CHAPTER 3
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The present value model is a framework for understanding how the prices of stocks and bonds are determined. Both stocks and bonds are claims of future cash flows. According to this model, their current prices should be equal to the present value of future cash flows, subject to the appropriate discount rates, which consist of the real interest rate, inflation expectations, and a premium for holding a risky asset. Other things being equal, an increase (decrease) in the expected future discount rates for both stocks and bonds should cause both stock prices and long-term bond prices to fall (rise), resulting in a positive correlation between returns on outstanding stocks and long-term bonds. However, Shiller and Beltratti (1992) found that the theoretical correlation between stock and long-term bond returns under the premise of the present value model is only slightly positive: a mere 0.06. The low theoretical correlation suggests that the discount rates for stocks and bonds do not move in tandem, so neither do the expected future cash flows for stocks and bonds.

Campbell and Ammer (1993) focused on the excess returns earned in holding stocks and bonds, that is, the returns over what would have been earned if people had invested their money in a highly liquid, virtually risk-free instrument like the one-month T-Bill. They break excess returns into components associated with "news" about future cash flows, which refer to dividends for stocks and coupons for bonds, and "news" about future discount rates, which consist of the real interest rate, inflation expectations, and the risk premiums for holding stocks or bonds. In distinguishing more asset return components than do Shiller and Beltratti, Campbell and Ammer also found that the correlation between stock and bond returns in general is small, but it seems to be increasing over time.

The low correlation is due to the balance among several offsetting factors. First, the discount rate for stocks may be different from the discount rate for bonds. This

would be the case if their risk premiums were different. Furthermore, the dividend stream that is discounted for a stock is fundamentally different from the coupon stream that is discounted for a long-term bond, and that also can lead to difference in their prices. Stock and bond returns tend to move in the same direction when expected future risk premiums for holding stocks and bonds change. Second relates to the effect of inflation. An inflation shock would affect bond prices much more than stock prices: Because the nominal value of the coupon is fixed, an inflation shock would dampen the real value of the bond's coupon stream; the nominal value of the stock dividend stream, in contrast, rises in response to an inflation shock, leaving the real value of the dividend stream fairly stable.

The third relates to the sources of interest rate changes. Suppose interest rates fall because the market gets information that future economic activity, and therefore corporate profits, are going to be on the low side. That information also would drive stock prices down, because it would imply eventually lower dividends. The effect on bond prices would be just the opposite: Bond prices would rise because the fixed coupon stream is discounted at a lower rate. Combining all three effects accounts for the small positive correlation between stock and bond returns. Thus, the relation between stocks and bonds depends on what underlying economic variables are driving asset prices.

It is therefore not surprising that a growing body of research has focused on forecasting stock and bonds returns using economic and monetary factors. Fama and French (1988, 1989), Fama (1990), and Schwert (1990) focus on economic factors and find that three business conditions proxies, the dividend yield[13], default

[13] The intuition for this relation, provided by Fama (1990), is that stock prices are low relative to dividends when discount rates and expected returns are high, and vice versa, so *D/V* varies with expected returns.

spread[14], and term spread[15], can explain significant variation in expected stock and/or bond returns. These studies generally find that the required returns that investors demand vary over the business cycle. Combining the previously used business cycles proxies with a measure of monetary policy, Booth and Booth (1997) find that a restrictive (expansive) monetary policy stance decreases (increases) returns of small stock portfolios and in some cases, corporate bond portfolios. The monetary policy stance measures have explanatory power in forecasting stock and bond returns, beyond business conditions proxies.

After detecting the small positive correlation between stock and bond returns, the next question is to explore the volatility of this correlation. Schwert (1989) presented evidence that equity and short-term bonds returns are more volatile during recessions. In particular, Schwert (1989) reports estimates that monthly equity returns were 68 per cent more volatile during recessions than during expansions in the post-war U.S. data (1953-1987). Over the same period, monthly short-term bond returns were estimated to be 134 per cent more volatile.

There are many more studies of stock market volatility than bond market volatility. The earliest, rigorous study of stock market variability appears to be by Fisher and Lorie (1970), which indicated that market returns during the period 1946-1965 were significantly less volatile than during the period 1926-1945. Officer (1973).concludes that the decline in stock market variability noted in the Fisher-Lorie study is better described as a return to the "normal" level of variability that prevailed before the Great Depression of the 1930s. Jones and Wilson (1989) concluded that the 1930s were the most volatile period by a significant amount, and the relative position of the

[14] The default spread is measured as the difference between the return on the corporate bond portfolio and the T-Bond portfolio. The measure is obtained by subtracting the 20-year T-Bond portfolio return from the return of a portfolio containing Aaa- and Aa-rated corporate bonds.

[15] The term spread is calculated using the long-term government bond return from Ibbotson Associates. To develop a measure of the term spread, the writers subtract the contemporaneous T-bill return from the long-term government bond return. This measure differs from Fama (1990) and Jensen (1996), in that they measure the difference between the 10-year and 1-year T-bond returns.

1980s compared to all other periods depends on the measure of volatility employed and the interval used (daily or monthly). Overall, on the question of whether the stock market is becoming more volatile, the answer is probably not.

The analysis of bond market volatility has generally concentrated on interest rate volatility because of the availability of interest rate data that extends back to 1926. There is no consistent rate of return series for bonds. Notably, interest rate volatility should be the major factor that is affecting bond return volatility, although the volatility should also be affected by other factors that impact the duration and convexity of the bond market – i.e., the maturity and coupon, and the term structure of the market. Given this background, two studies are relevant. Coleman, Fisher and Ibbotson (CFI) [1993] examined the volatility of yields during the period 1926-1988 and their results indicate a consistent increase in volatility over the four decades from 1950 through 1987, with the highest volatility during the period 1980-1987. Kouberek's (1992) analysis confirms the CFI contention that the level of rates has a significant effect on yield volatility, because the best predictive model implies that volatility is proportional to the level of interest rates.

Recently, an analysis of the volatility of bonds relative to the volatility of stocks by Reilly, Wright, and Chan (2000), indicates that the relationship is very unstable: there is generally very little correlation between the volatility of the two asset classes; and there has been an overall increase in the risk of bonds relative to the risk for common stocks. There has also been a significant positive trend in the correlation between the rates of return for bonds and stocks, as do the studies done by Shiller and Beltratti (1992), and Campbell and Ammer (1993). However, Zhou (2000) demonstrated empirically that the volatility of dividend-price ratios can largely be accounted for by the shifts in the term structure of interest rates and that the volatility of the stock market is closely related to the volatility of long-term bond yields. To summarize, Zhou's (2000) paper finds that the stock market movements are closely related to shifts in the state of the term structure.

In the end, the most important issue when investing is the concern of what real value growth one is likely to receive. Or as important, what is the risk of capital erosion when investing? Graflund (2001) examined the empirical distributions of the real return from a number of portfolios of Swedish stocks and bonds. He finds that the stocks yield a real return of about 7.5 per cent and bonds about 3.0 per cent. Graflund's results, was confirmed by Nielsen and Risager (2001) who studied a long time series of stock and bond returns for Denmark from 1922 to 1999. Their results suggest that an investor ought to avoid bonds in the long run. Finally, if the investor's goal is to minimize the risk of capital destruction, the preferable long-run passive portfolio is to diversify into mixed bond-stock portfolios.

How stock and bonds prices move relative to each other is important because it directly affects the risk of a portfolio that contains both kinds of long-term assets. While in theory, the correlation between changes in stock and long-term bond prices can be either positive or negative, depending on what underlying economic forces are driving asset prices, the above empirical evidence suggests that the correlation tends to be positive, although it seems small, it also appear to be increasing over time. The motivation for this study is based on the notion that the co-movement of stock and bond returns in Malaysia is negatively correlated for in order for investors to earn excess returns.

Another major implication for portfolio managers is the relationship between bond market and stock market volatility because this relationship has a critical effect on asset allocation decisions. We will re-examine Reilly, Wright, and Chan's (2000) conclusions that there is generally very little correlation between the volatility of the two asset classes for the Malaysian market. If tested negative, Zhou's (2000) findings that the volatility of the stock market is closely related to the volatility of long-term bond yields may mean that bonds are a more viable investment alternative given the recent volatility of the stock market.