Chapter 2

Review of Literature

Fernandez et al (2012)\(^1\) conducted the study that consisted of the Equity Risk Premium demanded by the 82 countries in 2012. This was done by surveying the professors, analysts and the managers of the companies of these countries and got answers from them regarding their required MRP Expectations. Various countries used different measures of the MRP ranging from 3 to 7%. They argued that the investors did not use the standard CAPM model for the ERP Expectations but they rather used the historical data and the advice from the textbooks and finance professors before making the ERP expectations. So, if the ex–post premium was high, the investors also perceived the ex-ante premium to be high, which leads to the undervaluation of the market prices of the stocks of these companies in these countries.

Michael Scholz et al (2012)\(^2\) in their study questioned whether empirical models were able to forecast the equity premium more accurately than the simple historical mean which was intensively debated in the financial literature. For a long time predicting asset returns had been a main objective in the empirical finance literature. It started with simple regressions of independent predictor variables like example the dividend price ratio, dividend yield, earnings price ratio or the book-to-market ratio on stock market returns. Other variables related to the interest rate like treasury-bill rates and long-term bond yield, or macroeconomic indicators like inflation were often incorporated to improve prediction. The low prediction power was disappointing, even when using nonparametric models that made use of typical predictor variables.

One overall idea of this paper was to exploit the interrelationship of present values of stock returns and bond returns. Motivated by economic theory and statistical arguments, they included the same year’s bond yield in the fully nonparametric prediction approach for excess stock returns. Since the current bond yield was unknown, it was estimated using again by the nonparametric techniques. The empirical study demonstrated that this approach improved the stock return prediction enormously. They moreover proved the consistency of their method and derived the asymptotic behavior of their final predictor. They illustrated the improvement using annual Danish stock and bond market data which were studied by different authors. Their results
confirmed their motivation of including the same year’s bond yield, namely that it captured the most important part of the stock returns that one related to the change in long-term interest rate.

Danaldson, Kamstra & Kramer (2010), studied the various methods and formulated the various models to predict the equity premium expectations of the investors. They stated that these estimates were imprecise and there was very little consensus about the true and the actual value of the equity risk premium which hampered the use of these estimates in the valuation methods and the capital budgeting decisions.

So, there must be some method that yet to be researched to determine the most accurate and plausible value of the equity premium and how this equity premium evolved over the different time periods. For this, they had exploited the information not only of the ex-post equity premium but also the related financial statistics of that era for which the equity risk premium estimates had been predicted. The various financial variables that they had studied were the dividend and the earnings yield, higher order moments of the excess return distribution and return volatility and price movement directions. Previously, the equity premium was measured through only one moment that is the difference between the return estimate and the risk free rate, but they had matched the multiple moments of the US market data, exploiting the joint distribution of the dividend yield, return volatility and realized excess returns and found that the ERP lied between 50 basis points of 3.5%. They had also found that the equity premium was conditionally vary with trends and breaks and if the whole set of financial statistics were considered for the estimation of the equity premium, the equity risk premium estimates became more accurate and precise than only to look at the realized excess returns.

Lettau, Ludwignon and Wachter (2008) linked the changing equity risk premiums in the United States to shifting volatility in the real economy. The risk in equities as a class came from more general concerns about the health and predictability of the overall economy. Put in more intuitive terms, the equity risk premium should be lower in an economy with predictable inflation, interest rates and economic growth than in one where these variables were volatile. In particular, they attributed that that the lower equity risks premiums of the 1990s (and higher equity values) to reduced volatility in real economic variables including employment, consumption and GDP growth.
Graham & Harvey (2007)\(^5\), analysed the results of survey of CFO’s conducted by the Duke University and CFO Magazine. The survey was all about their expectations on the S & P 500 over the 10 year T – bond yield. They also analysed that there was no correlation between the past returns and the future expected returns. So, they found the effect of the various variables like the price to earnings multiple and the interest rates of the long term bonds on the ERP expectations of the investors and explored that there was positive correlation between the real interest rates and the long run premiums.

Dimson et al (2006)\(^6\), used a new database of long-run stock, bond, bill, inflation, and currency returns to estimate the equity risk premium for 17 countries and a world index over a 106-year interval. Taking U.S. Treasury bills as the risk-free asset, the annualized equity premium for the world index was 4.7%. They reported the historical equity premium for each market in local currency and US dollars, and decomposed the premium into dividend growth, multiple expansion, the dividend yield, and changes in the real exchange rate and inferred that investors expect a premium on the world index of around 3-3.5 % on a geometric mean basis, or approximately 4.5 - 5% on an arithmetic basis.

Goyal & Welch (2006)\(^7\) predicted the equity risk premium expectations of the investors by regressing the various variables that were suggested by the various economists like dividend price ratios, earnings price ratios, dividend payout ratios, dividend yields, Book Market ratios, beta and interest rates etc on the Equity returns premium which was calculated by subtracting the risk free government T- Bill return from the returns earned by the investors as of 2005. They had examined the effect of these variables both in the sample and out of sample as of the year 2005. They found that these predictor models failed both in the in sample and the out-sample as they were unstable and their predictions were performed unexpectedly poor and also these models would not had helped investors to estimate the Equity risk Premium expectations. So, the new more methods were yet to be researched for the accurate estimation of the equity risk premium expectations of the investors.

Goetzmann & Ibbotson (2006)\(^8\) provided one of the first empirical estimates of the historical equity risk premium, as well as risk premium estimates for bond, the default risk premium and the real interest rate. They took the database of all the New York Stock Exchange (NYSE)
individual stocks from 1815 to 2001. They examined the realized risk premiums across a broad variety of markets and very long time periods by geometric averaging of the returns.

The equity risk premium estimates were predicted by both the demand and the supply of the risk capital. From the demand perspective, the risk premium was based upon the investors demand to be compensated with the expected returns for taking on the extra risk relative to the riskless bonds. While from the supply perspective, it was predicted as how the underlying economy and corporations could supply in the way of expected returns. The supply approach used the GDP growth to estimate the stock market, assuming the constant growth rate of the economy. Historical earning growth was a low estimate of the future growth because of declining dividend payout ratios and the current high price earnings (P/E) ratios. After adjusting for both the effects, and adding the current dividend yield, it gave an equity risk premium estimate of 1.25% per year, lower than the ERP estimated by historical realized equity risk premiums.

There were four ways to estimate the ERP expectations:

- The Historical Equity Risk Premium.
- The Equity Risk Premium demanded by the investors.
- The Equity Risk Premium supplied by the economy and the corporations.
- The consensus Equity Risk Premium estimate of the investors.

The ERP would not remain constant because of continual issuances and repurchases of stocks, changes in leverage, changes in underlying business and even changes in the covariance’s of individual stocks with each other. The demand of high risk often change as well, as investor’s behavior was sensitive to the changing wealth, past returns, changing incentive structures and so on.

Cochrane (2006) questioned the statistical significance of return predictability that if the stock returns could be predicted or not? For the same, he formulated the following null hypothesis:

Null Hypothesis: He set up a null hypothesis in which returns were not forecast able, that null hypothesis must also specify dividend growth that was forecast able, and the statistical evaluation of that null must also confront the lack of dividend-growth forecast ability in the data. If neither returns nor dividend growth was predictable, then the dividend-price ratio was a constant. If the null turns off return predictability, it must turned on the predictability of dividend growth, and then confront the evidence against such predictability in the data. He found that the
absence of dividend growth predictability gave much stronger statistical evidence against the null, with roughly 1-2% probability values than did the presence of return predictability, which only gave about 20% probability values. He argued that tests based on long-run return and dividend growth regressions provided the cleanest and most interpretable evidence on return predictability, again delivering about 1-2% probability values against the hypothesis that returns were unpredictable.

The only good piece of news was that observed return forecast ability did seem to be just enough to account for the volatility of price dividend ratios. If both return and dividend growth forecast coefficients were small, they would be forced to conclude that prices follow a “bubble” process, moving only on news of their own future values.

**Zhang and Fishback (2005)** showed how the investors’ mood changes affected the balance as far as the asset prices and expectancy on future returns was concerned. They showed that both the asset prices and capital itself were positively correlated to the investors’ mood, where the highest prices were associated with a more positive mood. Therefore the investor’s mood was a vital factor regarding price balance and asset return.

**Graham (2005)** provided direct measure of 10 year market returns based on multiyear survey of Chief Financial Officers. They did this by making 20 observations of each 10 year horizon. He stated that the determinants of long term risk premiums were not influenced by past stock returns. However, there was a positive correlation between real interest rates and the long run premiums.

**Polk Christopher et al (2004)** forecasted the equity risk premium. They said that if the investors were myopic mean variance optimizers, a stock return was linearly related to the beta in the cross-section. Therefore, the slope of the cross – sectional price of the risk was termed as the expected equity premium. They introduced the novel statistical methods for testing the stock return predictability based on the endogenous variables whose shocks were potentially correlated with the stock returns.

The Capital Asset Pricing Model (CAPM) predicted that risky assets should have lower prices and higher expected returns than the less risky stocks. They used this CAPM logic to construct a class of simple variables to forecast the equity premium. They constructed a number of alternate
proxies for the cross-section risk premium which were based on the various ordinal association measures between a stock or portfolio’s beta and its valuation ratios. Some of these measures were:

- They calculated the firm level accounting ratios including the Dividend to Price ratio (D/P), Book to Market Equity (BE/ME), the ratio of book value to its market value, Earning/Price ratio (E/P) and cash flow/Price (C/P).
- To control the growth opportunities, they had calculated the return on equity (ROE) and dividend payout ratio which drove the firm’s long term growth.
- The third set was for controlling the profitability which were measured through the D/BE, the ratio of dividends in the year t to the book equity in t-1 period and the non dividend paying dummy (DD) that was 0 for dividend payers and 1 for those who did not pay dividends.
- In this category, they measured the value weight average dividend yield and the value weight average past estimated beta. They then regressed the dividend yields on the portfolio betas. They also computed the value weight one year dividend growth.
- They also used the smoothed earnings yield and term yield spreads that logically predicted the market return if the expected equity premium was time varying.

They had measured the equity premium by applying the multiple regression on the above said variables in the US equity market taking the data from CRSP (Centre for Research in Securities Prices) and the NYSE and NASDAQ stocks from the period 1927–2002. They found by the above tests that the cross-sectional price of the risk was strongly correlated with the market yield measures and predicted the equity premium realizations especially in the first half of the 1927–2002 samples.

Ibbotson & Chen (2003)\(^\text{13}\) estimated the forward-looking (ex ante) long-term equity risk premium by extrapolating the way it had participated in the real economy. For the same, they had decomposed the historical equity returns from the period 1926 to 2000 into supply factors. They examined the historical real geometric long run market and long risk free return using their building block methodology. Those blocks include:

- Inflation
- Real Risk free Rate
• Real Capital gains
• Growth of real earnings per share
• Growth of real dividends
• Growth in payout ratio (dividend/ earning)
• Growth in book value
• Growth in ROE
• Growth in price/earnings ratio
• Growth in real GDP/ population
• Growth in equities excess of GDP/ Population
• Reinvestment

The key findings of their research were as follows:

• The growth in corporate productivity measured by earnings was in line and sync with the growth of overall economic productivity.
• The increase in the P/E Multiple of any equity share accounted for only a small portion of the total return of equity. The bulk of the return was attributable to dividend payments and nominal earnings growth (including inflation and real earnings growth).
• The increase in the equity market relative to economic productivity could be more than fully attributed to the increase in the P/E Multiple.
• A secular decline had occurred in the dividend yield and payout ratio, making dividend growth alone a poor measure of corporate profitability and future growth.
• Their forecast of the equity risk premium was only slightly lower than the pure historical return estimate. They estimated the expected long-term equity risk premium (relative to the long-term government bond yield) to be about 6 percentage points arithmetically and 4 percentage points geometrically.

McGrattan & Prescott (2003) had reexamined the equity premium puzzle of Mehra & Prescott (1985) which found the difference between the average equity and the debt returns puzzling because it was too large to be a premium for bearing the non – diversifiable risk. They reexamined by including some of the factors which were ignored by Mehra & Prescott (1985)
and they declared the puzzle not so puzzling since there was no too less T Bill returns and too high equity stock returns.

Some of the factors they chose to include in the Mehra & Prescott (1985) study were as follows:

- **Taxes:** Taxes should not be ignored while calculating the equity premium estimates as individuals had faced different effective tax rates on their interest and dividend income in most of the years during the past century. Further the difference in effective tax rates had varied a lot over time because of changes in both the tax code and regulations governing the financial intermediaries.

- **Regulatory Constraints:** Other regulatory constraints like the government regulations on the household and businesses during the World War II, forced the investors to invest according to the investment environment prevailing at the particular movement of time and conditions.

- **Diversification Costs:** The Diversification costs should also not be ignored as they had been very high and had varied by asset to asset and period to period.

- **Long Term Saving Instruments:** Lastly they focused on the long term saving instruments rather than the short term where long implied long enough so that asset liquidity values were very small as individuals did not hold 90 day US treasury bill for their retirement.

Unlike, the Mehra & Prescott (1985), by including these factors, they found there was no equity premium puzzle. Accounting for these factors, they found the difference between average equity returns and the debt returns during the peacetime in the last century was less than 1 percent, with average real equity return of somewhat 5 percent and the average debt return of almost 4 percent. Similarly, as predicted by the theory the real return on equity is equal to the after tax real return on capital plus a modest premium for bearing non – diversifiable aggregate risk.

**Goyal & Welch (2003)** suggested a simple graphical approach to evaluate the predictive power of popular equity premium and stock market time series forecasting regressions. They found that dividend ratios should had been known to have no predictive ability even prior to the 1990s, and that any seeming ability even then was driven by only two years, 1973 and 1974. Their paper also documented changes in the time-series processes of the dividends themselves and showed that an increasing persistence of dividend-price ratio was largely responsible for the inability of dividend ratios to predict equity premium. The dividend ratios had to predict long-run dividend
growth or stock returns with the time horizon of more than 5 years and in the short term, dividend yields primarily forecasted themselves.

Their paper found the following key findings:

a) The out of sample comparative sum-squared model residuals act as a powerful diagnostic for equity premium and stock price prediction.

b) For simple dividend-yield models predicting equity premium, their diagnostic suggested that good in sample performance was not guaranteed of out-of-sample performance. There had never been convincing evidence that dividend ratios were ever useful in predicting for investment purposes, even prior to the 1990s. Neither the dividend-yield nor the dividend price ratio had both the in-sample and out-of-sample performance that should have lead one to believe that it could outperform the simple prevailing equity premium average in an economically or statistically significant manner. A naive market-timing trader who just assumed that the equity premium was “like it has been” would typically have outperformed a trader who employed dividend-ratio forecasting regressions.

c) Their diagnostic further suggested that any remaining explanatory predictive ability of the dividend ratios in the post-war period prior to the 1990s was due to two years only, 1973 and 1974.

d) Their paper also offered some observations as to the underlying causes of poor prediction which were a) the primary source of poor predictive ability was the instability of the parameters. The estimated dividend-price ratio auto regression coefficient had increased from about 0.4 in 1945 to about 0.9 in 2002. b) The dividend yield had failed to forecast one year-ahead returns or dividend-growth rates, because it had primarily forecast its own change. c) Implementing the model to account for the time-varying properties of the dividend yield and dividend growth processes did not aid the dividend ratio in predicting stock market levels.

Arnott, R.D. and P. Bernstein (2002)\textsuperscript{16}, estimated the forward looking US equity risk premium relative to the bonds by taking the historical measures of returns since 1802. To estimate the equity premium, both the expected real stock returns and the expected real bond returns were
required as the equity premium is the extra return that the investors demand for taking the risky instruments. For the bond returns, the historical bond yields and the expected inflation were gauged and from there they determined the expected bond returns and for the stock returns they gauged the stock dividend yield in the past and the expected dividend growth. They used TIPS (Treasury Inflation Protected Securities) yield of 3.7% for the real risk free rate return, which yields a geometric intermediate equity risk premium of 2.4%. They had demonstrated that the long term forward looking risk premium was nowhere near to the level of the past and did not depend upon the past returns.

Fama & French (2002) estimated the equity risk premium using the dividend and earnings growth rates to measure the expected rate of the capital gains. Their estimates for the period 1951 to 2000 that were 2.55% and 4.32% were much lower than the historical stock return produced in the same period that was 7.43%. The reason for the high average stock returns was found to be decline in the discount rates that produced a large unexpected capital gains. They found the following results:

- The dividend growth model and the realized average returns produced similar real equity premium estimates for the period 1872 – 1950 that were 4.17% and 4.40% and for the 1951 to 2000, these estimates from the dividend growth and earnings growth models were far below the historical average.
- The estimates from the fundamentals like dividend growth and the earnings growth were more accurate and precise as they had lower standard errors than the estimates of the historical averages.
- The dividend and the earnings growth models produced roughly the same risk aversion for the period 1872 – 1949 and 1950 – 1999. In contrast, the Sharpe Ratio (the measure of risk aversion) was double from 1872 to 1950 to 1951 to 2000 period.
- The unconditional expected stock returns were better estimated through the average growth rate of the earnings rather than the average growth rate of the dividends.

Lewellen Jonathan (2002) studied the predictability of the stock returns with the financial ratios like Dividend Yield (DY), Book to Market (B/M) and Earning Price Ratios (E/P) in the various sub periods. He used the methodology to test whether DY, B/M, and E/P forecast stock
returns. Prices and dividends were collected from the Center for Research in Security Prices (CRSP) database. Earnings and book equity came from Compustat. The tests focused on NYSE equal- and value-weighted indices to be consistent with prior research and to avoid changes in the market composition as AMEX and NASDAQ firms enter the database. DY was calculated monthly on the value-weighted NYSE index. It was defined as dividends paid over the prior year divided by the current level of the index. Thus, DY was based on a rolling window of annual dividends. He used value-weighted DY to predict returns on both the equal- and value-weighted indices. The value-weighted DY was likely to be a better measure of aggregate dividend yield.

The empirical tests with DY extended from January 1946 – December 2000. He omitted the depression era because the properties of returns were much different prior to 1945. Returns were extremely volatile in the 1930s, and this volatility was reflected in both the variance and persistence of DY. As a robustness check, he split the sample in half and looked at the two sub periods, 1946 – 1972 and 1973 – 2000. Further, he investigated the influence of the last few years because recent stock returns had been so unusual. The tests with B/M and E/P were restricted to 1963 – 2000 when Compustat data was available. The regressions used log B/M and log E/P, both measured on the value-weighted NYSE index.

The literature on stock return predictability had evolved considerably over the last twenty years. Initially the empirical tests produced strong evidence that market returns were predictable, especially over long horizons. Later research questioned these findings, suggesting that small-sample biases explained the bulk of apparent predictability. The accumulated evidence suggested that DY, B/M, and E/P had weak power to predict returns. This paper provided the new tests of their predictive ability, emphasizing three main points:

a) He considered the ‘unconditional’ distribution of β. This distribution was generally appropriate for making inferences about predictability, but it ignored useful information when the predictive variable’s autocorrelation was close to one. It could substantially understate the significance of variables like DY, B/M, and E/P.

b) Empirically, incorporating the information ρ could be quite important. He found strong evidence that DY predicted returns. The tests examined NYSE equal- and value-weighted indices from 1946 – 2000. In both the full sample and various sub samples, DY was typically
significant at the 0.001 level, with many t-statistics greater than 3.0 or 4.0. The evidence for B/M and E/P ratios was weaker than for DY, but stronger than previous studies. Overall, B/M and E/P appeared to have limited forecasting ability.

c) The last few years of the sample had a large impact on the results. For the value-weighted index, adding 1995 – 2000 to the regressions reduced the OLS slope on DY by 59%, the slope on B/M by 61%, and the slope on E/P by 28%. However, the bias-adjusted estimates were less sensitive to the recent data. The estimates for equal-weighted returns actually increase with the addition of 1995 – 2000. This finding was explained by the sharp increase in the ratios’ sample autocorrelations, which lowered the bias-adjustment needed in the conditional tests.

Vuolteenaho Tuomo (2002) studied the factors that drove the firm level stock returns. He used the vector autoregressive model (VAR) to decompose an individual firm’s stock return into two components: changes in cash flow expectations and changes in the discount rates. He estimated the same from a large firm level panel from 1954 to 1996 CRSP–COMPUSTAT intersection. He analyzed the importance of the cash flow and expected return news on determining the firm level stock return. He found the following three main results:

a) The firm level stock returns were predominantly driven by changes in the cash flow. For excess log returns, the variance of expected return news was approximately one half of the variance of cash flows news. For market adjusted log returns, the variance of the expected returns news was one fifth of the cash flow news variance.

b) He found that cash flow news was positively correlated with shocks to the expected return for a typical stock. Good news about cash flows was typically accompanied by higher expected returns. This correlation appeared to be higher for smaller stocks and about zero for the larger stocks.

c) Cash flow news was more easily diversified away in portfolios than expected return news. For an equal-weight portfolio, the cash news variance was only three quarters of the expected return news variance.

These findings suggested that cash flow information was largely firm specific and that expected return information was predominantly driven by systematic and market wide components.
Constantinides (2002)\textsuperscript{20} began with a premise that the unconditional equity risk premium can be estimated from the historical average using the assumption that ERP followed a stationary path. He used the historical return and adjusted downward by the growth in price earnings ratio to calculate ERP. He removed the growth in price earnings ratio assuming no change in valuations. After his research he applied to behavioral finance to offer explanations for such high ERP estimates.

Arnott & Ryan (2001)\textsuperscript{21} began by breaking down the historical stock returns by analyzing dividend yields and real dividend growth. They pointed that the historical dividend yield is much higher than the current dividend yield of about 1.2\%. They argued that the changes from the stock repurchases, reinvestment and mergers and acquisitions affected the lower dividend yield represented by a higher dividend growth rate. They added that the dividend yield & the growth in real dividends helped in providing estimates for the future equity return. These two approaches estimated long horizon conditional Equity Risk Premium.

Campbell and Shiller (2001)\textsuperscript{22} began with the assumption of mean reversion of dividend/price and price/earnings ratios. For that they calculated the regressions of the dividend-price ratio and the price smoothened earnings ratio to predict future stock prices out ten years. After this they concluded that valuation ratios indicated a bear market in near future and predicted the negative real stock returns. They cautioned that valuation ratios have changed so much from their normal level, they might not be completely revert to the historical mean, but this experiment did not change their pessimism about next decade of stock market returns.

The price earnings ratios and dividend-price ratios as forecasting variables for the stock market were examined using aggregate annual US data from 1871 to 2000 and aggregate quarterly data for twelve countries since 1970. Various simple efficient-markets models of financial markets imply that these ratios should be useful in forecasting future dividend growth, future earnings growth, or future productivity growth. They concluded that, overall, the ratios did poorly in forecasting any of these. Rather, the ratios appeared to be useful primarily in forecasting future stock price changes, contrary to the simple efficient-markets models. This paper was an update of their earlier paper (1998), to take account of the remarkable behavior of the stock market in the closing years of the twentieth century.
Ang Andrew & Bekaert Geert (2001) studied the predictability of the stock returns in France, Germany, Japan, UK and the US by three instruments, the dividend yield, the earnings yield and the short rate. The predictability regression was suggested by a present value model with earnings growth, payout ratios and short rate as the independent variables.

The dividend yield and the nominal interest rates appeared to be the most popular predictors of the stock returns, but the earnings yield appeared to be more important predictor in forecasting the excess stock returns. They studied the same using the Monte Carlo Simulation Analysis with null hypothesis as there was no predictability of the stock returns.

The predictability evidence for the USA returns was found surprisingly weak by the t – statistic of the analysis. They also studied the stock returns predictability for the four other countries and it was found that the short rate remained only significant predictor of the excess stock returns.

They collected the data for the same for five countries from Morgan Stanley Capital International (MSCI) with 1 month Euro rate from Datastream as short term interest rate. The sample period was from February 1975 to Dec 1999 for the US, UK, France and Germany while it was from January 1978 to December 1999 for Japan.

It was also found that there were tantalizing cross country predictability patterns that appeared stronger than domestic predictability patterns.

Jagannathan et al. (2001) demonstrated that the U.S. equity premium has declined significantly during the last three decades. They studied the equity premium puzzle as there was a great difference between the theoretical and the data predicted premium. The surprising results of their study suggested that something else was there besides the inherent risk which was its size, other market imperfections like the inability of the investors to fully insure against the major risks outside the organized stock markets, the significant direct and indirect costs that investors faced in order to make transactions and incomplete knowledge among the investors about existing investment opportunities. These imperfections decreased the willingness of the investors to bear the risks and hence increased the required return for investing in risky assets, and the premium was expected to shrink when the imperfections got reduced by the introduction of the new technology which increased the transparency to access the information, communicate and transact with others etc.
They calculated the equity premium using a variation of a formula in the classic Gordon (1962) stock valuation model by calculating the equity premium as a function of the bond yield, the stock dividend yield, and the expected dividend growth rate. They calculated the premium for several measures of the aggregate U.S. stock portfolio and several assumptions about bond yields and stock dividends and got basically the same result. The premium averaged about 7 percentage points during 1926–70 and only about 0.7 of a percentage point after that. This result was shown to be reasonable by demonstrating the roughly equal returns that investments in stocks and consol bonds of the same duration would have earned between 1982 and 1999 years when the equity premium was estimated to have been zero.

Pastor & Stambaugh (2000)\textsuperscript{25} questioned the estimation of the equity risk premium by using the historical data if there was the structural breaks in the returns earned during this period. They found that the long history of aggregate stock returns contained information about the current equity premium even if the historical distribution of returns had experienced structural breaks. This study estimated the equity premium using a framework that combines the information in the entire return history with economically motivated prior beliefs. Our estimates also incorporate uncertainty about the timing of breaks.

Some of the results showed by them were:

1. First, changes in the equity premium were unlikely to be extreme. With an economically reasonable prior variance for shifts in the premium, equity returns before suspected breaks were still somewhat informative about the current premium.

2. Second, across sub periods separated by structural breaks, it seemed reasonable to believe that the equity premium was positively associated to at least some degree with equity volatility. They introduced a flexible prior that avoided specifying a parametric relation between the premium and volatility but allowed information about the price of risk from earlier sub periods to be used in estimating the current premium.

3. Third, shifts in the equity premium were likely to be accompanied by contemporaneous price changes in the opposite direction. They incorporated this prior belief by introducing "transition" regimes between the "stable" regimes, where the latter had the usual interpretation associated with sub periods separated by structural breaks. Within a
transition regime, their prior favored a negative relation between the equity return and the change in the premium between the previous and subsequent stable regimes.

Estimates of the equity premium based on reasonable priors fluctuated between 3.9 and 6.0 percent over the period from January 1834 through June 1999. The estimated premium rose through much of the nineteenth century and the first few decades of the twentieth century, but it declined fairly steadily after the 1930's except for a brief period in the mid 1970's. The estimated premium exhibited its sharpest decline of the entire period, to 4.8%, during the decade of the 1990's. They found that economically sensible priors were important in estimating the equity premium as well as in identifying the most likely dates at which breaks occurred. They also enable the current equity premium to be estimated with almost as much precision as what one would attribute to an estimate based on the long-sample average when potential breaks were ignored.

*Welch (2000)*\(^{26}\) surveyed 226 financial economists on the magnitude of the equity risk premium and reported interesting results. On average, economists forecasted an average annual risk premium (arithmetic) of about 7% for a ten-year time horizon and 6-7% for one to five-year time horizons. As with the other survey estimates, there was a wide range on the estimates, with the premiums ranging from 2% at the pessimistic end to 13% at the optimistic end. Interestingly, the survey also indicated that economists believed that their estimates were higher than the consensus belief and tried to adjust the premiums down to reflect that view.

*James Claus and Jacob Thomas (1999)*\(^{27}\) justified the equity premium estimate of about 8%. Such a high estimate along with the various other indicators such as price to book ratio and price to earnings ratios were also internally contradictory and inconsistent with the intuition and past experience, because of concerns relating to survivor bias and time-variation in the equity premium. In addition to these results, Historical evidence from other periods and other markets as well as surveys of investor beliefs suggested that the equity premium is much lower.

While projecting dividends to grow at earnings growth rates forecasted by analysts provided equity premium estimates as high as 8%, those growth forecasts exhibited substantial optimism bias and need to be adjusted downward. Overall, they believed that the commonly accepted
equity premium estimates were just not supported by an analysis that compares current market prices with reasonable expectations of future flows for the markets and years that they examined.

**Constantinides (1999)** considered a model with internal habit of the investors in the capital market where the utility was defined over the difference between the current consumption and the lagged past consumption. The risk aversion of the investors increased dramatically when the chances of recession became larger and thus the model generated the high equity premium. Since, risk aversion increased precisely when the consumption was low, it generated a precautionary demand for bonds that helped in the lower risk free rate and making the high equity premium estimates.

Equity might have a negative rate of return and thereby resulted in personal consumption falling relative to the other investment opportunities and making equity an undesirable asset relative to the bonds.

**Jeremy Siegal (1999)** found that the equity premium derived from the historical data underestimated the real return on fixed income assets and overestimated the expected return on assets.

The historical real returns of the fixed income securities were found to be unstable ranging from 0.8% to even low 0%. In contrast, the long term real returns of the stocks were found quite stable as over the entire 196 year period the after inflation geometric annual return on equity was 7%. In 1926 – 1998 period, the real return was 7.4% and since 1946, it was 7.8%. The individual investors due to the transaction costs and the lack of diversification could not be able to earn this 7% real equity returns as they were not able to fully diversify their portfolio and having more risk, thereby able to earn the real return of 5 to 6% over the most of the 19th and 20th century rather than 7%. For forward looking equity premium, it was calculated through the fundamentals with the current or the future P/E multiple values. If the future dividends grew no faster than in the past, the ex ante real stock returns were lower than 7% historical average. From the dividend discount model, the return on stocks was calculated by adding current dividend yield to the expected future growth rate of the dividends. The current dividend yield on the S&P 500 Index was 1.2% and since 1871, the real growth of dividends was 2.1%, they obtained the real stock returns of 3.3%, more than half of the historical average.
Booth, L. (1999) examined three alternative ways of estimating the expected return on the equity market in using the CAPM or some other risk premium model. The three techniques were:

1. direct estimation of the average nominal equity return for use as a forecast nominal equity return;
2. estimation of the average real equity return, which could then be added to a forecast inflation rate; and
3. estimation of an average equity risk premium, which was then added to a current risk-free rate.

Ibbotson and Sinquefeld's data on annual holding period returns were used to test the validity of their assumption that the equity risk premium followed a random walk and that the third of these approaches was thus the best method. The paper reached the three following major conclusions.

a) First, each of these three techniques involved a “bias” of some kind. The use of average equity returns as a forecast was subject to “risk-free rate” and “inflation rate” biases, while the use of an average equity risk premium was subject to a “term premium” bias. As a result, only the data could tell us which approach was best.

b) Second, from analyzing equity and bond return data and the trend in interest rates, the author concluded that the term premium bias when using average historic equity risk premium was by far the largest of the three sources of bias. Indeed, the popular practice of adding an historic average equity risk premium to the 30-year Treasury bond rate significantly overstated equity costs.

c) Third, after examining equity rates of return back to 1871, the author concluded that the real equity return seemed to follow a process that was close to a random walk and was thus the “best” of the three techniques to use as a “naive” forecast.

Campbell & Shiller (1998) examined the use of price earnings ratios and the dividend price ratios as forecasting variables for the stock market using the aggregate annual US data from 1871 to 2000 and aggregate quarterly data for twelve countries since 1970. It has been found that the dividend price ratio had done a poor job in forecasting the future dividend growth as the future dividend growth was almost the same regardless of the dividend
price ratio. There was a strong tendency for the dividend price ratio to predict the future price changes. The serious drawback of using the dividend price ratio was that it depends upon the shifts in the corporate financial policy or the dividend declaration policy, so the other valuation ratios like the price - earnings ratios were used to predict the stock market in a better way. The smoothed price – earnings ratio was a good forecaster of the ten year growth in the stock prices with $R^2$ statistic of 30% better than the dividend price ratio. Another variable ‘inflation’ was also responsible for future stock market. There was a argument that today’s high stock prices would be justified by the steady decline in the inflation that took place in the 1980s.

Bruner et al (1998)\textsuperscript{32} presented the results for determining the cost of capital for the firms. They sampled the 27 selected corporations, ten leading financial advisors and seven best selling textbooks and trade books and collected the data using the scheduled questionnaires and telephonic interview sent to the selected enumerators. The cost of capital was central to the modern finance influencing all the investment and divestment decisions, measures of economic profit and performance appraisal. The difference of few percent in capital costs could mean a jump in billion of expenditures, so the adequate estimation of cost of capital for the firm was critically required.

The different authors studied the various techniques used to estimate the cost of capital like finding the internal rate of return and the other time adjusted capital budgeting techniques and the CAPM model to estimate the cost of equity. The main area of disagreement among the various methods was in the details of implementing the CAPM to estimate the cost of equity. The CAPM was the dominant model for estimating the cost of equity. Some firms mentioned other multi pricing asset pricing models but these were in the small minority.

The CAPM model need the estimation of the risk free rate, the beta of the stock and the market risk premium to estimate the cost of equity. Some of the following insights were explored by this study for the best estimation of the weighted average cost of capital (WACC):

a) Weights should be based on market value mixes of debt and equity.

b) The after tax cost of debt should be estimated from pre-tax costs combined with marginal or statutory tax rates.

c) Betas were drawn from published sources, preferring those betas using long interval of equity returns.
d) Risk free rate should match the tenure of the cash flows being valued. For most of the capital projects and corporate acquisitions the yield on US government T bill of ten or more years would be appropriate.

e) Choice of ERP is the subject of considerable controversy both as to its value and the methods of estimation. Most of their best practice companies used a premium of 6% or lower while many texts and financial advisors used the larger figures.

Further, investigations were needed on the two principal topics. First, practitioners needed additional tools for sharpening their assessment of relative risk. Second, practitioners could benefit from further research on estimating the equity market risk premium (ERP). Current practice displayed large variation and focused primarily on averaging the past data. So, some more sophisticated model for estimating the ERP was required in the further research for the better prediction of the ERP estimate.

Mukherji et al (1997) experimented various fundamental variables including beta, BV/MV ratio, debt book value to stock market value ratio, Earnings per share to share price ratio, and the stock market value and sale per share to stock price ratio. They found that there was positive relationship between book value to stock market value, sale to stock price ratio and debt equity ratio, with the return and negative relation with the size and no correlation between the earnings to price ratio and beta.

Shlomo Benartzi, Richard H. Thaler (1995) analysed the equity premium puzzle, first documented by Mehra and Prescott, referred to the empirical fact that stocks had greatly outperformed bonds over the last century. As Mehra and Prescott suggested that it appeared difficult to explain the magnitude of the equity premium within the usual economics paradigm because the level of risk aversion necessary to justify such a large premium was implausibly large. They offered a new explanation based on Kahneman and Tversky's 'prospect theory'. Their explanation had two components.

- First, investors were assumed to be 'loss averse' meaning they were distinctly more sensitive to losses than to gains. For example if in a lottery there was equal pay off for
losses and gains, the investors were reluctant to invest in such lotteries as they were demanding high payoff in form of gains and less payoff in the form of losses.

- Second, investors were assumed to evaluate their portfolios frequently, even if they had long-term investment goals such as saving for retirement or managing a pension plan.

They dubbed this combination as 'myopic loss aversion'. Using simulations they found that the size of the equity premium was consistent with the previously estimated parameters of prospect theory if investors would evaluate their portfolios annually. That is, investors appeared to choose portfolios as if they were operating with a time horizon of about one year. The same approach was then used to study the size effect. Preliminary results suggested that myopic loss aversion might also have some explanatory power for this anomaly.

**Campbell Y. John (1993)**[^35], predicted the future expected equity risk premium by regressing the various independent variables like dividend price ratio, earnings price ratios and the interest rates on the dependent variable that is the stock returns over the different time horizons for a short and longer term of the equity risk premium. They found that the tests of predictability in the long horizon had greater power than in the short term horizon and these independent variables predicted the ERP better in the long term horizon whereas the historical stock returns predicted the short horizon ERP better than the regressed variables.

The equity returns were having a steady and stable upward drift in the long term horizon, as investors demand a increasing ERP in the equity market and expects to receive higher gains in the long future but with the small ups and downs swirls in the prices of the shares in the shorter time horizon.

**Blanchard (1993)**[^36] constructed the expected real rates on short and medium term bonds and stocks for the OECD countries from 1978, using the forecasts of inflation and found the sharp decrease in the equity premium. They had found that the movements in the premium were having the strong co relation with the movements in the inflation. A high premium in 1970’s was associated with the sharp increase in inflation while low premium in 1980’s was associated with the sharp decline in the inflation.
The other reasons were also explored satisfying the low frequency movements in the premium like the evolution of the government debt and the long lasting effects of the Great Crash in the post war period. In the Crash period, the investors perceived the investments to be highly risky thereby resulted in the high equity premium. They believed that the 2% was a better estimate of the future dividend growth, but there were several factors that argued for the higher growth like the low dividend payout ratio and the high quality of the current earnings.

Bradford & Barsky (1993) proposed models in which investors forecasted capital gains by extrapolating past price changes and augmented to allow the prices to depend on the current dividends. In particular, the elasticity of the stock price with respect to the dividend was always greater than unity. The trading of the rational speculators reinforced the positive feedback behavior which resulted in the buying of the stocks by the rational investors today which led to the increase in the prices which further increased the positive feedback behavior of the investors. Interpretations on the stock prices fluctuations that focus on the rates of changes were roughly divided into three categories.

- First, there was the present-value model, in which the price-dividend ratio was a good forecast of the present value of future dividend growth rates.
- Second, there was an "irrational" present-value model, in which stock price movements were driven by inappropriate shifts in expected fundamentals: for example, if investors believed that it was rational to extrapolate past dividend growth into the future, but it was not in fact rational to do so.
- Finally, there were "fads" and "irrational bubble" models, in which demands were largely determined by market expectations of short-term capital gains that were inconsistent with long-run fundamentals that were grossly falsified when bubbles "burst."

The models, in which the stock prices in the short term could be maintained above fundamentals by "castles in the air" promising further short-run capital gains, might have an essential role to play in accounting for short-run price dynamics. But while looking at the long swings in stock prices in terms of such "castles in the air" seem unjustified in light of the strong link between dividends and prices, and between dividends, earnings, and productivity. The present value model thus retains considerable power.
**Fama & French (1992)** experimented the positive relationship between beta and average stock return, which was the product of the negative correlation between the size and the beta. They concluded that there were other variables and had the greatest relationship between book to market value (BV/MV) ratio and the size of the company.

**Abel Andrew (1991)** found that in the 90 years from 1889 to 1978, the average real rate of return on stocks was 6.98% per year, while the average real rate of return on bills was only 0.8%. So, the equity premium (the difference of the average real stock returns & the real bond return), was found to be 6.18% per year. So, they researched the reasons for so high equity premium for the investors to invest in the stock market.

They introduced the CCAPM model which was consumption capital asset pricing model in which they explored the relation between the real stock returns and the future consumption. The investors demanded more premium for the stocks which were providing less returns at the time of low consumption as they were perceived to be risky assets.

The equity premium depends quantitatively on the two factors:

- The covariances of consumption growth with stock returns and bill returns, which measured the size of fluctuations in returns and how strongly the fluctuations were related to the fluctuations in the consumption growth.
- The coefficient of the relative risk aversion which showed how much the value of additional funds increased when consumption fell.

**Larry Epstein and Stanley Zin (1989)** investigated the testable restrictions on the time-series behavior of consumption and asset returns implied by a representative agent model in which intertemporal preferences were represented by utility functions that generalize conventional, time-additive and the expected utility. Their model was based on these preferences which allowed a clearer separation of observable behavior attributable to risk aversion and to intertemporal substitution. Further, they tested the predictions of both the consumption CAPM and the static CAPM, and performed the direct tests of the expected utility hypothesis. They found that the performance of the non-expected utility model and tests of the expected utility hypothesis were sensitive to the choice of both consumption measure and instrumental variables like real per capita income. Consumption growth rates and the real asset returns.
They had used the data for the United States differing in the measurement of consumption, asset returns and the time period. The model applied to the average behavior across the consumers if the preferences of the consumers were not varying. Thus they adopted the common assumption of identical and homothetic preferences to justify aggregation over consumers and applied the model on the per capita consumption.

**Campbell & Shiller (1988)**\(^{41}\) examined the time variation in corporate stock prices relative to the dividends. They introduced a dividend ratio model that made the log of the dividend price ratio on a stock to forecast the future one period real discount rates and future one period growth rates of the real dividends. Four versions of the linearized model differing in the measurement of discount rates were tested for US time series 1871 -1986 and 1926 – 1986 by VAR method, with version that used constant real discount rate and versions that measured the discount rates from real interest rate data, aggregate real consumption data, and the unexplained factors. They found the following three results:

- The log dividend price ratio moved with rationally expected future growth in the dividends. They had estimated that the unrestricted forecast of the present value of the future dividend growth rates had a standard deviation which was about half that of the actual log dividend price ratio.

- The various measures of short term discount rates they used like short term interest rates, consumption growth and volatility of stock returns themselves were not helpful in explaining the stock price movements. When they computed the rational expectation of the present value of the future discount rates, they found that they were far less variable than the log dividend price ratio that was not explained by the dividends.

- There was substantial unexplained variation in log dividend price ratio and more variables were to be introduced into the model to increase the explanation of the long term expected real stock returns.

**Mehra and Prescott (1985)**\(^{42}\) published the work on Equity Risk Premium Puzzle to estimate the equity premium expectations of the investors. The general equilibrium models that explain the equity were found strongly violated by the US data. The study showed that the historical realized ERP for the stock market 1889- 1978 appeared to be at odds with and, relative to
Treasury bills, far in excess of asset pricing theory values based on investors with reasonable risk aversion parameters. So, there was a need of the equilibrium model that simultaneously rationalize both historically large average equity return and small risk free return. This equity premium puzzle was not about why was the average equity return so high but rather it was why the average risk free rate so low.

They had also observed the covariance of the asset returns with the marginal utility of the consumption. It had been found that the stocks which were positively correlated with the consumption, i.e., they pay off more in the states when the consumption was high and hence marginal utility was low, demanded the higher premium by the investors for investing in such stocks as in the bad times when there was high marginal utility, they were providing less returns and thereby making these investments too risky.

In the equity premium puzzle, they had also observed the effect of the behavior and the past consumption patterns of the investors in deciding the estimates of the equity risk premium. Other factors were also observed like the liquidity, rules and regulations of the government on the investment policies, prevailing tax rates and the transaction costs in predicting the equity risk premium estimates for the investors.

Basu Sanjoy (1983)\textsuperscript{43} examined the empirical relationship between earnings' yield, firm size and returns on the common stock of NYSE firms. The results confirmed that the common stocks of high E/P firms earn, on average, higher risk-adjusted returns than the common stock of low E/P firms and that this effect was clearly significant even if experimental control was exercised over differences in firm size. On the other hand, while the common stock of small NYSE firms appeared to have earned substantially higher returns than the common stock of large NYSE firms, the size effect virtually disappeared when returns were controlled for differences in risk and E/P ratios. The evidence presented in this paper indicated that the E/P effect, however, was not entirely independent of firm size and that the effect of both variables on expected returns was considerably more complicated than previously documented in the literature.

Basu Sanjoy (1977)\textsuperscript{44} questioned the dominant financial theory of the time – the Efficient Market Hypothesis (EMH). Under the EMH, stock prices were assumed to be a perfect reflection of all known information about a company. That is, while some stocks would inevitably be
cheaper or more expensive than others, this simply reflected the different outlook for the future profits of each company. A company with bright prospects should justifiably trade at a higher multiple of its earnings (or book value etc) than one with a less positive outlook, as it was expected that its future earnings would grow at a faster rate. But assuming the two were equally risky (volatile), the total return from investing in each company should be equal – with the faster growth in profits offset by the higher price paid, and vice-versa. The only way for an investor to generate higher returns was to take on more risk – either through investing in riskier (more volatile) companies, or by taking on leverage.

This paper sought to challenge that assertion, by examining the performance of stocks in relation to their Price to Earnings (P/E) ratio – a commonly used yardstick for security valuation. It looked at the period from 1957 to 1971, and ranked every company by its trailing P/E ratio, then divided the universe into 5 portfolios based on their calculated ranking – from the lowest P/E quintile (value stocks) to the highest P/E quintile (growth stocks), with the portfolios rebalanced on an annual basis. If the market was efficient in respect of earnings multiples, then there should be no discernible difference in performance between these 5 portfolios.

Basu’s results however told a very different story. Over the 14 year study period, the two highest P/E ratio portfolios earned average annual returns of 9.3% and 9.5%, while the two lowest P/E ratio portfolios earned returns of 13.5% and 16.3%. In fact, the results showed that the average annualized returns decrease fairly consistently as the investors moved from the low P/E (value) portfolio to the high P/E (growth) portfolio. An annualized differential of 7.1% per annum between the value portfolio and the growth portfolio was extremely significant, while the value portfolio also outperformed the market over that period by an impressive 4.2% per annum.

The traditional rebuttal from EMH enthusiasts was that the lower PE portfolios must inherently be riskier – and these stronger returns were just compensation for the additional risk borne by investors in the value portfolio. However the exact opposite was found to be the case in this study, with systematic risk of the low P/E portfolios actually lower than the high P/E portfolios, leading to risk adjusted returns (Sharpe ratio) for the value portfolio of almost three times that of the growth portfolio.
He concluded that “the low P/E portfolios seemed to have, on average, earned higher absolute and risk-adjusted rates of return than the high PE securities.” Even after taking into account tax and transaction costs, “opportunities for earning ‘abnormal’ returns were afforded to investors.” This study instead suggested that a very simple approach of buying a diversified portfolio of low P/E firms outperformed the market by a substantial 4.2% per annum. Over the 14 year period of this study, the cumulative impact of this simple change was a 67% improvement in the final value of an investment portfolio compared with the performance of an index tracking alternative.

Edgar Lawrence Smith’s (1924) gave the first significant attempt to advocate equity investing as a means to achieve higher investment returns. Smith collected historical price and dividend data for stocks and corporate bonds over the period 1866 through 1923 from the Boston and New York Stock Exchanges. He formed stock and bond investment portfolios of ten securities each as the basis for simulating investor performance over four different time periods. He studied the relative appreciation returns and income returns from both asset classes and documented fairly convincingly that over a variety of sub-periods equities yielded higher income than bonds and also provided significant capital appreciation. Smith simulated the performance of these portfolios in a number of ways. The simplest was to treat the income and capital appreciation returns from the stock and bond portfolios separately and show that stocks nearly always dominated in both measures. He came close to developing a total return measure for the equity premium by the mechanical process of taking the income return each year from stocks and “paying” out of it the amount generated by the bond portfolio and then re-investing the residual back into shares. The relative growth of the stock portfolio through this procedure could be interpreted as a measure of the equity premium – at least with respect to corporate bonds.

Studies of various writers, especially Edgar Smith and Kenneth Van Strum had shown that in the long run stocks yield more than bonds. Economists have pointed out that the safety of bonds was largely illusory since every bondholder ran the risk of a fall in the purchasing power of money and this risk did not attach to the same degree to common stock, while the risks that did attach to them might be reduced, or insured against, by diversification.
Clark (1892)\textsuperscript{16}, for example, asserted that returns in excess of the riskless rate were due to monopolistic advantage, rather than compensation for insurable risk. In his view, innovation led to a comparative advantage which was in turn rewarded by excess return.

References


