Exhibit No.:
Issues: Rate of Return on Equity

Witness: Pauline M. Ahern
Exhibit Type: Direct Schedules
Sponsoring Party: Missouri American Water Company
Case Nos.: WR-2010-XXXX
SR-2010-XXXX
Date:

PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI

CASE NOS. WR-2010-XXXX
SR-2010-XXXX

SCHEDULES

TO ACCOMPANY THE

DIRECT TESTIMONY

OF

PAULINE M. AHERN, CRRA

ON BEHALF OF

MISSOURI AMERICAN WATER COMPANY

JEFFERSON CITY, MISSOURI

Missouri-American Water Company
Table of Contents
to the Financial Supporting Schedules
of Pauline M. Ahern, CRRA

Missouri-American Water Company
Summary of Cost of Capital and Fair Rate of Return
Based upon the Pro Forma Capital Structure of at April 30, 2010

Type of Capital	Ratios (1)	Cost Rate	Weighted Cost Rate
Long-Term Debt	50.06%	6.36% (1)	3.18%
Short-Term Debt	0.68%	3.62%	0.02%
Total Debt	50.74%		3.20%
Preferred Stock	0.32%	9.20%	0.03%
Common Equity	48.94%	11.60% (2)	5.68%
Total	100.00%		8.91%

(1) Company-provided.

(2) Based upon informed expert judgment from the entire study, the principal results of which are summarized on Page 2 of this Schedule.

Missouri-American Water Company
Brief Summary of Common Equity Cost Rate

No.	Principal Methods	Proxy Group of Six AUS Utility Reports Water Companies	Proxy Group of Eight AUS Utility Reports Gas Distribution Companies
1.	Discounted Cash Flow Model (DCF) (1)	11.73 %	8.68 %
2.	Risk Premium Model (RPM) (2)	11.12	10.85
3.	Capital Asset Pricing Model (CAPM) (3)	11.58	10.49
4.	Comparable Earnings Model (CEM) (4)	13.50	NMF
5.	Indicated Common Equity Cost Rate before Adjustment for Business Risk	12.15 %	10.35 %
6.	Business Risk Adjustment (5)	0.05	0.15
7.	Range of Indicated Common Equity Cost Rate After Adjustment for Business Risk	12.20 %	10.50 %
8.	Financial / Credit Risk Adjustment (6)	0.32	0.21
9.	Range of Indicated Common Equity Cost Rate After Adjustment for Business and Financial / Credit Risk	12.52 %	10.71 %
10.	Recommended Common Equity Cost Rate	11.60%	

Notes: (1) From Schedule PMA-7.
(2) From page 1 of Schedule PMA-11.
(3) From page 1 Schedule PMA-12.
(4) From pages 2 and 3 of Schedule PMA-14 of this Exhibit.
(5) Business risk adjustment to reflect Missouri-American Water Company's greater business risk due to its small size relative to the proxy groups as detailed in Ms. Ahern's accompanying direct testimony.

(6) Financial / credit risk adjustment to reflect Missouri-American Water Company's greater financial / credit risk relative to the proxy groups as detailed in Ms. Ahern's accompanying direct testimony.

Missouri-American Water Company
Derivation of Investment Risk Adjustment Based upon
Ibbotson Associates' Size Premia for the Decile Portfolios of the NYSE/AMEX/NASDAQ

Line No.		1 Market Capitalization on September 30, 2009 (1) (millions)	(times larger)	2 Applicable Decile of the NYSE/AMEX/ NASDAQ (2)	3 Applicable Size Premium (3)	4 Spread from Applicable Size Premium for (4)
1.	Missouri-American Water Company					
	a. Based Upon the Proxy Group of Six AUS Utility Reports Water Companies	$ 660.080		9	2.35%	
	b. Based Upon the Proxy Group of Eight AUS Utility Reports Gas Distribution Companies	$ 520.259		8 - 9	2.53%	
2.	Proxy Group of Six AUS Utility Reports Water Companies	$ 769.035	1.2 x	7 - 8	1.99%	0.37%
3.	Proxy Group of Eight AUS Utility Reports Gas Distribution Companies	$ 1,464.019	2.8 x	6	1.63%	0.90%

(A) Decile	(B) Number of Companies (millions)	(C) Recent Total Market Capitalization (millions)	(D) Recent Average Market Capitalization (millions)	(E) Size Premium (Return in Excess of CAPM) (2)
1 - Largest	165	$ 8,530,554.000	$ 51,700.327	-0.36%
2	175	1,682,132.000	$ 9,612.183	0.62%
3	183	804,806.000	$ 4,397.847	0.74%
4	189	540,900.000	$ 2,861.905	0.97%
5	211	409,557.000	$ 1,941.028	1.54%
6	243	342,820.000	$ 1,410.782	1.63%
7	319	283,476.000	$ 888.639	1.62%
8	393	241,137.000	$ 613.580	2.35%
9	603	181,013.000	$ 300.187	2.71%
10 - Smallest	1626	128,780.000	$ 79.200	5.81%

*From pages 7 and 11 of this Schedule

Notes:
(1) From Page 4 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 2.28% in Column 4, Line No. 2 is derived as follows 2.28% = 4.26% - 1.99%.

Missouri-American Water Company
Market Capitalization of United Water New York, Inc.
the Proxy Group of Six AUS Utility Reports Water Companies
and the Proxy Group of Eight AUS Utility Reports Natrual Gas Distribution Companies

Company	Exchange	1 Common Stock Shares Outstanding at December 31, 2008 (millions)	2 Book Value per Share at December 31, 2008 (1)	3 Total Common Equity at December 31, 2008 (millions)	4 Closing Stock Market Price on September 30, 2009	5 Market-to-Book Ratio on September 30, 2009 (2)	6 Market Capitalization on September 30, 2009 (3) (millions)
Missouri-American Water Company		NA	NA	$ 339.373 (4)	NA		
Based Upon the Proxy Group of Six AUS Utility Reports Water Companies						194.5 % (5)	$ 660.080 (6)
Based Upon the Proxy Group of Eight AUS Utility Reports Gas Distribution Companies						153.3 % (7)	$ 520.259 (8)
Proxy Group of Six AUS Utility Reports Water Companies							
American States Water Co.	NYSE	17.301	$ 17.947	$ 310.503	$ 36.180	201.6 %	$ 625.952
Aqua America, Inc.	NYSE	136.053	7.780	1,058.446	17.640	226.7	2,399.983
California Water Service Group	NYSE	20.723	19.445	402.949	38.940	200.3	806.954
Middlesex Water Company	NASDAQ	13.404	10.281	137.803	15.080	146.7	202.132
SJW Corporation	NYSE	18.452	13.783	254.326	22.850	165.8 %	421.638
York Water Company	NASDAQ	11.367	6.137	69.766	13.860	225.8	157.550
Average		36.217	$ 12.562	$ 372.299	$ 24.092	194.5 %	$ 769.035
Proxy Group of Eight AUS Utility Reports Gas Distribution Companies							
AGL Resources, Inc.	NYSE	76.900	$ 21.482	$ 1,652.000	$ 35.270	164.2 %	$ 2,712.263
Atmos Energy Corp.	NYSE	90.815	22.601	2,052.492	28.180	124.7	2,559.158
Delta Natural Gas Company	NYSE	3.296	17.475	57.594	26.500	151.6	87.338
Laclede Group, Inc.	NYSE	21.993	22.119	486.479	32.160	145.4	707.310
Northwest Natural Gas Company	NYSE	26.594	23.628	628.373	41.660	176.3	1,107.906
Piedmont Natural Gas Co., Inc.	NYSE	73.246	12.113	887.244	23.940	197.6	1,753.509
Southwest Gas Corporation	NYSE	44.192	23.485	1,037.841	25.580	108.9	1,130.419
WGL Holdings, Inc.	NYSE	49.917	20.986	1,047.564	33.140	157.9	1,654.246
Average		48.369	$ 20.486	$ 981.198	$ 30.804	153.3 %	$ 1,464.019

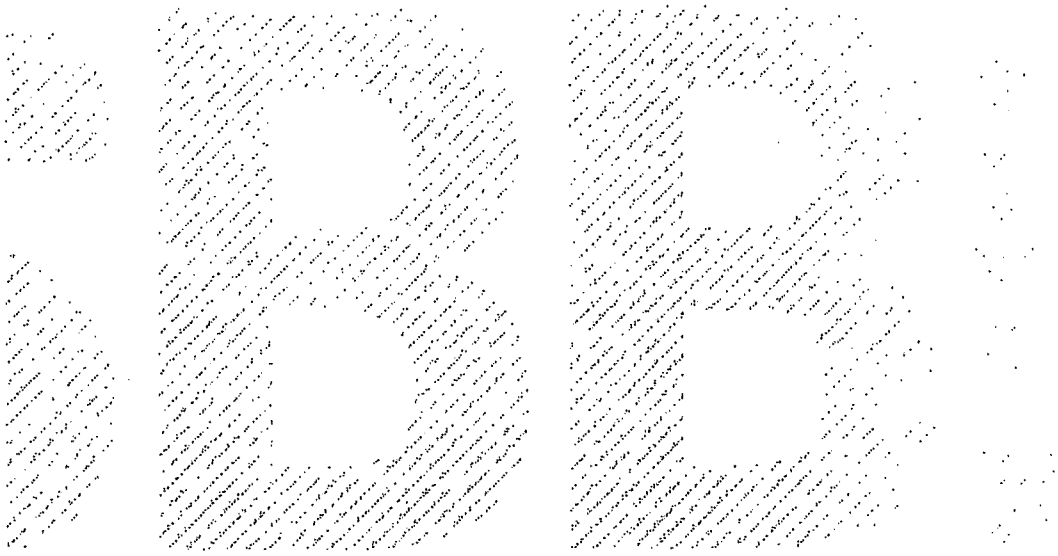
NA = Not Available

Notes:
(1) Column 3 / Column 1.
(2) Column 4 / Column 2.
(3) Column 5 * Column 3.
(4) From Missouri-American Water Co.'s 2008 Annual Report to the Missouri Public Service Commission.
(5) The market-to-book ratio of Missouri-American Water Company on September 30, 2009 is assumed to be equal to the average market-to-book ratio at September 30, 2009 of the proxy group of six AUS Utility Reports water companies.
(6) Missouri-American Water Company's common stock, if traded, would trade at a market-to-book ratio equal to the average market-to-book ratio at September 30, 2009 of the proxy group of six AUS Utility Reports water companies, 194.5%, and Missouri-American Water Company's market capitalization on September 30, 2009 would therefore have been $660.080 million. ($660.080 = $339.373 * 194.5%).
(7) The market-to-book ratio of Missouri-American Water Company on September 30, 2009 is assumed to be equal to the average market-to-book ratio at September 30 , 2009 of the proxy group of eight AUS Utility Reports gas distribution companies.
(8) Missouri-American Water Company's common stock, if traded, would trade at a market-to-book ratio equal to the average market-to-book ratio at September 30, 2009 of the proxy group of eight AUS Utility Reports gas distribution companies, 153.3%, and Missouri-American Water Company's market capitalization on September 30, 2009 would therefore have been $520.259 million. ($520.259 = $339.363 * 153.3%).

Source of Information: 2008 Annual Forms 10K
yahoo.finance.com

Ibbotson® SBBI®
2009 Valuation Yearbook

Market Results for
Stocks, Bonds, Bills, and Inflation
1926–2008



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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.

Size and Liquidity

Capitalization is not necessarily the underlying cause of the higher returns for smaller companies. While smaller companies are usually less liquid, with fewer shares traded on any given day, not all companies of the same size have the same liquidity. Stocks that are more liquid have higher valuations for the same cash flows because they have a lower cost of capital and commensurately lower returns on average. Stocks that are less liquid have a higher cost of capital and higher returns on average.[2]

While it would be very useful to estimate the equity cost of capital of companies that are not publicly traded, there is not a direct measure of liquidity for these companies because there are no public trades. Thus, there is usually no share turnover, no bid/ask spreads, etc. in which to measure liquidity. Even though liquidity is not directly observable, capitalization is; thus the size premium can serve as a partial measure of the increased cost of capital of a less liquid stock.

Size premiums presented in this book are measured from publicly traded companies of various sizes and therefore do not represent the full cost of capital for non-traded companies. The valuation for a non-publicly traded company should also reflect a discount for the very fact that it is not traded. This would be an illiquidity discount and could be applied to the valuation directly, or alternatively reflected as an illiquidity premium in the cost of capital.

This chapter does not tell you how to estimate this incremental illiquidity valuation discount (or cost of capital illiquidity premium) that is not covered by the size premium. At the end of this chapter, we show some empirical results on the impact of liquidity on stock returns.

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.

Table 7-1: Size-Decile Portfolios of the NYSE/AMEX/NASDAQ Bounds, Size, and Composition

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	165	$8,530,554	64.89
2	13.96	175	1,682,132	12.80
3	7.56	183	804,806	6.12
4	4.72	189	540,900	4.11
5	3.24	211	409,557	3.12
6	2.39	243	342,820	2.61
7	1.75	319	283,476	2.16
8	1.30	393	241,137	1.83
9	1.02	603	181,013	1.38
10-Smallest	0.83	1626	128,780	0.98
Mid-Cap 3–5	15.52	583	1,755,263	13.35
Low-Cap 6–8	5.44	955	867,434	6.60
Micro-Cap 9–10	1.85	2229	309,793	2.36

Data from 1926–2008. Source: Calculated (or Derived) based on data from CRSP US Stock Database and CRSP US Indices Database

Historical average percentage of total capitalization shows the average, over the last 83 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, 2008.

Table 7-2: Size-Decile Portfolios of the NYSE/AMEX/NASDAQ, Largest Company and Its Market Capitalization by Decile

Decile	Recent Market Capitalization (in Thousands)	Company Name
1-Largest	465,651,938	Exxon Mobil Corp.
2	18,503,467	Waste Management Inc. Del
3	7,360,271	Reliant Energy Inc.
4	4,225,152	IMS Health Inc.
5	2,785,538	Family Dollar Stores Inc.
6	1,848,961	Bally Technologies Inc.
7	1,197,133	Temple Inland Inc.
8	753,448	Kronos Worldwide Inc.
9	453,254	SWS Group Inc.
10-Smallest	218,533	Beazer Homes USA Inc.

Source: Calculated (or Derived) based on data from CRSP US Stock Database and CRSP US Indices Database
Market capitalization and name of largest company in each decile as of September 30, 2008.

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 165 stocks, while the smallest decile accounts for just over one percent of the market value. The data in the second column of Table 7-1 are averages across all 83 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 2008.

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 $7,360,271,000 but greater than $1,848,961,000. Low-cap stocks include deciles 6–8 and currently include all companies in the NYSE/AMEX/NASDAQ with market capitalizations at or below $1,848,961,000 but greater than $453,254,000. Micro-cap stocks include deciles 9–10 and include companies with market capitalizations at or below $453,254,000. The market capitalization of the smallest company included in the micro-capitalization group is currently $1,575,000.

Presentation of the Decile Data

Summary statistics of annual returns of the 10 deciles over 1926–2008 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.

Table 7-3
Size-Decile Portfolios of the NYSE/AMEX/NASDAQ
Largest and Smallest Company by Size Group

1926–1965

Date (Sept 30)	Capitalization of Largest Company (in Thousands) Mid-Cap 3–5	Low-Cap 6–8	Micro-Cap 9–10	Capitalization of Smallest Company (in Thousands) Mid-Cap 3–5	Low-Cap 6–8	Micro-Cap 9–10
1926	$60,103	$13,795	$4,213	$13,800	$4,263	$43
1927	64,820	14,491	4,415	14,522	4,450	65
1928	80,910	18,761	5,074	18,788	5,119	135
1929	103,054	24,328	5,862	24,480	5,873	118
1930	66,750	12,918	3,359	13,050	3,369	30
1931	42,607	8,142	1,927	8,222	1,944	15
1932	12,212	2,208	468	2,223	469	19
1933	40,298	7,210	1,830	7,280	1,875	120
1934	38,019	6,638	1,673	6,669	1,691	69
1935	37,631	6,549	1,350	6,605	1,383	38
1936	46,963	11,505	2,754	11,526	2,800	98
1937	51,750	13,635	3,539	13,793	3,563	68
1938	35,019	8,372	2,195	8,400	2,200	60
1939	35,409	7,478	1,819	7,500	1,854	75
1940	29,903	7,990	1,861	8,007	1,872	51
1941	30,362	8,316	2,086	8,336	2,087	72
1942	26,037	6,868	1,770	6,870	1,779	82
1943	42,721	11,403	3,847	11,475	3,903	395
1944	46,221	13,066	4,812	13,068	4,820	309
1945	55,125	17,325	6,413	17,575	6,428	225
1946	77,784	24,192	10,149	24,199	10,168	829
1947	57,830	17,719	6,373	17,735	6,380	508
1948	67,238	19,632	7,329	19,651	7,348	683
1949	56,082	14,549	5,037	14,577	5,108	379
1950	66,143	18,675	6,225	18,700	6,243	303
1951	82,517	22,750	7,598	22,860	7,600	668
1952	95,636	25,405	8,428	25,452	8,480	480
1953	98,218	25,340	8,156	25,374	8,168	459
1954	125,834	29,707	8,488	29,791	8,502	463
1955	170,829	41,445	12,366	41,681	12,444	553
1956	183,792	46,805	13,524	46,886	13,623	1,122
1957	194,300	47,658	13,844	48,509	13,848	925
1958	195,536	46,774	13,789	46,871	13,816	550
1959	256,283	64,110	19,548	64,221	19,701	1,804
1960	252,292	61,485	19,293	61,529	19,344	831
1961	296,261	77,983	23,562	77,996	23,613	2,455
1962	250,786	58,785	18,952	58,866	18,968	1,018
1963	308,903	71,846	23,927	71,971	24,056	296
1964	349,675	79,508	25,595	79,937	25,607	223
1965	365,675	84,600	28,483	85,065	28,543	250

Source: Calculated (or Derived) based on data from CRSP US Stock Database and CRSP US Indices Database ©2009 Center for Research in Security Prices (CRSP®), The University of Chicago Booth School of Business. Used with permission.

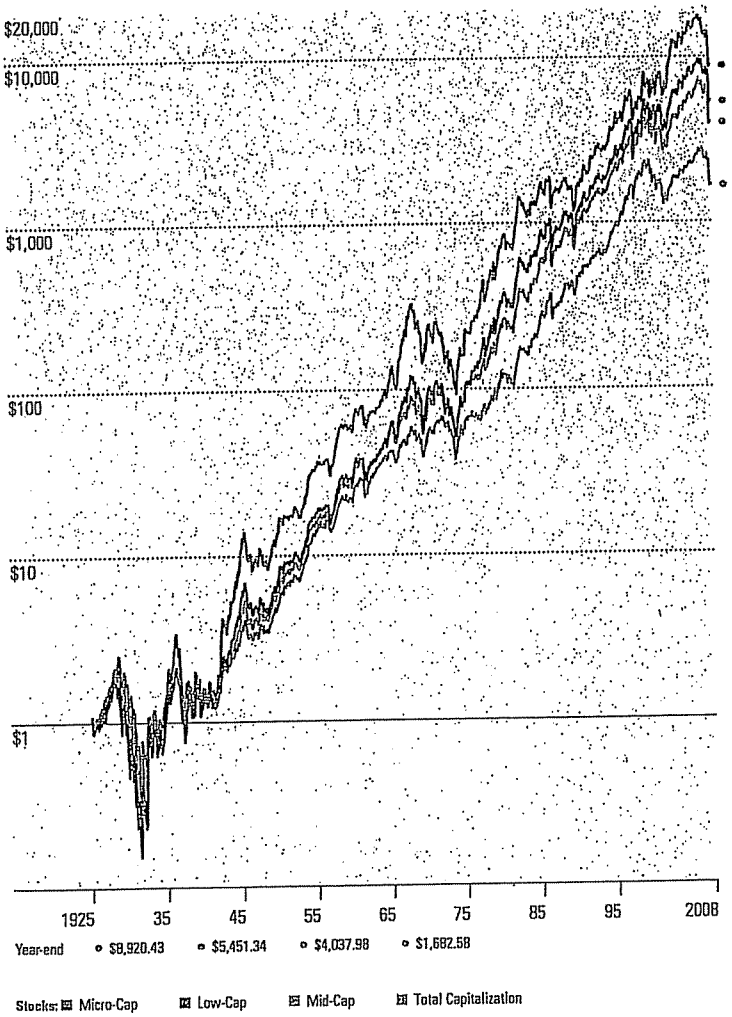
Table 7-3 (Continued)
Size-Decile Portfolios of the NYSE/AMEX/NASDAQ
Largest and Smallest Company by Size Group

1966–2008

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	$403,137	$99,960	$34,884	$100,107	$34,966	$381
1967	459,438	118,988	42,188	119,635	42,237	381
1968	531,306	150,893	60,543	151,260	60,719	592
1969	518,485	146,792	54,353	147,311	54,503	2,119
1970	382,884	94,754	29,916	94,845	29,932	822
1971	551,690	147,426	45,570	147,810	45,571	865
1972	557,181	143,835	46,728	144,263	46,757	1,031
1973	431,354	96,699	29,352	96,710	29,430	561
1974	356,876	79,878	23,355	80,280	23,400	444
1975	477,054	102,313	30,353	103,283	30,394	540
1976	566,296	121,717	34,864	121,992	34,901	564
1977	584,577	139,196	40,700	139,620	40,765	513
1978	580,881	164,093	47,927	164,455	48,038	830
1979	665,019	177,378	51,197	177,769	51,274	948
1980	762,195	199,312	50,496	199,315	50,544	549
1981	962,397	264,690	72,104	264,783	72,450	1,446
1982	770,517	210,301	55,336	210,630	55,423	1,060
1983	1,209,911	353,889	104,382	356,238	104,588	2,025
1984	1,075,436	315,965	91,004	316,103	91,195	2,093
1985	1,440,436	370,224	94,875	370,729	94,887	760
1986	1,857,621	449,015	110,617	449,462	110,953	706
1987	2,059,143	468,948	113,419	470,662	113,430	1,277
1988	1,957,926	421,340	94,449	421,675	94,573	696
1989	2,145,947	480,975	100,285	483,623	100,384	96
1990	2,171,217	474,065	93,750	474,477	93,790	132
1991	2,129,863	457,958	87,586	458,853	87,733	278
1992	2,428,671	500,327	103,352	500,346	103,500	510
1993	2,705,192	603,588	137,105	607,449	137,137	602
1994	2,470,244	596,059	148,104	597,975	148,216	598
1995	2,789,938	647,210	155,386	647,253	155,532	89
1996	3,142,657	751,316	193,001	751,680	193,016	1,043
1997	3,484,440	813,923	228,900	814,355	229,058	585
1998	4,216,707	925,688	252,553	926,215	253,031	1,671
1999	4,251,741	875,309	220,397	875,582	220,456	1,502
2000	4,143,902	840,000	192,083	840,730	192,439	1,393
2001	5,156,315	1,108,224	265,734	1,108,969	265,736	443
2002	4,930,326	1,116,525	308,980	1,124,331	309,245	501
2003	4,744,580	1,163,369	329,060	1,163,423	329,529	332
2004	6,241,953	1,607,854	505,437	1,607,931	506,410	1,393
2005	7,187,244	1,728,888	586,393	1,729,364	587,243	1,079
2006	7,777,183	1,946,588	626,955	1,947,240	627,017	2,247
2007	9,206,713	2,411,794	723,258	2,413,583	725,267	1,922
2008	7,360,271	1,848,961	453,254	1,849,950	453,398	1,575

Source: Calculated (or Derived) based on data from CRSP US Stock Database and CRSP US Indices Database ©2009 Center for Research in Security Prices (CRSP®), The University of Chicago Booth School of Business. Used with permission.

Graph 7-1: Size-Decile Portfolios of the NYSE/AMEX/NASDAQ
Wealth Indices of Investments in Mid-, Low-, Micro-, and Total Capitalization Stocks
Index (Year-End 1925 = $1.00)



Data from 1925–2008.

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.

Table 7-4: Size-Decile Portfolios of the NYSE/AMEX/NASDAQ
Summary Statistics of Annual Returns

Decile	Geometric Mean	Arithmetic Mean	Standard Deviation	Serial Correlation
1-Largest	8.9	10.8	19.48	0.09
2	10.1	12.5	22.33	0.04
3	10.4	13.1	23.89	-0.01
4	10.4	13.4	26.13	0.00
5	10.9	14.2	26.90	-0.02
6	10.9	14.5	27.59	0.04
7	10.8	14.8	29.82	0.02
8	11.0	16.0	34.44	0.06
9	11.1	16.6	36.70	0.05
10-Smallest	12.5	20.1	44.95	0.17
Mid Cap	10.5	13.4	24.93	-0.01
Low Cap	10.9	14.9	29.41	0.04
Micro	11.6	17.7	39.16	0.09
NYSE/AMEX/ NASDAQ Total Value Weighted Index	9.4	11.4	20.53	0.04

Data from 1926–2008. Source: Calculated (or Derived) based on data from CRSP US Stock Database and CRSP US Indices Database ©2009 Center for Research in Security Prices (CRSP®), The University of Chicago Booth School of Business. Used with permission.

Results are for quarterly re-ranking for the deciles. The small company stock summary statistics presented in earlier chapters comprise a re-ranking of the portfolios every five years prior to 1982.

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.

Table 7-5: Size-Decile Portfolios of the NYSE/AMEX/NASDAQ Long-Term Returns in Excess of CAPM

Decile	Beta*	Arithmetic Mean Return (%)	Actual Return in Excess of Riskless Rate** (%)	CAPM Return in Excess of Riskless Rate† (%)	Size Premium (Return in Excess of CAPM) (%)
1-Largest	0.91	10.75	5.56	5.91	-0.36
2	1.03	12.51	7.31	6.69	0.62
3	1.10	13.06	7.87	7.13	0.74
4	1.12	13.45	8.25	7.28	0.97
5	1.16	14.23	9.03	7.49	1.54
6	1.18	14.48	9.28	7.65	1.63
7	1.24	14.84	9.65	8.03	1.62
8	1.30	15.95	10.76	8.41	2.35
9	1.35	16.62	11.42	8.71	2.71
10-Smallest	1.41	20.13	14.93	9.12	5.81
Mid-Cap, 3–5	1.12	13.37	8.18	7.24	0.94
Low-Cap, 6–8	1.22	14.86	9.66	7.92	1.74
Micro-Cap, 9–10	1.36	17.72	12.52	8.79	3.74

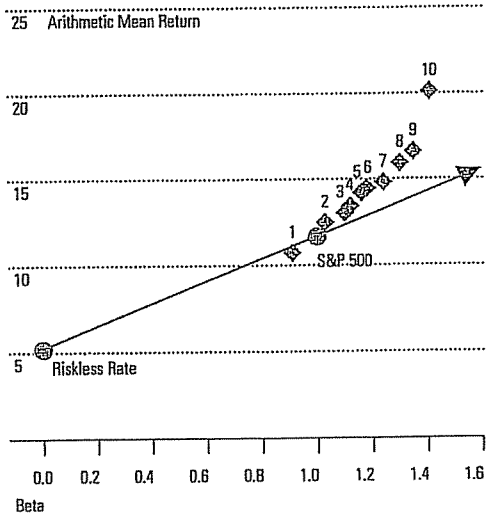
Data from 1926–2008.

*Betas are estimated from monthly returns in excess of the 30-day U.S. Treasury bill total return, January 1926–December 2008.

**Historical riskless rate measured by the 83-year arithmetic mean income return component of 20-year government bonds (5.20).

†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 (11.57 percent) minus the arithmetic mean income return component of 20-year government bonds (5.20 percent) from 1926–2008.

Graph 7-2: Security Market Line Versus Size-Decile Portfolios of the NYSE/AMEX/NASDAQ‡



Data from 1926–2008.

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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.

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 83 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).[3] Beta measures the extent to which a security or portfolio is exposed to systematic risk.[4] 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 explained 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.

Table 7-6: Size-Decile Portfolios 10a and 10b of the NYSE/AMEX/NASDAQ

Decile	Recent Number of Companies	Recent Decile Market Capitalization (in Thousands)	Market Capitalization of Largest Company (in Thousands)	Company Name
10a	409	$77,980,249	$218,533,000	Beazer Homes U.S.A. Inc.
10b	1182	75,412,545	136,500,000	Great Northern Iron Ore

Note: These numbers may not aggregate to equal decile 10 figures.

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Market capitalization and name of largest company in each decile as of September 30, 2008.

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.

Further Analysis of the 10th Decile

The size premia presented thus far do a great deal to explain the return due solely to size in publicly traded companies. However, by splitting the 10th decile into two size groupings we can get a closer look at the smallest companies. This magnification of the smallest companies will demonstrate whether the company size to size premia relationship continues to hold true.

As previously discussed, the method for determining the size groupings for size premia analysis was to take the stocks traded on the NYSE and break them up into 10 deciles, after which stocks traded on the AMEX and NASDAQ were allocated into the same size groupings. This same methodology was used to split the 10th decile into two parts: 10a and 10b, with 10b being the smaller of the two. This is equivalent to breaking the stocks down into 20 size groupings, with portfolios 19 and 20 representing 10a and 10b.

Table 7-7 shows that the pattern continues; as companies get smaller their size premium increases. There is a noticeable increase in size premium from 10a to 10b, which can also be demonstrated visually in Graph 7-3. This can be useful in valuing companies that are extremely small. Table 7-6 presents the size, composition, and breakpoints of deciles 10a and 10b.

First, the recent number of companies and total decile market capitalization are presented. Then the largest company and its market capitalization are presented.

Breaking the smallest decile down lowers the significance of the results compared to results for the 10th decile taken as a whole, however. The same holds true for comparing the 10th decile with the Micro-Cap aggregation of the 9th and 10th deciles. The more stocks included in a sample the more significance can be placed on the results. While this is not as much of a factor with the recent years of data, these size premia are constructed with data back to 1926. By breaking the 10th decile down into smaller components we have cut the number of stocks included in each grouping. The change over time of the number of stocks included in the 10th decile for the NYSE/AMEX/NASDAQ is presented in Table 7-8. With fewer stocks included in the analysis early on, there is a strong possibility that just a few stocks can dominate the returns for those early years.

While the number of companies included in the 10th decile for the early years of our analysis is low, it is not too low to still draw meaningful results even when broken down into subdivisions 10a and 10b. All things considered, size premia developed for deciles 10a and 10b are significant and can be used in cost of capital analysis. These size premia should greatly enhance the development of cost of capital analysis for very small companies.

Table 7-7: Long-Term Returns in Excess of CAPM Estimation for Decile Portfolios of the NYSE/AMEX/NASDAQ, with 10th Decile Split

	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	10.75	5.56	5.91	-0.36
2	1.03	12.51	7.31	6.69	0.62
3	1.10	13.06	7.87	7.13	0.74
4	1.12	13.45	8.25	7.28	0.97
5	1.16	14.23	9.03	7.49	1.54
6	1.18	14.48	9.28	7.65	1.63
7	1.24	14.84	9.65	8.03	1.62
8	1.30	15.95	10.76	8.41	2.35
9	1.35	16.62	11.42	8.71	2.71
10a	1.42	18.49	13.29	9.19	4.11
10b-Smallest	1.38	23.68	18.48	8.95	9.53
Mid-Cap, 3–5	1.12	13.37	8.18	7.24	0.94
Low-Cap, 6–8	1.22	14.86	9.66	7.92	1.74
Micro-Cap, 9–10	1.36	17.72	12.52	8.79	3.74

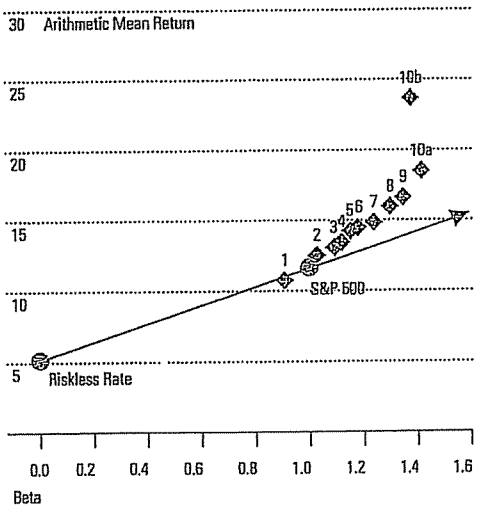
Data from 1926–2008. Source: Calculated (or Derived) based on data from CRSP US Stock Database and CRSP US Indices Database ©2009 Center for Research in Security Prices (CRSP®), The University of Chicago Booth School of Business. Used with permission.

*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 2008 .

**Historical riskless rate is measured by the 83-year arithmetic mean income return component of 20-year government bonds (5.20 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 (11.67 percent) minus the arithmetic mean income return component of 20-year government bonds (5.20 percent) from 1926–2008.

Graph 7-3: Security Market Line versus Size-Decile Portfolios of the NYSE/AMEX/NASDAQ, with 10th Decile Split‡



Data from 1926–2008.

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Table 7-8: Historical Number of Companies for NYSE/AMEX/NASDAQ Decile 10

Sept.	Number of Companies
1926	52*
1930	72
1940	78
1950	100
1960	109
1970	865
1980	685
1990	1,814
2000	1,927
2005	1,746
2006	1,744
2007	1,775
2008	1,626

Source: Calculated (or Derived) based on data from CRSP US Stock Database and CRSP US Indices Database ©2009 Center for Research in Security Prices (CRSP®), The University of Chicago Booth School of Business. Used with permission.

*The fewest number of companies was 49 in March, 1926

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.[5]

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 7-9 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 7-9 and depicted graphically in Graph 7-4.

Table 7-9: Long-Term Returns in Excess of CAPM Estimation for Decile Portfolios of the NYSE/AMEX/NASDAQ, with NYSE Market Benchmarks

	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	0.99	10.75	5.56	5.72	-0.16
2	1.11	12.51	7.31	6.45	0.86
3	1.18	13.06	7.87	6.81	1.05
4	1.20	13.45	8.25	6.97	1.28
5	1.23	14.23	9.03	7.14	1.89
6	1.26	14.48	9.28	7.28	2.00
7	1.32	14.84	9.65	7.63	2.01
8	1.38	15.95	10.76	8.00	2.76
9	1.42	16.62	11.42	8.25	3.17
10-Smallest	1.48	20.13	14.93	8.60	6.33
Mid-Cap, 3–5	1.19	13.37	8.18	6.92	1.26
Low-Cap, 6–8	1.30	14.86	9.66	7.54	2.12
Micro-Cap, 9–10	1.43	17.72	12.52	8.32	4.21

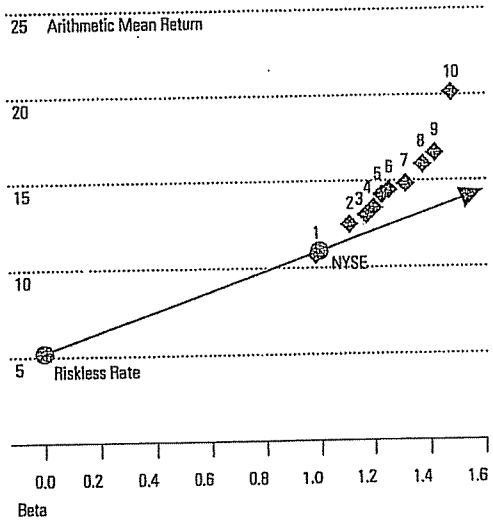
Data from 1926–2008. Source: Calculated (or Derived) based on data from CRSP US Stock Database and CRSP US Indices Database ©2009 Center for Research in Security Prices (CRSP®), The University of Chicago Booth School of Business. Used with permission.

*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 2008.

**Historical riskless rate is measured by the 83-year arithmetic mean income return component of 20-year government bonds (5.20 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 (11.67 percent) minus the arithmetic mean income return component of 20-year government bonds (5.20 percent) from 1926–2008.

Graph 7-4: Security Market Line versus Size-Decile Portfolios of the NYSE/AMEX/NASDAQ, with NYSE Market Benchmarks*



Data from 1926–2008.

For the entire period analyzed, 1926–2008, 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 5.80, as opposed to 6.47 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 7-9 are slightly higher than those resulting from the original study.

Measuring Beta with Sum Beta

The sum beta method attempts to provide a better measure of beta for small stocks by taking into account their lagged price reaction to movements in the market. [See Chapter 6.] Table 7-10 shows that using this method of beta estimation results in larger betas for the smaller size deciles of the NYSE/AMEX/NASDAQ while those of the larger size deciles remain relatively stable. From these results, it appears that the sum beta method corrects for possible errors that are made when estimating small company betas without adjusting for the lagged price reaction of small stocks. However, the sum beta, when applied to the CAPM, still does not account for all of the returns in excess of the riskless rate historically found for small stocks. Table 7-10 demonstrates that a size premium is still necessary to estimate the expected returns using sum beta in conjunction with the CAPM, though the premium is smaller than that needed when using the typical calculation of beta.

Graph 7-5 compares the 10 deciles of the NYSE/AMEX/NASDAQ to the security market line. There are two sets of decile portfolios—one set is plotted using the single variable regression method of calculating beta, as in Graph 7-2, and the second set uses the sum beta method. The portfolios plotted using sum beta more closely resemble the security market line. Again, this demonstrates that the sum beta method results in the desired effect: a higher estimate of returns for small companies. Yet the smaller portfolios still lie above the security market line, indicating that an additional premium may be required.

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Utilities

The utilities rating methodology encompasses two basic components: business risk analysis and financial analysis. Evaluation of industry characteristics, the utility's position within that industry, its regulation, and its management provides the context for assessing a firm's financial condition.

Historical analysis is a tool for identifying strengths and weaknesses, and provides a starting point for evaluating financial condition. Business position assessment is the qualitative measure of a utility's fundamental creditworthiness. It focuses on the forces that will shape the utilities' future.

Utilities credit analysis factors

Business risk	Financial risk
• Markets and service area economy	• Earnings protection
• Competitive position	• Capital structure
• Operations	• Cash flow adequacy
• Regulation	• Financial flexibility/capital attraction
• Management	
• Fuel, power, and water supply	
• Asset concentration	

The credit analysis of utilities is quickly evolving, as utilities are treated less as regulated monopolies and more as entities faced with a host of challengers in a competitive environment. Marketplace dynamics are supplanting the power of regulation, making it critically important to reduce costs and/or market new services in order to thwart competitors' inroads.

Markets and service area economy

Assessing service territory begins with the economic and demographic evaluation of the area in which the utility has its franchise. Strength of long-term demand for the product is examined from a macroeconomic perspective. This enables Standard & Poor's to evaluate the affordability of rates and the staying power of demand.

Standard & Poor's tries to discern any secular consumption trends and, more importantly, the reasons for them. Specific items examined include the size and growth rate of the market, strength of the franchise, historical and projected sales growth, income levels and trends in population, employment, and per capita income. A utility with a healthy economy and customer base—as illustrated by diverse employment opportunities, average or above-average wealth and income statistics, and low unemployment—will have a greater capacity to support its operations.

For electric and gas utilities, distribution by customer class is scrutinized to assess the depth and diversity of the utility's customer mix. For example, heavy industrial concentration is viewed cautiously, since a utility may have significant exposure to cyclical volatility. Alternatively, a large residential component yields a stable and more predictable revenue stream. The largest utility customers are identified to determine their importance to the bottom line and assess the risk of their loss and potential adverse effect on the utility's financial position. Credit concerns arise when individual customers represent more than 5% of revenues. The company or industry may play a significant role in the overall economic base of the service area. Moreover, large customers may turn to cogeneration or alternative power supplies to meet their energy needs, potentially leading to reduced cash flow for the utility (even in cases where a large customer pays discounted rates and is not a profitable account for the utility). Customer concentration is less significant for water and telecommunication utilities.

Competitive position

As competitive pressures have intensified in the utilities industry, Standard & Poor's analysis has deepened to include a more thorough review of competitive position.

Electric utility competition

For electric utilities, competitive factors examined include: percentage of firm wholesale revenues that are most vulnerable to competition; industrial load concentration; exposure of key customers to alternative suppliers; commercial concentrations; rates for various customer classes; rate design and flexibility; production costs, both marginal and fixed; the regional capacity situation; and transmission constraints. A regional focus is evident, but high costs and rates relative to national averages are also of significant concern because of the potential for electricity substitutes over time.

Mounting competition in the electric utility industry derives from excess generating capacity, lower barriers to entering the electric generating business, and marginal costs that are below embedded costs. Standard & Poor's has already witnessed declining prices in wholesale markets, as *de facto* retail competition is already being seen in several parts of the country. Standard & Poor's believes that over the coming years more and more customers will want and demand lower prices. Initial concerns focus on the largest industrial loads, but other customer classes will be increasingly vulnerable. Competition will not necessar-

ily be driven by legislation. Other pressures will arise from global competition and improving technologies, whether it be the declining cost of incremental generation or advances in transmission capacity or substitute energy sources like the fuel cell. It is impossible to say precisely when wide-open retail competition will occur; this will be evolutionary. However, significantly greater competition in retail markets is inevitable.

Gas utility competition

Similarly, gas utilities are analyzed with regard to their competitive standing in the three major areas of demand: residential, commercial, and industrial. Although regulated as holders of monopoly power, natural gas utilities have for some time been actively competing for energy market share with fuel oil, electricity, coal, solar, wood, etc. The long-term staying power of market demand for natural gas cannot be taken for granted. In fact, as the electric utility industry restructures and reduces costs, electric power will become more cost competitive and threaten certain gas markets. In addition, independent gas marketers have made greater inroads behind the city gate and are competing for large gas users. Moreover, the recent trend by state regulators to unbundle utility services is creating opportunities for outsiders to market niche products. Distributors still have the upper hand, but those who do not reduce and control costs, and thus rates, could find competition even more difficult.

Natural gas pipelines are judged to carry a somewhat higher business risk than distribution companies because they face competition in every one of their markets. To the extent a pipeline serves utilities versus industrial end users, its stability is greater. Over the next five years, pipeline competition will heat up since many service contracts with customers are expiring. Most distributor or end-use customers are looking to reduce pipeline costs and are working to improve their load factor to do so. Thus, pipelines will likely find it difficult to recontract all capacity in coming years. Being the pipeline of choice is a function of attractive transportation rates, diversity and quality of services provided, and capacity available in each particular market. In all cases though, periodic discounting of rates to retain customers will occur and put pressure on profitability.

Water utility competition

As the last true utility monopoly, water utilities face very little competition and there is currently no challenge to the continuation of franchise areas. The only exceptions have been cases where investor-owned water companies have been subject to condemnation and municipalization because of poor service or political motivations. In that regard, Standard & Poor's pays close attention to costs and rates in relation to neighboring utilities and national averages. (In contrast, the privatization of public water facilities has begun, albeit at a slower pace than anticipated. This is occurring mostly in the form of operating contracts and public/private partnerships, and not in asset transfers. This trend should continue as cities look for ways to balance their tight budgets.) Also, water utilities are not fully immune to the forces of competition; in a few instances wholesale customers can access more than one supplier.

Telephone competition

The Telecommunications Act of 1996 accelerates the continuing challenge to the local exchange companies' (LECs) century-old monopoly in the local loop. Competitive access providers (CAPs), both facilities-based and resellers, are aggressively pursuing customers, generally targeting metropolitan areas, and promising lower rates and better service.

Most long-distance calls are still originated and terminated on the local telephone company network. To complete such a call, the long-distance provider (including AT&T, MCI, Sprint and a host of smaller interexchange carriers or "IXCs") must pay the local telephone company a steep "access" fee to compensate the local phone company for the use of its local network. CAPs, in contrast, build or lease facilities that directly connect customers to their long-distance carrier, bypassing the local telephone company and avoiding access fees, and thereby can offer lower long-distance rates. But the LECs are not standing still; they are combating the loss of business to CAPs by lowering access fees, thereby reducing the economic incentive for a high usage long-distance customer to use a CAP. LECs are attempting to make up for the loss of revenues from lower access fees by increasing basic local service rates (or at least not lowering them), since basic service is far less subject to competition. LECs are improving operating efficiency and marketing high margin, value-added new services. Additionally, in the wake of the Telecommunications Act, LECs will capture at least some of the inter-LATA long-distance market. As a result of these initiatives, LECs continue to rebuild themselves—from the traditional utility monopoly to leaner, more marketing oriented organizations.

While LECs, and indeed all segments of the telecommunications sector, face increasing competition, there are favorable industry factors that tend to offset heightened business risk and auger for overall ratings stability for most LECs. Importantly, telecommunications is a declining-cost business. With increased deployment of fiber optics, the cost of transport has fallen dramatically and digital switching hardware and software have yielded more capable, trouble-free and cost-efficient networks. As a result, the cost of network maintenance has dropped sharply, as illustrated by the ratio of employees per 10,000 access lines, an oft cited measurement of efficiency. Ratios as low as 25 employees per 10,000 lines are being seen, down from the typical 40 or more employees per 10,000 ratio of only a few years ago.

In addition, networks are far more capable. They are increasingly digitally switched and able to accommodate high-speed communications. The infrastructure needed to accommodate switched broadband services will be built into telephone networks over the next few years. These advanced networks will enable telephone companies to look to a greater variety of high-margin, value-added serv-

ices. In addition to those current services such as call waiting or caller ID, the delivery of hundreds of broadcast and interactive video channels will be possible. While these services offer the potential of new revenue streams, they will simultaneously present a formidable challenge. LECs will be entering the new (to them) arena of multimedia entertainment and will have to develop expertise in marketing and entertainment programming acumen; such skills stand in sharp contrast to LECs' traditional strengths in engineering and customer service.

Operations

Standard & Poor's focuses on the nature of operations from the perspective of cost, reliability, and quality of service. Here, emphasis is placed on those areas that require management attention in terms of time or money and which, if unresolved, may lead to political, regulatory, or competitive problems.

Operations of electric utilities

For electrics, the status of utility plant investment is reviewed with regard to generating plant availability and utilization, and also for compliance with existing and contemplated environmental and other regulatory standards. The record of plant outages, equivalent availability, load factors, heat rates, and capacity factors are examined. Also important is efficiency, as defined by total megawatt hour per employee and customers per employee. Transmission interconnections are evaluated in terms of the number of utilities to which the utility in question has access, the cost structures and available generating capacity of these other utilities, and the price paid for wholesale power.

Because of mounting competition and the substantial escalation in decommissioning estimates, significant weight is given to the operation of nuclear facilities. Nuclear plants are becoming more vulnerable to high production costs that make their rates uneconomic. Significant asset concentration may expose the utility to poor performance, unscheduled outages or premature shutdowns, and large deferrals or regulatory assets that may need to be written off for the utility to remain competitive. Also, nuclear facilities tend to represent significant portions of their operators' generating capability and assets. The loss of a productive nuclear unit from both power supply and rate base can interrupt the revenue stream and create substantial additional costs for repairs and improvements and replacement power. The ability to keep these stations running smoothly and economically directly influences the ability to meet electric demand, the stability of revenues and costs, and, by extension, the ability to maintain adequate creditworthiness. Thus, economic operation, safe operation, and long-term operation are examined in depth. Specifically, emphasis is placed on operation and maintenance costs, busbar costs, fuel costs, refueling outages, forced outages, plant statistics, NRC evaluations, the potential need for repairs, operating licenses, decommissioning estimates and amounts held in external trusts, spent fuel storage capacity, and management's nuclear experience. In essence, favorable nuclear operations offer significant opportunities but, if a nuclear unit runs poorly or not at all, the attendant risks can be great.

Operations of gas utilities

For gas pipeline and distribution companies, the degree of plant utilization, the physical condition of the mains and lines, adequacy of storage to meet seasonal needs, "lost and unaccounted for" gas levels, and per-unit nongas operating and construction costs are important factors. Efficiency statistics such as load factor, operating costs per customer, and operating income per employee are also evaluated in comparison to other utilities and the industry as a whole.

Operations of water utilities

As a group, water utilities are continually upgrading their physical plant to satisfy regulations and to develop additional supply. Over the next decade, water systems will increasingly face the task of maintaining compliance, as drinking water regulations change and infrastructure ages. Given that the Safe Drinking Water Act was authorized in 1974, the first generation of treatment plants built to conform with these rules are almost 20 years old. Additionally, because the focus during this period was on satisfying environmental standards, deferred maintenance of distribution systems has been common, especially in older urban areas. The increasing cost of supplying treated water argues against the high level of unaccounted for water witnessed in the industry. Consequently, Standard & Poor's anticipates capital plans for rebuilding distribution lines and major renewal and replacement efforts aimed at treatment plants.

Operations of telephone companies

For telephone companies, cost-of-service analysis focuses on plant capability and measures of efficiency and quality of service. Plant capability is ascertained by looking at such parameters as percentage of digitally switched lines; fiber optic deployment, in particular in those portions of the plant key to network survival; and the degree of broadband capacity fiber and coaxial deployment and broadband switching capacity. Efficiency measures include operating margins, the ratio of employees per 10,000 access lines, and the extent of network and operations consolidation. Quality of service encompasses examination of quantitative measures, such as trouble reports and repeat service calls, as well as an assessment of qualitative factors, that may include service quality goals mandated by regulators.

Regulation

Regulatory rate-setting actions are reviewed on a case-by-case basis with regard to the potential effect on creditworthiness. Regulators' authorizing high rates of return is of little value unless the returns are earnable. Furthermore, allowing high returns based on noncash items does not benefit bondholders. Also, to be viewed positively, regulatory treatment should allow consistent performance from

period to period, given the importance of financial stability as a rating consideration.

The utility group meets frequently with commission and staff members, both at Standard & Poor's offices and at commission headquarters, demonstrating the importance Standard & Poor's places on the regulatory arena for credit quality evaluation. Input from these meetings and from review of rate orders and their impact weigh heavily in Standard & Poor's analysis.

Standard & Poor's does not "rate" regulatory commissions. State commissions typically regulate a number of diverse industries, and regulatory approaches to different types of companies often differ within a single regulatory jurisdiction. This makes it all but impossible to develop inclusive "ratings" for regulators.

Standard & Poor's evaluation of regulation also encompasses the administrative, judicial, and legislative processes involved in state and federal regulation. These can affect rate-setting activities and other aspects of the business, such as competitive entry, environmental and safety rules, facility siting, and securities sales.

As the utility industry faces an increasingly deregulated environment, alternatives to traditional rate-making are becoming more critical to the ability of utilities to effectively compete, maintain earnings power, and sustain creditor protection. Thus, Standard & Poor's focuses on whether regulators, both state and federal, will help or hinder utilities as they are exposed to greater competition. There is much that regulators can do, from allocating costs to more captive customers to allowing pricing flexibility—and sometimes just stepping out of the way.

Under traditional rate-making, rates and earnings are tied to the amount of invested capital and the cost of capital. This can sometimes reward companies more for justifying costs than for containing them. Moreover, most current regulatory policies do not permit utilities to be flexible when responding to competitive pressures of a deregulated market. Lack of flexible tariffs for electric utilities may lure large customers to wheel cheaper power from other sources.

In general, a regulatory jurisdiction is viewed favorably if it permits earning a return based on the ability to sustain rates at competitive levels. In addition to performance-based rewards or penalties, flexible plans could include market-based rates, price caps, index-based prices, and rates premised on the value of customer service. Such rates more closely mirror the competitive environment that utilities are confronting.

Electric industry regulation

The ability to enter into long-term arrangements at negotiated rates without having to seek regulatory approval for each contract is also important in the electric industry. (While contracting at reduced rates constrains financial performance, it lessens the potential adverse impact in the event of retail wheeling. Since revenue losses associated with this strategy are not likely to be recovered from ratepayers, utilities must control costs well enough to remain competitive if they are to sustain current levels of bondholder protection.)

Natural gas industry regulation

In the gas industry, too, several state commission policies weigh heavily in the evaluation of regulatory support. Examples include stabilization mechanisms to adjust revenues for changes in weather or the economy, rate and service unbundling decisions, revenue and cost allocation between sales and transportation customers, flexible industrial rates, and the general supportiveness of construction costs and gas purchases.

Water industry regulation

In all water utility activities, federal and state environmental regulations continue to play a critical role. The legislative timetable to effect the 1986 amendments to the Safe Drinking Water Act of 1974 was quite aggressive. But environmental standards-setting has actually slowed over the past couple of years due largely to increasing sentiment that the stringent, costly standards have not been justified on the basis of public health. A moratorium on the promulgation of significant new environmental rules is anticipated.

Telecommunications industry regulation

Despite the advances in telecommunications deregulation, analysis of regulation of telephone operators will continue to be a key rating determinant for the foreseeable future. The method of regulation may be either classic rate-based rate of return or some form of price cap mechanism. The most important factor is to assess whether the regulatory framework—no matter which type—provides sufficient financial incentive to encourage the rated company to maintain its quality of service and to upgrade its plant to accommodate new services while facing increasing competition from wireless operators and cable television companies.

Where regulators do still set tariffs based on an authorized return, Standard & Poor's strives to explore with regulators their view of the rate-of-return components that can materially impact reported versus regulatory earnings. Specifically these include the allowable base upon which the authorized return can be earned, allowable expenses, and the authorized return. Since regulatory oversight runs the gamut from strict, adversarial relationships with the regulated operating companies to highly supportive postures, Standard & Poor's probes beyond the apparent regulatory environment to ascertain the actual impact of regulation on the rated company.

Management

Evaluating the management of a utility is of paramount importance to the analytical process since management's abilities and decisions affect all areas of a company's operations. While regulation, the economy, and other outside factors can influence results, it is ultimately the quality of management that determines the success of a company.

With emerging competition, utility management will be more closely scrutinized by Standard & Poor's and will become an increasingly critical component of the credit evaluation. Management strategies can be the key determinant in differentiating utilities and in establishing where companies lie on the business position spectrum. It is imperative that managements be adaptable, aggressive, and proactive if their utilities are to be viable in the future; this is especially important for utilities that are currently uncompetitive.

The assessment of management is accomplished through meetings, conversations, and reviews of company plans. It is based on such factors as tenure, industry experience, grasp of industry issues, knowledge of customers and their needs, knowledge of competitors, accounting and financing practices, and commitment to credit quality. Management's ability and willingness to develop workable strategies to address their systems' needs, to deal with the competitive pressures of free market, to execute reasonable and effective long-term plans, and to be proactive in leading their utilities into the future are assessed. Management quality is also indicated by thoughtful balancing of public and private priorities, a record of credibility, and effective communication with the public, regulatory bodies, and the financial community. Boards of directors will receive ever more attention with respect to their role in setting appropriate management incentives.

With competition the watchword, Standard & Poor's also focuses on management's efforts to enhance financial condition. Management can bolster bondholder protection by taking any number of discretionary actions, such as selling common equity, lowering the common dividend payout, and paying down debt. Also important for the electric industry will be creativity in entering into strategic alliances and working partnerships that improve efficiency, such as central dispatching for a number of utilities or locking up at-risk customers through long-term contracts or expanded flexible pricing agreements. Proactive management teams will also seek alternatives to traditional rate-base, rate-of-return rate-making, move to adopt higher depreciation rates for generating facilities, segment customers by individual market preferences, and attempt to create superior service organizations.

In general, management's ability to respond to mounting competition and changes in the utility industry in a swift and appropriate manner will be necessary to maintain credit health.

Fuel, power, and water supply

Assessment of present and prospective fuel and power supply is critical to every electric utility analysis, while gauging the long-term natural gas supply position for gas pipeline and distribution companies and the water resources of a water utility is equally important. There is no similar analytical category for telephone utilities.

Electric utilities

For electric utilities emphasis is placed on generating reserve margins, fuel mix, fuel contract terms, demand-side management techniques, and purchased power arrangements. The adequacy of generating margins is examined nationally, regionally, and for each individual company. However, the reserve margin picture is muddied by the imprecise nature of peak-load growth forecasting, and also supply uncertainty relating to such things as Canadian capacity availability and potential plant shutdowns due to age, new NRC rules, acid rain remedies, fuel shortages, problems associated with nontraditional technologies, and so forth. Even apparently ample reserves may not be what they seem. Moreover, the quality of capacity is just as important as the size of reserves. Companies' reserve requirements differ, depending upon individual operating characteristics.

Fuel diversity provides flexibility in a changing environment. Supply disruptions and price hikes can raise rates and ignite political and regulatory pressures that ultimately lead to erosion in financial performance. Thus, the ability to alter generating sources and take advantage of lower cost fuels is viewed favorably.

Dependence on any single fuel means exposure to that fuel's problems: electric utilities that rely on oil or gas face the potential for shortages and rapid price increases; utilities that own nuclear generating facilities face escalating costs for decommissioning; and coal-fired capacity entails environmental problems stemming from concerns over acid rain and the "greenhouse effect."

Buying power from neighboring utilities, qualifying facility projects, or independent power producers may be the best choice for a utility that faces increasing electricity demand. There has been a growing reliance on purchased power arrangements as an alternative to new plant construction. This can be an important advantage, since the purchasing utility avoids potential construction cost overruns as well as risking substantial capital. Also, utilities can avoid the financial risks typical of a multiyear construction program that are caused by regulatory lag and prudence reviews. Furthermore, purchased power may enhance supply flexibility, fuel resource diversity, and maximize load factors. Utilities that plan to meet demand projections with a portfolio of supply-side options also may be better able to adapt to future growth uncertainties. Notwithstanding the benefits of purchasing, such a strategy has risks associated with it. By entering into a firm long-term purchased power contract that contains a fixed-cost component, utilities can incur substantial market, operating, regulatory, and financial risks. Moreover, regulatory treatment of purchased power removes any upside potential that might help offset the risks. Utilities are not compensated through incentive rate-making; rather, purchased power is recovered dollar-for-dollar as an operating expense.

To analyze the financial impact of purchased power, Standard & Poor's first calculates the net present value of future annual capacity payments (discounted at 10%). This represents a potential debt equivalent—the off-balance-sheet obligation that a utility incurs when it enters into a long-term purchased power contract. However, Standard

& Poor's adds to the utility's balance sheet only a portion of this amount, recognizing that such a contractual arrangement is not entirely the equivalent of debt. What percentage is added is a function of Standard & Poor's qualitative analysis of the specific contract and the extent to which market, operating, and regulatory risks are borne by the utility (the risk factor). For unconditional, take-or-pay contracts, the risk factor range is from 40%-80%, with the average hovering around 60%. A lower risk factor is typically assigned for system purchases from coal-fired utilities and a higher risk factor is usually designated for unit-specific nuclear purchases. The range for take-and-pay performance obligations is between 10%-50%.

Gas utilities

For gas distribution utilities, long-term supply adequacy obviously is critical, but the supply role has become even more important in credit analysis since the Federal Energy Regulatory Commission's Order 636 eliminated the interstate pipeline merchant business. This thrust gas supply responsibilities squarely on local gas distributors. Standard & Poor's has always believed distributor management has the expertise and wherewithal to perform the job well, but the risks are significant since gas costs are such a large percentage of total utility costs. In that regard, it is important for utilities to get preapprovals of supply plans by state regulators or at least keep the staff and commissioners well informed. To minimize risks, a well-run program would diversify gas sources among different producers or marketers, different gas basins in the U.S. and Canada, and different pipeline routes. Also, purchase contracts should be firm, with minimal take-or-pay provisions, and have prices tied to an industry index. A modest percentage of fixed-price gas is not unreasonable. Contracts, whether of gas purchases or pipeline capacity, should be intermediate term. Staggering contract expirations (preferably annually) provides an opportunity to be an active market player. A modest degree of reliance on spot purchases provides flexibility, as does the use of market-based storage. Gas storage and on-property gas resources such as liquefied natural gas or propane air are effective peak-day and peak-season supply management tools.

Since pipeline companies no longer buy and sell natural gas and are just common carriers, connections with varied reserve basins and many wells within those basins are of great importance. Diversity of sources helps offset the risks arising from the natural production declines eventually experienced by all reserve basins and individual wells. Moreover, such diversity can enhance a pipeline's attractiveness as a transporter of natural gas to distributors and end users seeking to buy the most economical gas available for their needs.

Water utilities

Nearly all water systems throughout the U.S. have ample long-term water supplies. Yet to gain comfort, Standard & Poor's assesses the production capability of treatment plants and the ability to pump water from underground aquifers in relation to the usage demands from consumers. Having adequate treated water storage facilities has become important in recent years and has helped many systems meet demands during peak summer periods. Of interest is whether the resources are owned by the utility or purchased from other utilities or local authorities. Owning properties with water rights provides more supply security. This is especially so in states like California where water allocations are being reduced, particularly since recent droughts and environmental issues have created alarm. Since the primary cost for water companies is treatment, it makes little difference whether raw water is owned or bought. In fact, compliance with federal and state water regulations is very high, and the overall cost to deliver treated water to consumers remains relatively affordable.

Asset concentration in the electric utility industry

In the electric industry, Standard & Poor's follows the operations of major generating facilities to assess if they are well managed or troubled. Significant dependence on one generating facility or a large financial investment in a single asset suggests high risk. The size or magnitude of a particular asset relative to total generation, net plant in service, and common equity is evaluated. Where substantial asset concentration exists, the financial profile of a company may experience wide swings depending on the asset's performance. Heavy asset concentration is most prevalent among utilities with costly nuclear units.

Earnings protection

In this category, pretax cash income coverage of all interest charges is the primary ratio. For this calculation, allowance for funds used during construction (AFUDC) is removed from income and interest expense. AFUDC and other such noncash items do not provide any protection for bondholders. To identify total interest expense, the analyst reclassifies certain operating expenses. The interest component of various off-balance-sheet obligations, such as leases and some purchased-power contracts, is included in interest expense. This provides the most direct indication of a utility's ability to service its debt burden.

While considerable emphasis in assessing credit protection is placed on coverage ratios, this measure does not provide the entire earnings protection picture. Also important are a company's earned returns on both equity and capital, measures that highlight a firm's earnings performance. Consideration is given to the interaction of embedded costs, financial leverage, and pretax return on capital.

Capital structure

Analyzing debt leverage goes beyond the balance sheet and covers quasi-debt items and elements of hidden financial leverage. Noncapitalized leases (including sale/leaseback obligations), debt guarantees, receivables financing, and purchased-power contracts are all considered debt equivalents and are reflected as debt in calculating capital

structure ratios. By making debt level adjustments, the analyst can compare the degree of leverage used by each utility company.

Furthermore, assets are examined to identify undervalued or overvalued items. Assets of questionable value are discounted to more accurately evaluate asset protection.

Some firms use short-term debt as a permanent piece of their capital structure. Short-term debt also is considered part of permanent capital when it is used as a bridge to permanent financing. Seasonal, self-liquidating debt is excluded from the permanent debt amount, but this situation is rare—with the exception of certain gas utilities. Given the long life of almost all utility assets, short-term debt may expose these companies to interest-rate volatility, remarketing risk, bank line backup risk, and regulatory exposure that cannot be readily offset. The lower cost of shorter-term obligations (assuming a positively sloped yield curve) is a positive factor that partially mitigates the risk of interest-rate variability. As a rule of thumb, a level of short-term debt that exceeds 10% of total capital is cause for concern.

Similarly, if floating-rate debt and preferred stock constitute over one-third of total debt plus preferred stock, this level is viewed as unusually high and may be cause for concern. It might also indicate that management is aggressive in its financial policies.

A layer of preferred stock in the capital structure is usually viewed as equity—since dividends are discretionary and the subordinated claim on assets provides a cushion for providers of debt capital. A preferred component of up to 10% is typically viewed as a permanent wedge in the capital structure of utilities. However, as rate-of-return regulation is phased out, preferred stock may be viewed by utilities—as many industrial firms would—as a temporary option for companies that are not current taxpayers that do not benefit from the tax deductibility of interest. Even now, floating-rate preferred and money market perpetual preferred are problematic; a rise in the rate due to deteriorating credit quality tends to induce a company to take out such preferred stock with debt. Structures that convey tax deductibility to preferred stock have become very popular and do generally afford such financings with equity treatment.

Cash flow adequacy

Cash flow adequacy relates to a company's ability to generate funds internally relative to its needs. It is a basic component of credit analysis because it takes cash to pay expenses, fund capital spending, pay dividends, and make interest and principal payments. Since both common and preferred dividend payments are important to maintain capital market access, Standard & Poor's looks at cash flow measures both before and after dividends are paid.

To determine cash flow adequacy, several quantitative relationships are examined. Emphasis is placed on cash flow relative to debt, debt service requirements, and capital spending. Cash flow adequacy is evaluated with respect to a firm's ability to meet all fixed charges, including capacity payments under purchased-power contracts. Despite the conditional nature of some contracts, the purchaser is obligated to pay a minimum capacity charge. The ratio used is funds from operations plus interest and capacity payments divided by interest plus capacity payments.

Financial flexibility/capital attraction

Financing flexibility incorporates a utility's financing needs, plans, and alternatives, as well as its flexibility to accomplish its financing program under stress without damaging creditworthiness. External funding capability complements internal cash flow. Especially since utilities are so capital intensive, a firm's ability to tap capital markets on an ongoing basis must be considered. Debt capacity reflects all the earlier elements: earnings protection, debt leverage, and cash flow adequacy. Market access at reasonable rates is restricted if a reasonable capital structure is not maintained and the company's financial prospects dim. The analyst also reviews indenture restrictions and the impact of additional debt on covenant tests.

Standard & Poor's assesses a company's capacity and willingness to issue common equity. This is affected by various factors, including the market-to-book ratio, dividend policy, and any regulatory restrictions regarding the composition of the capital structure.

STANDARD &POOR'S

RATINGSDIRECT®

May 27, 2009

Criteria | Corporates | General:

Criteria Methodology: Business Risk/Financial Risk Matrix Expanded

Primary Credit Analysts:
Solomon B Samson, New York (1) 212-438-7653; sol_samson@standardandpoors.com
Emmanuel Dubois-Pelerin, Paris (33) 1-4420-6673; emmanuel_dubois-pelerin@standardandpoors.com

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Criteria | Corporates | General:

Criteria Methodology: Business Risk/Financial Risk Matrix Expanded

(Editor's Note: In the previous version of this article published on May 26, certain of the rating outcomes in the table 1 matrix were missated. A corrected version follows.)

Standard & Poor's Ratings Services is refining its methodology for corporate ratings related to its business risk/financial risk matrix, which we published as part of 2008 Corporate Ratings Criteria on April 15, 2008, on RatingsDirect at www.ratingsdirect.com and Standard & Poor's Web site at www.standardandpoors.com.

This article amends and supersedes the criteria as published in Corporate Ratings Criteria, page 21, and the articles listed in the "Related Articles" section at the end of this report.

This article is part of a broad series of measures announced last year to enhance our governance, analytics, dissemination of information, and investor education initiatives. These initiatives are aimed at augmenting our independence, strengthening the rating process, and increasing our transparency to better serve the global markets.

We introduced the business risk/financial risk matrix four years ago. The relationships depicted in the matrix represent an essential element of our corporate analytical methodology.

We are now expanding the matrix, by adding one category to both business and financial risks (see table 1). As a result, the matrix allows for greater differentiation regarding companies rated lower than investment grade (i.e., 'BB' and below).

Table 1

Business And Financial Risk Profile Matrix

Business Risk Profile	Financial Risk Profile					
	Minimal	Modest	Intermediate	Significant	Aggressive	Highly Leveraged
Excellent	AAA	AA	A	A-	BBB	--
Strong	AA	A	A-	BBB	BB	BB-
Satisfactory	A-	BBB+	BBB	BB+	BB-	B+
Fair	--	BBB-	BB+	BB	BB-	B
Weak	--	--	BB	BB-	B+	B-
Vulnerable	--	--	--	B+	B	CCC+

These rating outcomes are shown for guidance purposes only. Actual rating should be within one notch of indicated rating outcomes.

The rating outcomes refer to issuer credit ratings. The ratings indicated in each cell of the matrix are the midpoints of a range of likely rating possibilities. This range would ordinarily span one notch above and below the indicated rating.

Business Risk/Financial Risk Framework

Our corporate analytical methodology organizes the analytical process according to a common framework, and it divides the task into several categories so that all salient issues are considered. The first categories involve fundamental business analysis; the financial analysis categories follow.

Our ratings analysis starts with the assessment of the business and competitive profile of the company. Two companies with identical financial metrics can be rated very differently, to the extent that their business challenges and prospects differ. The categories underlying our business and financial risk assessments are:

Business risk

- Country risk
- Industry risk
- Competitive position
- Profitability/Peer group comparisons

Financial risk

- Accounting
- Financial governance and policies/risk tolerance
- Cash flow adequacy
- Capital structure/asset protection
- Liquidity/short-term factors

We do not have any predetermined weights for these categories. The significance of specific factors varies from situation to situation.

Updated Matrix

We developed the matrix to make explicit the rating outcomes that are typical for various business risk/financial risk combinations. It illustrates the relationship of business and financial risk profiles to the issuer credit rating.

We tend to weight business risk slightly more than financial risk when differentiating among investment-grade ratings. Conversely, we place slightly more weight on financial risk for speculative-grade issuers (see table 1, again). There also is a subtle compounding effect when both business risk and financial risk are aligned at extremes (i.e., excellent/minimal and vulnerable/highly leveraged.)

The new, more granular version of the matrix represents a refinement--not any change in rating criteria or standards--and, consequently, holds no implications for any changes to existing ratings. However, the expanded matrix should enhance the transparency of the analytical process.

Financial Benchmarks

Table 2

Financial Risk Indicative Ratios (Corporates)

	FFO/Debt (%)	Debt/EBITDA (x)	Debt/Capital (%)
Minimal	greater than 60	less than 1.5	less than 25
Modest	45-60	1.5-2	25-35
Intermediate	30-45	2-3	35-45
Significant	20-30	3-4	45-50
Aggressive	12-20	4-5	50-60
Highly Leveraged	less than 12	greater than 5	greater than 60

How To Use The Matrix--And Its Limitations

The rating matrix indicative outcomes are what we typically observe--but are not meant to be precise indications or guarantees of future rating opinions. Positive and negative nuances in our analysis may lead to a notch higher or lower than the outcomes indicated in the various cells of the matrix.

In certain situations there may be specific, overarching risks that are outside the standard framework, e.g., a liquidity crisis, major litigation, or large acquisition. This often is the case regarding credits at the lowest end of the credit spectrum--i.e., the 'CCC' category and lower. These ratings, by definition, reflect some impending crisis or acute vulnerability, and the balanced approach that underlies the matrix framework just does not lend itself to such situations.

Similarly, some matrix cells are blank because the underlying combinations are highly unusual--and presumably would involve complicated factors and analysis.

The following hypothetical example illustrates how the tables can be used to better understand our rating process (see tables 1 and 2).

We believe that Company ABC has a satisfactory business risk profile, typical of a low investment-grade industrial issuer. If we believed its financial risk were intermediate, the expected rating outcome should be within one notch of 'BBB'. ABC's ratios of cash flow to debt (35%) and debt leverage (total debt to EBITDA of 2.5x) are indeed characteristic of intermediate financial risk.

It might be possible for Company ABC to be upgraded to the 'A' category by, for example, reducing its debt burden to the point that financial risk is viewed as minimal. Funds from operations (FFO) to debt of more than 60% and debt to EBITDA of only 1.5x would, in most cases, indicate minimal.

Conversely, ABC may choose to become more financially aggressive--perhaps it decides to reward shareholders by borrowing to repurchase its stock. It is possible that the company may fall into the 'BB' category if we view its financial risk as significant. FFO to debt of 20% and debt to EBITDA 4x would, in our view, typify the significant financial risk category.

Still, it is essential to realize that the financial benchmarks are guidelines, neither gospel nor guarantees. They can vary in nonstandard cases: For example, if a company's financial measures exhibit very little volatility, benchmarks may be somewhat more relaxed.

Moreover, our assessment of financial risk is not as simplistic as looking at a few ratios. It encompasses:

- a view of accounting and disclosure practices;
- a view of corporate governance, financial policies, and risk tolerance;
- the degree of capital intensity, flexibility regarding capital expenditures and other cash needs, including acquisitions and shareholder distributions; and
- various aspects of liquidity--including the risk of refinancing near-term maturities.

The matrix addresses a company's standalone credit profile, and does not take account of external influences, which would pertain in the case of government-related entities or subsidiaries that in our view may benefit or suffer from affiliation with a stronger or weaker group. The matrix refers only to local-currency ratings, rather than foreign-currency ratings, which incorporate additional transfer and convertibility risks. Finally, the matrix does not apply to project finance or corporate securitizations.

Related Articles

Industrials' Business Risk/Financial Risk Matrix--A Fundamental Perspective On Corporate Ratings, published April 7, 2005, on RatingsDirect.

Missouri-American Water Company
Capitalization and Financial Statistics
2002-2006, Inclusive

Notes:

(1) All capitalization and financial statistics are based upon financial statements as originally reported in each year.

(2) Computed by relating actual total debt interest or preferred stock dividends booked to average of beginning and ending total debt or preferred stock reported to be outstanding.

(3) Funds from operations (sum of net income, depreciation, amortization, net deferred income tax and investment tax credits, less total AFUDC) plus interest charges divided by interest charges.

(4) Funds from operations (as defined in Note 3) as a percentage of total debt.

Source of Information: Missouri-American Annual Reports to the Public Service Commission of the State of Missouri and Audited Financial Statements

MISSOURI-AMERICAN WATER COMPANY
CAPITALIZATION AND FINANCIAL STATISTICS (1)
2000 - 2004, INCLUSIVE

	2008	2007	2006	2005	2004	
			(MILLIONS OF DOLLARS)			
CAPITALIZATION STATISTICS						
AMOUNT OF CAPITAL EMPLOYED						
TOTAL PERMANENT CAPITAL	$725.243	$617.550	$510.163	$508.792	$515.396	
SHORT-TERM DEBT	54.280	66.810	62.875	24.530	21.475	
TOTAL-CAPITAL EMPLOYED	$779.523	$684.360	$573.038	$533.322	$536.871	
INDICATED AVERAGE CAPITAL COST RATES (2)						
TOTAL DEBT	5.50 %	5.44 %	5.80 %	5.83 %	5.84 %	
						5 YEAR AVERAGE
DIVIDEND PAYOUT RATIO	70.80 %	54.27 %	78.43 %	103.95 %	69.34 %	75.36 %
CAPITAL STRUCTURE RATIOS						
BASED ON TOTAL PERMANENT CAPITAL:						
LONG-TERM DEBT	53.21 %	51.17 %	55.70 %	55.87 %	56.26 %	54.44 %
MINORITY INTEREST	0.36	0.43	0.52	0.52	0.52	0.47
COMMON EQUITY	46.43	48.40	43.78	43.61	43.22	45.09
TOTAL	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
BASED ON TOTAL CAPITAL:						
TOTAL DEBT, INCLUDING SHORT-TERM	56.46 %	55.95 %	60.56 %	57.90 %	58.01 %	57.77 %
MINORITY INTEREST	0.34	0.38	0.46	0.50	0.50	0.44
COMMON EQUITY	43.20	43.67	38.98	41.60	41.49	41.79
TOTAL	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
DIVIDEND PAYOT RATIO	72.49 %	55.05 %	79.49 %	105.57 %	70.13 %	76.55 %
RATE OF RETURN ON AVERAGE COMMON EQUITY	3.13 %	6.28 %	7.71 %	9.51 %	6.75 %	6.68 %
TOTAL DEBT / EBITDA (3)	5.58 x	5.85 x	5.58 x	5.19 x	4.70 x	5.38 x
FUNDS FROM OPERATIONS / TOTAL DEBT(4)	12.00 %	10.48 %	6.50 %	17.28 %	13.62 %	11.98 %
TOTAL DEBT / TOTAL CAPITAL	56.46 %	55.95 %	60.56 %	57.90 %	58.01 %	57.78 %

Notes:

(1) All capitalization and financial statistics for the group are the arithmetic average of the achieved results for each individual company in the group, and are based upon financial statements as originally reported in each year.

(2) Computed by relating actual total debt interest or preferred stock dividends booked to average of beginning and ending total debt or preferred stock reported to be outstanding.

(3) Total debt as a percentage of EBITDA (Earnings before Interest, Income Taxes, Depreciation and Amortization)

(4) Funds from operations (as defined in Note 3) as a percentage of total debt.

Proxy Group of Six AUS Utility Reports Water Companies
Capitalization and Financial Statistics (1)
2004 - 2008, Inclusive

	2008	2007	2006	2005	2004	
			(MILLIONS OF DOLLARS)			
CAPITALIZATION STATISTICS						
AMOUNT OF CAPITAL EMPLOYED						
TOTAL PERMANENT CAPITAL	$748.685	$721.911	$653.390	$583.318	$547.791	
SHORT-TERM DEBT	$40.928	$18.061	$27.775	$29.466	$23.519	
TOTAL CAPITAL EMPLOYED	$789.613	$739.973	$681.165	$612.784	$571.310	
INDICATED AVERAGE CAPITAL COST RATES (2)						
TOTAL DEBT	5.86 %	6.24 %	6.50 %	6.26 %	6.28 %	
PREFERRED STOCK	2.98	5.34	5.34	5.33	3.56	
CAPITAL STRUCTURE RATIOS						5 YEAR AVERAGE
BASED ON TOTAL PERMANENT CAPITAL:						
LONG-TERM DEBT	48.80 %	49.03 %	47.38 %	50.03 %	50.00 %	49.05 %
PREFERRED STOCK	0.22	0.34	0.35	0.40	0.44	0.35
COMMON EQUITY	50.98	50.63	52.27	49.57	49.56	50.60
TOTAL	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
BASED ON TOTAL CAPITAL:						
TOTAL DEBT, INCLUDING SHORT-TERM	51.95 %	50.21 %	48.69 %	51.69 %	51.49 %	50.81 %
PREFERRED STOCK	0.20	0.34	0.35	0.40	0.42	0.34
COMMON EQUITY	47.85	49.45	50.96	47.91	48.09	48.85
TOTAL	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
FINANCIAL STATISTICS						
FINANCIAL RATIOS - MARKET BASED						
EARNINGS / PRICE RATIO	4.39 %	3.65 %	3.95 %	4.18 %	4.63 %	4.16 %
MARKET / AVERAGE BOOK RATIO	205.16	253.37	276.96	261.23	229.28	245.20
DIVIDEND YIELD	3.16	2.61	2.51	2.77	3.17	2.84
DIVIDEND PAYOUT RATIO	71.25	70.28	67.76	66.71	70.07	69.21
RATE OF RETURN ON AVERAGE BOOK COMMON EQUITY	8.98 %	9.09 %	10.64 %	10.53 %	10.32 %	9.91 %
TOTAL DEBT / EBITDA (3)	3.97 X	3.65 X	3.52 X	3.62 X	3.78 X	3.71 X
FUNDS FROM OPERATIONS / TOTAL DEBT (4)	18.49 %	16.80 %	21.00 %	19.35 %	20.42 %	19.21 %
TOTAL DEBT / TOTAL CAPITAL	51.95 %	50.21 %	48.69 %	51.69 %	51.49 %	50.81 %

See Page 2 for notes.

Proxy Group of Six AUS Utility Reports Water Companies
Capitalization and Financial Statistics
2004-2008, Inclusive

Notes:

(1) All capitalization and financial statistics for the group are the arithmetic average of the achieved results for each individual company in the group, and are based upon financial statements as originally reported in each year.

(2) Computed by relating actual total debt interest or preferred stock dividends booked to average of beginning and ending total debt or preferred stock reported to be outstanding.

(3) Total debt as a percentage of EBITDA (Earnings before Interest, Income Taxes, Depreciation and Amortization).

(4) Funds from operations (as defined in Note 3) as a percentage of total debt.

Selection Criteria:

The basis of selection was to include those water companies: 1) which are included in the Water Company Group of AUS Utility Reports (September 2009); 2) which have Value Line five-year EPS growth rate projections or Reuters consensus five-year EPS growth rate projections; 3) which have positive Value Line five-year DPS growth rate projections; 4) which have a Value Line adjusted beta as published in Value Line Investment Survey; 5) which have not cut or omitted their common dividends during the five years ending 2008 or through the time of the preparation of this testimony; 6) which have 60% or greater of 2008 total net operating income derived from and 60% or greater of 2008 total assets devoted to regulated water operations; and 7) which at the time of the preparation of Ms. Ahern's accompanying direct testimony, had not publicly announced that they were involved in any major merger or acquisition activity.

The following six water companies met the above criteria:

American States Water Co.
Aqua America, Inc.
California Water Service Group
Middlesex Water Company
SJW Corporation
York Water Co.

Source of Information: Standard & Poor's Compustat Services, Inc., PC Plus / Research Insight Database
EDGAR Online's I-Metrix Database
Company Annual Forms 10K
AUS Merger and Acquisition Quarterly Report, June 30, 2009

Capital Structure Based upon Total Capital for
the Proxy Group of Six AUS Utility Reports Water Companies
2004 - 2008, Inclusive

	2008	2007	2006	2005	2004	5 YEAR AVERAGE
American States Water Co.						
Long-Term Debt	40.95 %	44.11 %	45.95 %	48.03 %	44.83 %	44.78 %
Short-Term Debt	11.45	6.13	5.48	4.82	8.37	7.25
Preferred Stock	0.00	0.00	0.00	0.00	0.00	0.00
Common Equity	47.60	49.76	48.57	47.15	46.79	47.97
Total Capital	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
Aqua America, Inc.						
Long-Term Debt	52.38 %	54.48 %	48.52 %	48.68 %	50.03 %	50.82 %
Short-Term Debt	3.36	2.50	5.88	7.47	5.10	4.86
Preferred Stock	0.09	0.09	0.09	0.08	0.07	0.09
Common Equity	44.16	42.93	45.50	43.77	44.79	44.23
Total Capital	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
California Water Service Group						
Long-Term Debt	39.59 %	42.86 %	43.47 %	48.07 %	48.66 %	44.53 %
Short-Term Debt	5.46	0.00	0.00	0.00	0.00	1.09
Preferred Stock	0.00	0.51	0.51	0.61	0.61	0.45
Common Equity	54.95	56.63	56.01	51.33	50.72	53.93
Total Capital	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
Middlesex Water Company						
Long-Term Debt	44.91 %	48.37 %	49.98 %	54.75 %	51.36 %	49.88 %
Short-Term Debt	8.53	2.25	0.00	1.68	4.86	3.46
Preferred Stock	1.11	1.43	1.49	1.67	1.79	1.50
Common Equity	45.44	47.95	48.53	41.91	41.99	45.16
Total Capital	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
SJW Corporation						
Long-Term Debt	44.35 %	47.27 %	40.24 %	42.63 %	43.77 %	43.65
Short-Term Debt	3.75	1.09	3.80	0.00	0.00	1.73
Preferred Stock	0.00	0.01	0.01	0.02	0.04	0.02
Common Equity	51.90	51.63	55.95	57.35	56.19	54.60
Total Capital	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00
York Water Company						
Long-Term Debt	53.27 %	50.08 %	48.82 %	47.34 %	51.94 %	50.29 %
Short-Term Debt	3.70	2.13	0.00	6.65	0.00	2.50
Preferred Stock	0.00	0.00	0.00	0.00	0.00	0.00
Common Equity	43.03	47.79	51.18	46.01	48.06	47.21
Total Capital	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
Proxy Group of Six AUS Utility Reports Water Companies						
Long-Term Debt	45.91 %	47.86 %	46.16 %	48.25 %	48.43 %	47.32 %
Short-Term Debt	6.04	2.35	2.53	3.44	3.06	3.48
Preferred Stock	0.20	0.34	0.35	0.40	0.42	0.34
Common Equity	47.85	49.45	50.96	47.91	48.09	48.85
Total Capital	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %

Source of Information:
Standard & Poor's Compustat Services, Inc., PC Plus / Research Insight Data Base
EDGAR Online's I-Metrix Database
Annual Forms 10-K

Proxy Group of Eight AUS Utility Reports Gas Distribution Companies
Capitalization and Financial Statistics (1)
2004 - 2008, Inclusive

	2008	2007	2006	2005	2004	
			(MILLIONS OF DOLLARS)			
CAPITALIZATION STATISTICS						
AMOUNT OF CAPITAL EMPLOYED						
TOTAL PERMANENT CAPITAL	$1,920.515	$1,908.259	$1,846.585	$1,771.278	$1,502.998	
SHORT-TERM DEBT	$319.296	$184.755	$197.905	$136.681	$102.219	
TOTAL CAPITAL EMPLOYED	$2,239.811	$2,093.013	$2,044.489	$1,907.959	$1,605.217	
INDICATED AVERAGE CAPITAL COST RATES (2)						
TOTAL DEBT	5.68 %	6.21 %	6.52 %	6.54 %	6.06 %	
PREFERRED STOCK	6.79	4.83	4.80	4.78	4.82	
CAPITAL STRUCTURE RATIOS						5 YEAR AVERAGE
BASED ON TOTAL PERMANENT CAPITAL:						
LONG-TERM DEBT	47.65	49.29 %	50.81 %	50.95 %	50.02 %	49.74 %
PREFERRED STOCK	0.33	0.40	0.40	0.40	0.40	0.39
COMMON EQUITY	52.02	50.31	48.79	48.65	49.58	49.87
TOTAL	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
BASED ON TOTAL CAPITAL:						
TOTAL DEBT, INCLUDING SHORT-TERM	55.37 %	54.18 %	55.70 %	54.44 %	53.04 %	54.55 %
PREFERRED STOCK	0.27	0.35	0.35	0.36	0.37	0.34
COMMON EQUITY	44.36	45.47	43.95	45.20	46.59	45.11
TOTAL	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
FINANCIAL STATISTICS						
FINANCIAL RATIOS - MARKET BASED						
EARNINGS / PRICE RATIO	7.43 %	6.38 %	6.37 %	6.02 %	6.34 %	6.51 %
MARKET / AVERAGE BOOK RATIO	159.78	173.69	171.91	171.08	165.73	168.44
DIVIDEND YIELD	4.28	3.81	4.00	4.02	4.10	4.04
DIVIDEND PAYOUT RATIO	59.09	61.50	63.34	67.34	69.07	64.07
RATE OF RETURN ON AVERAGE BOOK COMMON EQUITY	11.58 %	11.08 %	10.93 %	10.50 %	10.40 %	10.90 %
TOTAL DEBT / EBITDA (3)	3.62 X	3.41 X	3.63 X	3.67 X	3.64 X	3.59 X
FUNDS FROM OPERATIONS / TOTAL DEBT (4)	16.41 %	19.87 %	19.09 %	19.05 %	21.24 %	19.13 %
TOTAL DEBT / TOTAL CAPITAL	55.37 %	54.18 %	55.70 %	54.44 %	53.04 %	54.55 %

See Page 2 for notes.

Proxy Group of Eight AUS Utility Reports Natural Gas Distribution Companies
Capitalization and Financial Statistics
2004-2008, Inclusive

Notes:

(1) All capitalization and financial statistics for the group are the arithmetic average of the achieved results for each individual company in the group, and are based upon financial statements as originally reported in each year.

(2) Computed by relating actual total debt interest or preferred stock dividends booked to average of beginning and ending total debt or preferred stock reported to be outstanding.

(3) Total debt as a percentage of EBITDA (Earnings before Interest, Income Taxes, Depreciation and Amortization).

(4) Funds from operations (as defined in Note 3) as a percentage of total debt.

Selection Criteria:

The basis of selection was to include those gas distribution companies: 1) which are included in the Natural Gas Distribution & Integrated Natural Gas Company Group of AUS Utility Reports (September 2009); 2) which have Value Line five-year EPS growth rate projections or Reuters consensus five-year EPS growth rate projections; 3) which have positive Value Line five-year DPS growth rate projections, 4) which have a Value Line adjusted beta as published in Value Line Investment Survey; 5) which have not cut or omitted their common dividends during the five years ending 2008 or through the time of the preparation of this testimony; 6) which have 60% or greater of 2008 total net operating income derived from and 60% or greater of 2008 total assets devoted to regulated gas distribution operations; and 7) which at the time of the preparation of Ms. Ahern's accompanying direct testimony, had not publicly announced that they were involved in any major merger or acquisition activity.

The following eight gas distribution companies met the above criteria:

AGL Resources, Inc.
Atmos Energy Corp.
Delta Natural Gas Company
Laclede Group, Inc.
Northwest Natural Gas Company
Piedmont Natural Gas Co., Inc.
Southwest Gas Corporation
WGL Holdings, Inc.

Source of Information: Standard & Poor's Compustat Services, Inc., PC Plus / Research Insight Database
EDGAR Online's I-Metrix Database
Company Annual Forms 10K
AUS Merger and Acquisition Quarterly Report, June 30, 2009

Capital Structure Based upon Total Capital for
the Proxy Group of Eight AUS Utility Reports Natural Gas Distribution Companies
for the Years 2004 through 2008

	2008	2007	2006	2005	2004	5 YEAR AVERAGE
AGL Resources, Inc.						
Long-Term Debt	39.64 %	42.25 %	42.55 %	43.96 %	48.05 %	43.29 %
Short-Term Debt	20.50	14.64	14.14	14.21	9.89	14.67
Preferred Stock	0.76	1.19	1.10	1.02	1.07	1.03
Common Equity	39.10	41.92	42.21	40.80	41.00	41.01
Total Capital	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
Atmos Energy Corp.						
Long-Term Debt	46.88 %	50.16 %	51.82 %	55.58 %	43.35 %	49.56 %
Short-Term Debt	7.75	3.55	9.07	3.68	0.00	4.81
Preferred Stock	0.00	0.00	0.00	0.00	0.00	0.00
Common Equity	45.37	46.29	39.11	40.74	56.65	45.63
Total Capital	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
Delta Natural Gas Company						
Long-Term Debt	48.02 %	50.51 %	50.14 %	48.92 %	50.52 %	49.62 %
Short-Term Debt	5.51	3.54	5.89	5.36	4.38	4.94
Preferred Stock	0.00	0.00	0.00	0.00	0.00	0.00
Common Equity	46.47	45.95	43.97	45.72	45.10	45.44
Total Capital	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
Laclede Group, Inc.						
Long-Term Debt	31.73 %	38.18 %	39.29 %	46.48 %	48.61 %	40.86 %
Short-Term Debt	28.57	20.40	20.60	8.63	8.56	17.35
Preferred Stock	0.05	0.08	0.09	0.12	0.15	0.10
Common Equity	39.65	41.34	40.01	44.78	42.68	41.69
Total Capital	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
Northwest Natural Gas Company						
Long-Term Debt	36.88 %	41.20 %	43.87 %	42.59 %	42.66 %	41.44 %
Short-Term Debt	17.86	11.40	8.03	10.19	8.76	11.25
Preferred Stock	0.00	0.00	0.00	0.00	0.00	0.00
Common Equity	45.26	47.40	48.11	47.21	48.59	47.31
Total Capital	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
Piedmont Natural Gas Co., Inc.						
Long-Term Debt	38.92 %	43.44 %	43.93 %	38.76 %	40.63 %	41.14 %
Short-Term Debt	19.19	10.30	9.05	9.31	6.73	10.92
Preferred Stock	0.00	0.00	0.00	0.00	0.00	0.00
Common Equity	41.89	46.26	47.02	51.93	52.63	47.94
Total Capital	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
Southwest Gas Corporation						
Long-Term Debt	52.20 %	58.58 %	61.07 %	64.50 %	61.61 %	59.60 %
Short-Term Debt	2.41	0.38	0.00	1.09	4.77	1.73
Preferred Stock	0.00	0.00	0.00	0.00	0.00	0.00
Common Equity	45.40	41.04	38.93	34.40	33.63	38.68
Total Capital	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
WGL Holdings, Inc.						
Long-Term Debt	33.54 %	34.82 %	36.11 %	39.72 %	39.97 %	36.83 %
Short-Term Debt	13.38	10.06	10.05	2.56	5.87	8.39
Preferred Stock	1.39	1.54	1.60	1.76	1.73	1.59
Common Equity	51.70	53.57	52.24	55.97	52.42	53.18
Total Capital	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
Average for the Proxy Group of Eight AUS Natural Gas Distribution						
Long-Term Debt	40.97 %	44.89 %	46.10 %	47.56 %	46.92 %	45.29 %
Short-Term Debt	14.40	9.29	9.60	6.88	6.12	9.26
Preferred Stock	0.27	0.35	0.35	0.36	0.37	0.34
Common Equity	44.36	45.47	43.95	45.20	46.59	45.11
Total Capital	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %

Source of Information:
Standard & Poor's Compustat Services, Inc., PC Plus / Research Insight Data Base
EDGAR Online's I-Metrix Database
Annual Forms 10-K

Missouri-American Water Company
Hypothetical Example of the Inadequacy of
A DCF Return Rate Related to Book Value
When Market Value is Greater / Less than Book Value

Line No.		1 Market Value	2 Book Value with Market to Book Ratio of 180%	3 Book Value with Market to Book Ratio of
1.	Per Share	$ 24.00	$ 13.33	$ 30.00
2.	DCF Cost Rate (1)	10.00%	10.00%	10.00%
3.	Return in Dollars	$ 2.400	$ 1.333	$ 3.000
4.	Dividends (2)	$ 0.840	$ 0.840	$ 0.840
5.	Growth in Dollars	$ 1.560	$ 0.493	$ 2.160
6.	Return on Market Value	10.00%	5.55% (3)	12.50% (4)
7.	Rate of Growth on Market Value	6.50% (5)	2.05% (6)	9.00% (7)

Notes:
(1) Comprised of 3.5% dividend yield and 6.5% growth.
(2) $24.00 * 3.5% yield = $0.840.
(3) $1.333 / $24.00 market value = 5.55%.
(4) $3.000 / $24.00 market value = 12.50%.
(5) Expected rate of growth per market based DCF model.
(6) Actual rate of growth when DCF cost rate is applied to book value ($1.333 possible earnings - $0.840 dividends = $0.493 for growth / $24.00 market value = 2.05%).
(7) Actual rate of growth when DCF cost rate is applied to book value ($3.000 possible earnings - $0.840 dividends = $2.160 for growth / $24.00 market value = 9.00%).