as an expert witness on the value of closely held utility common stock in a contested Federal Estate Tax case.

In addition, I have appeared as a Staff rate of return witness for the Arizona Corporation Commission, the Delaware Public Service Commission and the Virgin Islands Public Services Commission. I have testified on the fair rate of return on behalf of the City of New Orleans, Louisiana, and also acted as project manager for my firm in representing the City in the 1980-1981 rate proceeding of New Orleans Public Services, Inc. The City of New Orleans then had, as it does now, regulatory authority with regard to the retail rates charged by New Orleans Public Service, Inc., for electric and natural gas service. I have also acted as a consultant to the District of Columbia Public Service Commission itself -- not in the capacity of Staff.

I have testified before a number of local and county regulatory bodies in various states on the subject of fair rate of return on behalf of cable television companies as well as before an arbitration panel in Ohio and a State District Court in Texas. I have testified before the Public Works Committee of the Nebraska State Senate in relation to Legislative Bill 731 which proposed permitting Public Power Districts and Municipalities to enter the Cable Television field.

PROFESSIONAL ASSOCIATIONS,
PUBLICATIONS AND GUEST SPEAKER APPEARANCES

I am a Member of the Society of Utility and Regulatory Financial Analysts (SURFA), formerly known as the National Society of Rate of Return Analysts. I am a Certified Rate of Return Analyst (CRRA). I am on the Advisory Council of New Mexico State University's Center for Public Utilities which is endorsed by the National Association of Regulatory Utility Commissioners (NARUC). I am also a member of the Executive Advisory Council of the Rutgers University School of Business at Camden. AUS Consultants is an associate member of the American Gas Association (AGA) and I am a member of AGA's Rate and Strategic Issues Committee. I am also an associate member of the Energy Association of Pennsylvania and the National Association of Water Companies. AUS Consultants is an associate member of the New Jersey Utilities Association.

I often attend SURFA meetings during which considerable information on the subject of rate of return is exchanged. I have also attended corporate bond rating seminars held by Standard & Poor's Corporation. I continuously review financial publications of institutions such as Standard & Poor's, Moody's Investors' Service, Value Line Investment Survey, and periodicals of various agencies of the U.S. Government.

I co-authored an article with A. Gerald Harris entitled "Does Diversification Increase the Cost of Equity Capital?" which was published in the July 15, 1991 issue of Public Utilities Fortnightly. Also, an article which I co-authored with Pauline M. Ahern entitled "Comparable Earnings: New Life for an Old Precept" was published in the American Gas Association's

Financial Quarterly Review, Summer 1994. I also authored an article entitled "Why Performance-Based Incentives Are Essential" which was published in THE CITY GATE, Fall 1995, a magazine published by the Pennsylvania Gas Association.

I have appeared as a guest speaker before an annual convention of the Mid-American Cable Television Association in Kansas City, Missouri and as a guest panelist on the small water companies' operation seminar of the National Association of Water Companies' 77th Annual Convention in Hollywood, Florida. I addressed the Second Annual Seminar on Regulation of Water Utilities sponsored by N.A.R.U.C., at the University of South Florida's St. Petersburg campus. I have spoken on fair rate of return to the Third and Fourth Annual Utilities Conferences, as well as the special conference on the cost of capital in El Paso, Texas sponsored by New Mexico State University. In 1983 I also made a presentation on the Cost of Capital in Atlantic City, New Jersey, at a seminar co-sponsored by Temple University. I have also addressed the Public Utility Law Section of the American Bar Association's Third Institute on Fundamentals of Ratemaking which was held in Washington, D.C. and I addressed a Conference on Cable Television sponsored by The University of Texas School of Law at Austin, Texas. Also, I addressed a meeting of the New England Water Works Association at Boxborough, Massachusetts, on the subject of Enterprise Financing. In addition, I was a speaker and mock witness in three different Utility Workshops for Attorneys sponsored by the Financial Accounting Institute held in Boston and Washington, D.C. I also was on a panel at the 23rd Financial Forum sponsored by the National Society of Rate of Return Analysts. The topic was Rate of Return Determination in the Diversified and/or Partially Deregulated Environment. I addressed the 83rd Annual Meeting of the Pennsylvania Gas

Association in Hershey, PA. My topic was the Cost of Capital Implications of Demand Side Management. In June 1993, I lectured on the cost of capital at the American Gas Association's Gas Rate Fundamentals Course. In October 1993, I was a guest speaker at the University of Wisconsin's Center for Public Utilities -- my topic was "Diversification and Corporate Restructuring in the Electric Utility Industry - Trends and Cost of Capital Implications." In October 1994, I was a guest speaker on a panel at the Fourteenth Annual Electric & Natural Gas Conference in Atlanta, Ga., sponsored by the Bonbright Utilities Center of the University of Georgia and the Georgia Public Service Commission. The panel topic was "Responses to Competition and Incentive Rates." In October 1994, I was a guest speaker on a panel at a conference and workshop called "Navigating the Shoals of Cable Rate Regulation" sponsored by EXNET in Washington, D.C. The panel topic was "Rate of Return." Also, in March 1995, I was a guest speaker on a panel at a conference entitled, "Current Issues Challenging the Regulatory Process" sponsored by New Mexico State University - Center for Public Utilities. My panel topic concerned the electric industry and was titled, "Impact of a Competitive Structure on the Financial Markets". In May 1995, I was a guest speaker at the 87th Annual Meeting of the Pennsylvania Gas Association in Hershey, PA. My topic was "The Pennsylvania Economy and Utility Regulation: Impact on Industry, Consumers and Investors." In May 1996, I was on a panel at the 28th Financial Forum of the Society of Utility and Regulatory Financial Analysts. The panel's topic was "Revisiting the Risk Premium Approach" and was held in Richmond, Virginia. From 1996 through 2005, I participated as an instructor in 2-3 seminars per year on the "Basics of Regulation" (and the ratemaking process in a changing environment) and also in a program called "A Step Beyond the Basics", all sponsored by New

Mexico State University's Center for Public Utilities and NARUC. In March 2002, I was a guest speaker before the Rate and Strategic Issues Committee of the American Gas Association in St. Petersburg, Florida. My topic was Rate of Return Strategies. In December 2002, I was a guest speaker at a seminar entitled, "Service Innovations and Revenue Enhancements for the Energy Distribution Business" sponsored by the American Gas Association in Washington, DC. My topic was "The Impact of Volatile Energy Markets on Rate of Return Strategies". In February 2003, I spoke at the Rutgers University-Camden, NJ M.B.A. Speaker Series. I addressed M.B.A. students and interested faculty on the role of the expert witness in the public utility ratemaking process. In November 2003, 2004, 2007 and 2008, by invitation, I was a Guest Professor at Rutgers University – Camden for classes of undergraduate accounting and finance students. In October 2006, I made a presentation entitled "Mergers & Acquisitions: A Regulatory Perspective" at the Bonbright Center Electric and Natural Gas Conference at the University of Georgia. In February 2008, I taught a course entitled, "The Basics of Cost of Capital Analysis" in Albuquerque, NM as part of a program entitled, "More Basic Practical Training" sponsored by New Mexico State University's Center for Public Utilities.

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI

In the Matter of Missouri Gas Energy's
Tariff Sheets Designed to Increase Rates
for Gas Service in the Company's
Missouri Service Area

Case No. GR-2009-__

AFFIDAVIT OF FRANK J. HANLEY

STATE OF NEW JERSEY)

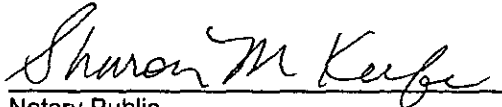
COUNTY OF BURLINGTON)

ss.

Frank J. Hanley, of lawful age, on his oath states: that he has participated in the preparation of the foregoing Direct Testimony in question and answer form, to be presented in the above case; that the answers in the foregoing Direct Testimony were given by him; that he has knowledge of the matters set forth in such answers; and that such matters are true and correct to the best of his knowledge and belief.


FRANK J. HANLEY

Subscribed and sworn to before me this 30th day of March 2009.


Notary Public

SHARON M. KEEFE
NOTARY PUBLIC OF NEW JERSEY
MY COMMISSION EXPIRES JULY 9, 2011

Missouri Gas Energy
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to the Financial Supporting Exhibits
of Frank J. Hanley

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Missouri Gas Energy
Summary of Cost of Capital and Fair Rate of Return
Based on a Hypothetical Capital Structure

<u>Type of Capital</u>	<u>Ratios (1)</u>	<u>Cost Rate</u>	<u>Weighted Cost Rate</u>
Long-Term Debt	41.06%	6.080% (2)	2.496%
Short-Term Debt	10.94%	4.920% (3)	0.538%
Total Debt	52.00%		
Common Equity	48.00%	11.250% (4)	5.400%
Total	100.00%		8.434%

Based on the Actual Capital Structure of Southern Union Company at December 31, 2008

<u>Type of Capital</u>	<u>Ratios (5)</u>	<u>Cost Rate</u>	<u>Weighted Cost Rate</u>
Long-Term Debt	56.16%	6.258% (5)	3.514%
Short-Term Debt	3.26%	5.920% (6)	0.193%
Preferred Equity	1.92%	7.758% (5)	0.149%
Common Equity	38.66%	15.250% (4)	5.896%
Total	100.00%		9.752%

- (1) The 52.00% total debt ratio has been allocated between the long-term and short-term debt based upon the average long-term and short-term debt ratios of the proxy group of nine Value Line natural gas distribution companies for the five quarters ended December 31, 2008 as shown on Page 4 of Schedule FJH-5. The allocation is derived as follows:

<u>Average for the Five Quarters ended December 31, 2008</u>	<u>Proxy Group of Nine Value Line Natural Gas Distribution Companies</u>	<u>Percent of Total Debt</u>
Long-Term Debt	40.84 %	78.96 %
Short-Term Debt	10.88 %	21.04 %
Total Debt	51.73 %	100.00 %

Therefore, the hypothetical long-term debt ratio of 41.06% is derived as 78.96% * 52.00%, and the short-term debt ratio of 10.94% is derived as 21.04% * 52.00%.

- (2) Derived on Schedule FJH-9.
(3) Based on 250 basis points plus an 100 basis points upfront cost above the six-quarter projected average beginning with the first quarter of 2009 and ending with the second quarter of 2010 of the 3-month LIBOR rate of 1.42% (from Page 7 of Schedule FJH-15).
(4) Based upon informed judgment from the entire study, the principal results of which are summarized on page 2 of Schedule FJH-1.
(5) Provided by Southern Union Company.
(6) Based on 350 basis points plus an 100 basis points upfront cost above the six-quarter projected average beginning with the first quarter of 2009 and ending with the second quarter of 2010 of the 3-month LIBOR rate of 1.42% (from Page 7 of Schedule FJH-15).

Missouri Gas Energy
Brief Summary of Common Equity Cost Rate

<u>No.</u>	<u>Principal Methods</u>	<u>Proxy Group of Nine Value Line Natural Gas Distribution Companies</u>	<u>Southern Union Company</u>
1.	Discounted Cash Flow Model (DCF) (1)	9.82 %	13.74 %
2.	Risk Premium Model (RPM) (2)	12.36	14.50
3.	Capital Asset Pricing Model (CAPM) (3)	11.33	15.10
4.	Comparable Earnings Model (CEM) (4)	NMF	15.50
5.	Indicated Common Equity Cost Rate before Adjustment for Business Risk (5)	11.09 %	14.62 %
6.	Business Risk Adjustment (6)	<u>0.15</u>	<u>0.65</u>
7.	Indicated Common Equity Cost Rate	<u>11.24 %</u>	<u>15.27 %</u>
8.	Recommended Common Equity Cost Rate	<u>11.25 %</u>	<u>15.25 %</u>

- Notes: (1) From Schedule FJH-11.
(2) From page 1 of Schedule FJH-15.
(3) From page 1 Schedule FJH-18.
(4) The CEM results are on Pages 1 and 2 of Schedule FJH-19. Mr. Hanley considers the result for the proxy group of nine Value Line natural gas distribution companies aberrant relative to the other cost of equity models and are not meaningful (NMF) in this particular study as explained in his direct testimony.
(5) Mid-point of the range of common equity cost rates produced by the cost of common equity models. For example, the indicated common equity cost rate for the proxy group of nine Value Line natural gas distribution companies, 11.09%, is the mid-point of the range of its cost of common equity results which is 9.82% - 12.36%. If the results of the cost of common equity models were averaged instead of taking the mid-point of the range, the indicated common equity cost rate would be 11.17% for the proxy group and 14.71% for SUG.
(6) Business risk adjustment to reflect Missouri Gas Energy's greater business risk due to its small size relative to the proxy groups as detailed in Mr. Hanley's accompanying direct testimony.

Missouri Gas Energy
Derivation of Investment Risk Adjustment Based upon
Ibbotson Associates' Size Premia for the Decile Portfolios of the NYSE/AMEX/NASDAQ

Line No.	1	2	3	4
	Market Capitalization on February 13, 2009 (1) (millions)	Applicable Decile of the NYSE/AMEX/ NASDAQ (2)	Applicable Size Premium (3)	Spread from Applicable Size Premium for (4)
1.	<u>Missouri Gas Energy</u>			
a.	<u>Based Upon the Proxy Group of Nine Value Line Natural Gas Distribution Companies</u>			
	\$ 681.129	8	2.20%	
b.	<u>Based on Southern Union Company</u>			
	\$ 298.652	9 -10	4.19%	
2.	<u>Proxy Group of Nine Value Line Natural Gas Distribution Companies</u>	2.3 x	1.60%	0.60%
3.	<u>Southern Union Company</u>	5.8	1.60%	2.58%

(A)	(B)	(C)	(D)	(E)
Decile	Number of Companies (millions)	Recent Total Market Capitalization (millions)	Recent Average Market Capitalization (millions)	Size Premium (Return in Excess of CAPM) (2)
1 - Largest	167	\$ 10,957,817.750	\$ 62,022.861	-0.34%
2	174	7,327,351.920	\$ 13,375.586	0.68%
3	192	1,111,672.200	\$ 5,789.959	0.76%
4	184	709,696.610	\$ 3,857.047	0.93%
5	203	541,399.790	\$ 2,666.994	1.47%
6	251	411,039.680	\$ 1,637.608	1.60%
7	275	379,465.160	\$ 1,379.873	1.50%
8	380	291,182.590	\$ 766.270	2.20%
9	641	284,538.240	\$ 443.897	2.56%
10 - Smallest	1775	201,705.150	\$ 113.637	5.82%

*From pages 7 and 14 of this Schedule

Notes:

- (1) From Page 3 of this Schedule.
- (2) Gleaned from Column (D) on the bottom of this page. The appropriate decile (Column (A)) corresponds to the market capitalization of the proxy group, which is found in Column 1.
- (3) Corresponding risk premium to the decile is provided on Column (E) on the bottom of this page.
- (4) Line No. 1a Column 3 – Line No. 2 Column 3 and Line No. 1b, Column 3 – Line No. 3 of Column 3 etc. For example, the 0.60% in Column 4, Line No. 2 is derived as follows 0.60% = 2.20% - 1.60%.
- (5) From MGE's 2007 Annual Report to the Public Service Commission of Missouri.
- (6) Derived on Schedule FJH-5.
- (7) Derived on Schedule FJH-6.

Missouri Gas Energy
Market Capitalization of Missouri Gas Energy
the Proxy Group of Nine Value Line Natural Gas Distribution Companies,
and Southern Union Company

Company	Exchange	1 Common Stock Shares Outstanding at December 31, 2007 (millions)	2 Book Value per Share at December 31, 2007 (1)	3 Total Common Equity at December 31, 2007 (millions)	4 Closing Stock Market Price on February 13, 2009	5 Market-to-Book Ratio on February 13, 2009 (2)	6 Market Capitalization on February 13, 2009 (3)
Missouri Gas Energy		NA	NA	\$ 389,885 (4)	NA		
Based Upon the Proxy Group of Nine Value Line Natural Gas Distribution Companies						174.7 % (5)	\$ 681,129 (6)
Based on Southern Union Company						76.6 % (7)	\$ 298,585 (8)
Proxy Group of Nine Value Line Natural Gas Distribution Companies							
AGL Resources Inc.	NYSE	76,800	\$ 21,482	\$ 1,652,000	\$ 31,460	146.4 %	\$ 2,419,274
Almos Energy Corp.	NYSE	90,815	22,601	2,052,492	25,180	111.5	2,287,622
The Laclede Group, Inc.	NYSE	21,993	22,119	488,479	45,300	204.8	996,304
New Jersey Resources Corp.	NYSE	42,176	17,236	726,958	39,230	227.6	1,654,564
Northwest Natural Gas Co.	NYSE	28,594	23,628	628,373	43,870	185.7	1,166,679
Piedmont Natural Gas Co., Inc.	NYSE	73,246	12,113	887,244	28,030	214.9	1,906,593
South Jersey Industries, Inc.	NYSE	29,843	17,285	515,254	37,860	219.3	1,129,856
Southwest Gas Corporation	NYSE	44,192	23,485	1,037,841	24,210	103.1	1,089,677
WGL Holdings, Inc.	NYSE	49,817	20,888	1,047,564	33,460	159.4	1,670,219
Average		50,631	\$ 20,192	\$ 1,003,801	\$ 34,068	174.7 %	\$ 1,588,999
Southern Union Company	NYSE	125,122	\$ 19,006	\$ 2,252,852	\$ 13,780	76.6 %	\$ 1,725,432

NA = Not Available

Notes: (1) Column 3 / Column 1.

(2) Column 4 / Column 2.

(3) Column 5 * Column 3.

(4) From MGE's 2007 Annual Report to the Public Service Commission of Missouri.

(5) The market-to-book ratio of Missouri Gas Energy on February 13, 2009 is assumed to be equal to the average market-to-book ratio at February 13, 2009 of the Proxy Group of Nine Value Line Natural Gas Distribution Companies.

(6) Missouri Gas Energy's common stock, if traded, would trade at a market-to-book ratio equal to the average market-to-book ratio at February 13, 2009 of the Proxy Group of Nine Value Line Natural Gas Distribution Companies, 174.7%, and Missouri Gas Energy's market capitalization on February 13, 2009 would therefore have been \$681,129 million. (\$681,129 = \$389,885 * 174.7%).

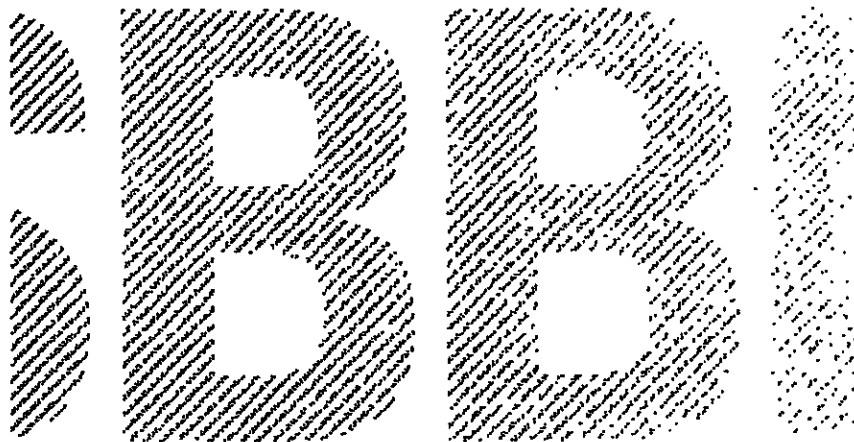
(7) The market-to-book ratio of Missouri Gas Energy on February 13, 2009 is assumed to be equal to the average market-to-book ratio at February 13, 2009 of Southern Union Company.

(8) Missouri Gas Energy's common stock, if traded, would trade at a market-to-book ratio equal to the average market-to-book ratio at February 13, 2009 of Southern Union Company, 76.6%, and Missouri Gas Energy's market capitalization on February 13, 2009 would therefore have been \$298,585 million. (\$298,585 = \$389,885 * 76.6%).

Source of information: 2007 Annual Forms 10K
yahoo.finance.com

Ibbotson® S&P®
2008 Valuation Yearbook

Market Results for
Stocks, Bonds, Bills, and Inflation
1926-2007



MORNINGSTAR®

Chapter 7

Firm Size and Return

The Firm Size Phenomenon

One of the most remarkable discoveries of modern finance is that of a relationship between firm size and return. The relationship cuts across the entire size spectrum but is most evident among smaller companies, which have higher returns on average than larger ones. Many studies have looked at the effect of firm size on return.¹ In this chapter, the returns across the entire range of firm size are examined.

Construction of the Decile Portfolios

The portfolios used in this chapter are those created by the Center for Research in Security Prices (CRSP) at the University of Chicago's Graduate School of Business. CRSP has refined the methodology of creating size-based portfolios and has applied this methodology to the entire universe of NYSE/AMEX/NASDAQ-listed securities going back to 1926.

The New York Stock Exchange universe excludes closed-end mutual funds, preferred stocks, real estate investment trusts, foreign stocks, American Depositary Receipts, unit investment trusts, and American Trusts. All companies on the NYSE are ranked by the combined market capitalization of their eligible equity securities. The companies are then split into 20 equally populated groups, or deciles. Eligible companies traded on the American Stock Exchange (AMEX) and the Nasdaq National Market (NASDAQ) are then assigned to the appropriate deciles according to their capitalization in relation to the NYSE breakpoints. The portfolios are rebalanced, using closing prices for the last trading day of March, June, September, and December. Securities added during the quarter are assigned to the appropriate portfolio when two consecutive month-end prices are available. If the final NYSE price of a security that becomes delisted is a month-end price, then that month's return is included in the quarterly return of the security's portfolio. When a month-end NYSE price is missing, the month-end value of the security is derived from merger terms, quotations on regional exchanges, and other sources. If a month-end value still is not determined, the last available daily price is used.

Base security returns are monthly holding period returns. All distributions are added to the month-end prices, and appropriate price adjustments are made to account for stock splits and dividends. The return on a portfolio for one month is calculated as the weighted average of the returns for its individual stocks. Annual portfolio returns are calculated by compounding the monthly portfolio returns.

Size of the Deciles

Table 7-1 reveals that the top three deciles of the NYSE/AMEX/NASDAQ account for most of the total market value of its stocks. Nearly two-thirds of the market value is represented by the first decile, which currently consists of 167 stocks, while the smallest decile accounts for just over one percent of the

¹ Rolf W. Banz was the first to document this phenomenon. See Banz, Rolf W. "The Relationship Between Returns and Market Value of Common Stocks," *Journal of Financial Economics*, Vol. 9, 1981, pp. 3-18.

market value. The data in the second column of Table 7-1 are averages across all 82 years. Of course, the proportion of market value represented by the various deciles varies from year to year.

Columns three and four give recent figures on the number of companies and their market capitalization, presenting a snapshot of the structure of the deciles near the end of 2007.

Table 7-1[†]
Size-Decile Portfolios of the NYSE/AMEX/NASDAQ Size and Composition
 1926 through September 30, 2007

Decile	Historical Average Percentage of Total Capitalization	Recent Number of Companies	Recent Decile Market Capitalization (in thousands)	Recent Percentage of Total Capitalization
1-largest	63.22%	187	\$10,357,817,750	62.34%
2	13.97%	174	2,327,351,920	14.01%
3	7.56%	192	1,111,672,200	6.59%
4	4.73%	184	709,598,610	4.27%
5	3.24%	203	541,399,790	3.26%
6	2.38%	251	411,039,680	2.47%
7	1.75%	275	379,465,160	2.28%
8	1.30%	380	291,182,590	1.75%
9	1.02%	641	284,538,240	1.71%
10-smallest	0.83%	1775	201,705,150	1.21%
Mid-Cap 3-5	15.53%	579	2,362,769,280	14.22%
Low-Cap 6-8	5.43%	906	1,081,697,170	6.51%
Micro-Cap 9-10	1.85%	2,416	486,243,740	2.93%

Historical average percentage of total capitalization shows the average, over the last 82 years, of the decile market values as a percentage of the total NYSE/AMEX/NASDAQ calculated each month. Number of companies in deciles, recent market capitalization of deciles, and recent percentage of total capitalization are as of September 30, 2007.

Table 7-2 gives the current breakpoints that define the composition of the NYSE/AMEX/NASDAQ size deciles. The largest company and its market capitalization are presented for each decile. Table 7-3 shows the historical breakpoints for each of the three size groupings presented throughout this chapter. Mid-cap stocks are defined here as the aggregate of deciles 3-5. Based on the most recent data (Table 7-2), companies within this mid-cap range have market capitalizations at or below \$9,206,713,000 but greater than \$2,411,794,000. Low-cap stocks include deciles 6-8 and currently include all companies in the NYSE/AMEX/NASDAQ with market capitalizations at or below \$2,411,794,000 but greater than \$723,258,000. Micro-cap stocks include deciles 9-10 and include companies with market capitalizations at or below \$723,258,000. The market capitalization of the smallest company included in the micro-capitalization group is currently \$1,922,000.

[†] Sources: ©2008 CRSP[®], Center for Research in Security Prices, Graduate School of Business, The University of Chicago used with permission. All rights reserved. www.crsp.chicagogsb.edu

Table 7-2¹
Size-Decile Portfolios of the NYSE/AMEX/NASDAQ, Largest Company
and Its Market Capitalization by Decile
September 30, 2007

Decile	Market Capitalization of Largest Company (in thousands)	Company Name
1-Largest	\$472,518,672	Exxon Mobil Corp.
2	20,234,526	General Mills Inc.
3	9,206,713	Reliant Energy Inc.
4	5,012,577	Manitowoc Co. Inc.
5	3,422,743	FMC Corp.
6	2,411,794	Webster Financial Corp.
7	1,633,320	Simpson Manufacturing Co. Inc.
8	1,128,765	Metal Management Inc.
9	723,268	Chadot Broadcasting Corp.
10-Smallest	363,479	Emergency Medical Services Corp.

Presentation of the Decile Data

Summary statistics of annual returns of the 10 deciles over 1926–2007 are presented in Table 7-4. Note from this exhibit that both the average return and the total risk, or standard deviation of annual returns, tend to increase as one moves from the largest decile to the smallest. Furthermore, the serial correlations of returns are near zero for all but the smallest deciles. Serial correlations and their significance will be discussed in detail later in this chapter.

Graph 7-1 depicts the growth of one dollar invested in each of three NYSE/AMEX/NASDAQ groups broken down into mid-cap, low-cap, and micro-cap stocks. The index value of the entire NYSE/AMEX/NASDAQ is also included. All returns presented are value-weighted based on the market capitalizations of the deciles contained in each subgroup. The sheer magnitude of the size effect in some years is noteworthy. While the largest stocks actually declined 9 percent in 1977, the smallest stocks rose more than 20 percent. A more extreme case occurred in the depression-recovery year of 1933, when the difference between the first and tenth decile returns was far more substantial, with the largest stocks rising 46 percent, and the smallest stocks rising 218 percent. This divergence in the performance of small and large company stocks is a common occurrence.