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MARTIN S. FRIEDMAN, P.A.
VALERIE L. LORD, OF COUNSEL
(LICENSED IN TEXAS ONLY)

June 28, 2003

BY FEDERAL EXPRESS

Ms. Blanca Bayo
Commission Clerk and Administrative Services Director
Florida Public Service Commission
2540 Shumard Oak Boulevard
Tallahassee, FL 32399

Re: Docket No. 020071-WS; Application of Utilities, Inc. of Florida for a rate
        increase
        Our File No.: 30057.40

Dear Ms. Bayo:

Enclosed please find for filing in the above-referenced docket an original and fifteen (15) copies of the Rebuttal Testimony of the following witnesses:

1. Rebuttal Testimony of Steven M. Lubertozzi   05764-03

2. Rebuttal Testimony of Patrick C. Flynn   05765-03

3. Rebuttal Testimony of David L. Orr   05766-03

4. Rebuttal Testimony of Frank Seidman   05767-03

5. Rebuttal Testimony of Hugh A. Gower   05768-03

6. Rebuttal Testimony of Pauline M. Ahern   05769-03

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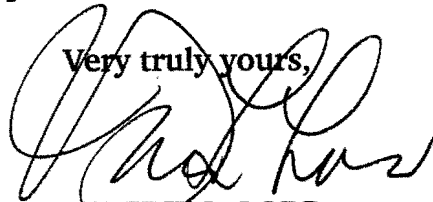05764 JUN 30 8

FPSC-COMMISSION CLERK

Please contact me if you have any questions.

Very truly yours,

VALERIE L. LORD
Of Counsel

VLL/dlv
Enclosures

cc: Stephen Burgess, Esquire (w/enclosure)(by Federal Express)
        Rosanne Gervasi, Esquire (w/enclosure) (by Federal Express)
        Mr. Steven M. Lubertozzi (w/enclosure) (by Federal Express)
        Mr. Patrick Flynn (w/enclosure) (by hand delivery)
        Mr. David L. Orr (w/enclosure) (by hand delivery)
        Mr. Hugh A. Gower (w/enclosure) (by U.S. Mail)
        Mr. Frank Seidman (w/enclosure) (by Federal Express)
        Ms. Pauline M. Aherne (w/enclosure) (by U.S. Mail)

utilities, inc.\2002 rate case\psc clerk (bayo) 083 (Rebuttal testimony) ltr.wpd

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

DOCKET NO. 020071-WS

UTILITIES, INC. OF FLORIDA

REBUTTAL TESTIMONY OF

PAULINE M. AHERN

REGARDING THE APPLICATION FOR

INCREASE IN WATER AND WASTEWATER

RATES AND CHARGES

IN

MARION, ORANGE, PASCO, PINELLAS AND SEMINOLE COUNTIES

REBUTTAL TESTIMONY OF PAULINE AHERN

1

I. INTRODUCTION

2

3 **Q. Please state your name, occupation and business address.**

4 A. My name is Pauline M. Ahern and I am a Vice President of AUS

5 Consultants - Utility Services. My business address is 155 Gaither Drive,

6 P.O. Box 1050, Moorestown, New Jersey 08057.

7 **Q. Please summarize your educational background and professional**

8 **experience.**

9 A. I am a graduate of Clark University, Worcester, MA, where I received a

10 Bachelor of Arts degree with honors in Economics in 1973. In 1991, I

11 received a Master of Business Administration with high honors from

12 Rutgers University.

13 In June 1988, I joined AUS Consultants - Utility Services as a Financial

14 Analyst and am now a Vice President. I am responsible for the

15 preparation of all fair rate of return and capital structure exhibits for the

16 principals of AUS Consultants - Utility Services, including myself. I

17 have offered expert testimony on behalf of investor-owned utilities before

18 fifteen state regulatory commissions. The details of these appearances,

19 as well as details of my educational background, are shown in Exhibit

20 (PMA-1) _____ supplementing this testimony.

21 I am also the Publisher of C. A. Turner Utility Reports, responsible for

22 the production, publication, distribution and marketing of these reports.

1   C. A. Turner Utility Reports provides financial data and related ratios

2   covering approximately 150 public utility companies on a monthly,

3   quarterly, and annual basis including electric, combination gas and

4   electric, gas distribution, gas transmission, telephone, water and

5   international utilities to about 1,000 subscribers, which include utilities,

6   state utility commissions, federal agencies, individuals, brokerage firms,

7   attorneys and public and collegiate libraries.

8   I also calculate and maintain the A.G.A. Index under contract with the

9   American Gas Association (A.G.A.). The A.G.A. Index is a market

10   capitalization weighted index of the common stocks of about 70

11   corporate members of the A.G.A.

12   I have co-authored an article with Frank J. Hanley, President, AUS

13   Consultants - Utility Services entitled "Comparable Earnings: New Life

14   for an Old Precept" which was published in the American Gas

15   Association's Financial Quarterly Review, Summer 1994. I also assisted

16   in the preparation of an article authored by Frank J. Hanley and A. Gerald

17   Harris entitled "Does Diversification Increase the Cost of Equity

18   Capital?" published in the July 15, 1991 issue of Public Utilities

19   Fortnightly.

20   I am a member of the Society of Utility and Regulatory Financial

21   Analysts, formerly the National Society of Rate of Return Analysts. In

22   1992, I was awarded the professional designation "Certified Rate of

1		Return Analyst" (CRRA) by the National Society of Rate of Return
2		Analysts. This designation is based upon education, experience and the
3		successful completion of a comprehensive written examination.
4		I am an associate member of the National Association of Water
5		Companies and a member of the Energy Association of Pennsylvania,
6		formerly the Pennsylvania Gas Association.
7	Q.	**What is the purpose of your testimony?**
8	A.	The purpose is to provide rebuttal testimony on behalf of Utilities, Inc. of
9		Florida (UIF or the Company) in response to the Office of Public Counsel
10		(OPC) Witness Mr. Mark A. Cicchetti regarding his recommendation that
11		the 50 basis points small utility premium adjustment to the leverage
12		formula which recognizes the risk of small water and wastewater systems
13		allowed in Order No. PSC-02-0898-PAA-WS dated July 5, 2002 and
14		Order No. PSC-01-2514-FOF-WS be disallowed in this proceeding. My
15		testimony will show that not only should Mr. Cicchetti's recommendation
16		be rejected, but also that the 50 basis points small utility premium is very
17		conservative relative to empirical data which supports a much larger
18		small company premium.
19	Q.	**Have you prepared an exhibit which supports your recommended**
20		**common equity cost rate?**
21	A.	Yes, I have. It has been marked for identification as Exhibit (PMA-2)
22		_____ and consists of 1 schedule.

1	**II.**	**SUMMARY**

2   **Q.**   **Please comment upon OPC Witness Cicchetti's recommendation that**

3   **"the 50 basis point premium for small utilities should not be applied**

4   **to Utilities, Inc. of Florida" (see page 3, lines 23-24 of OPC Witness**

5   **Cicchetti's direct testimony.)**

6   **A.**   Although OPC Witness Cicchetti is correct when he states that UIF "is

7   one of the largest water and wastewater utilities in Florida" (page 3, line

8   25 – page 4, line 1 of OPC Witness Cicchetti's direct testimony), the PSC

9   was clear in Order No. PSC-02-0898-PAA-WS that the 50 basis points

10   small utility premium should be applied to <u>all</u> water and wastewater

11   utilities in Florida when it stated:

12   Based on the foregoing, it is . . .
13   ORDERED that the leverage formula methodology approved in
14   this Order shall be applied to all water and wastewater utilities
15   that currently have an authorized return on equity.
16
17   Moreover, the proper comparison to make when assessing the

18   applicability of a small utility premium to UIF is UIF's size vis-à-vis the

19   nine natural gas utilities which comprise the leverage formula's Natural

20   Gas Index and not the other water and wastewater utilities in Florida.

21   The return on equity which forms the basis of the leverage formula and

22   to which the 40 basis points bond yield differential, the 50 basis points

23   private-placement premium and the 50 basis points small-utility risk

24   premium are added is based upon the market data of the much larger

25   (and, therefore, less business risky based on size) nine natural gas

1		utilities. Because size is a factor which affects business risk, the size
2		differential between UIF and the nine natural gas utilities must be
3		reflected in the allowed common equity cost rate for UIF. All else equal,
4		size has a bearing on risk.
5	Q.	**Please explain why size has a bearing on risk.**
6	A.	Smaller companies are less capable of coping with significant events
7		which affect sales, revenues and earnings.
8		The loss of revenues from a few larger customers, for example, would
9		have a greater effect on a small company than on a much larger company
10		with a larger customer base. Because the Company is the regulated utility
11		to whose rate base the Florida Public Service Commission's (PSC)
12		ultimately allowed overall cost of capital and fair rate of return will be
13		applied, the relevant risk reflected in the cost of capital must be that of
14		the Company, including the impact of its small size on common equity
15		cost rate. Size is an important factor which affects common equity cost
16		rate, and the Company is significantly smaller than the average company
17		in the Natural Gas Utility Index whose market data is utilized in the
18		leverage formula based upon either total revenues or market
19		capitalization.
20		

	2001 Total Revenues(1) ($ millions)	Times Greater than The Company	Market Capitalization(1) ($ Millions)	Times Greater than the Company
Table 1				
Nine Natural Gas Utilities In the Leverage Formula				
Natural Gas Index	$1,219.428	598.1x	$957.949	109.7x
Utilities, Inc. of Florida	2.039		8.734	

(1)   From Schedule 1, page 3 of Exhibit (PMA-2) _____.

I have also made a study of the market capitalization of the nine natural gas utilities and UIF. The results are shown on page 3 of Schedule 1 of Exhibit (PMA-2) _____ which summarizes the market capitalizations as of December 31, 2001.

UIF's common stock is not publicly traded. Consequently, I have assumed that if it were publicly traded, its common shares would be selling at the same market-to-book ratio as the nine natural gas utilities, or 181.7% at December 31, 2001. Hence, the Company's market capitalization is estimated at $8.734 million as of December 31, 2001. In contrast, the market capitalization of the average natural gas utility utilized in the leverage formula was $957.949 million on December 31, 2001, or 109.7 times larger than the Company's estimated market capitalization. It is conventional wisdom, supported by actual returns over time, and a general premise contained in basic finance textbooks, that smaller companies tend to be more risky causing investors to expect

1   greater returns as compensation for that risk.

2   **Q.**   **Does the financial literature affirm a relationship between size and**

3   **common equity cost rate?**

4   **A.**   Yes. Brigham[1] states:

5   A number of researchers have observed that portfolios of small-
6   firms have earned consistently higher average returns than those
7   of large-firms stocks; this is called "small-firm effect." On the
8   surface, it would seem to be advantageous to the small firms to
9   provide average returns in a stock market that are higher than
10   those of larger firms. In reality, it is bad news for the small firm;
11   what *the small-firm effect means is that the capital market*
12   *demands higher returns on stocks of small firms than on*
13   *otherwise similar stocks of the large firms.* (italics added)
14

15   **Q.**   **What is the small size premium indicated by comparison of the size**

16   **of UIF relative to the new natural gas utilities used in the leverage**

17   **formula.**

18   **A.**   It is between 424 and 429 basis points, or 4.24% to 4.29%. This

19   premium is based upon data contained in Chapter 7 entitled, "Firm Size

20   and Return" from Ibbotson Associates' <u>Stocks, Bonds, Bills and</u>

21   <u>Inflation-Valuation Edition 2002 Yearbook</u>. The determinations are

22   based on the size premiums for decile portfolios of New York Stock

23   Exchange (NYSE), American Stock Exchange (AMEX) and NASDAQ

24   listed companies for the 1926-2001 period and related data shown on

25   Schedule 1 of Exhibit (PMA-2) _____. The size premium for the 5th

26   decile in which the nine natural gas utilities fall has been compared to the

---

[1]   Eugene F. Brigham, <u>Fundamentals of Financial Management, Fifth Edition</u>, The Dryden Press, 1989, p. 623.

1		size premium for the 10th decile in which UIF falls, if its stock were
2		traded and sold at the December 31, 2001 average market/book ratio of
3		181.7% experienced by the nine natural gas utilities. As shown on page
4		1 of Schedule 1 of Exhibit (PMA-2) _____, the size premium spread
5		between the nine natural gas utilities and UIF is 4.29% based upon S&P
6		500 benchmarks and 4.24% based upon NYSE benchmarks. The 50 basis
7		point leverage formula small size premium is an extremely conservatively
8		reasonable estimate of the magnitude of an adjustment needed to reflect
9		the business risk differential between UIF and the nine natural gas
10		utilities. Page 2 contains notes relative to page 1. Page 3 contains data
11		in support of page 1 while pages 4 through 15 of Schedule 1 contain
12		relevant information from the Ibbotson Associates' <u>Valuation Edition</u>
13		<u>2002 Yearbook</u> discussed previously.
14		In view of all the foregoing, the small size premium included in the
15		leverage formula should not be eliminated by the PSC in determining the
16		allowed return on equity for UIF. The 50 basis point small size premium
17		is both conservatively reasonable and consistent with the PSC's Orders
18		PSC-02-0898-PAA-WS and PSC-01-2514-FOF-WS.
19	**Q.**	**On page 4, lines 11-13 of his direct testimony, OPC Witness Cicchetti**
20		**states that the "bond yield differential of 40 basis points [is] to**
21		**compensate for the fact that Florida water and wastewater utilities**
22		**are smaller than the companies used in the indexes to calculate the**

1   **cost of equity." Please comment.**

2 A. Mr. Cicchetti is incorrect in characterizing the 40 basis points bond yield

3   differential premium as compensation for the size, and hence size related

4   risk, differential between the nine natural gas utilities used in the index

5   used to calculate the base cost of equity in the leverage formula and the

6   water and wastewater utilities in Florida. Referring to the 40 basis points

7   bond yield differential, Order PSC-02-0898-PAA-WS clearly states:

8   A bond yield differential of 40 basis points to reflect the
9   difference in yields between an A/A2 rated bond, which is the
10   average bond rating for the NG utility index, and BBB-/Baa3
11   rated bond. Florida WAW utilities are assumed to be comparable
12   to WAW companies with the lowest investment grade bond
13   rating, which is Baa3. This adjustment compensates for the
14   difference between the credit quality of "A" rated debt and the
15   credit quality of the minimum investment grade rating.
16
17   In addition, Order PSC-01-2514-FOF-WS makes a clear distinction

18   between the three adjustments to the leverage formula when it states:

19   Moreover, we find that an adjustment for a bond yield differential
20   and a private placement premium is appropriate. This would be
21   in agreement with all the witnesses' testimonies. As for the small
22   size premium, we find that an adjustment is justified in light of
23   the new information presented in witness Lester's testimony
24   concerning the size of Florida's WAW utilities.
25
26   Note that OPC Witness Cicchetti was a witness in that proceeding and

27   therefore, is included in the PSC's reference to the bond yield differential

28   being "in agreement with all the witnesses' testimonies."

29   It is clear from Order Nos. PSC-01-2514-FOF-WS and PSC-02-0898-

30   PAA-WS, that the 40 basis points bond yield adjustment is separate and

1		distinct from the small size premium. Moreover, as previously discussed
2		it is clear from these orders that the leverage formula and all three
3		adjustments be applied to all water and wastewater utilities in Florida.
4		Hence, it is imperative that the 50 basis points small utility premium be
5		included in the cost of common equity resulting from the leverage
6		formula when they PSC determines the allowable rate of return on
7		common equity applicable to UIF.
8	Q.	**Does that conclude your direct testimony?**
9	A.	Yes.

UTILITIES, INC. OF FLORIDA
DOCKET NO.: 020071-WS

EXHIBIT (PMA-1) ____.

APPENDIX A

PROFESSIONAL QUALIFICATIONS

OF

PAULINE M. AHERN, CRRA
VICE PRESIDENT

AUS CONSULTANTS – UTILITY SERVICES

PROFESSIONAL QUALIFICATIONS
OF
PAULINE M. AHERN, CRRA
VICE PRESIDENT
AUS CONSULTANTS – UTILITY SERVICES

PROFESSIONAL EXPERIENCE

1996-Present

As a Vice President, I continue to prepare fair rate of return and cost of capital exhibits, as well as submitting testimony on same before state public utility commissions. I continue to provide assistance and support throughout the entire ratemaking litigation process.

As the Publisher of C.A. Turner Utility Reports, I am responsible for the production, publishing, and distribution of the reports. C.A. Turner Utility Reports provides financial data and related ratios for about 200 public utilities, i.e., electric, combination gas and electric, natural gas distribution, natural gas transmission, telephone, and water utilities, on a monthly, quarterly and annual basis. C.A. Turner Utility Reports has about 1,000 subscribers including utilities, many state regulatory commissions, federal agencies, individuals, brokerage firms, attorneys, as well as public and academic libraries. The publication has continuously provided financial statistics on the utility industry since 1930.

As the Publisher of C.A. Turner Utility Reports, I supervise the production, publishing, and distribution of the AGA Rate Service publications under license from the American Gas Association. I am also responsible for maintaining and calculating the performance of the AGA Index, a market capitalization weighted index of the common stocks of the approximately 90 corporate members of the AGA. In addition, I supervise the production of a quarterly survey of investor-owned water company rate case activity on behalf of the National Association of Water Companies.

1994-1996

As an Assistant Vice President, I prepared fair rate of return and cost of capital exhibits which are filed along with expert testimony before various state and federal public utility regulatory bodies. These supporting exhibits include the determination of an appropriate ratemaking capital structure and the development of embedded cost rates of senior capital. The exhibits also support the determination of a recommended return on common equity through the use of various market models, such as, but not limited to, Discounted Cash Flow analysis, Capital Asset Pricing Model and Risk Premium Methodology, as well as an assessment of the risk characteristics of the client utility. I also assisted in the preparation of responses to any interrogatories received regarding such testimonies filed on behalf of client utilities. Following the filing of fair rate of return testimonies, I assisted in the evaluation of opposition testimony in order to prepare interrogatory questions, areas of cross-examination, and rebuttal testimony. I also evaluated and assisted in the preparation of briefs and exceptions following the hearing process. I have submitted testimony before state public utility commissions regarding appropriate capital structure ratios and fixed capital cost rates.

1990-1994

As a Senior Financial Analyst, I prepared and supervised two analysts in the preparation of fair rate of return and cost of capital exhibits which are filed along with expert testimony before various state and federal public utility regulatory bodies. The team also assisted in the preparation of interrogatory responses.

I evaluated the final orders and decisions of various commissions to determine whether further actions are warranted and to gain insight which may assist in the preparation of future rate of return studies.

I assisted in the preparation of an article authored by Frank J. Hanley and A. Gerald Harris entitled "Does Diversification Increase the Cost of Equity Capital?" published in the July 15, 1991 issue of Public Utilities Fortnightly.

I co-authored an article with Frank J. Hanley entitled "Comparable Earnings: New Life for an Old Precept" which was published in the American Gas Association's Financial Quarterly Review, Summer 1994.

I was awarded the professional designation "Certified Rate of Return Analyst" (CRRA) by the National Society of Rate of Return Analysts (now the Society of Utility and Regulatory Financial Analysts (SURFA)). This designation is based upon education, experience and the successful completion of a comprehensive examination.

As Administrator of Financial Analysis for C. A. Turner Utility Reports, which reports financial data for over 200 utility companies and has approximately 1,000 subscribers, I oversee the preparation of this monthly publication, as well as the annual publication, Financial Statistics - Public Utilities.

1988-1990

As a Financial Analyst, I assisted in the preparation of fair rate of return studies including capital structure determination, development of senior capital cost rates, as well as the determination of an appropriate rate of return on equity. I also assisted in the preparation of interrogatory responses, interrogatory questions of the opposition, areas of cross-examination and rebuttal testimony. I also assisted in the preparation of the annual publication C.A. Turner Utility Reports - Financial Statistics - Public Utilities.

1973-1975

As a research assistant in the Research Department of the Regional Economics Division of the Federal Reserve Bank of Boston, I was involved in the development and maintenance of econometric models to simulate regional economic conditions in New England in order to study the effects of, among other things, the energy crisis of the early 1970's and property tax revaluations on the economy of New England. I was also involved in the statistical analysis and preparation of articles for the New England Economic Review. Also, I acted as assistant editor for New England Business Indicators.

1972

As a research assistant in the Office of the Assistant Secretary for International Affairs, U.S. Treasury Department, Washington, D.C., I developed and maintained econometric models which simulated the economy of the United States in order to study the results of various alternate foreign trade policies so that national trade policy could be formulated and recommended.

I am also a member of the Society of Utility and Regulatory Financial Analysts (formerly the National Society of Rate of Return Analysts).

Clients Served

I have offered expert testimony before the following commissions:

Arkansas	Maryland
California	Michigan
Delaware	Missouri
Hawaii	New Jersey
Illinois	Pennsylvania
Indiana	South Carolina
Maine	Virginia

Washington

I have sponsored testimony on the rate of return and capital structure effects of merger and acquisition issues for:

California-American Water Company   New Jersey-American Water Company

I have sponsored testimony on fair rate of return and related issues for:

Audubon Water Company   Pinelands Water Company
Carolina Water Service, Inc.   Pittsburgh Thermal
Consumers Illinois Water Company   Sussex Shores Water Company
Consumers Maine Water Company   Thames Water Americas
Consumers New Jersey Water Company   Tidewater Utilities, Inc.
Elizabethtown Water Company   United Utility Companies
Emporium Water Company   United Water Delaware, Inc.
Greenridge Utilities, Inc.   United Water Indiana, Inc.
GTE Hawaiian Telephone Inc.   United Water Virginia, Inc.
Long Neck Water Company   United Water West Lafayette, Inc.
Middlesex Water Company   Wellsboro Electric Company
Missouri-American Water Company   Western Utilities, Inc.

I have sponsored testimony on capital structure and senior capital cost rates for the following clients:

Alpena Power Company   PG Energy Inc.
Arkansas-Western Gas Company   United Water Delaware, Inc.
Associated Natural Gas Company   Washington Natural Gas Company

I have assisted in the preparation of rate of return studies on behalf of the following clients:

Algonquin Gas Transmission Company   GTE Arkansas, Inc.
Arkansas-Louisiana Gas Company   GTE California, Inc.
Arkansas Western Gas Company   GTE Florida, Inc.
Artesian Water Company   GTE Hawaiian Telephone
Associated Natural Gas Company   GTE North, Inc.
Atlantic City Electric Company   GTE Northwest, Inc.
Bridgeport-Hydraulic Company   GTE Southwest, Inc.
Cambridge Electric Light Company   Great Lakes Gas Transmission L.P.
Carolina Power & Light Company   Hawaiian Electric Company
Citizens Gas and Coke Utility   Hawaiian Electric Light Company
Columbia Gas/Gulf Transmission Cos.   IES Utilities Inc.
Commonwealth Electric Company   Illinois Power Company
Commonwealth Telephone Company   Interstate Power Company
Conestoga Telephone & Telegraph Co.   Iowa Electric Light and Power Company
Connecticut Natural Gas Corporation   Iowa Southern Utilities Company
Consolidated Gas Transmission Company   North Carolina Natural Gas Corp.
Consumers Power Company   Kentucky-West Virginia Gas Company
CWS Systems, Inc.   Lockhart Power Company
Delmarva Power & Light Company   Middlesex Water Company
East Honolulu Community Services, Inc.   Milwaukee Metropolitan Sewer District
Equitable Gas Company   Mountaineer Gas Company
Florida Power & Light Company   National Fuel Gas Distribution Corp.
Equitrans, Inc.   National Fuel Gas Supply Corp.
Gary Hobart Water Company   Newco Waste Systems of NJ, Inc.
Gasco, Inc.   New Jersey-American Water Company
GTE Alaska, Inc.   New Jersey Natural Gas Company

Rate of Return Study Clients, Continued

New York-American Water Company
Northumbrian Water Company
Oklahoma Natural Gas Company
Orange and Rockland Utilities
Paiute Pipeline Company
PECO Energy Company
Penn-York Energy Corporation
Pennsylvania-American Water Co.
PG Energy Inc.
Philadelphia Electric Company
South Carolina Pipeline Company
Southwest Gas Corporation
Stamford Water Company
Tesoro Alaska Petroleum Company
United Telephone of New Jersey
United Utility Companies
United Water Arkansas, Inc.

United Water Delaware, Inc.
United Water Idaho, Inc.
United Water Indiana, Inc.
United Water New Jersey, Inc.
United Water New York, Inc.
United Water Pennsylvania, Inc.
United Water Virginia, Inc.
United Water West Lafayette, Inc.
Vista-United Telecommunications Corp.
Washington Natural Gas Company
Washington Water Power Corporation
Waste Management of New Jersey –
  Transfer Station A
Wellsboro Electric Company
Western Reserve Telephone Company
Western Utilities, Inc.

EDUCATION:

1973 – Clark University – B.A. – Honors in Economics
1991 – Rutgers University – M.B.A. – High Honors

PROFESSIONAL AFFILIATIONS:

Society of Utility and Regulatory Financial Analysts
Energy Association of Pennsylvania
National Association of Water Companies

UTILITIES, INC. OF FLORIDA
DOCKET NO.: 020071-WS

EXHIBIT (PMA-2) ____.

Utilities, Inc of Florida
Derivation of Investment Risk Adjustment Based upon
Ibbotson Associates' Size Premia for the Decile Portfolios of the NYSE/AMEX/NASDAQ

		1		2		3		4		5		6
Line No		Total Operating Revenues for the Year 2001 (1)		Market Capitalization on December 31, 2001 (1)		Applicable Decile of the NYSE/AMEX/ NASDAQ		Based upon S&P 500 Benchmarks (2)		Based upon NYSE Benchmarks (3)		Spread from Applicable Size Premium (4)
		(millions)	(times larger)	(millions)	(times larger)							
1	Utilities, Inc of Florida	$ 2 039		$ 8 734		10 (5)		5 33% (6)		5 73% (7)		
2	Nine Natural Gas Utilities in the Leverage Formula's Natural Gas Index	$ 1,219 428	598 1 x	$ 957 949	109 7 x	5 (8)		1 04% (9)		1 49% (10)		4 29% 4 24%

Decile	Number of Companies	Recent Total Market Capitalization (millions)	Recent Average Market Capitalization (millions)
1 - Largest	183	$7,931,281 293	$43,340 335
2	208	1,347,488 388	6,478 310
3	228	668,485 903	2,931 956
4	230	392,628 829	1,707 082
5	277	295,821 191	1,067 947
6	341	236,034 069	692 182
7	386	168,579 453	436 734
8	538	146,043 985	271 457
9	766	107,370 955	140 171
10 - Smallest	2056	72,757 805	35 388

See page 2 for notes

<u>Utilities, Inc. of Florida</u>
Derivation of Investment Risk Adjustment Based upon
<u>Ibbotson Associates' Size Premia for the Decile Portfolios of the NYSE</u>

Notes:

(1)   From page 3 of this Schedule.

(2)   From page 13 of this Schedule.

(3)   From page 15 of this Schedule.

(4)   Line No. 1 – Line No. 2 and Line No. 1 – Line No. 3 of Columns 3 and 4, respectively. For example, the 4.29% in Column 5, Line No. 2 is derived as follows 4.29% = 5.33% - 1.04%.

(5)   With an estimated market capitalization of $8.734 million, Utilities, Inc. of Florida falls in the 10th decile of the NYSE/AMEXNASDAQ which has an average market capitalization of $35.388 million as shown in the table on the bottom half of page 1 of this Schedule.

(6)   Size premium applicable to the 10th decile of the NYSE/AMEXNASDAQ based upon S&P 500 benchmarks from page 13 of this Schedule.

(7)   Size premium applicable to the 10th decile of the NYSE/AMEXNASDAQ based upon NYSE benchmarks from page 15 of this Schedule.

(8)   With an estimated market capitalization of $958.298 million, nine natural gas utilities in the Generic Natural Gas Index falls between in the 5th decile of the NYSE/AMEXNASDAQ which has an average market capitalization of $1,067.947 million shown in the table on the bottom half of page 1 of this Schedule.

(9)   Size premium applicable to the 5th decile of the NYSE/AMEXNASDAQ based upon S&P 500 benchmarks from page 13 of this Schedule.

(10)   Size premium applicable to the 5th decile of the NYSE/AMEXNASDAQ based upon NYSE benchmarks from page 15 of this Schedule.

Source of Information: Ibbotson Associates, <u>Stocks, Bonds, Bills and Inflation – Valuation Edition – 2002 Yearbook</u>, Chicago, IL, 2002

Utilities, Inc. of Florida
Market Capitalization of Utilities, Inc. of Florida and
the Nine Natural Gas Utilities in the Leverage Formula's Natural Gas Index

	1	2	3	4	5	6	7
	Common Stock Shares Outstanding at December 31, 2002	Book Value per Share at December 31, 2002 (1)	Total Common Equity at December 31, 2002	Closing Stock Market Price on December 31, 2001	Market-to-Book Ratio at December 31, 2001 (2)	Market Capitalization on December 31, 2001 (3)	Total Revenues for the Year 2001
	(millions)		(millions)			(millions)	(millions)
Utilities, Inc. of Florida	NA	NA	$ 4 807 (4)	NA	181 7 % (5) $	8 734 (6) $	2 039
Nine Natural Gas Utilities in the Leverage Formula's Natural Gas Index							
AGL Resources Inc	55 100	$ 12 185	$ 671 400	$ 23 020	188 9 %	$ 1,268 402	$ 1,049 300
Atmos Energy Corporation	40 792	14 313	583 864	21 250	148 5	866 830	1,442 275
Cascade Natural Gas Corporation	11 045	11 012	121 633	22 050	200 2	243 542	335 814
Laclede Group, Inc	18 878	15 260	288 085	23 900	156 6	451 184	1,002 109
NICOR Inc	44 398	16 388	727 600	41 640	254 1	1,848 733	2,544 100
Northwest Natural Gas Co	25 228	18 557	468 161	25 500	137 4	643 314	650 252
Piedmont Natural Gas Co , Inc	32 463	17 262	560 379	35 800	207 4	1,162 175	1,107 856
Southwest Gas Corp	32 493	24 790	805 517	22 350	90 2	726 219	1,396 688
WGL Holdings	48 543	11 544	560 379	29 070	251 8	1,411 145	1,446 456
Average	34 327	$ 15 701	$ 531 891	$ 27 176	181 7 %	$ 957 949	$ 1,219 428

NA = Not Available

Notes   (1) Column 3 / Column 1
    (2) Column 4 / Column 2
    (3) Column 5 * Column 3
    (4) Company-provided
    (5) The market-to-book ratio of Utilities, Inc. of Florida at December 31, 2001 is assumed to be equal to the average market-to-book ratio at December 31, 2001 of the nine natural gas utilities in the Generic Natural Gas Index
    (6) Utilities, Inc. of Florida's common stock, if traded, would trade at a market-to-book ratio equal to the average market-to-book ratio at December 31, 2001 of the nine natural gas utilities in the Generic Natural Gas Index, 181 7%, and Utilities, Inc. of Florida's market capitalization at December 31, 2001 would therefore have been $8 734 million   ($8 734 = $4 807 * 181 7%)

Source of Information   Standard & Poor's Compustat Services, Inc , PC Plus Research Insight Data Base
    Annual Forms 10-K
    Utilities, Inc. of Florida 2001 Annual Report to the Florida Public Service Commission

Stocks, Bonds, Bills,
and Inflation

SBBI

Valuation Edition
2002 Yearbook

IbbotsonAssociates

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 Depository Receipts, unit investment trusts, and Americus Trusts. All companies on the NYSE are ranked by the combined market capitalization of their eligible equity securities. The companies are then split into 10 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. Approximately two-thirds of the market value is represented by the first decile, which currently consists of 183 stocks, while the smallest decile accounts for less than one percent of the market value. The data in the second column of Table 7-1 are averages across all

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[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.

76 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 2001.

Table 7-1

Size-Decile Portfolios of the NYSE/AMEX/NASDAQ Size and Composition
1926-2001

Decile	Historical Average Percentage of Total Capitalization	Recent Number of Companies	Recent Decile Market Capitalization (in thousands)	Recent Percentage of Total Capitalization
1-Largest	63.23%	183	$7,931,281,293	69.78%
2	14.04%	208	1,347,488,388	11.85%
3	7.61%	228	668,485,903	5.88%
4	4.76%	230	392,628,829	3.45%
5	3.25%	277	295,821,191	2.60%
6	2.37%	341	236,034,069	2.08%
7	1.72%	386	168,579,453	1.48%
8	1.27%	538	146,043,985	1.28%
9	0.96%	766	107,370,955	0.94%
10-Smallest	0.79%	2,056	72,757,806	0.64%
Mid-Cap 3-5	15.62%	735	1,356,935,923	11.94%
Low-Cap 6-8	5.35%	1,265	550,657,507	4.84%
Micro-Cap 9-10	1.76%	2,822	180,128,760	1.58%

Source: Center for Research in Security Prices, University of Chicago.

Historical average percentage of total capitalization shows the average, over the last 76 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, 2001.

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 $5,252,063,000 but greater than $1,114,792,000. Low-cap stocks include deciles 6-8 and currently include all companies in the NYSE/AMEX/NASDAQ with market capitalizations at or below $1,114,792,000 but greater than $269,275,000. Micro-cap stocks include deciles 9-10 and include companies with market capitalizations at or below $269,275,000. The market capitalization of the smallest company included in the micro-capitalization group is currently $443 thousand.

Table 7-2

Size-Decile Portfolios of the NYSE/AMEX/NASDAQ, Largest Company
and Its Market Capitalization by Decile
September 30, 2001

Decile	Market Capitalization of Largest Company (in thousands)	Company Name
1-Largest	$484,237,211	General Electric Co.
2	12,379,335	TXU Corp.
3	5,252,063	Equifax Inc.
4	2,599,543	Bergen Brunswig Corp.
5	1,656,910	Pentair Inc.
6	1,114,792	La-Z-Boy Inc.
7	717,946	Cabot Oil & Gas Corp.
8	462,105	Star Gas Partners LP
9	269,275	Ackerley Group Inc.
10-Smallest	104,356	Huttig Building Products Inc.

Source: Center for Research in Security Prices, University of Chicago.

Presentation of the Decile Data

Summary statistics of annual returns of the 10 deciles over 1926–2001 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 two 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 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. This divergence in the performance of small and large company stocks is a common occurrence.

Table 7-3

Size-Decile Portfolios of the NYSE/AMEX/NASDAQ
Largest and Smallest Company by Size Group

from 1926 to1965

Date (Sept 30)	Capitalization of Largest Company (in thousands)			Capitalization of Smallest Company (in thousands)		
	Mid-Cap 3-5	Low-Cap 6-8	Micro-Cap 9-10	Mid-Cap 3-5	Low-Cap 6-8	Micro-Cap 9-10
1926	$61,490	$14,040	$4,305	$14,100	$4,325	$43
1927	$65,281	$14,746	$4,450	$15,311	$4,496	$72
1928	$81,998	$18,975	$5,074	$19,050	$5,119	$135
1929	$107,085	$24,328	$5,875	$24,480	$5,915	$126
1930	$67,808	$13,050	$3,219	$13,068	$3,264	$30
1931	$42,607	$8,142	$1,905	$8,222	$1,927	$15
1932	$12,431	$2,170	$473	$2,196	$477	$19
1933	$40,298	$7,210	$1,830	$7,280	$1,875	$100
1934	$38,129	$6,669	$1,669	$6,734	$1,673	$68
1935	$37,631	$6,519	$1,350	$6,549	$1,383	$38
1936	$46,920	$11,505	$2,660	$11,526	$2,668	$98
1937	$51,750	$13,601	$3,500	$13,635	$3,539	$68
1938	$36,102	$8,325	$2,125	$8,372	$2,145	$60
1939	$35,784	$7,367	$1,697	$7,389	$1,800	$75
1940	$31,050	$7,990	$1,861	$8,007	$1,872	$51
1941	$31,744	$8,316	$2,086	$8,338	$2,087	$72
1942	$26,135	$6,870	$1,779	$6,875	$1,788	$82
1943	$43,218	$11,475	$3,847	$11,480	$3,903	$395
1944	$48,621	$13,066	$4,800	$13,068	$4,812	$309
1945	$55,268	$17,325	$6,413	$17,575	$6,428	$225
1946	$79,158	$24,192	$10,013	$24,199	$10,051	$829
1947	$57,830	$17,735	$6,373	$17,872	$6,380	$747
1948	$67,238	$19,575	$7,313	$19,651	$7,329	$784
1949	$55,506	$14,549	$5,037	$14,577	$5,106	$379
1950	$65,881	$18,675	$6,176	$18,750	$6,201	$303
1951	$82,517	$22,750	$7,567	$22,860	$7,598	$668
1952	$97,936	$25,452	$8,428	$25,532	$8,480	$480
1953	$98,595	$25,374	$8,156	$25,395	$8,168	$459
1954	$125,834	$29,645	$8,484	$29,707	$8,488	$483
1955	$170,829	$41,445	$12,353	$41,681	$12,366	$553
1956	$183,434	$46,805	$13,481	$46,886	$13,524	$1,122
1957	$192,861	$47,658	$13,844	$48,509	$13,848	$925
1958	$195,083	$46,774	$13,789	$46,871	$13,816	$550
1959	$253,644	$64,221	$19,500	$64,372	$19,548	$1,804
1960	$246,202	$61,485	$19,344	$61,529	$19,385	$831
1961	$296,261	$79,058	$23,562	$79,422	$23,613	$2,455
1962	$250,433	$58,866	$18,952	$59,143	$18,968	$1,018
1963	$308,438	$71,846	$23,819	$71,971	$23,822	$296
1964	$344,033	$79,343	$25,594	$79,508	$25,595	$223
1965	$363,759	$84,479	$28,365	$84,600	$28,375	$250

Source: Center for Research in Security Prices, University of Chicago.

Firm Size and Return

Table 7-3 (continued)

Size-Decile Portfolios of the NYSE/AMEX/NASDAQ
Largest and Smallest Company by Size Group

from 1966 to 2001

Date (Sept 30)	Capitalization of Largest Company (In thousands)			Capitalization of Smallest Company (In thousands)		
	Mid-Cap 3-5	Low-Cap 6-8	Micro-Cap 9-10	Mid-Cap 3-5	Low-Cap 6-8	Micro-Cap 9-10
1966	$399,455	$99,578	$34,884	$99,935	$34,968	$381
1967	$459,170	$117,985	$42,267	$118,329	$42,313	$381
1968	$528,326	$149,261	$60,351	$150,128	$60,397	$592
1969	$517,452	$144,770	$54,273	$145,684	$54,280	$2,119
1970	$380,246	$94,025	$29,910	$94,047	$29,916	$822
1971	$542,517	$145,340	$45,571	$145,673	$45,589	$865
1972	$545,211	$139,647	$46,728	$139,710	$46,757	$1,031
1973	$424,584	$94,809	$29,601	$95,378	$29,606	$561
1974	$344,013	$75,272	$22,476	$75,853	$22,481	$444
1975	$465,763	$96,954	$28,140	$97,266	$28,144	$540
1976	$551,071	$118,184	$31,987	$118,212	$32,002	$564
1977	$573,084	$135,804	$39,192	$137,323	$39,264	$513
1978	$572,967	$159,778	$46,621	$160,524	$46,629	$830
1979	$661,336	$174,480	$49,068	$174,517	$49,172	$948
1980	$764,562	$194,012	$48,671	$194,241	$48,953	$549
1981	$954,865	$259,028	$71,276	$261,059	$71,289	$1,446
1982	$762,028	$205,590	$54,875	$206,536	$54,883	$1,060
1983	$1,200,680	$352,698	$103,443	$352,944	$103,530	$2,025
1984	$1,068,972	$314,650	$90,419	$315,214	$90,659	$2,093
1985	$1,432,342	$367,413	$93,810	$368,249	$94,000	$780
1986	$1,857,621	$444,827	$109,956	$445,648	$109,975	$706
1987	$2,069,143	$467,430	$112,035	$468,948	$112,125	$1,277
1988	$1,957,926	$420,257	$94,268	$421,340	$94,302	$696
1989	$2,147,608	$480,975	$100,285	$483,623	$100,384	$96
1990	$2,164,185	$472,003	$93,827	$474,065	$93,750	$132
1991	$2,129,863	$457,958	$87,586	$458,853	$87,733	$278
1992	$2,428,671	$500,346	$103,352	$501,050	$103,500	$510
1993	$2,711,068	$608,520	$137,945	$608,825	$137,987	$602
1994	$2,497,073	$601,552	$149,435	$602,552	$149,532	$598
1995	$2,793,761	$653,178	$158,011	$654,019	$158,063	$89
1996	$3,150,685	$763,377	$195,188	$763,812	$195,326	$1,043
1997	$3,511,132	$818,299	$230,472	$821,028	$230,554	$480
1998	$4,216,707	$934,284	$253,329	$936,727	$253,336	$1,671
1999	$4,251,741	$875,309	$218,336	$875,582	$218,368	$1,502
2000	$4,143,902	$840,000	$192,598	$840,730	$192,721	$1,462
2001	$5,252,063	$1,114,792	$269,275	$1,115,200	$270,391	$443

Source: Center for Research in Security Prices, University of Chicago.

Table 7-4

Size-Decile Portfolios of the NYSE/AMEX/NASDAQ, Summary Statistics of Annual Returns
1926-2001

Decile	Geometric Mean	Arithmetic Mean	Standard Deviation	Serial Correlation
1-Largest	9.9%	11.7%	19.19%	0.08
2	11.0	13.3	21.99	0.03
3	11.4	13.9	23.89	-0.02
4	11.4	14.4	26.14	-0.01
5	11.6	14.9	26.96	-0.01
6	11.8	15.4	27.98	0.05
7	11.6	15.7	30.23	0.02
8	11.8	16.7	33.99	0.06
9	12.0	17.6	36.91	0.08
10-Smallest	13.4	21.1	45.66	0.17
Mid-Cap, 3-5	11.4	14.2	24.96	-0.02
Low-Cap, 6-8	11.7	15.7	29.75	0.04
Micro-Cap, 9-10	12.5	18.6	39.41	0.11
NYSE/AMEX/NASDAQ Total Value-Weighted Index	10.3	12.3	20.26	0.03

Aspects of the Firm Size Effect

The firm size phenomenon is remarkable in several ways. First, the greater risk of small stocks does not, in the context of the capital asset pricing model (CAPM), fully account for their higher returns over the long term. In the CAPM, only systematic or beta risk is rewarded; small company stocks have had returns in excess of those implied by their betas.

Second, the calendar annual return differences between small and large companies are serially correlated. This suggests that past annual returns may be of some value in predicting future annual returns. Such serial correlation, or autocorrelation, is practically unknown in the market for large stocks and in most other equity markets but is evident in the size premia.

Third, the firm size effect is seasonal. For example, small company stocks outperformed large company stocks in the month of January in a large majority of the years. Such predictability is surprising and suspicious in light of modern capital market theory. These three aspects of the firm size effect—long-term returns in excess of systematic risk, serial correlation, and seasonality—will be analyzed thoroughly in the following sections.

Firm Size and Return

Graph 7-1

Size-Decile Portfolios of the NYSE/AMEX/NASDAQ: Wealth Indices of Investments in Mid-, Low-, Micro- and Total Capitalization Stocks
1925–2001*

*Year-End 1925 = $1.00
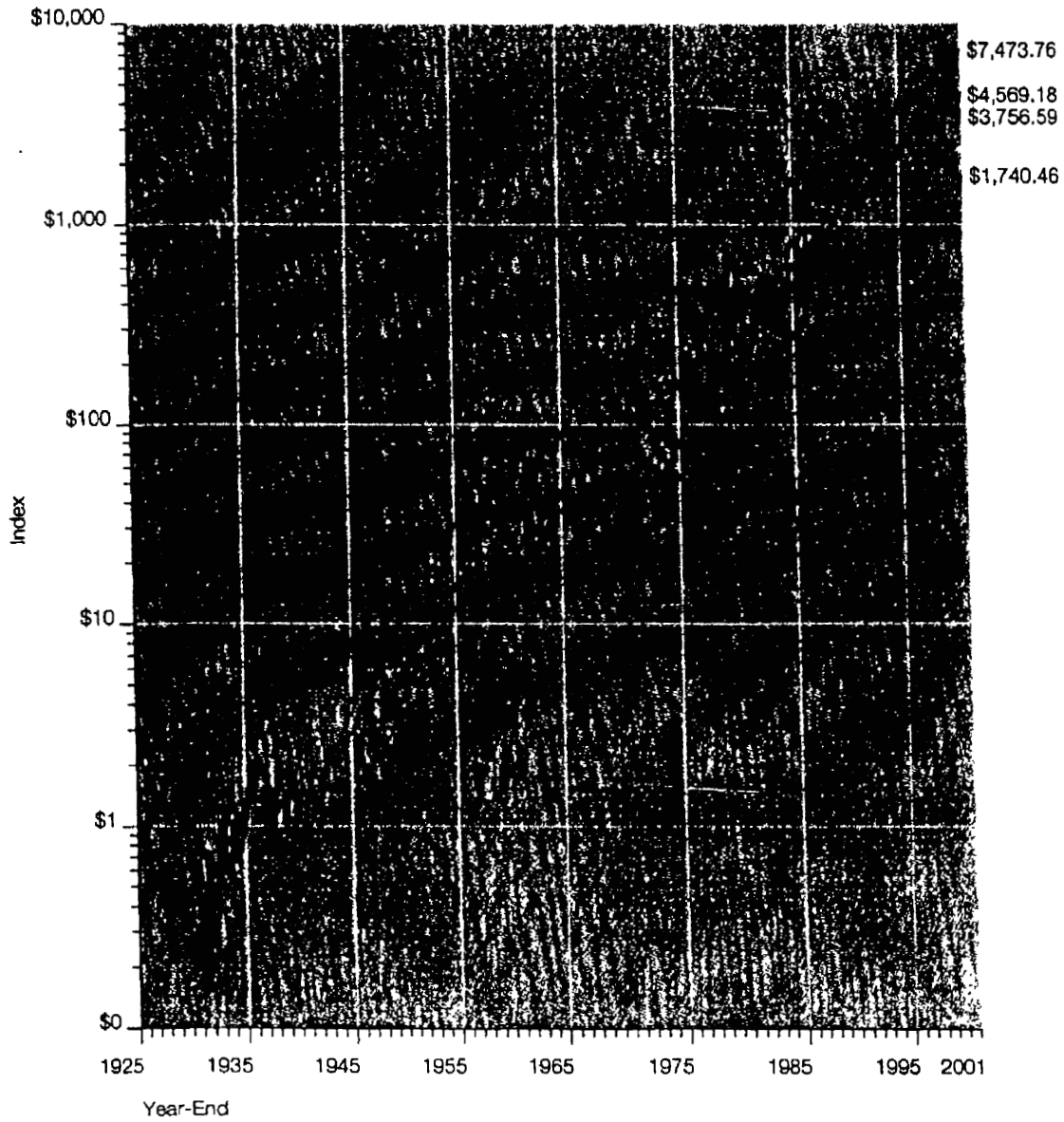
Long-Term Returns in Excess of Systematic Risk

The capital asset pricing model (CAPM) does not fully account for the higher returns of small company stocks. Table 7-5 shows the returns in excess of systematic risk over the past 76 years for each decile of the NYSE/AMEX/NASDAQ. Recall that the CAPM is expressed as follows:

$$k_s = r_f + (\beta_s \times ERP)$$

Table 7-5 uses the CAPM to estimate the return in excess of the riskless rate and compares this estimate to historical performance. According to the CAPM, the expected return on a security should consist of the riskless rate plus an additional return to compensate for the systematic risk of the security. The return in excess of the riskless rate is estimated in the context of the CAPM by multiplying the equity risk premium by β (beta). The equity risk premium is the return that compensates investors for taking on risk equal to the risk of the market as a whole (systematic risk).[2] Beta measures the extent to which a security or portfolio is exposed to systematic risk.[3] The beta of each decile indicates the degree to which the decile's return moves with that of the overall market.

A beta greater than one indicates that the security or portfolio has greater systematic risk than the market; according to the CAPM equation, investors are compensated for taking on this additional risk. Yet, Table 7-5 illustrates that the smaller deciles have had returns that are not fully explainable by their higher betas. This return in excess of that predicted by CAPM increases as one moves from the largest companies in decile 1 to the smallest in decile 10. The excess return is especially pronounced for micro-cap stocks (deciles 9–10). This size-related phenomenon has prompted a revision to the CAPM, which includes a size premium. Chapter 4 presents this modified CAPM theory and its application in more detail.

This phenomenon can also be viewed graphically, as depicted in the Graph 7-2. The security market line is based on the pure CAPM without adjustment for the size premium. Based on the risk (or beta) of a security, the expected return lies on the security market line. However, the actual historic returns for the smaller deciles of the NYSE/AMEX/NASDAQ lie above the line, indicating that these deciles have had returns in excess of that which is appropriate for their systematic risk.

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2 The equity risk premium is estimated by the 76-year arithmetic mean return on large company stocks, 12.65 percent, less the 76-year arithmetic mean income-return component of 20-year government bonds as the historical riskless rate, in this case 5.23 percent. (It is appropriate, however, to match the maturity, or duration, of the riskless asset with the investment horizon.) See Chapter 5 for more detail on equity risk premium estimation.
3 Historical betas were calculated using a simple regression of the monthly portfolio (decile) total returns in excess of the 30-day U.S. Treasury bill total returns versus the S&P 500 total returns in excess of the 30-day U.S. Treasury bill, January 1926–December 2001. See Chapter 6 for more detail on beta estimation.

Table 7-5

Long-Term Returns in Excess of CAPM Estimation for Decile Portfolios of the NYSE/AMEX/NASDAQ 1926-2001

Decile	Beta*	Arithmetic Mean Return	Realized Return in Excess of Riskless Rate**	Estimated Return in Excess of Riskless Rate†	Size Premium (Return in Excess of CAPM)
1-Largest	0.91	11.69%	6.46%	6.74%	-0.28%
2	1.04	13.27%	8.04%	7.71%	0.33%
3	1.09	13.94%	8.71%	8.13%	0.59%
4	1.13	14.44%	9.21%	8.38%	0.83%
5	1.16	14.92%	9.69%	8 65%	1.04%
6	1.18	15.37%	10.15%	8.79%	1.36%
7	1.24	15.66%	10.43%	9.17%	1.26%
8	1.28	16.66%	11.43%	9.50%	1.94%
9	1.34	17.61%	12.38%	9.97%	2.41%
10-Smallest	1.42	21.11%	15.89%	10.55%	5.33%
Mid-Cap, 3-5	1.12	14.25%	9.02%	8.30%	0.72%
Low-Cap, 6-8	1.22	15.70%	10.47%	9.05%	1.42%
Micro-Cap, 9-10	1.36	18.63%	13.40%	10.10%	3.30%

*Betas are estimated from monthly portfolio total returns in excess of the 30-day U.S. Treasury bill total return versus the S&P 500 total returns in excess of the 30-day U.S. Treasury bill, January 1926–December 2001.

**Historical riskless rate is measured by the 76-year arithmetic mean income return component of 20-year government bonds (5.23 percent).

†Calculated in the context of the CAPM by multiplying the equity risk premium by beta. The equity risk premium is estimated by the arithmetic mean total return of the S&P 500 (12.65 percent) minus the arithmetic mean income return component of 20-year government bonds (5.23 percent) from 1926–2001.

Graph 7-2

Security Market Line versus Size-Decile Portfolios of the NYSE/AMEX/NASDAQ 1926-2001
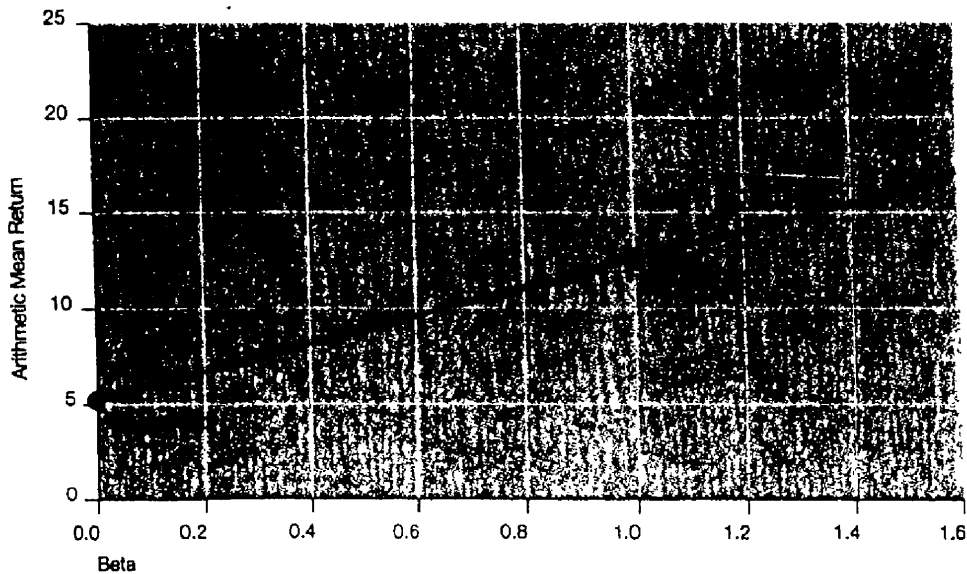
Alternative Methods of Calculating the Size Premia

The size premia estimation method presented above makes several assumptions with respect to the market benchmark and the measurement of beta. The impact of these assumptions can best be examined by looking at some alternatives. In this section we will examine the impact on the size premia of using a different market benchmark for estimating the equity risk premia and beta. We will also examine the effect on the size premia study of using sum beta or an annual beta.[4]

Changing the Market Benchmark

In the original size premia study, the S&P 500 is used as the market benchmark in the calculation of the realized historical equity risk premium and of each size group's beta. The NYSE total value-weighted index is a common alternative market benchmark used to calculate beta. Table 7-6 uses this market benchmark in the calculation of beta. In order to isolate the size effect, we require an equity risk premium based on a large company stock benchmark. The NYSE deciles 1-2 large company index offers a mutually exclusive set of portfolios for the analysis of the smaller company groups: mid-cap deciles 3-5, low-cap deciles 6-8, and micro-cap deciles 9-10. The size premia analyses using these benchmarks are summarized in Table 7-6 and depicted graphically in Graph 7-3.

For the entire period analyzed, 1926-2001, the betas obtained using the NYSE total value-weighted index are higher than those obtained using the S&P 500. Since smaller companies had higher betas using the NYSE benchmark, one would expect the size premia to shrink. However, as was illustrated in Chapter 5, the equity risk premium calculated using the NYSE deciles 1-2 benchmark results in a value of 6.65, as opposed to 7.42 when using the S&P 500. The effect of the higher betas and lower equity risk premium cancel each other out, and the resulting size premia in Table 7-6 are slightly higher than those resulting from the original study.

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4 Sum beta is the method of beta estimation described in Chapter 6 that was developed to better account for the lagged reaction of small stocks to market movements. The sum beta methodology was developed for the same reason that the size premia were developed; small company betas were too small to account for all of their excess returns.

Table 7-6

Long-Term Returns in Excess of CAPM Estimation for Decile Portfolios of the
NYSE/AMEX/NASDAQ, with NYSE Market Benchmarks
1926–2001

Decile	Beta*	Arithmetic Mean Return	Realized Return in Excess of Riskless Rate**	Estimated Return in Excess of Riskless Rate†	Size Premium (Return in Excess of CAPM)
1-Largest	0.94	11.69%	6.46%	6.26%	0.20%
2	1.09	13.27%	8.04%	7.27%	0.77%
3	1.15	13.94%	8.71%	7.67%	1.05%
4	1.20	14.44%	9.21%	7.95%	1.26%
5	1.23	14.92%	9.69%	8.20%	1.49%
6	1.26	15.37%	10.15%	8.37%	1.78%
7	1.32	15.66%	10.43%	8.77%	1.66%
8	1.37	16.66%	11.43%	9.11%	2.32%
9	1.44	17.61%	12.38%	9.57%	2.81%
10-Smallest	1.53	21.11%	15.89%	10.16%	5.73%
Mid-Cap, 3-5	1.18	14.25%	9.02%	7.85%	1.17%
Low-Cap, 6-8	1.30	15.70%	10.47%	8.64%	1.83%
Micro-Cap, 9-10	1.46	18.63%	13.40%	9.70%	3.70%

*Betas are estimated from monthly portfolio total returns in excess of the 30-day U.S. Treasury bill total return versus the NYSE total capitalization-weighted index total returns in excess of the 30-day U.S. Treasury bill, January 1926–December 2001.

**Historical riskless rate is measured by the 76-year arithmetic mean income return component of 20-year government bonds (5.23 percent).

†Calculated in the context of the CAPM by multiplying the equity risk premium by beta. The equity risk premium is estimated by the arithmetic mean total return of the NYSE deciles 1-2 (11.88 percent) minus the arithmetic mean income return component of 20-year government bonds (5.23 percent) from 1926–2001.

Graph 7-3

Security Market Line versus Size-Decile Portfolios of the NYSE/AMEX/NASDAQ with NYSE Market Benchmarks
1926–2001