

The Equity Risk Premium: An Historical Analysis

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Global Financial Data

What is the Equity Risk Premium?

- The Equity Risk Premium compares the returns on different asset classes—stocks, government bonds, and cash (Treasury bills)
- The Equity-Bill premium compares equity returns with a risk-free investment
- The Equity-Bond premium compares equity returns with a default-risk-free long-term asset

What is the value of the Equity Risk Premium?

- Equity Risk Premium estimates vary widely
- Arnott and Ryan contend that the equity risk premium is actually zero, focusing on real dividend growth and P/E overvaluation.
- A survey of economists gave an average forecast of 7% with a range of 2-13%
- Historical risk premiums depend highly upon the starting date and the number of years that are covered

Equity Premiums by Decade

Years	USA	UK	Australia	Japan	Germany	Italy
1919-1929	8.89	2.00	8.54			
1929-1939	-4.18	-4.08	1.47	6.1	-2.67	0.4
1939-1949	6.43	5.12	4.47	14.64	20.49	24.49
1949-1959	18.45	13.24	11.89	26.95	22.05	17.33
1959-1969	5.28	3.17	9.06	2.16	0.36	-1.3
1969-1979	-0.06	0.86	2.67	5.58	-5.45	-8.6
1979-1989	4.02	8.46	4.66	12.94	7.12	8.64
1989-1999	9.43	4.19	-2.07	-9.97	3.22	-1.81
1999-2002	-24.05	-20.97	-7.73	-23.15	-29.26	-20.29
1925-2002	4.49	3.56	4.16	5.56	4.53	3.56

- The average stock-bond equity premium is fairly consistent between countries over long periods of time
- The average over the past 75 years is around 4.5% with a range of 3.5-5.5%
- In individual decades, the largest risk premium was in the 1950s
- The 1930s and 1990s were periods of negative equity premiums in some countries. In Japan in the 1990s, the equity premium was -10%.
- The equity premium has a very high standard deviation over 10-year periods.

30-year Equity Premiums

- Even over 30-year periods, the risk premium can vary dramatically
- In the US, the equity premium was 10.84% between 1941 and 1971, but 2.42% between 1965 and 1995.
- The 30-year equity premium to 1941 was 1.55%, to 1971 it was 10.84% and to 2001 it was 3.54%.
- The 30-year premium to 1965 was 9.55%, but to 1995 it was 2.42%.
- The past provides little indication to investors today of what their long-term returns will be.

Returns to Different Asset Classes

- To try and understand why the equity premium varies so much, we want to look at each asset class in detail to determine
 - 1. What should drive returns in theory
 - 2. What economic factors drive returns
 - 3. What cyclical factors drive returns
 - 4. How returns have varied over time

1. Cash-Treasury Bills

- Investors use treasury bills for safety and liquidity
- The primary risk comes from inflation and reinvestment risk
- In the long run, the after-tax return on bills should equal the inflation rate
- However, in the short run, central banks manipulate short-run interest rates, thus affecting the returns to cash

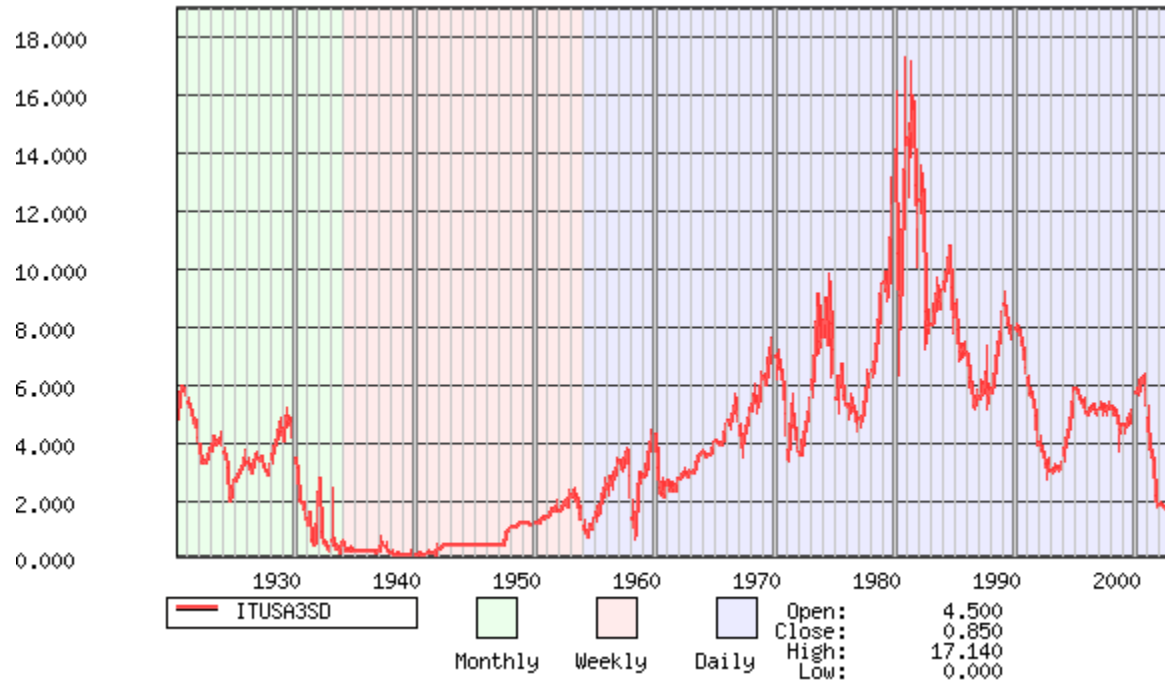
Historical data on Bills

- In the 20th Century in the US, the return to bills averaged 4.04% vs. 3.19% for inflation, leaving a cushion for taxes.
- The best real returns were in the 1920s (4.87%) and 1930s (2.67%), periods of deflation, and the 1980s (3.83%) a period of disinflation
- The worst real returns were in the 1940s (-4.63%) when the US government pegged interest rates, the inflationary 1910s (-2.51%) and the inflationary 1970s (-0.82%).

Conclusion on Bills

- Bills do worst in periods of rising inflation
- Bills do best in periods of deflation and disinflation
- During periods of steady inflation, bill returns should provide no real return after taxes and inflation

Bill yields in the USA 1920-2003



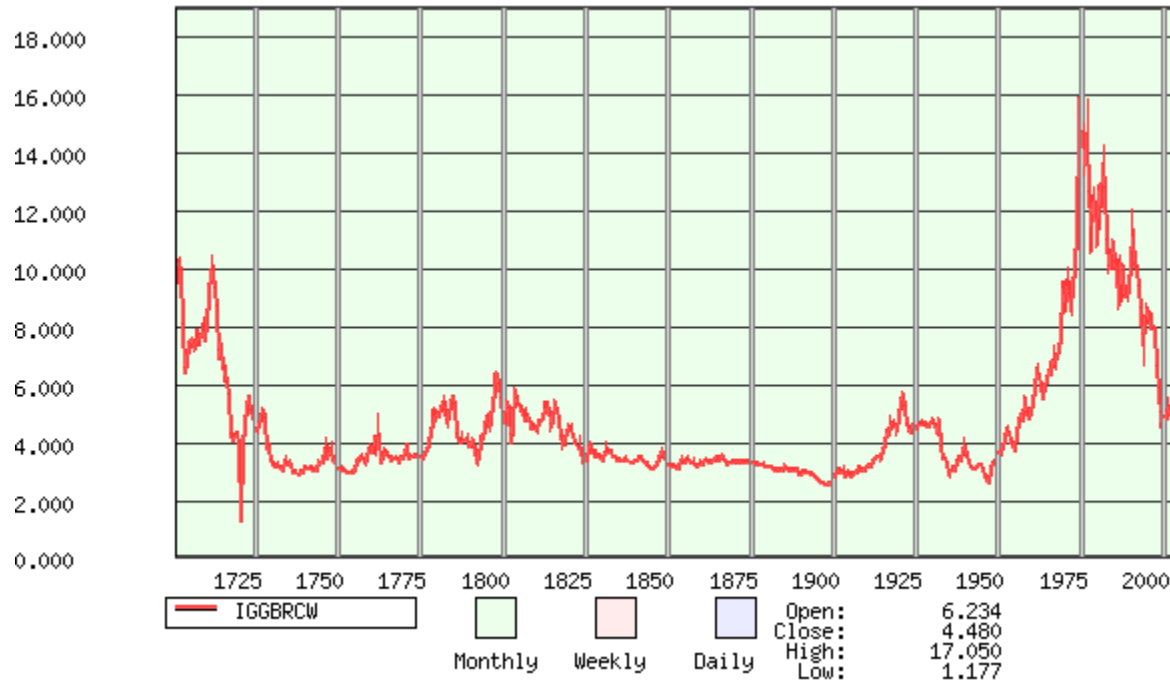
2. Government Bonds

- Government bonds are free of default risk, but suffer from interest rate risk
- Nominal bonds face inflation risk, but inflation-adjusted bonds (TIPS) avoid inflation risk
- The return on bonds should equal the nominal growth rate in the economy.
- Between 1929 and 2001, per capita GDP in the US grew by 5.4%, and the annual returns to government bonds was 5.5%.

Bonds and Inflation

- There are four possibilities: steady or no inflation, rising inflation, disinflation and deflation
- No inflation is illustrated by Britain in the 19th Century. Between 1820 and 1900, annual bond returns by decade ranged from 2.79% in the 1860s to 3.81% in the 1870s, an amazingly small range.
- Other countries saw declining interest rates during the last half of the 19th Century as the risk to bonds issued outside of the UK fell.
- Compare the behavior of bond yields in the 19th and 20th Centuries in Britain

British Consol Yields 1700-2003



2. Periods of Rising Inflation

- Rising inflation is the worst possible scenario for bonds. Rising interest rates reduce bond prices causing capital losses to investors.
- In periods of hyperinflation (Germany in the 1920s), investors are completely wiped out
- The Keynesian inflation of 1940-1980 produced a long-term bear market for fixed-income investors.
- The price of the British consol went from 93 in 1934 to 15 in 1974-a 40-year bear market!
- In the US, inflation beat government bond total returns in every decade from 1940 to 1980

3. Periods of disinflation and deflation

- Periods of disinflation are positive for bonds because investors receive both interest and capital gains.
- Between 1977 and 2002, total returns to government bonds beat inflation by over 5% per annum.
- Periods of deflation also are positive for bonds. In the US, bonds provided real returns of over 6% in the deflationary 1920s and 1930s

Conclusion on Bond Returns

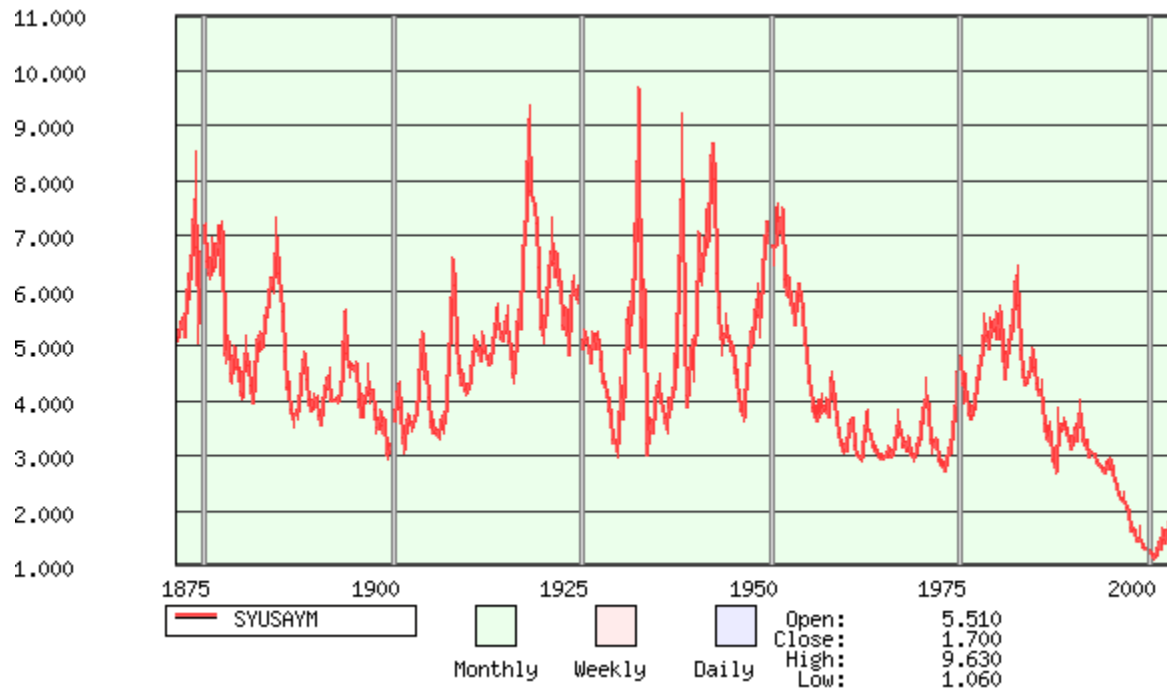
- Bond market cycles are longer than stock market cycles because bond market cycles are based upon inflation cycles and not business cycles
- Inflation is the primary factor driving bond returns. The lower the inflation the better.

Equity Returns

- The sources of equity returns are capital gains and dividends.
- The share of each of these to investor returns has changed over time
- During the 19th Century, 90% of investor returns came from dividends, only 10% from capital gains
- During the 20th Century, capital gains became increasingly important.
- Between 1952 and 2002, capital gains represented 50% of investor returns in the US.
- During the 1990s, capital gains represented 85% of total returns to investors.

- Until the 1950s, the dividend yield exceeded the yield on government bonds
- Today the dividend yield is the lowest it has ever been in history
- These facts complicate comparisons on equity returns over time
- Because it is primarily fluctuations in capital gains, not dividends, that drive stock returns over time, we will concentrate on capital gains.

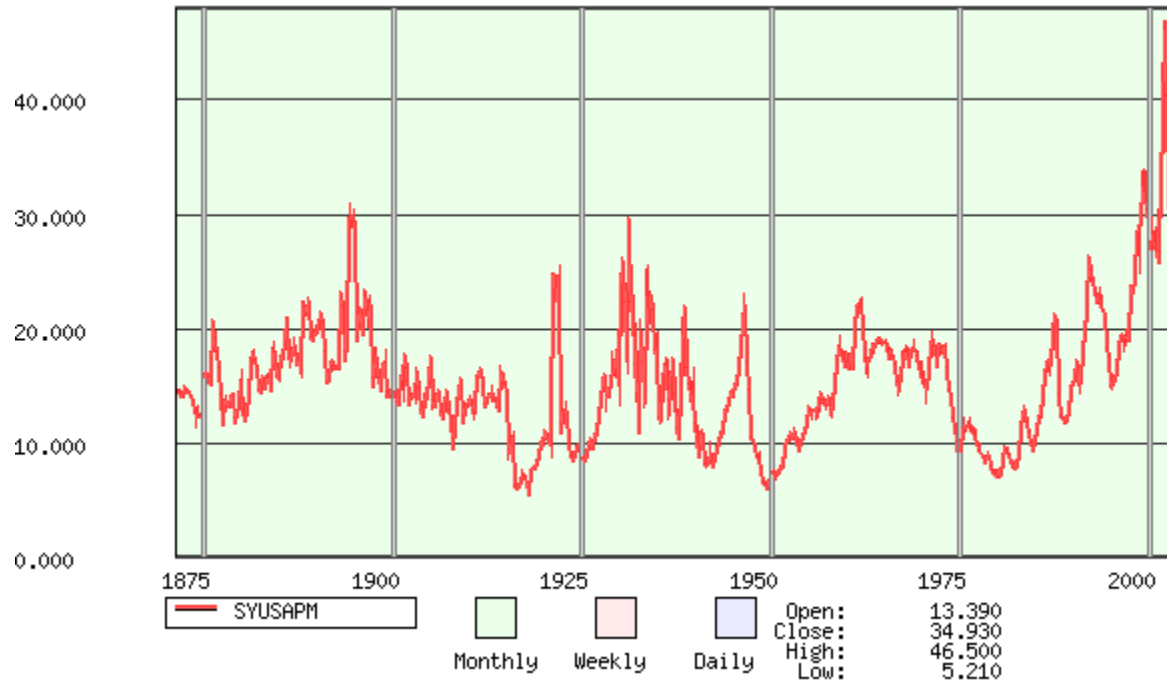
US Stock Market Dividend Yield, 1871-2003



Factors determining Equity Returns

- Equity returns depend upon two factors— changes in corporate earnings and expectations of the growth in future corporate earnings.
- Rising earnings lead to increases in stock prices.
- Expectations of future earnings growth leads to an expansion in the P/E ratio, and expectations of declines in future earnings leads to a contraction in the P/E Ratio.

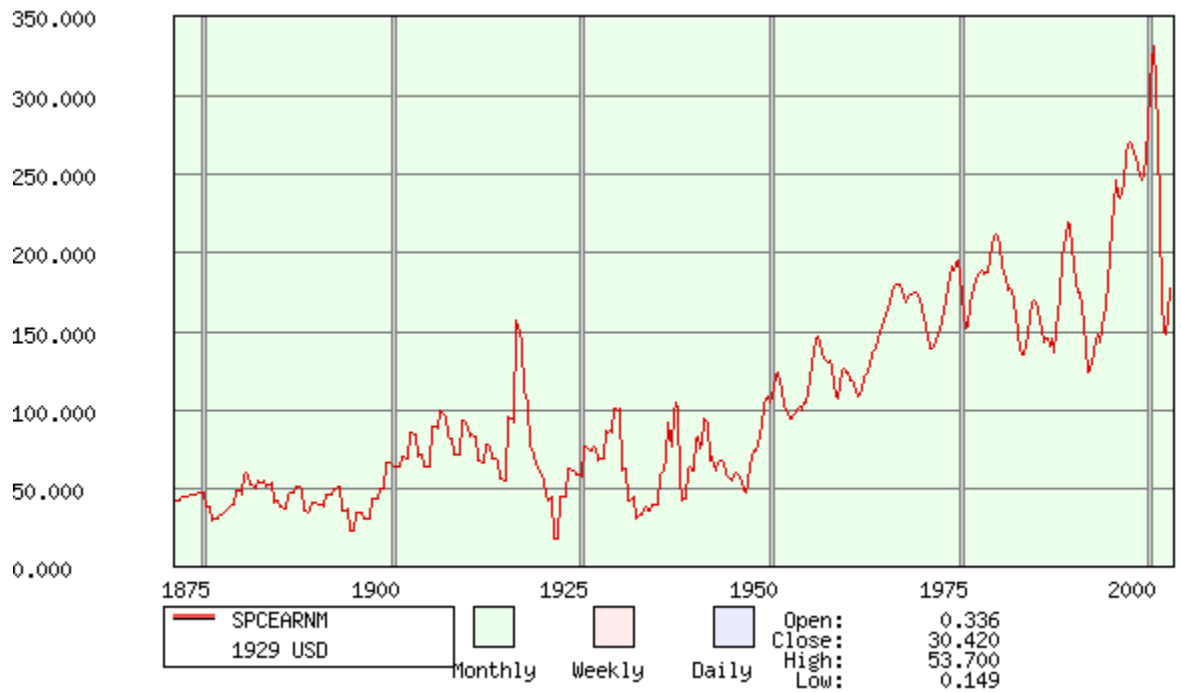
P/E Ratios for the S&P Composite, 1871-2003



Factors determining Equity Returns

- Equity returns depend upon the growth in corporate earnings and expectations. This produces four possibilities
- 1. Falling earnings and falling earnings expectations (P/E contraction) leads to bear markets. The best example of this is the 1930s when the US stock market collapsed (1929-1932). As a result, the stock market declined by over 90%.
- 2. Rising earnings and rising earnings expectations (P/E expansion) leads to bull markets. The 1980s and 1990s provide a good example of this.
- During the 1980s and the 1990s, earnings doubled in each decade, and the P/E Multiple doubled in each decade as well.
- The result was a 16-fold return to US equity investors.

Inflation-adjusted S&P Composite Earnings, 1871-2003



- Returns during periods of rising earnings, but P/E contraction, or declining earnings and P/E expansion depend upon which factor has the strongest impact.
- Since the P/E ratio is more volatile than changes in earnings, changes in the P/E ratio are likely to predominate.
- Hence, in the 1970s, a declining P/E ratio offset an overall increase in corporate earnings to produce a declining stock market.
- Currently, a high P/E ratio means that even if earnings rise, if investor expectations fall, the market could decline.

The Equity Risk Premium in Periods of Low Interest Rates

- Today, interest rates are at their lowest levels in 50 years. This reduces the applicability of past data on the equity premium to the current investment environment.
- The large equity risk premium during the past 50 years was largely due to an unusual set of circumstances that is unlikely to be repeated in the near future. These were
 1. A 40-year bear market reducing returns on bonds and bills.
 2. An expansion in the P/E ratio in the 1950s, 1980s and 1990s. This artificially increased returns to equities.
 3. Rapid earnings growth in the 1950s and 1990s also increased the equity premium

10 Rules to Remember about the Equity Premium

- 1. Bonds beat bills unless there is a bear market in bonds due to rising interest rates
- 2. Stocks beat bonds unless there is a bear market in equities due to declining earnings or expectations of declining earnings
- 3. The best returns to investors occur in periods of disinflation and rising earnings (the 1980s)
- 4. The worst returns to investors occur in periods of rising inflation and falling earnings (the 1910s)

- 5. The equity risk premium is maximized in periods of rising inflation and rising earnings (the 1950s)
- 6. The equity risk premium is minimized in periods of disinflation/deflation and falling earnings (the 1930s)
- 7. Variations in the risk premium, even over investment periods of 30 years, is so great that the average risk premium is irrelevant
- 8. The current equity premium over the past 10 or 30 years provides no predictive capacity over the future equity premium

- 9. There is mean reversion to the equity premium. Years when the equity premium is high (1971, 1999) are the worst periods to invest in equities, and years when it is low (1981) are often the best
- 10. The four things that determine the future value of the risk premium are the future inflation rate (which determines nominal bill returns), the future growth rate of the economy (which determines bond returns), the future growth in corporate profits (which determine stock returns) and investor expectations of these variables