

EE433: Paper Summary 01

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This paper captures the overall idea of “*Common Risk Factors in the Return on Stocks and Bonds*” by Eugene F. Fama and Kenneth R. French which is the extension of their previously done papers in 1992 (studying the joint roles of market β , size, E/P, leverage, and book-to-market in the cross-section of average stock returns).

There are three main differences from their previous papers. First, the set of asset returns now includes the debt instruments- U.S. government bond and corporate bonds as well as stocks. Second, the set of explanatory variables extends to term-structure variables that might play a role in bond returns. Finally, and most importantly, the method is changed from cross-section regression to time-series regression. In this paper, the inputs used as explained variables are the returns for government bond portfolios in two maturity ranges, corporate bond portfolios in five rating groups, and 25 stock portfolios formed based on size and book-to-market equity. The control variables can be categorized into two sets. First, **bond-market factors**, *TERM*- a proxy of the risk that arises from unexpected changes in interest rates- is the difference between the monthly long-term government bond return and the one-month Treasury bill rate. *DEF*- a proxy for the default risk- is the difference between the return on a market portfolio of long-term corporate bonds and the long-term government bond return. Second, **stock-market factors**, *SMB* (*Small minus Big*)- captured the risk factor in return related to size- is the difference between the returns on small and big stocks with about the same weight-average book-to-market equity. *HML* (*High minus Low*)- mimic the risk factor in returns related to book-to-market equity- is the difference between the simple average returns on the high and low book-to-market equity portfolios. *RM-RF*-captured the market risk premium- is the difference between the one-month rate of return of the market portfolio and a one-month bill rate.

In time-series regression, running on *TERM* and *DEF* only. Interestingly, the common variation captured by *TERM* and *DEF* is stronger for stocks than for bonds, i.e., the coefficients are greater than (or equal) for stocks than for bonds. However, the variation of *TERM* and *DEF* can explain most of the variation in the return for bonds (except for low-grade bonds), but not for stocks. There are plenty of variations on stocks that cannot be explained by *TERM* and *DEF*. Next, use *RM-RF*, *SMB*, and *HML* as regressors. These three stock-market factors capture a strong common variation in stocks return (greater than using either *RM-RF* alone or *SMB* and *HML* alone). Furthermore, these can explain the variation in bond returns as well (even a little). Up to this point, it is noticeable that the bond-market factors, alone, can capture common variation in stock returns as well as bond returns. Plus, using alone, stock-market factors can also capture shared variation in bond returns as well as stock returns. Hence, it could be better to use these bond-and-stock factors together, five-factor regression. It shows, nevertheless, a contradiction to our previous belief. Adding the stock-market factors to the regressions for stocks eliminates the strong slope on *TERM* and *DEF* observed when using, alone, bond-market factors. Moreover, the bond returns that respond to stock-market factors also disappear. The argument for this is that the stock returns share three stock-market factors, and the links between stock and bond returns come largely from two shared term-structure factors. The common variation in stock return related to the term-structure factors is included in the excess market return. Next, testing how well the average premiums for those five proxy risk factors explain the cross-section of the average returns on stocks and bonds, reveals that the low average *TERM* and *DEF* returns cannot explain the cross-section of average stock returns. About robustness, the five-factor model is quite robust. It can explain (whether spurious or real) the January seasonals in returns on stocks and bonds. Besides, the stock-market factors have already absorbed the strong spread in average return from *E/P* (*Earning/Price*) and *D/P* (*Dividend/Price*) portfolios.

To summarize, the results of this paper suggest that there are at least three stock-market factors and two bond-market factors in returns. Stock returns have shared variation due to the three stock-market factors, and they are linked to bonds returns through shared variation in two bond-market factors. In addition, the five-factor model, at least, can well explain the common variation in bond and stock returns and the cross-section average returns.