

Equity vs. Bonds: Reasonable Expectations for the First Half of the 21st Century

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U.S. Equities Have A Great Track Record...

Inflation-Adjusted Average Rates of Return
Between 1926 and 2002

	Geometric	Arithmetic
Large-Capitalization Equities	7.2%	9.7%
Long-Term Govt. Bonds	2.5%	2.7%
U.S. Treasury Bills	0.8%	0.8%

Will U.S. Equities Continue To Offer Such Real Returns Over the Next 50-75 years?

- Importance: Plans to strengthen Social Security count on higher return on equities.
- Are today's workers saving enough for their retirement?

The Technology of Transferring Cash Between Companies and Investors Has Changed....Dividends Are Obsolete

- Share repurchases transfer cash from firms to shareholders with lower tax burden. Most cash is a return of basis... the rest a capital gain.
- Annual share repurchases in the U.S. = \$150 billion.... Dividends \$120 billion.
- Companies issuing new shares to employees via options. Net share repurchases less than gross share repurchases.

The Gordon (1962) of Share Valuation

- Value of a share is the PV of future dividends.

- If dividends grow at a constant rate g , then

$$V = D / (k - g)$$

where V = value of a share, D = current dividend per share, and k is the CAPM risk-adjusted RoR.

- If markets are in equilibrium, then P , the price of a share, equals V and therefore

$$k = (D/P) + g$$

The Modernized Gordon Model

- The value of shares of stock is still the present value of the cash they receive, but

$$k = \theta \frac{E}{P} + (1 - \theta) \rho$$

where theta = the fraction of earnings paid in cash to shareholders via dividends and net repurchases, E is earnings per share, P is the current share price and rho is the ROE of the firm, the incremental earnings per dollar reinvested in the firm.

Explanations of the terms in the modernized Gordon Model

- The first term is the cash received by shareholders from the firm

$$\theta \frac{E}{P} = \frac{D}{P} + \frac{S}{P}$$

- The second term reflects the fact that growth in the cash to shareholders requires retained earnings and depends on the rate of return realized on the real investments derived from retained earnings

$$g = (1 - \theta) \rho$$

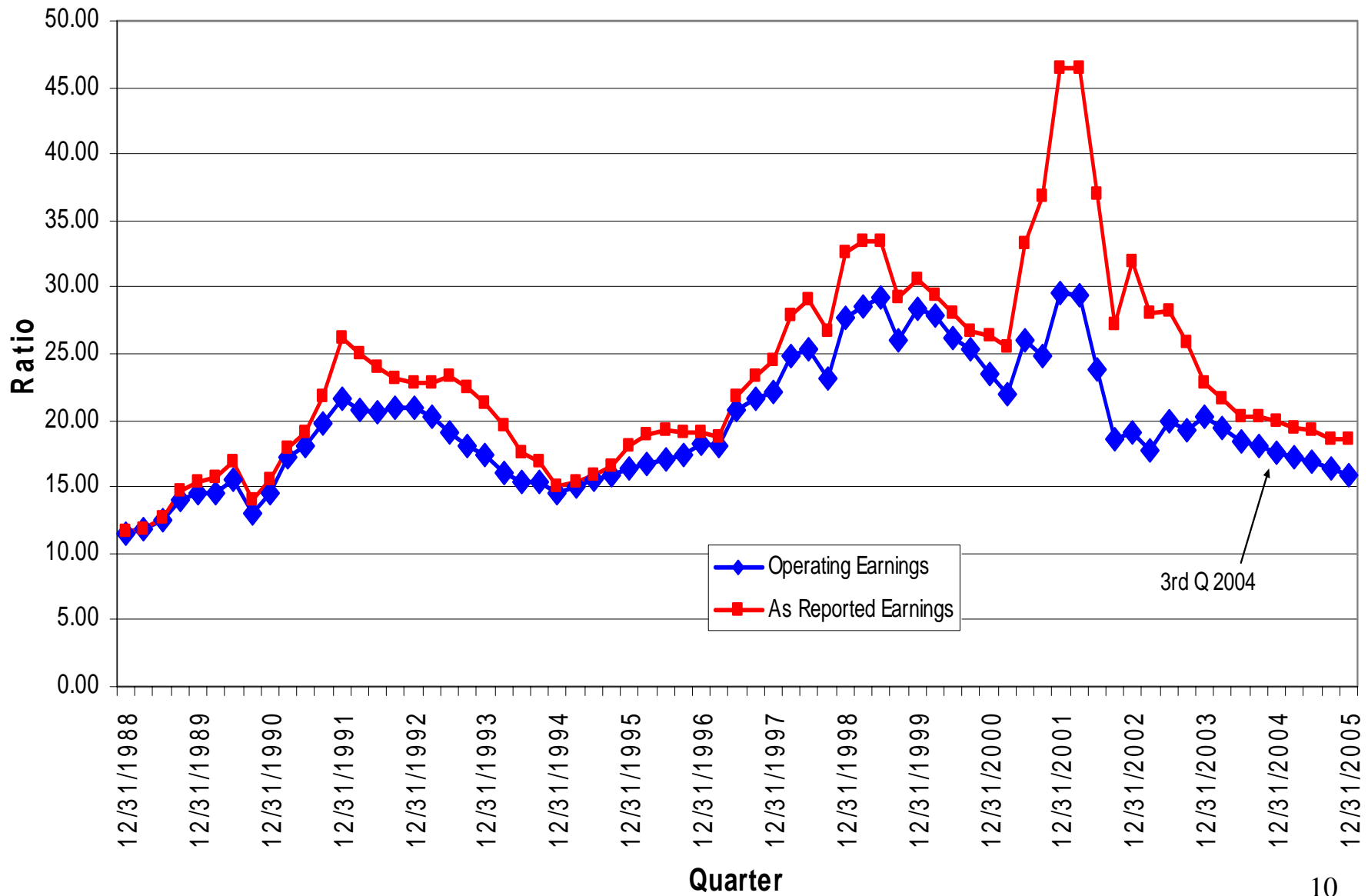
Even in steady state equilibrium, there are two different growth rates...

- All economic aggregates such as GDP, the total value of equities, total earnings, total dividends paid, etc. grow at rate g .
- All per share items such as earnings per share, dividends per share, and share prices grow at the rate g plus the rate of net share repurchase.
- The higher growth in per share figures is due to continuing share repurchases.

What if P-E ratios stay at approximately current levels?

- As of November 4, 2004, S&P 500 = 1,161.67 and the 2004 earnings estimate for the S&P 500 was \$66.43. This gives a P-E ratio of 17.48. S&P 500 earnings for 2005 are estimated at \$73.12 for a P-E of 15.89.
- Reasonable numbers for all of the parameters in the modernized Gordon model are $\theta = 0.625$, $E/P = 0.06$ and $\rho = 0.08$.

Price-Earnings Ratios of the S&P500



Alternative Measures of Current (11/4/04) P-E Ratios

	Operating Earnings	As Reported Earnings
$P_{11/4/04}/E_{10/1/03-9/30/04}$	18.10	20.27
$P_{11/4/04}/E_{04}$	17.49	20.00
$P_{11/4/04}/E_{05}$	15.78	18.52

Stocks Selling at Normal Multiples

- The inflated P-E multiples of the late 1990s have disappeared
- S&P 500 stocks selling at 15-18 times next year's earnings
- Quality of earnings is higher due more cautious accounting practices

Justifying Setting the Return on Equity at .08

- The average real return on capital in the nonfarm nonfinancial business was 8.5% between 1959-96 (Poterba, 1997)
- An extra \$1 of retained earnings, allows firms to borrow 56 cents without increasing their debt-equity ratio. With real interest rates at roughly 3 percent, this allows incremental equity to earn about 11.5%
- The corporate income tax lowers the return on equity to approximately 8%

Current Market Levels Allow An Equilibrium Expected Real Rate of Return of 6.75%

- Simply do the math...

$$\begin{aligned}k &= \theta \frac{E}{P} + (1 - \theta) \rho \\&= (0.625)(.06) + (.375)(.08) \\&= 0.0675\end{aligned}$$

- Even a 6.75 % expected real return results in a substantial *ex-ante* premium for stock investors.

Risk-Free Interest Rates

- T-Bills = zero or slightly negative real return
- Treasury Inflation-Protected Securities
 - 10-year maturity = 1.7% real
 - 20-year maturity = 2.1% real
 - 30-year maturity = 2.1% real
- Expected risk premium of stocks over risk-free long bonds = 475 basis points

The range of reasonable estimates for the expected real return on equities in new Social Security individual accounts

- 5.75% to 8.0%
- Social Security is using 6.5% to evaluate partial privatization proposals

Should Social Security Use the Expected Return on Equities for Projecting Future Asset Balances?

- Due to the skewness of financial returns, the expected outcome is greater than the most likely outcome.
- The extra return from stocks comes with extra risks.
- Use the safe rate of return for projections; better outcomes are likely with stocks, but equities are riskier.

Peter Diamond, John Campbell and I Used Similar Approaches and Got Similar Answers

- We were all asked the same question; We ended up using similar approaches with similar answers
- All three of us thought it unlikely that returns in the next 50 years would match those of the last 75 years, but were comfortable with a real average return of 6.5%
- My estimate of the equity premium over long-term government bonds is 4.75 percent

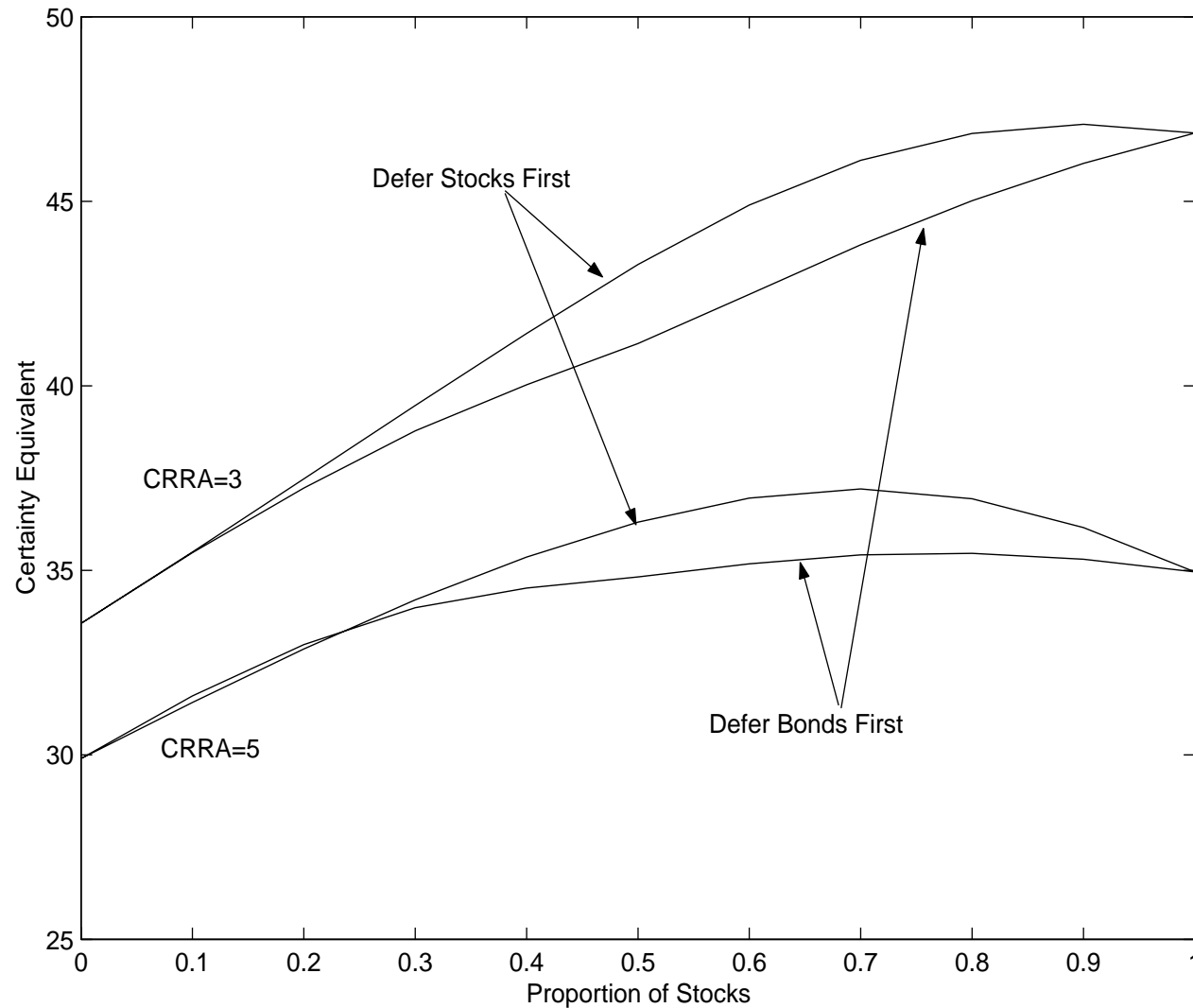
Equity Returns in the Next 50 Years Could Nearly Match the 20th Century

- With P-E ratio in the 15-17 range, equity returns are likely to be less than 1926-2002, but not dramatically less
- Balanced equity-debt portfolios still look attractive

Poterba, Shoven and Sialm

- Used actual returns on actively managed equity mutual funds and bond funds from 1963 to 1998
- Evaluated different asset location and allocation choices
- Asset location decisions – should stock or bond funds be given preference in a TDA?
- Asset allocation – bootstrap simulations of certainty equivalent outcomes for different degrees of risk aversion

Asset Allocation for Defined Contribution Pension Plans



Asset Allocation Results of Poterba, Shoven, Sialm

- Optimal allocation to stocks = 80-90% with $CRRA = 3$
- Optimal allocation to stocks = 60-70% with $CRRA = 5$
- 100% bonds offers lower certainty equivalent outcome than 100% stocks with either $CRRA$ of 3 or 5
- Note: All of these results based on bootstrapped 1963-98 real returns

Bottom Line

- Stocks still offer attractive risk premium of approximately 475 basis points over safe, long bonds
- Defined Contribution pension accumulators still should hold more than 50% stocks
- Defined Benefit plans should overfund shutdown or accrued liabilities by at least 10 percent --- Then hold between 50 – 70 percent stocks