Docket	:	A.12-04-015 et al
Exhibit Number	:	DRA-01
Commissioner	:	Ferron
ALJ	:	Galvin
Witness	:	Woolridge

DIVISION OF RATEPAYER ADVOCATES
CALIFORNIA PUBLIC UTILITIES COMMISSION

Report on The Cost of Capital for Test Year 2013

A.12-04-015 et al

San Francisco, California
August 6, 2012

TABLE OF CONTENTS

CHAPTER 1 — RATE OF RETURN RECOMMENDATIONS 1-1

WITNESS: J. Randall Woolridge

A. SUMMARY 1-2

B. CAPITAL STRUCTURE AND SENIOR CAPITAL COST RATES…….. 1-3

C. THE COST OF EQUITY CAPITAL……. 1-3

D. THE COST OF CAPITAL FOR PG&E, SDG&E, SCE, AND SCG..... 1-6

CHAPTER 2 — OVERVIEW OF CAPITAL COST RATES AND THE COST OF COMMON EQUITY CAPITAL

A. SUMMARY. 2-8

B. LONG-TERM CAPITAL COSTS IN THE U.S..... 2-8

C. RECENT MARKET VOLATILITY AND THE PERFORMANCE OF UTILITY STOCKS 2-11

D. UTILITY CAPITAL COST INDICATORS: 2007 VERSUS 2012 .....…… 2-12

E. THE COST OF COMMON EQUITY CAPITAL 2-14

F. LONG TERM UTILITY CAPITAL COSTS 2-16

G. THE INVESTMENT RISK OF UTILITIES 2-17

CHAPTER 3 — CAPITAL STRUCTURE, SENIOR CAPITAL COST RATES, AND COMPARABLE ENERGY UTILITY GROUPS

A. SUMMARY 3-19

B. WEIGHTED AVERAGE COST OF CAPITAL 3-19

C. THE CAPITAL STRUCTURE RATIOS FOR PG&E, SDG&E, SCE, AND SCG . 3-21

D. SENIOR CAPITAL COST RATES FOR PG&E, SDG&E, SCE, AND SCG..... 3-26

E. COMPARABLE GROUPS OF ELECTRIC UTILITY AND GAS COMPANIES.. 3-26

CHAPTER 4 — THE COST OF COMMON EQUITY CAPITAL

A. SUMMARY 4-27

B. COST OF EQUITY ESTIMATION 4-27

C. DISCOUNTED CASH FLOW ANALYSIS .....… 4-28

D. CAPITAL ASSET PRICING MODEL (CAPM) 4-38
E. HISTORICAL RISK PREMIUM MODEL (HRP) 4-44
F. COMMON EQUITY COST RATE SUMMARY 4-47

CHAPTER 5 — CRITIQUE OF COMPANY TESTIMONY

A. SUMMARY 5-49
B. DISCOUNTED CASH FLOW ANALYSIS 5-52
C. CAPITAL ASSET PRICING MODEL 5-58
D. HISTORICAL AND ALLOWED RISK PREMIUM 5-66
E. OTHER TESTIMONY ISSUES 5-69

APPENDICES

A. THE RESEARCH ON ANALYSTS' LONG-TERM EPS GROWTH RATE FORECASTS A-1
B. BUILDING BLOCKS EQUITY RISK PREMIUM B-1
C. UNING HISTORICAL RETURNS TO MEASURE THE EXPECTED EQUITY RISK PREMIUM A-1

ATTACHMENTS

JRW-1 RESUME OF J. RANDALL WOOLRIDGE
JRW-2 RECOMMENDED COST OF CAPITAL
JRW-3 INTEREST RATES
JRW-4 FINANCIAL STATISTICS FOR ELECTRIC PROXY GROUP
JRW-5 CAPITAL STRUCTURE FOR ELECTRIC COMPANIES
JRW-6 RETURN ON EQUITY AND MARKET-TO-BOOK RATIOS
JRW-7 UTILITY COST OF CAPITAL INDICATORS
JRW-8 INDUCTRY BETAS
JRW-9 THE DCF MODEL
JRW-10 DCF EQUITY COST RATE RESULTS
JRW-11 CAPM EQUITY COST RATE RESULTS
JRW-12 HRP EQUITY COST RATE RESULTS
JRW-13 CEC EQUIRT COST RATE RESULTS
JRW-14 GDP AND S&P 500 GROWTH RATES

CHAPTER 1

RATE OF RETURN RECOMMENDATIONS

A. SUMMARY

This chapter presents a summary of the Division of Ratepayer Advocates' ("DRA") cost of capital study for the test year 2013 for Pacific Gas & Electric Company ("PG&E"), San Diego Gas & Electric Company ("SGD&E"), Southern California Edison ("SCE"), and Southern California Gas Company ("SCG"). In their applications, PG&E, SDG&E, SCE, and SCG are asking for overall rates of return of 8.45%, 8.20%, 8.24%, and 8.42%, respectively. DRA is proposing rates of return for PG&E, SDG&E, SCE, and SCG of 7.28%, 6.90%, 7.11%, and 7.17%.

The primary area of contention between the four companies and DRA is the proposed return on common equity. DRA is adopting the proposed capital structures of PG&E, SDG&E, SCE, and SCG. DRA is also employing the senior capital cost rates for the four companies.

B. CAPITAL STRUCTURE AND SENIOR CAPITAL COST RATES

PG&E, SDG&E, SCE, and SCG have proposed capital structures that are summarized in Table 1-1.

Table 1-1
Capital Structures for PG&E, SDG&E, SCE, and SCG

	PG&E	SDGE	SCE	SCG
Long-Term Debt	**47.00%**	**45.25%**	**43.00%**	**45.60%**
Preferred Equity	**1.00%**	**2.75%**	**9.00%**	**2.40%**
Common Equity	**52.00%**	**52.00%**	**48.00%**	**52.00%**

The California Energy Companies ("CECs") have all claimed that their requested capital structures are necessary to maintain their credit quality and financial integrity.

Table 1-2 provides the preferred stock and long-term debt cost rates requested by PG&E, SDG&E, SCE, and SCG. In general, these rates have declined slightly since the 2007 Cost of Capital report. At this point, DRA is accepting these senior capital cost rates for PG&E, SDG&E, SCE, and SCG.

Table 1-2
Senior Capital Cost Rates for PG&E, SDG&E, SCE, and SCG

	PG&E	SDGE	SCE	SCG
Long-Term Debt	**5.69%**	**5.09%**	**5.53%**	**5.72%**
Preferred Equity	**5.60%**	**6.35%**	**5.86%**	**6.00%**

C. THE COST OF EQUITY CAPITAL

The primary difference between the CECs' requested returns and DRA's recommendation is in the return on equity ("ROE") component. As is reflected in Table 1-3, PG&E, SDG&E, SCE, and SCG are requesting ROEs of 11.00%, 11.00%, 11.10%, and 10.90%. DRA is recommending equity cost rates of 8.50% for SDG&E and SCG and 8.75% for PG&E and SCE.

Table 1-3
Company vs DRA Equity Cost Rates for PG&E, SDG&E, SCE, and SCG

	PG&E	SDGE	SCE	SCG
Company	**11.00%**	**11.00%**	**11.10%**	**10.90%**
DRA	**8.75%**	**8.50%**	**8.75%**	**8.50%**

DRA's financial model results are derived from the application of two generally accepted models - the Discounted Cash Flow ("DCF") model and the Capital Asset Pricing Model ("CAPM"). In addition, DRA has also used a Historical Risk Premium ("HRP") model as a check on its DCF and CAPM results. The CECs have employed the DCF, CAPM, and HRP models. PG&E has also used an Expected Earnings ("EE") approach, and PG&E, SDG&E and SCG have also used an Authorized Risk Premium ("ARP"). The CECs have each applied these models to proxy groups of electric utilities. SCG has also used a proxy group of gas companies. PG&E has also applied the DCF model to a group of non-utility companies. DRA has used proxy groups of electric and gas companies (the "Electric Proxy Group" and the "Gas Proxy Group").

Table 1-4 shows the results of the various equity cost rate studies of PG&E, SDG&E, SCE, and SCG.

Table 1-4
Equity Cost Rate Results of PG&E, SDG&E, SCE, and SCG

Approach	PG&E*	SDGE	SCE	SCG
DCF	9.3%-10.1%	9.6%-11.3%	9.4%-9.9%	8.4%-10.1%
CAPM	10.8%-11.5%	10.4%-10.9%	9.7%-11.7%	10.2%-10.7%
HRP	10.1%	10.1%	8.8%	10.1%-10.2%
ARP	10.8%	10.5%		10.3%
EE	11.4%			

* Only for utility group

DRA provides market evidence that capital costs are currently at low levels and that capital cost rates have declined since the last CEC cost of capital proceeding. In particular, DRA provides evidence showing: (1) the yields on 10-year U.S. Treasury bond and 30-year "A" rated Utility bonds have decreased by over 200 basis points, respectively; (2) while dividend yields for electric utilities have increased by about 70 basis points, the projected earnings per share ("EPS") growth rates of Wall Street analysts for electric companies have declined on the order of 200 to 300 basis points; and (3) the average betas of electric companies have declined from 0.93 to 0.73. These data provide strong support that the required returns on electric utility stocks have declined over the past five years.

In terms of the DCF approach, the primary area of disagreement is the DCF growth rate. The witnesses for PG&E, SDG&E, SCE and SCG rely excessively on the projected EPS growth rates of Wall Street analysts and *Value Line*. DRA provides empirical evidence that demonstrates the long-term earnings growth rates of Wall Street analysts are overly optimistic and upwardly-biased. DRA also shows that the estimated long-term EPS growth rates of *Value Line* are overstated. Consequently, in developing a DCF growth rate, DRA has used both historic and projected growth rate measures and have evaluated growth in dividends, book value, and earnings per share.

The CAPM approach requires an estimate of the risk-free interest rate, beta, and the equity risk premium. The witnesses for PG&E, SDG&E, SCE and SCG make a minor and a major error in their CAPM applications. The minor error is that they all use interest rate forecasts which are above current market interest rates. The equity risk

premiums used by PG&E, SDG&E, SCE and SCG are in the 7.9% to 9.7% range and are derived from studies of historical stock and bond returns as well as of projections of stock market returns. As discussed in this report, there are three procedures for estimating an equity risk premium – historical stock and bond returns, surveys of financial professionals, and expected return models derived from fundamental earnings and dividend data. There is evidence that risk premiums based on historic stock and bond returns are subject to a myriad of empirical errors. In addition, the market risk premiums computed using projected market returns are based on using analysts' EPS growth rate projections that are overly optimistic and upwardly biased and are not consistent with prospective economic and earnings growth. DRA uses an equity risk premium of 5.01% which (1) uses all three approaches to estimating an equity premium and (2) employs the results of many studies of the equity risk premium. The 5.01% equity risk premium is consistent with the equity risk premiums: (1) discovered in recent academic studies by leading finance scholars; (2) employed by leading investment banks and management consulting firms; and (3) that result from surveys of financial forecasters, corporate CFOs, analysts, and companies.

The differences between SDG&E, SCE and SCG and DRA in terms of the application of the HRP model relate to (1) the use of forecasted versus spot interest rates as base yields, and (2) the measurement of historic returns in terms of arithmetic versus geometric means.

D. THE COST OF CAPITAL FOR PG&E, SDG&E, SCE, AND SCG

Tables 1-5, 1-6, 1-7, and 1-8 provide DRA's overall cost of capital recommendations for PG&E, SDG&E, SCE, and SCG, respectively. Since DRA has accepted the capital structure and senior capital cost rates for these companies, the only area of disagreement is the cost of equity capital.

Table 1-5
PG&E
2013 Cost Capital

	Capital Structure Ratio	Cost Rate	Weighted Cost Rate
Long-Term Debt	**47.00%**	**5.69%**	**2.67%**
Preferred Equity	**1.00%**	**5.60%**	**0.06%**
Common Equity	**52.00%**	**8.75%**	**4.55%**
Total			**7.28%**

Table 1-6
SDG&E
2013 Cost Capital

	Capital Structure Ratio	Cost Rate	Weighted Cost Rate
Long-Term Debt	**45.25%**	**5.09%**	**2.30%**
Preferred Equity	**2.75%**	**6.35%**	**0.17%**
Common Equity	**52.00%**	**8.50%**	**4.42%**
Total			**6.90%**

Table 1-7
SCE
2013 Cost Capital

	Capital Structure Ratio	Cost Rate	Weighted Cost Rate
Long-Term Debt	**43.00%**	**5.53%**	**2.61%**
Preferred Equity	**9.00%**	**5.86%**	**0.14%**
Common Equity	**48.00%**	**8.75%**	**4.20%**
Total			**7.11%**

Table 1-8
SCG
2013 Cost Capital

	Capital Structure Ratio	Cost Rate	Weighted Cost Rate
Long-Term Debt	**45.60%**	**5.72%**	**2.61%**
Preferred Equity	**2.40%**	**6.00%**	**0.14%**
Common Equity	**52.00%**	**8.50%**	**4.42%**
Total			**7.17%**

CHAPTER 2
OVERVIEW OF CAPITAL COST RATES AND THE COST OF COMMON EQUITY CAPITAL

A. SUMMARY

This chapter presents an overview of capital costs and the cost of common equity capital. One major theme is that capital costs in the U.S. are at low levels relative to the last fifty years. The yields on long-term U. S. Treasury bonds are at levels not seen since the 1950s. Indicators of public utility capital cost rates provide additional evidence that capital costs for public utility companies have also declined since the last rate case. Finally, the cost of equity capital is reviewed as well as the investment risk of public utilities.

B. LONG-TERM CAPITAL COSTS IN THE U.S.

The mortgage crisis, subprime crisis, credit crisis, economic recession and the restructuring of financial institutions have had tremendous global economic implications. This issue first surfaced in the summer of 2007 as a mortgage crisis. It expanded into the subprime area in late 2008 and led to the collapse of certain financial institutions, notably Bear Stearns, in the first quarter of 2008 and Lehman Brother in late 2008. Commodity and energy prices peaked and then began to decline in the summer of 2008, as the crisis in the financial markets spread to the global economy. The turmoil in the financial sector peaked in September of 2008 with the failure of several large financial institutions, Bank of America's buyout of Merrill Lynch, and the government takeover of AIG, Fannie Mae and Freddie Mac.

In response to the market crisis, the Federal Reserve ("Fed") took extraordinary steps in an effort to stabilize capital markets. Most significantly, the Fed has opened its lending facilities to numerous banking and investment firms to promote credit markets.

As a result, the balance sheet of the Federal Reserve grew by hundreds of billions of dollars in support of the financial system. The federal government took a series of measures to shore up the economy and the markets. The Troubled Asset Relief Program ("TARP") was aimed at providing over $700 billion in government funds to the banking system in the form of equity investments. The federal government spent billions bailing out a number of prominent financial institutions, including AIG, Citigroup, and Bank of America. The government also bailed out other industries, most notably the auto industry. In 2009, President Obama signed into law his $787 billion economic stimulus, which included significant tax cuts and government spending aimed at creating jobs and turning around the economy.

The spillover of the financial crisis to the economy has been ongoing. According to the National Bureau of Economic Research ("NBER"), the economy slipped into a recession in the 4th quarter of 2007. The NBER has indicated that the recession ended in the 2nd quarter of 2009. Nonetheless, the recovery of the economy has lagged the recoveries from previous recessions. Since the 2nd quarter of 2009, economic growth has only been 2.4% per year, and just 1.8% in the first quarter of 2012. Furthermore, the muted economic recovery in the U.S. has been hindered by global economic concerns, especially the continuing fiscal and monetary issues in Europe and the prospect of slowing economic growth in China. As a result, the U.S. is still saddled with relatively high unemployment, large government budget deficits, continued housing market issues, and uncertainty about future economic growth. The stalled economic recovery is reflected in the stock market. The stock market bottomed out in March of 2009, and then increased about 100% over the next two years. However, since that time, the stock market advance has been slowed by the U.S. and global economic uncertainties and concerns.

Long-term capital cost rates for U.S. corporations are a function of the required returns on risk-free securities plus a risk premium. The risk-free rate of interest is the yield on long-term U.S Treasury yields. The yields on ten-year U.S. Treasury bonds from 1953 to the present are provided on page 1 of Attachment JRW-3. These yields peaked in the early 1980s and have generally declined since that time. In the summer of 2003, these yields hit a 60-year low at 3.33%. They subsequently increased and

fluctuated between the 4.0% and 5.0% levels over the next four years in response to ebbs and flows in the economy. Ten-year Treasury yields began to decline in mid-2007 at the beginning of the financial crisis. In 2008 Treasury yields declined to below 3.0% as a result of the expansion of the mortgage and subprime market credit crisis, the turmoil in the financial sector, the government bailout of financial institutions, the monetary stimulus provided by the Federal Reserve, and the economic recession. From 2008 until 2011, these rates fluctuated between 2.5% and 3.5%. Over the past six months, the yields on ten-year Treasuries have declined from 2.5% to below 2.0% as economic uncertainties have persisted.

The credit market for corporate and utility debt experienced higher rates due to the credit crisis. The short-term credit markets were initially hit with credit issues, leading to the demise of several large financial institutions. The primary indicator of the short-term credit market is the 3-month London Interbank Offered Rate ("LIBOR"). LIBOR peaked in the third quarter of 2008 at 4.75%. It has since declined to below 0.5% as the short-term credit markets opened up and U.S. Treasury rates have remained low. The long-term corporate credit markets tightened up during the financial crisis, but have improved significantly since 2009.

Interest rates on long-term utility and corporate debt have declined to historically low levels. These low rates reflect the actions of the Federal Reserve as well as the weak economy, Panel A of page 2 of Attachment JRW-3 provides the yields on A, BBB+, and BBB rated public utility bonds. These yields peaked in November 2008 and have since declined by nearly 400 basis points. For example, the yields on 'A' rated utility bonds, which peaked at about 7.75% in November of 2008, have declined to 3.76% as of July 2, 2012. Panel B of Attachment JRW-3 provides the yield spreads on A, BBB+, and BBB rated public utility bonds relative to Treasury bonds. These yield spreads increased dramatically in the third quarter of 2008 during the peak of the financial crisis and have decreased significantly since that time. For example, the yield spreads between 30-year U.S. Treasury bonds and 'A' rated utility bonds peaked at over 3.50% in November of 2008, declined to 1.0% in the summer of 2012, and have since increased to about 1.25%.

As previously noted, the risk premium is the return premium required by investors to purchase riskier securities. The risk premium required by investors to buy corporate

bonds is observable based on yield differentials in the markets. The equity risk premium is the return premium required to purchase stocks as opposed to bonds. The equity risk premium is not observable in the markets (as are bond risk premiums) since expected stock market returns are not readily observable. As a result, equity risk premiums must be estimated using market data. There are alternative methodologies to estimate the equity risk premium, and these alternative approaches and equity risk premium results are subject to much debate. One way to estimate the equity risk premium is to compare the mean returns on bonds and stocks over long historical periods. Measured in this manner, the equity risk premium has been in the 5% to 7% range. However, studies by leading academics indicate the forward-looking equity risk premium is actually in the 4.0% to 5.0% range. These lower equity risk premium results are in line with the findings of equity risk premium surveys of CFOs, academics, analysts, companies, and financial forecasters.

In summary, the Federal Reserve and the U.S. government have taken extraordinary actions and committed great sums of money to rescue the economy, certain industries, and the capital markets. But the economy is still on an uncertain path.

C. RECENT MARKET VOLATILITY AND THE PERFORMANCE OF UTILITY STOCKS

The volatility in the markets over the past year has received much attention in the financial press. Market volatility is usually measured by the VIX. The VIX is the stock ticker symbol for the Chicago Board Options Exchange Market Volatility Index. The VIX, which is quoted as a percentage, is a measure of the implied volatility of S&P 500 index options for the next 30 day period. Higher levels of the VIX imply that investors expect larger market upward or downward movements in the next 30 days. Market volatility increased significantly in early August of 2011. Panel A of page 3 of Attachment JRW-3 shows the historic levels of the VIX since 1990. The VIX reached an all-time high of 60 in association with the financial crisis in 2008. To highlight recent VIX movement, Panel B of page 4 of Attachment JRW-3 shows the VIX over the past two years. In 2011, the VIX hovered in the 20 range until late July. But then

uncertainties related primarily to the impact of the European debt situation on global financial markets and economies had an abnormally large impact on day-to-day stock market movements. As a result, the short-term volatility of the stock market increased significantly. However, as these uncertainties have declined and the stock market has recovered, the VIX has declined significantly. At its current level of 18, the VIX is below its historic norm of 20.

Utility stocks have performed quite well during the recent period of uncertainty. Page 4 of Attachment JRW-3 graphs the performance of the Dow Jones Utility Index versus the S&P 500 over the past year. When the S&P 500 declined by over 10% in early August of 2011, utility stocks declined by much less. As the S&P 500 recovered in the fourth quarter of 2011, utility stocks continued to increase in value as well. In the first quarter of 2012, the S&P 500 performed much better than the stocks of utilities. However, utility stocks have outperformed the S&P 500 during the second quarter of 2012 as the S&P 500 has declined by about 7.0% while utility stocks have appreciated about 2.0%.

Overall, utility stocks have proven to be safe havens in the markets since utility stocks have low risk relative to the overall stock market. Utility stocks did not decline as much as the overall market in the market decline of the third quarter of 2011 and second quarter of 2012, and they did not increase in value as much as the overall market in the recovery of the stock market in the first quarter of 2012. The low relative volatility and risk of utility stocks is reflected in their low betas.

D. UTILITY CAPITAL COST INDICATORS: 2007 VERSUS 2012

Page 5 of Attachment JRW-3 provide capital cost indicators for electric utilities for 2007 - the year of the last California Energy Company cost of capital rate case, and 2012. Panels A and B provide the yields on ten-year Treasury bonds and thirty-year, “BBB” rated utility bonds for the six month periods prior to the hearings for the 2007 rate case (April 2007 to September 2007), and the most recent six months - February 2012 to July 2012. The average ten-year Treasury yields for these 2007 and 2012 time periods

are 4.79% and 1.94%, respectively. These yields suggest a significant decline in capital costs. Panel B of page 5 of Attachment JRW-3 shows the yields on thirty year, BBB rated public utility bonds for the same six month periods. The average yields for these periods are 6.29% and 4.51%, respectively. These yields also indicate a large decline in utility capital costs. Overall, the Treasury and utility bond yields suggest a decline in capital costs of more than 200 basis points since the last rate case.

According to the DCF model, the equity cost rate is the sum of the dividend yield and the expected growth rate. Panel C of page 5 of Attachment JRW-3 provides the dividend yields for electric utility companies used in the 2007 rate case and the current dividend yields for the Electric Proxy Group used by DRA in this proceeding. On average, the electric utility dividend yield in 2012 (4.2%) is above the 2007 dividend yield (3.5%) by 70 basis points. However, the current expected EPS growth rate of Wall Street analysts is well below 2007 levels. As shown in Panel D of page 5 of Attachment JRW-3, the average projected EPS growth rate of Wall Street analysts was 7.4% in 2007, but is only 4.3% in 2012. The combination of the dividend yields and expected EPS growth rates suggest that the equity cost rate for electric utilities has declined somewhat since 2007.

Finally, Beta is a key equity cost rate factor in the CAPM. As shown in Panel E of page 5 of Attachment JRW-3, the average Beta for electric utility companies was 0.93 in 2007. Today, the average Beta for electric utility companies is only 0.73.

Overall, the significantly lower interest rates, the decline in volatility, the performance of utility stocks suggest that utility capital costs are low in today's markets. The DCF and CAPM capital cost indicators certainly indicate that the equity cost rate for electric utilities is lower today that it was at the time of the last California Energy Company cost of capital rate case in 2007.

E. THE COST OF COMMON EQUITY CAPITAL

In a competitive industry, the return on a firm's common equity capital is determined through the competitive market for its goods and services. Due to the capital requirements needed to provide utility services, however, and the economic benefit to society from avoiding duplication of these services, some public utilities are monopolies. It is not appropriate to permit monopoly utilities to set their own prices because of the lack of competition and the essential nature of the services. Thus, regulation seeks to establish prices which are fair to consumers and at the same time are sufficient to meet the operating and capital costs of the utility, i.e., provide an adequate return on capital to attract investors.

The total cost of operating a business includes the cost of capital. The cost of common equity capital is the expected return on a firm's common stock that the marginal investor would deem sufficient to compensate for risk and the time value of money. In equilibrium, the expected and required rates of return on a company's common stock are equal.

Normative economic models of the firm, developed under very restrictive assumptions, provide insight into the relationship between firm performance or profitability, capital costs, and the value of the firm. Under the economist's ideal model of perfect competition where entry and exit is costless, products are undifferentiated, and there are increasing marginal costs of production, firms produce up to the point where price equals marginal cost. Over time, a long-run equilibrium is established where price equals average cost, including the firm's capital costs. In equilibrium, total revenues equal total costs, and because capital costs represent investors' required return on the firm's capital, actual returns equal required returns and the market value and the book value of the firm's securities must be equal.

In the real world, firms can achieve competitive advantage due to product market imperfections. Most notably, companies can gain competitive advantage through product differentiation (adding real or perceived value to products) and by achieving economies of scale (decreasing marginal costs of production). Competitive advantage allows firms to price products above average cost and thereby earn accounting profits greater than

those required to cover capital costs. When these profits are in excess of that required by investors, or when a firm earns a return on equity in excess of its cost of equity, investors respond by valuing the firm's equity in excess of its book value.

James M. McTaggart, founder of the international management consulting firm Marakon Associates, has described this essential relationship between the return on equity, the cost of equity, and the market-to-book ratio in the following manner:[1]

> Fundamentally, the value of a company is determined by the cash flow it generates over time for its owners, and the minimum acceptable rate of return required by capital investors. This "cost of equity capital" is used to discount the expected equity cash flow, converting it to a present value. The cash flow is, in turn, produced by the interaction of a company's return on equity and the annual rate of equity growth. High return on equity (ROE) companies in low-growth markets, such as Kellogg, are prodigious generators of cash flow, while low ROE companies in high-growth markets, such as Texas Instruments, barely generate enough cash flow to finance growth.
>
> A company's ROE over time, relative to its cost of equity, also determines whether it is worth more or less than its book value. If its ROE is consistently greater than the cost of equity capital (the investor's minimum acceptable return), the business is economically profitable and its market value will exceed book value. If, however, the business earns an ROE consistently less than its cost of equity, it is economically unprofitable and its market value will be less than book value.

As such, the relationship between a firm's return on equity, cost of equity, and market-to-book ratio is relatively straightforward. A firm which earns a return on equity above its cost of equity will see its common stock sell at a price above its book value. Conversely, a firm which earns a return on equity below its cost of equity will see its common stock sell at a price below its book value.

This relationship between return on equity, cost of equity, and market-to-book ratios was the topic of a classic Harvard Business School case study entitled "A Note on Value Drivers." On page 2 of that case study, the author describes the relationship very succinctly:[2]

---

[1] James McTaggart, "The Ultimate Poison Pill: Closing the Value Gap," *Commentary* (Spring 1988), p. 2.

[2] Benjamin Esty, "A Note on Value Drivers," Harvard Business School, Case 9-297-082, April 7, 1997.

For a given industry, more profitable firms – those able to generate higher returns per dollar of equity – should have higher market-to-book ratios. Conversely, firms which are unable to generate returns in excess of their cost of equity should sell for less than book value.

Profitability	*Value*
If ROE > K	*then Market/Book > 1*
If ROE = K	*then Market/Book =1*
If ROE < K	*then Market/Book < 1*

To assess the relationship by industry, as suggested above, DRA performed a regression study between estimated return on equity and market-to-book ratios using natural gas distribution, electric utility and water utility companies. DRA used all companies in these three industries that are covered by *Value Line* and have estimated return on equity and market-to-book ratio data. The results are presented in Panels A-C of Attachment JRW-6. The average R-squares for the electric, gas, and water companies are 0.51, 0.71, and 0.77, respectively.[3] This demonstrates the strong positive relationship between ROEs and market-to-book ratios for public utilities.

F. LONG TERM UTILITY CAPITAL COSTS

Attachment JRW-7 provides indicators of public utility equity cost rates over the past decade.

Page 1 shows the yields on long-term "A" rated public utility bonds. These yields decreased from 2000 until 2003, hovered in the 5.50%-6.50% ranges from mid-2003 until mid-2008, spiked up to the 7.0% to 8.0% range with onset of the financial crisis, remained high and volatile until early 2009, and then decreased to the 5.0% range in early 2010. These yields increased by almost 100 basis points in 2011 with renewed prospects for economic recovery, but they have since declined and are below 4.0% as of mid-year 2012.

[3] R-square measures the percent of variation in one variable (e.g., market-to-book ratios) explained by another variable (e.g., expected return on equity). R-squares vary between zero and 1.0, with values closer to 1.0 indicating a higher relationship between two variables.

Page 2 of Attachment JRW-7 provides the dividend yields for the Electric and Gas Proxy Groups over the past decade. The dividend yields for both groups have declined slightly over the decade. The Electric Proxy Group yields bottomed out at 2.75% in 2006, increased to over 3.5% in 2009. They have since declined as electric utility stocks have continued to recover. The Gas Proxy Group yields bottomed out at 3.75% in 2007, increased to the 4.2% in 2009, and have since declined to 3.8%.

Average earned returns on common equity and market-to-book ratios for the two groups are on page 3 of Attachment JRW-7. For the Electric Proxy Group, earned returns on common equity peaked early in the decade at 11.0%. Over the past five years, they have been in the 8.0% to 9.0% range. As of 2011, the average ROE for the group was just over 8.0%. The average market-to-book ratios for this group have ranged from 1.5X to 2.3X. As of 2011, the market-to-book average was about 1.75X. For the Gas Proxy Group, earned returns on common equity have been in the 10.0% to 12.0% range. The average ROE as of 2010 was just below 10.0%%. Over the past decade, the average market-to-book ratios for this group have ranged from 1.50X to 1.80X.

G. THE INVESTMENT RISK OF UTILITIES

The expected or required rate of return on common stock is a function of market-wide, as well as company-specific, factors. The most important market factor is the time value of money as indicated by the level of interest rates in the economy. Common stock investor requirements generally increase and decrease with like changes in interest rates. The perceived risk of a firm is the predominant factor that influences investor return requirements on a company-specific basis. A firm's investment risk is often separated into business and financial risk. Business risk encompasses all factors that affect a firm's operating revenues and expenses. Financial risk results from incurring fixed obligations in the form of debt in financing its assets.

Due to the essential nature of their service as well as their regulated status, public utilities are exposed to a lesser degree of business risk than other, non-regulated businesses. The relatively low level of business risk allows public utilities to meet much

of their capital requirements through borrowing in the financial markets, thereby incurring greater than average financial risk. Nonetheless, the overall investment risk of public utilities is below most other industries. Attachment JRW-8 provides an assessment of investment risk for 100 industries as measured by beta, which according to modern capital market theory is the only relevant measure of investment risk. These betas come from the *Value Line Investment Survey* and are compiled annually by Aswath Damodoran of New York University.[4] The study shows that the investment risk of utilities is very low. The average beta for electric, water, and gas utility companies are 0.73, 0.66, and 0.66, respectively. These are well below the *Value Line* average of 1.15. As such, these data indicate that the cost of equity capital for utilities is amongst the lowest of all industries in the U.S. according to the CAPM.

[4] They may be found on the Internet at http:// www.stern.nyu.edu/~adamodar.

CHAPTER 3

CAPITAL STRUCTURE, SENIOR CAPITAL COST RATES, AND COMPARABLE ENERGY UTILITY GROUPS

A. SUMMARY

This chapter discusses the concept of the weighted average cost of capital that is being developed in this report. It then presents the capital structure ratios and senior capital cost rates that have been recommended by PG&E, SDG&E, SCE, and SCG. DRA has elected to adopt the capital structure ratios and senior capital cost rates presented by the companies. The final topic of the chapter is the use of comparable groups to measure the cost of equity capital. The witnesses for each of the four companies have presented alternative comparable groups. DRA has elected to use a group of electric utility and gas distribution companies. An analysis is performed comparing PG&E, SDG&E, SCE, and SCG and the comparable groups on a number of financial and risk metrics. It is concluded that SDG&E and SCG, as indicated by bond ratings, are less risky than PG&E and SCE .

B. WEIGHTED AVERAGE COST OF CAPITAL

The overall rate of return or cost of capital is a weighted average cost of debt, preferred equity, and common equity, where the weights are the market-value percentages of debt, preferred equity, and common equity in a firm's capital structure. The overall cost of capital, which is called the firm's weighted average cost of capital ("WACC"), is specified by the following formula:

$$WACC = w_d\, k_d + w_c k_s + w_p k_p$$

where,

w_d = the fraction of debt in capital structure,

w_c = the fraction of equity in capital structure,

w_p = the fraction of preferred stock in capital structure,

k_d = cost of debt,

k_s = cost of equity,

k_p = cost of preferred stock.

To apply the formula, one must estimate the cost of debt, preferred stock and common equity using methodologies accepted by both financial economists and regulators. In addition, one must estimate the appropriate capital structure mix of debt, preferred stock, and common equity. With these inputs, the WACC can be calculated from the above equation.

The cost of capital is influenced by a number of factors. Some are beyond a firm's control, but others are affected by its financing and investment decisions. Two important factors that are beyond a firm's direct control are the level of interest rates and tax rates. A firm can directly affect its cost of capital through its capital structure policy, dividend policy, and investment policy.

In calculating the weighted average cost of capital we assume that a firm has a given target capital structure. However, a firm can alter its capital structure and that would affect its cost of capital. Normally, the after-tax cost of debt is lower than the cost of equity. Therefore, if a firm decides to use more debt, this change in the weights in the WACC formula will tend to reduce the WACC. However, using more debt raises the level of risk of both debt and equity, and these increases in component costs, after a certain point, will completely offset the effects of the change in the weights. In other words, as more debt is used initially the WACC declines, but, after a certain point, as debt ratio continues to increase, the WACC starts to rise.

The optimal capital structure is defined as the one that would minimize the WACC, or maximize the price of the firm's stock. Firms analyze a number of factors before establishing a target capital structure. Most importantly, since using more debt raises the risk borne by both stockholders and bondholders, firms consider the effect of capital structure on risk.

C. THE CAPITAL STRUCTURE RATIOS FOR PG&E, SDG&E, SCE, AND SCG.

Table 3-1 provides the recommended capital structures of PG&E, SDG&E, SCE, and SCG. These recommended capital structures include common equity ratios of 52.0% for PG&E, 52.0% for SDG&E, 48.0% for SCE, and 52.0% for SCG. In this filing, SDG&E is requesting to increase its common equity ratio from 49.0% to 52.0%, and SCG is requesting to increase its common equity ratio from 48.0% to 52.0%. PG&E and SCE are requesting the same common equity ratios as in the last rate case.

Table 3-1
Capital Structures for PG&E, SDG&E, SCE, and SCG

	PG&E	SDGE	SCE	SCG
Long-Term Debt	**47.00%**	**45.25%**	**43.00%**	**45.6%**
Preferred Equity	**1.0%**	**2.75%**	**9.00%**	**2.40%**
Common Equity	**52.0%**	**52.0%**	**48.0%**	**52.0%**

Table 3-2 shows the average capital structures of the parent companies of PG&E, SDG&E, SCE, and SCG for 2011 and as projected for 2012, 2013, and the 2015-17 time periods. These average capital structures of the parent companies include common equity ratios of 50.9% for PG&E Corp. (PG&E), 48.8% for Sempra (SDG&E), 40.4% for Edison International (SCE), and 48.8% for Sempra (SCG). These data indicate that each of the companies are requesting capital structures for rate making purposes that include more common equity than is employed by their parent companies.

Table 3-2
Average Parent Company Capital Structures for PG&E, SDG&E, SCE, and SCG

	PG&E	SDGE	SCE	SCG
Long-Term Debt	**48.1%**	**50.9%**	**55.2%**	**50.9%**
Preferred Equity	**1.0%**	**0.40%**	**4.40%**	**0.40%**
Common Equity	**50.9%**	**48.8%**	**40.4%**	**48.8%**

Table 3-3 provides the average capital structure ratios for the companies in the Electric and Gas Proxy Groups. These individual company data are shown on page 3 of Attachment JRW-5. The average common equity ratio for the Electric and Gas Proxy Groups are 48.3% and 56.8%.

Table 3-3
Average Capital Structures for Electric and Gas Proxy Groups

	Electric Proxy Group	Gas Proxy Group
Long-Term Debt	**51.1%**	**43.0%**
Preferred Equity	**0.6%**	**0.2%**
Common Equity	**48.3%**	**56.8%**

Overall, despite the fact that the CECs are requesting capital structures that include more common equity than the capital structures of their parent companies, the requested capital structures are in the range of the capital structures of the Electric and Gas Proxy Groups and thus DRA will adopt the requested capital structures.

1. Debt Equivalence

SCE, PG&E and SDG&E claim that they must have a strong capital structure due to debt equivalence ("DE"). Despite the acceptance of the utilities proposed capital structures, DRA would like to make several comments regarding the utilities claims regarding DE.

DE is the practice of imputing amounts of debt to Purchase Power Agreements ("PPAs"). The major rating agencies claim that including DE in utility financial analysis allows for more meaningful comparisons with utilities that build generation, as opposed to buying their power. Credit rating agencies consider PPAs to be fixed financial commitments with characteristics similar to debt securities. Credit rating agencies apply a DE factor to the capitalizations of electric utilities that purchase power under PPAs. According to the rating agencies, the PPA creates risk by requiring a utility to pay a minimum amount on a regular basis for many years into the future in the form of a capacity payment. In application, the rating agencies apply a risk factor to the present value of expected payments, which reflects the likelihood of recovery by the buyer. The risk factor is subjective, ranges from 0% to 100%, and is determined based on an analysis

of regulatory treatment and timeliness of the recovery of purchased-power costs. The product of the risk factor (expressed as a percentage) and the net present value of the PPA's capacity payments represents the equivalent amount of debt to be used for capitalization purposes and for the calculation of credit rating ratios. These adjusted ratios are then compared to the ratios of utilities that build and generate their own power.

Whereas DRA has accepted the capital structures for PG&E, SDG&E, SCE, and SCG, DRA does not accept that DE needs to be part of the determination of the appropriate capital structures for ratemaking purposes. This is due to several factors discussed below:

1. DE is strictly a concept and methodology developed by rating agencies and is not an element of Generally Accepted Accounting Principles ("GAAP"). Hence, the debt imputed by rating agencies is not recognized as debt on a company's financial statements.

2. A key element of the DE calculation is the risk factor that is applied to the present value of expected payments. The risk factor used by rating agencies is subjective and ranges from 0% to 100%. It is supposed to reflect the expected regulatory treatment and timeliness of the recovery of purchased-power costs. S&P does not indicate how the risk factor is determined. However, Standard & Poor's does indicate that they use a risk factor of 50% as a generic guideline for utilities with PPAs included as an operating expense in base tariffs. Furthermore, when purchased power costs may be recovered via a fuel-adjustment clause, risk is lower and S&P deems a risk factor of 25% as appropriate. Regardless, given the methodology for imputing debt from PPAs, the risk factor is extremely important, but it is also based on unpublished, subjective factors.

3. There are advantages of PPAs which may mitigate risks. PPAs do shift some risks to the power supplier. For example, construction and operating risks are borne by the power supplier. The risk to the utility is that of recovering the fixed

financial obligation in rates. Moody's recognizes some of the benefits of PPAs and looks at them in a more positive manner. For example, Moody's states:[5]

> "If a utility enters into a PPA for the purpose of providing an assured supply and there is reasonable assurance that regulators will allow the costs to be recovered in regulated rates, Moody's may view the PPA as being most akin to an operating cost. In this circumstance, there most likely will be no imputed adjustment to the obligations of the utility."

4. The arguments for including DE in the ratemaking process argue that the credit rating process is simply a matter of applying credit metrics or ratios to determine credit ratings. However, as the rating agencies insist, this is far from the truth. For example, with reference to the credit ratios, S&P states:[6]

> "It is important to emphasize that these metrics are only guidelines associated with expectations for various rating levels. Although credit ratio analysis is an important part of the rating process, these three statistics are by no means the only critical financial measures that Standard & Poor's uses in its analytical process. We also analyze a wide array of financial ratios that do not have published guidelines for each rating category"

Furthermore, S&P has warned against strict interpretations about credit ratings associated with the credit ratios:[7]

> "The key ratio medians for U.S. corporates by rating category and their definitions are displayed below. The ratio medians are purely statistical, and are not intended as a guide to achieving a given rating level. They are not hurdles or prerequisites that should be achieved to attain a specific debt rating."

---

[5] Moody's Rating Methodology: Global Regulated Electric Utilities, March 2005, page 10.

[6] Standard & Poor's, "New Business Profile Scores Assigned for U.S. Utility and Power Companies: Financial Guidelines revised," June 2, 2004, p. 3.

[7] Standard & Poor's, "Corporate Ratings Criteria," June 9, 2005, p. 42.

Moody's appears to be even more qualitative in their rating approach. Moody's explains their approach in the following fashion:[8]

> "Because it involves a look into the future, credit rating is by nature subjective. Moreover, because long-term credit judgments involve so many factors unique to particular industries, issuers, and countries, we believe that any attempt to reduce credit rating to a formulaic methodology would be misleading and would lead to serious mistakes.
>
> "That is why Moody's uses a multidisciplinary or "universal" approach to risk analysis, which aims to bring an understanding of *all* relevant risk factors and viewpoints to every rating analysis. We then rely on the judgment of a diverse group of credit risk professionals to weigh those factors in light of a variety of plausible scenarios for the issuer and thus come to a conclusion on what the rating should be."

5. Finally, it is important to note that there is no regulatory consensus on how to deal with DE issues in the power supply procurement process and/or in setting an overall cost of capital for a public utility. Some state utilities commissions have included an adjustment, and some have not. In addition, in decisions where it is deemed that a DE adjustment is necessary, there is not agreement on the appropriate methodology to be used for the adjustment. In particular, the risk factor applied to the present value of future payment obligations is subject to much debate.

In sum, while accepting the capital structures proposed by PG&E, SDG&E, SCE, and SCG, DRA does not agree with the companies' positions on DE and its role in the determination of the appropriate capital structures for ratemaking purposes. The utilities have reasonable assurances that the CPUC will allow for full recovery of costs of PPAs

[8] http://www.moodys.com/moodys/cust/AboutMoodys/AboutMoodys.aspx?%20topic=rapproach

and thus such costs are akin to operating costs, as Moody's recognizes. There is no reason to conclude that PPAs increase the risks of utilities compared to self-generation.

D. SENIOR CAPITAL COST RATES FOR PG&E, SDG&E, SCE, AND SCG.

Table 3-2 shows the recommended senior capital cost rates for PG&E, SDG&E, SCE, and SCG. DRA accepts these rates as the cost rates for senior capital.

Table 3-2
Senior Capital Cost Rates for PG&E, SDG&E, SCE, and SCG

	PG&E	SDGE	SCE	SCG
Long-Term Debt	**5.69%**	**5.09%**	**5.53%**	**5.72%**
Preferred Equity	**5.60%**	**6.35%**	**5.86%**	**6.00%**

E. COMPARABLE GROUPS OF ELECTRIC UTILITY AND GAS COMPANIES.

To develop a fair rate of return recommendation for the CECs, DRA has evaluated the return requirements of investors on the common stock of the Electric Proxy Group and the Gas Proxy Group.

The Electric Proxy Group consists of thirty-four electric utility companies. The selection criteria include the following:

1. Listed as Electric Utility by *Value Line Investment Survey* and listed as an Electric Utility or Combination Electric & Gas company in *AUS Utilities Report*;
2. At least 50% of revenues from regulated electric operations as reported by *AUS Utilities Report;*
3. An investment grade bond rating as reported by *AUS Utilities Report;*
4. Has paid a cash dividend for the past three years, with no cuts or omissions;
5. Not involved in an acquisition of another utility, and/or was not the target of an acquisition, in the past six months; and
6. Analysts' long-term EPS growth rate forecasts available from Yahoo, Reuters, and Zacks.

Summary financial statistics for the proxy group are listed on page 1 of Attachment JRW-4.[9] The median operating revenues and net plant for the Electric Proxy Group are $4,075.1M and $9,144.0M, respectively. The group receives 77% of revenues from regulated electric operations, has an A-/BBB+ bond rating from Standard & Poor's, a current common equity ratio of 45.3%, and an earned return on common equity of 9.9%.

The Gas Proxy Group consists of eight natural gas distribution companies. These companies meet the following selection criteria: (1) listed as a Natural Gas Distribution, Transmission, and/or Integrated Gas Companies in *AUS Utility Reports*; (2) listed as a Natural Gas Utility in the Standard Edition of the *Value Line Investment Survey*; and (3) an investment grade bond rating by Moody's and Standard & Poor's. As shown on page 2 of Attachment JRW-4, the companies meeting these criteria include AGL Resources, Atmos Energy Corporation, Laclede Group, Northwest Natural Gas Company, Piedmont Natural Gas Company, South Jersey Industries, Southwest Gas, and WGL Holdings. The only companies that met these criteria and were not included in the group were New Jersey Resources and UGI. These companies were excluded due to their low percentage of revenues from regulated gas operations. Summary financial statistics for the proxy group are listed on page 2 of Attachment JRW-4. The median operating revenues and net plant for the Gas Proxy Group are $1,728.6M and $2,609.4M, respectively. The group receives 60% of revenues from regulated gas operations, has an 'A2/A3' Moody's bond rating and an 'A/A-' bond rating from Standard & Poor's, a current common equity ratio of 47.1%, and an earned return on common equity of 9.3%.

The relative riskiness of the Electric and Gas Proxy Groups are assessed using five different risk measures published by *Value Line* and provided on page 4 of Attachment JRW-4. These measures include Beta, Safety, Financial Strength, Stock Price Stability, and Earnings Predictability. Four of the five of the risk measures suggest that the Gas Proxy Group is less risky than the Electric Proxy Group. However, the magnitude of the differences in the risk metrics is not large. Nonetheless, these *Value*

---

[9] In my testimony, I present financial results using both mean and medians as measures of central tendency. However, due to outliers among means, I have used the median as a measure of central tendency.

Line measures do suggest that that the Gas Proxy Group is a little less risky than the Electric Proxy Group.

1. Summary Discussion of PG&E, SDG&E, SCE, and SCG and the Comparable Groups

The summary financial statistics and *Value Line* risk metrics indicate the following about PG&E, SDG&E, SCE, and SCG and the proxy groups: (1) the parent companies of PG&E, SDG&E, SCE, and SCG are larger than their respective groups; (2) bond ratings, *Value Line* safety and financial strength rankings indicate that Sempra, parent of SDG&E and SCG, is less risky than PG&E and SCE and the two proxy groups; and (3) SCE uses more debt than the proxy groups and PG&E, SDG&E, and SCG. Bond ratings suggest that SCE and PG&E are similar in risk to each other and slightly riskier than the two proxy groups. DRA is relying on bond ratings to assess the relative riskiness of the CECs relative to each other and the two proxy groups. Based on bond ratings, DRA concludes that SDG&E and SCG are less risky than PG&E and SCE, and that SDG&E and SCG are similar in risk to the two proxy groups.

CHAPTER 4
THE COST OF COMMON EQUITY CAPITAL

A. SUMMARY

This chapter sets forth DRA's methodology, analysis and results of two cost of equity models, which form the basis of DRA's cost of equity recommendations. The two approaches used in estimating cost of equity are the DCF and CAPM approaches. In accordance with the Commission's policy DRA has also used a HRP approach as a check on these results.

The application of these three equity cost rate models to the groups of electric utility and gas distribution companies indicates an equity cost rate range of 7.4%-8.50% range. Giving primary weight to the DCF results, DRA concludes that the appropriate base equity cost for the CECs is 8.50%. The risk analysis performed in Chapter 3 suggests that (1) SDG&E and SCG are less risky than SCE and PG&E; and (2) SCE and PG&E are relatively similar in risk to each other and slightly riskier than the two groups.

B. COST OF EQUITY ESTIMATION

The cost of common equity is the rate of return that investors require on their equity investments. The costs of debt and preferred stock are normally based on historical or book values and can be determined with a great degree of accuracy. The cost of common equity capital, however, cannot be determined precisely and must instead be estimated from market data and informed judgment. This return to the stockholder should be commensurate with returns on investments in other enterprises having comparable risks.

According to valuation principles, the present value of an asset equals the discounted value of its expected future cash flows. Investors discount these expected cash flows at their required rate of return that, as noted above, reflects the time value of

money and the perceived riskiness of the expected future cash flows. As such, the cost of common equity is the rate at which investors discount expected cash flows associated with common stock ownership.

Models have been developed to ascertain the cost of common equity capital for a firm. Each model, however, has been developed using restrictive economic assumptions. Consequently, judgment is required in selecting appropriate financial valuation models to estimate a firm's cost of common equity capital, in determining the data inputs for these models, and in interpreting the models' results. All of these decisions must take into consideration the firm involved as well as conditions in the economy and the financial markets.

The three most commonly used approaches in estimating cost of equity are the DCF model, the CAPM, and the HRP model.

C. DISCOUNTED CASH FLOW ANALYSIS

1. Overview

According to the discounted cash flow model, the current stock price is equal to the discounted value of all future dividends that investors expect to receive from investment in the firm. As such, stockholders' returns ultimately result from current as well as future dividends. As owners of a corporation, common stockholders are entitled to a pro-rata share of the firm's earnings. The DCF model presumes that earnings that are not paid out in the form of dividends are reinvested in the firm so as to provide for future growth in earnings and dividends. The rate at which investors discount future dividends, which reflects the timing and riskiness of the expected cash flows, is interpreted as the market's expected or required return on the common stock. Therefore this discount rate represents the cost of common equity. Algebraically, the DCF model can be expressed as:

$$P = \frac{D1}{(1+k)1} + \frac{D2}{(1+k)2} + \ldots \frac{Dn}{(1+k)n}$$

where P is the current stock price, Dn is the dividend in year n, and k is the cost of common equity.

Virtually all investment firms use some form of the DCF model as a valuation technique. One common application for investment firms is called the three-stage DCF or dividend discount model ("DDM"). The stages in a three-stage DCF model are presented in Attachment JRW-9. This model presumes that a company's dividend payout progresses initially through a growth stage, then proceeds through a transition stage, and finally assumes a steady-state stage. The dividend-payment stage of a firm depends on the profitability of its internal investments, which, in turn, is largely a function of the life cycle of the product or service. These stages are depicted in the graphic below labeled the Three-Stage DCF Model.[10]

1. Growth stage: Characterized by rapidly expanding sales, high profit margins, and abnormally high growth in earnings per share. Because of highly profitable expected investment opportunities, the payout ratio is low. Competitors are attracted by the unusually high earnings, leading to a decline in the growth rate.

2. Transition stage: In later years, increased competition reduces profit margins and earnings growth slows. With fewer new investment opportunities, the company begins to pay out a larger percentage of earnings.

3. Maturity (steady-state) stage: Eventually the company reaches a position where its new investment opportunities offer, on average, only slightly attractive returns on equity. At that time its earnings growth rate, payout ratio, and return on equity stabilize for the remainder of its life. The constant-growth DCF model is appropriate when a firm is in the maturity stage of the life cycle.

In using this model to estimate a firm's cost of equity capital, dividends are projected into the future using the different growth rates in the alternative stages, and then the equity cost rate is the discount rate that equates the present value of the future dividends to the current stock price.

[10] This description comes from William F. Sharp, Gordon J. Alexander, and Jeffrey V. Bailey, *Investments* (Prentice-Hall, 1995), pp. 590-91.

Under certain assumptions, including a constant and infinite expected growth rate, and constant dividend/earnings and price/earnings ratios, the DCF model can be simplified to the following:

$$P = \frac{D1}{k - g}$$

where D1 represents the expected dividend over the coming year and g is the expected growth rate of dividends. This is known as the constant-growth version of the DCF model. To use the constant-growth DCF model to estimate a firm's cost of equity, one solves for k in the above expression to obtain the following:

$$k = \frac{D1}{P} + g$$

The economics of the public utility business indicate that the industry is in the steady-state or constant-growth stage of a three-stage DCF. The economics include the relative stability of the utility business, the maturity of the demand for public utility services, and the regulated status of public utilities (especially the fact that their returns on investment are effectively set through the ratemaking process). The DCF valuation procedure for companies in this stage is the constant-growth DCF. In the constant-growth version of the DCF model, the current dividend payment and stock price are directly observable. Therefore, the primary problem and controversy in applying the DCF model to estimate equity cost rates entails estimating investors' expected dividend growth rate.

In applying the DCF model, one should be sensitive to several factors when using the DCF model to estimate a firm's cost of equity capital. In general, one must recognize the assumptions under which the DCF model was developed in estimating its components (the dividend yield and expected growth rate). The dividend yield can be measured precisely at any point in time, but tends to vary somewhat over time. Estimation of expected growth is considerably more difficult. One must consider recent firm

performance, in conjunction with current economic developments and other information available to investors, to accurately estimate investors' expectations.

DRA's DCF analysis is provided in Attachment JRW-10. The DCF summary is on page 1 of this Attachment, and the supporting data and analysis for the dividend yield and expected growth rate are provided on the following pages of the Attachment.

2. Dividend Yield

The dividend yields on the common stock for the companies in the proxy groups are provided on pages 2 and 3 of Attachment JRW-10 for the six-month period ending July 2012. For the DCF dividend yields for the groups, I am using the median of the six month and July 2012 dividend yields. Table 4-1 shows these dividend yields.

Table 4-1

	July 2012 Dividend Yield	Six Month Dividend Yield	DCF Dividend Yield
Electric Proxy Group	**4.1%**	**4.3%**	**4.2%**
Gas Proxy Group	**3.9%**	**3.9%**	**3.9%**

According to the traditional DCF model, the dividend yield term relates to the dividend yield over the coming period. As indicated by Professor Myron Gordon, who is commonly associated with the development of the DCF model for popular use, this is obtained by: (1) multiplying the expected dividend over the coming quarter by 4 and (2) dividing this dividend by the current stock price to determine the appropriate dividend yield for a firm that pays dividends on a quarterly basis.[11]

In applying the DCF model, some analysts adjust the current dividend for growth over the coming year as opposed to the coming quarter. This can be complicated because firms tend to announce changes in dividends at different times during the year. As such, the dividend yield computed based on presumed growth over the coming quarter as opposed to the coming year can be quite different. Consequently, it is common for

[11] *Petition for Modification of Prescribed Rate of Return*, Federal Communications Commission, Docket No. 79-05, Direct Testimony of Myron J. Gordon and Lawrence I. Gould at 62 (April 1980).

analysts to adjust the dividend yield by some fraction of the long-term expected growth rate.

DRA will adjust the dividend yield by one-half (1/2) the expected growth so as to reflect growth over the coming year. This is the approach employed by the Federal Energy Regulatory Commission ("FERC").[12] The DCF equity cost rate ("K") is computed as:

$$K = [(D/P) * (1 + 0.5g)] + g$$

3. DCF Growth Rate

There is much debate as to the proper methodology to employ in estimating the growth component of the DCF model. By definition, this component is investors' expectation of the long-term dividend growth rate. Presumably, investors use some combination of historical and/or projected growth rates for earnings and dividends per share and for internal or book value growth to assess long-term potential.

DRA has analyzed a number of measures of growth for companies in the proxy groups. DRA has reviewed *Value Line's* historical and projected growth rate estimates for earnings per share ("EPS"), dividends per share ("DPS"), and book value per share ("BVPS"). In addition, DRA has utilized the average EPS growth rate forecasts of Wall Street analysts as provided by Yahoo, Reuters and Zacks. These services solicit five-year earnings growth rate projections from securities analysts and compile and publish the means and medians of these forecasts. Finally, DRA have also assessed prospective growth as measured by prospective earnings retention rates and earned returns on common equity.

Historical growth rates for EPS, DPS, and BVPS are readily available to virtually all investors and are presumably an important ingredient in forming expectations concerning future growth. However, one must use historical growth numbers as measures

[12] Opinion No. 414-A, *Transcontinental Gas Pipe Line Corp.*, 84 FERC ¶61,084 (1998).

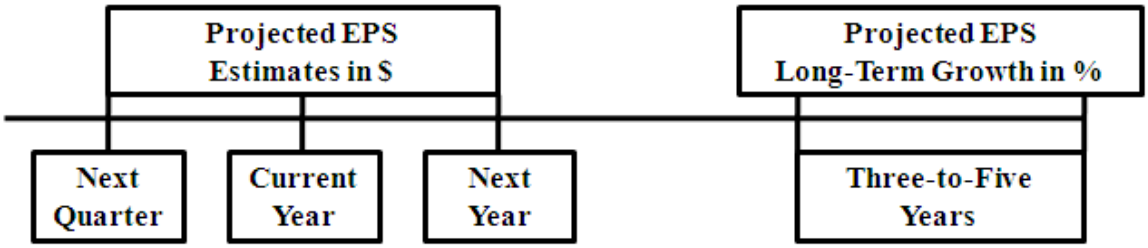
of investors' expectations with caution. In some cases, past growth may not reflect future growth potential. Also, employing a single growth rate number (for example, for five or ten years), is unlikely to accurately measure investors' expectations due to the sensitivity of a single growth rate figure to fluctuations in individual firm performance as well as overall economic fluctuations (i.e., business cycles). However, one must appraise the context in which the growth rate is being employed. According to the conventional DCF model, the expected return on a security is equal to the sum of the dividend yield and the expected long-term growth in dividends. Therefore, to best estimate the cost of common equity capital using the conventional DCF model, one must look to long-term growth rate expectations.

Internally generated growth is a function of the percentage of earnings retained within the firm (the earnings retention rate) and the rate of return earned on those earnings (the return on equity). The internal growth rate is computed as the retention rate times the return on equity. Internal growth is significant in determining long-run earnings and therefore, dividends. Investors recognize the importance of internally generated growth and pay premiums for stocks of companies that retain earnings and earn high returns on internal investments.

Analysts' EPS forecasts for companies are collected and published by a number of different investment information services, including Institutional Brokers Estimate System ("I/B/E/S"), Bloomberg, FactSet, Zacks, First Call and Reuters, among others. Thompson Reuters publishes analysts' EPS forecasts under different product names, including I/B/E/S, First Call, and Reuters. Bloomberg, FactSet, and Zacks publish their own set of analysts' EPS forecasts for companies. These services do not reveal: (1) the analysts who are solicited for forecasts; or (2) the actual analysts who actually provide the EPS forecasts that are used in the compilations published by the services. IBES, Bloomberg, FactSet, and First Call are fee-based services. These services usually provide detailed reports and other data in addition to analysts' EPS forecasts. Thompson Reuters and Zacks do provide limited EPS forecasts data free-of-charge on the internet. Yahoo finance (http://finance.yahoo.com) lists Thompson Reuters as the source of its summary EPS forecasts. The Reuters website (www.reuters.com) also publishes EPS forecasts from Thompson Reuters, but with more

detail. Zacks (www.zacks.com) publishes its summary forecasts on its website. Zacks estimates are also available on other websites, such as msn.money (http://money.msn.com).

These services solicit the EPS forecasts of analysts of investment and financial service firms and publish the average EPS estimates for future quarterly and annual time periods as well as the average long-term EPS growth rate forecasts. As shown in the figure below, the projected EPS near-term estimates are usually provided for the next quarter, the current fiscal year, and the next fiscal year. The long-term projected EPS growth rate is for a three-to-five year time period.



The following example provides the EPS forecasts compiled by Reuters for ALLETE Inc. (stock symbol "ALE").

Consensus Earnings Estimates
ALLETE Inc.
www.reuters.com
June 28, 2012

	# of Estimates	Mean	High	Low
Earnings (per share)				
Quarter Ending Jun-12	3	0.42	0.52	0.36
Quarter Ending Sep-12	3	0.70	0.72	0.68
Year Ending Dec-12	4	2.56	2.58	2.53
Year Ending Dec-13	4	2.85	2.86	2.81
LT Growth Rate (%)	2	6.50	8.00	5.00

These figures can be interpreted as follows. The top line shows that six analysts have provided EPS estimates for the quarter ending September 30, 2012. The mean, high and low estimates are $0.42, $0.52, and $0.36, respectively. The second line shows the quarterly EPS estimates for the quarter ending December 31, 2012. Lines three and four show the annual EPS estimates for the fiscal years ending December 2012 and December 2013. The quarterly and annual EPS forecasts in lines 1-4 are expressed in dollars and cents. As in the ALE case shown here, it is common for more analysts to provide estimates of annual EPS as opposed to quarterly EPS. The bottom line shows the projected long-term EPS growth rate which is expressed as a percent. For ALE, two analysts have provided long-term EPS growth rate forecasts, again which represents three- to five-year forecasts, with mean, high and low growth rates of 6.50%, 8.00%, and 5.00%.

The DCF growth rate is the long-term projected growth rate in EPS, DPS, and BVPS. Therefore, in developing an equity cost rate using the DCF model, the projected long-term growth rate is the projection used in the DCF model.

In developing a DCF growth rate, some analysts rely exclusively on the projected long-term EPS growth rates of Wall Street analysts. However, there are several issues with these long-term EPS growth rate forecasts as measures of an appropriate long-term DCF growth rate. First, the appropriate growth rate in the DCF model is the dividend growth rate, not the earnings growth rate. Nonetheless, over the very long-term, dividend and earnings will have to grow at a similar growth rate. Therefore, consideration must be given to other indicators of growth, including prospective dividend growth, internal growth, as well as projected earnings growth. Second, a new study by Lacina, Lee, and Xu (2011) has shown that analysts' long-term earnings growth rate forecasts are not more accurate at forecasting future earnings than naïve random walk forecasts of future earnings.[13] Employing data over a twenty year period, these authors demonstrate that using the most recent year's EPS figure to forecast EPS in the next 3-5 years proved to be just as accurate as using the EPS estimates from analysts' long-term earnings growth rate

[13] M. Lacina, B. Lee and Z. Xu, *Advances in Business and Management Forecasting (Vol. 8),* Kenneth D. Lawrence, Ronald K. Klimberg (ed.), Emerald Group Publishing Limited, pp.77-101

forecasts. In the authors' opinion, these results indicate that the analysts' long-term earnings growth rate forecasts should be used with caution as inputs for valuation and cost of capital purposes. Finally, and most significantly, it is well-known that the long-term EPS growth rate forecasts of Wall Street securities analysts are overly optimistic and upwardly biased. This has been demonstrated in a number of academic studies over the years. This issue is discussed at length in Appendix A of this testimony. Hence, using these growth rates as a DCF growth rate will provide an overstated equity cost rate. On this issue, a study by Easton and Sommers (2007) found that optimism in analysts' growth rate forecasts leads to an upward bias in estimates of the cost of equity capital of almost 3.0 percentage points.[14]

According to the DCF model, the equity cost rate is a function of the dividend yield and expected growth rate. It is DRA's opinion that investors are well aware of the bias in analysts' EPS growth rate forecasts, and therefore, stock prices reflect the upward bias. Since stock prices reflect the bias, it affects the dividend yield in the DCF equity cost rate computation. However, to reflect the bias, the DCF growth rate needs to be adjusted downward from the projected EPS growth rate.

Historic growth rates for the companies in the proxy groups, as published in the *Value Line Investment Survey*, are on pages 4 and 5 of Attachment JRW-10. For the Electric Proxy Group, the historical growth measures in EPS, DPS, and BVPS, as measured by the medians, range from 1.3% to 4.5%, with an average of 3.3%. The range of the medians for the Gas Proxy Group is 2.5% to 6.3%, with an average of 4.5%.

Value Line's projections of EPS, DPS, and BVPS growth for the proxy groups are shown on page 6 and 7 of Attachment JRW-10. As above, due to the presence of outliers, medians are used in the analysis. The median range for the projected *Value Line* data for the Electric Proxy Group is from 3.5% to 5.3%, with an average of 4.3%. For the Gas Proxy Group, the median range is from 2.8% to 5.3%, with an average of 4.0%.

[14] Easton, P., & Sommers, G. (2007). Effect of analysts' optimism on estimates of the expected rate of return implied by earnings forecasts. *Journal of Accounting Research*, 45(5), 983–1015.

Also provided on pages 6 and 7 of Attachment JRW-10 is prospective sustainable growth for the proxy groups as measured by *Value Line*'s average projected retention rate and return on shareholders' equity. As noted above, sustainable growth is a primary driver of long-run earnings growth. For the Electric Proxy Group, the median prospective sustainable growth rate for the three companies with data is 4.0%. The median prospective sustainable growth rate for the Gas Proxy Group is 4.7%.

As discussed above, Yahoo, Zacks, and Reuters collect, summarize, and publish Wall Street analysts' 5-year EPS growth rate forecasts for the companies in the proxy groups. These forecasts for the companies in the proxy groups are on pages 8 and 9 Attachment JRW-10. The medians of analysts' projected EPS growth rates for the Electric and Gas Proxy Groups are 4.6% and 4.6%, respectively.[15]

The summary DCF growth rate indicators for the two proxy groups are on page 10 of Attachment JRW-10. Historical growth rate indicators for the Electric Proxy Group are low, with a median of 3.3%. The high end of the range for the Electric Proxy Group is 4.6% which is the projected EPS growth rates of Wall Street analysts. The average of the historic, sustainable, and projected growth rate indicators is 4.1%, and the average of the sustainable and projected EPS growth rates is 4.3%. Given primary weight to the sustainable and projected growth rate measures, an expected growth rate in the 4.0% to 4.5% range is appropriate for the Electric Proxy Group. DRA will use the midpoint of this range, 4.25%, as the DCF growth rate for the Electric Proxy Group.

The historical growth rate figures for the Gas Proxy Group suggest a baseline growth rate in the 4.5% range for these companies. The projected and sustainable growth rates from *Value Line* are 4.0% and 4.7% for the group. Analysts projected EPS growth is 4.6%. The average of sustainable and projected EPS growth rate indicators is 4.4%. Giving more weight to the projected and sustainable growth rate indicators, an expected DCF growth rate in the 4.4% range is reasonable for the group. DRA will use this figure as the DCF growth rate for the Gas Proxy Group.

---

[15] Since there is considerable overlap in analyst coverage between the three services, and not all of the companies have forecasts from the different services, I have averaged the expected five-year EPS growth rates from the three services for each company to arrive at an expected EPS growth rate by company.

4. DCF Summary

DRA's DCF-derived equity cost rate for the groups is summarized on page 1 of Attachment JRW-10 and in Table 4-2.

$$\text{DCF Equity Cost Rate (k)} = \frac{D}{P} + g$$

Table 4-2

	Dividend Yield	1 + ½ Growth Adjustment	DCF Growth Rate	Equity Cost Rate
Electric Proxy Group	**4.20%**	**1.02125**	**4.25%**	**8.5%**
Gas Proxy Group	**3.90%**	**1.02200**	**4.40%**	**8.4%**

These results are summarized on page 1 of Attachment JRW-10.

D. CAPITAL ASSET PRICING MODEL (CAPM)

1. Overview

The CAPM is a risk premium approach to gauging a firm's cost of equity capital. According to the risk premium approach, the cost of equity is the sum of the interest rate on a risk-free bond (Rf) and a risk premium (RP), as in the following:

$$k = Rf + RP$$

The yield on long-term Treasury securities is normally used as Rf. Risk premiums are measured in different ways. The CAPM is a theory of the risk and expected returns of common stocks. In the CAPM, two types of risk are associated with a stock: firm-specific risk or unsystematic risk; and market or systematic risk, which is measured by a firm's beta. The only risk that investors receive a return for bearing is systematic risk.

According to the CAPM, the expected return on a company's stock, which is also the equity cost rate (K), is equal to:

$$K = (Rf) + ßi * [E(Rm) - (Rf)]$$

Where:

K represents the estimated rate of return on the stock;

E(Rm) represents the expected return on the overall stock market. Frequently, the 'market' refers to the S&P 500;

(Rf) represents the risk-free rate of interest;

[E(Rm) - (Rf)] represents the expected equity or market risk premium—the excess return that an investor expects to receive above the risk-free rate for investing in risky stocks; and

Beta—(ßi) is a measure of the systematic risk of an asset.

To estimate the required return or cost of equity using the CAPM requires three inputs: the risk-free rate of interest (Rf), the beta (ßi), and the expected equity or market risk premium, [E(Rm) - (Rf)]. Rf is the easiest of the inputs to measure – it is the yield on long-term Treasury bonds. ßi, the measure of systematic risk, is a little more difficult to measure because there are different opinions about what adjustments, if any, should be made to historical betas due to their tendency to regress to 1.0 over time. And finally, an even more difficult input to measure is the expected equity or market risk premium, [E(Rm) - (Rf)]. I will discuss each of these inputs, with most of the discussion focusing on the expected equity risk premium.

2. Risk-Free Interest Rate

The yield on long-term U.S. Treasury bonds has usually been viewed as the risk-free rate of interest in the CAPM. The yield on long-term U.S. Treasury bonds, in turn, has been considered to be the yield on U.S. Treasury bonds with 30-year maturities. The yield on 30-year Treasury bonds has been in the 2.6% to 4.0% range over the last six months. These rates are currently at the lower end of this range. Given the recent range of yields, and the prospect of higher rates in the future, DRA will use 4.0%, as the risk-free rate, or R_f, in my CAPM.

3. Beta

Beta (ß) is a measure of the systematic risk of a stock. The market, usually taken to be the S&P 500, has a beta of 1.0. The beta of a stock with the same price movement as the market also has a beta of 1.0. A stock whose price movement is greater than that of the market, such as a technology stock, is riskier than the market and has a beta greater than 1.0. A stock with below average price movement, such as that of a regulated public utility, is less risky than the market and has a beta less than 1.0. Estimating a stock's beta involves running a linear regression of a stock's return on the market return. As shown on page 3 of Attachment JRW-11, the slope of the regression line is the stock's ß. A steeper line indicates the stock is more sensitive to the return on the overall market. This means that the stock has a higher ß and greater than average market risk. A less steep line indicates a lower ß and less market risk.

Several online investment information services, such as Yahoo and Reuters, provide estimates of stock betas. Usually these services report different betas for the same stock. The differences are usually due to: (1) the time period over which the ß is measured and (2) any adjustments that are made to reflect the fact that betas tend to regress to 1.0 over time. In estimating an equity cost rate for the proxy groups, I am using the betas for the companies as provided in the *Value Line Investment Survey*. As shown on page 3 of Attachment JRW-11, the median betas for the companies in the Electric and Gas Proxy Group are 0.73 and 0.68, respectively.

4. Equity Risk Premium

The equity or market risk premium - $(E(R_m) – R_f)$ - is equal to the expected return on the stock market (e.g., the expected return on the S&P 500 ($E(R_m)$) minus the risk-free rate of interest (R_f). The equity premium is the difference in the expected total return between investing in equities and investing in "safe" fixed-income assets, such as long-term government bonds. However, while the equity risk premium is easy to define conceptually, it is difficult to measure because it requires an estimate of the expected return on the market.

Risk Premium Approaches and Studies

Page 4 of Attachment JRW-11 highlights the primary approaches to, and issues in, estimating the expected equity risk premium. The traditional way to measure the equity risk premium was to use the difference between historical average stock and bond returns. In this case, historical stock and bond returns, also called ex post returns, were used as the measures of the market's expected return (known as the ex ante or forward-looking expected return). This type of historical evaluation of stock and bond returns is often called the "Ibbotson Approach" after Professor Roger Ibbotson who popularized this method of using historical financial market returns as measures of expected returns. Most historical assessments of the equity risk premium suggest an equity risk premium of 5-7% above the rate on long-term U.S. Treasury bonds. However, this can be a problem because: (1) ex post returns are not the same as ex ante expectations, (2) market risk premiums can change over time, increasing when investors become more risk-averse and decreasing when investors become less risk-averse, and (3) market conditions can change such that ex post historical returns are poor estimates of ex ante expectations.

The use of historical returns as market expectations has been criticized in numerous academic studies.[16] The general theme of these studies is that the large equity risk premium discovered in historical stock and bond returns cannot be justified by the fundamental data. These studies, which fall under the category "Ex Ante Models and Market Data," compute ex ante expected returns using market data to arrive at an expected equity risk premium. These studies have also been called "Puzzle Research" after the famous study by Mehra and Prescott in which the authors first questioned the magnitude of historical equity risk premiums relative to fundamentals.[17]

In addition, there are a number of surveys of financial professionals regarding the equity risk premium. *CFO Magazine* conducts a quarterly survey of CFOs which includes questions regarding their views on the current expected returns on stocks and

[16] The problems with using ex post historical returns as measures of ex ante expectations will be discussed at length later in my testimony.

[17] R. Mehra and Edward Prescott, "The Equity Premium: A Puzzle," *Journal of Monetary Economics* (1985).

bonds. Usually over 500 CFOs normally participate in the survey.[18] Questions regarding expected stock and bond returns are also included in the Federal Reserve Bank of Philadelphia's annual survey of financial forecasters which is published as the *Survey of Professional Forecasters*.[19] This survey of professional economists has been published for almost 50 years. In addition, Pablo Fernandez conducts annual surveys of financial analysts and companies regarding the equity risk premiums they use in their investment and financial decision-making.

Derrig and Orr (2003), Fernandez (2007), and Song (2007) have completed the most comprehensive reviews to date of the research on the equity risk premium.[20] Derrig and Orr's study evaluated the various approaches to estimating equity risk premiums as well as the issues with the alternative approaches and summarized the findings of the published research on the equity risk premium. Fernandez examined four alternative measures of the equity risk premium – historical, expected, required, and implied. He also reviewed the major studies of the equity risk premium and presented the summary equity risk premium results. Song provides an annotated bibliography and highlights the alternative approaches to estimating the equity risk summary.

Page 5 of Attachment JRW-11 provides a summary of the results of the primary risk premium studies reviewed by Derrig and Orr, Fernandez, and Song, as well as other more recent studies of the equity risk premium. In developing page 5 of Attachment JRW-11, the studies are categorized as in page 4 of Attachment JRW-11. The results are also included for the "Building Blocks" approach to estimating the equity risk premium, which are presented in Appendix B. The Building Blocks approach is a hybrid approach employing elements of both historic and ex ante models.

---

[18] See www.cfosurvey.org.

[19] Federal Reserve Bank of Philadelphia, *Survey of Professional Forecasters*, (February 12, 2010). The *Survey of Professional Forecasters* was formerly conducted by the American Statistical Association ("ASA") and the National Bureau of Economic Research ("NBER") and was known as the ASA/NBER survey. The survey, which began in 1968, is conducted each quarter. The Federal Reserve Bank of Philadelphia, in cooperation with the NBER, assumed responsibility for the survey in June 1990.

[20] Richard Derrig and Elisha Orr, "Equity Risk Premium: Expectations Great and Small," Working Paper (version 3.0), Automobile Insurers Bureau of Massachusetts, (August 28, 2003), Pablo Fernandez, "Equity Premium: Historical, Expected, Required, and Implied," IESE Business School Working Paper, (2007), and Zhiyi Song, "The Equity Risk Premium: An Annotated Bibliography," CFA Institute, (2007).

Page 5 of Attachment JRW-11 provides a summary of the results of the equity risk premium studies that were reviewed. These include the results of: (1) the various studies of the historical risk premium, (2) ex ante equity risk premium studies, (3) equity risk premium surveys of CFOs, Financial Forecasters, analysts, companies and academics, and (4) the Building Block approaches to the equity risk premium. There are results reported for over thirty studies, and the median equity risk premium is 5.11%.

The studies cited on page 5 of Attachment JRW-11 include equity risk premium studies and surveys that were published over the past decade and included an equity risk premium estimate. Most of these studies were published prior to the financial crisis. In addition, some of these studies were published in the early 2000s at the market peak. It should be noted many of these studies (as indicated) used data over long periods of time (as long as fifty years of data) and so they were not estimating an equity risk premium as of a point in time (e.g., the year 2001). To assess the effect of the earlier studies on the equity risk premium, on page 6 of Attachment JRW-11, page 5 of Attachment JRW-11 has been reconstructed, but all studies published before January 2, 2010 have been eliminated. The median for the 2010-2012 studies is 5.01%. This is the market risk premium figure that will be used in DRA's CAPM.

It is important to note that DRA's market risk premium is consistent with the contemporaneous market risk premiums of several notable services:

1. The June 2012 CFO survey, conducted by *CFO Magazine* and Duke University, reports an expected 10-year equity risk premium was 4.5%;

2. The financial forecasters in the Federal Reserve Bank of Philadelphia survey project mean long-term expected stock and bond returns were 6.80% and 4.0%, which provides an expected market risk premium of 2.80%;

3. Pablo Fernandez's recently published the results of a 2012 survey of financial analysts and companies, which included over 7,000 responses, reports a median market risk premium employed by U.S. analysts and U.S. companies of 5.0% and 5.5%.

5. CAPM Equity Cost Rate Summary

The results of DRA's CAPM study for the proxy groups are provided in Table 4-3.

Table 4-3
CAPM Results
$K = (R_f) + ß * [E(R_m) - (R_f)]$

	Risk-Free Rate	Beta	Equity Risk Premium	Equity Cost Rate
Electric Proxy Group	**4.0%**	**0.73**	**5.01%**	**7.7%**
Gas Proxy Group	**4.0%**	**0.68**	**5.01%**	**7.4%**

These results are summarized on page 1 of Attachment JRW-11.

E. HISTORICAL RISK PREMIUM MODEL (HRP)

1. Overview

Like the CAPM, the Historical Risk Premium Model ("HRP") is a risk premium approach to gauging a firm's cost of equity capital. According to the HRP approach, the cost of equity is the sum of the interest rate on a bond (Rb) and a risk premium (RP), as in the following:

$$k = Rb + RP$$

The base yield (Rb) in an HRP is normally the yield on (1) long-term Treasury securities or (2) a public utility bond. Risk premiums are measured in different ways. In using the HRP approach to estimate an equity cost rate for a utility, the risk premium is usually derived by an assessment of historical utility stock and bond returns. However, as discussed at length in Chapter 5, there are a number of problems with using historical stock and bond returns to estimate an expected equity risk premium.

2. HRP Study

DRA has performed a HRP studies using the data employed by SCE and SCG. DRA has made two modifications to these studies in arriving at an equity cost rates: (1) DRA has used the prospective yields on utility and Treasury bonds that are much more reflective of current bond yields; and (2) DRA has used the arithmetic as well as geometric mean in calculating the risk premium. These modifications are discussed below.

Base Yield in HRP Study

Table 4-4 summarizes the base yields used by DRA as well as those used by SCE and SCG. SCE has used a projected rate on Baa utility bonds of 5.61%. As shown in panel B of Attachment JRW-12, this is well in excess of current rates. The range on the current rates on A and BBB rated utility bonds is from 3.9% to 4.4%. DRA is using a prospective yield of 4.75% on A/BBB rated utility bonds. SDG&E and SCG have based their HRP on long-term Treasury yields. These yields are currently about 2.5%. SDG&E and SCG have used 4.20%. DRA is employing 4.0%.

Table 4-4
HRP Base Yields

	Base Yield	Company Base Yield	DRA Base Yield
SCE	**Prospective Baa Utility Bond Yield**	**5.61%**	**4.75%**
SDG&E, SCG	**20-Year Treasury Yield**	**4.20%**	**4.00%**

Risk Premium in HRP Study

Table 4-5 shows the risk premiums used in the HRP study by DRA as well as by SDG&E, SCE, and SCG.

Table 4-5
HRP Risk Premiums

	Risk Premium	Company Risk Premium	DRA Risk Premium
SCE	**S&P Electric Utilities - Baa Utility Bond Return 1945-2011**	**3.31%**	**2.74%**
SDG&E SCG	**S&P Utilities - 20-Year Treasury Income Return 1931-2011**	**5.7%**	**4.73%**

DRA has employed the data used by SCE and SCG for each HRP study. The difference is that DRA has employed the average of the arithmetic and geometric mean returns and not the difference in the arithmetic mean returns alone. As discussed at length in Chapter 5, there are a number of problems with using historical stock and bond returns to estimate an expected equity risk premium. These problems include measuring returns with arithmetic as opposed to geometric mean returns, survivorship bias (only the successful companies survive – the losers disappear), unattainable returns (since the returns are measured from stock indexes, and returns are computed at fixed intervals, and the return computation methodology requires periodic rebalancing of all stocks). Using the geometric mean return serves to mitigate the empirical biases associated with the use of historical returns to estimate an equity risk premium. Furthermore, as evidence of the appropriate mean return measure, the U.S. Securities and Exchange Commission requires

equity mutual funds to report historic return performance using geometric mean and not arithmetic mean returns.[21]

3. HRP Equity Cost Rate Summary

The results of DRA's HRP study for the three electric utility groups are provided in Table 4-6. The average of the two models is 8.11%.

Table 4-6
DRA HRP Equity Cost Rate

	Base Yield	Risk Premium	Equity Cost Rate
SCE Data	**4.75%**	**2.74%**	**7.49%**
SDG&E, SCG Data	**4.00%**	**4.73%**	**8.73%**
Average	**4.375%**	**3.735%**	**8.11%**

F. COMMON EQUITY COST RATE SUMMARY

DRA's DCF, CAPM, and HRP equity cost rate results for the CECs are provided as indicated in Table 4-7.

Table 4-7
Equity Cost Rate Summary

	DCF	CAPM	HRP
Electric Proxy Group	**8.50%**	**7.7%**	**8.11%**
Gas Proxy Group	**8.40%**	**7.4%**	**8.11%**

Given these results, I conclude that the equity cost rate for the CECs is in the 7.4%-8.50% range. I give primary weight to the DCF results since, as previously discussed, I believe it provides the best measure of the equity cost rate for public utilities. Therefore, I will use a base equity cost rate of 8.50% for the CECs. This range is supported by the HRP results. The risk analysis performed in Chapter 3 indicated that (1)

[21] U.S. Securities and Exchange Commission, Form N-1A.

SDG&E and SCG are less risky than SCE and PG&E and similar in risk to the proxy groups; and (2) SCE and PG&E are relatively similar in risk to each other and slightly riskier than their groups. Given this analysis and discussion, DRA will use base level ROE for SDG&E and SCG. DRA will add 25 basis points to the base ROE for SCE and PG&E to reflect the lower bond ratings (BBB+ for SCE and BBB for PG&E) relative to the Electric Proxy Group (A-/BBB+). The 25 basis points reflects the typical difference between the yields for different bond rating categories (e.g., A- vs. BBB+). Therefore, DRA recommends a ROE of 8.50% for SDG&E and SCG and 8.75% for PG&E and SCE.

CHAPTER 5
CRITIQUE OF COMPANY TESTIMONY

A. SUMMARY

This chapter reviews the cost of capital testimonies of the witnesses for PG&E, SDG&E, SCE, and SCG. The chapter reviews each of the equity cost rate methodologies presented by PG&E, SDG&E, SCE, and SCG. The cost of capital recommendations of the four companies are presented in Attachment JRW-2. The issues related to their capital structure and debt cost rate position have previously been discussed. In this section I am focusing on the errors in their equity cost rate studies. The witnesses that provide the equity cost rate recommendations are: (1) PG&E – Mr. William E. Avera; (2) SDG&E– Mr. Roger A. Morin; (3) SCE – Mr. Paul T. Hunt; and (4) SCG – Mr. Roger A. Morin. These witnesses use proxy groups and employ various common equity cost rate approaches including DCF, CAPM, various risk premium analyses, including HRP and ARP, and the EE approach. Table 5-1 provides a summary of the equity cost rate results for the four energy companies.

Table 5-1
Equity Cost Rate Results of PG&E, SDG&E, SCE, and SCG

	PG&E*	SDGE	SCE	SCG
DCF	**9.3%-10.1%**	**9.6%-11.3%**	**9.4%-9.9%**	**8.4%-10.1%**
CAPM	**10.8%-11.5%**	**10.4%-10.9%**	**9.7%-11.7&**	**10.2%-10.7%**
HRP		**10.1%**	**8.8%**	**10.1%-10.2%**
ARP	**10.8%**	**10.5%**		**10.3%**
EE	**10.8%**			
Recommendation	**11.0%**	**11.0%**	**11.1%**	**10.9%**

* Only for utility group

Mr. William E. Avera provides PG&E's equity cost analysis. He recommends an equity cost rate of 11.0%. His equity cost rate estimates are provided in Panel A of page 1 of Attachment JRW-13. He uses DCF, CAPM, ARP, and EE approaches. He uses a proxy group of fourteen combination electric and gas companies and a proxy group of

twelve non-utility companies. Based on these results, he concludes that the equity cost rate for PG&E is in the range of 10.2% to 11.4%, with a point estimate of 11.0%. While Mr. Avera does not make an explicit adjustment, he notes that he considered flotation costs in arriving at a point estimate within his reasonable equity cost rate range.

The errors in Mr. Avera's equity cost rate analysis include: (1) the adjustment of the dividend yield for a full year of growth; (2) the expected DCF growth rate, and in particular Mr. Avera's excessive reliance on the projected growth rates of Wall Street analysts and *Value Line* to measure expected DCF growth; (3) the measurement and magnitude of the equity risk premium used in CAPM and RP approaches; (4) the validity of the Expected Earnings equity cost rate approach; and (5) Mr. Avera's adjustments for size and flotation costs.

Mr. Roger A. Morin provides the equity cost rate recommendations for SDG&E and for SCG. For SDG&E, Mr. Morin recommends an equity cost rate of 10.9%. SDG&E adds another 10 basis points to this figure to account for risks and policy considerations as supported by Mr. Widjaja. Mr. Morin's equity cost rate estimates are provided in Panel A of page 2 of Attachment JRW-13. He uses DCF, CAPM, HRP, and ARP approaches. He uses a proxy group of thirty-one combination electric and gas companies and a proxy group of thirteen western utility companies. Mr. Morin includes a flotation cost adjustment of 20-23 basis points to each of his equity cost rate approaches. He arrives at an equity cost rate of 10.4%, and then adds an additional risk adjustment of 50 basis points to account for the higher beta for SDG&E's parent company, Sempra Energy.

For SCG, Mr. Morin has recommended an equity cost rate of 10.5%. Mr. Morin's equity cost rate estimates are provided in Panel A of page 5 of Attachment JRW-13. He uses DCF, CAPM, HRP, and ARP approaches. Mr. Morin uses a proxy group of seven natural gas companies and a group of thirty-one combination electric and gas companies. For SCG, Mr. Morin arrives at an equity cost rate of 10.1% which includes a flotation cost adjustment of 20-23 basis points to each of his equity cost rate approaches. Mr. Morin then adds an additional risk adjustment of 40 basis points to account for the risk of SCG relative to other gas companies.

The errors in Mr. Morin's equity cost rate analysis include: (1) the adjustment of the dividend yield for a full year of growth; (2) the expected DCF growth rate, and in particular Mr. Morin's excessive reliance on the projected growth rates of Wall Street analysts and *Value Line* to measure expected DCF growth; (3) Mr. Morin's use of the empirical ECAPM; (4) the measurement and magnitude of the equity risk premium used in CAPM and RP approaches; (5) the adjustment for flotation costs; and (6) the risk adjustment to account for the firm-specific risks of SDG&E and SCG.

Mr. Paul T. Hunt provides SCE's equity cost analysis. Mr. Hunt's equity cost rate estimates are provided in Panel A of page 4 of Attachment JRW-13. He indicates that his equity cost rate studies support the Company's requested return on equity of 11.0%. Mr. Hunt uses DCF, CAPM, and HRP approaches and adds a flotation cost adjustment to his equity cost rate estimates. He uses a proxy group of twenty six combination electric and gas companies. He adjusts his base equity cost rate estimates for (1) the risk differences between his comparable group and SCE and (2) the financial risk differences between a market value capital structure and a book value regulatory capital structure ("leverage adjustment"). These two adjustments add between 0.6% to 1.0% to his base equity cost rates for SCE.

The errors in Mr. Hunt's equity cost rate analysis include: (1) the adjustment of the dividend yield for a full year of growth; (2) the expected DCF growth rate, and in particular the excessive reliance on the projected growth rates of Wall Street analysts and *Value Line* to measure expected DCF growth; (3) the measurement and magnitude of the equity risk premium used in CAPM and RP approaches; (4) Mr. Hunt's use of relevered betas in his CAPM; (5) the projected base yield in Mr. Hunt's HRP analysis; (6) the risk adjustment associated with SCE's firm specific risks; and (7) the financial risk adjustment associated with the difference between market value and book value capital structures.

In the discussion below, DRA reviews the equity cost rate analyses and estimates of the different witnesses. DRA evaluates these recommendations by equity cost rate approach (DCF, CAPM, etc.), and highlight and discuss common issues in their analyses as well as individual areas of concern.

B. DISCOUNTED CASH FLOW ANALYSIS

Table 5-2 summarizes the DCF results presented by PG&E, SDG&E, SCE, and SCG. The discussion below evaluates the alternative methodological issues in the DCF analyses. The primary error in the DCF analyses of the PG&E, SDG&E, SCE, and SCG witnesses is their reliance on the upwardly biased projected EPS growth rate forecasts of Wall Street analysts.

Table 5-2
DCF Result
PG&E, SDG&E, SCE, and SCG Electric Utility Groups

	Dividend Yield	Expected Growth	DCF Equity Cost Rate
PG&E	**4.4%**	**5.2%**	**9.6%**
SDG&E	**4.2%**	**5.85%**	**10.1%**
SCE	**4.5%**	**5.15%**	**9.67%**
SCG	**4.0%**	**5.59%**	**9.1%**

The discussion below highlights the errors in the dividend yields and expected growth rates for the PG&E, SDG&E, SCE, and SCG cost of capital witnesses. I also address specific issues with the individual witnesses.

1. Dividend Yield

The witnesses for PG&E, SDG&E, SCE, and SCG all adjust the spot dividend yield for a full year of growth. As I discuss in Chapter 4, the dividend yield term relates to the dividend yield over the coming period to the traditional DCF model. That is, the dividend yield is obtained by: (1) multiplying the expected dividend over the coming quarter by 4, and (2) dividing this dividend by the current stock price to determine the appropriate dividend yield for a firm, which pays dividends on a quarterly basis. As noted, PG&E, SDG&E, SCE, and SCG all adjust the current dividend for growth over the coming year as opposed to the coming quarter. The problem is that firms tend to announce changes in dividends at different times during the year. As such, the dividend yield computed based on presumed growth over the coming quarter as opposed to the coming year can be quite different. To recognize this, I have adjusted the dividend yield

by one-half of the long-term expected growth rate. As previously noted, this is the approach used by FERC.

2. DCF Growth Rate

. The source of DCF growth rates for the three cost of capital witnesses are provided in Table 5-3.

Table 5-3
DCF Result
PG&E, SDG&E, SCE and SCG

	Source of Expected Growth Rate
PG&E	**IBES, Zacks, *Value Line* Projected EPS Growth, Sustainable Growth (br+sv)**
SDG&E	**Zacks, *Value Line* Projected EPS**
SCE	**IBES Projected EPS Growth, Sustainable Growth (br+sv)**
SCG	**Zacks, *Value Line* Projected EPS Growth**

The primary error in the DCF analyses of PG&E, SDG&E, SCE, and SCG is their reliance on the projected EPS growth rate results from Wall Street analysts and *Value Line* for their DCF growth rate.

It is DRA's contention that investors today are unlikely to rely exclusively on the EPS growth rate forecasts of Wall Street analysts and *Value Line* and ignore other growth rate measure in arriving at their expected growth rates for equity investments. As discussed in Chapter 4, the appropriate growth rate in the DCF model is the dividend growth rate, not the earnings growth rate. Hence, consideration must be given to other indicators of growth, including historical prospective dividend growth, internal growth, as well as projected earnings growth. In addition, as discussed in Chapter 4, a recent study by Lacina, Lee, and Xu (2011) has shown that analysts' long-term earnings growth rate forecasts are not more accurate at forecasting future earnings than naïve random walk forecasts of future earnings.[22] As such, the weight given to analysts' projected EPS growth rate should be limited. And finally, and most significantly, it is well-known that

[22] M. Lacina, B. Lee and Z. Xu, *Advances in Business and Management Forecasting (Vol. 8),* Kenneth D. Lawrence, Ronald K. Klimberg (ed.), Emerald Group Publishing Limited, pp.77-101

the long-term EPS growth rate forecasts of Wall Street securities analysts are overly optimistic and upwardly biased. Moreover, this reference is to the long-term growth rate forecasts, and not to the quarter-to-quarter EPS estimates of analysts. Hence, using the long-term growth rate forecasts of Wall Street analysts as a DCF growth rate produces an overstated equity cost rate. A study by Easton and Sommers (2007) found that optimism in analysts' growth rate forecasts leads to an upward bias in estimates of the cost of equity capital of almost 3.0 percentage points.[23] These issues are addressed in more detail in Appendix A.

3. Specific DCF Issues

PG&E DCF Model

There are several additional errors with PG&E's DCF model results as presented by Mr. Avera. These errors include: (1) he has relied exclusively on the upwardly biased and overly optimistic long-term EPS growth rate forecasts of Wall Street analysts and *Value Line* to measure DCF growth; (2) his DCF results are tainted due to the elimination of some DCF results and the presence of outliers; (3) his sustainable growth rate measure is overstated, and (4) the DCF results for his non-utility comparable group are excessive and therefore are not an indication of the equity cost rate for PG&E. The first issue is addressed in Appendix A. The other issues are addressed below.

DCF Results are Tainted due to the Elimination of DCF Results and Outliers– Mr. Avera's DCF results are tainted due to his selective elimination of low-end DCF results. The asymmetric elimination of low end and not high end results leads to an overstatement of the DCF equity cost rate.

[23] Easton, P., & Sommers, G. (2007). Effect of analysts' optimism on estimates of the expected rate of return implied by earnings forecasts. *Journal of Accounting Research*, 45(5), 983–1015.

Sustainable Growth Rate Forecasts – Mr. Avera's sustainable growth rate analysis, as found in Schedule WEA-1, indicates a growth rate for the group of 4.8% (the average of column d). However, this figure is higher than *Value Line*'s projected growth in book value of 4.35% for the group. This suggests that his br*sv methodology is flawed in that it produces higher sustainable growth rates (using *Value Line* data) than *Value Line* actually is forecasting.

DCF Results for Non-Utility Companies – Mr. Avera also computes a DCF equity cost rate using a group of comparable non-utility companies using the same methodology he employs for his comparable utility group. The average using his different growth rate measures is 12.0%. These companies are listed in Schedule WEA-3. This group includes such companies as Abbott Labs, Coca-Cola, General Mills, PepsiCo, Procter & Gamble, and WalMart. While many of these companies are large and successful, their lines of business are vastly different from the electric utility business and they do not operate in a highly regulated environment. In addition, as discussed in Appendix A, the upward bias in the EPS growth rate forecasts of Wall Street analysts is particularly severe for non-utility companies and therefore the DCF equity cost rate estimates for this group are particularly overstated. As such, the non-utility group is not an appropriate proxy for PG&E, and therefore the equity cost rate results for this group should be ignored.

SDG&E and SCG DCF Models

Beyond the dividend yield adjustment and the sole reliance on the upwardly biased EPS growth rates of Wall Street analysts and *Value Line*, there are several other issues with the DCF analyses of SDG&E and SCG. One common element of these two is the inclusion of a flotation cost adjustment. As discussed later in this report, such an adjustment is not appropriate. For SDG&E, Mr. Morin has included the DCF results for a Western electric utilities group. The DCF growth rate figures for this subgroup of utilities are inflated due to the reliance on the upwardly biased EPS growth rates of Wall Street analysts and *Value Line*. For SCG, Mr. Morin has erred by including a group of combination electric and gas companies in his proxy group, and not relying solely on a group of gas distribution companies..

SCE DCF Model

Beyond the dividend yield adjustment and the sole reliance on the upwardly biased EPS growth rates of Wall Street analysts and *Value Line*, there are several other issues with the DCF analyses of SCE.

The DCF Model overstates SCE's Equity Cost Rate - SCE argues that the DCF does not provide a reliable equity cost rate estimate at the present time because (1) the assumptions of constant price/earnings ("P/E") and market-to-book ("M/B") ratios, and (2) the DCF model produces insufficient earnings when market-to-book ratios are above 1.0. These issues are addressed below.

(1) *The assumptions used in the derivation of the DCF model* - First, it must be noted that all economic models are derived using fairly restrictive assumptions. In the DCF model, assumptions such as constant P/E and M/B ratios make the model internally consistent. Criticisms of the assumptions of the model are valid if it can be demonstrated that the model is not robust with respect to obvious real world conditions that deviate from these assumptions. No such evidence has been provided by SCE. The fact that the DCF model is used almost universally in the investment community and in utility ratemaking is indicative of the robustness of the methodology. The model does not require that investors have an infinite investment horizon. Simply put, the DCF model only presumes that stocks are priced on the basis of current and prospective dividends. Especially in the case of public utility stocks, I believe that this is a reasonable assumption.

P/E and M/B ratios change constantly as new information comes to the market that causes investors to revalue a company's shares (the numerator of the P/E and M/B ratios) relative to current earnings (the denominator of the P/E ratio) and book value (the denominator of the M/B ratio). This new information may be associated with changes in the economic landscape that result in changes in equity cost rates (such as changes in interest rates or investors' risk/return tradeoff). In the context of the DCF model, a change in P/E and M/B ratios indicates a change in a firm's share price relative to past earnings and book value. Share prices look forward and are determined by a firm's prospective cash returns

discounted to the present by investors' required return. Earnings and book value look backwards and are a function of firm performance and generally accepted accounting conventions.

Thus, in the context of the DCF model, the fact that P/E and M/B ratios change is simply an indication that new information relating to the economic environment is available and has caused investors to revalue shares. The DCF is based on expectations, and thus it is also likely that the new information actually results in a change in equity cost rates.

(2) *The DCF model produces insufficient earnings when market-to-book ratios are above 1.0.* - The market value of a firm's equity exceeds the book value of equity when the firm is expected to earn more on the book value of investment than investors require. In other words, the expected return on equity capital is greater than the cost of equity capital (the return that investors require). Given the almost universal application of the DCF model in regulatory and investment circles, it is rather obvious that public utilities would not be selling in excess of 1.00 times book value if the DCF model produced insufficient earnings.

<u>DCF Results are Tainted due to the Elimination of DCF Results and Outliers</u>– Mr. Hunt's DCF results are tainted due to his selective elimination of low-end DCF results. The asymmetric elimination of low end and not high end results leads to an overstatement of the DCF equity cost rate.

C. CAPITAL ASSET PRICING MODEL

Table 5-4 summarizes the CAPM results presented by PG&E, SDG&E, SCE, and SCG. The CAPM analyses are inflated due to (1) forecasted risk-free interest rates which are somewhat above current interest rates, and (2) excessive equity risk premium estimates.

Table 5-4
CAPM Results
PG&E, SDG&E, SCE, and SCG

	Risk-Free Rate	Beta	Equity Risk Premium	CAPM Equity Cost Rate
PG&E	**3.80%**	**0.73**	**9.7%**	**10.8%**
SDG&E	**4.20%**	**0.74**	**7.9%**	**10.1%**
SCE	**3.75%**	**0.855**	**8.28%**	**10.83%**
SCG	**4.20%**	**0.72**	**7.9%**	**9.9%**

1. Risk-Free Interest Rate

The cost of capital witnesses for PG&E, SDG&E, SCE, and SCG all use projected interest rates on long-term Treasury bonds as the base yield in their CAPM analyses. Forecasts of market-determined rates like interest and exchange rates, in my opinion, are not reliable, credible, or accurate. I am not aware of any empirical studies that indicate forecasted interest rates are better measures of future interest rates than today's interest rates. None of the cost of capital witnesses have provided empirical evidence in support of their interest rate projections. The investors in fixed income securities like Treasury Bonds are primarily sophisticated financial institutions. These institutional investors are not going to buy bonds at today's interest rates if they believe that interest rates are going to increase in the near future and leave them with capital losses associated with the decline in the bond price. As discussed in Chapter 4, the current yield on 30-year Treasuries is 2.7%.

2. Beta

All witnesses, including myself, have used betas from *Value Line*. The only differences are that SCE's Mr. Hunt has also used Bloomberg Betas and he also adjusts his betas for the market value – book value leverage of SCE. This adjustment is not appropriate.

3. Market Risk Premium

The primary problem with the CAPM analyses of PG&E, SDG&E, SCE, and SCG is the size of the market or equity risk premium. The three witnesses use market risk premiums that vary from 7.9% to 9.7%. They employ alternative methodologies to compute an equity risk premium, including (1) historic stock and bond returns; (2) an expected market risk premium that is computed as the expected return on the S&P 500 (computed by applying the DCF model to the S&P 500); (3) a prospective market risk premium that is computed as the expected return on *Value Line* stocks (computed by applying the DCF model to the *Value Line* database of stocks; and (3) an current market risk premium that is computed using the spread between Baa corporate bond yields and preferred stock yields relative to the risk-free interest rate.

<u>PG&E Market Risk Premium</u>

Mr. Avera develops an expected market risk premium by: (1) applying the DCF model to the S&P 500 to get an expected market return; and (2) subtracting the risk-free rate of interest. Mr. Avera's estimated market return of 13.5% for the S&P 500 equals the sum of the dividend yield of 2.6% and expected EPS growth rate of 10.9%. The expected EPS growth rate is the average of the expected EPS growth rates from IBES. Subtracting a 3.8% risk-free rate yields an expected market risk premium of 9.8%. The primary error in this approach is his expected DCF growth rate. As previously discussed, the expected EPS growth rates of Wall Street analysts are overly optimistic and upwardly biased. In addition, the projected growth rate is inconsistent with economic and earnings growth in the U.S.

A long-term EPS growth rate of 10.9% is not consistent with historic as well as projected economic and earnings growth in the U.S for several reasons: (1) long-term EPS and economic growth, as measured by GDP, is about ½ of Mr. Avera's projected EPS growth rate of 10.9%; (2) more recent trends in GDP growth, as well as projections of GDP growth, suggest slower economic and earnings growth in the future; and (3) over time, EPS growth tends to lag behind GDP growth.

Table 5-5 provides the growth rates in nominal GDP, S&P 500 stock price appreciation, and S&P 500 EPS and DPS growth since 1960. The data are provided on page 1 of Attachment JRW-14 and are presented graphically on page 2 of Attachment JRW-14.

Table 5-5
GDP, S&P 500 Stock Price, EPS, and DPS Growth
1960-Present

Nominal GDP	**6.80%**
S&P 500 Stock Price	**6.21%**
S&P 500 EPS	**6.98%**
S&P 500 DPS	**5.18%**
Average	**6.29%**

The historical long-run growth rates for GDP, S&P EPS, and S&P DPS are in the 5% to 7% range. By comparison, Mr. Avera's long-run growth rate projection of 10.9% is vastly overstated. These estimates suggest that companies in the U.S. would be expected to: (1) increase their growth rate of EPS by over 50% in the future and (2) maintain that growth indefinitely in an economy that is expected to grow at about one-half of his projected growth rates.

The more recent trends suggest lower future economic growth than the long-term historic GDP growth. The historic GDP growth rates for 10-, 20-, 30-, 40- and 50- years are presented in Panel A of page 3 of Attachment JRW-14. These figures clearly suggest that nominal GDP growth in recent decades has slowed and that a figure in the range of 4.0% to 5.0% is more appropriate today for the U.S. economy. These figures indicate that Mr. Avera long-term growth EPS growth rate of 10.9% is even more inflated.

There are several forecasts of annual GDP growth that are available from economists and government agencies. These are listed in Panel B of page 3 of Attachment JRW-15. The mean 10-year nominal GDP growth forecast (as of February 2012) by

economists in the recent *Survey of Professional Forecasters* is 4.9%. The Energy Information Administration ("EIA"), in its projections used in preparing *Annual Energy Outlook*, forecasts long-term GDP growth of 4.8% for the period 2009-2035. The Congressional Budget Office, in its forecasts for the period 2012 to 2022, projects a nominal GDP growth rate of 4.8%. As such, projections of nominal GDP growth provide additional evidence that Mr. Avera's long-term EPS growth rate of 10.9% is highly overstated.

Brad Cornell of the California Institute of Technology recently published a study on GDP growth, earnings growth, and equity returns. He finds that long-term EPS growth in the U.S. is directly related to GDP growth, with GDP growth providing an upward limit on EPS growth. In addition, he finds that long-term stock returns are determined by long-term earnings growth. He concludes with the following observations:[24]

> The long-run performance of equity investments is fundamentally linked to growth in earnings. Earnings growth, in turn, depends on growth in real GDP. This article demonstrates that both theoretical research and empirical research in development economics suggest relatively strict limits on future growth. In particular, real GDP growth in excess of 3 percent in the long run is highly unlikely in the developed world. In light of ongoing dilution in earnings per share, this finding implies that investors should anticipate real returns on U.S. common stocks to average no more than about 4–5 percent in real terms.

Given current inflation in the 3% range, the results imply nominal expected stock market returns in the 7% to 8% range. As such, Mr. Avera's projected earnings growth rates and implied expected stock market returns and equity risk premiums are not indicative of the realities of the U.S. economy and stock market. As such, his CAPM equity cost rates are vastly overstated and should be ignored.

---

[24] Bradford Cornell, "Economic Growth and Equity Investing," *Financial Analysts Journal* (January- February, 2010), p. 63.

SDG&E and SCG Market Risk Premium

Mr. Roger A. Morin uses a market risk premium of 7.90% for both SDG&E and SCG. He computes the market risk premium as the average of (1) a historic risk premium of 6.7% that is computed as the difference between the arithmetic mean stock return and the mean bond income return over the 1926-2011 period; and (2) a prospective market risk premium that is computed as the expected return on *Value Line* stocks minus the risk-free rate of interest. The expected return of 13.1% on the *Value Line* stocks is calculated using the DCF model and employs a dividend yield of 2.9% and an expected growth rate of 10.2%. Subtracting a risk-free rate of 4.2% yields a prospective market risk premium of 9.1%.

Historical Risk Premium - Mr. Morin's historical market risk premium is the difference between the arithmetic average stock return and the bond income (coupon only) return over the 1926-2011 period. The primary error with this historical market risk premium is that the Ibbotson historic returns are poor measures of expected market risk premiums and result in an overstated measure of the expected market risk premium. The errors associated with computing an expected equity risk premium using historical stock and bond returns are addressed at length earlier and in Appendix C of this testimony. In short, there are a myriad of empirical problems, which result in historical market returns producing inflated estimates of expected risk premiums. Among the errors are the U.S. stock market survivorship bias (the "Peso Problem"), the company survivorship bias (only successful companies survive – poor companies do not survive), and unattainable return bias (the Ibbotson procedure presumes monthly portfolio rebalancing).

Prospective Market Risk Premium - Mr. Morin's prospective market risk premium is computed as the expected return on *Value Line* stocks minus the risk-free rate of interest. The expected return of 13.1% on the *Value Line* stocks is calculated using the DCF model and employs a dividend yield of 2.9% and an expected growth rate of 10.2%. Subtracting a risk-free rate of 4.2% yields a prospective market risk premium of 9.1%. As in the market risk premium analysis of Mr. Avera, the primary error here is the expected DCF growth rate and the resulting expected market return. As previously discussed, the expected EPS growth rates of Wall Street analysts are overly optimistic

and upwardly biased and the projected EPS growth rate of 10.2% is inconsistent with economic and earnings growth in the U.S. In addition long-term stock returns are tied to long-term economic and earnings growth, and historic and especially prospective economic growth does not support an expected earnings growth rate of 10.2%

SCE Market Risk Premium

Mr. Hunt computes a current expected market risk premium as the spread between Baa corporate bond yields and preferred stock yields relative to the risk-free interest rate. In both cases, he computes the current yield premium (2.10% for Baa bonds and 3.63% for preferreds), assumes that 15% of the spread is due to default risk and the rest is due to systematic risk, and then assumes a beta level of 0.26 for bonds and 0.4 for preferred stocks. This approach yields a market risk premium of 7.50% using bonds and 9.06% using preferred stocks.

Mr. Hunt's approach is very novel and is based on ad hoc and outdated assumptions. DRA is unable to locate any literature or regulatory cases which have employed this novel approach to estimating a market risk premium, and Mr. Hunt fails to provide any such sources. In addition, the market risk premium estimates are based on ad hoc and outdated assumptions. The presumption that 15% of the yield premium is due to systematic risk is not the result of any empirical analysis performed by Mr. Hunt. In addition, the estimates of beta for bonds and preferred stock are not the result of any empirical analysis performed by Mr. Hunt but based on outdated empirical studies. Nonetheless, the estimated market risk premiums of 7.50% and 9.06% are directly the result of the assumed level of systematic risk and betas.

4. Other CAPM Issues

SDG&E, SCE, and SCG Use of the Empirical CAPM ("ECAPM")

SDG&E, SCE, and SCG have employed a variation of the CAPM, the ECAPM. The ECAPM attempts to model the well-known finding of tests of the CAPM that have

indicated the Security Market Line ("SML") is not as steep as predicted by the CAPM. As such, the ECAPM is nothing more than an ad hoc version of the CAPM and has not been theoretically or empirically validated in refereed journals. The ECAPM provides for weights which are used to adjust the risk-free rate and market risk premium in applying the ECAPM. The error with using the ECAPM is this case is that the companies use betas from Value Line and Bloomberg. These betas are adjusted to reflect the fact that historically, betas tend to regress toward 1.0 over time. Using adjusted betas, therefore, increases the return for stocks with betas less than 1.0, and decreases the return for stocks with betas greater than 1.0. Therefore, since the companies have employed adjusted betas, there is no reason to use the ECAPM.

PG&E Size Adjustment

Dr. Avera includes a size adjustment in his CAPM approach for the size of the companies in the utility group. This adjustment is based on the historical stock market returns studies as performed by Morningstar (formerly Ibbotson Associates). There are numerous errors in using historical market returns to compute risk premiums. These errors provide inflated estimates of expected risk premiums. Among the errors are survivorship bias (only successful companies survive – poor companies do not survive) and unattainable return bias (the Ibbotson procedure presumes monthly portfolio rebalancing). The net result is that Ibbotson's size premiums are poor measures for risk adjustment to account for the size of the Company.

In addition, Professor Annie Wong has tested for a size premium in utilities and concluded that, unlike industrial stocks, utility stocks do not exhibit a significant size premium.[25] As explained by Professor Wong, there are several reasons why such a size premium would not be attributable to utilities. Utilities are regulated closely by state and federal agencies and commissions, and hence, their financial performance is monitored on an ongoing basis by both the state and federal governments. In addition, public utilities

[25] Annie Wong, "Utility Stocks and the Size Effect: An Empirical Analysis," *Journal of the Midwest Finance Association*, pp. 95-101, (1993).

must gain approval from government entities for common financial transactions such as the sale of securities. Furthermore, unlike their industrial counterparts, accounting standards and reporting are fairly standardized for public utilities. Finally, a utility's earnings are predetermined to a certain degree through the ratemaking process in which performance is reviewed by state commissions and other interested parties. Overall, in terms of regulation, government oversight, performance review, accounting standards, and information disclosure, utilities are much different than industrials, which could account for the lack of a size premium.

As noted, there are errors in using historical market returns to compute risk premiums. With respect to the small firm premium, Richard Roll (1983) found that one-half of the historic return premium for small companies disappears once biases are eliminated and historic returns are properly computed. The error arises from the assumption of monthly portfolio rebalancing and the serial correlation in historic small firm returns.[26]

In a more recent paper, Ching-Chih Lu (2009) estimated the size premium over the long-run. Lu acknowledges that many studies have demonstrated that smaller companies have historically earned higher stock market returns. However, Lu highlights that these studies rebalance the size portfolios on an annual basis. This means that at the end of each year the stocks are sorted based on size, split into deciles, and the returns are computed over the next year for each stock decile. This annual rebalancing creates the problem. Using a size premium in estimating a CAPM equity cost rate requires that a firm carry the extra size premium in its discount factor for an extended period of time, not just for one year, which is the presumption with annual rebalancing. Through an analysis of small firm stock returns for longer time periods (and without annual rebalancing), Lu finds that the size premium disappears within two years. Lu's conclusion with respect to the size premium is:[27]

---

[26] *See* Richard Roll, "On Computing Mean Returns and the Small Firm Premium," *Journal of Financial Economics*, pp. 371-86, (1983).

[27] Ching-Chih Lu, "The Size Premium in the Long Run," 2009 Working Paper, SSRN abstract no. 1368705.

However, an analysis of the evolution of the size premium will show that it is inappropriate to attach a fixed amount of premium to the cost of equity of a firm simply because of its current market capitalization. For a small stock portfolio which does not rebalance since the day it was constructed, its annual return and the size premium are all declining over years instead of staying at a relatively stable level. This confirms that a small firm should not be expected to have a higher size premium going forward sheerly because it is small now.

D. HISTORICAL AND ALLOWED RISK PREMIUM

The CECs use both HRP and ARP equity cost rate studies. The results for the HRP studies of SDG&E, SCE, and SCG are provided in Table 5-6. SDG&E and SCG compute a HRP as the difference between utility stock returns and the return on long-term U.S. Treasury bonds. SCE calculates a HRP as the difference between utility stock returns and Baa utility bond returns. There are two issues with these analyses, the base interest rate and the risk premium.

Table 5-6
HRP Results
SDG&E, SCE, SCG

	Base Interest Rate	Risk Premium	RP Equity Cost Rate
SDG&E	**4.20%**	**5.60%**	**9.90%**
SCE	**5.52%**	**3.31%**	**8.83%**
SCG	**4.20%**	**5.65%**	**10.85%**

1. HRP Base Interest Rate

In each of the HRP models, SDG&E and SCG uses the projected interest rates on U. S. Treasury bonds and SCE uses the projected interest rates on Baa utility bonds. The primary issue with these base interest rates is that the forecasted interest rates on utility and U. S. Treasury bonds are above current market interest rates. There is no empirical

evidence that forecasts of market-determined interest rates are better measures of future interest rates than today's interest rates. In addition, SCE's base interest rate is on long-term utility bonds. These bonds are subject to credit risk since they are not default risk-free like an obligation of the U.S. Treasury. As a result, the yield on a utility bond includes a premium for default risk and therefore the bond's yield-to-maturity, which is the yield reported and used in the markets, is above its expected rate of return. Hence, using a utility bond's yield-to-maturity as a base yield results in an overstatement of investors' return expectations.

2. HRP Risk Premium

SDG&E, SCE, and SCG compute their risk premium as the difference in the arithmetic mean returns on public utility stock returns and public utility bond returns over various time periods between the years 1937-2011. The errors in the historical evaluation of stock and bond returns to measure an ex ante equity risk premium is discussed at length in Appendix C. In short, using the historic relationship between stock and bond returns is subject to a myriad of empirical biases which results in an overstatement of the expected equity risk premium. These empirical issues include measuring returns with arithmetic as opposed to geometric mean returns, survivorship bias, unattainable returns (since the returns are measured from stock indexes). The measurement of the return is a significant issue. Damodaran provides a summary of why the geometric mean may be a better measure of return over longer time periods:[28]

[28] Aswath. Damodaran, "A New "Risky" World Order: Unstable Risk Premiums - Implications for Practice" NUU Working Paper, 2010, p. 25.

> "There are, however, strong arguments that can be made for the use of geometric averages. First, empirical studies seem to indicate that returns on stocks are negatively correlated over long periods of time. Consequently, the arithmetic average return is likely to overstate the premium. Second, while asset pricing models may be single period models, the use of these models to get expected returns over long periods (such as five or ten years) suggests that the estimation period may be much longer than a year. In this context, the argument for geometric average premiums becomes stronger."

PG&E, SDG&E and SCG also estimate a market risk premium using the ARP model. The results for the ARP studies of PG&E, SDG&E, and SCG are provided in Table 5-7. PG&E calculates the ARP by a regression of the difference between the average annual authorized ROEs utilities and the yield of BBB rated utility bonds. SDG&E and SCG compute an ARP by regressing the difference between the average annual authorized ROEs of utilities and the yield on long-term U.S. Treasury bonds. There are two issues with these analyses, the base interest rate and the risk premium.

Table 5-7
ARP Results
PG&E, SDG&E, and SCG

	Base Interest Rate	Risk Premium	RP Equity Cost Rate
PG&E	**5.88%**	**4.89%**	**10.77%**
SDG&E	**4.20%**	**6.30%**	**10.5%**
SCG	**4.20%**	**6.14%**	**10.30%**

3. ARP Base Interest Rate

In each of the ARP models, SDG&E and SCG use the projected interest rates on U. S. Treasury bonds and PG&E uses the projected interest rates on Baa utility bonds. The primary issue with these base interest rates is that the forecasted interest rates on utility and U. S. Treasury bonds are above current market interest rates. As discussed above, there is no empirical evidence that forecasts of market-determined interest rates are better measures of future interest rates than today's interest rates. In addition, PG&E's

base interest rate is on long-term utility bonds. These bonds are subject to credit risk since they are not default risk-free like an obligation of the U.S. Treasury. As a result, the yield on a utility bond includes a premium for default risk and therefore the bond's yield-to-maturity above its expected rate of return. Hence, using a utility bond's yield-to-maturity as a base yield results in an overstatement of investors' return expectations.

4. ARP Risk Premium

In the ARP approach used by PG&E, SDG&E, and SCG, the risk premium is inflated as a measure of investor's required risk premium since the utilities have been selling at a market-to-book ratios in excess of 1.0 for many years. This indicates that the authorized rates of return have been greater than the return that investors require. Therefore, the risk premium produced from these studies is overstated as a measure of investor return requirements and produces an inflated equity cost rate.

E. OTHER TESTIMONY ISSUES

1. <u>PG&E Expected Earnings Approach</u>

Dr. Avera estimates equity cost rate of 11.40% for the utility group using an approach he calls the Expected Earnings ("EE") approach. His methodology involves using the expected ROE for the companies in his utility proxy group as estimated by *Value Line*. This approach is fundamentally flawed for several reasons. First, these ROE results include the profits associated with the unregulated operations of the utility proxy group. More importantly, since Dr. Avera has not evaluated the market-to-book ratios for these companies, he cannot indicate whether the past and projected returns on common equity are above or below investors' requirements. These returns on common equity are excessive if the market-to-book ratios for these companies are above 1.0.

2. <u>Flotation Cost Adjustment</u>

PG&E, SDG&E, and SCG make an upward adjustment to their equity cost rates for flotation costs. Flotation costs are the costs associated with issuing common stock. For PG&E, Mr. Avera's adjustment is implicit. For SDG&E and SCG, Mr. Morin makes an explicit flotation cost adjustment in each of his equity cost rate models.

DRA believes that a flotation cost adjustment is erroneous for several reasons. First, the companies have not identified any actual flotation costs for the companies. Therefore, the company is requesting annual revenues in the form of a higher return on equity for flotation costs that have not been identified. Second, it is commonly argued that a flotation cost adjustment (such as that used by the utility) is necessary to prevent the dilution of the existing shareholders. In this case, a flotation cost adjustment is justified by reference to bonds and the manner in which issuance costs are recovered by including the amortization of bond flotation costs in annual financing costs. However, this is incorrect for several reasons:

(1) If an equity flotation cost adjustment is similar to a debt flotation cost adjustment, the fact that the market-to-book ratios for utility companies are about 1.5X actually suggests that there should be a flotation cost reduction (and not increase) to the equity cost rate. This is because when (a) a bond is issued at a price in excess of face or book value, and (b) the difference between market price and the book value is greater than the flotation or issuance costs, the cost of that debt is lower than the coupon rate of the debt. The amount by which market values of utility companies are in excess of book values is much greater than flotation costs. Hence, if common stock flotation costs were exactly like bond flotation costs, and one was making an explicit flotation cost adjustment to the cost of common equity, the adjustment would be downward;

(2) If a flotation cost adjustment is needed to prevent dilution of existing stockholders' investment, then the reduction of the book value of stockholder investment associated with flotation costs can occur only when a company's stock is selling at a market price at/or below its book value. As noted above, utility companies are selling at market prices well in excess of book value. Hence, when new shares are sold, existing shareholders realize an increase in the book value per share of their investment, not a decrease;

(3) Flotation costs consist primarily of the underwriting spread or fee and not out-of-pocket expenses. On a per share basis, the underwriting spread is the difference between the price the investment banker receives from investors and the price the investment banker pays to the company. Hence, these are not expenses that must be recovered through the regulatory process. Furthermore, the underwriting spread is known to the investors who are buying the new issue of stock, who are well aware of the difference between the price they are paying to buy the stock and the price that the company is receiving. The offering price which they pay is what matters when investors decide to buy a stock based on its expected return and risk prospects. Therefore, the company is not entitled to an adjustment to the allowed return to account for those costs; and

(4) Flotation costs, in the form of the underwriting spread, are a form of a transaction cost in the market. They represent the difference between the price paid by investors and the amount received by the issuing company. Whereas the utilities believes that it should be compensated for these transaction costs, they have not accounted for other market transaction costs in determining a cost of equity for the utilities, such as, most notably, brokerage fees that investors pay when they buy shares in the open market. Brokerage fees increase the effective stock price paid by investors to buy shares. If the utilities had included these brokerage fees or transaction costs in their DCF analysis, the higher effective stock prices paid for stocks would lead to lower dividend yields and equity cost rates. This would result in a downward adjustment to their DCF equity cost rate.

3. <u>SCE MV/BV Adjustment</u>

Mr. Hunt's equity cost rate approaches include an adjustment to reflect the financial risk differences between a market value capital structure and a book value regulatory capital structure ("leverage adjustment"). Mr. Hunt claims that an upward adjustment is needed because (1) market values are greater than book values for utilities and (2) the overall rate of return is applied to a book value capitalization in the ratemaking process. This adjustment is unwarranted for the following reasons:

(1) The market value of a firm's equity exceeds the book value of equity when the firm is expected to earn more on the book value of investment than investors require. This relationship is described very succinctly in the Harvard Business School case study, which I quote earlier in my testimony. As such, the reason that market values exceed book values is that the company is earning a return on equity in excess of its cost of equity;

(2) Despite Mr. Hunt's contention that this represents a leverage adjustment, there is no change in leverage. The utility's financial statements and fixed financial obligations remain the same. Thus, there is no need for a leverage adjustment because there is no change in leverage; and

(3) Financial publications and investment firms report capitalizations on a book value and not a market value basis.

DRA also believes that Mr. Hunt's MV/BV adjustment is erroneous because it is illogical. The MV/BV adjustment increases the ROEs for utilities that have high returns on common equity and decreases the ROEs for utilities that have low returns on common equity. The graphs presented in Attachment JRW-6 demonstrate that there is a strong positive relationship between expected returns on common equity and market-to-book ratios for public utilities. Hence, in the context of Mr. Hunt's leverage adjustment, this means that: (1) for a utility with a relatively high market-to-book ratio (e.g., 2.5) and ROE (e.g., 12.0%), the leverage adjustment will increase the estimated equity cost rate, while (2) for a utility with a relatively low market-to-book ratio (e.g., 0.5) and ROE (e.g., 5.0%), the leverage adjustment will decrease the estimated equity cost rate. Therefore, the adjustment will result in even higher market-to-book ratios for utilities with relatively high ROEs and even lower market-to-book ratios for utilities with relatively low ROEs.

4. <u>SCE, SDG&E and SCG Risk Adjustments</u>

Mr. Hunt also includes an adjustment to account for the higher firm-specific risks of SCE. SDG&E's recommended equity cost rate of 11.0% includes a risk adjustment of 60 basis points to account for the utility's unique risks. Likewise, SCG's recommended equity cost rate of 10.5% includes a 40 basis point adjustment for company-specific risks.

These firm-specific risk adjustments are unwarranted. DRA is relying on bond ratings to assess the relative riskiness of the CECs relative to each other and the proxy groups. Bond ratings suggest that (1) SCE and PG&E are similar in risk to each other and slightly riskier than the Electric Proxy Group; and (2) SDG&E and SCG are less risky than PG&E and SCE and are similar in risk to the two proxy groups.

APPENDIX

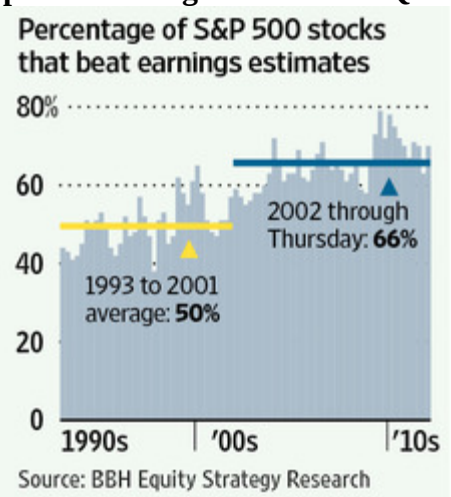
Q. PLEASE DISCUSS THE ISSUE REGARDING THE ACCURACY OF ANALYSTS' EPS FORECASTS.

A. Most of the attention given the accuracy of analysts' EPS forecasts comes from media coverage of company's quarterly earnings announcements. When companies announced earnings beat Wall Street's EPS estimates (" a positive surprise"), their stock prices usually go up. When a company's EPS figure misses or is below Wall Street's forecasted EPS ("A negative surprise"), their stock price usually declines, sometimes precipitously so. Wall Street's estimate is the consensus forecast for quarterly EPS made by analysts who follow the stock as of the announcement date. And so Wall Street's estimate is the consensus EPS made in the days leading up to the EPS announcement.

In recent years, it has become more common for companies to beat Wall Street's quarterly EPS estimate. A recent *Wall Street Journal* article summarized the results for the first quarter of 2012: "While this "positive surprise ratio" of 70% is above the 20 year average of 58% and also higher than last quarter's tally, it is just middling since the current bull market began in 2009. In the past decade, the ratio only dipped below 60% during the financial crisis. Look before 2002, though, and 70% would have been literally off the chart. From 1993 through 2001, about half of companies had positive surprises.[1] Figure 1 below provides the record for companies beating Wall Street's EPS estimate on a quarterly basis over the past twenty years.

[1] Spencer Jakab, "Earnings Surprises Lose Punch," *Wall Street Journal* (May 7, 2012), p. C1.

Figure 1
Percent of Companies Beating Wall Street's Quarterly Estimates



Q. PLEASE REVIEW THE ACADEMIC RESEARCH ON THE ACCURACY OF ANALYSTS' NEAR-TERM EPS ESTIMATES.

A. There is a long history of studies that evaluate how well analysts forecast near-term EPS estimates and long-term EPS growth rates. Most of these studies have evaluated the accuracy of earnings forecasts for the current quarter or year. Many of the early studies indicated that analysts make overly optimistic EPS earnings forecasts for quarter-to-quarter EPS (Stickel (1990); Brown (1997); Chopra (1998)).[2] More recent studies have shown that the optimistic bias tends to be larger for longer-term forecasts and smaller for forecasts made nearer to the EPS announcement date. Richardson, Teoh, and Wysocki (2004) report that the upward bias in earnings growth rates declines in the quarters leading up to the

[2] S. Stickel, "Predicting Individual Analyst Earnings Forecasts," *Journal of Accounting Research*, Vol. 28, 409-417, 1990. Brown, L.D., "Analyst Forecasting Errors: Additional Evidence," *Financial Analysts Journal*, Vol. 53, 81-88, 1997, and Chopra, V.K., "Why So Much Error in Analysts' Earnings Forecasts?" *Financial Analysts Journal*, Vol. 54, 30-37 (1998).

earnings announcement date.[3] They call this result the "walk-down to beatable analyst forecasts." They hypothesize that the walk-down might be driven by the "earning-guidance game," in which analysts give optimistic forecasts at the start of a fiscal year, then revise their estimates downwards until the firm can beat the forecasts at the earnings announcement date.

However, two regulatory developments over the past decade have potentially impacted analysts' EPS growth rate estimates. First, Regulation Fair Disclosure ("Reg FD") was introduced by the Securities and Exchange Commission ("SEC") in October of 2000. Reg FD prohibits private communication between analysts and management so as to level the information playing field in the markets. With Reg FD, analysts are less dependent on gaining access to management to obtain information and therefore, are not as likely to make optimistic forecasts to gain access to management. Second, the conflict of interest within investment firms with investment banking and analyst operations was addressed in the Global Analysts Research Settlements ("GARS"). GARS, as agreed upon on April 23, 2003, between the SEC, NASD, NYSE and ten of the largest U.S. investment firms, includes a number of regulations that were introduced to prevent investment bankers from pressuring analysts to provide favorable projections.

[3] S. Richardson, S. Teoh, and P. Wysocki, "The Walk-Down to Beatable Analyst Forecasts: The Role of Equity Issuance and Insider Trading Incentives," *Contemporary Accounting Research*, pp. 885−924, (2004).

The previously cited *Wall Street Journal* article acknowledged the impact of the new regulatory rules in explaining the recent results:[4] " What changed? One potential reason is the tightening of rules governing analyst contacts with management. Analysts now must rely on publicly available guidance or, gasp, figure things out by themselves. That puts companies, with an incentive to set the bar low so that earnings are received positively, in the driver's seat. While that makes managers look good short-term, there is no lasting benefit for buy-and-hold investors."

These comments on the impact of regulatory developments on the accuracy of short-term EPS estimates was addressed in a study by Hovakimian and Saenyasiri (2010).[5] The authors investigate analysts' forecasts of annual earnings for the following time periods: (1) the time prior to Reg FD (1984-2000); (2) the time period after Reg FD but prior to GARS (2000-2002);[6] and (3) the time period after GARS (2002-2006). For the pre-Reg FD period, Hovakimian and Saenyasiri find that analysts generally make overly optimistic forecasts of annual earnings. The forecast bias is higher for early forecasts and steadily declines in the months leading up to the earnings announcement. The results are similar for the time period after Reg FD but prior to GARS. However, the bias is lower in the later forecasts (the forecasts made just prior to the announcement).

[4] Spencer Jakab, "Earnings Surprises Lose Punch," *Wall Street Journal* (May 7, 2012), p. C1.

[5] A. Hovakimian and E. Saenyasiri, "Conflicts of Interest and Analysts Behavior: Evidence from Recent Changes in Regulation," *Financial Analysts* Journal (July-August, 2010), pp. 96-107.

[6] Whereas the GARS settlement was signed in 2003, rules addressing analysts' conflict of interest by separating the research and investment banking activities of analysts went into effect with the passage of NYSE and NASD rules in July of 2002.

For the time period after GARS, the average forecasts declined significantly, but a positive bias remains. In sum, Hovakimian and Saenyasiri find that: (1) analysts make overly optimistic short-term forecasts of annual earnings; (2) Reg FD had no effect on this bias; and (3) GARS did result in a significant reduction in the bias, but analysts' short-term forecasts of annual earnings still have a small positive bias.

Q. PLEASE TURN TO THE REVIEW THE ACADEMIC RESEARCH ON THE ACCURACY OF ANALYSTS' LONG-TERM EPS GROWTH RATE FORECASTS.

A. There have been very few studies regarding the accuracy of analysts' long-term EPS growth rate forecasts. Cragg and Malkiel (1968) studied analysts' long-term EPS growth rate forecasts made in 1962 and 1963 by five brokerage houses for 185 firms. They concluded find that analysts' long-term earnings growth forecasts are on the whole no more accurate than naive forecasts based on past earnings growth. Harris (1999) evaluated the accuracy of analysts' long-term EPS forecasts over the 1982-1997 time-period using a sample of 7,002 firm-year observations.[7] He concluded the following: (1) the accuracy of analysts' long-term EPS forecasts is very low; (2) a superior long-run method to forecast long-term EPS growth is to assume that all companies will have an earnings growth rate equal to historic GDP growth; and (3) analysts' long-term EPS forecasts are significantly upwardly biased, with forecasted earnings growth exceeding actual

[7] R.D. Harris, "The Accuracy, Bias, and Efficiency of Analysts' Long Run Earnings Growth Forecasts," *Journal of Business Finance & Accounting*, pp. 725-55 (June/July 1999).

earnings growth by seven percent per annum. Subsequent studies by DeChow, P., A. Hutton, and R. Sloan (2000), and Chan, Karceski, and Lakonishok (2003) also conclude that analysts' long-term EPS growth rate forecasts are overly optimistic and upwardly biased.[8] The Chan, Karceski, and Lakonishok (2003) study evaluated the accuracy of analysts' long-term EPS growth rate forecasts over the 1982-98 time period. They reported a median IBES growth forecast of 14.5%, versus a median realized five-year growth rate of about 9%. They also found the IBES forecasts of EPS beyond two years are not accurate. They concluded the following: "Over long horizons, however, there is little forecastability in earnings, and analysts' estimates tend to be overly optimistic."

Lacina, Lee, and Xu (2011) evaluated the accuracy of analysts' long-term earnings growth rate forecasts over the 1983-2003 time period.[9] The study included 27,081 firm year observations, and compare the accuracy of analysts' EPS forecasts to those produced by two naïve forecasting models: (1) a random walk model ("RW") where the long-term EPS (t+5) is simply equal to last year's EPS figure (t-1); (2) a RW model with drift ("RWGDP"), where the drift or growth rate is GDP growth for period t-1. In this model, long-term EPS (t+5) is simply equal to last year's EPS figure (t-1) times (1 + GDP growth (t-1)). The authors conclude that that using the RW model to forecast EPS in the next 3-5

[8] P. DeChow, A. Hutton, and R. Sloan, "The Relation Between Analysts' Forecasts of Long-Term Earnings Growth and Stock Price Performance Following Equity Offerings," *Contemporary Accounting Research (2000)* and K. Chan, L., Karceski, J., & Lakonishok, J., "The Level and Persistence of Growth Rates," *Journal of Finance* pp. 643−684, (2003).

[9] M. Lacina, B. Lee and Z. Xu, *Advances in Business and Management Forecasting (Vol. 8),* Kenneth D. Lawrence, Ronald K. Klimberg (ed.), Emerald Group Publishing Limited, pp.77-101

years proved to be just as accurate as using the EPS estimates from analysts' long-term earnings growth rate forecasts. They find that the RWGDP model performs better than the pure RW model, and that both perform as well as analysts; in forecasting long-term EPS. They also discover an optimistic bias in analysts long-term EPS forecasts. In the authors' opinion, these results indicate that that analysts' long-term earnings growth rate forecasts should be used with caution as inputs for valuation and cost of capital purposes.

Q. PLEASE ADDRESS THE ISSUE REGARDING THE SUPERIORITY OF ANALYSTS' EPS FORECASTS OVER HISTORIC AND TIME-SERIES ESTIMATES OF EPS GROWTH?

A. As highlighted by the classic study by Brown and Rozeff (1976) and the other studies that followed, analysts' forecasts of quarterly earnings estimates are superior to the estimates derived from historic and time-series analyses.[10] This is often attributed to the information and timing advantage that analysts have over historic and time-series analyses. These studies relate to analysts' forecasts of quarterly and/or annual forecasts, and not to long-term EPS growth rate forecasts. The previously cited studies by Harris (1999), Chan, Karceski, and Lakonishok (2003), and Lacina, Lee, and Xu (2011) all conclude that analysts' forecasts are no better than time-series models and historic growth rates in forecasting long-term EPS. Harris (1999) and Lacina, Lee, and Xu (2011) concluded that historic GDP

[10] L. Brown and M. Rozeff, "The Superiority of Analyst Forecasts as Measures of Expectations: Evidence from Earnings," *The Journal of Finance* 33 (1): pp. 1-16 (1976).

growth was superior to analysts' forecasts for long run earnings growth. These overall results are similar to the findings by Bradshaw, Drake, Myers, and Myers (2009) that discovered that time-series estimates of annual earnings are more accurate over longer horizons than analysts' forecasts of earnings. As the authors state, "These findings suggest an incomplete and misleading generalization about the superiority of analysts' forecasts over even simple time-series-based earnings forecasts."[11]

Q. PLEASE DISCUSS YOUR STUDY OF THE ACCURACY OF ANALYSTS' LONG-TERM EARNINGS GROWTH RATES.

A. To evaluate the accuracy of analysts' EPS forecasts, I have compared actual 3-5 year EPS growth rates with forecasted EPS growth rates on a quarterly basis over the past 20 years for all companies covered by the I/B/E/S data base. In Panel A of page 1 of Attachment JRW-A1, I show the average analysts' forecasted 3-5 year EPS growth rate with the average actual 3-5 year EPS growth rate for the past twenty years.

The following example shows how the results can be interpreted. For the 3-5 year period prior to the first quarter of 1999, analysts had projected an EPS growth rate of 15.13%, but companies only generated an average annual EPS growth rate over the 3-5 years of 9.37%. This projected EPS growth rate figure represented the average projected growth rate for over 1,510 companies, with an average of 4.88 analysts' forecasts per company. For the entire twenty-year

[11] M. Bradshaw, M. Drake, J. Myers, and L. Myers, "A Re-examination of Analysts' Superiority Over Time-Series Forecasts," Workings paper, (1999), http://ssrn.com/abstract=1528987.

period of the study, for each quarter there were on average 5.6 analysts' EPS projections for 1,281 companies. Overall, my findings indicate that forecast errors for long-term estimates are predominantly positive, which indicates an upward bias in growth rate estimates. The mean and median forecast errors over the observation period are 143.06% and 75.08%, respectively. The forecasting errors are negative for only eleven of the eighty quarterly time periods: five consecutive quarters starting at the end of 1995 and six consecutive quarters starting in 2006. As shown in Panel A of page 1 of Attachment JRW-A1, the quarters with negative forecast errors were for the 3-5 year periods following earnings declines associated with the 1991 and 2001 economic recessions in the U.S. Thus, there is evidence of a persistent upward bias in long-term EPS growth forecasts.

The average 3-5 year EPS growth rate projections for all companies provided in the I/B/E/S database on a quarterly basis from 1988 to 2008 are shown in Panel B of page 1 of Attachment JRW-A1. In this graph, no comparison to actual EPS growth rates is made, and hence, there is no follow-up period. Therefore, since companies are not lost from the sample due to a lack of follow-up EPS data, these results are for a larger sample of firms. Analysts' forecasts for EPS growth were higher for this larger sample of firms, with a more pronounced run-up and then decline around the stock market peak in 2000. The average projected growth rate hovered in the 14.5%-17.5% range until 1995 and then increased dramatically over the next five years to 23.3% in the fourth quarter of the year 2000. Forecasted EPS growth has since declined to the 15.0% range.

Q. IS THE UPWARD BIAS IN ANALYSTS' GROWTH RATE FORECASTS GENERALLY KNOWN IN THE MARKETS?

A. Yes. Page 2 of Attachment JRW-A1 provides an article published in the *Wall Street Journal*, dated March 21, 2008, that discusses the upward bias in analysts' EPS growth rate forecasts.[12] In addition, a recent *Bloomberg Businessweek* article also highlighted the upward bias in analysts' EPS forecasts, citing a study by McKinsey Associates. This article is provided on pages 3 and 4 of Exhibit JRW-12. The article concludes with the following:[13]

> ***The bottom line:*** *Despite reforms intended to improve Wall Street research, stock analysts seem to be promoting an overly rosy view of profit prospects.*

Q. HAVE REGULATORY DEVELOPMENTS LIKE REGULATION FD IMPACTED THE ACCURACY OF ANALYSTS' LONG-TERM EARNINGS GROWTH RATES.

A. Whereas Hovakimian and Saenyasiri evaluated the impact of regulations on analysts' short-term EPS estimates, there is little research on the impact of Reg FD and GARS on the long-term EPS forecasts of Wall Street analysts. My study with Patrick Cusatis did find that the long-term EPS growth rate forecasts of analysts did not decline significantly and have continued to be overly-optimistic in the post Reg FD and GARS period.[14] Analysts' long-term EPS growth rate

[12] Andrew Edwards, "Study Suggests Bias in Analysts' Rosy Forecasts," *Wall Street Journal* (March 21, 2008), p. C6.
[13] Roben Farzad, 'For Analysts, Things are Always Looking Up,' *Bloomberg Businessweek* (June 14, 2010), pp. 39-40.
[14] P. Cusatis and J. R. Woolridge, "The Accuracy of Analysts' Long-Term EPS Growth Rate Forecasts," Working

forecasts before and after GARS are about two times the level of historic GDP growth. These observations are supported by a *Wall Street Journal* article entitled "Analysts Still Coming Up Rosy – Over-Optimism on Growth Rates is Rampant – and the Estimates Help to Buoy the Market's Valuation." The following quote provides insight into the continuing bias in analysts' forecasts:

> Hope springs eternal, says Mark Donovan, who manages Boston Partners Large Cap Value Fund. "You would have thought that, given what happened in the last three years, people would have given up the ghost. But in large measure they have not.
>
> These overly optimistic growth estimates also show that, even with all the regulatory focus on too-bullish analysts allegedly influenced by their firms' investment-banking relationships, a lot of things haven't changed. Research remains rosy and many believe it always will.[15]

Q. ARE THESE OBSERVATIONS CONSISTENT WITH THE FINDINGS OF A RECENT MCKINSEY STUDY ON THE IMPACT OF THESE REGULATIONS ON THE ACCURACY OF ANALYSTS' EPS GROWTH RATE FORECASTS?

A. Yes. McKinsey recently published a study entitled "Equity Analysts: Still too Bullish" in which they reported on a study of the accuracy on analysts long-term EPS growth rate forecasts. They concluded that after a decade of stricter regulation, analysts' long-term earnings forecasts continue to be excessively optimistic.

Paper, (July 2008).

[15] Ken Brown, "Analysts Still Coming Up Rosy – Over-Optimism on Growth Rates is Rampant – and the Estimates Help to Buoy the Market's Valuation," *Wall Street Journal*, p. C1, (January 27, 2003).

They made the following observation (emphasis added): [16]

> Alas, a recently completed update of our work only reinforces this view—despite a series of rules and regulations, dating to the last decade, that were intended to improve the quality of the analysts' long-term earnings forecasts, restore investor confidence in them, and prevent conflicts of interest. For executives, many of whom go to great lengths to satisfy Wall Street's expectations in their financial reporting and long-term strategic moves, this is a cautionary tale worth remembering. This pattern confirms our earlier findings that analysts typically lag behind events in revising their forecasts to reflect new economic conditions. When economic growth accelerates, the size of the forecast error declines; when economic growth slows, it increases. So as economic growth cycles up and down, the actual earnings S&P 500 companies report occasionally coincide with the analysts' forecasts, as they did, for example, in 1988, from 1994 to 1997, and from 2003 to 2006. <u>Moreover, analysts have been persistently overoptimistic for the past 25 years, with estimates ranging from 10 to 12 percent a year, compared with actual earnings growth of 6 percent. Over this time frame, actual earnings growth surpassed forecasts in only two instances, both during the earnings recovery following a recession. On average, analysts' forecasts have been almost 100 percent too high.</u>

Q. ARE ANALYSTS' EPS GROWTH RATE FORECASTS LIKEWISE UPWARDLY BIASED FOR UTILITY COMPANIES?

A. Yes. To evaluate whether analysts' EPS growth rate forecasts are upwardly biased for utility companies, I conducted a study similar to the one described above using a group of electric utility and gas distribution companies. The results are shown on Panels A and B of page 5 of Attachment JRW-A1. The projected EPS growth rates for electric utilities have been in the 4% to 6% range over the last twenty

[16] Marc H. Goedhart, Rishi Raj, and Abhishek Saxena, "Equity Analysts, Still Too Bullish," *McKinsey on Finance*, pp. 14-17, (Spring 2010).

years, with the recent figures approximately 5%. As shown, the achieved EPS growth rates have been volatile and on average, below the projected growth rates. Over the entire period, the average quarterly 3-5 year projected and actual EPS growth rates are 4.59% and 2.90%, respectively.

For gas distribution companies, the projected EPS growth rates have declined from about 6% in the 1990s to about 5% in the 2000s. The achieved EPS growth rates have been volatile. Over the entire period, the average quarterly 3-5 year projected and actual EPS growth rates are 5.15% and 4.53%, respectively.

Overall, the upward bias in EPS growth rate projections for electric utility and gas distribution companies is not as pronounced as it is for all companies. Nonetheless, the results here are consistent with the results for companies in general -- analysts' projected EPS growth rate forecasts are upwardly-biased for utility companies.

Q. ARE *VALUE LINE*'S GROWTH RATE FORECASTS OVERLY OPTIMISTIC?

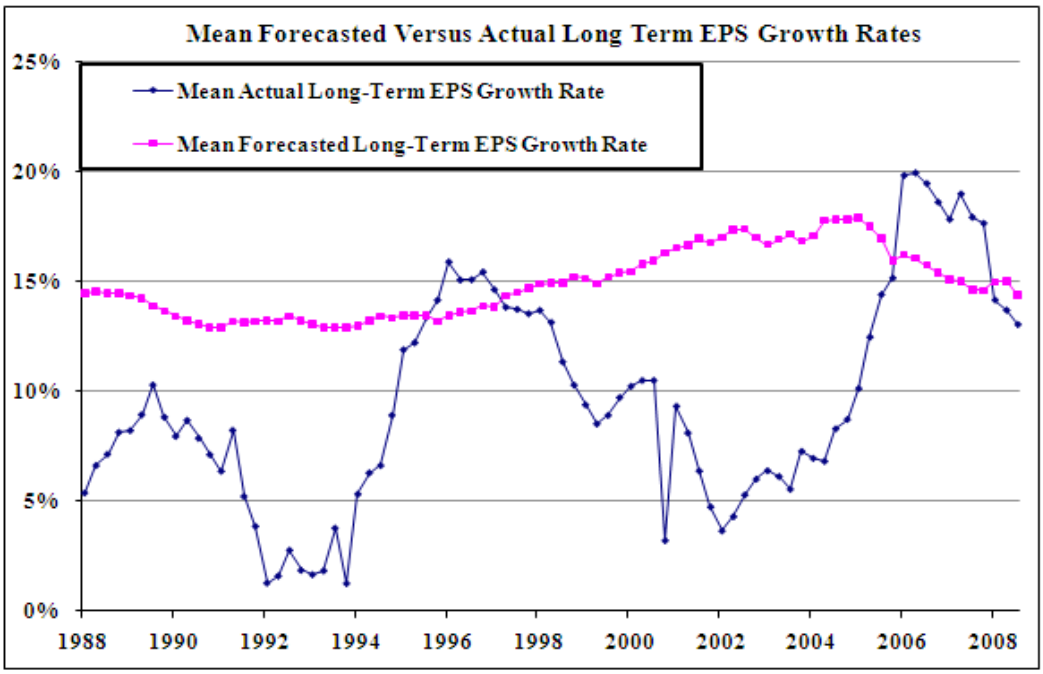
A. Yes. *Value Line* has a decidedly positive bias to its earnings growth rate forecasts as well. To assess *Value Line*'s earnings growth rate forecasts, I used the *Value Line Investment Analyzer*. The results are summarized in Panel A of Page 6 of Attachment JRW-A1. I initially filtered the database and found that *Value Line* has 3-5 year EPS growth rate forecasts for 2,333 firms. The average projected

EPS growth rate was 14.70%. This is high given that the average historical EPS growth rate in the U.S. is about 7%. A major factor seems to be that *Value Line* only predicts negative EPS growth for 43 companies. This is less than two percent of the companies covered by *Value Line*. Given the ups and downs of corporate earnings, this is unreasonable.

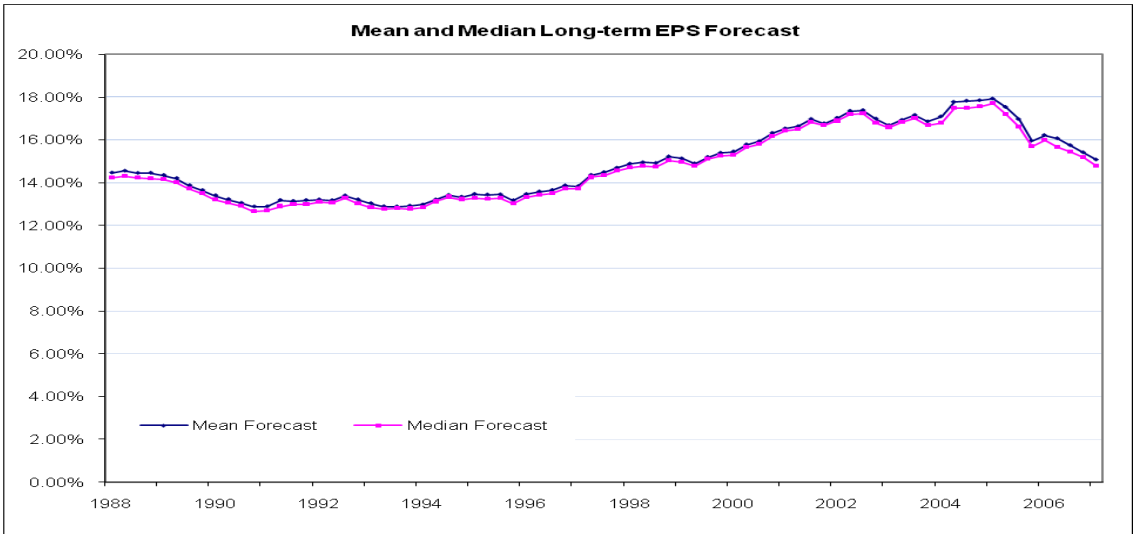
To put this figure in perspective, I screened the *Value Line* companies to see what percent of companies covered by *Value Line* had experienced negative EPS growth rates over the past five years. *Value Line* reported a five-year historic growth rate for 2,219 companies. The results are shown in Panel B of page 6 of Attachment JRW-A1 and indicate that the average 5-year historic growth rate was 3.90%, and *Value Line* reported negative historic growth for 844 firms which represents 38.0% of these companies.

These results indicate that *Value Line*'s EPS forecasts are excessive and unrealistic. It appears that the analysts at *Value Line* are similar to their Wall Street brethren in that they are reluctant to forecast negative earnings growth.

Panel A
Long-Term Forecasted Versus Actual EPS Growth Rates
1988-2009



Panel B
Long-Term Forecasted EPS Growth Rates
1988-2007



Source: Patrick J. Cusatis and J. Randall Woolridge, "The Accuracy of Analysts' Long-Term Earnings Per Share Growth Rate Forecasts," (July, 2008).

THE WALL STREET JOURNAL.

Study Suggests Bias in Analysts' Rosy Forecasts

By ANDREW EDWARDS
March 21, 2008; Page C6

Despite an economy teetering on the brink of a recession -- if not already in one -- analysts are still painting a rosy picture of earnings growth, according to a study done by Penn State's Smeal College of Business.

The report questions analysts' impartiality five years after then-New York Attorney General Eliot Spitzer forced analysts to pay $1.5 billion in damages after finding evidence of bias.

"Wall Street analysts basically do two things: recommend stocks to buy and forecast earnings," said J. Randall Woolridge, professor of finance. "Previous studies suggest their stock recommendations do not perform well, and now we show that their long-term earnings-per-share growth-rate forecasts are excessive and upwardly biased."

The report, which examined analysts' long-term (three to five years) and one-year per-share earnings expectations from 1984 through 2006 found that companies' long-term earnings growth surpassed analysts' expectations in only two instances, and those came right after recessions.

Over the entire time period, analysts' long-term forecast earnings-per-share growth averaged 14.7%, compared with actual growth of 9.1%. One-year per-share earnings expectations were slightly more accurate: The average forecast was for 13.8% growth and the average actual growth rate was 9.8%.

"A significant factor in the upward bias in long-term earnings-rate forecasts is the reluctance of analysts to forecast" profit declines, Mr. Woolridge said. The study found that nearly one-third of all companies experienced profit drops over successive three-to-five-year periods, but analysts projected drops less than 1% of the time.

The study's authors said, "Analysts are rewarded for biased forecasts by their employers, who want them to hype stocks so that the brokerage house can garner trading commissions and win underwriting deals."

They also concluded that analysts are under pressure to hype stocks to generate trading commissions, and they often don't follow stocks they don't like.

Write to Andrew Edwards at andrew.edwards@dowjones.com

Markets & Finance June 10, 2010, 5:00PM EST

Bloomberg Businessweek

For Analysts, Things Are Always Looking Up

They're raising earnings estimates for U.S. companies at a record pace

By Roben Farzad

For years, the rap on Wall Street securities analysts was that they were shills, reflexively producing upbeat research on companies they cover to help their employers win investment banking business. The dynamic was well understood: Let my bank take your company public, or advise it on this acquisition, and—wink, wink—I will recommend your stock through thick or thin. After the Internet bubble burst, that was supposed to change. In April 2003 the Securities & Exchange Commission reached a settlement with 10 Wall Street firms in which they agreed, among other things, to separate research from investment banking.

Seven years on, Wall Street analysts remain a decidedly optimistic lot. Some economists look at the global economy and see troubles—the European debt crisis, persistently high unemployment worldwide, and housing woes in the U.S. Stock analysts as a group seem unfazed. Projected 2010 profit growth for companies in the Standard & Poor's 500-stock index has climbed seven percentage points this quarter, to 34 percent, data compiled by Bloomberg show. According to Sanford C. Bernstein (AB), that's the fastest pace since 1980, when the Dow Jones industrial average was quoted in the hundreds and Nancy Reagan was getting ready to order new window treatments for the Oval Office.

Among the companies analysts expect to excel: Intel (INTL) is projected to post an increase in net income of 142 percent this year. Caterpillar, a multinational that gets much of its revenue abroad, is expected to boost its net income by 47 percent this year. Analysts have also hiked their S&P 500 profit estimate for 2011 to $95.53 a share, up from $92.45 at the beginning of January, according to Bloomberg data. That would be a record, surpassing the previous high reached in 2007.

With such prospects, it's not surprising that more than half of S&P 500-listed stocks boast overall buy ratings. It is telling that the proportion has essentially held constant at both the market's October 2007 high and March 2009 low, bookends of a period that saw stocks fall by more than half. If the analysts are correct, the market would appear to be attractively priced right now. Using the $95.53 per share figure, the price-to-earnings ratio of the S&P 500 is a modest 11 as of June 9. If, however, analysts end up being too high by, say, 20 percent, the P/E would jump to almost 14.

If history is any guide, chances are good that the analysts are wrong. According to a recent McKinsey report by Marc Goedhart, Rishi Raj, and Abhishek Saxena, "Analysts have been persistently over-optimistic for 25 years," a stretch that saw them peg earnings growth at 10 percent to 12 percent a year when the actual number was ultimately 6 percent. "On average," the researchers note, "analysts' forecasts have been almost 100 percent too high," even after regulations were enacted to weed out conflicts and improve the rigor of their calculations. As the chart below shows, in most years analysts have been forced to lower their estimates after it became apparent they had set them too high.

While a few analysts, like Meredith Whitney, have made their names on bearish calls, most are chronically bullish. Part of the problem is that despite all the reforms they remain too aligned with the companies they cover. "Analysts still need to get the bulk of their information from companies, which have an incentive to be over-optimistic," says Stephen Bainbridge, a professor at UCLA Law School who specializes in the securities industry. "Meanwhile, analysts don't want to threaten that ongoing access by being too negative." Bainbridge says that with the era of the overpaid, superstar analyst long over, today's job description calls for resisting the urge to be an iconoclast. "It's a matter of herd behavior," he says.

So what's a more plausible estimate of companies' earning power? Looking at factors including the strengthening dollar, which hurts exports, and higher corporate borrowing costs, David Rosenberg, chief economist at Toronto-based investment shop Gluskin Sheff + Associates, says "disappointment looms." Bernstein's Adam Parker says every 10 percent drop in the value of the euro knocks U.S. corporate earnings down by 2.5 percent to 3 percent. He sees the S&P 500 earning $86 a share next year.

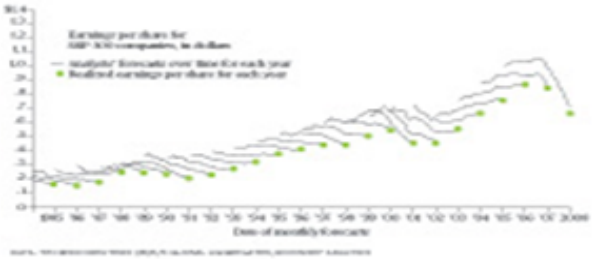
As realities hit home, "It's only natural that analysts will have to revise down their views," says Todd Salamone, senior vice-president at Schaeffer's Investment Research. The market may be making its own downward adjustment, as the S&P 500 has already fallen 14 percent from its high in April. If precedent holds, analysts are bound to curb their enthusiasm belatedly, telling us next year what we really needed to know this year.

The bottom line: *Despite reforms intended to improve Wall Street research, stock analysts seem to be promoting an overly rosy view of profit prospects.*

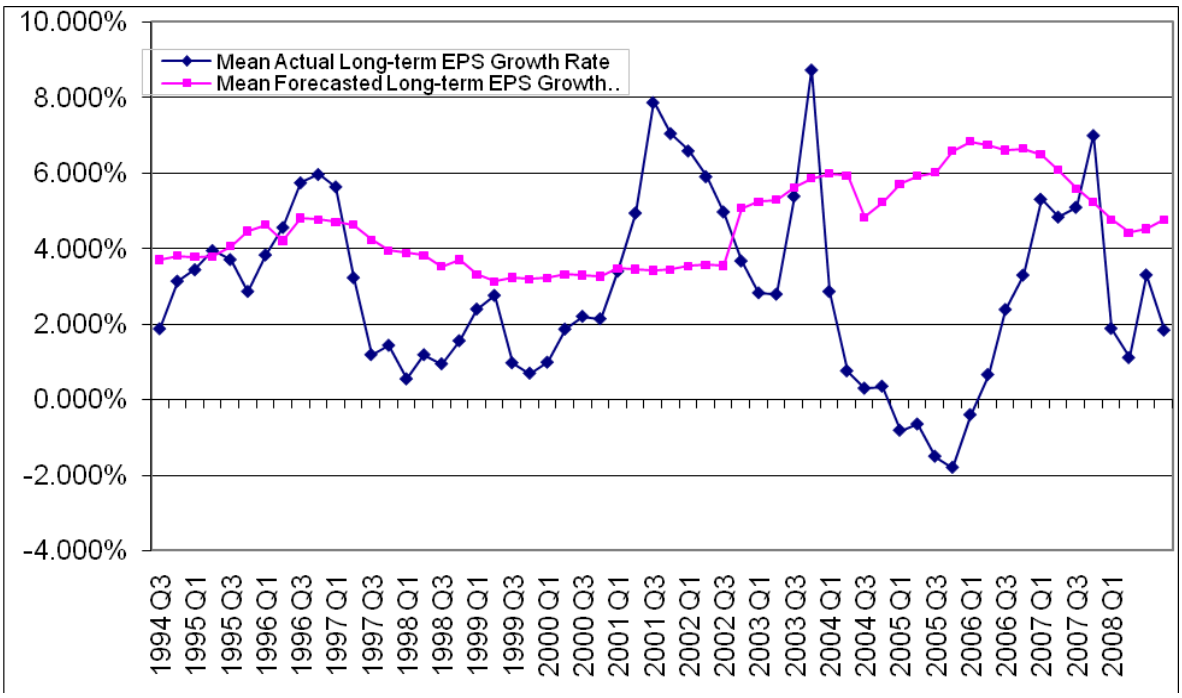
Bloomberg Businessweek Senior Writer Farzad covers Wall Street and international finance.

The Earnings Roller Coaster

Analysts have a long history of overestimating future profits. As this chart from McKinsey shows, analysts on average tend to start high and ratchet their numbers down as the companies get closer to releasing their results. Initial estimates proved to be too low in only a few cases.

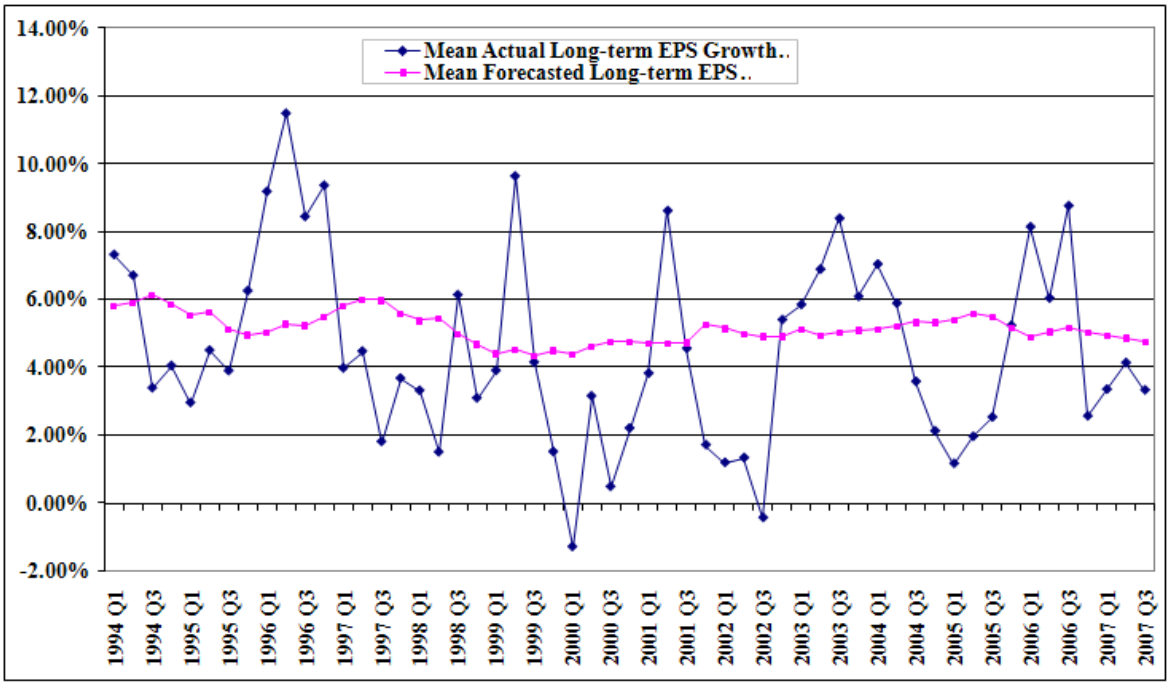


Panel A
Long-Term Forecasted Versus Actual EPS Growth Rates
Electric Utility Companies
1988-2008



Data Source: IBES

Panel B
Long-Term Forecasted Versus Actual EPS Growth Rates
Gas Distribution Companies



Panel A
Value Line 3-5 year EPS Growth Rate Forecasts

	Average Projected EPS Growth rate	Number of Negative EPS Growth Projections	Percent of Negative EPS Growth Projections
2,333 Companies	**14.70%**	**43**	**1.80%**

Value Line Investment Survey , June, 2012

Panel B
Historical Five-Year EPS Growth Rates for Value Line Companies

	Average Historical EPS Growth rate	Number with Negative Historical EPS Growth	Percent with Negative Historical EPS Growth
2,219 Companies	**3.90%**	**844**	**38.00%**

Value Line Investment Survey , June, 2012

Q. PLEASE DISCUSS YOUR DEVELOPMENT OF AN EQUITY RISK PREMIUM COMPUTED USING THE BUILDING BLOCKS METHODOLOGY.

A. Ibbotson and Chen (2003) evaluate the ex post historical mean stock and bond returns in what is called the Building Blocks approach.[1] They use 75 years of data and relate the compounded historical returns to the different fundamental variables employed by different researchers in building ex ante expected equity risk premiums. Among the variables included were inflation, real EPS and DPS growth, ROE and book value growth, and price-earnings ("P/E") ratios. By relating the fundamental factors to the ex post historical returns, the methodology bridges the gap between the ex post and ex ante equity risk premiums. Ilmanen (2003) illustrates this approach using the geometric returns and five fundamental variables – inflation ("CPI"), dividend yield ("D/P"), real earnings growth ("RG"), repricing gains ("PEGAIN") and return interaction/reinvestment ("INT").[2] This is shown on page 7 of Exhibit JRW-11. The first column breaks the 1926-2000 geometric mean stock return of 10.7% into the different return components demanded by investors: the historical U.S. Treasury bond return (5.2%), the excess equity return (5.2%), and a small interaction term (0.3%). This 10.7% annual stock return over the 1926-2000 period can then be broken down into the following fundamental elements: inflation (3.1%), dividend yield (4.3%),

[1] Roger Ibbotson and Peng Chen, "Long Run Returns: Participating in the Real Economy," *Financial Analysts Journal*, (January 2003).

[2] Antti Ilmanen, Expected Returns on Stocks and Bonds," *Journal of Portfolio Management*, (Winter 2003), p. 11.

real earnings growth (1.8%), repricing gains (1.3%) associated with higher P/E ratios, and a small interaction term (0.2%).

Q. HOW ARE YOU USING THIS METHODOLOGY TO DERIVE AN EX ANTE EXPECTED EQUITY RISK PREMIUM?

A. The third column in the graph on page 7 of Exhibit JRW-11 shows current inputs to estimate an ex ante expected market return. These inputs include the following:

CPI – To assess expected inflation, I have employed expectations of the short-term and long-term inflation rate. Long term inflation forecasts are available in the Federal Reserve Bank of Philadelphia's publication entitled *Survey of Professional Forecasters*. While this survey is published quarterly, only the first quarter survey includes long-term forecasts of gross domestic product ("GDP") growth, inflation, and market returns. In the first quarter 2011 survey, published on February 10, 2012, the median long-term (10-year) expected inflation rate as measured by the CPI was 2.30% (see Panel A of page 8 of Exhibit JRW-11).

The University of Michigan's Survey Research Center surveys consumers on their short-term (one-year) inflation expectations on a monthly basis. As shown on page 9 of Exhibit JRW-11, the current short-term expected inflation rate is 3.2%.

As a measure of expected inflation, I will use the average of the long-term (2.3%) and short-term (3.2%) inflation rate measures, or 2.8%.

D/P – As shown on page 10 of Exhibit JRW-11, the dividend yield on the S&P 500 has fluctuated from 1.0% to almost 3.5% over the past decade. Ibbotson and Chen (2003) report that the long-term average dividend yield of the S&P 500 is 4.3%. As of May 17, 2012, the indicated S&P 500 dividend yield was 2.4%. I will use this figure in my ex ante risk premium analysis.

RG – To measure expected real growth in earnings, I use the historical real earnings growth rate S&P 500 and the expected real GDP growth rate. The S&P 500 was created in 1960 and includes 500 companies which come from ten different sectors of the economy. On page 11 of Exhibit JRW-11, real EPS growth is computed using the CPI as a measure of inflation. The real growth figure over 1960-2010 period for the S&P 500 is 2.8%.

The second input for expected real earnings growth is expected real GDP growth. The rationale is that over the long-term, corporate profits have averaged 5.50% of U.S. GDP.[3] Expected GDP growth, according to the Federal Reserve Bank of Philadelphia's *Survey of Professional Forecasters,* is 2.6% (see Panel B of page 8 of Exhibit JRW-11).

Given these results, I will use 2.70%, for real earnings growth.

PEGAIN – PEGAIN is the repricing gain associated with an increase in the P/E ratio. It accounted for 1.3% of the 10.7% annual stock return in the 1926-2000 period. In estimating an ex ante expected stock market return, one issue is whether investors expect P/E ratios to increase from their current levels. The P/E

[3]Marc. H. Goedhart, et al, "The Real Cost of Equity," *McKinsey on Finance* (Autumn 2002), p.14.

ratios for the S&P 500 over the past 25 years are shown on page 10 of Exhibit JRW-11. The run-up and eventual peak in P/Es in the year 2000 is very evident in the chart. The average P/E declined until late 2006, and then increased to higher high levels, primarily due to the decline in EPS as a result of the financial crisis and the recession. As of 3/31/12, the average P/E for the S&P 500 was 15.97, which is in line with the historic average. Since the current figure is near the historic average, a PEGAIN would not be appropriate in estimating an ex ante expected stock market return.

Q. GIVEN THIS DISCUSSION, WHAT IS THE EX ANTE EXPECTED MARKET RETURN AND EQUITY RISK PREMIUM USING THE "BUILDING BLOCKS METHODOLOGY"?

A. My expected market return is represented by the last column on the right in the graph entitled "Decomposing Equity Market Returns: The Building Blocks Methodology" set forth on page 7 of Exhibit JRW-11. As shown, my expected market return of 7.90% is composed of 2.80% expected inflation, 2.40% dividend yield, and 2.70% real earnings growth rate.

Q. IS AN EXPECTED MARKET RETURN OF 7.90% CONSISTENT WITH THE FORECASTS OF MARKET PROFESSIONALS?

A. Yes. In the first quarter 2012 *Survey of Financial Forecasters*, published on February 10, 2012 by the Federal Reserve Bank of Philadelphia, the median long-term expected return on the S&P 500 was 6.8% (see Panel D of page 8 of Exhibit JRW-11).

Q. IS AN EXPECTED MARKET RETURN OF 7.90% CONSISTENT WITH THE EXPECTED MARKET RETURNS OF CORPORATE CHIEF FINANCIAL OFFICERS (CFOs)?

A. Yes. John Graham and Campbell Harvey of Duke University conduct a quarterly survey of corporate CFOs. The survey is a joint project of Duke University and *CFO Magazine*. In the June 2012 survey, the mean expected return on the S&P 500 over the next ten years was 6.3%.[4]

Q. GIVEN THIS EXPECTED MARKET RETURN, WHAT IS THE EX ANTE EQUITY RISK PREMIUM USING THE BUILDING BLOCKS METHODOLOGY?

A. The current 30-year U.S. Treasury yield is 2.80%. This ex ante equity risk premium is simply the expected market return from the Building Blocks methodology minus this risk-free rate:

Ex Ante Equity Risk Premium = 7.90% - 2.80% = 5.10%

Q. HOW ARE YOU USING THIS EQUITY RISK PREMIUM ESTIMATE IN YOUR CAPM EQUITY COST RATE STUDY?

[4] The survey results are available at www.cfosurvey.org.

A. This is only one estimate of the equity risk premium. As shown on page 6 of Exhibit JRW-11, I am also using the results of other studies and surveys to determine an equity risk premium for my CAPM.

Q. PLEASE DISCUSS THE ISSUES INVOLVED IN USING HISTORICAL STOCK AND BOND RETURNS TO COMPUTE A FORWARD-LOOKING OR EX ANTE RISK PREMIUM.

A. Using the historical relationship between stock and bond returns to measure an ex ante equity risk premium is erroneous and overstates the true market equity risk premium. The equity risk premium is based on expectations of the future. When past market conditions vary significantly from the present, historic data does not provide a realistic or accurate barometer of expectations of the future. More significantly, there are a number of empirical issues that can result in historical returns being poor measures of the expected risk premium.

Q. PLEASE DISCUSS THE EMPITICAL ISSUES WITH USING HISTORIC STOCK AND BOND RETURNS TO ESTIMATE AN EQUITY RISK PREMIUM.

A. There are a number of flaws in using historic returns over long time periods to estimate expected equity risk premiums. These issues include:

(A) Biased historical bond returns

(B) Use of the arithmetic versus the geometric mean return

(C) The large error in measuring the equity risk premium using historical returns

(D) Unattainable and biased historical stock returns

(E) Company Survivorship bias

(F) The “Peso Problem” - U.S. stock market survivorship bias

These issues will be addressed in order.

A. Biased Historical Bond Returns

Q. HOW ARE HISTORICAL BOND RETURNS BIASED?

A. An essential assumption of these studies is that over long periods of time, investors' expectations are realized. However, the experienced returns of bondholders in the past invalidate this critical assumption. Historic bond returns are biased downward as a measure of expectancy because of capital losses suffered by bondholders in the past. As such, risk premiums derived from this data are biased upwards.

B. The Arithmetic versus the Geometric Mean Return

Q. PLEASE DISCUSS THE ISSUE RELATING TO THE USE OF THE ARITHMETIC VERSUS THE GEOMETRIC MEAN RETURNS IN THE IBBOTSON METHODOLOGY.

A. The measure of investment return has a significant effect on the interpretation of the risk premium results. When analyzing a single security price series over time (i.e., a time series), the best measure of investment performance is the geometric mean return. Using the arithmetic mean overstates the return experienced by investors. In a study entitled "Risk and Return on Equity: The Use and Misuse of Historical Estimates," Carleton and Lakonishok make the following observation: "The geometric mean measures the changes in wealth over more than one period on a buy and hold (with dividends invested) strategy."[1] When a historic stock and

[1] Willard T. Carleton and Josef Lakonishok, "Risk and Return on Equity: The Use and Misuse of Historical Estimates,"

bond return study covers more than one period (and he assumes that dividends are reinvested), he should be employing the geometric mean and not the arithmetic mean.

Q. PLEASE PROVIDE AN EXAMPLE DEMONSTRATING THE PROBLEM WITH USING THE ARITHMETIC MEAN RETURN.

A. To demonstrate the upward bias of the arithmetic mean, consider the following example. Assume that you have a stock (that pays no dividend) that is selling for $100 today, increases to $200 in one year, and then falls back to $100 in two years. The table below shows the prices and returns.

Time Period	Stock Price	Annual Return
0	$100	
1	$200	100%
2	$100	-50%

The arithmetic mean return is simply (100% + (-50%))/2 = 25% per year. The geometric mean return is $((2 * .50)^{(1/2)}) - 1 = 0\%$ per year. Therefore, the arithmetic mean return suggests that your stock has appreciated at an annual rate of 25%, while the geometric mean return indicates an annual return of 0%. Since after two years, your stock is still only worth $100, the geometric mean return is the appropriate return measure. For this reason, when stock returns and earnings growth rates are reported in the financial press, they are generally reported using the geometric mean. This is because of the upward bias of the arithmetic mean. As further evidence of the appropriate mean return measure, the SEC requires

Financial Analysts Journal, pp. 38-47, (January-February, 1985).

equity mutual funds to report historic return performance using geometric mean and not arithmetic mean returns.[2] Therefore, the historic arithmetic mean return measures are biased and should be disregarded.

Q. PLEASE PROVIDE ADDITIONAL INSIGHTS INTO THE DEBATE OVER THE USE OF THE ARITHMETIC VERSUS THE GEOMETRIC MEAN RETURN IN DEVELOPING AN EXPECTED MARKET RISK PREMIUM.

A. In measuring historic returns to develop an expected equity risk premium, finance texts will often recommend the use of an arithmetic mean return as a measure of central tendency. A common justification for using the arithmetic mean return is that since annual stock returns are not serially correlated, the best measure of a return for next year is the arithmetic mean of past returns. On the other hand, Damodaran suggests that such an estimate is not appropriate in estimating an equity risk premium:[3]

> "There are, however, strong arguments that can be made for the use of geometric averages. First, empirical studies seem to indicate that returns on stocks are negatively correlated over long periods of time. Consequently, the arithmetic average return is likely to overstate the premium. Second, while asset pricing models may be single period models, the use of these models to get expected returns over long periods (such as five or ten years) suggests that the estimation period may be much longer than a year. In this context, the argument for geometric average premiums becomes stronger."

[2] SEC, Form N-1A.

[3] Aswath. Damodaran, "A New "Risky" World Order: Unstable Risk Premiums - Implications for Practice" NUU Working Paper, 2010, p. 25.

C. The Error in Measuring Equity Risk Premiums with Historic Data

Q. PLEASE DISCUSS THE ERROR IN MEASURING THE EQUITY RISK PREMIUM USING HISTORICAL STOCK AND BOND RETURNS.

A. Measuring the equity risk premium using historical stock and bond returns is subject to a substantial forecasting error. For example, the arithmetic mean long-term equity risk premium of approximately 6.5% has a standard deviation of over 20.0%. This may be interpreted in the following way with respect to the historical distribution of the long-term equity risk premium using a standard normal distribution and a 95%, +/- 2 standard deviation confidence interval: We can say, with a 95% degree of confidence, that the true equity risk premium is between -34.7% and +47.7%. As such, the historical equity risk premium is measured with a substantial amount of error.

D. Unattainable and Biased Historic Stock Returns

Q. YOU NOTE THAT HISTORIC STOCK RETURNS ARE BIASED USING THE IBBOTSON METHODOLOGY. PLEASE ELABORATE.

A. Returns developed using Ibbotson's methodology are computed on stock indexes and therefore: (1) cannot be reflective of expectations because these returns are unattainable to investors and (2) produce biased results. This methodology assumes: (1) monthly portfolio rebalancing and (2) reinvestment of interest and dividends. Monthly portfolio rebalancing presumes that investors rebalance their portfolios at the end of each month in order to have an equal dollar amount invested in each security at the beginning of each month. The assumption generates high transaction

costs and thereby renders these returns unattainable to investors. In addition, an academic study demonstrates that the monthly portfolio rebalancing assumption produces biased estimates of stock returns.[4]

Transaction costs themselves provide another bias in historic versus expected returns. In the past, the observed stock returns were not the realized returns of investors, due to the much higher transaction costs of previous decades. These higher transaction costs are reflected through the higher commissions on stock trades and the lack of low cost mutual funds like index funds.

E. Company Survivorship Bias

Q. HOW DOES COMPANY SURVIVORSHIP BIAS AFFECT THE HISTORIC EQUITY RISK PREMIUM?

A. Using historic data to estimate an equity risk premium suffers from company survivorship bias. Company survivorship bias results when using returns from indexes like the S&P 500. The S&P 500 includes only companies that have survived. The fact that returns of firms that did not perform well were dropped from these indexes is not reflected. Therefore, these stock returns are upwardly biased because they only reflect the returns from more successful companies.

F. The "Peso Problem" - U.S. Stock Market Survivorship Bias

[4] See Richard Roll, "On Computing Mean Returns and the Small Firm Premium," *Journal of Financial Economics*, pp. 371-86, (1983).

Q. WHAT IS THE "PESO PROBLEM," AND HOW DOES IT RELATE TO SURVIVORSHIP BIAS IN U. S. STOCK MARKET RETURNS?

A. The use of historic return data also suffers from the so-called "Peso Problem," which is also known as U.S. stock market survivorship bias. The "peso problem" issue was first highlighted by the Nobel laureate, Milton Friedman, and gets its name from conditions related to the Mexican peso market in the early 1970s. This issue involves the fact that past stock market returns were higher than were expected at the time because despite war, depression and other social, political, and economic events, the U.S. economy survived and did not suffer hyperinflation, invasion and/or the calamities of other countries. As such, highly improbable events, which may or may not occur in the future, are factored into stock prices, leading to seemingly low valuations. Higher than expected stock returns are then earned when these events do not subsequently occur. Therefore, the "peso problem" indicates that historic stock returns are overstated as measures of expected returns because the U.S. markets have not experienced the disruptions of other major markets around the world.

Q. DO YOU HAVE ANY OTHER THOUGHTS ON THE USE OF HISTORICAL RETURN DATA TO ESTIMATE AN EQUITY RISK PREMIUM?

A. Yes. Jay Ritter, a Professor of Finance at the University of Florida, identified the use of historical stock and bond return data to estimate a forward-looking equity

risk premium as one of the "Biggest Mistakes" taught by the finance profession.[5] His argument is based on the theory behind the equity risk premium, the excessive results produced by historical returns, and the previously-discussed errors such as survivorship bias in historical data.

[5] Jay Ritter, "The Biggest Mistakes We Teach," *Journal of Financial Research* (Summer 2002).

ATTACHMENT

Attachment JRW-1
Educational Background, Research, and Related Business Experience
J. Randall Woolridge

J. Randall Woolridge is a Professor of Finance and the Goldman, Sachs & Co. and Frank P. Smeal Endowed Faculty Fellow in Business Administration in the College of Business Administration of the Pennsylvania State University in University Park, PA. In addition, Professor Woolridge is Director of the Smeal College Trading Room and President and CEO of the Nittany Lion Fund, LLC.

Professor Woolridge received a Bachelor of Arts degree in Economics from the University of North Carolina, a Master of Business Administration degree from the Pennsylvania State University, and a Doctor of Philosophy degree in Business Administration (major area-finance, minor area-statistics) from the University of Iowa. He has taught Finance courses including corporation finance, commercial and investment banking, and investments at the undergraduate, graduate, and executive MBA levels.

Professor Woolridge's research has centered on empirical issues in corporation finance and financial markets. He has published over 35 articles in the best academic and professional journals in the field, including the *Journal of Finance*, the *Journal of Financial Economics*, and the *Harvard Business Review*. His research has been cited extensively in the business press. His work has been featured in the *New York Times*, *Forbes*, *Fortune*, *The Economist*, *Barron's*, *Wall Street Journal*, *Business Week*, *Investors' Business Daily*, *USA Today*, and other publications. In addition, Dr. Woolridge has appeared as a guest to discuss the implications of his research on CNN's *Money Line*, CNBC's *Morning Call* and *Business Today*, and Bloomberg's *Morning Call*.

Professor Woolridge's stock valuation book, *The StreetSmart Guide to Valuing a Stock* (McGraw-Hill, 2003), was released in its second edition. He has also co-authored *Spinoffs and Equity Carve-Outs: Achieving Faster Growth and Better Performance* (Financial Executives Research Foundation, 1999) as well as a textbook entitled *Basic Principles of Finance* (Kendall Hunt, 2011). Dr. Woolridge is a founder and a managing director of www.valuepro.net - a stock valuation website.

Professor Woolridge has also consulted with corporations, financial institutions, and government agencies. In addition, he has directed and participated in university- and company-sponsored professional development programs for executives in 25 countries in North and South America, Europe, Asia, and Africa.

Over the past twenty-five years Dr. Woolridge has prepared testimony and/or provided consultation services in regulatory rate cases in the rate of return area in following states: Alaska, Arizona, California, Colorado, Connecticut, Delaware, Florida, Hawaii, Indiana, Kansas, Kentucky, Massachusetts, Missouri, Nebraska, New Jersey, New York, Ohio, Oklahoma, Pennsylvania, South Carolina, Texas, Utah, Vermont, Washington, and Washington, D.C. He has also prepared testimony which was submitted to the Federal Energy Regulatory Commission.

Attachment JRW-2
California Energy Cost of Capital Report
Cost of Capital

Panel A
Pacific Gas & Electric Company
2013

Capital Source	Capitalization Ratio	Cost Rate	Weighted Cost Rate
Long-Term Debt	47.00%	5.69%	2.67%
Preferred Stock	1.00%	5.60%	0.06%
Common Equity	52.00%	8.75%	4.55%
Total	100.00%		7.28%

Panel B
San Diego Gas & Electric Company
2013

Capital Source	Capitalization Ratio	Cost Rate	Weighted Cost Rate
Long-Term Debt	45.25%	5.09%	2.30%
Preferred Stock	2.75%	6.35%	0.17%
Common Equity	52.00%	8.50%	4.42%
Total	100.00%		6.90%

Panel C
Southern California Edison
2013

Capital Source	Capitalization Ratio	Cost Rate	Weighted Cost Rate
Long-Term Debt	43.00%	5.53%	2.38%
Preferred Stock	9.00%	5.86%	0.53%
Common Equity	48.00%	8.75%	4.20%
Total	100.00%		7.11%

Panel D
Southern California Gas Company
2013-2015

Capital Source	Capitalization Ratio	Cost Rate	Weighted Cost Rate
Long-Term Debt	45.60%	5.72%	2.61%
Preferred Stock	2.40%	6.00%	0.14%
Common Equity	52.00%	8.50%	4.42%
Total	100.00%		7.17%

Attachment JRW-2
California Energy Cost of Capital Report
Cost of Capital

Panel A
Pacific Gas & Electric Company
2013-2015

Capital Source	Capitalization Ratio	Cost Rate	Weighted Cost Rate
Long-Term Debt	47.00%	5.69%	2.67%
Preferred Stock	1.00%	5.60%	0.06%
Common Equity	52.00%	11.00%	5.72%
Total	100.00%		8.45%

Panel B
San Diego Gas & Electric Company
2013-2015

Capital Source	Capitalization Ratio	Cost Rate	Weighted Cost Rate
Long-Term Debt	45.25%	5.09%	2.30%
Preferred Stock	2.75%	6.35%	0.17%
Common Equity	52.00%	11.00%	5.72%
Total	100.00%		8.20%

Panel C
Southern California Edison
2013-2015

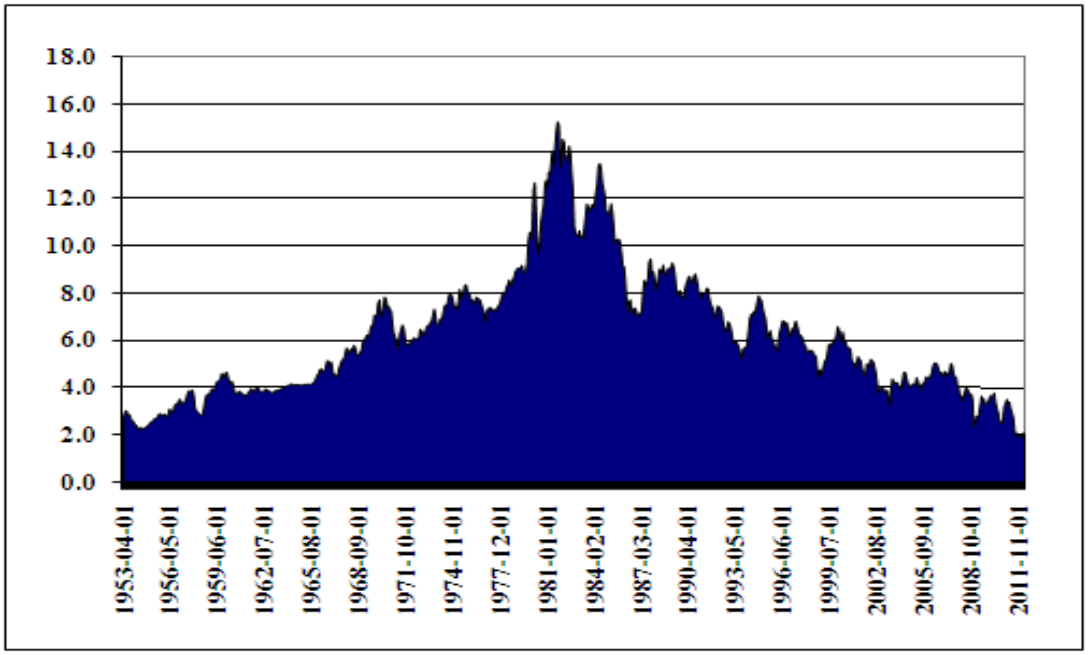
Capital Source	Capitalization Ratio	Cost Rate	Weighted Cost Rate
Long-Term Debt	43.00%	5.53%	2.38%
Preferred Stock	9.00%	5.86%	0.53%
Common Equity	48.00%	11.10%	5.33%
Total	100.00%		8.23%

Panel D
Southern California Gas Company
2013-2015

Capital Source	Capitalization Ratio	Cost Rate	Weighted Cost Rate
Long-Term Debt	45.60%	5.72%	2.61%
Preferred Stock	2.40%	6.00%	0.14%
Common Equity	52.00%	10.90%	5.67%
Total	100.00%		8.42%

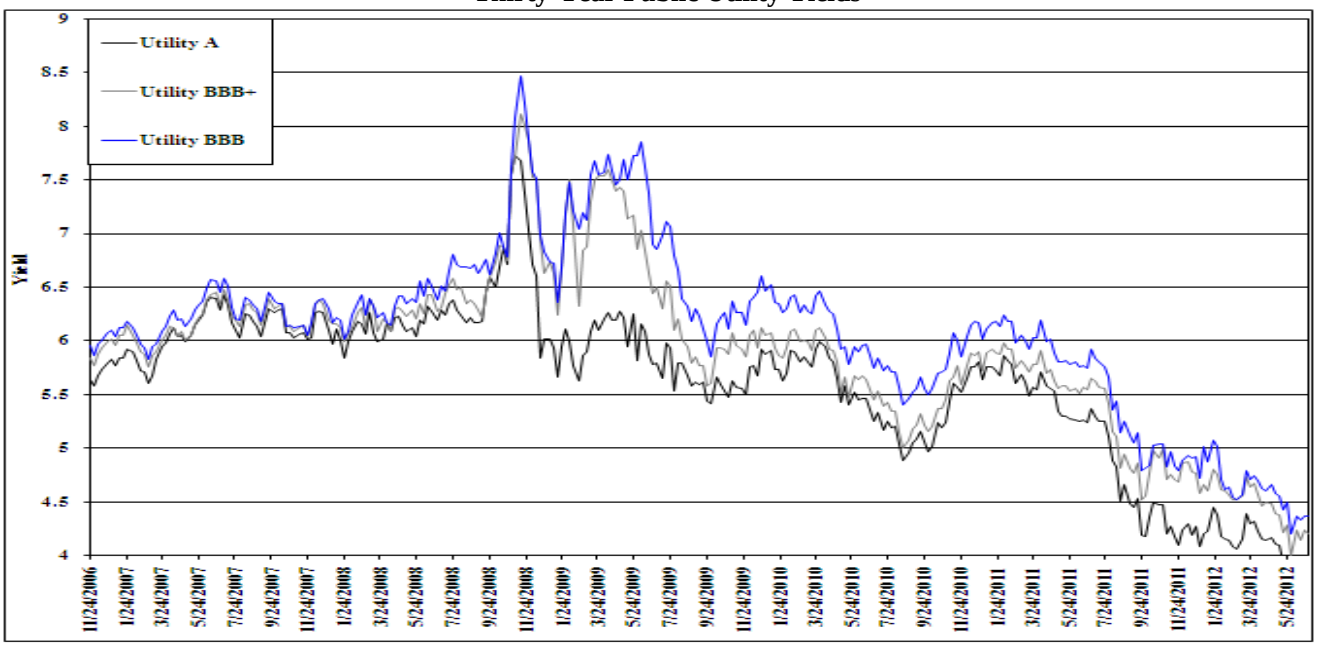
Attachment JRW-3

Panel A
Ten-Year Treasury Yields
1953-Present

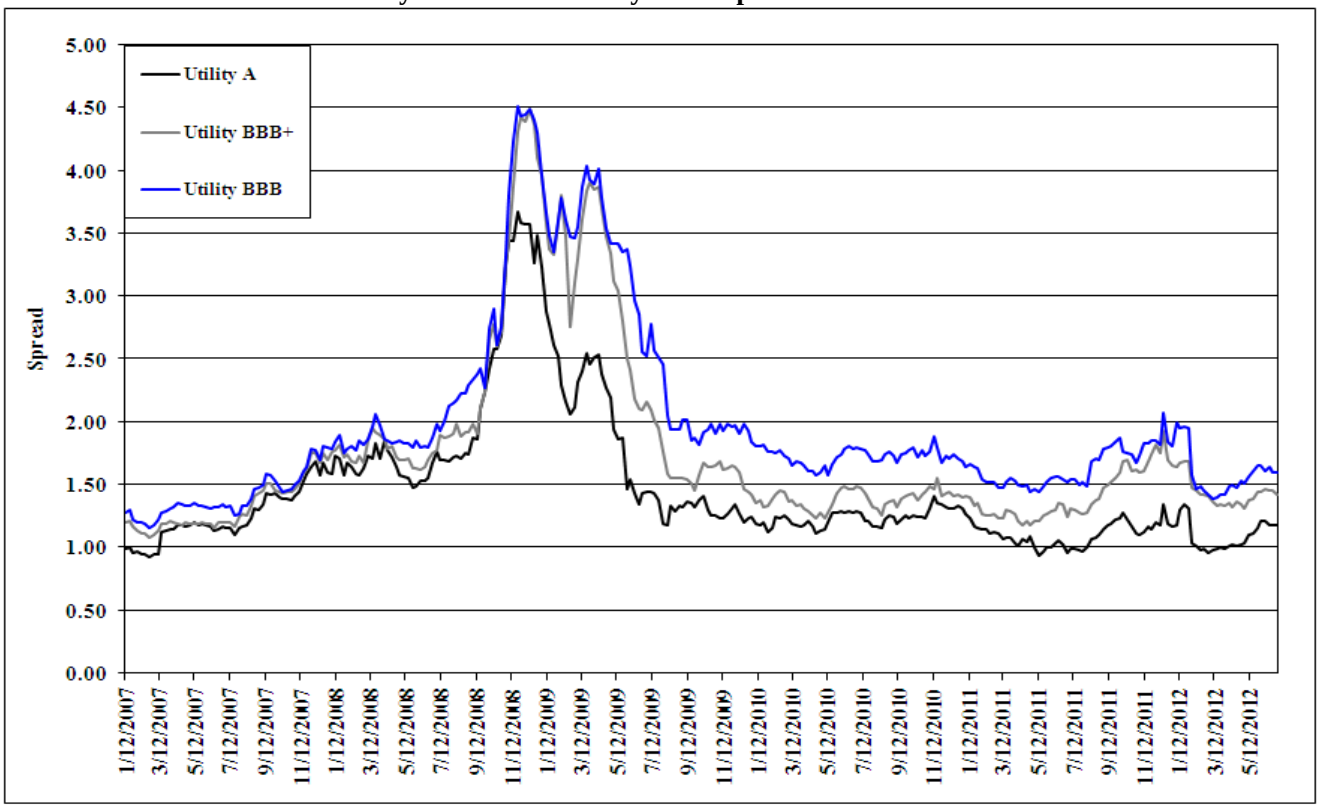


Source: http://research.stlouisfed.org/fred2/data/GS10.txt

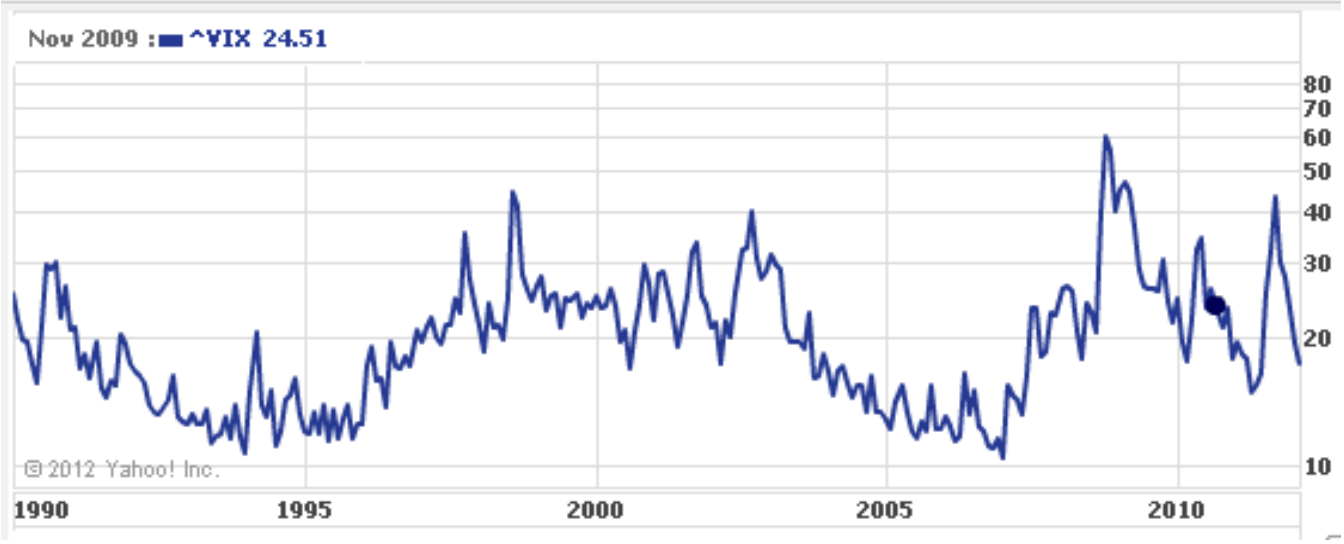
Attachment JRW-3
Panel A
Thirty-Year Public Utility Yields



Panel B
Thirty-Year Public Utility Yield Spread Over Treasuries



Attachment JRW-3
Panel A
S&P 500 - VIX - 1990-Present



Panel B
S&P 500 - VIX - Last Year

Attachment JRW-3

Dow Jones Utility Index vs. S&P 500 - 12 Months

Panel A
Ten-Year Treasury Yields
2007 and 2012

4/1/07	4.69	1/1/12	1.97
5/1/07	4.75	2/1/12	1.97
6/1/07	5.10	3/1/12	2.17
7/1/07	5.00	4/1/12	2.05
8/1/07	4.67	5/1/12	1.98
9/1/07	4.52	6/1/12	1.47
Average	4.79	Average	1.94

Panel B
Thirty-Year, BBB Rated Public Utility Bonds
2007 and 2012

4/6/07	6.24	2/3/12	4.71
5/4/07	6.14	3/2/12	4.52
6/1/07	6.38	4/6/12	4.69
7/6/07	6.59	5/4/12	4.58
8/3/07	6.20	6/1/12	4.20
9/7/07	6.19	6/29/12	4.37
Average	6.29	Average	4.51

Panel C
Electric Utility Dividend Yields

2007 Dividend Yields for Electric Utility Companies*	3.5%
2012 Dividend Yields for Electric Utility Companies**	4.2%

*Source: Average for utility groups, DRA Report on the Cost of Capital for Test Year 2008, A.07-05-003 et al, Table 4-6, page 4-24.
** Page 1 of Attachment JRW-10.

Panel D
Electric Utility Projected EPS Growth Rates

Company	Yahoo	Zack's	Reuters	Average
2007 Mean Growth Rates*	7.7%	7.1%	7.4%	7.4%
2012 Mean Growth Rates*	4.1%	4.4%	4.5%	4.3%

*Source: Average for utility groups, DRA Report on the Cost of Capital for Test Year 2008, A.07-05-003 et al, Table 4-4, page 4-19.
** Page 1 of Attachment JRW-10.

Panel E
Electric Utility Betas
2007, 2012

2007 Electric Utility Betas*	0.93
2012 Electric Utility Betas**	0.73

*Source: Average for utility groups, DRA Report on the Cost of Capital for Test Year 2008, A.07-05-003 et al, Table 4-8, page 4-29.
** Page 3 of Attachment JRW-11.

Attachment JRW-4

California Energy Companies

Summary Financial Statistics

Electric Proxy Group

Company	Operating Revenue ($mil)	Percent Elec Revenue	Percent Gas Revenue	Net Plant ($mil)	Market Cap ($mil)	S&P Bond Rating	Moody's Bond Rating	Pre-Tax Interest Coverage	Primary Service Area	Common Equity Ratio	Return on Equity	Market to Book Ratio
ALLETE, Inc. (NYSE-ALE)	926.0	90	0	2,002.8	1,468.4	A-	Baa1	3.9	MN, WI	56.3	7.7	1.32
Alliant Energy Corporation (NYSE-LNT)	3,486.0	74	12	7,081.3	4,825.2	A-/BBB+	A2/A3	3.7	WS,IA,IL,MN	51.2	13.8	1.54
Ameren Corporation (NYSE-AEE)	7,285.0	87	13	17,535.0	7,746.2	BBB-	Baa2	3.1	IL,MO	51	2.1	1.04
American Electric Power Co. (NYSE-AEP)	15,011.0	95	0	37,432.0	18,127.6	BBB	Baa2	3.3	10 States	44.7	14.2	1.22
Avista Corporation (NYSE-AVA)	1,595.5	61	34	2,872.9	1,494.5	A-	Baa1	3.3	WA,OR,ID	44	12.8	1.24
Black Hills Corporation (NYSE-BKH)	1,234.7	50	41	2,819.1	1,393.6	BBB+	A3	1.4	CO,SD,WY,MT	44.8	8.8	1.14
Cleco Corporation (NYSE-CNL)	1,086.4	94	0	2,906.0	2,408.5	BBB	Baa2	3.5	LA	51.9	NM	1.68
CMS Energy Corporation (NYSE-CMS)	6,191.0	62	34	10,755.0	5,837.8	BBB+	A3	2.5	MI	29.6	9.4	1.91
Consolidated Edison, Inc. (NYSE-ED)	12,666.0	70	13	25,255.0	17,184.4	A-	A3/Baa1	3.8	NY,PA	51	11.3	1.49
Dominion Resources, Inc. (NYSE-D)	13,814.0	51	12	30,288.0	29,857.6	A	Baa1/Baa2	3.7	VA,NC	36.7	7.6	2.51
DTE Energy Company (NYSE-DTE)	8,715.0	59	16	13,924.0	9,365.7	A	A2	3.3	MI	47.1	5.4	1.32
Edison International (NYSE-EIX)	12,834.0	84	0	32,680.0	14,276.6	BBB+	A1	2.7	CA	38.2	8.7	1.43
Entergy Corporation (NYSE-ETR)	11,071.5	79	1	25,586.8	11,177.8	A-/BBB+	Baa1	4.5	AK,LA,MS,TX	41.1	8.2	1.24
Exelon Corporation (NYSE-EXC)	18,559.0	51	4	42,105.0	30,956.1	A-	A2/A3	6.7	PA,MD,IL	53.5	4.5	1.41
FirstEnergy Corporation (ASE-FE)	16,760.0	63	0	30,566.0	19,990.0	BBB	Baa1	2.4	OH,PANJ,WV,MD,NY	42.1	35.9	1.50
Great Plains Energy Incorporated (NYSE-GXP)	2,304.8	100	0	7,119.2	2,705.6	BBB	Baa2	2.2	MO,KS	41.8	8.2	0.93
Hawaiian Electric Industries, Inc. (NYSE-HE)	3,346.6	92	0	3,375.7	2,519.6	BBB-	Baa2	3.8	HI	47.7	11.8	1.62
IDACORP, Inc. (NYSE-IDA)	1,016.4	100	0	3,420.6	1,917.8	A-	A2	2.6	ID	51.8	11.7	1.15
MGE Energy, Inc. (NYSE-MGEE)	531.0	72	27	1,006.9	1,048.0	AA-	A1	5.8	WI	60.6	9.9	1.88
Nextera Energy (NYSE-NEE)	15,579.0	68	0	43,968.0	27,105.0	A	Aa3	3.5	FL	38.8	6.5	1.78
OGE Energy Corp. (NYSE-OGE)	3,916.1	57	10	7,704.6	5,199.2	BBB+	Baa1	4.4	OK,AR	42.3	7.6	2.04
Pepco Holdings, Inc. (NYSE-POM)	5,578.0	76	4	8,399.0	4,233.1	A	A3	2.5	DC.MD,VA,NJ	45.3	5.7	0.97
PG&E Corporation (NYSE-PCG)	15,000.0	78	22	34,249.0	18,323.0	BBB	A3	3.5	CA	48.3	9.6	1.46
Pinnacle West Capital Corp. (NYSE-PNW)	3,213.2	100	0	9,889.0	5,234.1	BBB-	Baa2	3.3	AZ	49.8	10.7	1.40
PNM Resources, Inc. (NYSE-PNM)	1,618.3	80	0	3,656.2	1,431.4	BBB/BBB-	Baa2	2.8	NM,TX	45.2	5.2	0.91
Portland General Electric (NYSE-POR)	1,808.0	100	0	4,288.0	1,848.2	A-	A3	2.7	OR	49.3	14.6	1.09
SCANA Corporation (NYSE-SCG)	4,234.0	57	18	10,255.0	5,981.4	A-	A3	2.9	SC,NC,GA	42.1	14.3	1.50
Southern Company (NYSE-SO)	17,249.0	95	0	45,855.0	39,499.4	A	A2/A3	4.9	GA,AL,FL,MS	46.5	14.2	2.15
TECO Energy, Inc. (NYSE-TE)	3,277.3	62	12	5,985.6	3,718.2	BBB+	Baa1	3.2	FL	42.9	12.2	1.64
UIL Holdings Corporation (NYSE-UIL)	1,467.7	54	46	2,605.6	1,655.1	NR	Baa2	3.0	CT	38.8	11.6	1.47
UniSource Energy Corporation (NYSE-UNS)	1,483.6	85	9	3,203.9	1,417.0	BBB+	NR	NA	AZ	33.3	11.6	1.49
Westar Energy, Inc. (NYSE-WR)	2,164.9	100	0	6,884.9	3,456.4	BBB+	Baa1	3.0	KS	45.9	13.2	1.25
Wisconsin Energy Corporation (NYSE-WEC)	4,348.9	74	24	10,235.0	8,461.7	A-	A1	3.7	WI	43.9	9.8	2.07
Xcel Energy Inc. (NYSE-XEL)	10,416.3	83	16	22,672.7	13,272.9	A	A3	3.1	MN,WI,ND,SD,MI,CO	45.5	10.3	1.56
Mean	6,758.5	77	11	15,252.4	9,562.9	A-/BBB+	A3/Baa1	3.4		45.4	10.6	1.48
Median	4,075.1	77	7	9,144.0	5,216.6	A-/BBB+	A3/Baa1	3.3		45.3	9.9	1.47

Data Source: AUS Utility Reports, June, 2012; Pre-Tax Interest Coverage and Primary Service Territory are from Value Line Investment Survey, 2012.

California Energy Companies

PG&E Corporation (NYSE-PCG)	15,000.0	78	22	34,249.0	18,323.0	BBB	A3	3.5	CA	48.3	9.6	1.46
Sempra Energy (NYSE-SRE)	9,985.0	28	53	24,076.0	15,424.0	A+	Aa3	3.6	CA	45.5	14.2	1.55
Edison International (NYSE-EIX)	12,834.0	84	0	32,680.0	14,276.6	BBB+	A1	2.7	CA	38.2	8.7	1.43

Data Source: AUS Utility Reports, June, 2012; Pre-Tax Interest Coverage and Primary Service Territory are from Value Line Investment Survey, 2012.

Attachment JRW-4
California Energy Companies
Summary Financial Statistics for Proxy Group

`

Panel B
Gas Proxy Group

Company	Operating Revenue ($mil)	Percent Gas Revenue	Net Plant ($mil)	S&P Bond Rating	Moody's Bond Rating	Pre-Tax Interest Coverage	Primary Service Area	Common Equity Ratio	Return on Equity	Market to Book Ratio
AGL Resources Inc. (NYSE-AGL)	2,338.0	68	7,900.0	A+	Aa3	6.5	GA,TN,VA,NJ,FL,MD,IL	40.7	6.7	1.34
Atmos Energy Corporation (NYSE-ATO)	4,351.3	62	5,246.2	BBB+	Baa2	3.1	LA,KY,TX,MS,CO,KS,KY	46.6	8.9	1.25
Laclede Group, Inc. (NYSE-LG)	1,570.0	56	936.9	A	A2	4.7	MO	55.3	11.5	1.48
Northwest Natural Gas Co. (NYSE-NWN)	660.2	56	1,893.9	A+	A1	7.0	OR,WA	46.5	9.1	1.67
Piedmont Natural Gas Co., Inc. (NYSE-PNY)	1,253.7	100	2,697.4	A	A3	3.4	NC,SC,TN	47.6	10.3	2.05
South Jersey Industries, Inc. (NYSE-SJI)	828.6	58	1,352.4	A	A2	5.7	NJ	45.5	15.0	2.34
Southwest Gas Corporation (NYSE-SWX)	1,887.2	74	3,218.9	BBB	Baa2	3.5	AZ,NV,CA	49.5	9.4	1.88
WGL Holdings, Inc. (NYSE-WGL)	2,683.4	45	2,521.4	A+	A2	5.7	DC,MD,VA	58.1	8.4	1.63
Mean	1,946.6	65	3,220.9	A/A-	A2/A3	5.0		48.7	9.9	1.70
Median	1,728.6	60	2,609.4	A/A-	A2/A3	5.2		47.1	9.3	1.65

Data Source: AUS *Utility Reports* , May 2012; Pre-Tax Interest Coverage and Primary Service Territory are from *Value Line Investment Survey* , 2012.

Attachment JRW-4
California Water Utility Cost of Capital Report
***Value Line* Risk Metrics**

Panel A
Electric Proxy Group

Company	Beta	Safety Rank	Financial Strength	Earnings Predictability	Price Stability
ALLETE	0.70	2	A	70	100
Alliant Energy	0.75	2	A	70	95
Amer. Elec. Power	0.70	3	B++	90	100
Ameren Corp.	0.80	3	B++	90	95
Avista Corp.	0.70	2	A	65	100
Black Hills	0.85	3	B+	35	90
Cleco Corp.	0.65	1	A	75	100
CMS Energy Corp.	0.75	3	B+	40	95
Consol. Edison	0.60	1	A+	85	100
Dominion Resources	0.70	2	B++	70	100
DTE Energy	0.75	3	B+	75	100
Edison Int'l	0.80	3	B++	80	95
Entergy Corp.	0.70	2	A	95	100
Exelon Corp.	0.80	2	A	95	90
FirstEnergy Corp.	0.80	2	B++	75	90
G't Plains Energy	0.75	3	B+	70	90
Hawaiian Elec.	0.70	3	B+	70	90
IDACORP Inc.	0.70	3	B+	85	100
MGE Energy	0.60	1	A	90	100
NextEra Energy	0.75	2	A	85	95
OGE Energy	0.80	2	A	95	95
Pepco Holdings	0.75	3	B	70	95
PG&E Corp.	0.55	3	B++	90	100
Pinnacle West Capital	0.70	2	B++	65	100
PNM Resources	0.95	3	B	15	65
Portland General	0.75	2	B++	45	100
SCANA Corp.	0.70	2	B++	100	100
Southern Co.	0.55	1	A	100	100
TECO Energy	0.85	2	B++	70	90
UIL Holdings	0.70	2	B++	85	90
UNS Energy	0.75	3	B+	35	95
Westar Energy	0.75	2	B++	80	100
Wisconsin Energy	0.65	1	A	95	100
Xcel Energy Inc.	0.65	2	B++	100	100
Mean	**0.73**	**2.2**	**B++**	**75**	**96**

Data Source: *Value Line Investment Survey* , 2012.

Panel B
Gas Proxy Group

Company	Beta	Safety Rank	Financial Strength	Earnings Predictability	Price Stability
AGL Resources Inc. (NYSE-ATG)	0.75	1	A	95	100
Atmos Energy Corporation (NYSE-ATO)	0.70	2	B++	90	100
Laclede Group, Inc. (NYSE-LG)	0.60	2	B++	80	100
Northwest Natural Gas Co. (NYSE-NWN)	0.60	1	A	90	100
Piedmont Natural Gas Co., Inc. (NYSE-PNY)	0.70	2	B++	95	100
South Jersey Industries, Inc. (NYSE-SJI)	0.65	2	B++	85	100
Southwest Gas Corporation (NYSE-SWX)	0.75	3	B	75	95
WGL Holdings, Inc. (NYSE-WGL)	0.65	1	A	95	100
Mean	**0.68**	**1.8**	**B++**	**88**	**99**

Data Source: *Value Line Investment Survey* , 2012.

Panel C
Parent Companies of California Energy Companies

Company	Beta	Safety Rank	Financial Strength	Earnings Predictability	Price Stability
PG&E Corp.	0.55	3	B++	90	100
Sempra Energy	0.80	2	A	90	95
Edison Int'l	0.80	3	B++	80	95

Attachment JRW-5
California Energy Companies
Value Line Risk Metrics

Beta - A relative measure of the historical sensitivity of the stock's price to overall fluctuations in the New York Stock Exchange Composite Index. A Beta of 1.50 indicates a stock tends to rise (or fall) 50% more than the New York Stock Exchange Composite Index. The "Beta coefficient" is derived from a regression analysis of the relationship between weekly percentage changes in the price of a stock and weekly percentage changes in the NYSE Index over a period of five years. In the case of shorter price histories, a smaller time period is used, but two years is the minimum. The Betas are adjusted for their long-term tendency to converge toward 1.00. Additionally, Value Line shows betas computed based on monthly total returns for the trailing three year, five-year and 10-year periods.

Safety Rank - A measurement of potential risk associated with individual common stocks. The Safety Rank is computed by averaging two other Value Line indexes - the Price Stability Index and the Financial strength Rating. Safety Ranks range from 1 (Highest) to 5 (Lowest). Conservative investors should try to limit their purchases to equities ranked 1 (Highest) and 2 (Above Average) for Safety.

Financial Strength Rating - A relative measure of financial strength of the companies reviewed by Value Line. The relative ratings range from A++ (strongest) down to C (weakest), in nine steps.

Price Stability Index - A measure of the stability of a stock's price. It includes sensitivity to the market (see Beta) as well as the stock's inherent volatility. Value Line Stability ratings range from 100 (highest) to 5 (lowest).

Earnings Predictability Index - A measure of the reliability of an earnings forecast. Predictability is based upon the stability of year-to-year comparisons, with recent years being weighted more heavily that earlier ones. The most reliable forecasts tend to be those with the highest rating (100); the least reliable, the lowest (5). The earnings stability is derived from the standard deviation of percentage changes in quarterly earnings over an eight-year period. Special adjustments are made for comparisons around zero and from plus to minus.

Attachment JRW-5
California Energy Companies
Cost of Capital

Panel A
Pacific Gas & Electric Company
2012

Capital Source	Capitalization Ratio	Cost Rate	Weighted Cost Rate
Long-Term Debt	47.00%	5.69%	2.67%
Preferred Stock	1.00%	5.60%	0.06%
Common Equity	52.00%	11.00%	5.72%
Total	100.00%		8.45%

Panel B
San Diego Gas & Electric Company
2012

Capital Source	Capitalization Ratio	Cost Rate	Weighted Cost Rate
Long-Term Debt	45.25%	5.09%	2.30%
Preferred Stock	2.75%	6.35%	0.17%
Common Equity	52.00%	11.00%	5.72%
Total	100.00%		8.20%

Panel C
Southern California Edison
2012

Capital Source	Capitalization Ratio	Cost Rate	Weighted Cost Rate
Long-Term Debt	43.00%	5.53%	2.38%
Preferred Stock	9.00%	5.86%	0.53%
Common Equity	48.00%	11.10%	5.33%
Total	100.00%		8.23%

Panel D
Southern California Gas Company
2012

Capital Source	Capitalization Ratio	Cost Rate	Weighted Cost Rate
Long-Term Debt	45.60%	5.72%	2.61%
Preferred Stock	2.40%	6.00%	0.14%
Common Equity	52.00%	10.90%	5.67%
Total	100.00%		8.42%

Attachment JRW-5
California Energy Companies
Capital Structure Ratios and Debt Cost Rate

Panel A - PG&E Corp. Capitalization Ratios

Year	2011	2012	2013	2015-17	Average
Long-Term Debt	48.8%	48.5%	46.5%	48.5%	48.1%
Preferred Stock	1.0%	1.0%	1.0%	1.0%	1.0%
Common Equity	50.2%	50.5%	52.5%	50.5%	50.9%
Total	100.0%	100.0%	100.0%	100.0%	100.0%

Source: *Value Line* Investment Survey

Panel B - Sempra Energy Capitalization Ratios

Year	2011	2012	2013	2015-17	Average
Long-Term Debt	50.4%	50.5%	51.0%	51.5%	50.9%
Preferred Stock	0.4%	0.5%	0.5%	0.0%	0.4%
Common Equity	49.2%	49.0%	48.5%	48.5%	48.8%
Total	100.0%	100.0%	100.0%	100.0%	100.0%

Source: *Value Line* Investment Survey

Panel C - Edison Internatonal Capitalization Ratios

Year	2011	2012	2013	2015-17	Average
Long-Term Debt	55.3%	54.5%	55.5%	55.5%	55.2%
Preferred Stock	4.1%	5.0%	4.5%	4.0%	4.4%
Common Equity	40.6%	40.5%	40.0%	40.5%	40.4%
Total	100.0%	100.0%	100.0%	100.0%	100.0%

Source: *Value Line* Investment Survey

Panel D - Sempra Energy Capitalization Ratios

Year	2011	2012	2013	2015-17	Average
Long-Term Debt	50.4%	50.5%	51.0%	51.5%	50.9%
Preferred Stock	0.4%	0.5%	0.5%	0.0%	0.4%
Common Equity	49.2%	49.0%	48.5%	48.5%	48.8%
Total	100.0%	100.0%	100.0%	100.0%	100.0%

Source: *Value Line* Investment Survey

Attachment JRW-5
California Energy Companies
Capital Structure Ratios and Debt Cost Rate

Panel A
Electric Proxy Group

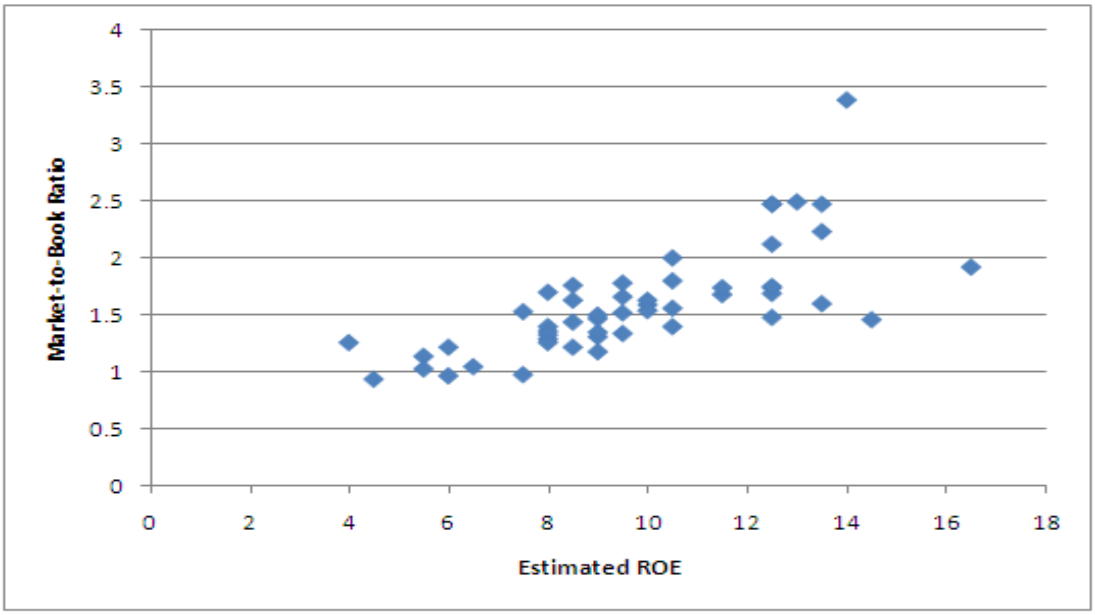
	Long-Term Debt	Preferred Stock	Common Stock	Total Capital
ALLETE	44.3	0.0	55.7	100
Alliant Energy	45.7	3.5	50.9	100
Amer. Elec. Power	50.7	0.0	49.3	100
Ameren Corp.	45.3	1.0	53.7	100
Avista Corp.	51.4	0.0	48.6	100
Black Hills	51.4	0.0	48.6	100
Cleco Corp.	48.5	0.0	51.5	100
CMS Energy Corp.	66.9	0.5	32.6	100
Consol. Edison	46.6	1.0	52.5	100
Dominion Resources	59.8	0.9	39.3	100
DTE Energy	50.6	0.0	49.4	100
Edison Int'l	55.3	4.1	40.6	100
Entergy Corp.	52.2	1.4	46.4	100
Exelon Corp.	45.7	0.3	54	100
FirstEnergy Corp.	54.2	0.0	45.8	100
G't Plains Energy	47.8	0.6	51.6	100
Hawaiian Elec.	44.9	1.2	53.9	100
IDACORP Inc.	45.6	0.0	54.4	100
MGE Energy	39.6	0.0	60.4	100
NextEra Energy	58.2	0.0	41.8	100
OGE Energy	51.6	0.0	48.4	100
Pepco Holdings	49.1	0.0	50.9	100
PG&E Corp.	48.8	1.0	50.2	100
Pinnacle West Capital	44.1	0.0	55.9	100
PNM Resources	51.5	0.4	48.1	100
Portland General	49.6	0.0	50.4	100
SCANA Corp.	54.3	0.0	45.7	100
Southern Co.	50.0	2.9	47.1	100
TECO Energy	54.3	0.0	45.8	100
UIL Holdings	58.6	0.0	41.4	100
UNS Energy	67.8	0.0	32.2	100
Westar Energy	49.6	0.3	50.1	100
Wisconsin Energy	53.6	0.4	46	100
Xcel Energy Inc.	51.1	0.0	48.9	100
Mean	51.1	0.6	48.3	100.0

Panel B
Gas Proxy Group

	Long-Term Debt	Preferred Stock	Common Stock	Total Capital
AGL Resources	51.8	0.0	48.2	100.0
Atmos Energy	49.4	0.0	50.6	100.0
Laclede Group	38.9	0.0	61.1	100.0
Northwest Nat. Gas	47.3	0.0	52.7	100.0
Piedmont Natural Gas	40.4	0.0	59.6	100.0
South Jersey Inds.	40.5	0.0	59.5	100.0
Southwest Gas	43.2	0.0	56.8	100.0
WGL Holdings Inc.	32.3	1.5	66.2	100.0
Mean	43.0	0.2	56.8	100.0

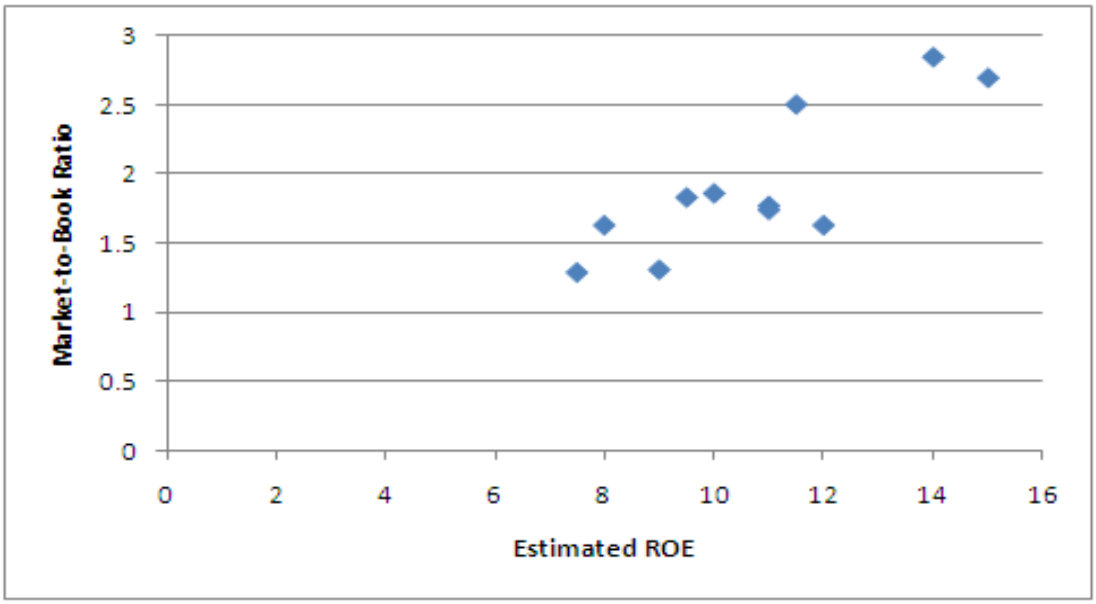
Attachment JRW-6

Panel A



R-Square = .52, N=51.

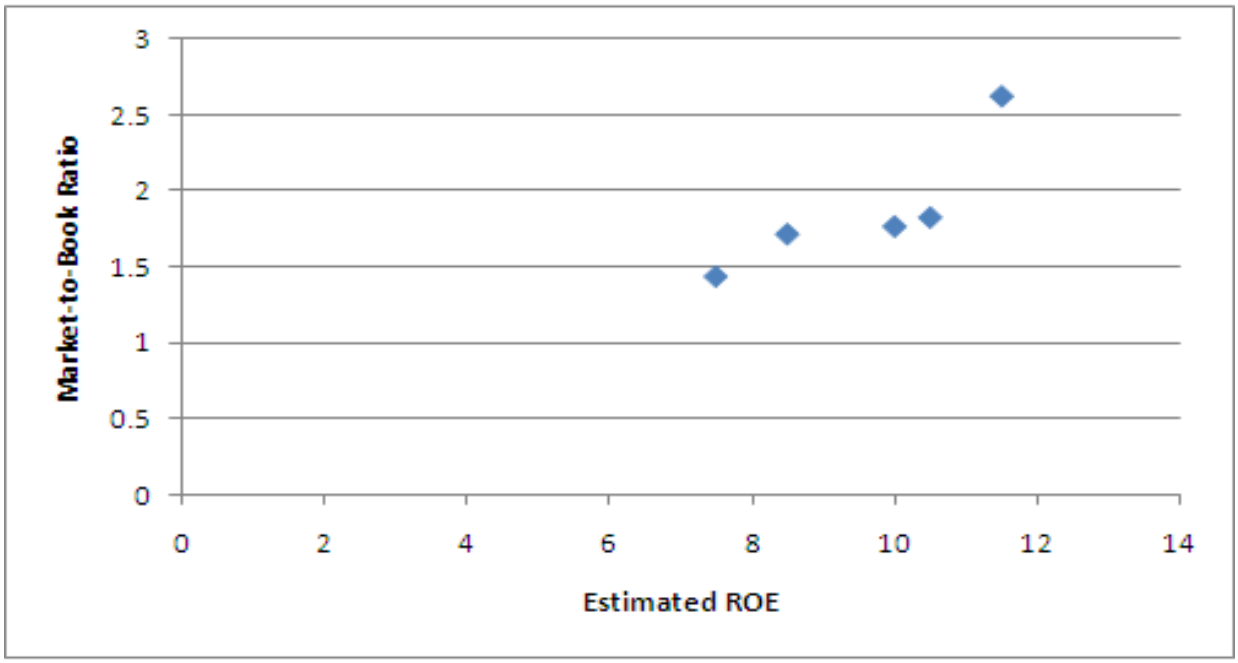
Panel B



R-Square = .71, N=11.

Attachment JRW-6

Panel C

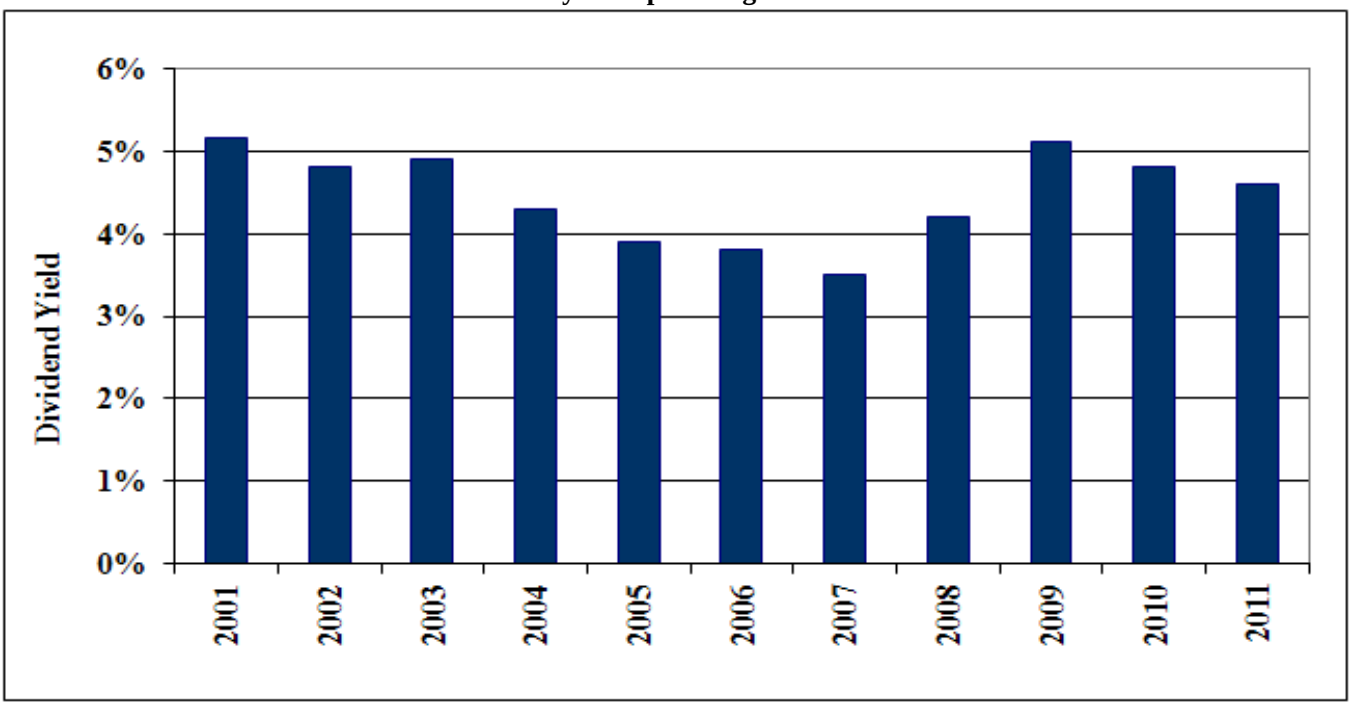


R-Square = .77, N=5.

Attachment JRW-7
Long-Term 'A' Rated Public Utility Bonds

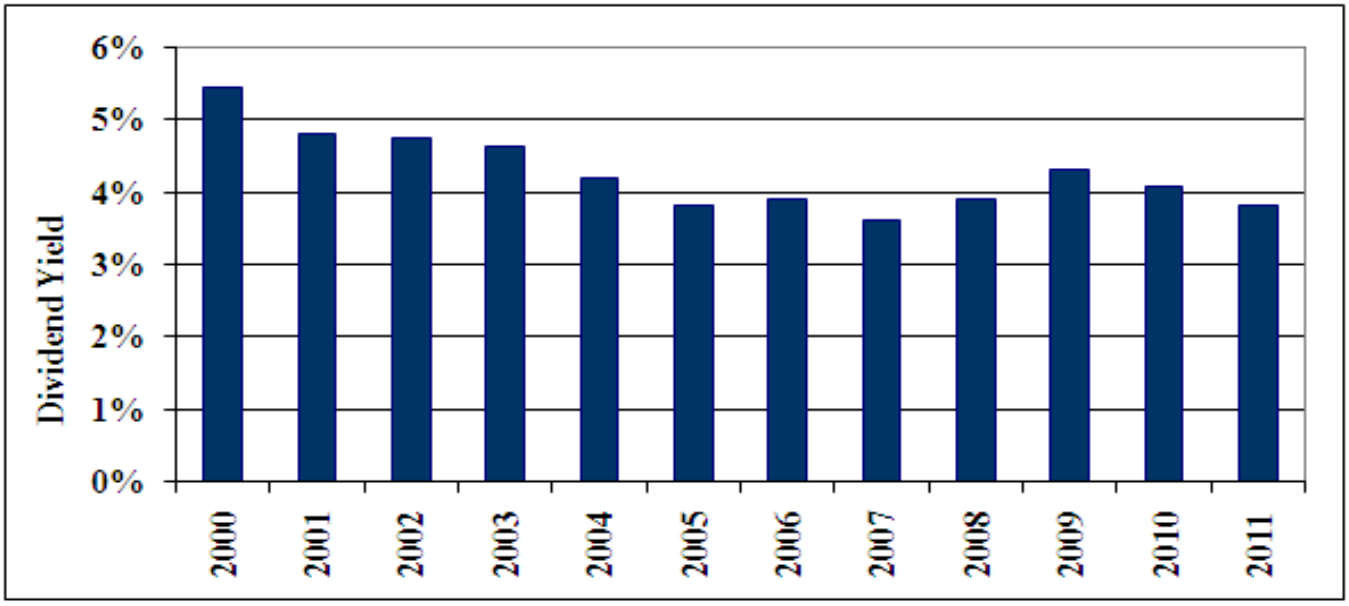
Attachment JRW-7

Panel A
Electric Proxy Group Average Dividend Yield



Data Source: ***Value Line Investment Survey.***

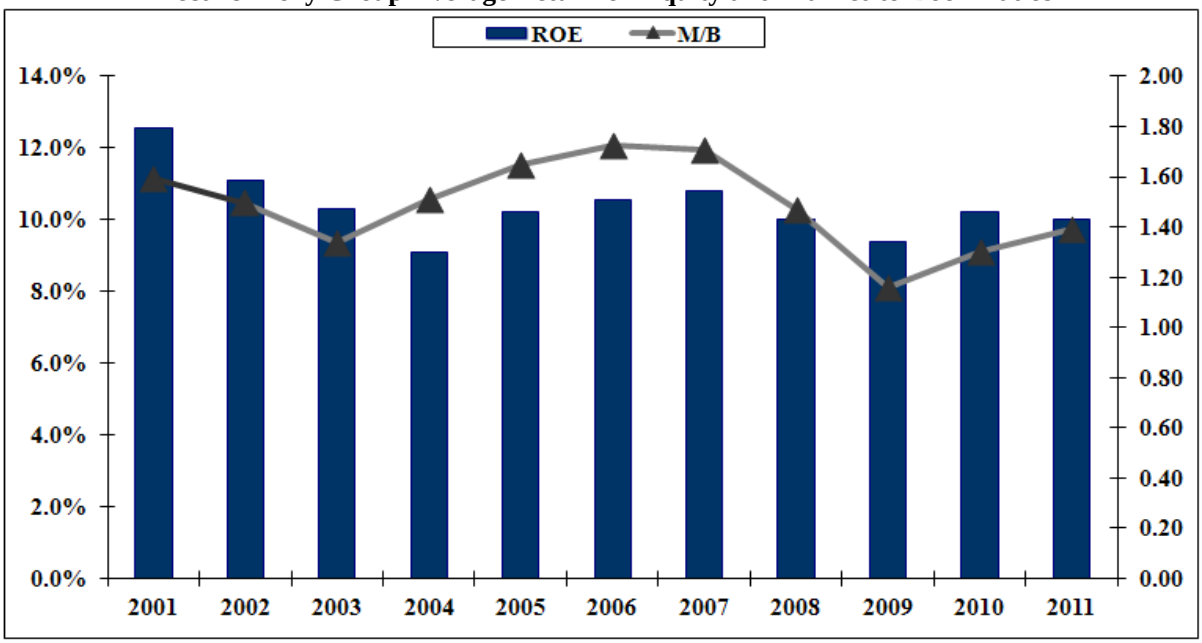
Panel B
Gas Proxy Group Average Dividend Yield



Data Source: *Value Line Investment Survey.*

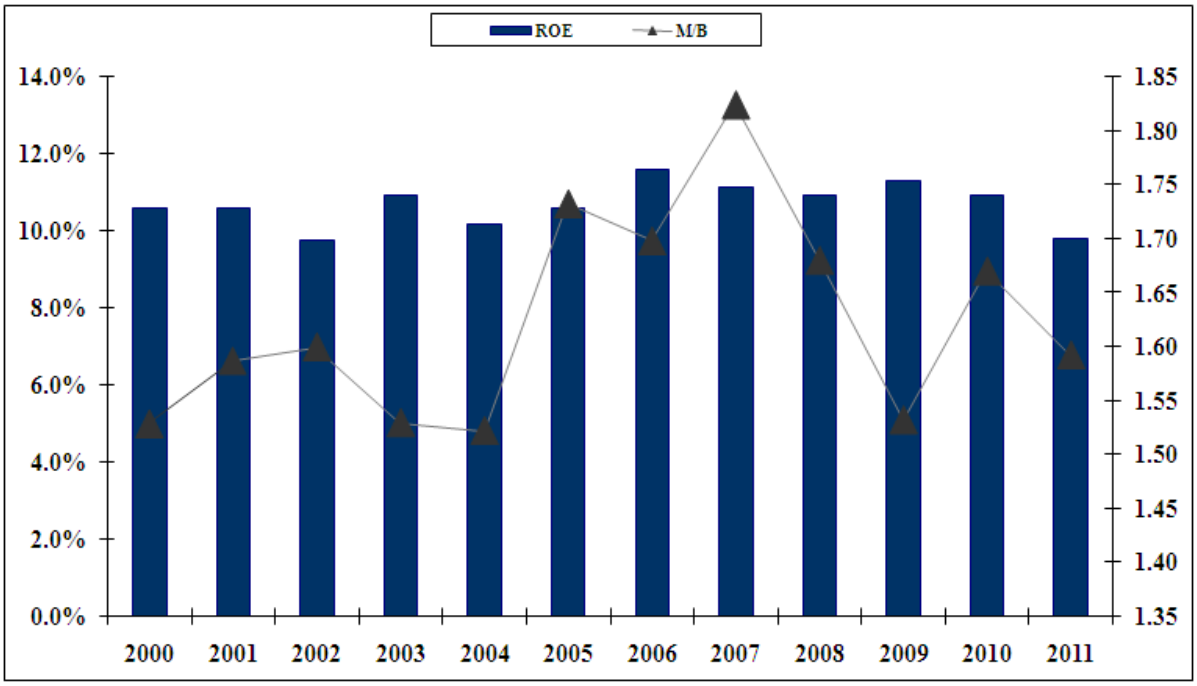
Attachment JRW-7

Panel A
Electric Proxy Group Average Return on Equity and Market-to-Book Ratios



Data Source: ***Value Line Investment Survey.***

Panel B
Gas Proxy Group Average Return on Equity and Market-to-Book Ratios



Data Source: *Value Line Investment Survey.*

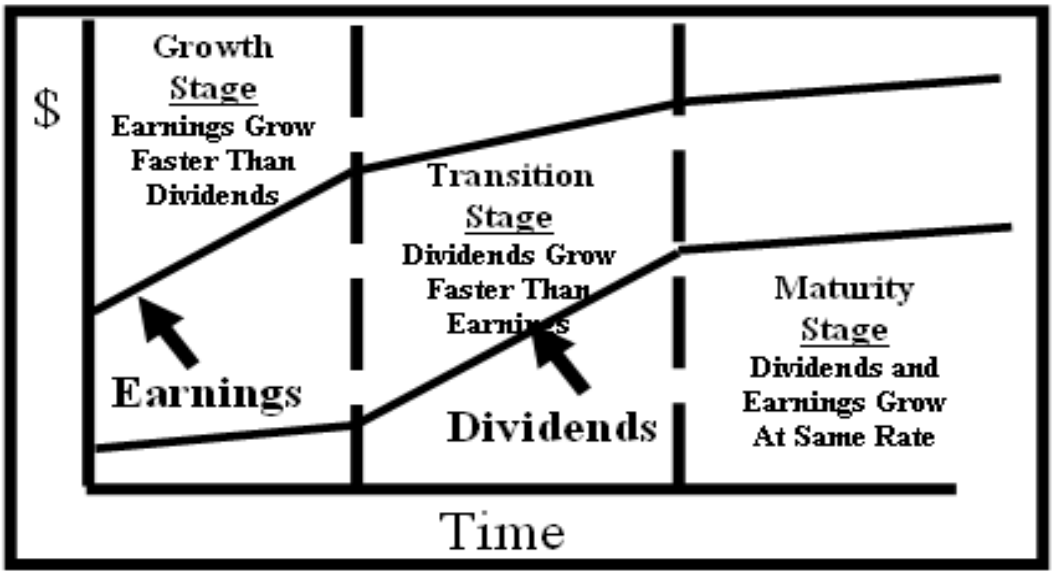
Attachment JRW-8

Industry Average Betas

Industry Name	No.	Beta	Industry Name	No.	Beta	Industry Name	No.	Beta
Public/Private Equity	11	2.18	Natural Gas (Div.)	29	1.33	IT Services	60	1.06
Advertising	31	2.02	Financial Svcs. (Div.)	225	1.31	Retail Building Supply	8	1.04
Furn/Home Furnishings	35	1.81	Toiletries/Cosmetics	15	1.30	Computer Software	184	1.04
Heavy Truck & Equip	21	1.80	Apparel	57	1.30	Med Supp Non-Invasiv	146	1.03
Semiconductor Equip	12	1.79	Computers/Peripherals	87	1.30	Biotechnology	158	1.03
Retail (Hardlines)	75	1.77	Retail Store	37	1.29	E-Commerce	57	1.03
Newspaper	13	1.76	Chemical (Specialty)	70	1.28	Telecom. Equipment	99	1.02
Hotel/Gaming	51	1.74	Precision Instrument	77	1.28	Pipeline MLPs	27	0.98
Auto Parts	51	1.70	Wireless Networking	57	1.27	Telecom. Services	74	0.98
Steel	32	1.68	Restaurant	63	1.27	Oil/Gas Distribution	13	0.96
Entertainment	77	1.63	Shoe	19	1.25	Utility (Foreign)	4	0.96
Metal Fabricating	24	1.59	Publishing	24	1.25	Industrial Services	137	0.93
Automotive	12	1.59	Trucking	36	1.24	Bank (Midwest)	45	0.93
Insurance (Life)	30	1.58	Human Resources	23	1.24	Reinsurance	13	0.93
Oilfield Svcs/Equip.	93	1.55	Entertainment Tech	40	1.23	Food Processing	112	0.91
Coal	20	1.53	Engineering & Const	25	1.22	Medical Services	122	0.91
Chemical (Diversified)	31	1.51	Air Transport	36	1.21	Insurance (Prop/Cas.)	49	0.91
Building Materials	45	1.50	Machinery	100	1.20	Beverage	34	0.88
Semiconductor	141	1.50	Securities Brokerage	28	1.20	Telecom. Utility	25	0.88
R.E.I.T.	5	1.47	Petroleum (Integrated)	20	1.18	Tobacco	11	0.85
Homebuilding	23	1.45	Healthcare Information	25	1.17	Med Supp Invasive	83	0.85
Recreation	56	1.45	Packaging & Container	26	1.16	Educational Services	34	0.83
Railroad	12	1.44	Precious Metals	84	1.15	Environmental	82	0.81
Retail (Softlines)	47	1.44	Diversified Co.	107	1.14	Bank	426	0.77
Maritime	52	1.40	Funeral Services	6	1.14	Electric Util. (Central)	21	0.75
Office Equip/Supplies	24	1.38	Property Management	31	1.13	Electric Utility (West)	14	0.75
Cable TV	21	1.37	Pharmacy Services	19	1.12	Retail/Wholesale Food	30	0.75
Retail Automotive	20	1.37	Drug	279	1.12	Thrift	148	0.71
Chemical (Basic)	16	1.36	Aerospace/Defense	64	1.10	Electric Utility (East)	21	0.70
Paper/Forest Products	32	1.36	Foreign Electronics	9	1.09	Natural Gas Utility	22	0.66
Power	93	1.35	Internet	186	1.09	Water Utility	11	0.66
Petroleum (Producing)	176	1.34	Information Services	27	1.07	Total Market	5891	1.15
Electrical Equipment	68	1.33	Household Products	26	1.07			
Metals & Mining (Div.)	73	1.33	Electronics	139	1.07			

Source: Damodaran Online 2012 - http://pages.stern.nyu.edu/~adamodar/

Attachment JRW-9
Three-Stage DCF Model



Source: William F. Sharpe, Gordon J. Alexander, and Jeffrey V. Bailey, Investments (Prentice-Hall, 1995), pp. 590-91.

Attachment JRW-10

California Energy Companies
Discounted Cash Flow Analysis

Panel A
Electric Proxy Group

Dividend Yield*	4.20%
Adjustment Factor	1.02125
Adjusted Dividend Yield	4.3%
Growth Rate**	4.25%
Equity Cost Rate	8.5%

* Page 2 of Attachment JRW-10
** Based on data provided on pages 3, 4, 5, and 6 of Attachment JRW-10

Panel B
Gas Proxy Group

Dividend Yield*	3.90%
Adjustment Factor	1.022
Adjusted Dividend Yield	4.0%
Growth Rate**	4.40%
Equity Cost Rate	8.4%

* Page 2 of Attachment JRW-10
** Based on data provided on pages 3, 4, 5, and 6 of Attachment JRW-10

Attachment JRW-10

California Energy Companies
Monthly Dividend Yields

Electric Proxy Group

Company	Feb	Mar	Apr	May	Jun	Jul	Mean
ALLETE, Inc. (NYSE-ALE)	4.3%	4.5%	4.6%	4.4%	4.8%	4.5%	4.5%
Alliant Energy Corporation (NYSE-LNT)	4.0%	4.2%	4.1%	4.2%	4.1%	4.0%	4.1%
Ameren Corporation (NYSE-AEE)	4.9%	5.1%	5.1%	5.1%	5.0%	4.8%	5.0%
American Electric Power Co. (NYSE-AEP)	4.5%	4.7%	4.9%	4.9%	5.0%	4.8%	4.8%
Avista Corporation (NYSE-AVA)	4.4%	4.3%	4.5%	4.6%	4.6%	4.5%	4.5%
Black Hills Corporation (NYSE-BKH)	4.4%	4.4%	4.5%	4.5%	4.7%	4.6%	4.5%
Cleco Corporation (NYSE-CNL)	3.4%	3.2%	3.2%	3.2%	3.1%	3.1%	3.2%
CMS Energy Corporation (NYSE-CMS)	3.8%	4.5%	4.4%	4.4%	4.2%	4.1%	4.2%
Consolidated Edison, Inc. (NYSE-ED)	4.1%	4.2%	4.2%	4.2%	4.1%	3.9%	4.1%
Dominion Resources, Inc. (NYSE-D)	3.9%	3.9%	4.2%	4.2%	4.0%	3.9%	4.0%
DTE Energy Company (NYSE-DTE)	4.4%	4.4%	4.3%	4.3%	4.3%	4.0%	4.3%
Edison International (NYSE-EIX)	3.2%	3.2%	3.0%	3.0%	3.0%	2.9%	3.1%
Entergy Corporation (NYSE-ETR)	4.7%	4.9%	5.0%	4.9%	5.3%	5.0%	5.0%
Exelon Corporation (NYSE-EXC)	5.3%	5.4%	5.6%	5.4%	4.0%	4.1%	5.0%
FirstEnergy Corporation (ASE-FE)	5.2%	5.1%	4.8%	4.9%	4.6%	4.6%	4.9%
Great Plains Energy Incorporated (NYSE-GXP)	4.0%	4.1%	4.3%	4.2%	4.3%	4.1%	4.2%
Hawaiian Electric Industries, Inc. (NYSE-HE)	4.8%	4.8%	4.9%	4.9%	4.7%	4.4%	4.8%
IDACORP, Inc. (NYSE-IDA)	2.9%	3.2%	3.3%	3.2%	3.4%	3.3%	3.2%
MGE Energy, Inc. (NYSE-MGEE)	3.5%	3.4%	3.5%	3.4%	3.4%	3.3%	3.4%
Nextra Energy (NYSE-NEE)	3.7%	3.7%	3.8%	4.0%	3.7%	3.6%	3.8%
OGE Energy Corp. (NYSE-OGE)	2.8%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
Pepco Holdings, Inc. (NYSE-POM)	5.4%	5.5%	5.8%	5.6%	5.8%	5.6%	5.6%
PG&E Corporation (NYSE-PCG)	4.4%	4.4%	4.2%	4.2%	4.2%	4.1%	4.3%
Pinnacle West Capital Corp. (NYSE-PNW)	4.4%	4.4%	4.4%	4.5%	4.4%	4.1%	4.4%
PNM Resources, Inc. (NYSE-PNM)	2.8%	2.8%	3.2%	2.7%	3.2%	3.1%	3.0%
Portland General Electric (NYSE-POR)	4.3%	4.3%	4.2%	4.3%	4.3%	4.2%	4.3%
SCANA Corporation (NYSE-SCG)	4.4%	4.3%	4.4%	4.4%	4.3%	4.2%	4.3%
Southern Company (NYSE-SO)	4.2%	4.3%	4.2%	4.3%	4.3%	4.2%	4.3%
TECO Energy, Inc. (NYSE-TE)	4.6%	5.0%	5.0%	5.0%	5.1%	4.9%	4.9%
UIL Holdings Corporation (NYSE-UIL)	5.0%	4.9%	5.1%	5.1%	5.3%	4.9%	5.1%
UniSource Energy Corporation (NYSE-UNS)	4.6%	4.5%	4.8%	4.7%	4.7%	4.5%	4.6%
Westar Energy, Inc. (NYSE-WR)	4.5%	4.6%	4.7%	4.8%	4.8%	4.5%	4.7%
Wisconsin Energy Corporation (NYSE-WEC)	3.0%	3.5%	3.4%	3.5%	3.3%	3.1%	3.3%
Xcel Energy Inc. (NYSE-XEL)	3.9%	4.0%	3.9%	3.9%	3.8%	3.9%	3.9%
Mean	4.2%	4.3%	4.3%	4.3%	4.3%	4.1%	4.2%
Median	4.4%	4.4%	4.4%	4.4%	4.3%	4.1%	4.3%

Data Source: AUS *Utility Reports* , monthly issues.

Attachment JRW-10

California Energy Companies
Monthly Dividend Yields

Panel B
Gas Proxy Group

Company	Feb	Mar	Apr	May	Jun	Jul	Mean
AGL Resources Inc. (NYSE-ATG)	4.4%	3.5%	3.7%	3.8%	5.0%	4.9%	4.2%
Atmos Energy Corporation (NYSE-ATO)	4.3%	4.4%	4.5%	4.4%	4.2%	4.1%	4.3%
Laclede Group, Inc. (NYSE-LG)	4.1%	4.0%	4.2%	4.3%	4.3%	4.3%	4.2%
Northwest Natural Gas Co. (NYSE-NWN)	3.8%	3.8%	3.9%	4.0%	3.9%	3.7%	3.9%
Piedmont Natural Gas Co., Inc. (NYSE-PNY)	3.5%	3.5%	3.7%	4.1%	4.1%	3.8%	3.8%
South Jersey Industries, Inc. (NYSE-SJI)	2.9%	3.0%	3.2%	3.3%	3.4%	3.2%	3.2%
Southwest Gas Corporation (NYSE-SWX)	2.6%	2.5%	2.5%	2.6%	2.8%	2.7%	2.6%
WGL Holdings, Inc. (NYSE-WGL)	3.6%	3.8%	3.8%	4.1%	4.2%	4.0%	3.9%
Mean	3.7%	3.6%	3.7%	3.8%	4.0%	3.8%	3.8%
Median	3.7%	3.7%	3.8%	4.1%	4.2%	3.9%	3.9%

Data Source: AUS *Utility Reports* , monthly issues.

Attachment JRW-10

California Energy Companies
DCF Equity Cost Growth Rate Measures
***Value Line* Historic Growth Rates**

Electric Proxy Group

Company	*Value Line* Historic Growth					
	Past 10 Years			Past 5 Years		
	Earnings	Dividends	Book Value	Earnings	Dividends	Book Value
ALLETE, Inc. (NYSE-ALE)				0.5%	12.0%	5.5%
Alliant Energy Corporation (NYSE-LNT)	2.0%	-3.0%	0.5%	5.0%	8.0%	3.5%
Ameren Corporation (NYSE-AEE)	-1.5%	-5.0%	3.5%	-1.5%	-6.5%	1.0%
American Electric Power Co. (NYSE-AEP)	2.0%	-3.0%	1.0%	1.5%	4.0%	5.0%
Avista Corporation (NYSE-AVA)	5.0%	7.5%	3.5%	9.5%	12.5%	4.0%
Black Hills Corporation (NYSE-BKH)	-4.0%	3.0%	7.5%	-4.0%	2.5%	4.0%
Cleco Corporation (NYSE-CNL)	5.0%	1.5%	8.0%	10.0%	2.0%	10.0%
CMS Energy Corporation (NYSE-CMS)	-5.5%	-7.5%	-4.5%	8.5%		2.0%
Consolidated Edison, Inc. (NYSE-ED)	1.0%	1.0%	4.0%	4.5%	1.0%	4.5%
Dominion Resources, Inc. (NYSE-D)	7.0%	3.5%	3.5%	6.5%	6.5%	3.5%
DTE Energy Company (NYSE-DTE)	2.0%	0.5%	3.5%	5.0%	1.5%	4.0%
Edison International (NYSE-EIX)		7.0%	11.0%	6.0%	5.5%	8.5%
Entergy Corporation (NYSE-ETR)	9.5%	10.0%	4.5%	8.5%	9.0%	4.5%
Exelon Corporation (NYSE-EXC)	8.0%		5.5%	4.5%	7.0%	7.5%
FirstEnergy Corporation (ASE-FE)	0.5%	4.0%	3.0%	-2.0%	4.0%	1.5%
Great Plains Energy Incorporated (NYSE-GXP)	-2.5%	-6.5%	4.5%	-9.5%	-13.0%	5.5%
Hawaiian Electric Industries, Inc. (NYSE-HE)	-2.0%		2.0%	-3.0%		1.5%
IDACORP, Inc. (NYSE-IDA)	-0.5%	-4.5%	3.5%	8.5%		5.0%
MGE Energy, Inc. (NYSE-MGEE)	4.5%	1.0%	6.5%	6.5%	1.5%	6.0%
Nextera Energy (NYSE-NEE)	7.5%	6.5%	8.0%	11.0%	7.5%	9.0%
OGE Energy Corp. (NYSE-OGE)	6.0%	1.0%	6.0%	8.5%	2.0%	8.5%
Pepco Holdings, Inc. (NYSE-POM)	-0.5%		0.5%	-0.5%	1.5%	1.0%
PG&E Corporation (NYSE-PCG)		8.5%	8.0%	3.5%	16.0%	6.5%
Pinnacle West Capital Corp. (NYSE-PNW)	-2.0%	4.0%	2.0%	.01.015		0.5%
PNM Resources, Inc. (NYSE-PNM)	-7.5%	-0.5%	1.5%	-12.0%	-8.0%	-1.0%
Portland General Electric (NYSE-POR)				8.5%		2.0%
SCANA Corporation (NYSE-SCG)	4.5%	4.5%	3.5%	2.0%	4.0%	4.5%
Southern Company (NYSE-SO)	3.0%	3.0%	3.5%	3.0%	4.0%	6.0%
TECO Energy, Inc. (NYSE-TE)	-5.0%	-4.5%	-2.0%	3.5%	1.5%	6.5%
UIL Holdings Corporation (NYSE-UIL)	-2.0%			4.5%		-0.5%
UniSource Energy Corporation (NYSE-UNS)	7.0%	20.0%	7.0%	13.0%	14.5%	5.0%
Westar Energy, Inc. (NYSE-WR)		-4.5%	-3.0%	1.0%	7.0%	6.0%
Wisconsin Energy Corporation (NYSE-WEC)	9.0%	3.0%	6.5%	10.0%	14.0%	7.0%
Xcel Energy Inc. (NYSE-XEL)	-1.0%	-4.0%		4.5%	3.5%	4.5%
Mean	1.7%	1.7%	3.8%	3.8%	4.5%	4.5%
Median	2.0%	1.3%	3.5%	4.5%	4.0%	4.5%
	Average of Median Figures =			3.3%		

Data Source: *Value Line Investment Survey.*

Attachment JRW-10

California Water Utility Cost of Capital Report
DCF Equity Cost Growth Rate Measures
***Value Line* Historic Growth Rates**

Panel B
Gas Proxy Group

Company	*Value Line* Historic Growth					
	Past 10 Years			Past 5 Years		
	Earnings	Dividends	Book Value	Earnings	Dividends	Book Value
AGL Resources Inc. (NYSE-ATG)	9.0%	5.0%	7.0%	4.5%	7.5%	5.5%
Bay State Gas Company (NYSE-ATO)	7.0%	1.5%	6.5%	4.0%	1.5%	4.5%
Laclede Group, Inc. (NYSE-LG)	6.5%	1.5%	5.0%	6.0%	2.5%	6.5%
Northwest Natural Gas Co. (NYSE-NWN)	4.0%	3.0%	4.0%	4.5%	4.5%	4.0%
Piedmont Natural Gas Co., Inc. (NYSE-PNY)	5.0%	4.5%	5.0%	4.5%	4.0%	3.0%
South Jersey Industries, Inc. (NYSE-SJI)	9.5%	6.5%	10.5%	7.0%	9.5%	7.0%
Southwest Gas Corporation (NYSE-SWX)	6.0%	2.0%	4.5%	6.5%	4.0%	5.0%
WGL Holdings, Inc. (NYSE-WGL)	3.0%	2.0%	4.0%	3.0%	2.5%	5.0%
Mean	6.3%	3.3%	5.8%	5.0%	4.5%	5.1%
Median	6.3%	2.5%	5.0%	4.5%	4.0%	5.0%
	Average of Median Figures =			4.5%		

Data Source: *Value Line Investment Survey, 2012.*

Attachment JRW-10

California Energy Companies
DCF Equity Cost Growth Rate Measures
***Value Line* Projected Growth Rates**

Electric Proxy Group

Company	*Value Line* Projected Growth Est'd. '09-'11 to '15-'17			*Value Line* Sustainable Growth		
	Earnings	Dividends	Book Value	Return on Equity	Retention Rate	Internal Growth
ALLETE, Inc. (NYSE-ALE)	7.5%	2.0%	4.0%	10.0%	41.0%	4.1%
Alliant Energy Corporation (NYSE-LNT)	6.0%	5.5%	3.5%	10.5%	33.0%	3.5%
Ameren Corporation (NYSE-AEE)	-1.0%	2.5%	0.5%	7.0%	28.0%	2.0%
American Electric Power Co. (NYSE-AEP)	4.5%	3.5%	4.5%	10.0%	41.0%	4.1%
Avista Corporation (NYSE-AVA)	5.5%	6.5%	3.5%	9.0%	38.0%	3.4%
Black Hills Corporation (NYSE-BKH)	7.0%	2.0%	2.0%	8.5%	38.0%	3.2%
Cleco Corporation (NYSE-CNL)	6.5%	11.5%	6.0%	11.5%	44.0%	5.1%
CMS Energy Corporation (NYSE-CMS)	7.0%	10.0%	5.0%	12.5%	39.0%	4.9%
Consolidated Edison, Inc. (NYSE-ED)	4.0%	1.0%	8.0%	9.5%	43.0%	4.1%
Dominion Resources, Inc. (NYSE-D)	6.5%	6.0%	5.5%	14.5%	35.0%	5.1%
DTE Energy Company (NYSE-DTE)	4.0%	3.5%	3.5%	9.5%	40.0%	3.8%
Edison International (NYSE-EIX)	1.0%	3.0%	4.0%	9.0%	55.0%	5.0%
Entergy Corporation (NYSE-ETR)	-4.5%	1.0%	3.0%	9.5%	37.0%	3.5%
Exelon Corporation (NYSE-EXC)	-2.0%	0.0%	6.0%	12.0%	39.0%	4.7%
FirstEnergy Corporation (ASE-FE)	5.0%	1.5%	4.5%	10.5%	38.0%	4.0%
Great Plains Energy Incorporated (NYSE-GXP)	5.5%	5.0%	2.0%	7.5%	38.0%	2.9%
Hawaiian Electric Industries, Inc. (NYSE-HE)	9.0%	1.0%	5.5%	9.0%	35.0%	3.2%
IDACORP, Inc. (NYSE-IDA)	3.0%	8.0%	5.5%	8.0%	46.0%	3.7%
MGE Energy, Inc. (NYSE-MGEE)	4.5%	3.5%	5.0%	10.5%	24.0%	2.5%
Nextera Energy (NYSE-NEE)	5.0%	8.0%	6.5%	12.5%	47.0%	5.9%
OGE Energy Corp. (NYSE-OGE)	6.0%	4.5%	8.0%	11.5%	59.0%	6.8%
Pepco Holdings, Inc. (NYSE-POM)	7.0%	1.0%	2.0%	8.0%	31.0%	2.5%
PG&E Corporation (NYSE-PCG)	4.5%	2.0%	4.0%	10.5%	47.0%	4.9%
Pinnacle West Capital Corp. (NYSE-PNW)	5.0%	2.5%	3.5%	9.0%	36.0%	3.2%
PNM Resources, Inc. (NYSE-PNM)	15.5%	10.5%	3.0%	9.0%	56.0%	5.0%
Portland General Electric (NYSE-POR)	5.5%	3.5%	4.0%	9.0%	46.0%	4.1%
SCANA Corporation (NYSE-SCG)	4.0%	2.0%	5.5%	9.5%	44.0%	4.2%
Southern Company (NYSE-SO)	5.0%	4.0%	5.5%	12.5%	30.0%	3.8%
TECO Energy, Inc. (NYSE-TE)	7.5%	5.0%	4.5%	13.0%	37.0%	4.8%
UIL Holdings Corporation (NYSE-UIL)	4.0%	0.0%	3.5%	9.5%	29.0%	2.8%
UniSource Energy Corporation (NYSE-UNS)	4.0%	6.0%	3.0%	13.0%	39.0%	5.1%
Westar Energy, Inc. (NYSE-WR)	6.5%	3.0%	4.5%	8.5%	39.0%	3.3%
Wisconsin Energy Corporation (NYSE-WEC)	6.5%	13.5%	3.5%	14.0%	37.0%	5.2%
Xcel Energy Inc. (NYSE-XEL)	6.0%	5.0%	4.5%	10.0%	38.0%	3.8%
Mean	5.0%	4.3%	4.3%	10.2%	39.6%	4.1%
Median	5.3%	3.5%	4.3%	9.8%	38.5%	4.0%
Average of Median Figures =		4.3%				4.0%

Data Source: *Value Line Investment Survey*.

Attachment JRW-10

California Energy Companies
DCF Equity Cost Growth Rate Measures
***Value Line* Projected Growth Rates**

Panel B
Gas Proxy Group

	Value Line			*Value Line*		
	Projected Growth Est'd. '09-'11 to '15-'17			Sustainable Growth		
Company	Earnings	Dividends	Book Value	Return on Equity	Retention Rate	Internal Growth
AGL Resources Inc. (NYSE-ATG)	5.5%	2.0%	6.0%	12.0%	51.0%	6.1%
Bay State Gas Company (NYSE-ATO)	4.0%	1.5%	6.0%	8.0%	46.0%	3.7%
Laclede Group, Inc. (NYSE-LG)	2.0%	2.5%	4.5%	11.0%	40.0%	4.4%
Northwest Natural Gas Co. (NYSE-NWN)	4.0%	3.0%	4.5%	11.5%	43.0%	4.9%
Piedmont Natural Gas Co., Inc. (NYSE-PNY)	2.5%	3.5%	1.5%	13.0%	28.0%	3.6%
South Jersey Industries, Inc. (NYSE-SJI)	9.0%	9.0%	6.5%	15.5%	49.0%	7.6%
Southwest Gas Corporation (NYSE-SWX)	9.0%	8.0%	6.5%	10.5%	58.0%	6.1%
WGL Holdings, Inc. (NYSE-WGL)	3.0%	2.5%	4.0%	10.0%	38.0%	3.8%
Mean	4.9%	4.0%	4.9%	11.4%	44.1%	5.0%
Median	4.0%	2.8%	5.3%	11.3%	44.5%	4.7%
Average of Median Figures =		4.0%			Median =	4.7%

Data Source: ***Value Line Investment Survey, 2012.***

Attachment JRW-10

California Energy Companies
DCF Equity Cost Growth Rate Measures
Analysts Projected EPS Growth Rate Estimates

Electric Proxy Group

Company	Yahoo	Zack's	Reuters	Average
ALLETE, Inc. (NYSE-ALE)	5.0%	5.0%	6.5%	5.5%
Alliant Energy Corporation (NYSE-LNT)	6.3%	6.2%	5.9%	6.1%
Ameren Corporation (NYSE-AEE)	-2.3%	0.3%	-3.1%	-1.7%
American Electric Power Co. (NYSE-AEP)	3.5%	3.6%	3.8%	3.7%
Avista Corporation (NYSE-AVA)	4.0%	4.7%	4.5%	4.4%
Black Hills Corporation (NYSE-BKH)	6.0%	6.0%	na	6.0%
Cleco Corporation (NYSE-CNL)	3.0%	na	3.0%	3.0%
CMS Energy Corporation (NYSE-CMS)	6.0%	5.6%	6.1%	5.9%
Consolidated Edison, Inc. (NYSE-ED)	3.2%	3.6%	3.5%	3.4%
Dominion Resources, Inc. (NYSE-D)	5.4%	4.9%	4.9%	5.1%
DTE Energy Company (NYSE-DTE)	4.3%	5.0%	3.8%	4.4%
Edison International (NYSE-EIX)	0.3%	1.5%	2.5%	1.4%
Entergy Corporation (NYSE-ETR)	1.0%	2.0%	1.7%	1.6%
Exelon Corporation (NYSE-EXC)	-9.1%	-4.7%	-0.6%	-4.8%
FirstEnergy Corporation (ASE-FE)	3.2%	1.2%	3.9%	2.7%
Great Plains Energy Incorporated (NYSE-GXP)	9.8%	7.8%	8.5%	8.7%
Hawaiian Electric Industries, Inc. (NYSE-HE)	9.2%	7.1%	6.6%	7.6%
IDACORP, Inc. (NYSE-IDA)	4.0%	5.0%	4.5%	4.5%
MGE Energy, Inc. (NYSE-MGEE)	4.0%	4.0%	4.0%	4.0%
Nextera Energy (NYSE-NEE)	5.2%	5.7%	5.7%	5.5%
OGE Energy Corp. (NYSE-OGE)	5.0%	5.5%	5.0%	5.2%
Pepco Holdings, Inc. (NYSE-POM)	4.9%	3.4%	4.9%	4.4%
PG&E Corporation (NYSE-PCG)	1.5%	2.5%	2.9%	2.3%
Pinnacle West Capital Corp. (NYSE-PNW)	6.2%	5.7%	6.0%	6.0%
PNM Resources, Inc. (NYSE-PNM)	9.3%	9.3%	9.5%	9.3%
Portland General Electric (NYSE-POR)	3.7%	4.1%	4.3%	4.0%
SCANA Corporation (NYSE-SCG)	4.5%	4.8%	4.6%	4.6%
Southern Company (NYSE-SO)	5.4%	5.0%	5.5%	5.3%
TECO Energy, Inc. (NYSE-TE)	3.5%	3.9%	4.6%	4.0%
UIL Holdings Corporation (NYSE-UIL)	4.1%	4.5%	4.3%	4.3%
UniSource Energy Corporation (NYSE-UNS)	5.5%	4.5%	5.5%	5.2%
Westar Energy, Inc. (NYSE-WR)	4.6%	6.2%	5.6%	5.5%
Wisconsin Energy Corporation (NYSE-WEC)	5.5%	5.3%	6.5%	5.7%
Xcel Energy Inc. (NYSE-XEL)	5.1%	4.9%	5.0%	5.0%
Mean	4.1%	4.4%	4.5%	4.3%
Median	4.6%	4.9%	4.6%	4.6%

Data Sources: www.reuters.com, www.zacks.com, http://quote.yahoo.com, June 28, 2012.

Attachment JRW-10

California Energy Companies
DCF Equity Cost Growth Rate Measures
Analysts Projected EPS Growth Rate Estimates

Panel B
Gas Proxy Group

Company	Yahoo	Zack's	Reuters	Average
AGL Resources Inc. (NYSE-GAS)	-5.7%	4.3%	5.0%	1.2%
Atmos Energy Corporation (NYSE-ATO)	4.4%	5.0%	5.4%	4.9%
Laclede Group, Inc. (NYSE-LG)	5.3%	3.0%	5.0%	4.4%
Northwest Natural Gas Co. (NYSE-NWN)	4.5%	4.1%	4.2%	4.3%
Piedmont Natural Gas Co., Inc. (NYSE-PNY)	4.6%	4.7%	5.2%	4.8%
South Jersey Industries, Inc. (NYSE-SJI)	9.0%	6.0%	8.0%	7.7%
Southwest Gas Corporation (NYSE-SWX)	4.2%	4.4%	2.6%	3.7%
WGL Holdings, Inc. (NYSE-WGL)	4.8%	4.9%	4.8%	4.8%
Mean	3.9%	4.6%	5.0%	4.5%
Median	4.5%	4.6%	5.0%	4.6%

Data Sources: www.reuters.com, www.zacks.com, http://quote.yahoo.com, July 4, 2012.

Attachment JRW-10

California Energy Companies
DCF Growth Rate Indicators

Electric and Gas Proxy Groups
Summary Growth Rates

Growth Rate Indicator	Electric Proxy Group	Gas Proxy Group
Historic *Value Line* Growth in EPS, DPS, and BVPS	3.3%	4.5%
Projected *Value Line* Growth in EPS, DPS, and BVPS	4.3%	4.0%
Sustainable Growth ROE * Retention Rate	4.0%	4.7%
Projected EPS Growth from Yahoo, Zacks, and Reuters	4.6%	4.6%
Average of Historic and Projected Growth Rates	4.1%	4.5%
Average of Sustainable and Projected Growth Rates	4.3%	4.4%

Attachment JRW-11

California Energy Companies
Capital Asset Pricing Model

Panel A
Electric Proxy Group

Risk-Free Interest Rate	**4.00%**
Beta*	**0.73**
Ex Ante Equity Risk Premium**	**5.01%**
CAPM Cost of Equity	**7.7%**

* See page 3 of Attachment JRW-11
** See pages 5 and 6 of Attachment JRW-11

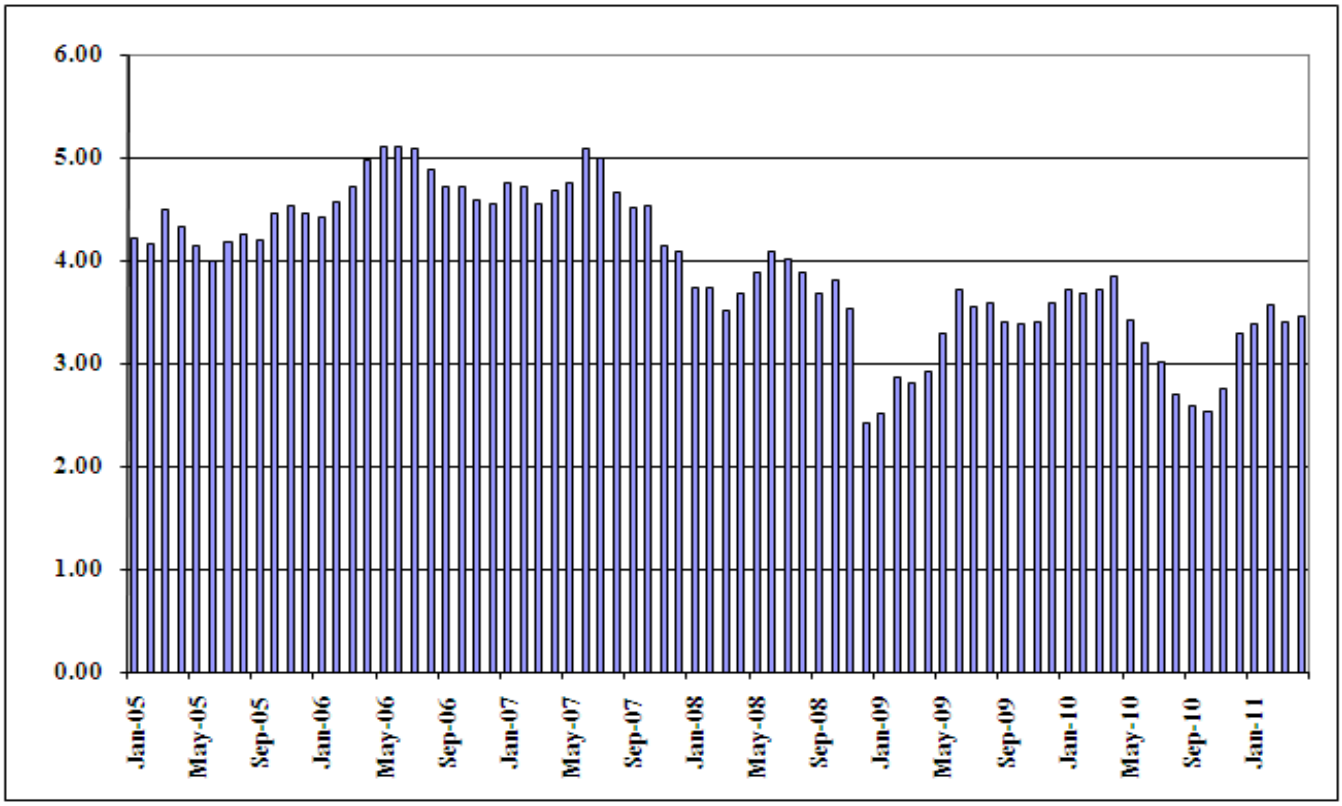
Panel B
Gas Proxy Group

Risk-Free Interest Rate	**4.00%**
Beta*	**0.68**
Ex Ante Equity Risk Premium**	**5.01%**
CAPM Cost of Equity	**7.4%**

* See page 3 of Attachment JRW-11
** See pages 5 and 6 of Attachment JRW-11

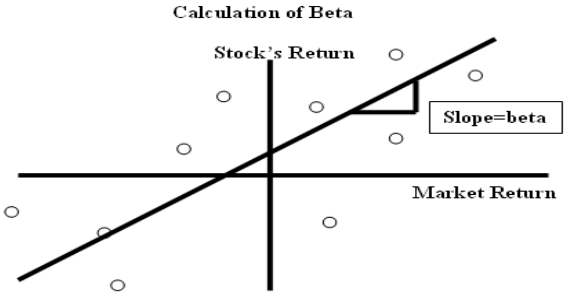
Attachment JRW-11

Ten-Year U.S. Treasury Yields
January 2000-Present



Attachment JRW-11

Panel A
Betas



Electric Proxy Group

Company Name	Beta
ALLETE, Inc. (NYSE-ALE)	0.70
Alliant Energy Corporation (NYSE-LNT)	0.75
Ameren Corporation (NYSE-AEE)	0.80
American Electric Power Co. (NYSE-AEP)	0.70
Avista Corporation (NYSE-AVA)	0.70
Black Hills Corporation (NYSE-BKH)	0.85
Cleco Corporation (NYSE-CNL)	0.65
CMS Energy Corporation (NYSE-CMS)	0.75
Consolidated Edison, Inc. (NYSE-ED)	0.60
Dominion Resources, Inc. (NYSE-D)	0.70
DTE Energy Company (NYSE-DTE)	0.75
Edison International (NYSE-EIX)	0.80
Entergy Corporation (NYSE-ETR)	0.70
Exelon Corporation (NYSE-EXC)	0.80
FirstEnergy Corporation (ASE-FE)	0.80
Great Plains Energy Incorporated (NYSE-GXP)	0.75
Hawaiian Electric Industries, Inc. (NYSE-HE)	0.70
IDACORP, Inc. (NYSE-IDA)	0.70
MGE Energy, Inc. (NYSE-MGEE)	0.60
Nextera Energy (NYSE-NEE)	0.75
OGE Energy Corp. (NYSE-OGE)	0.80
Pepco Holdings, Inc. (NYSE-POM)	0.75
PG&E Corporation (NYSE-PCG)	0.55
Pinnacle West Capital Corp. (NYSE-PNW)	0.70
PNM Resources, Inc. (NYSE-PNM)	0.95
Portland General Electric (NYSE-POR)	0.75
SCANA Corporation (NYSE-SCG)	0.70
Southern Company (NYSE-SO)	0.55
TECO Energy, Inc. (NYSE-TE)	0.85
UIL Holdings Corporation (NYSE-UIL)	0.70
UniSource Energy Corporation (NYSE-UNS)	0.75
Westar Energy, Inc. (NYSE-WR)	0.75
Wisconsin Energy Corporation (NYSE-WEC)	0.65
Xcel Energy Inc. (NYSE-XEL)	0.65
Mean	0.73
Median	0.73

Data Source: *Value Line Investment Survey, 2012.*

Gas Proxy Group

Company	Beta
AGL Resources Inc. (NYSE-ATG)	0.75
Atmos Energy Corporation (NYSE-ATO)	0.70
Laclede Group, Inc. (NYSE-LG)	0.60
Northwest Natural Gas Co. (NYSE-NWN)	0.60
Piedmont Natural Gas Co., Inc. (NYSE-PNY)	0.70
South Jersey Industries, Inc. (NYSE-SJI)	0.65
Southwest Gas Corporation (NYSE-SWX)	0.75
WGL Holdings, Inc. (NYSE-WGL)	0.65
Mean	0.68
Median	0.68

Data Source: *Value Line Investment Survey, 2012.*

Attachment JRW-11

Risk Premium Approaches

	Historical Ex Post Excess Returns	Surveys	Ex Ante Models and Market Data
Means of Assessing the Equity-Bond Risk Premium	Historical average is a popular proxy for the ex ante premium – but likely to be misleading	Investor and expert surveys can provide direct estimates of prevailing expected returns/premiums	Current financial market prices (simple valuation ratios or DCF-based measures) can give most objective estimates of feasible ex ante equity-bond risk premium
Problems/Debated Issues	Time variation in required returns and systematic selection and other biases have boosted valuations over time, and have exaggerated realized excess equity returns compared with ex ante expected premiums	Limited survey histories and questions of survey representativeness. Surveys may tell more about hoped-for expected returns than about objective required premiums due to irrational biases such as extrapolation.	Assumptions needed for DCF inputs, notably the trend earnings growth rate, make even these models' outputs subjective. The range of views on the growth rate, as well as the debate on the relevant stock and bond yields, leads to a range of premium estimates.

Source: Antti Ilmanen, Expected Returns on Stocks and Bonds," *Journal of Portfolio Management* , (Winter 2003).

Attachment JRW-11

California Energy Companies
Capital Asset Pricing Model
Equity Risk Premium

Category	Study Author	Publication Date	Time Period Of Study	Methodology	Return Measure	Range Low	Range High	Midpoint of Range	Mean	Median
Historical Risk Premium										
	Ibbotson	2012	1926-2011	Historical	Arithmetic				5.70%	
					Geometric				4.10%	
	Bate	2008	1900-2007	Historical	Geometric				4.50%	
	Shiller	2006	1926-2005	Historical	Arithmetic				7.00%	
					Geometric				5.50%	
	Damodoran	2006	1926-2005	Historical	Arithmetic				6.70%	
					Geometric				5.10%	
	Siegel	2005	1926-2005	Historical	Arithmetic				6.10%	
					Geometric				4.60%	
	Dimson, Mar	2006	1900-2005	Historical	Arithmetic				5.50%	
	Goyal & Wel	2006	1872-2004	Historical Stock Returns - Bond Returns					4.77%	
	Median									5.50%
Ex Ante Models (Puzzle Research)										
	Claus Thoma	2001	1985-1998	Abnormal Earnings Model					3.00%	
	Arnott and Be	2002	1810-2001	Fundamentals - Div Yld + Growth					2.40%	
	Constantinide	2002	1872-2000	Historical Returns & Fundamentals - P/D & P/E					6.90%	
	Cornell	1999	1926-1997	Historical Returns &		3.50%	5.50%	4.50%	4.50%	
	Easton, Taylo	2002	1981-1998	Residual Income Model					5.30%	
	Fama French	2002	1951-2000	Fundamental DCF v		2.55%	4.32%		3.44%	
	Harris & Mar	2001	1982-1998	Fundamental DCF with Analysts' EPS Growth					7.14%	
	Best & Byrne	2001								
	McKinsey	2002	1962-2002	Fundamental (P/E, l		3.50%	4.00%		3.75%	
	Siegel	2005	1802-2001	Historical Geometric					2.50%	
	Grabowski	2006	1926-2005	Historical and Proje		3.50%	6.00%	4.75%	4.75%	
	Maheu & Mc	2006	1885-2003	Historical Excess R		4.02%	5.10%	4.56%	4.56%	
	Bostock	2004	1960-2002	Bond Yields, Credit		3.90%	1.30%	2.60%	2.60%	
	Bakshi & Che	2005	1982-1998	Fundamentals - Interest Rates					7.31%	
	Donaldson, K	2006	1952-2004	Fundamental, Divid		3.00%	4.00%	3.50%	3.50%	
	Campbell	2008	1982-2007	Historical & Project		4.10%	5.40%		4.75%	
	Best & Byrne	2001	Projection	Fundamentals - Div Yld + Growth					2.00%	
	Fernandez	2007	Projection	Required Equity Risk Premium					4.00%	
	DeLong & M	2008	Projection	Earnings Yield - TIPS					3.22%	
	Damodoran	2012	Projection	Fundamentals - Implied from FCF to Equity Model					6.11%	
	Social Security									
	Office of Chief Actuary		1900-1995							
	John Campbe	2001	1860-2000	Historical &	Arithmet	3.00%	4.00%	3.50%	3.50%	
			Projected for 75 Years		Geometr	1.50%	2.50%	2.00%	2.00%	
	Peter Diamon	2001	Projected for 75 Years	Fundamentals (D/P,		3.00%	4.80%	3.90%	3.90%	
	John Shoven	2001	Projected for 75 Years	Fundamentals (D/P,		3.00%	3.50%	3.25%	3.25%	
	Median									3.75%
Surveys										
	Survey of Fin	2012	10-Year Projection	About 50 Financial Forecastsers					2.80%	
	Duke - CFO M	2012	10-Year Projection	Approximately 500 CFOs					4.90%	
	Welch - Acad	2008	30-Year Projection	Random Academics		5.00%	5.74%	5.37%	5.37%	
	Fernandez - A	2012	Long-Term	Survey of Academics					5.60%	
	Fernandez - A	2012	Long-Term	Survey of Analysts					5.00%	
	Fernandez - C	2012	Long-Term	Survey of Companies					5.50%	
	Median									5.19%
Building Block										
	Ibbotson and	2012	1926-2010	Historical	Arithmetic			5.99%	4.95%	
					Geometric			3.91%		
	Woolridge		2012	Current Supply Model (D/P & Earnings Growth)					5.10%	
	Median									5.03%
Mean										**4.87%**
Median										**5.11%**

Attachment JRW-11

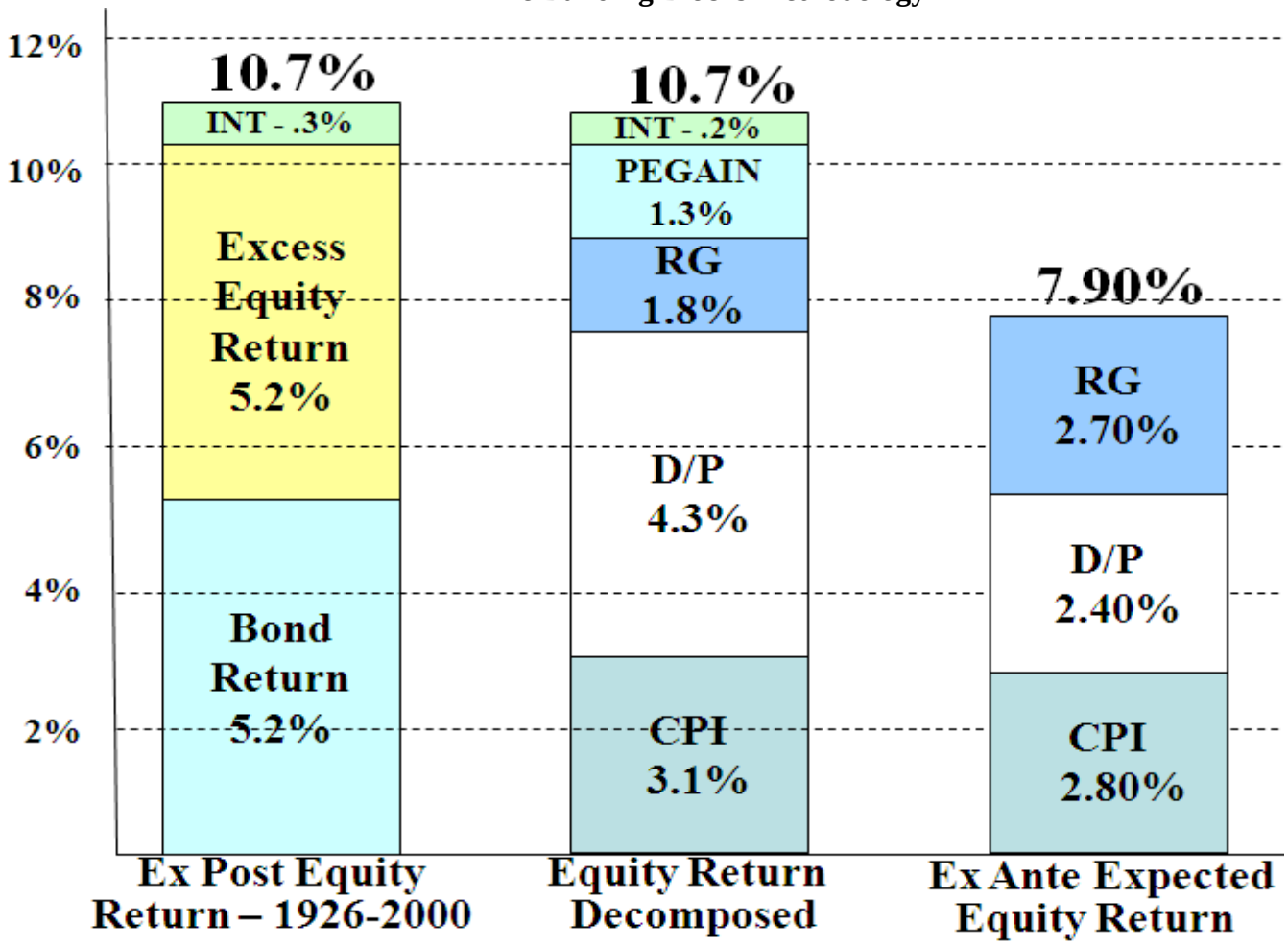
California Energy Companies
Capital Asset Pricing Model
Equity Risk Premium
Summary of 2010-12 Equity Risk Premium Studies

Summary of 2010-12 Equity Risk Premium Studies

Category	Study Authors	Publication Date	Time Period Of Study	Methodol	Return Measure	Range Low	Range High	Midpoint of Range	Mean	Average
Historical Risk Premium										
	Ibbotson	2012	1926-2011	Histori	Arithmetic				5.70%	
					Geometric				4.10%	
	Median									4.90%
Ex Ante Models (Puzzle Research)										
	Damodoran	2012	Projection	Fundamentals - Implied from FCF to Equity Model					6.11%	
	Median									6.11%
Surveys										
	Survey of Financial Fore	2012	Year Project	About 50 Financial Forecastsers					2.80%	
	Duke - CFO Magazine S	2012	Year Project	Approximately 500 CFOs					4.50%	
	Fernandez - Academics	2012	Long-Term	Survey of Academics					5.60%	
	Fernandez - Analysts	2012	Long-Term	Survey of Analysts					5.00%	
	Fernandez - Companies	2012	Long-Term	Survey of Companies					5.50%	
	Median									5.00%
Building Block										
	Ibbotson and Chen	2012	1926-2010	Histori	Arithmetic			5.99%	4.95%	
					Geometric			3.91%		
	Woolridge		2012	Current Supply Model (D/P & Earnings Growth)					5.10%	
	Median									5.03%
Mean										**5.26%**
Median										**5.01%**

Attachment JRW-11

California Energy Companies
Decomposing Equity Market Returns
The Building Blocks Methodology



Attachment JRW-11

California Energy Companies

2012 Survey of Professional Forecasters
Philadelphia Federal Reserve Bank
Long-Term Forecasts

Table Seven
LONG-TERM (10 YEAR) FORECASTS

Panel A

SERIES: CPI INFLATION RATE	
STATISTIC	
MINIMUM	0.99
LOWER QUARTILE	2.10
MEDIAN	2.30
UPPER QUARTILE	2.70
MAXIMUM	6.40
MEAN	2.49
STD. DEV.	0.84
N	37
MISSING	8

Panel B

SERIES: REAL GDP GROWTH RATE	
STATISTIC	
MINIMUM	1.90
LOWER QUARTILE	2.50
MEDIAN	2.64
UPPER QUARTILE	2.90
MAXIMUM	3.75
MEAN	2.67
STD. DEV.	0.41
N	37
MISSING	8

Panel C

SERIES: PRODUCTIVITY GROWTH	
STATISTIC	
MINIMUM	1.20
LOWER QUARTILE	1.60
MEDIAN	1.85
UPPER QUARTILE	2.10
MAXIMUM	3.10
MEAN	1.93
STD. DEV.	0.45
N	26
MISSING	19

Panel D

SERIES: STOCK RETURNS (S&P 500)	
STATISTIC	
MINIMUM	4.00
LOWER QUARTILE	5.00
MEDIAN	6.80
UPPER QUARTILE	7.60
MAXIMUM	9.20
MEAN	6.30
STD. DEV.	1.54
N	19
MISSING	26

Panel E

SERIES: BOND RETURNS (10-YEAR)	
STATISTIC	
MINIMUM	-2.00
LOWER QUARTILE	3.40
MEDIAN	4.00
UPPER QUARTILE	4.50
MAXIMUM	8.40
MEAN	3.83
STD. DEV.	1.72
N	26
MISSING	19

Panel F

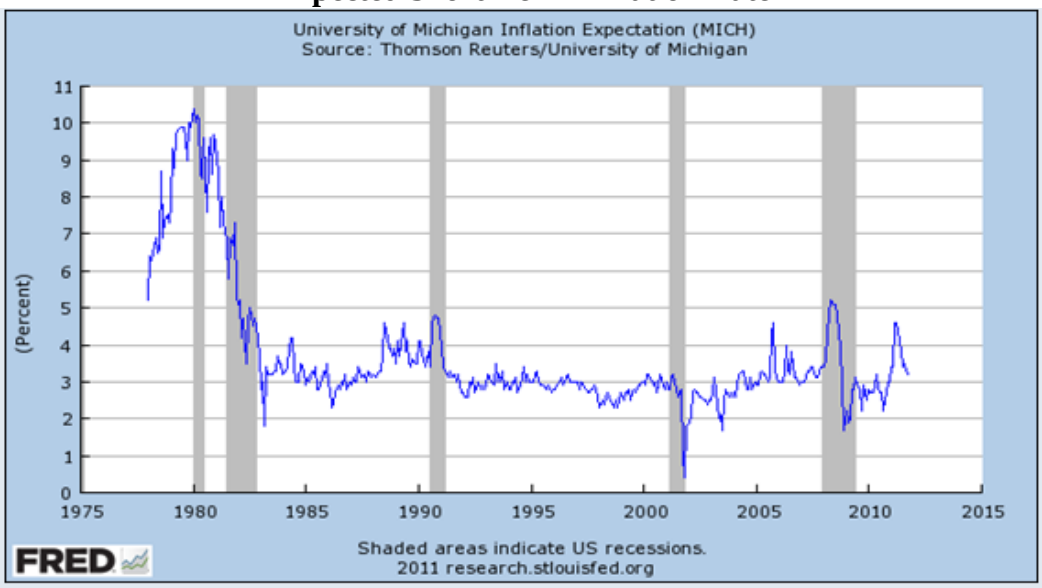
SERIES: BILL RETURNS (3-MONTH)	
STATISTIC	
MINIMUM	-2.00
LOWER QUARTILE	2.75
MEDIAN	3.00
UPPER QUARTILE	3.31
MAXIMUM	4.75
MEAN	2.93
STD. DEV.	1.13
N	30
MISSING	13

Source: Philadelphia Federal Researve Bank, Survey of Professional Forecasters, February 10, 2012.

Attachment JRW-11

California Energy Companies

University of Michigan Survey Research Center
Expected Short-Term Inflation Rate

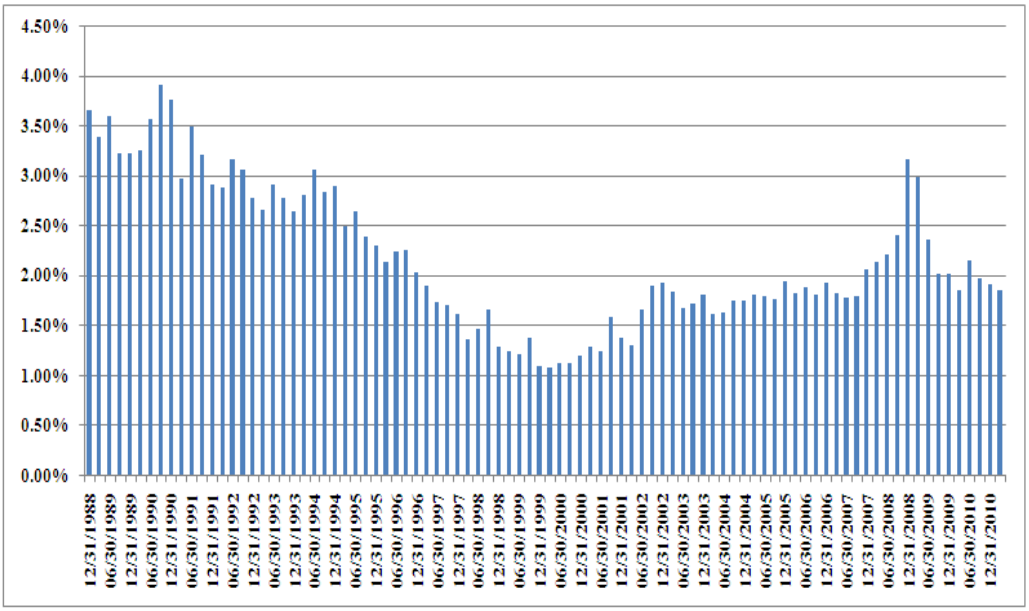


Data Source: http://research.stlouisfed.org/fred2/series/MICH?cid=98

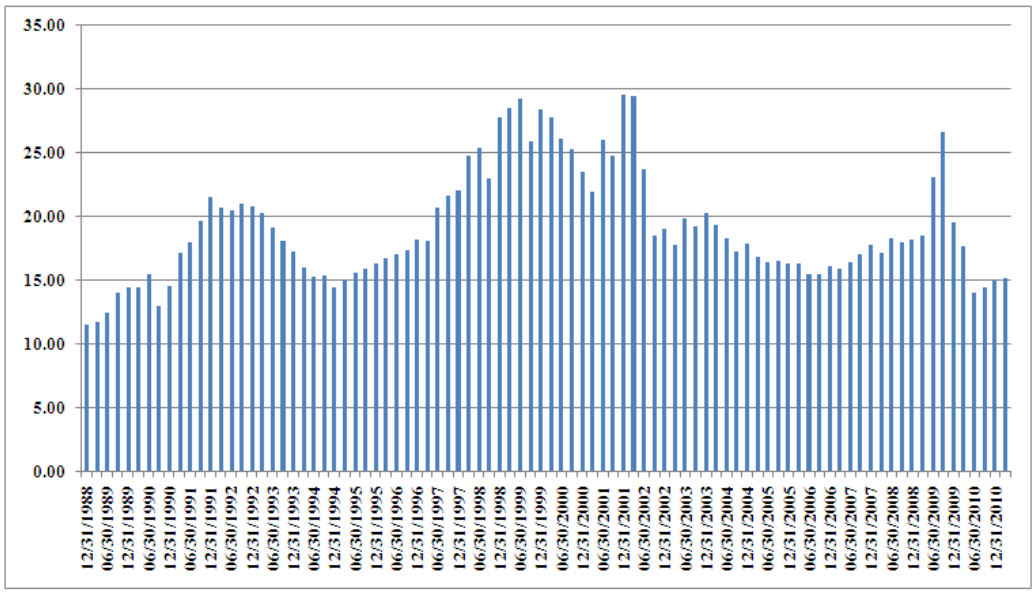
Attachment JRW-11

Decomposing Equity Market Returns
The Building Blocks Methodology

S&P 500 Dividend Yield



S&P 500 P/E Ratio



Attachment JRW-11

California Energy Companies
CAPM
Real S&P 500 EPS Growth Rate

Year	S&P 500 EPS	Annual Inflation CPI	Inflation Adjustment Factor	Real S&P 500 EPS	
1960	3.10	1.48		3.10	
1961	3.37	0.07	1.01	3.35	
1962	3.67	1.22	1.02	3.59	
1963	4.13	1.65	1.04	3.99	
1964	4.76	1.19	1.05	4.55	
1965	5.30	1.92	1.07	4.97	
1966	5.41	3.35	1.10	4.90	
1967	5.46	3.04	1.14	4.80	
1968	5.72	4.72	1.19	4.81	
1969	6.10	6.11	1.26	4.83	10-Year
1970	5.51	5.49	1.34	4.13	2.89%
1971	5.57	3.36	1.38	4.04	
1972	6.17	3.41	1.43	4.33	
1973	7.96	8.80	1.55	5.13	
1974	9.35	12.20	1.74	5.37	
1975	7.71	7.01	1.86	4.14	
1976	9.75	4.81	1.95	4.99	
1977	10.87	6.77	2.08	5.22	
1978	11.64	9.03	2.27	5.13	
1979	14.55	13.31	2.57	5.66	10-Year
1980	14.99	12.40	2.89	5.18	2.30%
1981	15.18	8.94	3.15	4.82	
1982	13.82	3.87	3.27	4.23	
1983	13.29	3.80	3.40	3.91	
1984	16.84	3.95	3.53	4.77	
1985	15.68	3.77	3.66	4.28	
1986	14.43	1.13	3.70	3.90	
1987	16.04	4.41	3.87	4.15	
1988	22.77	4.42	4.04	5.64	
1989	24.03	4.65	4.22	5.69	10-Year
1990	21.73	6.11	4.48	4.85	-0.65%
1991	19.10	3.06	4.62	4.14	
1992	18.13	2.90	4.75	3.81	
1993	19.82	2.75	4.88	4.06	
1994	27.05	2.67	5.01	5.40	
1995	35.35	2.54	5.14	6.88	
1996	35.78	3.32	5.31	6.74	
1997	39.56	1.70	5.40	7.33	
1998	38.23	1.61	5.48	6.97	
1999	45.17	2.68	5.63	8.02	10-Year
2000	52.00	3.39	5.82	8.93	6.29%
2001	44.23	1.55	5.92	7.48	
2002	47.24	2.38	6.06	7.80	
2003	54.15	1.88	6.17	8.77	
2004	67.01	3.26	6.37	10.51	
2005	68.32	3.42	6.60	10.35	
2006	81.96	2.54	6.77	12.11	
2007	87.51	4.08	7.04	12.43	
2008	65.39	0.09	7.05	9.28	
2009	59.65	2.72	7.24	8.24	10-Year
2010	83.66	1.50	7.35	11.39	2.46%
2011	97.05	2.96	7.57	12.83	
Data Source: http://pages.stern.nyu.edu/~adamodar/				Real EPS Growth	**2.8%**

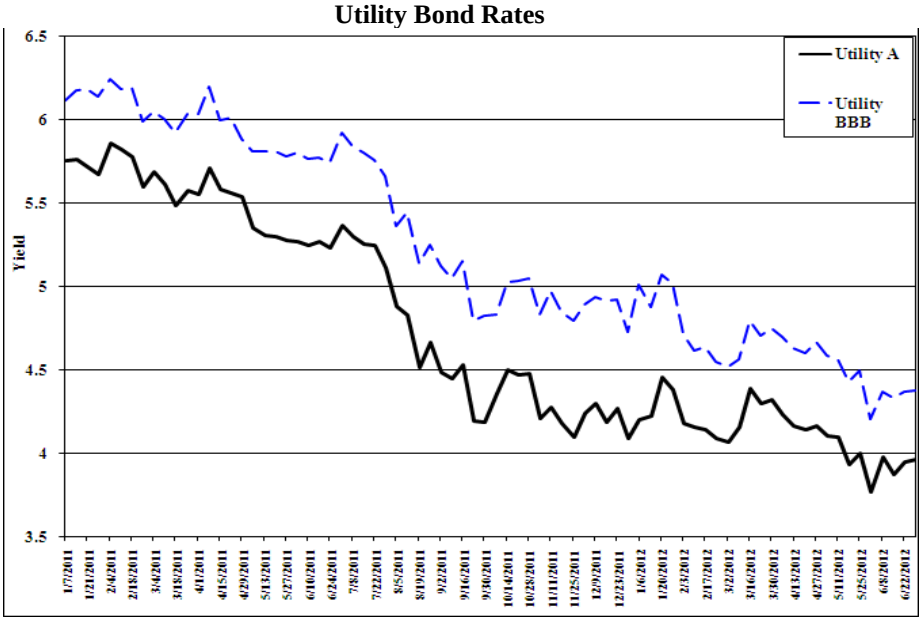
Attachment JRW-12
California Energy Companies
Historical Risk Premium Analysis

Historical Risk Premium Analysis

Panel A
Historical Risk Premium Equity Cost Rate

HRP Based on Utility Bond Yields		
Prospective Utility Bond Yields		
Utility A Rated	4.50%	
Utility BBB Rated	5.00%	
Average		4.75%
Risk Premium		
SCE Arithmetic	3.32%	
SCE Geometric	2.16%	
Average		2.74%
HRP Equity Cost Rate		7.49%
HRP Based on Treasury Bond Yields		
Prospective Treasury Bond Yields		
Long-Term	4.00%	
Average		4.00%
Risk Premium		
SCG Arithmetic	5.58%	
SCG Geometric	3.89%	
Average		4.73%
HRP Equity Cost Rate		8.73%

Panel B
Utility Bond Rates



Attachment JRW-12
California Energy Companies
Historical Risk Premium Analysis

	Year	S&P Utility Index Return	Bond Total Return		Year	S&P Utility Index Return	Bond Total Return
1	1932	-0.54%	17.64%	41	1972	8.15%	5.74%
2	1933	-21.87%	0.11%	42	1973	-18.07%	-7.30%
3	1934	-20.41%	9.83%	43	1974	-21.55%	3.79%
4	1935	76.63%	5.53%	44	1975	44.49%	3.16%
5	1936	20.69%	6.03%	45	1976	31.81%	16.87%
6	1937	-37.04%	-0.21%	46	1977	8.64%	-0.89%
7	1938	22.45%	6.01%	47	1978	-3.71%	-0.72%
8	1939	11.26%	6.68%	48	1979	13.58%	-0.72%
9	1940	-17.15%	7.54%	49	1980	15.08%	-3.96%
10	1941	-31.57%	0.30%	50	1981	11.74%	2.63%
11	1942	15.39%	-4.56%	51	1982	26.52%	32.58%
12	1943	46.07%	2.15%	52	1983	20.01%	3.26%
13	1944	18.03%	2.79%	53	1984	26.04%	14.04%
14	1945	53.33%	10.18%	54	1985	33.05%	30.63%
15	1946	1.26%	-0.12%	55	1986	28.53%	26.22%
16	1947	-13.16%	-2.77%	56	1987	-2.92%	-3.99%
17	1948	4.01%	3.38%	57	1988	18.27%	9.38%
18	1949	31.39%	6.93%	58	1989	47.80%	19.16%
19	1950	3.25%	-0.32%	59	1990	-2.57%	5.48%
20	1951	18.63%	-4.69%	60	1991	14.61%	20.33%
21	1952	19.25%	1.17%	61	1992	8.10%	7.72%
22	1953	7.85%	3.56%	62	1993	14.41%	15.23%
23	1954	24.72%	3.05%	63	1994	-7.94%	-7.82%
24	1955	11.26%	-0.74%	64	1995	42.15%	30.59%
25	1956	5.06%	-4.23%	65	1996	3.14%	-1.60%
26	1957	6.36%	6.67%	66	1997	24.69%	14.92%
27	1958	40.70%	-4.97%	67	1998	14.82%	13.29%
28	1959	7.49%	-4.71%	68	1999	-8.85%	-9.74%
29	1960	20.26%	13.80%	69	2000	59.70%	21.65%
30	1961	29.33%	-0.92%	70	2001	-30.41%	3.57%
31	1962	-2.44%	6.90%	71	2002	-30.04%	17.33%
32	1963	12.36%	0.99%	72	2003	26.11%	1.48%
33	1964	15.91%	3.37%	73	2004	24.22%	8.54%
34	1965	4.67%	0.69%	74	2005	16.79%	7.82%
35	1966	-4.48%	3.85%	75	2006	20.95%	0.82%
36	1967	-0.63%	-7.55%	76	2007	19.36%	10.28%
37	1968	10.32%	0.70%	77	2008	-28.99%	26.43%
38	1969	-15.42%	-3.62%	78	2009	11.94%	-17.13%
39	1970	16.56%	11.21%	79	2010	5.49%	10.52%
40	1971	2.41%	12.39%	80	2011	19.88%	7.31%
				Arithmetic Mean		11.22%	5.64%
				Geometric Mean		9.11%	5.22%

Data; Southern Califonia Gas, Exhibit RAM-7.

Attachment JRW-12
California Energy Companies
Historical Risk Premium Analysis

	Year	S&P Utility Index Return	Bond Total Return		Year	S&P Utility Index Return	Bond Total Return
1	1947	-12.17%	-1.05%	33	1979	0.51%	-8.96%
2	1948	1.48%	1.36%	34	1980	6.86%	-2.13%
3	1949	24.50%	7.41%	35	1981	20.45%	1.39%
4	1950	5.28%	2.68%	36	1982	35.60%	39.43%
5	1951	17.26%	-2.53%	37	1983	13.36%	18.04%
6	1952	19.67%	4.53%	38	1984	24.72%	18.96%
7	1953	9.19%	0.21%	39	1985	25.35%	30.76%
8	1954	23.46%	9.42%	40	1986	28.07%	29.96%
9	1955	12.33%	1.28%	41	1987	-7.30%	-1.38%
10	1956	2.83%	-7.79%	42	1988	17.16%	11.55%
11	1957	10.29%	-0.62%	43	1989	31.49%	16.24%
12	1958	38.35%	3.04%	44	1990	2.06%	7.76%
13	1959	4.77%	-1.92%	45	1991	28.91%	19.49%
14	1960	21.84%	10.97%	46	1992	5.45%	13.10%
15	1961	28.90%	3.81%	47	1993	12.56%	18.43%
16	1962	1.71%	7.86%	48	1994	-13.17%	-6.63%
17	1963	10.29%	3.38%	49	1995	30.10%	25.54%
18	1964	15.36%	5.17%	50	1996	-0.32%	2.04%
19	1965	2.99%	0.84%	51	1997	25.02%	18.25%
20	1966	-4.34%	-5.72%	52	1998	15.91%	7.06%
21	1967	-2.67%	-5.06%	53	1999	-16.03%	-3.91%
22	1968	8.66%	-0.54%	54	2000	52.19%	12.72%
23	1969	-13.42%	-7.92%	55	2001	-16.54%	6.53%
24	1970	12.59%	11.37%	56	2002	-14.81%	15.51%
25	1971	2.26%	12.74%	57	2003	23.40%	19.36%
26	1972	4.19%	14.81%	58	2004	25.89%	13.03%
27	1973	-18.71%	-0.36%	59	2005	17.42%	4.58%
28	1974	-25.36%	-15.40%	60	2006	22.66%	4.82%
29	1975	50.39%	20.37%	61	2007	22.79%	3.85%
30	1976	23.53%	23.77%	62	2008	-25.37%	-10.11%
31	1977	9.22%	8.22%	63	2009	2.99%	29.42%
32	1978	-3.78%	0.30%	64	2010	3.17%	7.41%
				65	2011	20.46%	19.78%
				Arithmetic Mean		10.80%	7.48%
				Geometric Mean		9.10%	6.94%

Data: Southern Califonia Edison, Appendix D-2.

Panel A
Summary of PG&E's Equity Cost Rate Approaches and Results

Approach	Utility Group	Non-Utility Proxy Group
DCF		
Earnings Growth		
Value Line	10.10%	12.20%
IBES	9.70%	10.90%
Zack's	9.40%	11.70%
br+sv	9.30%	13.20%
CAPM - Current Bond Yield		
Unadjusted	10.80%	
Size Adjusted	11.50%	
Utility Risk Premium		
Projected Bond Yields	10.80%	
Expected Earnings		N/A
Value Line 2014-16	11.40%	N/A

Panel B
Summary of PG&E's DCF Results

	Utility Group	Non-Utility Proxy Group
Average Adjusted Dividend Yield	4.40%	2.90%
Growth*	5.20%	9.10%
DCF Result	9.60%	12.00%

* Expected EPS Growth from IBES, Zacks, and Value Line

Panel C
Summary of PG&E's CAPM Results
2013 Bond Yield

	Utility Group
Risk-Free Rate	3.80%
Beta	0.73
Market Risk Premium	9.70%
CAPM Result	10.80%
Size Adjustment	0.70%
Adjusted CAPM Result	11.5%

Panel D
Summary of PG&E's RP Results
2013 Bond Yield

	Utility Group
BBB Bond Yield	5.88%
Adjusted Risk Premium	4.89%
Risk Premium Result	10.77%

Panel E
Summary of PG&E's Expected Earnings Approach

	Utility Group
Adjusted Expected ROE	11.40%

Panel A
Summary of SDG&E's Equity Cost Rate Approaches and Results

Approach	Cost Rate
CAPM	10.40%
Empirical CAPM	10.90%
Historical RP Electric Utilities	10.10%
Allowed RP Gas Utilities	10.50%
DCF	
Electric & Gas Utilities - Zacks Growth	10.10%
Electric & Gas Utilities - VL Growth	9.60%
Western Utilities - Zacks Growth	11.30%
Western Utilities - VL Growth	10.10%
Equity Cost Rate Conclusion	10.40%
Risk Adjustment	0.50%
Company Risk Adjustment	0.10%
Equity Cost Rate Recommendation	11.00%

Panel B
Summary of SDG&E's CAPM Results

Risk-Free Rate	4.20%
Beta	0.74
Equity Risk Premium	7.90%
CAPM Result	10.1%
Flotation Cost Adjustment	0.30%
Adjusted CAPM Result	10.4%

Summary of SDG&E's ECAPM Results

Risk-Free Rate	4.20%
Alpha	0.25
Beta	0.75
Equity Risk Premium	7.9%
ECAPM Result	10.60%
Flotation Cost Adjustment	0.3%
Adjusted ECAPM Result	10.9%

Panel C
Summary of SDG&E's Risk Premium Results

	Electric Utility Index	Allowed Risk Premium
Base Yield	4.20%	4.20%
Risk Premium	5.60%	6.30%
RP Equity Cost Rate	9.8%	10.5%
Flotation Cost Adjustment	0.30%	
Adjusted RP Result	10.1%	10.5%

Panel D
Summary of SDG&E's DCF Results

	E & G Utilities VL Growth	E & G Utilities Zack's Growth	West Utilities VL Growth	West Utilities Zack's Growth
Adjusted Dividend Yield	4.32%	4.32%	4.20%	4.00%
Growth	5.59%	5.03%	6.88%	5.91%
DCF Result	9.90%	9.35%	11.08%	9.90%
Flotation Cost Adjustment	0.23%	0.23%	0.22%	0.21%
Adjusted DCF Result	10.13%	9.58%	11.30%	10.11%

Panel A
Summary of SCE's Equity Cost Rate Approaches and Results

Approach	Cost Rate	Cost Rate Adjusted for SCE Risks	Cost Rate Adjusted for MV/BV
DCF	9.4%-9.9%	10.1%-10.7%	10.1%-10.7%
CAPM	9.7%-11.7%	9.7%-11.7%	10.2%-12.4%
Historical RP	8.80%	9.30%	9.80%

Panel B
Summary of SCE's DCF Results

	IBES Growth	br*sv Growth	Average
Average Adjusted Dividend Yield	4.65%	4.40%	4.53%
Growth*	5.24%	5.04%	5.14%
DCF Result	9.89%	9.44%	9.67%

Panel C
Summary of SCE's CAPM Results
Relevered Bloomberg Betas

	MRP=7.5%	MRP=9.06%	MRP=8.28%
Risk-Free Rate	3.75%	3.75%	3.75%
Beta	0.855	0.855	0.855
Market Risk Premium	7.50%	9.06%	8.28%
CAPM Result	10.16%	11.50%	10.83%

Relevered Value Line Betas

	MRP=7.5%	MRP=9.06%	MRP=8.28%
Risk-Free Rate	3.75%	3.75%	3.75%
Beta	0.7968	0.7968	0.7968
Market Risk Premium	7.50%	9.06%	8.28%
CAPM Result	10.16%	11.50%	10.83%

Panel D
Summary of SCE's RP Results

Projected Baa Bond Yield	5.52%
Adjusted Risk Premium	3.31%
Risk Premium Result	8.83%

Panel A
Summary of Dr. Morin's Equity Cost Rate Approaches and Results

Approach	Cost Rate
CAPM	10.20%
Empirical CAPM	10.70%
Historical RP Electric Utilities	10.10%
Historical RP Gas Utilities	10.20%
Allowed RP Gas Utilities	10.30%
DCF	
Gas Utilities - Zacks Growth	9.10%
Gas Utilities - VL Growth	8.40%
Electric & Gas Utilities - Zacks Growth	9.60%
Electric & Gas Utilities - VL Growth	10.10%
Equity Cost Rate Conclusion	10.10%
Risk Adjustment	0.40%
Equity Cost Rate Recommendation	10.50%

Panel B
Summary of SCG's CAPM Results

Risk-Free Rate	4.20%
Beta	0.72
Equity Risk Premium	7.90%
CAPM Result	9.9%
Flotation Cost Adjustment	0.30%
Adjusted CAPM Result	10.2%

Summary of SCG's ECAPM Results

Risk-Free Rate	4.20%
Alpha	0.25
Beta	0.75
Equity Risk Premium	7.9%
ECAPM Result	10.40%
Flotation Cost Adjustment	0.30%
Adjusted ECAPM Result	10.7%

Panel C
Summary of SCG's Risk Premium Results

	S&P Utility Index	Gas Utility Index	Allowed Risk Premium
Base Yield	4.20%	4.20%	4.20%
Risk Premium	5.60%	5.70%	6.14%
RP Equity Cost Rate	9.8%	9.9%	10.3%
Flotation Cost Adjustment	0.30%	0.30%	
Adjusted RP Result	10.1%	10.2%	10.3%

Panel D
Summary of SCG's DCF Results

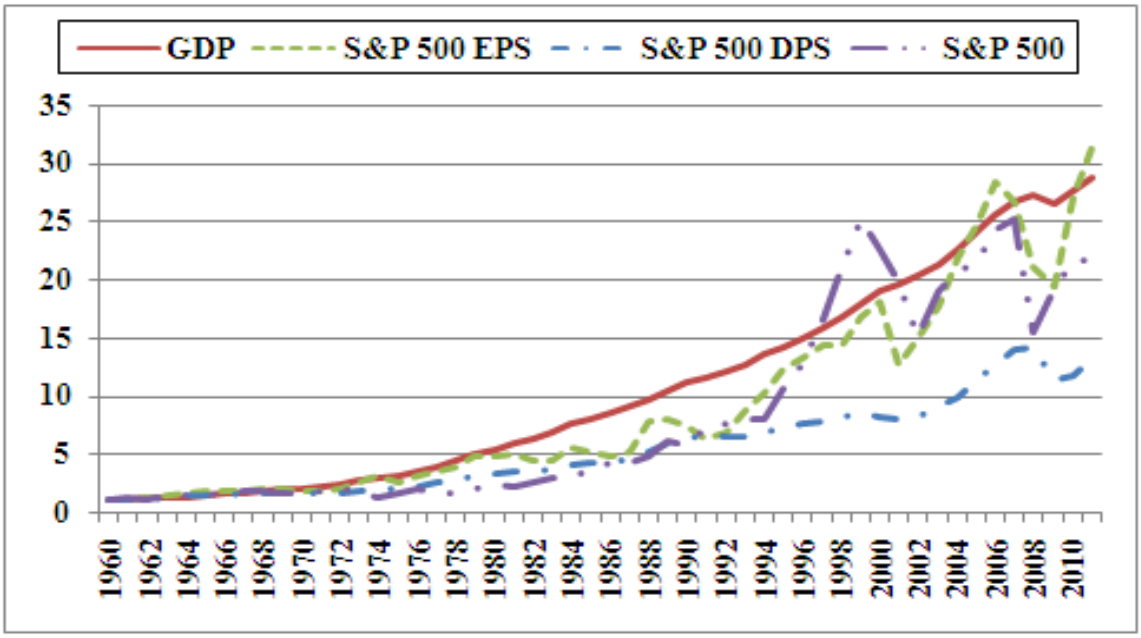
	Gas Utilities Zack's Growth	Gas Utilities VL Growth	E & G Utilities Zack's Growth	E & G Utilities VL Growth
Adjusted Dividend Yield	3.70%	3.70%	4.32%	4.32%
Growth	4.55%	5.71%	5.03%	5.59%
DCF Result	8.24%	8.92%	9.35%	9.90%
Flotation Cost Adjustment	0.20%	0.19%	0.23%	0.23%
Adjusted DCF Result	8.44%	9.11%	9.58%	10.13%

Growth Rates
GNP, S&P 500 Price, EPS, and DPS

	GDP	S&P 500	Earnings	Dividends	
1960	526.4	58.11	3.10	1.98	
1961	544.8	71.55	3.37	2.04	
1962	585.7	63.10	3.67	2.15	
1963	617.8	75.02	4.13	2.35	
1964	663.6	84.75	4.76	2.58	
1965	719.1	92.43	5.30	2.83	
1966	787.7	80.33	5.41	2.88	
1967	832.4	96.47	5.46	2.98	
1968	909.8	103.86	5.72	3.04	
1969	984.4	92.06	6.10	3.24	
1970	1038.3	92.15	5.51	3.19	
1971	1126.8	102.09	5.57	3.16	
1972	1237.9	118.05	6.17	3.19	
1973	1382.3	97.55	7.96	3.61	
1974	1499.5	68.56	9.35	3.72	
1975	1637.7	90.19	7.71	3.73	
1976	1824.6	107.46	9.75	4.22	
1977	2030.1	95.10	10.87	4.86	
1978	2293.8	96.11	11.64	5.18	
1979	2562.2	107.94	14.55	5.97	
1980	2788.1	135.76	14.99	6.44	
1981	3126.8	122.55	15.18	6.83	
1982	3253.2	140.64	13.82	6.93	
1983	3534.6	164.93	13.29	7.12	
1984	3930.9	167.24	16.84	7.83	
1985	4217.5	211.28	15.68	8.20	
1986	4460.1	242.17	14.43	8.19	
1987	4736.4	247.08	16.04	9.17	
1988	5100.4	277.72	24.12	10.22	
1989	5482.1	353.40	24.32	11.73	
1990	5800.5	330.22	22.65	12.35	
1991	5992.1	417.09	19.30	12.97	
1992	6342.3	435.71	20.87	12.64	
1993	6667.4	466.45	26.90	12.69	
1994	7085.2	459.27	31.75	13.36	
1995	7414.7	615.93	37.70	14.17	
1996	7838.5	740.74	40.63	14.89	
1997	8332.4	970.43	44.09	15.52	
1998	8793.5	1229.23	44.27	16.20	
1999	9353.5	1469.25	51.68	16.71	
2000	9951.5	1320.28	56.13	16.27	
2001	10286.2	1148.09	38.85	15.74	
2002	10642.3	879.82	46.04	16.08	
2003	11142.2	1111.91	54.69	17.88	
2004	11853.3	1211.92	67.68	19.41	
2005	12623.0	1248.29	76.45	22.38	
2006	13377.2	1418.30	87.72	25.05	
2007	14028.7	1468.36	82.54	27.73	
2008	14291.5	903.25	65.39	28.05	
2009	13939.0	1115.10	59.65	22.31	
2010	14526.5	1257.64	83.66	23.12	
2011	15094.0	1257.60	97.05	26.02	**Average**
Growth Rates	**6.80**	**6.21**	**6.98**	**5.18**	**6.29**

Data Sources: GDPA - http://research.stlouisfed.org/fred2/categories/106
S&P 500, EPS and DPS - http://pages.stern.nyu.edu/~adamodar/

Long-Term Growth of GDP, S&P 500, S&P 500 EPS, and S&P 500 DPS



	GDP	S&P 500	S&P 500 EPS	S&P 500 DPS
Growth Rates	6.80	6.21	6.98	5.18

Panel A
Historic GDP Growth Rates

10-Year Average	4.2%
20-Year Average	4.9%
30-Year Average	5.8%
40-Year Average	6.9%
50-Year Average	6.9%
60-Year Average	6.9%
Average of Periods	6.0%

Panel B
Projected GDP Growth Rates

	Time Frame	Projected Nominal GDP Growth Rate
Congressional Budget Office	2012-2022	4.8%
Survey of Financial Forecasters	Ten Year	4.9%
Energy Information Administration	2009-2035	4.8%

Sources:
http://www.cbo.gov/sites/default/files/cbofiles/attachments/02-01-OutlookTestimonyHouse.pdf
http://www.philadelphiafed.org/research-and-data/real-time-center/survey-of-professional-forecasters/2012/survq112.cfm