ILLINOIS AMERICAN WATER COMPANY

EXHIBITS

TO ACCOMPANY

EXHIBIT 8.00R1: THE REBUTTAL TESTIMONY

OF

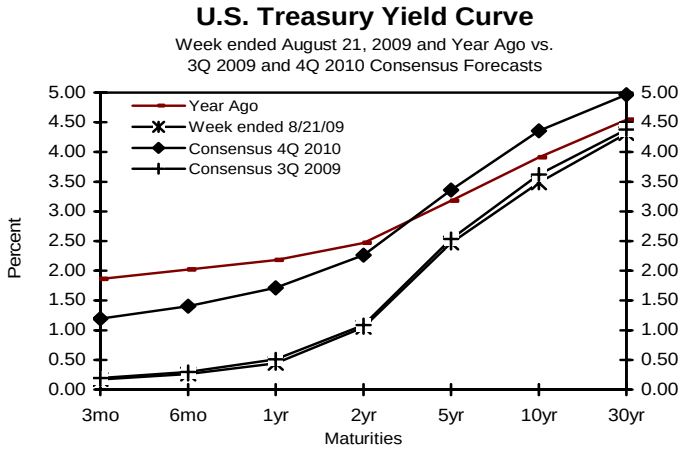
PAULINE M. AHERN, CRRA
PRINCIPAL
AUS CONSULTANTS

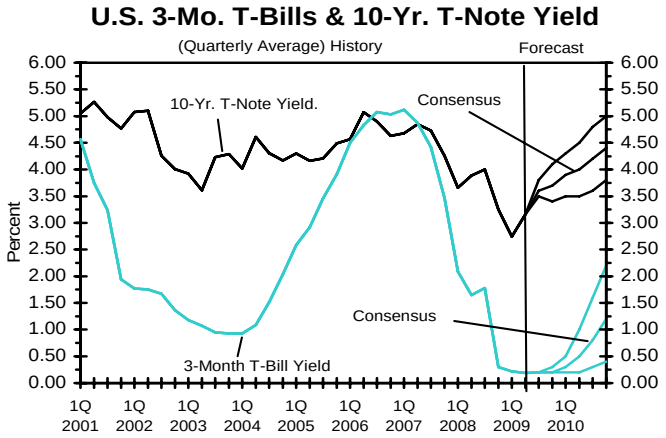
OCTOBER 2009

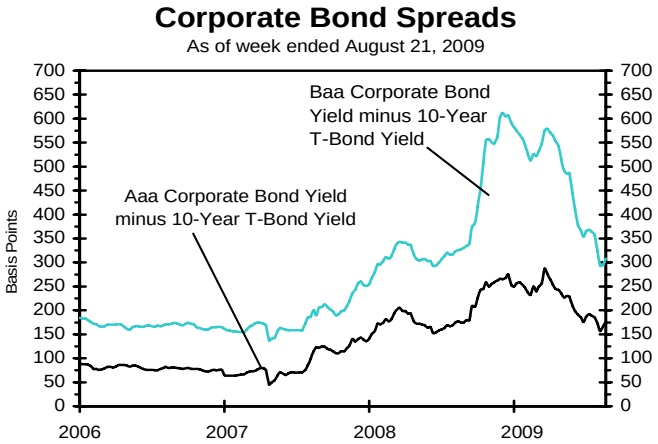
Consensus Forecasts Of U.S. Interest Rates And Key Assumptions[1]

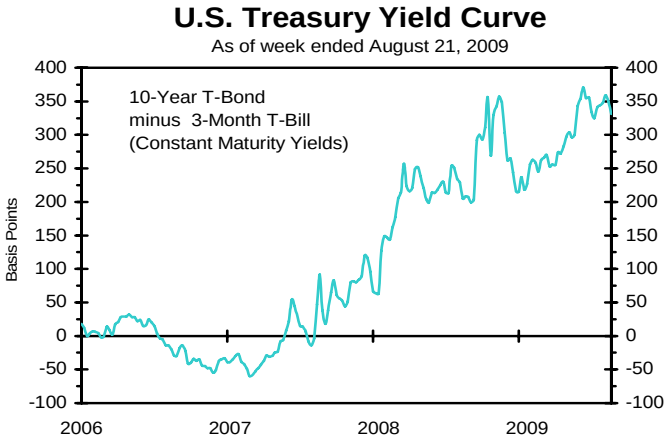
	History								Consensus Forecasts-Quarterly Avg.					
	Average For Week End				Average For Month			Latest Q	3Q	4Q	1Q	2Q	3Q	4Q
Interest Rates	Aug. 21	Aug. 14	Aug. 7	July 31	July	June	May	2Q 2009	2009	2009	2010	2010	2010	2010
Federal Funds Rate	0.16	0.17	0.18	0.15	0.16	0.21	0.18	0.18	**0.2**	**0.2**	**0.2**	**0.4**	**0.7**	**1.1**
Prime Rate	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	**3.2**	**3.2**	**3.3**	**3.4**	**3.8**	**4.2**
LIBOR, 3-mo.	0.44	0.45	0.47	0.49	0.52	0.62	0.82	0.85	**0.6**	**0.6**	**0.6**	**0.8**	**1.1**	**1.5**
Commercial Paper, 1-mo.	0.17	0.19	0.17	0.19	0.18	0.18	0.22	0.21	**0.3**	**0.3**	**0.3**	**0.5**	**0.9**	**1.2**
Treasury bill, 3-mo.	0.17	0.18	0.18	0.19	0.18	0.18	0.18	0.19	**0.2**	**0.2**	**0.3**	**0.5**	**0.8**	**1.2**
Treasury bill, 6-mo.	0.26	0.28	0.29	0.26	0.28	0.31	0.30	0.36	**0.3**	**0.4**	**0.5**	**0.7**	**1.0**	**1.4**
Treasury bill, 1 yr.	0.44	0.47	0.49	0.49	0.48	0.51	0.50	0.57	**0.5**	**0.6**	**0.8**	**1.0**	**1.3**	**1.7**
Treasury note, 2 yr.	1.05	1.16	1.23	1.14	1.02	1.18	0.93	1.01	**1.1**	**1.2**	**1.4**	**1.6**	**1.9**	**2.3**
Treasury note, 5 yr.	2.47	2.65	2.73	2.63	2.46	2.71	2.13	2.13	**2.5**	**2.6**	**2.8**	**2.9**	**3.1**	**3.4**
Treasury note, 10 yr.	3.48	3.67	3.77	3.67	3.56	3.72	3.29	3.16	**3.6**	**3.7**	**3.9**	**4.0**	**4.2**	**4.4**
Treasury note, 30 yr.	4.31	4.47	4.52	4.49	4.41	4.52	4.23	3.97	**4.4**	**4.5**	**4.6**	**4.7**	**4.8**	**5.0**
Corporate Aaa bond	5.24	5.34	5.34	5.40	5.41	5.61	5.54	5.50	**5.4**	**5.5**	**5.6**	**5.6**	**5.7**	**5.8**
Corporate Baa bond	6.56	6.62	6.71	6.91	7.09	7.50	8.06	8.10	**7.0**	**7.0**	**7.0**	**7.0**	**7.1**	**7.2**
State & Local bonds	4.58	4.65	4.65	4.69	4.72	4.81	4.56	4.85	**4.7**	**4.8**	**4.8**	**4.8**	**4.9**	**5.0**
Home mortgage rate	5.12	5.29	5.22	5.25	5.22	5.42	4.86	5.08	**5.3**	**5.3**	**5.4**	**5.6**	**5.7**	**5.9**
	History								Consensus Forecasts-Quarterly Avg.					
	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
Key Assumptions	2007	2007	2008	2008	2008	2008	2009	2009	2009	2009	2010	2010	2010	2010
Major Currency Index	77.0	73.3	72.0	70.9	73.5	81.3	82.7	79.4	**76.4**	**76.1**	**76.2**	**76.4**	**76.6**	**76.6**
Real GDP	3.6	2.1	-0.7	1.5	-2.7	-5.4	-6.4	-1.0	**2.3**	**2.3**	**2.4**	**2.8**	**2.7**	**2.8**
GDP Price Index	1.6	2.3	1.9	1.8	4.0	0.1	1.9	0.0	**1.5**	**1.4**	**1.4**	**1.5**	**1.6**	**1.7**
Consumer Price Index	2.4	5.8	4.5	4.5	6.2	-8.3	-2.4	1.3	**2.6**	**1.8**	**1.7**	**1.6**	**2.1**	**2.1**

Individual panel members' forecasts are on pages 4 through 9. Historical data for interest rates except LIBOR is from Federal Reserve Release (FRSR) H.15. LIBOR quotes available from *The Wall Street Journal*. Definitions reported here are same as those in FRSR H.15. Treasury yields are reported on a constant maturity basis. Historical data for the U.S. Federal Reserve Board's Major Currency Index is from FRSR H.10 and G.5. Historical data for Real GDP and GDP Chained Price Index are from the Bureau of Economic Analysis (BEA). Consumer Price Index (CPI) history is from the Department of Labor's Bureau of Labor Statistics (BLS).









Schedule 8.02R1

Illinois American Water Company
Derivation of Projected GDP Growth Rate

	GDP Chain-Type Price Index (2000=1.000)	Real Gross Domestic Product	Nominal Gross Domestic Product	Nominal Gross Domestic Product Growth
2006	1.167	11,295	13,178	
2007	1.198	11,524	13,808	4.78%
2008	1.225	11,671	14,292	3.51%
2009	1.237	11,333	14,014	-1.95%
2010	1.243	11,599	14,422	2.91%
2011	1.258	12,025	15,128	4.90%
2012	1.274	12,428	15,831	4.65%
2013	1.297	12,811	16,610	4.92%
2014	1.324	13,139	17,398	4.74%
2015	1.354	13,451	18,208	4.66%
2016	1.385	13,785	19,086	4.82%
2017	1.417	14,157	20,053	5.07%
2018	1.450	14,565	21,119	5.32%
2019	1.484	14,976	22,231	5.27%
2020	1.521	15,398	23,428	5.38%
2021	1.560	15,790	24,636	5.16%
2022	1.600	16,193	25,906	5.16%
2023	1.638	16,620	27,226	5.10%
2024	1.675	17,066	28,588	5.00%
2025	1.711	17,548	30,017	5.00%
2026	1.746	18,022	31,469	4.84%
2027	1.782	18,480	32,938	4.67%
2028	1.820	18,929	34,451	4.59%
2029	1.858	19,386	36,015	4.54%
2030	1.896	19,875	37,687	4.64%
			Year 11+	4.92%
			Year 6+	4.95%

Source of Information: Energy Information Administration: Annual Energy Outlook 2009 with Projections to 2030 - April 2009 Table 20 Macroeconomic

Schedule 8.03R1

Docket No. 09-0319
ICC Staff Exhibit 4.0
Schedule 4.6

Illinois - American Water Company, Inc.

Correction of ICC Staff Witness McNally's DCF Cost of Common Equity Estimates

Water Group

Company	(1) Estimate Using 5.62% as Stage 3 Growth Rate	(2) Estimate Using 4.92% as Stage 3 Growth Rate
American States Water Co.	9.25 %	8.68 %
Aqua America, Inc.	9.59	9.03
Artesian Resources	10.17	9.62
California Water Svc Group	9.69	9.14
Connecticut Water Svc, Inc.	11.01	10.51
Middlesex Water Co.	11.14	10.62
SJW Corp.	10.51	9.98
York Water Co.	9.67	9.12
Average	10.13 %	9.59 %

Utility Group

Company	(1) Estimate Using 5.62% as Stage 3 Growth Rate	(2) Estimate Using 4.92% as Stage 3 Growth Rate
American Electric Power Co.	10.85 %	10.33 %
FirstEnergy Corp.	11.16	10.64
Idacorp, Inc.	10.12	9.57
Pinnacle West Capital Corp.	13.14	12.67
Progress Energy, Inc.	12.21	11.73
Average	11.49 %	10.99 %

Illinois American Water Company

Correction of ICC Staff Witness McNally's Risk Premium Analysis (CAPM)

Risk Premium (CAPM) Cost of Equity Estimates

Proxy Group	Risk-Free Rate (1)		Beta		Risk Premium	Cost of Common Equity
Water Group	4.67%	+	0.68	x	(12.70% - 4.67%)	10.13%
Utility Group	4.67%	+	0.69	x	(12.70% - 4.67%)	10.21%

Notes: (1) Average forecast based upon six quarterly estimates of 30-year U.S. Treasury Bonds (notes) per the consensus of nearly 50 economists reported in Blue Chip Financial Forecasts dated September 1, 2009 (from Schedule 8.01R1). The estimates are detailed below.

Third Quarter 2009	4.40%
Fourth Quarter 2009	4.50%
First Quarter 2010	4.60%
Second Quarter 2010	4.70%
Third Quarter 2010	4.80%
Fourth Quarter 2010	5.00%
Average	4.67%

Illinois 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		2	3	4
		Market Capitalization (1) (millions)	(times larger)	Applicable Decile of the NYSE/AMEX/ NASDAQ (2)	Applicable Size Premium (3)	Spread from Applicable Size Premium for (4)
1.	Illinois American Water Company					
a.	Based Upon ICC Staff Witness McNally's Utility Group	$ 367.046		9	2.71%	
2.	ICC Staff Witness McNally's Utility Group	$ 8,129.789	22.1 x	2 - 3	0.68%	2.03%

(A)	(B)	(C)	(D)	(E)
Decile	Number of Companies (millions)	Recent Total Market Capitalization (millions)	Recent Average Market Capitalization (millions)	Size Premium (Return in Excess of CAPM) (2)
1 - Largest	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 5 and 9 of this Schedule

Notes:

(1) From page 2 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 gropu, which is found in Column 2.
(3) Corresponding risk premium to the decile is provided in Column (E) on the bottom of this page.
(4) Line No. 1, Column 3 - Line No. 2, Column 3. For example, the 2.03% in Column 4, Line No. 2 is derived as follows 2.03% = 2.71% - 0.68%.

Illinois American Water Company
Market Capitalization of Illinois American Water Company and
ICC Staff Witness McNally's Utility Group

Company	Exchange	1 Common Stock Shares Outstanding at Fiscal Year End 2008 (millions)	2 Book Value per Share at Fiscal Year End 2008 (1)	3 Total Common Equity at Fiscal Year End 2008 (millions)	4 Closing Stock Market Price (2)	5 Market-to-Book Ratio (3)	6 Market Capitalization (4) (millions)
Illinois American Water Company		NA	NA	$ 306.127 (5)	NA		
ICC Staff Witness McNally's Utility Group						119.9 % (6)	$ 367.046 (7)
ICC Staff Witness McNally's Utility Group							
American Electric Power Co.	NYSE	426.321	$ 25.082	$ 10,693.000	$ 30.790	122.8 %	$ 13,126.424
FirstEnergyCorp.	NYSE	307.000	26.980	8,283.000	44.710	165.7	13,725.970
Idacorp, Inc.	NYSE	45.332	28.731	1,302.437	28.160	98.0	1,276.549
Pinnacle West Capital Corp.	NYSE	100.948	34.136	3,445.979	39.030	114.3	3,940.000
Progress Energy, Inc.	NYSE	264.000	32.905	8,687.000	32.500	98.8	8,580.000
Average		228.720	$ 29.567	$ 6,482.283	$ 35.038	119.9 %	$ 8,129.789

NA = Not Available

Notes:
(1) Column 3 / Column 1.
(2) From ICC Staff Exhibit 4.0, Schedule 4.4.
(3) Column 4 / Column 2.
(4) Column 4 * Column 1.
(5) From Illinois American Water Company"s 2008 Annual Report to the Illinois Commerce Commission.
(6) The market-to-book ratio of Illinois American Water Company is assumed to be equal to the average market-to-book ratio of ICC Staff Witness McNally's Utility Group.
(7) Illinois American Water Company's common stock, if traded, would trade at a market-to-book ratio equal to the average market-to-book ratio of ICC Staff Witness McNally's Utility Group, 119.9%, and Illinois American Water Company's market capitalization would therefore have been $367.046 million. ($367.046 = $306.127 * 119.9%).

Source of Information: I-Metrix Database
Zacks.com

Ibbotson® SBBI®
2009 Valuation Yearbook

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

MORNINGSTAR®

Chapter 7
Firm Size and Return

The Firm Size Phenomenon

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

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 ©2009 Center for Research in Security Prices (CRSP®), The University of Chicago Booth School of Business. Used with permission.

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 ©2009 Center for Research in Security Prices (CRSP®), The University of Chicago Booth School of Business. Used with permission.
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.

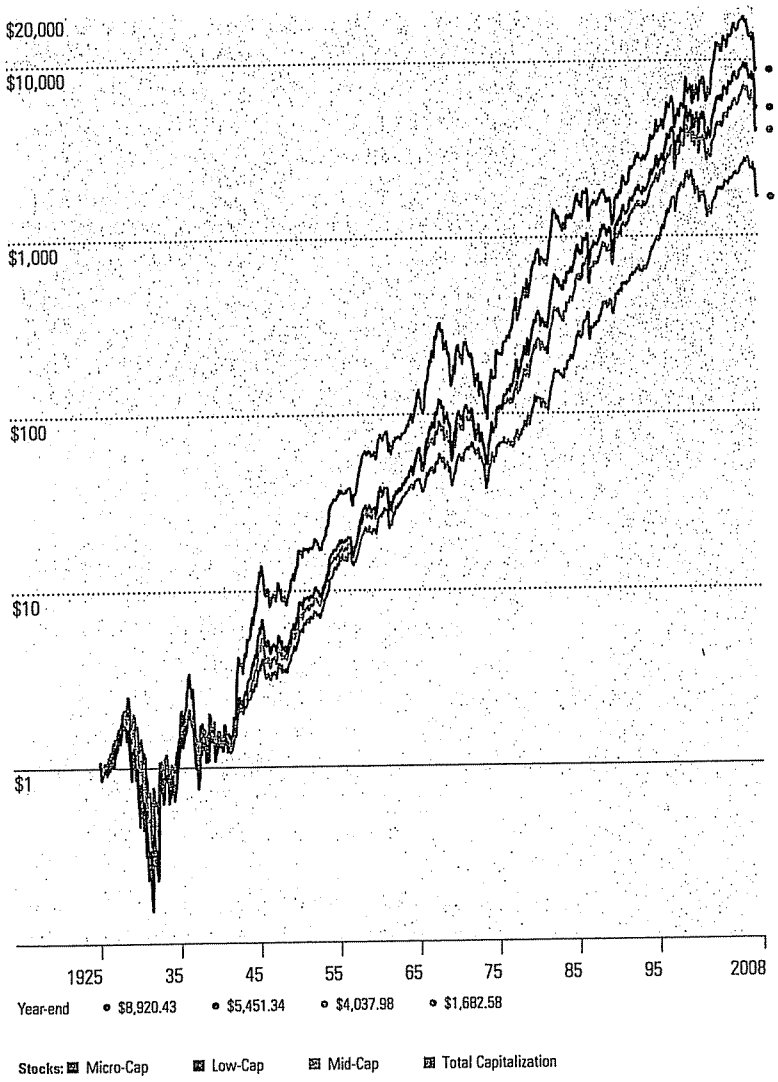
Table 7-3 (Continued)
Size-Decile Portfolios of the NYSE/AMEX/NASDAQ
Largest and Smallest Company by Size Group

1966–2008

Date (Sept 30)	Capitalization of Largest Company (in Thousands) 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
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

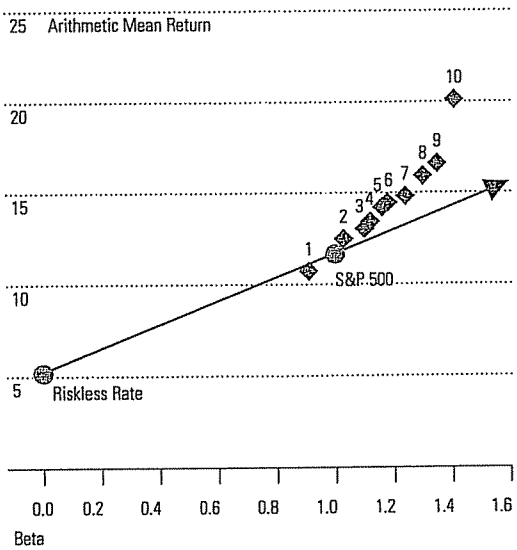
Decile	Beta*	Arith-metic Mean Return (%)	Actual Return in Excess of Riskless Rate** (%)	CAPM Return in Excess of Riskless Rate† (%)	Size Premium (Return in Excess of CAPM) (%)
1-Largest	0.91	10.75	5.56	5.91	-0.36
2	1.03	12.51	7.31	6.69	0.62
3	1.10	13.06	7.87	7.13	0.74
4	1.12	13.45	8.25	7.28	0.97
5	1.16	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 (11.67 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.

‡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.

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.

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.

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

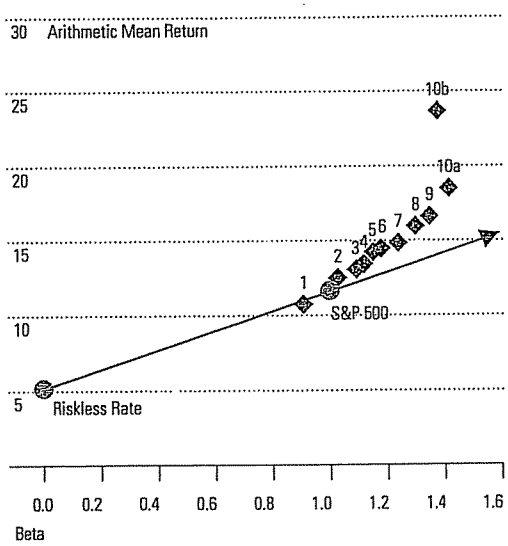
Data from 1926–2008. Source: Calculated (or Derived) based on data from CRSP US Stock Database and CRSP US Indices Database ©2009 Center for Research in Security Prices (CRSP®), The University of Chicago Booth School of Business. Used with permission.

*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.

‡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 7-8: 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

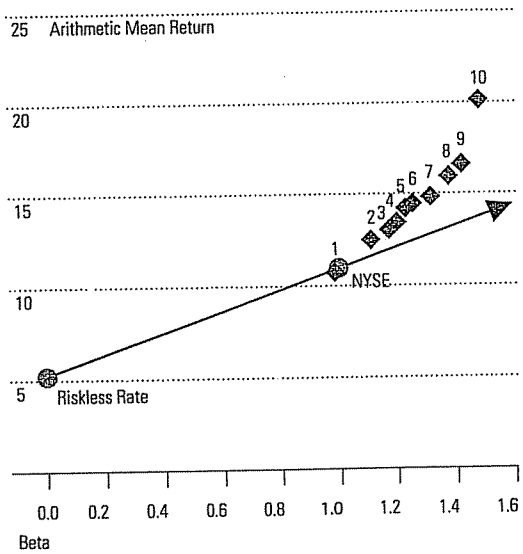
Data from 1926–2008. Source: Calculated (or Derived) based on data from CRSP US Stock Database and CRSP US Indices Database ©2009 Center for Research in Security Prices (CRSP®), The University of Chicago Booth School of Business. Used with permission.

*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.

Illinois American Water Company
Comparison of Bond Ratings, Business Risk and Financial Risk Profiles for
ICC Staff Witness McNally's Utility Group

	Moody's		Standard & Poor's							
	Bond Rating		Bond Rating							
	September 2009		September 2009							
ICC Staff Witness McNally's Utility Group	Bond Rating	Numerical Weighting (1)	Bond Rating	Numerical Weighting (1)	Credit Rating	Numerical Weighting (1)	Business Risk Profile (2)	Numerical Weighting (1)	Financial Risk Profile (2)	Numerical Weighting (1)
American Electric Power (3)	Baa2	9.0	BBB	9.0	BBB	9.0	Excellent	1.0	Aggressive	5.0
Firstenergy Corp (4)	Baa1	8.0	BBB+	8.0	BBB	9.0	Strong	2.0	Significant	4.0
Idacorp, Inc (5)	A3	7.0	A-	7.0	BBB	9.0	Excellent	1.0	Aggressive	5.0
Progress Energy, Inc (6)	A1	5.0	A-	7.0	BBB+	8.0	Excellent	1.0	Aggressive	5.0
Pinnacle West Capital Corporation (7)	Baa2	9.0	BBB-	10.0	BBB-	10.0	Strong	2.0	Significant	4.0
Average	Baa1	7.6	BBB+	8.2	BBB	9.0	Excellent	1.4	Aggressive	4.6

Notes:
(1) From page 2 of this Schedule.
(2) From Standard & Poor's Issuer Ranking: U.S. Regulated Electric Utilities, Strongest to Weakest, September 1, 2009.
(3) Ratings, Business Risk Profiles and Financial Risk Profiles are a composite of Columbus Southern Power Co., Indiana Michigan Power Co., Kentucky Power Co., AEP Texas Central Co., Southwestern Electric Power Co., AEP Texas North Co., Public Service Company of Oklahoma, Ohio Power Co. and Appalachian
(4) Ratings, Business Risk Profiles and Financial Risk Profiles are a composite of Pennsylvania Power Co., Ohio Edison Co., Cleveland Electric Illuminating Co., Jersey Central Power & Light Co., Metropolitan Edison Co., Pennsylvania Electric Co. and Toledo Edison Co.
(5) Ratings, Business Risk Profiles and Financial Risk Profiles are those of Idaho Power Co.
(6) Ratings, Business Risk Profiles and Financial Risk Profiles are a composite of Progress Energy Florida, Inc. and Progress Energy Carolinas, Inc.
(7) Ratings, Business Risk Profiles and Financial Risk Profiles are those of Arizona Public Svc. Co.

Source Information: Moody's Investors Service
Standard & Poor's Global Utilities Rating Service

Illinois American Water Company
Numerical Assignment for
Moody's and Standard & Poor's Bond Ratings,
Standard & Poor's Credit Ratings, and
Standard & Poor's Business and Financial Risk Profiles

Moody's Bond Rating	Numerical Bond Weighting	Standard & Poor's Bond / Credit Rating
Aaa	1	AAA
Aa1	2	AA+
Aa2	3	AA
Aa3	4	AA-
A1	5	A+
A2	6	A
A3	7	A-
Baa1	8	BBB+
Baa2	9	BBB
Baa3	10	BBB-
Ba1	11	BB+
Ba2	12	BB
Ba3	13	BB-

Standard & Poor's

Business Risk Profile	Numerical Weighting	Financial Risk Profile	Numerical Weighting
Excellent	1	Minimal	1
Strong	2	Modest	2
Satisfactory	3	Intermediate	3
Fair	4	Significant	4
Weak	5	Aggressive	5
Vulnerable	6	Highly Leveraged	6

Illinois American Water Company
Yields on Moody's A and Baa Rated Public Utility Bonds
and Aaa Rated Corporate Bonds Since September 1989

Date	Aaa Corporate Bonds	Moody's A PU Bonds	Moody's Baa PU Bonds	Spread between Aaa v A PU Bonds	Spread Between Aaa v Baa PU Bonds	Spread between A and Baa PU Bonds
Sep-89	9.01%	9.58%	9.70%	0.57%	0.69%	0.12%
Oct-89	8.92%	9.54%	9.64%	0.62%	0.72%	0.10%
Nov-89	8.89%	9.51%	9.64%	0.62%	0.75%	0.13%
Dec-89	8.86%	9.44%	9.60%	0.58%	0.74%	0.16%
Jan-90	8.99%	9.56%	9.74%	0.57%	0.75%	0.18%
Feb-90	9.22%	9.76%	9.96%	0.54%	0.74%	0.20%
Mar-90	9.37%	9.85%	10.06%	0.48%	0.69%	0.21%
Apr-90	9.46%	9.92%	10.13%	0.46%	0.67%	0.21%
May-90	9.47%	10.00%	10.16%	0.53%	0.69%	0.16%
Jun-90	9.26%	9.80%	9.96%	0.54%	0.70%	0.16%
Jul-90	9.24%	9.75%	9.92%	0.51%	0.68%	0.17%
Aug-90	9.41%	9.92%	10.12%	0.51%	0.71%	0.20%
Sep-90	9.56%	10.12%	10.32%	0.56%	0.76%	0.20%
Oct-90	9.53%	10.05%	10.28%	0.52%	0.75%	0.23%
Nov-90	9.30%	9.90%	10.12%	0.60%	0.82%	0.22%
Dec-90	9.05%	9.73%	9.96%	0.68%	0.91%	0.23%
Jan-91	9.04%	9.71%	9.96%	0.67%	0.92%	0.25%
Feb-91	8.83%	9.47%	9.68%	0.64%	0.85%	0.21%
Mar-91	8.93%	9.55%	9.74%	0.62%	0.81%	0.19%
Apr-91	8.86%	9.46%	9.64%	0.60%	0.78%	0.18%
May-91	8.86%	9.44%	9.64%	0.58%	0.78%	0.20%
Jun-91	9.01%	9.59%	9.79%	0.58%	0.78%	0.20%
Jul-91	9.00%	9.55%	9.69%	0.55%	0.69%	0.14%
Aug-91	8.75%	9.29%	9.47%	0.54%	0.72%	0.18%
Sep-91	8.61%	9.16%	9.34%	0.55%	0.73%	0.18%
Oct-91	8.55%	9.12%	9.32%	0.57%	0.77%	0.20%
Nov-91	8.48%	9.05%	9.28%	0.57%	0.80%	0.23%
Dec-91	8.31%	8.88%	9.07%	0.57%	0.76%	0.19%
Jan-92	8.20%	8.84%	8.98%	0.64%	0.78%	0.14%
Feb-92	8.29%	8.93%	9.09%	0.64%	0.80%	0.16%
Mar-92	8.35%	8.97%	9.16%	0.62%	0.81%	0.19%
Apr-92	8.33%	8.93%	9.11%	0.60%	0.78%	0.18%
May-92	8.28%	8.87%	9.01%	0.59%	0.73%	0.14%
Jun-92	8.22%	8.78%	8.90%	0.56%	0.68%	0.12%
Jul-92	8.07%	8.57%	8.69%	0.50%	0.62%	0.12%
Aug-92	7.95%	8.44%	8.58%	0.49%	0.63%	0.14%
Sep-92	7.92%	8.40%	8.54%	0.48%	0.62%	0.14%
Oct-92	7.99%	8.54%	8.76%	0.55%	0.77%	0.22%
Nov-92	8.10%	8.63%	8.86%	0.53%	0.76%	0.23%
Dec-92	7.98%	8.43%	8.69%	0.45%	0.71%	0.26%
Jan-93	7.91%	8.27%	8.57%	0.36%	0.66%	0.30%
Feb-93	7.71%	8.04%	8.31%	0.33%	0.60%	0.27%
Mar-93	7.58%	7.90%	8.10%	0.32%	0.52%	0.20%
Apr-93	7.46%	7.81%	8.11%	0.35%	0.65%	0.30%
Apr-93	7.43%	7.86%	8.18%	0.43%	0.75%	0.32%
May-93	7.33%	7.75%	8.05%	0.42%	0.72%	0.30%
Jun-93	7.17%	7.54%	7.93%	0.37%	0.76%	0.39%
Jul-93	6.85%	7.25%	7.59%	0.40%	0.74%	0.34%
Aug-93	6.66%	7.04%	7.35%	0.38%	0.69%	0.31%
Sep-93	6.67%	7.03%	7.27%	0.36%	0.60%	0.24%
Oct-93	6.93%	7.30%	7.69%	0.37%	0.76%	0.39%
Nov-93	6.93%	7.34%	7.73%	0.41%	0.80%	0.39%
Dec-93	6.92%	7.33%	7.66%	0.41%	0.74%	0.33%
Jan-94	7.08%	7.47%	7.76%	0.39%	0.68%	0.29%
Mar-94	7.48%	7.47%	7.76%	-0.01%	0.28%	0.29%
Apr-94	7.88%	7.85%	8.11%	-0.03%	0.23%	0.26%
May-94	7.99%	8.33%	8.61%	0.34%	0.62%	0.28%
Jun-94	7.97%	8.31%	8.64%	0.34%	0.67%	0.33%
Jul-94	8.11%	8.47%	8.80%	0.36%	0.69%	0.33%
Aug-94	8.07%	8.41%	8.74%	0.34%	0.67%	0.33%
Sep-94	8.34%	8.64%	8.98%	0.30%	0.64%	0.34%
Oct-94	8.57%	8.86%	9.24%	0.29%	0.67%	0.38%
Nov-94	8.68%	8.98%	9.35%	0.30%	0.67%	0.37%
Dec-94	8.46%	8.76%	9.16%	0.30%	0.70%	0.40%
Jan-95	8.46%	8.73%	9.15%	0.27%	0.69%	0.42%
Feb-95	8.26%	8.52%	8.93%	0.26%	0.67%	0.41%
Mar-95	8.12%	8.37%	8.78%	0.25%	0.66%	0.41%
Apr-95	8.03%	8.27%	8.67%	0.24%	0.64%	0.40%
May-95	7.65%	7.91%	8.30%	0.26%	0.65%	0.39%
Jun-95	7.30%	7.60%	8.01%	0.30%	0.71%	0.41%
Jul-95	7.41%	7.70%	8.11%	0.29%	0.70%	0.41%
Aug-95	7.57%	7.83%	8.24%	0.26%	0.67%	0.41%
Sep-95	7.32%	7.62%	7.98%	0.30%	0.66%	0.36%
Oct-95	7.12%	7.46%	7.82%	0.34%	0.70%	0.36%
Nov-95	7.02%	7.43%	7.81%	0.41%	0.79%	0.38%
Dec-95	6.82%	7.23%	7.63%	0.41%	0.81%	0.40%
Jan-96	6.81%	7.22%	7.64%	0.41%	0.83%	0.42%
Feb-96	6.99%	7.37%	7.78%	0.38%	0.79%	0.41%
Mar-96	7.35%	7.73%	8.15%	0.38%	0.80%	0.42%
Apr-96	7.50%	7.89%	8.32%	0.39%	0.82%	0.43%
May-96	7.62%	7.98%	8.45%	0.36%	0.83%	0.47%
Jun-96	7.71%	8.06%	8.51%	0.35%	0.80%	0.45%
Jul-96	7.65%	8.02%	8.44%	0.37%	0.79%	0.42%
Aug-96	7.46%	7.84%	8.25%	0.38%	0.79%	0.41%
Sep-96	7.66%	8.01%	8.41%	0.35%	0.75%	0.40%
Oct-96	7.39%	7.77%	8.15%	0.38%	0.76%	0.38%
Nov-96	7.10%	7.49%	7.87%	0.39%	0.77%	0.38%
Dec-96	7.20%	7.59%	7.98%	0.39%	0.78%	0.39%

Illinois American Water Company
Yields on Moody's A and Baa Rated Public Utility Bonds
and Aaa Rated Corporate Bonds Since September 1989

Date	Aaa Corporate Bonds	Moody's A PU Bonds	Moody's Baa PU Bonds	Spread between Aaa v A PU Bonds	Spread Between Aaa v Baa PU Bonds	Spread between A and Baa PU Bonds
Jan-97	7.42%	7.77%	8.18%	0.35%	0.76%	0.41%
Feb-97	7.31%	7.64%	8.02%	0.33%	0.71%	0.38%
Mar-97	7.55%	7.87%	8.26%	0.32%	0.71%	0.39%
Apr-97	7.73%	8.03%	8.42%	0.30%	0.69%	0.39%
May-97	7.58%	7.89%	8.28%	0.31%	0.70%	0.39%
Jun-97	7.41%	7.72%	8.12%	0.31%	0.71%	0.40%
Jul-97	7.14%	7.48%	7.87%	0.34%	0.73%	0.39%
Aug-97	7.22%	7.51%	7.93%	0.29%	0.71%	0.42%
Sep-97	7.15%	7.47%	7.79%	0.32%	0.64%	0.32%
Oct-97	7.00%	7.35%	7.67%	0.35%	0.67%	0.32%
Nov-97	6.87%	7.25%	7.49%	0.38%	0.62%	0.24%
Dec-97	6.76%	7.16%	7.41%	0.40%	0.65%	0.25%
Jan-98	6.61%	7.05%	7.28%	0.44%	0.67%	0.23%
Feb-98	6.67%	7.12%	7.36%	0.45%	0.69%	0.24%
Feb-98	6.72%	7.16%	7.37%	0.44%	0.65%	0.21%
Mar-98	6.69%	7.16%	7.37%	0.47%	0.68%	0.21%
Apr-98	6.69%	7.16%	7.34%	0.47%	0.65%	0.18%
May-98	6.53%	7.03%	7.21%	0.50%	0.68%	0.18%
Jun-98	6.55%	7.03%	7.23%	0.48%	0.68%	0.20%
Jul-98	6.52%	7.00%	7.20%	0.48%	0.68%	0.20%
Aug-98	6.40%	6.93%	7.13%	0.53%	0.73%	0.20%
Oct-98	6.37%	6.96%	7.13%	0.59%	0.76%	0.17%
Nov-98	6.41%	7.03%	7.31%	0.62%	0.90%	0.28%
Dec-98	6.22%	6.91%	7.24%	0.69%	1.02%	0.33%
Jan-99	6.24%	6.97%	7.30%	0.73%	1.06%	0.33%
Feb-99	6.40%	7.09%	7.41%	0.69%	1.01%	0.32%
Mar-99	6.62%	7.26%	7.55%	0.64%	0.93%	0.29%
Apr-99	6.64%	7.22%	7.51%	0.58%	0.87%	0.29%
May-99	6.93%	7.47%	7.74%	0.54%	0.81%	0.27%
Jun-99	7.23%	7.74%	8.03%	0.51%	0.80%	0.29%
Jul-99	7.19%	7.71%	7.97%	0.52%	0.78%	0.26%
Aug-99	7.40%	7.91%	8.16%	0.51%	0.76%	0.25%
Sep-99	7.39%	7.93%	8.19%	0.54%	0.80%	0.26%
Oct-99	7.55%	8.06%	8.32%	0.51%	0.77%	0.26%
Nov-99	7.36%	7.94%	8.12%	0.58%	0.76%	0.18%
Dec-99	7.55%	8.14%	8.28%	0.59%	0.73%	0.14%
Jan-00	7.78%	8.35%	8.40%	0.57%	0.62%	0.05%
Feb-00	7.68%	8.25%	8.33%	0.57%	0.65%	0.08%
Mar-00	7.68%	8.28%	8.40%	0.60%	0.72%	0.12%
Apr-00	7.64%	8.29%	8.40%	0.65%	0.76%	0.11%
May-00	7.99%	8.70%	8.86%	0.71%	0.87%	0.16%
Jun-00	7.67%	8.36%	8.47%	0.69%	0.80%	0.11%
Jul-00	7.65%	8.25%	8.33%	0.60%	0.68%	0.08%
Aug-00	7.55%	8.13%	8.25%	0.58%	0.70%	0.12%
Sep-00	7.62%	8.23%	8.32%	0.61%	0.70%	0.09%
Oct-00	7.55%	8.14%	8.29%	0.59%	0.74%	0.15%
Nov-00	7.45%	8.11%	8.25%	0.66%	0.80%	0.14%
Dec-00	7.21%	7.84%	8.01%	0.63%	0.80%	0.17%
Jan-01	7.15%	7.80%	7.99%	0.65%	0.84%	0.19%
Feb-01	7.10%	7.74%	7.94%	0.64%	0.84%	0.20%
Mar-01	6.98%	7.68%	7.85%	0.70%	0.87%	0.17%
Apr-01	7.20%	7.94%	8.06%	0.74%	0.86%	0.12%
May-01	7.29%	7.99%	8.11%	0.70%	0.82%	0.12%
Jun-01	7.18%	7.85%	8.02%	0.67%	0.84%	0.17%
Jul-01	7.13%	7.78%	8.05%	0.65%	0.92%	0.27%
Aug-01	7.02%	7.59%	7.95%	0.57%	0.93%	0.36%
Sep-01	7.17%	7.75%	8.12%	0.58%	0.95%	0.37%
Oct-01	7.03%	7.63%	8.02%	0.60%	0.99%	0.39%
Nov-01	6.97%	7.57%	7.96%	0.60%	0.99%	0.39%
Dec-01	6.77%	7.83%	8.27%	1.06%	1.50%	0.44%
Jan-02	6.55%	7.66%	8.13%	1.11%	1.58%	0.47%
Feb-02	6.51%	7.54%	8.18%	1.03%	1.67%	0.64%
Mar-02	6.81%	7.76%	8.32%	0.95%	1.51%	0.56%
Apr-02	6.76%	7.57%	8.26%	0.81%	1.50%	0.69%
May-02	6.75%	7.52%	8.33%	0.77%	1.58%	0.81%
Jun-02	6.63%	7.42%	8.26%	0.79%	1.63%	0.84%
Jul-02	6.53%	7.31%	8.07%	0.78%	1.54%	0.76%
Aug-02	6.37%	7.17%	7.74%	0.80%	1.37%	0.57%
Sep-02	6.15%	7.08%	7.62%	0.93%	1.47%	0.54%
Oct-02	6.32%	7.23%	8.00%	0.91%	1.68%	0.77%
Nov-02	6.31%	7.14%	7.76%	0.83%	1.45%	0.62%
Dec-02	6.21%	7.07%	7.61%	0.86%	1.40%	0.54%
Jan-03	6.17%	7.06%	7.47%	0.89%	1.30%	0.41%
Feb-03	5.95%	6.93%	7.17%	0.98%	1.22%	0.24%

Illinois American Water Company
Yields on Moody's A and Baa Rated Public Utility Bonds
and Aaa Rated Corporate Bonds Since September 1989

Date	Aaa Corporate Bonds	Moody's A PU Bonds	Moody's Baa PU Bonds	Spread between Aaa v A PU Bonds	Spread Between Aaa v Baa PU Bonds	Spread between A and Baa PU Bonds
Mar-03	5.89%	6.79%	7.05%	0.90%	1.16%	0.26%
Apr-03	5.74%	6.64%	6.94%	0.90%	1.20%	0.30%
May-03	5.22%	6.36%	6.47%	1.14%	1.25%	0.11%
Jun-03	4.97%	6.21%	6.30%	1.24%	1.33%	0.09%
Jul-03	5.49%	6.57%	6.67%	1.08%	1.18%	0.10%
Aug-03	5.88%	6.78%	7.08%	0.90%	1.20%	0.30%
Sep-03	5.72%	6.56%	6.87%	0.84%	1.15%	0.31%
Oct-03	5.70%	6.43%	6.79%	0.73%	1.09%	0.36%
Nov-03	5.65%	6.37%	6.69%	0.72%	1.04%	0.32%
Dec-03	5.62%	6.27%	6.61%	0.65%	0.99%	0.34%
Jan-04	5.54%	6.15%	6.47%	0.61%	0.93%	0.32%
Feb-04	5.50%	6.15%	6.28%	0.65%	0.78%	0.13%
Mar-04	5.33%	5.97%	6.12%	0.64%	0.79%	0.15%
Apr-04	5.73%	6.35%	6.46%	0.62%	0.73%	0.11%
May-04	6.04%	6.62%	6.75%	0.58%	0.71%	0.13%
Jun-04	6.01%	6.46%	6.84%	0.45%	0.83%	0.38%
Jul-04	5.82%	6.27%	6.67%	0.45%	0.85%	0.40%
Aug-04	5.65%	6.14%	6.45%	0.49%	0.80%	0.31%
Sep-04	5.46%	5.98%	6.27%	0.52%	0.81%	0.29%
Oct-04	5.47%	5.94%	6.17%	0.47%	0.70%	0.23%
Nov-04	5.52%	5.97%	6.16%	0.45%	0.64%	0.19%
Dec-04	5.47%	5.92%	6.10%	0.45%	0.63%	0.18%
Jan-05	5.36%	5.78%	5.95%	0.42%	0.59%	0.17%
Feb-05	5.20%	5.61%	5.76%	0.41%	0.56%	0.15%
Mar-05	5.40%	5.83%	6.01%	0.43%	0.61%	0.18%
Apr-05	5.33%	5.64%	5.95%	0.31%	0.62%	0.31%
May-05	5.15%	5.53%	5.88%	0.38%	0.73%	0.35%
Jun-05	4.96%	5.40%	5.70%	0.44%	0.74%	0.30%
Jul-05	5.06%	5.51%	5.80%	0.45%	0.74%	0.29%
Aug-05	5.09%	5.50%	5.81%	0.41%	0.72%	0.31%
Sep-05	5.13%	5.52%	5.83%	0.39%	0.70%	0.31%
Oct-05	5.35%	5.79%	6.08%	0.44%	0.73%	0.29%
Nov-05	5.42%	5.88%	6.19%	0.46%	0.77%	0.31%
Dec-05	5.37%	5.80%	6.14%	0.43%	0.77%	0.34%
Jan-06	5.29%	5.75%	6.06%	0.46%	0.77%	0.31%
Feb-06	5.35%	5.82%	6.11%	0.47%	0.76%	0.29%
Mar-06	5.53%	5.98%	6.26%	0.45%	0.73%	0.28%
Apr-06	5.84%	6.29%	6.54%	0.45%	0.70%	0.25%
May-06	5.95%	6.42%	6.59%	0.47%	0.64%	0.17%
Jun-06	5.89%	6.40%	6.61%	0.51%	0.72%	0.21%
Jul-06	5.85%	6.37%	6.61%	0.52%	0.76%	0.24%
Aug-06	5.68%	6.20%	6.43%	0.52%	0.75%	0.23%
Sep-06	5.51%	6.00%	6.26%	0.49%	0.75%	0.26%
Oct-06	5.51%	5.98%	6.24%	0.47%	0.73%	0.26%
Nov-06	5.33%	5.80%	6.04%	0.47%	0.71%	0.24%
Dec-06	5.32%	5.81%	6.05%	0.49%	0.73%	0.24%
Jan-07	5.40%	5.96%	6.16%	0.56%	0.76%	0.20%
Feb-07	5.39%	5.90%	6.10%	0.51%	0.71%	0.20%
Mar-07	5.30%	5.85%	6.10%	0.55%	0.80%	0.25%
Apr-07	5.47%	5.97%	6.24%	0.50%	0.77%	0.27%
May-07	5.47%	5.99%	6.23%	0.52%	0.76%	0.24%
Jun-07	5.79%	6.30%	6.54%	0.51%	0.75%	0.24%
Jul-07	5.73%	6.25%	6.49%	0.52%	0.76%	0.24%
Aug-07	5.79%	6.24%	6.51%	0.45%	0.72%	0.27%
Sep-07	5.74%	6.18%	6.45%	0.44%	0.71%	0.27%
Oct-07	5.66%	6.11%	6.36%	0.45%	0.70%	0.25%
Nov-07	5.44%	5.97%	6.27%	0.53%	0.83%	0.30%
Dec-07	5.49%	6.16%	6.51%	0.67%	1.02%	0.35%
Jan-08	5.33%	6.02%	6.35%	0.69%	1.02%	0.33%
Feb-08	5.53%	6.21%	6.60%	0.68%	1.07%	0.39%
Mar-08	5.51%	6.21%	6.68%	0.70%	1.17%	0.47%
Apr-08	5.55%	6.29%	6.81%	0.74%	1.26%	0.52%
May-08	5.57%	6.27%	6.79%	0.70%	1.22%	0.52%
Jun-08	5.68%	6.38%	6.93%	0.70%	1.25%	0.55%
Jul-08	5.67%	6.40%	6.97%	0.73%	1.30%	0.57%
Aug-08	5.64%	6.37%	6.98%	0.73%	1.34%	0.61%
Sep-08	5.65%	6.49%	7.15%	0.84%	1.50%	0.66%
Oct-08	6.28%	7.56%	8.58%	1.28%	2.30%	1.02%
Nov-08	6.12%	7.20%	8.98%	1.08%	2.86%	1.78%
Dec-08	5.05%	6.54%	8.13%	1.49%	3.08%	1.59%
Jan-09	5.05%	6.39%	7.90%	1.34%	2.85%	1.51%
Feb-09	5.27%	6.30%	7.74%	1.03%	2.47%	1.44%
Mar-09	5.50%	6.42%	8.00%	0.92%	2.50%	1.58%
Apr-09	5.39%	6.48%	8.03%	1.09%	2.64%	1.55%
May-09	5.54%	6.49%	7.76%	0.95%	2.22%	1.27%
Jun-09	5.61%	6.20%	7.30%	0.59%	1.69%	1.10%
Jul-09	5.41%	5.97%	6.87%	0.56%	1.46%	0.90%
Aug-09	5.26%	5.71%	6.36%	0.45%	1.10%	0.65%
Average	6.91%	7.47%	7.81%	0.56%	0.90%	0.34%
Median	6.95%	7.48%	7.96%	0.52%	0.76%	0.29%

Source of Information:
S&P Public Utility Index and Moody's Public Utility Bond Average Annual Yields 1928-2009, (AUS Consultants - Utility Services, 2009).

Illinois American Water Company
Percent Change in Gross Domestic Product for the Years 1998 - 2007

Code	Industry Title	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	'06-'07 % chg	'98-'07 % chg
Value added (Millions of dollars)													
VA	Gross domestic product	8746997	9268410	9816969	10127976	10469601	10960770	11685901	12433908	13194689	13841339	4.90%	5.23%
VA	Private industries	7652501	8127193	8614288	8869652	9131169	9542338	10194273	10861451	11556044	12103781	4.74%	5.23%
VA	Agriculture, forestry, fishing, and hunting	102395	93779	98019	97895	95444	114383	142160	128752	125398	161385	28.70%	5.19%
VA	Farms	78901	68774	71526	73134	70819	88267	114673	100866	95678 ...			
VA	Forestry, fishing, and related activities	23494	25005	26494	24761	24625	26116	27487	27886	29720 ...			
VA	Mining	74785	85397	121334	118737	106534	143345	171341	225674	262383	275764	5.10%	15.60%
VA	Oil and gas extraction	35173	47217	80990	72515	62753	93817	114315	149627	159440 ...			
VA	Mining, except oil and gas	27031	27492	26992	27082	26834	27238	30333	37661	43492 ...			
VA	Support activities for mining	12581	10688	13353	19140	16946	22290	26693	38385	59452 ...			
VA	Utilities	180806	185417	189291	202286	207326	219976	240271	249498	273397	295920	8.24%	5.63%
VA	Construction	374387	406602	435914	469535	482277	496212	539216	607879	630031	562625	-10.70%	4.63%
VA	Manufacturing	1343850	1373112	1426218	1341330	1352640	1359327	1427887	1483900	1549725	1615777	4.26%	2.07%
VA	Durable goods	806865	820392	865268	778871	774784	771794	807475	840869	882845	926689	4.97%	1.55%
VA	Wood products	29358	31930	31437	31313	30421	32103	37477	37089	37448 ...			
VA	Nonmetallic mineral products	42327	45103	45743	44862	45941	45134	49335	50733	54690 ...			
VA	Primary metals	49422	47303	48193	41072	41943	38352	54533	57823	63390 ...			
VA	Fabricated metal products	112705	116360	121686	112040	107403	106304	115193	123273	131083 ...			
VA	Machinery	111472	105629	109296	103157	96525	94277	103446	114781	123204 ...			
VA	Computer and electronic products	165673	162777	185563	136931	124152	124001	125461	132715	139708 ...			
VA	Electrical equipment, appliances, and components	44735	48196	50580	49194	48785	48804	45659	43977	44986 ...			
VA	Motor vehicles, bodies and trailers, and parts	108827	115397	118105	103694	118882	124093	106942	99093	96859 ...			
VA	Other transportation equipment	63344	64253	64439	69175	69642	62352	70877	81959	90404 ...			
VA	Furniture and related products	29101	30965	32712	30200	31061	33447	31196	30806	31385 ...			
VA	Miscellaneous manufacturing	49902	52480	57515	57234	60029	62928	67357	68620	69690 ...			
VA	Nondurable goods	536985	552720	560950	562459	577855	587533	620413	643031	666879	689087	3.33%	2.81%
VA	Food and beverage and tobacco products	137539	153567	154809	167129	172880	167940	161045	163701	160660 ...			
VA	Textile mills and textile product mills	27127	26440	26453	22713	21948	23107	23119	21249	19457 ...			
VA	Apparel and leather and allied products	26049	24739	25052	22796	20913	18259	17325	16549	16413 ...			
VA	Paper products	52154	54150	55594	48946	50311	50310	50687	52526	52460 ...			
VA	Printing and related support activities	46508	48183	49009	46868	45662	45249	45554	45226	46188 ...			
VA	Petroleum and coal products	30643	22399	26248	33376	26246	39148	56621	77759	86341 ...			
VA	Chemical products	153362	157142	157057	157227	174363	179485	198746	199751	213956 ...			
VA	Plastics and rubber products	63603	66100	66728	63406	65534	64034	67314	66270	71404 ...			
VA	Wholesale trade	542939	577698	591688	607078	615365	637005	686657	723740	762206	799053	4.83%	4.39%
VA	Retail trade	598633	635456	662430	691578	719578	751483	776919	812739	847985	886538	4.55%	4.46%
VA	Transportation and warehousing	273704	287410	301622	296948	304557	316576	344625	358527	385444	403480	4.68%	4.41%
VA	Air transportation	52501	54888	57678	49960	48336	51729	49142	45494	49985 ...			
VA	Rail transportation	24531	24668	25530	25559	26191	28079	29835	33268	37496 ...			
VA	Water transportation	6516	6413	7222	7417	6958	8739	9510	9228	9936 ...			
VA	Truck transportation	86196	89838	92821	93315	95651	98360	111395	118640	124702 ...			
VA	Transit and ground passenger transportation	13777	14400	14457	15088	15684	16066	17580	17371	18056 ...			
VA	Pipeline transportation	9245	9243	8718	9166	11519	9858	10671	9121	11285 ...			
VA	Other transportation and support activities	59852	64750	70225	71359	73378	75425	85337	90555	96863 ...			
VA	Warehousing and storage	21085	23209	24971	25084	26841	28320	31155	34849	37123 ...			
VA	Information	381573	439313	458304	476934	482981	489083	530619	570546	598770	645310	7.77%	6.01%
VA	Publishing industries (includes software)	96656	118664	116733	118671	118993	123546	130830	142237	150282 ...			
VA	Motion picture and sound recording industries	25288	30107	32525	33568	38884	38282	40243	41955	43071 ...			
VA	Broadcasting and telecommunications	229782	253834	271301	283196	278949	277937	302218	324154	336936 ...			
VA	Information and data processing services	29847	36709	37746	41499	46156	49318	57328	62199	68481 ...			
VA	Finance, insurance, real estate, rental, and leasing	1684608	1798398	1930952	2059197	2141889	2244618	2378770	2548952	2756560	2860733	3.78%	6.06%

http://www.bea.gov/industry/gdpbyind_data.htm

Illinois American Water Company
Percent Change in Gross Domestic Product for the Years 1998 - 2007

Code	Industry Title	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	'06-'07 % chg	'98-'07 % chg
Value added (Millions of dollars)													
VA	Finance and insurance	641118	679842	740489	782627	822728	864623	907883	982497	1093733	1113599	1.82%	6.33%
VA	Federal Reserve banks, credit intermediation, and related activities	277742	308007	319025	360055	417443	445015	457792	506097	569742	...		
VA	Securities, commodity contracts, and investments	134070	139930	167713	170223	148390	145887	158266	183797	217772	...		
VA	Insurance carriers and related activities	217437	216867	238264	234393	237439	254999	267747	264457	280862	...		
VA	Funds, trusts, and other financial vehicles	11869	15038	15487	17956	19456	18723	24077	28146	25357	...		
VA	Real estate and rental and leasing	1043490	1118556	1190463	1276571	1319162	1379995	1470887	1566455	1662826	1747134	5.07%	5.89%
VA	Real estate	950298	1017949	1082118	1169699	1215893	1274230	1366737	1461295	1557072	...		
VA	Rental and leasing services and lessors of intangible assets	93192	100608	108345	106872	103269	105765	104149	105160	105754	...		
VA	Professional and business services	976168	1064543	1140848	1165880	1188985	1248930	1338190	1453237	1560905	1684211	7.90%	6.25%
VA	Professional, scientific, and technical services	565310	613936	675121	698825	705227	733125	792709	851919	925333	1003077	8.40%	6.58%
VA	Legal services	120893	127345	136126	145563	145752	154213	168743	176420	186785	...		
VA	Computer systems design and related services	92862	107792	125744	127064	127323	124333	126870	132959	146493	...		
VA	Miscellaneous professional, scientific, and technical services	351555	378798	413251	426198	432152	454580	497096	542540	592054	...		
VA	Management of companies and enterprises	156810	170458	183354	177636	183799	195502	210146	234882	242095	261705	8.10%	5.86%
VA	Administrative and waste management services	254047	280150	282373	289419	299958	320303	335335	366435	393477	419429	6.60%	5.73%
VA	Administrative and support services	231877	255407	257207	264073	273252	290899	304336	334397	359294	...		
VA	Waste management and remediation services	22170	24742	25166	25346	26706	29403	30999	32039	34183	...		
VA	Educational services, health care, and social assistance	601537	634488	678436	739327	799568	857265	916268	961534	1022312	1090737	6.69%	6.84%
VA	Educational services	67634	72774	79239	85094	93268	100096	108296	113940	120946	129411	7.00%	7.48%
VA	Health care and social assistance	533904	561713	599197	654233	706300	757169	807972	847594	901366	961326	6.65%	6.75%
VA	Ambulatory health care services	276083	288565	307624	338120	361803	385673	406661	433554	464519	...		
VA	Hospitals and nursing and residential care facilities	214539	225566	238552	258044	281113	303854	330483	340015	358319	...		
VA	Social assistance	43282	47583	53022	58069	63384	67641	70828	74026	78528	...		
VA	Arts, entertainment, recreation, accommodation, and food services	305973	327774	350119	361469	381505	398862	427462	448420	479826	505676	5.39%	5.74%
VA	Arts, entertainment, and recreation	76824	83801	88676	95664	102390	107188	113744	117448	126182	131132	3.92%	6.12%
VA	Performing arts, spectator sports, museums, and related activities	34634	37757	40012	42695	46731	49577	52713	55013	60390	...		
VA	Amusements, gambling, and recreation industries	42191	46044	48664	52969	55659	57611	61031	62434	65792	...		
VA	Accommodation and food services	229148	243973	261443	265805	279115	291674	313718	330972	353643	374545	5.91%	5.61%
VA	Accommodation	78072	84297	90672	87487	89100	90692	98428	105123	112358	...		
VA	Food services and drinking places	151077	159677	170771	178318	190015	200982	215290	225849	241285	...		
VA	Other services, except government	211145	217806	229112	241458	252521	265274	273890	288054	301103	316573	5.14%	4.60%
VA	Government	1094496	1141217	1202681	1258325	1338432	1418433	1491628	1568716	1649362	1740999	5.56%	5.29%
VA	Federal	352911	361860	378749	385701	417325	448589	479354	502637	526427	547052	3.92%	4.99%
VA	General government	293058	300904	315362	325665	352873	383934	412592	438912	458598	...		
VA	Government enterprises	59853	60956	63387	60036	64452	64655	66762	63725	67829	...		
VA	State and local	741585	779357	823932	872623	921107	969844	1012274	1066079	1122935	1193947	6.32%	5.43%
VA	General government	677223	711795	754226	800769	848938	896175	935844	987012	1042915	...		
VA	Government enterprises	64363	67562	69706	71854	72169	73668	76430	79068	80020	...		
VA	NIPA reconciliation item /1/	...	...	...	...	...	...	...	3741	-10717	-3441		
	Addenda:												
VA	Gross domestic product, NIPAs	...	...	...	...	...	...	...	12433908	13194689	13841339	4.90%	
VA	Less: Value added, all industries	...	...	...	...	...	...	...	12430167	13205406	13844780	4.84%	
VA	Equals: NIPA reconciliation item /1/	...	...	...	...	...	...	...	3741	-10717	-3441	-67.89%	
VA	Private goods-producing industries /3/	1895417	1958889	2081485	2027496	2036893	2113266	2280603	2446205	2567536	2615550	1.87%	3.64%
VA	Private services-producing industries /4/	5757084	6168304	6532802	6842155	7094276	7429072	7913670	8415246	8988508	9488231	5.56%	5.71%
VA	Information-communications-technology-producing industries /5/	385038	425942	465786	424164	416624	421198	440488	470110	504964	541732	7.28%	3.87%

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The Equity Premium

EUGENE F. FAMA and KENNETH R. FRENCH*

ABSTRACT

We estimate the equity premium using dividend and earnings growth rates to measure the expected rate of capital gain. Our estimates for 1951 to 2000, 2.55 percent and 4.32 percent, are much lower than the equity premium produced by the average stock return, 7.43 percent. Our evidence suggests that the high average return for 1951 to 2000 is due to a decline in discount rates that produces a large unexpected capital gain. Our main conclusion is that the average stock return of the last half-century is a lot higher than expected.

THE EQUITY PREMIUM—the difference between the expected return on the market portfolio of common stocks and the risk-free interest rate—is important in portfolio allocation decisions, estimates of the cost of capital, the debate about the advantages of investing Social Security funds in stocks, and many other applications. The average return on a broad portfolio of stocks is typically used to estimate the expected market return. The average real return for 1872 to 2000 on the S&P index (a common proxy for the market portfolio, also used here) is 8.81 percent per year. The average real return on six-month commercial paper (a proxy for the risk-free interest rate) is 3.24 percent. This large spread (5.57 percent) between the average stock return and the interest rate is the source of the so-called equity premium puzzle: Stock returns seem too high given the observed volatility of consumption (Mehra and Prescott (1985)).

We use fundamentals (dividends and earnings) to estimate the expected stock return. Along with other evidence, the expected return estimates from fundamentals help us judge whether the realized average return is high or low relative to the expected value.

The logic of our approach is straightforward. The average stock return is the average dividend yield plus the average rate of capital gain:

$$A(R_t) = A(D_t/P_{t-1}) + A(GP_t), \tag{1}$$

* Fama is from the University of Chicago and French is from Dartmouth College. The comments of John Campbell, John Cochrane, Kent Daniel, John Heaton, Jay Ritter, Andrei Shleifer, Rex Sinquefield, Tuomo Vuolteenaho, Paul Zarowin, and seminar participants at Boston College, Dartmouth College, the NBER, Purdue University, the University of Chicago, and Washington University have been helpful. Richard Green (the editor) and the two referees get special thanks.

where D_t is the dividend for year t, P_{t-1} is the price at the end of year $t-1$, $GP_t = (P_t - P_{t-1})/P_{t-1}$ is the rate of capital gain, and $A(\ )$ indicates an average value. (Throughout the paper, we refer to D_t/P_{t-1} as the dividend yield and D_t/P_t is the dividend–price ratio. Similarly, Y_t/P_{t-1}, the ratio of earnings for year t to price at the end of year $t-1$, is the earnings yield and Y_t/P_t is the earnings–price ratio.)

Suppose the dividend–price ratio, D_t/P_t, is stationary (mean reverting). Stationarity implies that if the sample period is long, the compound rate of dividend growth approaches the compound rate of capital gain. Thus, an alternative estimate of the expected stock return is

$$A(RD_t) = A(D_t/P_{t-1}) + A(GD_t), \tag{2}$$

where $GD_t = (D_t - D_{t-1})/D_{t-1}$ is the growth rate of dividends. We call (2) the dividend growth model.

The logic that leads to (2) applies to any variable that is cointegrated with the stock price. For example, the dividend–price ratio may be nonstationary because firms move away from dividends toward share repurchases as a way of returning earnings to stockholders. But if the earnings–price ratio, Y_t/P_t, is stationary, the average growth rate of earnings, $A(GY_t) = A((Y_t - Y_{t-1})/Y_{t-1})$, is an alternative estimate of the expected rate of capital gain. And $A(GY_t)$ can be combined with the average dividend yield to produce another estimate of the expected stock return:

$$A(RY_t) = A(D_t/P_{t-1}) + A(GY_t). \tag{3}$$

We call (3) the earnings growth model.[1]

We should be clear about the expected return concept targeted by (1), (2), and (3). D_t/P_t and Y_t/P_t vary through time because of variation in the conditional (point-in-time) expected stock return and the conditional expected growth rates of dividends and earnings (see, e.g., Campbell and Shiller (1989)). But if the stock return and the growth rates are stationary (they have constant unconditional means), D_t/P_t and Y_t/P_t are stationary. Then, like the average return (1), the dividend and earnings growth models (2) and (3) provide estimates of the unconditional expected stock return. In short, the focus of the paper is estimates of the unconditional expected stock return.

The estimate of the expected real equity premium for 1872 to 2000 from the dividend growth model (2) is 3.54 percent per year. The estimate from the average stock return, 5.57 percent, is almost 60 percent higher. The difference between the two is largely due to the last 50 years. The equity premium for 1872 to 1950 from the dividend growth model, 4.17 percent per year, is close to the estimate from the average return, 4.40 percent. In con-

[1] Motivated by the model in Lettau and Ludvigson (2001), one can argue that if the ratio of consumption to stock market wealth is stationary, the average growth rate of consumption is another estimate of the expected rate of capital gain. We leave this path to future work.

trast, the equity premium for 1951 to 2000 produced by the average return, 7.43 percent per year, is almost three times the estimate, 2.55 percent, from (2). The estimate of the expected real equity premium for 1951 to 2000 from the earnings growth model (3), 4.32 percent per year, is larger than the estimate from the dividend growth model (2). But the earnings growth estimate is still less than 60 percent of the estimate from the average return.

Three types of evidence suggest that the lower equity premium estimates for 1951 to 2000 from fundamentals are closer to the expected premium. (a) The estimates from fundamentals are more precise. For example, the standard error of the estimate from the dividend growth model is less than half the standard error of the estimate from the average return. (b) The Sharpe ratio for the equity premium from the average stock return for 1951 to 2000 is just about double that for 1872 to 1950. In contrast, the equity premium from the dividend growth model has a similar Sharpe ratio for 1872 to 1950 and 1951 to 2000. (c) Most important, valuation theory specifies relations among the book-to-market ratio, the return on investment, and the cost of equity capital (the expected stock return). The estimates of the expected stock return for 1951 to 2000 from the dividend and earnings growth models line up with other fundamentals in the way valuation theory predicts. But the book-to-market ratio and the return on investment suggest that the expected return estimate from the average stock return is too high.

Our motivation for the dividend growth model (2) is simpler and more general, but (2) can be viewed as the expected stock return estimate of the Gordon (1962) model. Our work is thus in the spirit of a growing literature that uses valuation models to estimate expected returns (e.g., Blanchard (1993), Claus and Thomas (2001), and Gebhardt, Lee, and Swaminathan (2001)). Claus and Thomas and Gebhardt, Lee, and Swaminathan use forecasts by security analysts to estimate expected cash flows. Their analyst forecasts cover short periods (1985 to 1998 and 1979 to 1995). We use realized dividends and earnings from 1872 to 2000. This 129-year period provides a long perspective, which is important for judging the competing expected return estimates from fundamentals and realized stock returns. Moreover, though the issue is controversial (Keane and Runkle (1998)), Claus and Thomas find that analyst forecasts are biased; they tend to be substantially above observed growth rates. The average growth rates of dividends and earnings we use are unbiased estimates of expected growth rates.

Like us, Blanchard (1993) uses dividend growth rates to estimate the expected rate of capital gain, which he combines with an expected dividend yield to estimate the expected stock return. But his focus is different and his approach is more complicated than ours. He is interested in the path of the conditional expected stock return. His conditional expected return is the sum of the fitted values from time-series regressions of the realized dividend yield and a weighted average of 20 years of future dividend growth rates on four predetermined variables (the dividend yield, the real rate of capital gain, and the levels of interest rates and inflation). He focuses on describing the path of the conditional expected return in terms of his four explanatory variables.

In contrast, our prime interest is the unconditional expected return, which we estimate more simply as the sum of the average dividend yield and the average growth rate of dividends or earnings. This approach is valid if the dividend–price and earnings–price ratios are stationary. And we argue below that it continues to produce estimates of the average expected stock return when the price ratios are subject to reasonable forms of nonstationarity. Given its simplicity and generality, our approach is an attractive addition to the research toolbox for estimating the expected stock return.

Moreover, our focus is comparing alternative estimates of the unconditional expected stock return over the long 1872 to 2000 period, and explaining why the expected return estimates for 1951 to 2000 from fundamentals are much lower than the average return. Our evidence suggests that much of the high return for 1951 to 2000 is unexpected capital gain, the result of a decline in discount rates.

Specifically, the dividend–price and earnings–price ratios fall from 1950 to 2000; the cumulative percent capital gain for the period is more than three times the percent growth in dividends or earnings. All valuation models agree that the two price ratios are driven by expectations about future returns (discount rates) and expectations about dividend and earnings growth. Confirming Campbell (1991), Cochrane (1994), and Campbell and Shiller (1998), we find that dividend and earnings growth rates for 1950 to 2000 are largely unpredictable. Like Campbell and Shiller (1998), we thus infer that the decline in the price ratios is mostly due to a decline in expected returns. Some of this decline is probably expected, the result of reversion of a high 1950 conditional expected return to the unconditional mean. But most of the decline in the price ratios seems to be due to the unexpected decline of expected returns to ending values far below the mean.

The paper proceeds as follows. The main task, addressed in Sections I and II, is to compare and evaluate the estimates of the unconditional annual expected stock return provided by the average stock return and the dividend and earnings growth models. Section III then considers the issues that arise if the goal is to estimate the long-term expected growth of wealth, rather than the unconditional expected annual (simple) return. Section IV concludes.

I. The Unconditional Annual Expected Stock Return

Table I shows estimates of the annual expected real equity premium for 1872 to 2000. The market portfolio is the S&P 500 and its antecedents. The deflator is the Producer Price Index until 1925 (from Shiller (1989)) and the Consumer Price Index thereafter (from Ibbotson Associates). The risk-free interest rate is the annual real return on six-month commercial paper, rolled over at midyear. The risk-free rate and S&P earnings data are from Shiller, updated by Vuolteenaho (2000) and us. Beginning in 1925, we construct S&P book equity data from the book equity data in Davis, Fama, and French (2000), expanded to include all NYSE firms. The data on dividends, prices, and returns for 1872 to 1925 are from Shiller. Shiller's annual data on the

Table I

Real Equity Premium and Related Statistics for the S&P Portfolio

The inflation rate for year t is $Inf_t = L_t/L_{t-1} - 1$, where L_t is the price level at the end of year t. The real return for year t on six-month (three-month for the year 2000) commercial paper (rolled over at midyear) is F_t. The nominal values of book equity and price for the S&P index at the end of year t are b_t and p_t. Nominal S&P dividends and earnings for year t are d_t and y_t. Real rates of growth of dividends, earnings, and the stock price are $GD_t = (d_t/d_{t-1})*(L_{t-1}/L_t) - 1$, $GY_t = (y_t/y_{t-1})*(L_{t-1}/L_t) - 1$, and $GP_t = (p_t/p_{t-1})*(L_{t-1}/L_t) - 1$. The real dividend yield is $D_t/P_{t-1} = (d_t/p_{t-1})*(L_{t-1}/L_t)$. The real income return on investment is $Y_t/B_{t-1} = (1 + y_t/b_{t-1})*(L_{t-1}/L_t) - 1$. The dividend growth estimate of the real S&P return for t is $RD_t = D_t/P_{t-1} + GD_t$, the earnings growth estimate is $RY_t = D_t/P_{t-1} + GY_t$, and R_t is the realized real S&P return. The dividend and earnings growth estimates of the real equity premium for year t are $RXD_t = RD_t - F_t$ and $RXY_t = RY_t - F_t$, and $RX_t = R_t - F_t$ is the real equity premium from the realized real return. The Sharpe ratio for $RD_t - F_t$ (the mean of $RD_t - F_t$ divided by the standard deviation of R_t) is SD, SY is the Sharpe ratio for $RY_t - F_t$ (the mean of $RY_t - F_t$ divided by the standard deviation of R_t), and SR is the Sharpe ratio for $R_t - F_t$ (the mean of $R_t - F_t$ divided by the standard deviation of R_t). Except for the Sharpe ratios, all variables are expressed as percents, that is, they are multiplied by 100.

	Inf_t	F_t	D_t/P_{t-1}	GD_t	GY_t	GP_t	RD_t	RY_t	R_t	RXD_t	RXY_t	RX_t	SD	SY	SR
Means of annual values of variables															
1872–2000	2.16	3.24	4.70	2.08	NA	4.11	6.78	NA	8.81	3.54	NA	5.57	0.20	NA	0.31
1872–1950	0.99	3.90	5.34	2.74	NA	2.96	8.07	NA	8.30	4.17	NA	4.40	0.22	NA	0.23
1951–2000	4.00	2.19	3.70	1.05	2.82	5.92	4.74	6.51	9.62	2.55	4.32	7.43	0.15	0.25	0.44
Standard deviations of annual values of variables															
1872–2000	7.51	8.48	1.39	12.37	NA	17.83	12.56	NA	18.03	13.00	NA	18.51			
1872–1950	9.11	10.63	1.12	15.28	NA	18.48	15.41	NA	18.72	16.02	NA	19.57			
1951–2000	3.11	2.46	1.17	5.09	13.79	16.77	5.21	13.51	17.03	5.62	14.02	16.73			
Means of annual continuously compounded returns and growth rates															
1872–2000	1.86	2.87		1.34	NA	2.48			7.00						
1872–1950	0.59	3.33		1.60	NA	1.22			6.41						
1951–2000	3.88	2.14		0.92	1.89	4.46			7.94						

	b_t/p_t	RD_t	RY_t	R_t	Y_t/B_{t-1}
Means of annual values of variables					
1951–2000	0.66	4.74	6.51	9.62	7.60

level of the S&P (used to compute returns and other variables involving price) are averages of daily January values. The S&P dividend, price, and return data for 1926 to 2000 are from Ibbotson Associates, and the returns for 1926 to 2000 are true annual returns.

Without showing the details, we can report that the CRSP value-weight portfolio of NYSE, AMEX, and Nasdaq stocks produces average returns and dividend growth estimates of the expected return close to the S&P estimates for periods after 1925 when both indices are available. What one takes to be the risk-free rate has a bigger effect. For example, substituting the one-month Treasury bill rate for the six-month commercial paper rate causes estimates of the annual equity premium for 1951 to 2000 to rise by about one percent. But for our main task—comparing equity premium estimates from (1), (2), and (3)—differences in the risk-free rate are an additive constant that does not affect inferences.

One can estimate expected returns in real or nominal terms. Since portfolio theory says the goal of investment is consumption, real returns seem more relevant, and only results for real returns are shown. Because of suspicions about the quality of the price deflator during the early years of 1872 to 2000, we have replicated the results for nominal returns. They support all the inferences from real returns.

The dividend and earnings growth models (2) and (3) assume that the market dividend–price and earnings–price ratios are stationary. The first three annual autocorrelations of D_t/P_t for 1872 to 2000 are 0.73, 0.51, and 0.47. For the 1951 to 2000 period that occupies much of our attention, the autocorrelations are 0.83, 0.72, and 0.69. The autocorrelations are large, but their decay is roughly like that of a stationary first-order autoregression (AR1). This is in line with formal evidence (Fama and French (1988), Cochrane (1994), and Lamont (1998)) that the market dividend–price ratio is highly autocorrelated but slowly mean-reverting. S&P earnings data for the early years of 1872 to 2000 are of dubious quality (Shiller (1989)), so we estimate expected returns with the earnings growth model (3) only for 1951 to 2000. The first three autocorrelations of Y_t/P_t for 1951 to 2000, 0.80, 0.70, and 0.61, are again roughly like those of a stationary AR1.

We emphasize, however, that our tests are robust to reasonable nonstationarity of D_t/P_t and Y_t/P_t. It is not reasonable that the expected stock return and the expected growth rates of dividends and earnings that drive D_t/P_t and Y_t/P_t are nonstationary processes that can wander off to infinity. But nonstationarity of D_t/P_t and Y_t/P_t due to structural shifts in productivity or preferences that permanently change the expected return or the expected growth rates is reasonable. Such regime shifts are not a problem for the expected return estimates from (2) and (3), as long as D_t/P_t and Y_t/P_t mean-revert within regimes. If the regime shift is limited to expected dividend and earnings growth rates, the permanent change in expected growth rates is offset by a permanent change in the expected dividend yield, and (2) and (3) continue to estimate the (stationary) expected stock return. (An Appendix, available on request, provides an example.) If there is a perma-

nent shift in the expected stock return, it is nonstationary, but like the average return in (1), the dividend and earnings growth models in (2) and (3) estimate the average expected return during the sample period.

Indeed, an advantage of the expected return estimates from fundamentals is that they are likely to be less sensitive than the average return to long-lived shocks to dividend and earnings growth rates or the expected stock return. For example, a permanent shift in the expected return affects the average dividend yield, which is common to the three expected return estimates, but it produces a shock to the capital gain term in the average return in (1) that is not shared by the estimates in (2) and (3). In short, the estimates of the expected stock return from fundamentals are likely to be more precise than the average stock return.

A. *The Equity Premium*

For much of the period from 1872 to 2000—up to about 1950—the dividend growth model and the average stock return produce similar estimates of the expected return. Thereafter, the two estimates diverge. To illustrate, Table I shows results for 1872 to 1950 (79 years) and 1951 to 2000 (50 years). The year 1950 is a big year, with a high real stock return (23.40 percent), and high dividend and earnings growth estimates of the return (29.96 percent and 24.00 percent). But because the three estimates of the 1950 return are similarly high, the ordering of expected return estimates, and the inferences we draw from them, are unaffected by whether 1950 is allocated to the earlier or the later period. Indeed, pushing the 1950 break-year backward or forward several years does not affect our inferences.

For the earlier 1872 to 1950 period, there is not much reason to favor the dividend growth estimate of the expected stock return over the average return. Precision is not an issue; the standard errors of the two estimates are similar (1.74 percent and 2.12 percent), the result of similar standard deviations of the annual dividend growth rate and the rate of capital gain, 15.28 percent and 18.48 percent. Moreover, the dividend growth model and the average return provide similar estimates of the expected annual real return for 1872 to 1950, 8.07 percent and 8.30 percent. Given similar estimates of the expected return, the two approaches produce similar real equity premiums for 1872 to 1950, 4.17 percent (dividend growth model) and 4.40 percent (stock returns).

The competition between the dividend growth model and the average stock return is more interesting for 1951 to 2000. The dividend growth estimate of the 1951 to 2000 expected return, 4.74 percent, is less than half the average return, 9.62 percent. The dividend growth estimate of the equity premium, 2.55 percent, is 34 percent of the estimate from returns, 7.43 percent. The 1951 to 2000 estimates of the expected stock return and the equity premium from the earnings growth model, 6.51 percent and 4.32 percent, are higher than for the dividend growth model. But they are well below the estimates from the average return, 9.62 percent and 7.43 percent.

B. Evaluating the Expected Return Estimates for 1951 to 2000

We judge that the estimates of the expected stock return for 1951 to 2000 from fundamentals are closer to the true expected value, for three reasons.

(a) The expected return estimates from the dividend and earnings growth models are more precise than the average return. The standard error of the dividend growth estimate of the expected return for 1951 to 2000 is 0.74 percent, versus 2.43 percent for the average stock return. Since earnings growth is more volatile than dividend growth, the standard error of the expected return from the earnings growth model, 1.93 percent, is higher than the estimate from the dividend growth model, but it is smaller than the 2.43 percent standard error of the average stock return. Claus and Thomas (2001) also argue that expected return estimates from fundamentals are more precise than average returns, but they provide no direct evidence.

(b) Table I shows Sharpe ratios for the three equity premium estimates. Only the average premium in the numerator of the Sharpe ratio differs for the three estimates. The denominator for all three is the standard deviation of the annual stock return. The Sharpe ratio for the dividend growth estimate of the equity premium for 1872 to 1950, 0.22, is close to that produced by the average stock return, 0.23. More interesting, the Sharpe ratio for the equity premium for 1951 to 2000 from the dividend growth model, 0.15, is lower than but similar to that for 1872 to 1950. The Sharpe ratio for the 1951 to 2000 equity premium from the earnings growth model, 0.25, is somewhat higher than the dividend growth estimate, 0.15, but it is similar to the estimates for 1872 to 1950 from the dividend growth model, 0.22, and the average return, 0.23.

In asset pricing theory, the Sharpe ratio is related to aggregate risk aversion. The Sharpe ratios for the 1872 to 1950 and 1951 to 2000 equity premiums from the dividend growth model and the earnings growth model suggest that aggregate risk aversion is roughly similar in the two periods. In contrast, though return volatility falls a bit, the equity premium estimate from the average stock return increases from 4.40 percent for 1872 to 1950 to 7.43 percent for 1951 to 2000, and its Sharpe ratio about doubles, from 0.23 to 0.44. It seems implausible that risk aversion increases so much from the earlier to the later period.

(c) Most important, the behavior of other fundamentals favors the dividend and earnings growth models. The average ratio of the book value of equity to the market value of equity for 1951 to 2000 is 0.66, the book-to-market ratio B_t/P_t is never greater than 1.12, and it is greater than 1.0 for only 6 years of the 50-year period. Since, on average, the market value of equity is substantially higher than its book value, it seems safe to conclude that, on average, the expected return on investment exceeds the cost of capital.

Suppose investment at time $t - 1$ generates a stream of equity earnings for $t, t + 1, \ldots, t + N$ with a constant expected value. The average income return on book equity, $A(Y_t/B_{t-1})$, is then an estimate of the expected return on equity's share of assets. It is an unbiased estimate when N is infinite and

it is upward biased when N is finite. In either case, if the expected return on investment exceeds the cost of capital, we should find that (except for sampling error) the average income return on book equity is greater than estimates of the cost of equity capital (the expected stock return):

$$A(Y_t/B_{t-1}) > E(R). \tag{4}$$

Table I shows that (4) is confirmed when we use the dividend and earnings growth models to estimate the expected real stock return for 1951 to 2000. The estimates of $E(R)$, 4.74 percent (dividend growth model) and 6.51 percent (earnings growth model), are below 7.60 percent, the average real income return on book equity, $A(Y_t/B_{t-1})$. In contrast, the average real stock return for 1951 to 2000, 9.62 percent, exceeds the average income return by more than 2 percent. An expected stock return that exceeds the expected income return on book equity implies that the typical corporate investment has a negative net present value. This is difficult to reconcile with an average book-to-market ratio substantially less than one.

To what extent are our results new? Using analyst forecasts of expected cash flows and a more complicated valuation model, Claus and Thomas (2001) produce estimates of the expected stock return for 1985 to 1998 far below the average return. Like us, they argue that the estimates from fundamentals are closer to the true expected return. We buttress this conclusion with new results on three fronts. (a) The long-term perspective provided by the evidence that, for much of the 1872 to 2000 period, average returns and fundamentals produce similar estimates of the expected return. (b) Direct evidence that the expected return estimates for 1951 to 2000 from fundamentals are more precise. (c) Sharpe ratios and evidence on how the alternative expected return estimates line up with the income return on investment. These new results provide support for the expected return estimates from fundamentals, and for the more specific inference that the average stock return for 1951 to 2000 is above the expected return.

II. Unexpected Capital Gains

Valuation theory suggests three potential explanations for why the 1951 to 2000 average stock return is larger than the expected return. (a) Dividend and earnings growth for 1951 to 2000 is unexpectedly high. (b) The expected (post-2000) growth rates of dividends and earnings are unexpectedly high. (c) The expected stock return (the equity discount rate) is unexpectedly low at the end of the sample period.

A. Is Dividend Growth for 1951 to 2000 Unexpectedly High?

If the prosperity of the United States over the last 50 years was not fully anticipated, dividend and earnings growth for 1951 to 2000 exceed 1950 expectations. Such unexpected in-sample growth produces unexpected cap-

ital gains. But it does not explain why the average return for 1951 to 2000 (the average dividend yield plus the average rate of capital gain) is so much higher than the expected return estimates from fundamentals (the average dividend yield plus the average growth rate of dividends or earnings). To see the point, note that unexpected in-sample dividend and earnings growth do not affect either the 1950 or the 2000 dividend–price and earnings–price ratios. (The 2000 ratios depend on post-2000 expected returns and growth rates.) Suppose D_t/P_t and E_t/P_t were the same in 1950 and 2000. Then the total percent growth in dividends and earnings during the period would be the same as the percent growth in the stock price. And (1), (2), and (3) would provide similar estimates of the expected stock return.

It is worth dwelling on this point. There is probably survivor bias in the U.S. average stock return for 1872 to 1950, as well as for 1951 to 2000. During the 1872 to 2000 period, it was not a foregone conclusion that the U.S. equity market would survive several financial panics, the Great Depression, two world wars, and the cold war. The average return for a market that survives many potentially cataclysmic challenges is likely to be higher than the expected return (Brown, Goetzmann, and Ross (1995)). But if the positive bias shows up only as higher than expected dividend and earnings growth during the sample period, there is similar survivor bias in the expected return estimates from fundamentals—a problem we do not solve. Our more limited goal is to explain why the average stock return for 1951 to 2000 is so high relative to the expected return estimates from the dividend and earnings growth models.

Since unexpected growth for 1951 to 2000 has a similar effect on the three expected return estimates, the task of explaining why the estimates are so different falls to the end-of-sample values of future expected returns and expected dividend and earnings growth. We approach the problem by first looking for evidence that expected dividend or earnings growth is high at the end of the sample period. We find none. We then argue that the large spread of capital gains over dividend and earnings growth for 1951 to 2000, or equivalently, the low end-of-sample dividend–price and earnings–price ratios, are due to an unexpected decline in expected stock returns to unusually low end-of-sample values.

B. Are Post-2000 Expected Dividend and Earnings Growth Rates Unusually High?

The behavior of dividends and earnings provides little evidence that rationally assessed (i.e., true) long-term expected growth is high at the end of the sample period. If anything, the growth rate of real dividends declines during the 1951 to 2000 period (Table II). The average growth rate for the first two decades, 1.60 percent, is higher than the average growth rates for the last three, 0.68 percent. The regressions in Table III are more formal evidence on the best forecast of post-2000 real dividend growth rates. Re-

Table II

Means of Simple Real Equity Premium and Related Statistics for the S&P Portfolio for 10-year Periods

The inflation rate for year t is $Inf_t = L_t/L_{t-1} - 1$, where L_t is the price level at the end of year t. The real return for year t on six-month (three-month for the year 2000) commercial paper (rolled over at midyear) is F_t. The nominal price of the S&P index at the end of year t is p_t. Nominal S&P dividends and earnings for year t are d_t and y_t. Real rates of growth of dividends, earnings, and the stock price are $GD_t = (d_t/d_{t-1})*(L_{t-1}/L_t) - 1$, $GY_t = (y_t/y_{t-1})*(L_{t-1}/L_t) - 1$, and $GP_t = (p_t/p_{t-1})*(L_{t-1}/L_t) - 1$. The real dividend yield is $D_t/P_{t-1} = (d_t/p_{t-1})*(L_{t-1}/L_t)$. The dividend growth estimate of the real S&P return for t is $RD_t = D_t/P_{t-1} + GD_t$, the earnings growth estimate is $RY_t = D_t/P_{t-1} + GY_t$, and R_t is the realized real S&P return. The dividend and earnings growth estimates of the real equity premium for year t are $RXD_t = RD_t - F_t$ and $RXY_t = RY_t - F_t$, and $RX_t = R_t - F_t$ is the real equity premium from the realized real return. All variables are expressed as percents, that is, they are multiplied by 100.

	Inf_t	F_t	D_t/P_{t-1}	GD_t	GY_t	GP_t	RD_t	RY_t	R_t	RXD_t	RXY_t	RX_t
1872–1880	−2.77	9.86	6.29	4.62	NA	7.13	10.91	NA	13.42	1.06	NA	3.56
1881–1890	−1.72	7.23	5.04	0.69	NA	0.04	5.73	NA	5.08	−1.51	NA	−2.15
1891–1900	0.18	5.08	4.40	4.49	NA	4.75	8.89	NA	9.15	3.81	NA	4.08
1901–1910	1.95	3.18	4.45	3.25	NA	2.33	7.70	NA	6.78	4.52	NA	3.60
1911–1920	6.82	0.82	5.70	−3.43	NA	−6.52	2.27	NA	−0.83	1.45	NA	−1.64
1921–1930	−1.70	7.41	5.72	9.07	NA	11.83	14.78	NA	17.54	7.37	NA	10.13
1931–1940	−1.23	2.80	5.31	0.36	NA	2.21	5.67	NA	7.52	2.87	NA	4.72
1941–1950	6.04	−4.57	5.90	3.02	NA	2.33	8.91	NA	8.22	13.48	NA	12.79
1951–1960	1.79	1.05	4.68	1.22	0.61	10.64	5.90	5.30	15.32	4.85	4.24	14.27
1961–1970	2.94	2.27	3.21	1.98	2.07	2.69	5.19	5.27	5.90	2.92	3.01	3.63
1971–1980	8.11	−0.30	4.04	−0.86	3.47	−1.92	3.18	7.50	2.12	3.48	7.80	2.42
1981–1990	4.51	5.32	4.19	2.32	0.37	5.40	6.51	4.56	9.59	1.19	−0.75	4.28
1991–2000	2.68	2.61	2.36	0.58	7.58	12.80	2.94	9.94	15.16	0.32	7.32	12.54

Table III

Regressions to Forecast Real Dividend and Earnings Growth Rates, GD_t and GY_t

The price level at the end of year t is L_t. The nominal values of book equity and price for the S&P index at the end of year t are b_t and p_t. Nominal S&P dividends and earnings for year t are d_t and y_t. The real dividend and earnings growth rates for year t are $GD_t = (d_t/d_{t-1})*(L_{t-1}/L_t) - 1$ and $GY_t = (y_t/y_{t-1})*(L_{t-1}/L_t) - 1$, and R_t is the realized real return on the S&P portfolio for year t. The regression intercept is *Int*, and t-Stat is the regression coefficient (*Coef*) divided by its standard error. The regression R^2 is adjusted for degrees of freedom. Except for the dividend payout ratio, d_t/y_t, all variables are expressed as percents, that is, they are multiplied by 100.

Panel A: One Year: The Regressions Forecast Real Dividend Growth, GD_t, with Variables Known at $t - 1$

	Int	d_{t-1}/y_{t-1}	d_{t-1}/p_{t-1}	GD_{t-1}	GD_{t-2}	GD_{t-3}	R_{t-1}	R_{t-2}	R_{t-3}	R^2
1875–1950, N = 76 years										
Coef	29.56	−23.12	−2.63	−0.12	−0.07	−0.03	0.22	0.13	0.09	0.38
t-Stat	3.22	−3.17	−1.77	−1.08	−0.64	−0.29	2.24	1.37	1.01	
1951–2000, N = 50 years										
Coef	−2.16	2.97	0.11	−0.07	−0.20	−0.06	0.11	0.07	0.01	0.01
t-Stat	−0.40	0.33	0.16	−0.45	−1.57	−0.45	2.17	1.33	0.22	

Panel B: Two Years: The Regressions Forecast Real Dividend Growth, GD_t, with Variables Known at $t - 2$

	Int	d_{t-2}/y_{t-2}	d_{t-2}/p_{t-2}	GD_{t-2}	GD_{t-3}	R_{t-2}	R_{t-3}	R^2
1875–1950, N = 76 years								
Coef	6.61	−11.60	0.31	−0.26	0.05	0.24	0.11	0.07
t-Stat	0.64	−1.28	0.18	−2.02	0.39	2.03	1.00	
1951–2000, N = 50 years								
Coef	−4.11	7.62	0.32	−0.14	−0.03	0.05	−0.01	−0.05
t-Stat	−0.73	0.81	0.46	−1.13	−0.28	0.99	−0.16	

Panel C: One Year: The Regressions Forecast Real Earnings Growth, GY_t, with Variables Known at $t - 1$

	Int	Y_{t-1}/B_{t-2}	d_{t-1}/y_{t-1}	y_{t-1}/p_{t-1}	GY_{t-1}	GY_{t-2}	GY_{t-3}	R_{t-1}	R_{t-2}	R_{t-3}	R^2
1951–2000, N = 50 years											
Coef	5.48	0.11	13.06	−1.36	0.21	−0.13	−0.31	0.28	−0.25	0.03	0.40
t-Stat	0.33	0.11	0.52	−1.91	1.17	−0.89	−2.64	2.39	−2.18	0.26	

Panel D: Two Years: The Regressions Forecast Real Earnings Growth, GY_t, with Variables Known at $t - 2$

	Int	Y_{t-2}/B_{t-3}	d_{t-2}/y_{t-2}	y_{t-2}/p_{t-2}	GY_{t-2}	GY_{t-3}	R_{t-2}	R_{t-3}	R^2
1951–2000, N = 50 years									
Coef	−7.60	0.46	2.05	−0.74	−0.16	−0.39	−0.31	−0.12	0.23
t-Stat	−0.43	1.66	0.76	−1.02	−0.92	−2.54	−2.59	−0.97	

gressions are shown for forecasts one year ahead (the explanatory variables for year t dividend growth are known at the end of year $t - 1$) and two years ahead (the explanatory variables are known at the end of year $t - 2$).

The regression for 1875 to 1950 suggests strong forecast power one year ahead. The slopes on the lagged payout ratio, the dividend–price ratio, and the stock return are close to or more than two standard errors from zero, and the regression captures 38 percent of the variance of dividend growth. Even in the 1875 to 1950 period, however, power to forecast dividend growth does not extend much beyond a year. When dividend growth for year t is explained with variables known at the end of year $t - 2$, the regression R^2 falls from 0.38 to 0.07. Without showing the details, we can report that extending the forecast horizon from two to three years causes all hint of forecast power to disappear. Thus, for 1875 to 1950, the best forecast of dividend growth more than a year or two ahead is the historical average growth rate.

We are interested in post-2000 expected dividend growth, and even the short-term forecast power of the dividend regressions for 1872 to 1950 evaporates in the 1951 to 2000 period. The lagged stock return has some information ($t = 2.17$) about dividend growth one year ahead. But the 1951 to 2000 regression picks up only one percent of the variance of dividend growth. And forecast power does not improve for longer forecast horizons. Our evidence that dividend growth is essentially unpredictable during the last 50 years confirms the results in Campbell (1991), Cochrane (1991, 1994), and Campbell and Shiller (1998). If dividend growth is unpredictable, the historical average growth rate is the best forecast of future growth.

Long-term expected earnings growth also is not unusually high in 2000. There is no clear trend in real earnings growth during the 1951 to 2000 period. The most recent decade, 1991 to 2000, produces the highest average growth rate, 7.58 percent per year (Table II). But earnings growth is volatile. The standard errors of 10-year average growth rates vary around 5 percent. It is thus not surprising that 1981 to 1990, the decade immediately preceding 1991 to 2000, produces the lowest average real earnings growth rate, 0.37 percent per year.

The regressions in Table III are formal evidence on the predictability of earnings growth during the 1951 to 2000 period. There is some predictability of near-term growth, but it is largely due to transitory variation in earnings that is irrelevant for forecasting long-term earnings. In the 1951 to 2000 regression to forecast earnings growth one year ahead, the slope on the first lag of the stock return is positive (0.28, $t = 2.39$), but the slope on the second lag is negative (-0.25, $t = -2.18$) and about the same magnitude. Thus, the prediction of next year's earnings growth from this year's return is reversed the following year. In the one-year forecast regression for 1951 to 2000, the only variable other than lagged returns with power to forecast earnings growth ($t = -2.64$) is the third lag of earnings growth. But the slope is negative, so it predicts that the strong earnings growth of recent years is soon to be reversed.

In the 1951 to 2000 regression to forecast earnings one year ahead, there is a hint ($t = -1.91$) that the low earnings–price ratio at the end of the period implies higher than average expected growth one year ahead. But the effect peters out quickly; the slope on the lagged earnings–price ratio in the regression to forecast earnings growth two years ahead is -1.02 standard errors from zero. The only variables with forecast power two years ahead are the second lag of the stock return and the third lag of earnings growth. But the slopes on these variables are negative, so again the 2000 prediction is that the strong earnings growth of recent years is soon to be reversed. And again, regressions (not shown) confirm that forecast power for 1951 to 2000 does not extend beyond two years. Thus, beyond two years, the best forecast of earnings growth is the historical average growth rate.

In sum, the behavior of dividends for 1951 to 2000 suggests that future growth is largely unpredictable, so the historical mean growth rate is a near optimal forecast of future growth. Earnings growth for 1951 to 2000 is somewhat predictable one and two years ahead, but the end-of-sample message is that the recent high growth rates are likely to revert quickly to the historical mean. It is also worth noting that the market survivor bias argument of Brown, Goetzmann, and Ross (1995) suggests that past average growth rates are, if anything, upward biased estimates of future growth. In short, we find no evidence to support a forecast of strong future dividend or earnings growth at the end of our sample period.

C. Do Expected Stock Returns Fall during the 1951 to 2000 Period?

The S&P dividend–price ratio, D_t/P_t, falls from 7.18 percent at the end of 1950 to a historically low 1.22 percent at the end of 2000 (Figure 1). The growth in the stock price, P_{2000}/P_{1950}, is thus 5.89 times the growth in dividends, D_{2000}/D_{1950}. The S&P earnings–price ratio, Y_t/P_t, falls from 13.39 percent at the end of 1950 to 3.46 percent at the end of 2000, so the percent capital gain of the last 50 years is 3.87 times the percent growth in earnings. (Interestingly, almost all of the excess capital gain occurs in the last 20 years; Figure 1 shows that the 1979 earnings–price ratio, 13.40 percent, is nearly identical to the 13.39 percent value of 1950.)

All valuation models say that D_t/P_t and E_t/P_t are driven by expected future returns (discount rates) and expectations about future dividend and earnings growth. Our evidence suggests that rational forecasts of long-term dividend and earnings growth rates are not unusually high in 2000. We conclude that the large spread of capital gains for 1951 to 2000 over dividend and earnings growth is largely due to a decline in the expected stock return.

Some of the decline in D_t/P_t and E_t/P_t during 1951 to 2000 is probably anticipated in 1950. The dividend–price ratio for 1950, 7.18 percent, is high (Figure 1). The average for 1872 to 2000 is 4.64 percent. If D_t/P_t is mean-reverting, the expectation in 1950 of the yield in 2000 is close to the unconditional mean, say 4.64 percent. The actual dividend–price ratio for 2000 is

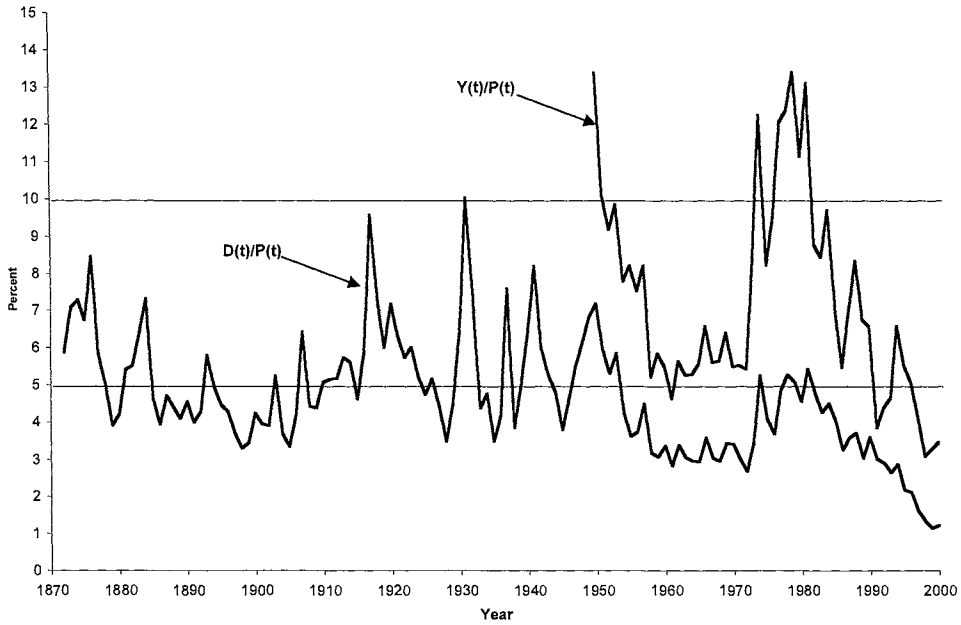

Figure 1. Dividend–price and earnings–price ratios.

1.22 percent. The 2000 stock price is thus 4.64/1.22 = 3.80 times what it would be if the dividend yield for 2000 hit the historical mean. Roughly speaking, this unexpected capital gain adds about 2.67 percent to the compound annual return for 1951 to 2000.

Similarly, part of the large difference between the 1951 to 2000 capital gain and the growth in earnings is probably anticipated in 1950. The 13.39 percent value of Y_t/P_t in 1950 is high relative to the mean for 1951 to 2000, 7.14 percent. If the earnings–price ratio is stationary, the expectation in 1950 of Y_t/P_t for 2000 is close to the unconditional mean, say 7.14 percent. The actual Y_t/P_t for 2000 is 3.46 percent. Thus, the 2000 stock price is 7.14/3.46 = 2.06 times what it would be if the ratio for 2000 hit the 7.14 percent average value for 1951 to 2000. Roughly speaking, this estimate of the unexpected capital gain adds about 1.45 percent to the compound annual return for the 50-year period.

In short, the percent capital gain for 1951 to 2000 is several times the growth of dividends or earnings. The result is historically low dividend–price and earnings–price ratios at the end of the period. Since the ratios are high in 1950, some of their subsequent decline is probably expected, but much of it is unexpected. Given the evidence that rational forecasts of long-term growth rates of dividends and earnings are not high in 2000, we conclude that the unexpected capital gains for 1951 to 2000 are largely due to a decline in the discount rate. In other words, the low end-of-sample price ratios imply low (rationally assessed, or true) expected future returns.

Like us, Campbell (1991), Cochrane (1994), and Campbell and Shiller (1998) find that, for recent periods, dividend and earnings growth are largely unpredictable, so variation in dividend–price and earnings–price ratios is largely due to the expected stock return. The samples in Campbell (1991) and Cochrane (1994) end in 1988 (before the strong subsequent returns that produce sharp declines in the price ratios), and they focus on explaining, in general terms, how variation in D_t/P_t splits between variation in the expected stock return and expected dividend growth. Campbell and Shiller (1998) focus on the low expected future returns implied by the low price ratios of recent years.

In contrast, we are more interested in what the decline in the price ratios says about past returns, specifically, that the average return for 1951 to 2000 is above the expected return. And this inference does not rest solely on the information in price ratios. We buttress it with two types of novel evidence. (a) The perspective from our long sample period that, although the average stock return for 1951 to 2000 is much higher than expected return estimates from fundamentals, the two approaches produce similar estimates for 1872 to 1950. (b) Evidence from Sharpe ratios, the book-to-market ratio, and the income return on investment, which also suggests that the average return for 1951 to 2000 is above the expected value.

III. Estimating the Expected Stock Return: Issues

There are two open questions about our estimates of the expected stock return. (a) In recent years the propensity of firms to pay dividends declines and stock repurchases surge. How do these changes in dividend policy affect our estimates of the expected return? (b) Under rather general conditions, the dividend and earnings growth models (2) and (3) provide estimates of the expected stock return. Are the estimates biased and does the bias depend on the return horizon? This section addresses these issues.

A. Repurchases and the Declining Incidence of Dividend Payers

Share repurchases surge after 1983 (Bagwell and Shoven (1989) and Dunsby (1995)), and, after 1978, the fraction of firms that do not pay dividends steadily increases (Fama and French (2001)). More generally, dividends are a policy variable, and changes in policy can raise problems for estimates of the expected stock return from the dividend growth model. There is no problem in the long-term, as long as dividend policies stabilize and the dividend–price ratio resumes its mean-reversion, though perhaps to a new mean. (An Appendix, available on request, provides an example involving repurchases.) But there can be problems during transition periods. For example, if the fraction of firms that do not pay dividends steadily increases, the market dividend–price ratio is probably nonstationary; it is likely to decline over time, and the dividend growth model is likely to underestimate the expected stock return.

Fortunately, the earnings growth model is not subject to the problems posed by drift in dividend policy. The earnings growth model provides an estimate of the expected stock return when the earnings–price ratio is stationary. And as discussed earlier, the model provides an estimate of the average expected return during the sample period when there are permanent shifts in the expected value of Y_t/P_t, as long as the ratio mean-reverts within regimes.

The earnings growth model is not, however, clearly superior to the dividend growth model. The standard deviation of annual earnings growth rates for 1951 to 2000 (13.79 percent, versus 5.09 percent for dividends) is similar to that of capital gains (16.77 percent), so much of the precision advantage of using fundamentals to estimate the expected stock return is lost. We see next that the dividend growth model has an advantage over the earnings growth model and the average stock return if the goal is to estimate the long-term expected growth of wealth.

B. The Investment Horizon

The return concept in discrete time asset pricing models is a one-period simple return, and our empirical work focuses on the one-year return. But many, if not most, investors are concerned with long-term returns, that is, terminal wealth over a long holding period. Do the advantages and disadvantages of different expected return estimates depend on the return horizon? This section addresses this question.

B.1. The Expected Annual Simple Return

There is downward bias in the estimates of the expected annual simple return from the dividend and earnings growth models—the result of a variance effect. The expected value of the dividend growth estimate of the expected return, for example, is the expected value of the dividend yield plus the expected value of the annual simple dividend growth rate. The expected annual simple return is the expected value of the dividend yield plus the expected annual simple rate of capital gain. If the dividend–price ratio is stationary, the compound rate of capital gain converges to the compound dividend growth rate as the sample period increases. But because the dividend growth rate is less volatile than the rate of capital gain, the expected simple dividend growth rate is less than the expected simple rate of capital gain.

The standard deviation of the annual simple rate of capital gain for 1951 to 2000 is 3.29 times the standard deviation of the annual dividend growth rate (Table I). The resulting downward bias of the average dividend growth rate as an estimate of the expected annual simple rate of capital gain is roughly 1.28 percent per year (half the difference between the variances of the two growth rates). Corrected for this bias, the dividend growth estimate of the equity premium in the simple returns of 1951 to 2000 rises from 2.55 to 3.83 percent (Table IV), which is still far below the estimate from the average return, 7.43 percent. Since the earnings growth rate and the annual rate of capital gain have similar standard deviations for 1951 to 2000,

Table IV

Estimates of the Real Equity Premium in Simple Annual and Long-term Returns: 1951 to 2000

The inflation rate for year t is $Inf_t = L_t/L_{t-1}$, where L_t is the price level at the end of year t. The real return for year t on six-month (three-month for the year 2000) commercial paper (rolled over at midyear) is F_t. The nominal value of the S&P index at the end of year t is p_t. Nominal S&P dividends and earnings for year t are d_t and y_t. Real rates of growth of dividends, earnings, and the stock price are $GD_t = (d_t/d_{t-1})*(L_{t-1}/L_t) - 1$, $GY_t = (y_t/y_{t-1})*(L_{t-1}/L_t) - 1$, and $GP_t = (p_t/p_{t-1})*(L_{t-1}/L_t) - 1$. The real dividend yield is $D_t/P_{t-1} = (d_t/p_{t-1})*(L_{t-1}/L_t)$. The dividend growth estimate of the real S&P return for t is $RD_t = D_t/P_{t-1} + GD_t$, the earnings growth estimate is $RY_t = D_t/P_{t-1} + GY_t$, and R_t is the realized real S&P return. The dividend and earnings growth estimates of the real equity premium for year t are $RXD_t = RD_t - F_t$ and $RXY_t = RY_t - F_t$, and $RX_t = R_t - F_t$ is the real equity premium from the realized real return. The average values of the equity premium estimates are $A(RXD_t)$, $A(RXY_t)$, and $A(RX_t)$. The first column of the table shows unadjusted estimates of the annual simple equity premium. The second column shows bias-adjusted estimates of the annual premium. The bias adjustment is one-half the difference between the variance of the annual rate of capital gain and the variance of either the dividend growth rate or the earnings growth rate. The third column shows bias-adjusted estimates of the expected equity premium relevant if one is interested in the long-term growth rate of wealth. The bias adjustment is one-half the difference between the variance of the annual dividend growth rate and the variance of either the growth rate of earnings or the rate of capital gain. The equity premiums are expressed as percents.

		Bias-adjusted	
	Unadjusted	Annual	Long-term
$A(RXD_t)$	2.55	3.83	2.55
$A(RXY_t)$	4.32	4.78	3.50
$A(RX_t)$	7.43	7.43	6.16

13.79 percent and 16.77 percent (Table I), the bias of the earnings growth estimate of the expected return is smaller (0.46 percent). Corrected for bias, the estimate of the equity premium for 1951 to 2000 from the earnings growth model rises from 4.32 to 4.78 percent (Table IV), which again is far below the 7.43 percent estimate from the average return.

B.2. Long-term Expected Wealth

The (unadjusted) estimate of the expected annual simple return from the dividend growth model is probably the best choice if we are concerned with the long-term expected wealth generated by the market portfolio. The annual dividend growth rates of 1951 to 2000 are essentially unpredictable. If the dividend growth rate is serially uncorrelated, the expected value of the compounded dividend growth rate is the compounded expected simple growth rate:

$$E\left[\prod_{t=1}^{T}(1 + GD_t)\right] = [1 + E(GD)]^T. \tag{5}$$

And if the dividend–price ratio is stationary, for long horizons the expected compounded dividend growth rate is the expected compounded rate of capital gain:

$$E\left[\prod_{t=1}^{T}(1+GD_t)\right] = E\left[\prod_{t=1}^{T}(1+GP_t)\right]. \tag{6}$$

Thus, when the horizon T is long, compounding the true expected annual simple return from the dividend growth model produces an unbiased estimate of the expected long-term return:

$$[1+E(RD)]^T = E\left[\prod_{t=1}^{T}(1+R_t)\right]. \tag{7}$$

In contrast, if the dividend growth rate is unpredictable and the dividend–price ratio is stationary, part of the higher volatility of annual rates of capital gain is transitory, the result of a mean-reverting expected annual return (Cochrane (1994)). Thus, compounding even the true unconditional expected annual simple return, $E(R)$, yields an upward biased measure of the expected compounded return:

$$[1+E(R)]^T > E\left[\prod_{t=1}^{T}(1+R_t)\right]. \tag{8}$$

There is a similar problem in using the average (simple) earnings growth rate to estimate long-term expected wealth. The regressions in Table III suggest that the predictability of earnings growth for 1951 to 2000 is due to transitory variation in earnings. As a result, annual earnings growth is 2.71 times more volatile than dividend growth (Table I). The compound growth rate of earnings for 1951 to 2000, 1.89 percent, is 2.05 times the compound dividend growth rate, 0.92 percent. But because earnings are more volatile, the average simple growth rate of earnings, 2.82 percent, is 2.69 times the average simple growth rate of dividends, 1.05 percent. As a result, the average simple growth rate of earnings produces an upward biased estimate of the compound rate of growth of long-term expected wealth.

We can correct the bias by subtracting half the difference between the variance of earnings growth and the variance of dividend growth (0.82 percent) from the average earnings growth rate. The estimate of the expected rate of capital gain provided by this adjusted average growth rate of earnings is 2.00 percent per year. Using this adjusted average growth rate of earnings, the earnings growth estimate of the expected real stock return for 1951 to 2000 falls from 6.51 to 5.69 percent. The estimate of the equity premium falls from 4.32 to 3.50 percent (Table IV), which is closer to the 2.55 percent obtained when the average dividend growth rate is used to

estimate the expected rate of capital gain. Similarly, adjusting for the effects of transitory return volatility causes the estimate of the equity premium from realized stock returns to fall from 7.43 to 6.16 percent, which is still far above the bias-adjusted estimate of the earnings growth model (3.50 percent) and the estimate from the dividend growth model (2.55 percent).

Finally, we only have estimates of the expected growth rates of dividends and earnings and the expected rate of capital gain. Compounding estimates rather than true expected values adds upward bias to measures of expected long-term wealth (Blume (1974)). The bias increases with the imprecision of the estimates. This is another reason to favor the more precise estimate of the expected stock return from the dividend growth model over the earnings growth estimate or the estimate from the average stock return.

IV. Conclusions

There is a burgeoning literature on the equity premium. Our main additions are on two fronts. (a) A long (1872 to 2000) perspective on the competing estimates of the unconditional expected stock return from fundamentals (the dividend and earnings growth models) and the average stock return. (b) Evidence (estimates of precision, Sharpe ratios, and the behavior of the book-to-market ratio and the income return on investment) that allows us to choose between the expected return estimates from the two approaches.

Specifically, the dividend growth model and the realized average return produce similar real equity premium estimates for 1872 to 1950, 4.17 percent and 4.40 percent. For the half-century from 1951 to 2000, however, the equity premium estimates from the dividend and earnings growth models, 2.55 percent and 4.32 percent, are far below the estimate from the average return, 7.43 percent.

We argue that the dividend and earnings growth estimates of the equity premium for 1951 to 2000 are closer to the true expected value. This conclusion is based on three results.

(a) The estimates from fundamentals, especially the estimate from the dividend growth model, are more precise; they have lower standard errors than the estimate from the average return.

(b) The appealing message from the dividend and earnings growth models is that aggregate risk aversion (as measured by the Sharpe ratio for the equity premium) is on average roughly similar for the 1872 to 1949 and 1950 to 1999 periods. In contrast, the Sharpe ratio for the equity premium from the average return just about doubles from the 1872 to 1950 period to the 1951 to 2000 period.

(c) Most important, the average stock return for 1951 to 2000 is much greater than the average income return on book equity. Taken at face value, this says that investment during the period is on average unprofitable (its expected return is less than the cost of capital). In contrast, the lower estimates of the expected stock return from the dividend and earnings growth models are less than the income return on investment, so the message is

that investment is on average profitable. This is more consistent with book-to-market ratios that are rather consistently less than one during the period.

If the average stock return for 1951 to 2000 exceeds the expected return, stocks experience unexpected capital gains. What is the source of the gains? Growth rates of dividends and earnings are largely unpredictable, so there is no basis for extrapolating unusually high long-term future growth. This leaves a decline in the expected stock return as the prime source of the unexpected capital gain. In other words, the high return for 1951 to 2000 seems to be the result of low expected future returns.

Many papers suggest that the decline in the expected stock return is in part permanent, the result of (a) wider equity market participation by individuals and institutions, and (b) lower costs of obtaining diversified equity portfolios from mutual funds (Diamond (1999), Heaton and Lucas (1999), and Siegel (1999)). But there is also evidence that the expected stock return is slowly mean reverting (Fama and French (1989) and Cochrane (1994)). Moreover, there are two schools of thought on how to explain the variation in expected returns. Some attribute it to rational variation in response to macroeconomic factors (Fama and French (1989), Blanchard (1993), and Cochrane (1994)), while others judge that irrational swings in investor sentiment are the prime moving force (e.g., Shiller (1989)). Whatever the story for variation in the expected return, and whether it is temporary or partly permanent, the message from the low end-of-sample dividend–price and earnings–price ratios is that we face a period of low (true) expected returns.

Our main concern, however, is the unconditional expected stock return, not the end-of-sample conditional expected value. Here there are some nuances. If we are interested in the unconditional expected annual simple return, the estimates for 1951 to 2000 from fundamentals are downward biased. The bias is rather large when the average growth rate of dividends is used to estimate the expected rate of capital gain, but it is small for the average growth rate of earnings. On the other hand, if we are interested in the long-term expected growth of wealth, the dividend growth model is probably best, and the average stock return and the earnings growth estimate of the expected return are upward biased. But our bottom line inference does not depend on whether one is interested in the expected annual simple return or long-term expected wealth. In either case, the bias-adjusted expected return estimates for 1951 to 2000 from fundamentals are a lot (more than 2.6 percent per year) lower than bias-adjusted estimates from realized returns. (See Table IV.) Based on this and other evidence, our main message is that the unconditional expected equity premium of the last 50 years is probably far below the realized premium.

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