

Discounting The Future

Introduction

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In this financial series we will use bond math to value equities. This series is partitioned as follows...

Discounting The Future - Part I - Valuing A Term Bond

In this white paper we will value a term bond. During the bond's term a term bond pays interest at the coupon rate (face value x coupon rate) and at the end of the term it pays the face value (i.e. principal balance).

Discounting The Future - Part II - Valuing A Perpetual Bond

In this white paper we will value a perpetual bond. A perpetual bond is a fixed-income security with no maturity date, meaning the issuer never repays the principal. Similar to the US federal debt, will assume that bond principal increases over time at a constant rate. From the perspective of the issuer, cash flow for this bond consists of coupon payments paid (negative cash flow) plus bond principal increases received (positive cash flow).

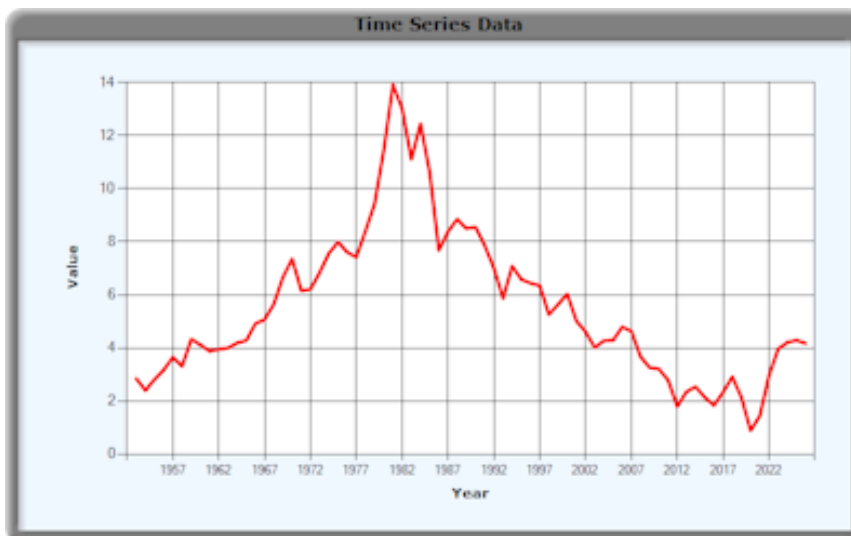
Discounting The Future - Part III - Valuing Common Stock

In this white paper we will use perpetual bond math to value a common stock. From the perspective of the issuer, cash flow for this stock consists of net income (positive cash flow) minus balance sheet investment (negative cash flow).

In this series we will use the following market rates...

Ten Year Treasury Rate

We will use the 10 year treasury rate as our base interest rate. The data for the following graph and summary statistics come from the Federal Reserve Bank of St Louis... [1]



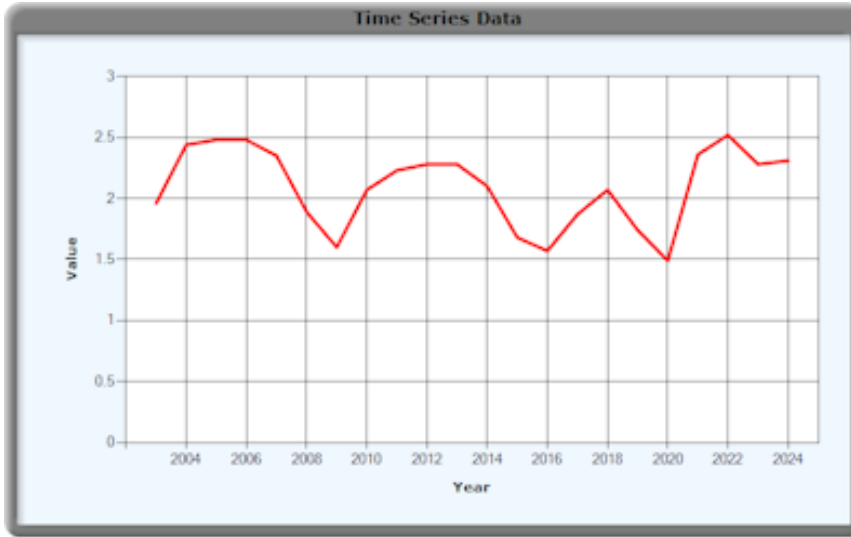
Range: 1953 - 2026

Mean rate: 5.51%

Median rate: 4.71%

Inflation Rate

We will use the Fed's 10 year breakeven inflation rate as our estimate of future inflation. The data for the following graph and summary statistics come from the Federal Reserve Bank of St Louis... [2]



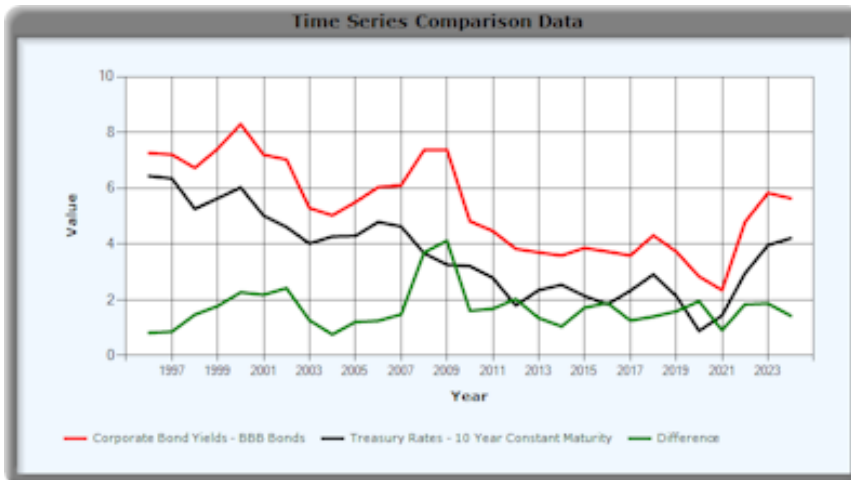
Range: 2003 - 2024

Mean rate: 2.09%

Median rate: 2.17%

Bond Risk Premium

We will use the difference between the BBB bond yield and the 10 year treasury rate as our estimate of the bond risk premium. The data for the following graph and summary statistics come from the Federal Reserve Bank of St Louis... [2]



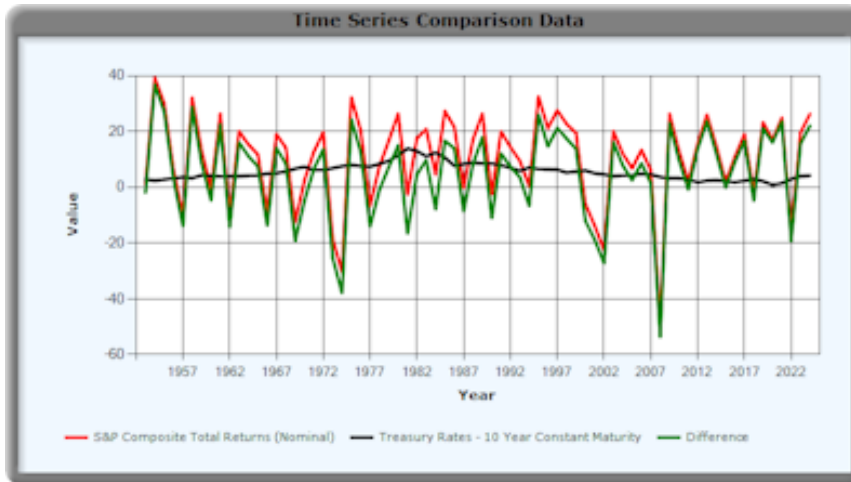
Range: 1996 - 2024

Mean rate: 1.71%

Volatility: 0.75%

Equity Risk Premium

We will use the difference between the 10 year treasury rate and the nominal return of the S&P 500 composite as our estimate of the equity risk premium . The data for the following graph and summary statistics come from the Federal Reserve Bank of St Louis...



Range: 1953 - 2024

Mean rate: 4.97%

Volatility: 16.48%

Rate that we will use: 4.75%

Real Rate

We will define the real rate of return to be the ten year treasury yield minus the go-forward inflation rate. This statement in mathematical terms is...

$$\text{Real rate} = 10\text{Y treasury rate} - \text{Inflation rate} \quad (1)$$

References

- [1] Federal Reserve Bank of St Louis: Treasury Rates - 10 Year Constant Maturity
- [2] Federal Reserve Bank of St Louis: 10 Year Breakeven Inflation Rate