

Client XYZ



GLOBAL WATERSHED ANALYSIS

Setting Long-Run Forecasts for Client XYZ

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Overview

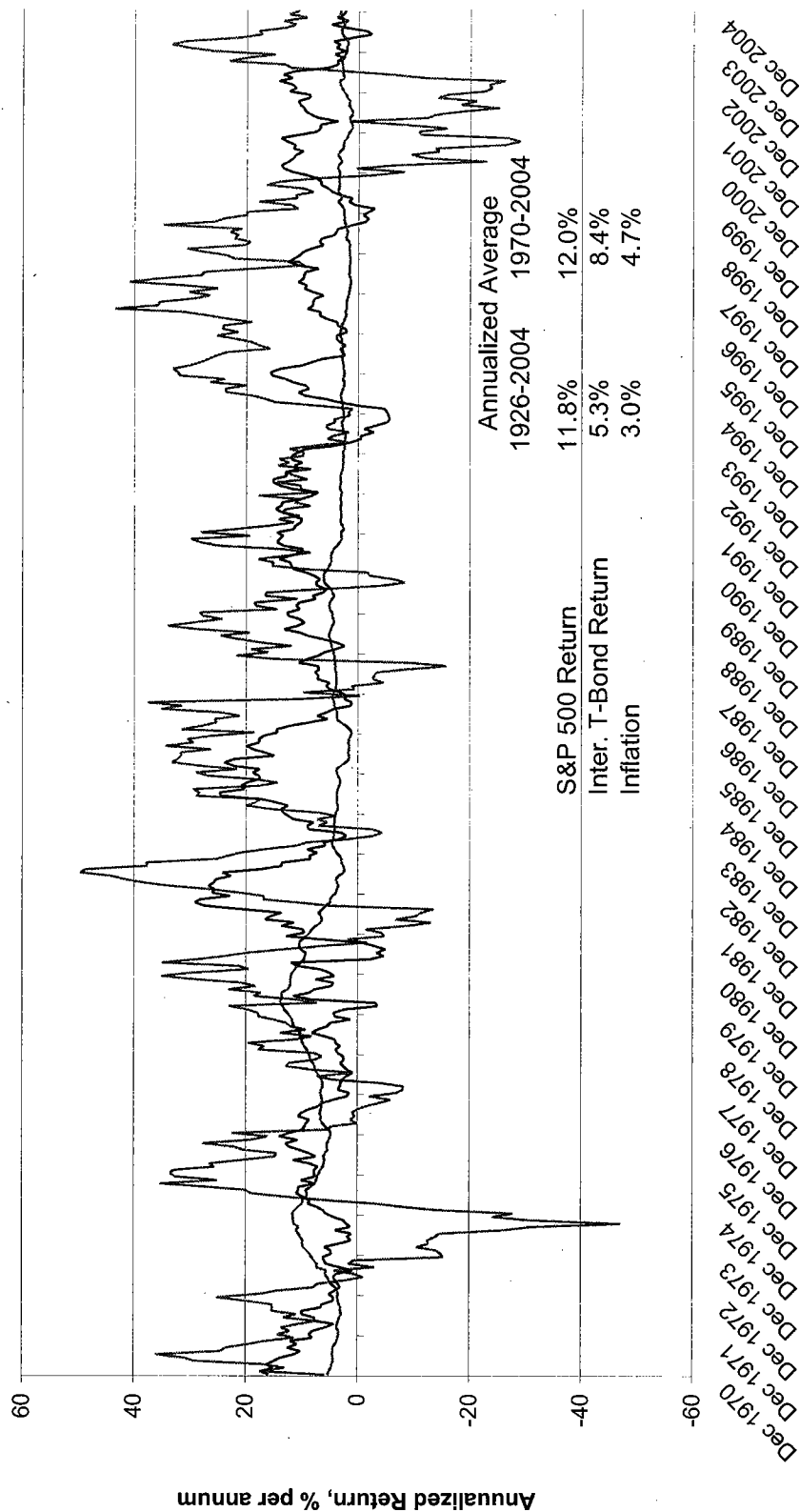
- The historical record of US capital market returns
- How Russell uses the historical record to make forecasts — incorporating theory to better use historical data
- The three components of long-run equity return
- From now to the long-run

Historical Returns

- We focus on the “modern” history (1970-2004) of US stocks and bond returns.
- This period includes extraordinary economic events but is recent enough to be similar to today’s financial, economic and legal environment.
- Reliable data goes back to 1926. We use this data to gain perspective and provide a check on our assumptions.

Historical Returns

Rolling Twelve Month Returns of Stocks and Bonds



12 Months Ended

— S&P 500 — IT Govt TR — Inflation



What About the Future?

- In forecasting the future, the only data we have is from the past.
- The art of forecasting lies in using the data on past returns in a sensible way.
- Financial theory and institutional knowledge are valuable in making sense of the data. They provide structure and impose disciplined thinking.

Forming Expectations from the bottom up

- Return expectations can be divided into components:
 - Component 1: Expected inflation –maintaining purchasing parity
 - Component 2: Real (after inflation) return expectation of a base (very low risk) asset
 - Component 3: Risk premium for additional level of risk relative to the base asset
- The forecast for any asset is the sum of the three components
- A good forecast will give good and understandable forecasts of each component.
- The separation into components facilitates the use of theory and statistical techniques – it is easier to understand each part rather than their sum.

A First Approach – Historical

- The most straightforward way to use the past to forecast the future is to simply take the average historical returns and project them forward:

	1970-2004	1926-2004
Expected Inflation	4.7%	3.0%
Expected Real T-Bond Return	3.7%	2.3%
Equity Risks Premium	3.6%	6.5%
Expected Equity Return	12.0%	11.8%

- Can we do better?

Component 1: Expected Inflation

- Most difficult component to address because it is determined by government policy
- Data:

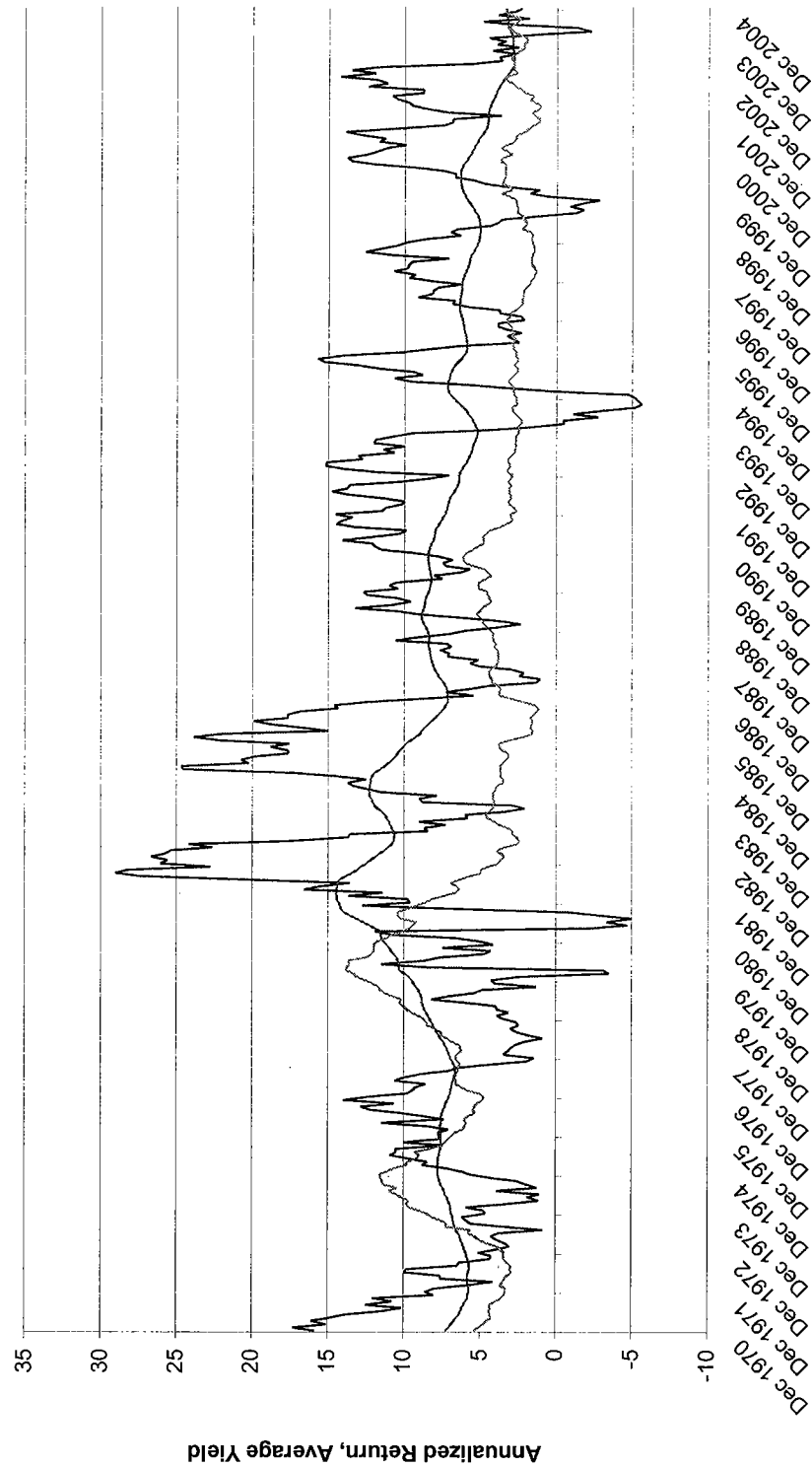
Long History,	1926 – 2004:	3.0%
Modern History,	1970 – 2004:	4.7%
“Normal” Post-War,	1952 – 1972:	2.3%
“Normal” Modern,	1982 – 2004:	3.1%
- We expect “normal” times going forward
- Russell’s long-run forecast for inflation is 3%

Component 2: Expected Real T-Bond Return

- Over the 1970 – 2004 period, the real return on intermediate T-Bonds was 3.7% while the “real yield” was 2.9%. This difference was due to a persistent decline in interest rates and inflation.
- The real yield is a good proxy for the real return investors expect to get. Thus over this period investors were consistently surprised by falling interest rates and inflation.
- In the future we don’t expect this systematic error.
- We use the average real yield over the 1970-2004 period, rounded to 3%.

Intermediate Treasury Yield and Return

Intermediate Treasury Yield and Return

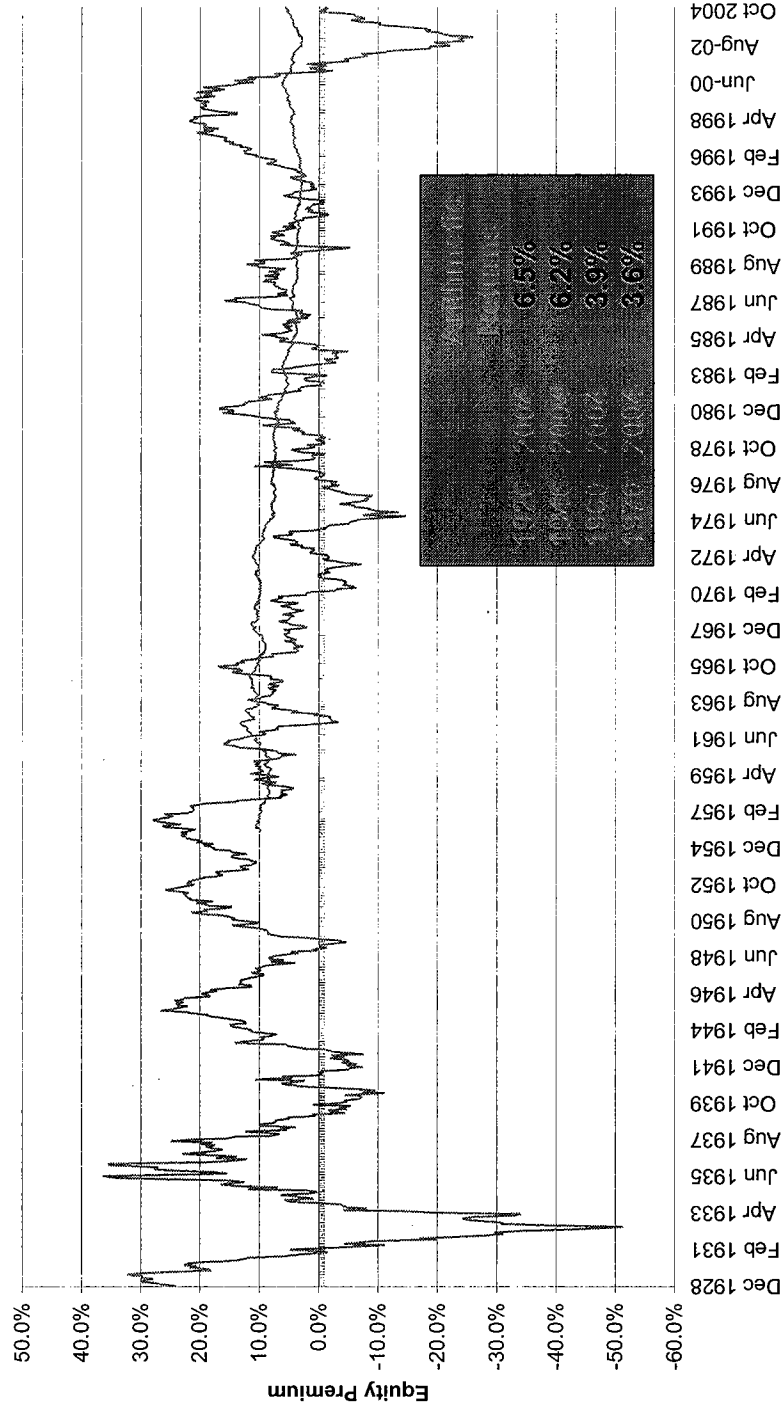


Component 3: Equity Risk Premium

- This component is critical in asset allocation since it is a primary driver of the equity/bond allocation.
- The historical equity premium over the 1970-2004 period was 3.6%.
- The historical equity premium has been generally declining over the past 50 years.

Historical Equity Premium

S&P 500 Minus Intermediate Treasury Bonds
3-Year and 30-Year Rolling Averages



— 3-Year Rolling Average — 30-Year Rolling Average

Source: Ibbotson Associates



Equity Risk Premium: The "Fundamentals" Approach

- An alternative to the historical approach – more structure and theory to guide interpretation of the data
- Concept: the dividend discount model
 - Today's stock price is the present value of the expected stream of future dividends
 - Three ingredients: portion of earnings paid out in dividends, expected growth in earnings, and a discount rate – the "required return"
- Implication:

Required return $\approx$ dividend yield + earnings growth

Fundamentals Approach

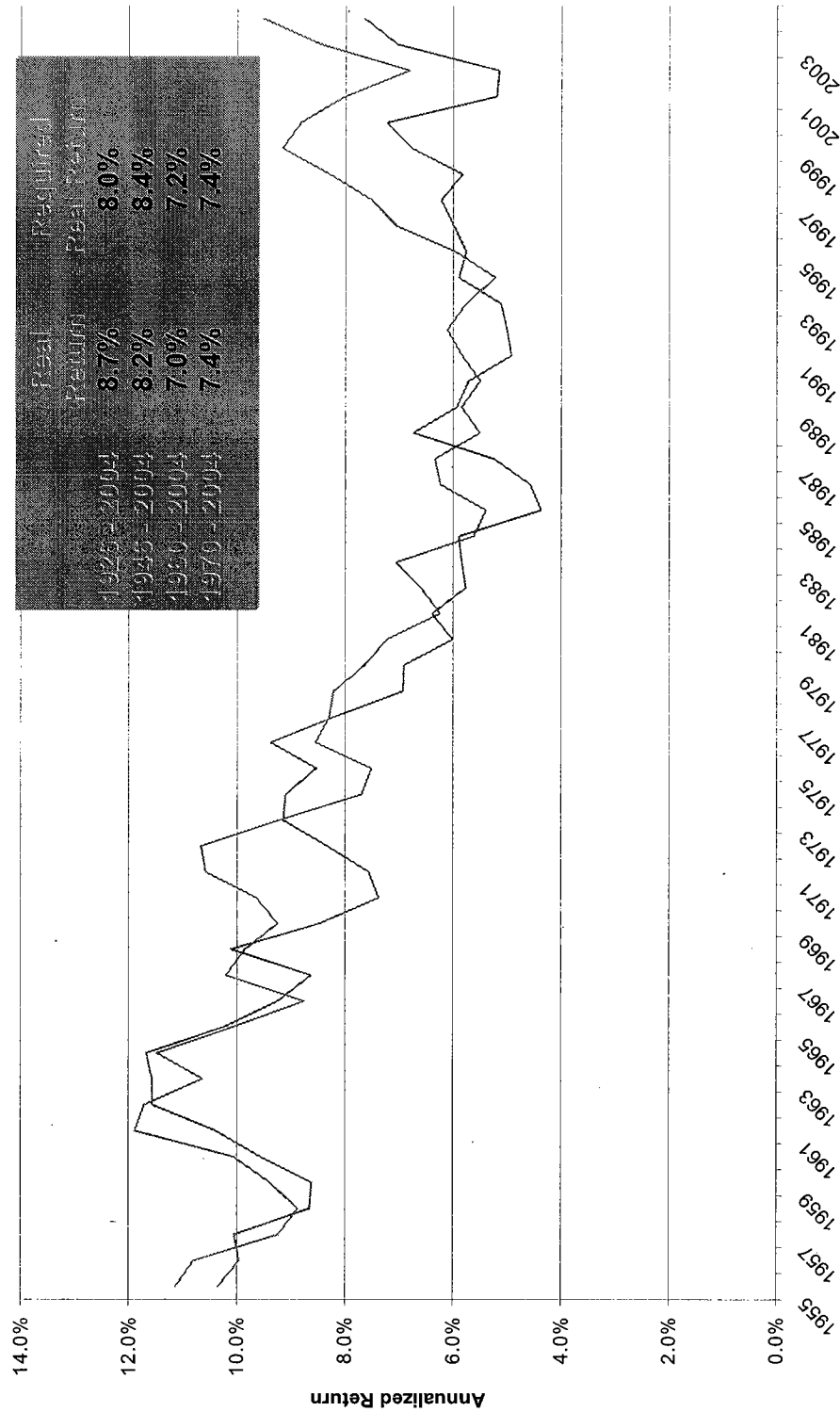
- Used in much of the recent research on the equity premium
- Key observation: actual real return on equity has consistently exceeded the required real rate*
- Conclusion: going forward, the actual real return on equity and the equity premium will reflect the required return rather than the historical returns – the equity premium will be lower

*2003 spike in earnings growth of 75% distorts historical averages which include that year



Realized Equity Return Vs. Required Equity Return

30-year Moving Average



— Required Real Return — Real Equity Return



Stock Market Data Used in "Irrational Exuberance" & Valuation Ratios and the Long-Run Stock Market Outlook
by John Y Campbell and Robert J. Shiller, Journal of Portfolio Mgmt., Winter 1998. Updated by Robert J. Shiller, 2005

Why Have Equities Outperformed the Fundamentals?

Proposed explanations:

1. The actual realized return to investors is smaller than the index return in the data
2. Irrational exuberance
3. Over-optimistic views on earnings growth
4. Decline in the required real rate of return
 - Over the years equity has seemed less risky
 - Declines boost equity prices and valuation measures

Historical Behavior of Real Earnings Growth and the Dividend Yield

Dividend yield

- Statistically significant downward trend since 1926 – trend value has decreased from 5.9% to 2.3%
- Less volatility since 1960
- Current 1.6% value is at a historic low

Real earnings growth

- Very volatile, with no significant trend, over time
- “Average” growth is very sensitive to the endpoint

The evidence is consistent with the notion that the required real rate of return on equity has declined.



Component 3: Equity Risk Premium

A good estimate of the current value of the required return is the sum of the trend values of real earnings growth and the dividend yield

- Real earnings growth = 3.9%
- Dividend yield = 2.3%*

Required real equity return = 6%
Equity premium = 3%

*Consistent with a long-run P/E of 21, using the average 0.47 dividend payout ratio over 1970-2004. This ratio has fluctuated between 0.4 and 0.6 for most of the postwar period.

Adding It Up

- Current inflation expectations: 3%
- Current expectations for intermediate government bonds: 6%
- Current expectations for US stocks: 9%



Russell's 20-Year Forecasts: Getting From Now to the Long Run

- Russell's shorter forecasts usually differ from the long-run forecasts:

	Inflation	T-Bonds	US Equity
5-Year	2.4%	4.0%	6.9%
10-Year	2.9%	5.0%	8.0%
20-Year	3.1%	5.6%	8.6%
Long Run	3.0%	6.0%	9.0%

- Why? Current intermediate T-bond yield is 3.5%. Our model assumes a slow upward drift in interest rates.
- During this adjustment period bond returns will be lower than 6% and equity returns will be 3% plus the bond return

Forecast: December 2004



What does this mean for Client XYZ?

Policy Asset Classes & Strategies	Client XYZ Target Allocation (%)	Expected 20-Year Policy Returns * (%)	Expected Equilibrium Returns (%)	Expected Total Excess** (%)	Expected Total 20-Yr (%)
Equity					
US	35	8.6	9.0	0.5	9.1
Non-US	15	8.7	9.0	1.0	9.7
Private	6	13.7	14.0	n/a	13.7
Real Estate	6	6.2	7.0	n/a	6.2
Fixed Income	31	6.1	6.5	0.4	6.5
Absolute return					
Strategies					
Hedge Funds	3	8.0	8.4	n/a	8.0
Global TAA**	4	8.4	8.4	n/a	8.4
Total	100	8.0	8.4		8.4



How does this forecast compare to history?

- 20 year forecast 8.5%
- 20 year Client XYZ DB return (through 3/31/05) 10.2
- 20 year weighted index (through 3/31/05) 11.2

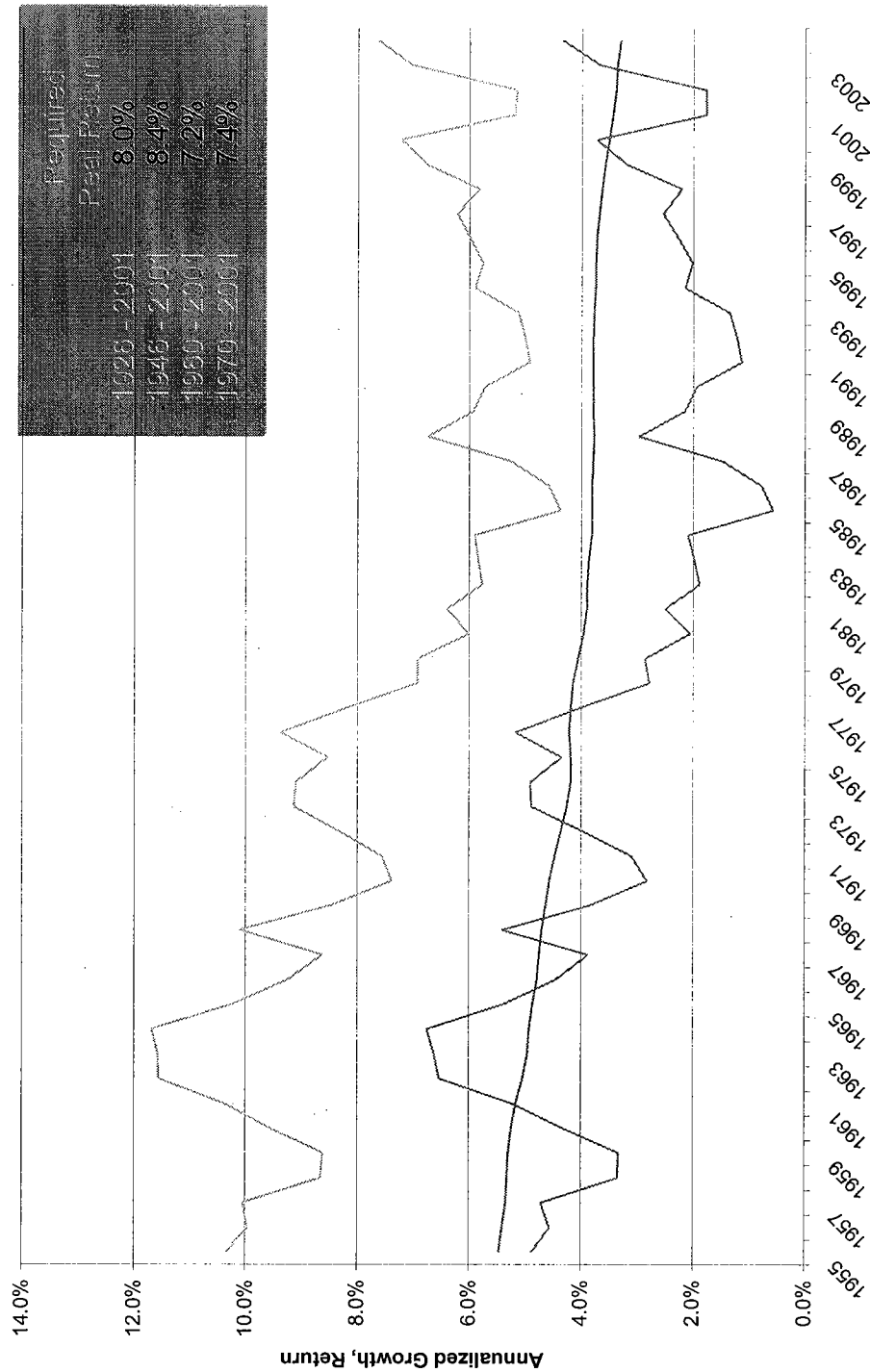
*47% R3000, 15% MSCI EAFE, 31% LB Aggregate, 7% NCREIF





Appendix

Required Real Equity Return 30-year Moving Average

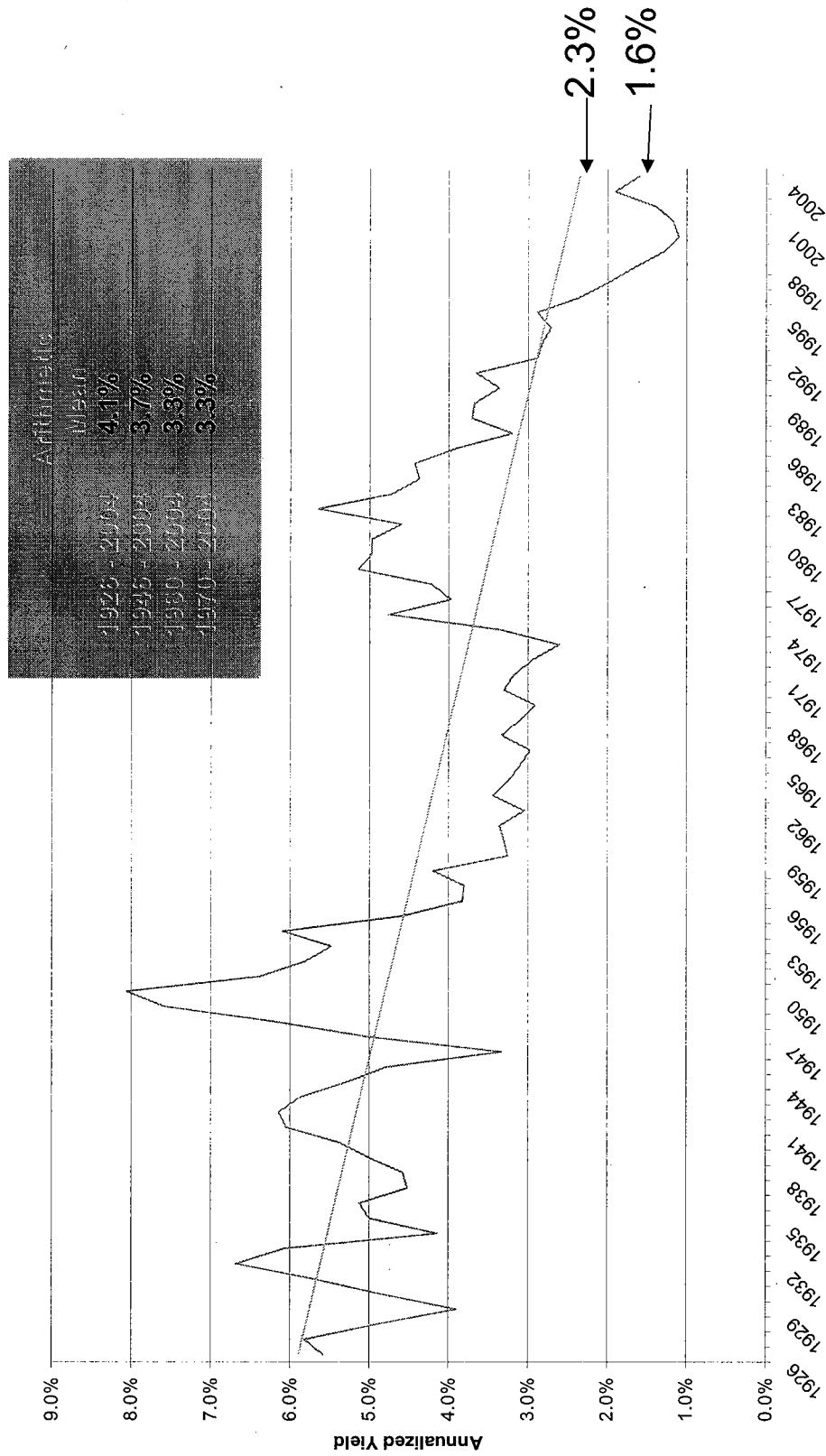


— Real D/P — Real E Growth — Required Real Return



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 by John Y Campbell and Robert J. Shiller, Journal of Portfolio Mgmt., Winter 1998. Updated by Robert J. Shiller, 2005

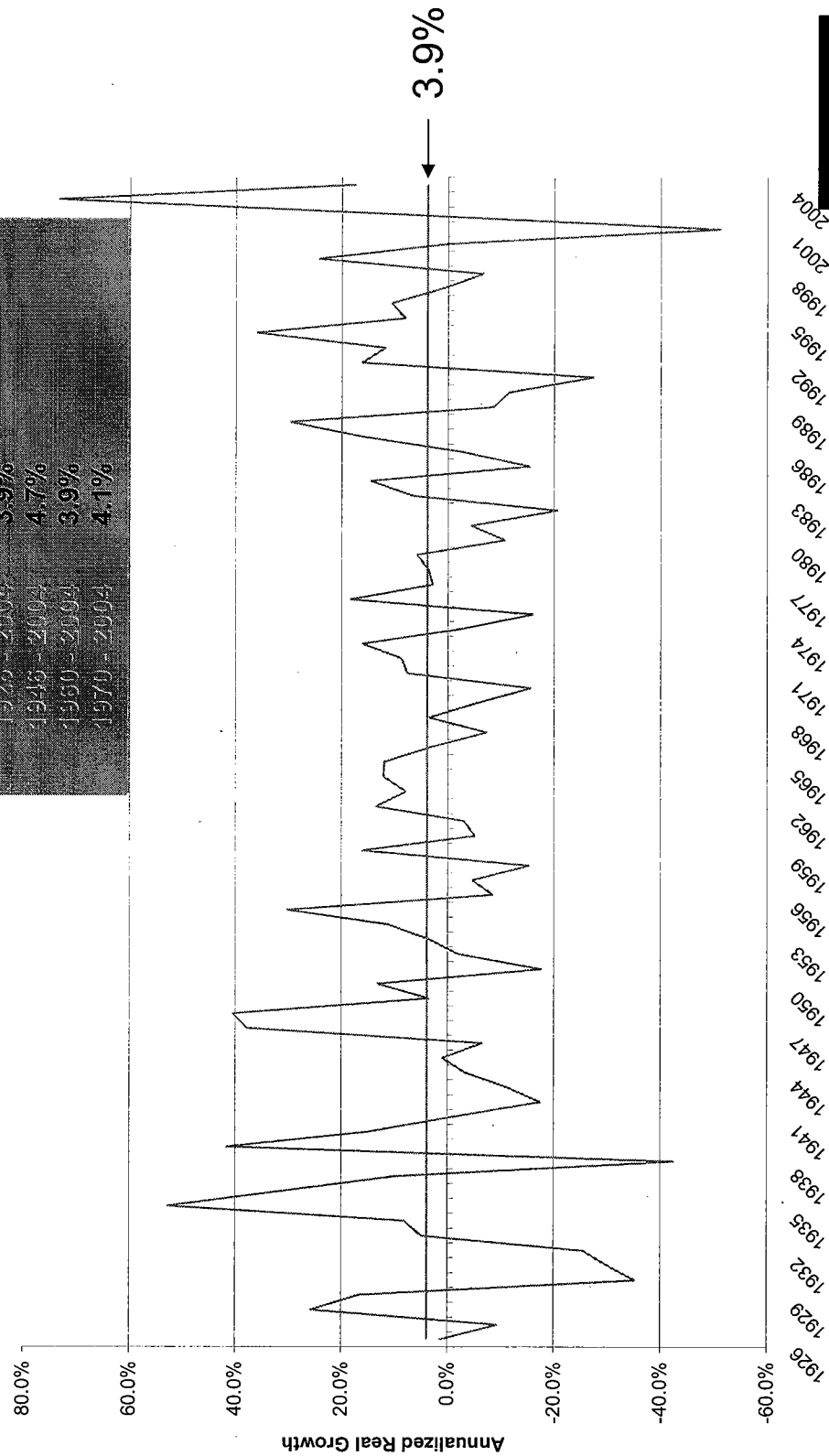
Dividend Yield



Stock Market Data Used in "Irrational Exuberance" & Valuation Ratios and the Long-Run Stock Market Outlook
 by John Y Campbell and Robert J. Shiller, Journal of Portfolio Mgmt., Winter 1998. Updated by Robert J. Shiller, 2005

Real Earnings Growth

Annualized Mean	
1926 - 2004	3.9%
1926 - 2004	4.7%
1950 - 2004	3.9%
1970 - 2004	4.1%



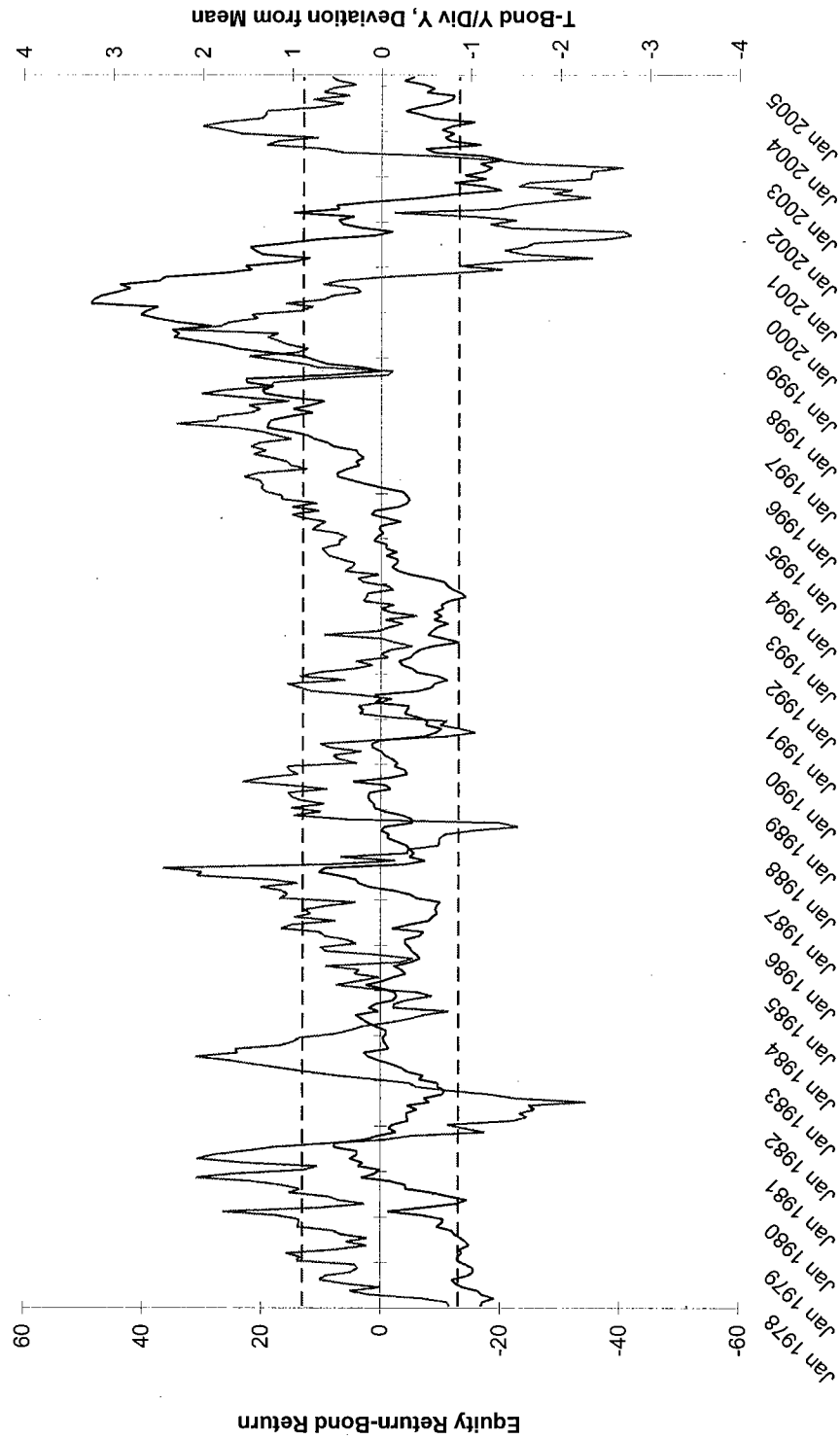
Stock Market Data Used in "Irrational Exuberance" & Valuation Ratios — Real E Growth — Trend Real E Growth
 by John Y Campbell and Robert J. Shiller, Journal of Portfolio Mgmt., Winter 1998. Updated by Robert J. Shiller, 2005

Market Valuation and the Near-Term Performance of Stocks and Bonds

- Our long-term forecasts ignore current market valuation.
- Valuation measures are useful in predicting near-term relative returns of stocks and bonds.
- Consider the ratio of the yield on intermediate T-bonds to the dividend yield on equity:
 - When the ratio is significantly above its long-run average, equity is overvalued relative to bonds.
 - When the ratio is significantly below its long-run average, equity is undervalued relative to bonds.
 - This ratio tends to revert to a long-run average.

Market Valuation and Performance

Market Valuation and Performance



Russell

Equity-Bonds — Govt Y/Eq Y Minus Mean - - - Plus 1 SD - - - Minus 1 SD

Market Valuation and the Near-Term Performance of Stocks and Bonds

- Over or undervaluation can persist for a long time - timing market corrections is very difficult.
- This relationship is about relative valuation - it is ambiguous about how the correction will occur.
- Large movements in relative valuation occur even with pricing seems close to long-run equilibrium.

Market Valuation - Where Are We Now?

- The equilibrium value of the intermediate T-bond/Dividend Yield ratio in our long-run model is 6.0%/2.3% = 2.6.
- The average value of this ratio over the period 1978-2005/3 is also 2.6.
- The current (3/2005) value is 2.3.
- Thus equities are moderately undervalued relative to bonds.
- More sophisticated methods based on earnings yield rather than dividend yield give a much stronger signal of stocks being undervalued.



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