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On the Relation between Stocks and Bonds – Part II

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The previous issue of the *Economic Letter* discussed the relationship between the movements in the stock and bond market, at the macroeconomic level. How stock and bond 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 latest empirical evidence suggests that the correlation tends to be positive, and although it seems small, it also appears to be increasing over time.

This issue delves deeper into the relationship between stocks and bonds by focusing at the individual firm level, or the microeconomic level. While the previous analysis was based on virtually default-free Treasury bonds, this analysis focuses on corporate bonds, which entail default risk. Therefore, corporate bond prices are determined not only by the interest rates in the economy but also by the credit risk borne by the bondholders. The credit risk in a corporate bond depends on the expected future cash flows of the issuing firm, which also determines the firm's stock price; therefore, information about the firm's cash flow prospects provides an important linkage between individual stocks and bonds that is absent from the aggregate stock and default-free bond prices.

At issue is how this additional linkage affects the comovement between individual stock and bond prices. In theory, information about a firm's future cash flows can have either similar or dissimilar effects on its stock and bond prices, implying that individual stock and bond prices can be either positively or negatively correlated. This *Economic Letter* reviews the theory as well as the latest empirical evidence on the comovement between individual stock and bond prices based on recent U.S. data. The comovement between stocks and bonds at the micro level is important to an investor who holds both kinds of financial claims against the same company because this correlation directly affects the risk of her portfolio. It is also important to an investor who holds just the firm's bonds (stocks) because the

value of her bond (stock) holdings may be affected by the value of the firm's stocks (bonds) that she does not hold. Finally, if changes in individual stock price can be used to predict future changes in individual bond price, or vice versa, the forecasting power of individual asset price can lead to potentially profitable investment strategies. This *Letter* investigates whether such profit potential exists by examining the lead-lag relationship between individual stock and bond prices.

Comovement between individual stocks and bonds

Stocks and bonds issued by the same firm represent different claims on the same underlying assets of the firm. Hence, relevant information about the firm should have an impact on both the firm's outstanding stocks and its outstanding bonds, leading to comovement between individual stock and bond prices. However, depending on the type of firm-specific information disseminated over time, individual stocks and bonds can be either positively or negatively correlated.

Suppose there is good news about the firm's future cash flows which leads to an increase in the firm's market value. The firm's bonds should appreciate in value because their default risk has declined. The firm's stocks also should appreciate in value because they are claims on the firm's residual cash flows, that is, the remaining cash flows after paying off the bondholders. This should result in a positive correlation between the firm's stock and bond prices.

On the other hand, suppose there is news that the firm has invested in a risky project (relative to the firm's existing asset risk) that has potentially high payoffs. Further suppose that on a risk-adjusted basis the value of the firm is unchanged after the adoption of the risky project, because the higher expected future cash flows are discounted at a higher discount rate due to the increase in risk. Since bonds are fixed senior claims, and since stocks are residual junior claims, the firm's cash flows are not distributed symmetrically to its bondholders and stockholders. The adoption of a risky project could lead to increase in the volatility of the firm's cash flows, which would increase the default risk of the firm's outstanding bonds, and, in turn depress their market value. On the other hand, since the stockholders would get all the payoffs once the bondholders are paid in full, the stockholders would reap all the up-side gains of the risky project in the event that it succeeds in generating superior payoffs. To put it in simpler terms, since the value of the firm remains constant, and since it is claimed by both the bondholders and the stockholders, a fall in bond value must be accompanied by a rise in stock value, and vice versa. Hence, news about the underlying risk of the firm would move the firm's outstanding stocks and bonds in opposite directions, resulting in a negative correlation between individual stock and bond prices.

Whether the prices of stocks and bonds issued by the same firm move in the same or opposite directions, then, is an empirical question. Using weekly data for U.S. firms, I find that individual stock and bond prices tend to move in the same direction (see Kwan 1996 for full details). The findings suggest that individual stocks and bonds are driven by firm-specific information that is predominantly related to the mean value of the firm's underlying assets rather than to the volatility of the firm's cash flows. While the comovement between individual stocks and individual bonds was detected regardless of firm size, this relationship was found to be absent in the case of AAA-rated bonds. It appears that AAA-rated bonds may have so little default risk relative to stocks that they are insensitive to information about the issuing firm.

Lead-lag relationship between individual stocks and bonds

After detecting the positive correlation between individual stock and bond prices, the next question to explore is the dynamic of this correlation. At issue is whether the stock market and the bond market are equally efficient. In an efficient market, asset prices fully reflect all available information. Hence, if firm-specific information reaches the stock market and the bond market at the same time, as predicted by the efficient market hypothesis, this information should be embedded into individual stock and bond prices simultaneously, so that the price of one would not lead the price of the other. However, if firm-specific

information arrives at one market sooner than the other market, this information would be embedded into individual stock and bond prices at different times, resulting in a lead-lag relationship between individual stocks and bonds.

Is it plausible that information will arrive at different markets at different times? Firm-specific information can be classified as public or private. Public information is known to all participants in both the stock and the bond markets. As such, even in the absence of trading among investors, public information would lead to price changes. Public information most likely arrives at the stock and bond markets and is embedded into individual stock and bond prices simultaneously.

Private information, however, is known only to the informed traders, who seek to profit from their private information by trading with the uninformed investors. These informed traders could systematically prefer to trade in either the stock or the bond market, and, as a result, their private information would be conveyed through one market or the other. Their choice of market may depend on which has the lower transaction costs. Since, in general, the transaction costs are lower for trading stocks than trading bonds, informed traders may prefer to trade in the stock market to take advantage of their private information. Furthermore, compared to the bond market, the stock market tends to have higher liquidity and hence is more resilient to trading activities. As a result, informed traders may be better able to “hide” their trade in the stock market than in the bond market. However, informed traders may prefer the bond market because insider-trading laws require disclosure for stock, option, and equity-linked bond transactions by insiders, while there is no disclosure requirement for insider-trading activity in regular bonds, regardless of bond rating. Hence, if the informed trader is an insider of the firm, she may want to trade in the bond market to avoid disclosing her trading activities. Therefore, a priori, it is not clear where the informed trader would prefer to trade.

Furthermore, if an uninformed trader can spend resources to get information, it is unclear whether investors in the stock market and the bond market would make similar decisions about getting information. Stock investors and bond investors may have different degrees of risk aversion, holding periods, marginal tax brackets, and institutional constraints (for example, commercial banks are prohibited from direct investing in equities), any or all of which can lead to variations in the desire for information. Based on the above considerations, it seems quite plausible that private, firm-specific information may be reflected in individual stock and bond prices at different rates.

If private information is first embedded in the stock (bond) price before being reflected in the bond (stock) price, one would observe that individual stocks lead (lag) individual bonds. In other words, individual bond (stock) prices will comove with individual stock (bond) prices with a time lag. Kwan (1996) found that past individual stock prices have explanatory power for current individual bond prices. However, past bond prices have no explanatory power for current stock prices. The findings indicate that individual stocks tend to lead individual bonds, suggesting that firm-specific information is embedded in the stock prices before being reflected in the bond prices.

The lead-lag relationship between stocks and bonds was detected regardless of firm size. This relationship holds for all except the AAA-rated bonds. This further indicates that AAA-rated bonds are relatively insensitive to firm-specific information. Along this line, while individual stocks comove with individual bonds for all bonds rated below AAA, the strength of the comovement was found to increase as the bond rating declines. This suggests that firm-specific information embedded in stock prices plays an increasingly important role in bond prices as the corporate bond becomes riskier. Whereas AAA-rated bonds are relatively insensitive to firm-specific information, the prices of bonds that are rated below investment grade are heavily influenced by the issuing firm’s stock prices and are insensitive to changes in interest rates. Thus, speculative grade bonds appear to behave more like equity securities than like fixed-income securities.

Conclusion

Individual stocks and bonds issued by the same firm are expected to move together because they are claims on the same underlying assets. However, the way that prices of stocks and bonds issued by the same firm move together depends on the properties of firm-specific information disseminated over time and on the dynamics of information flows in the stock and bond markets. Recent research finds that individual stock and bond prices tend to move in the same direction. This suggests that stocks and bonds are driven by firm-specific information that is predominantly related to the mean value, rather than the volatility, of the issuing firm's assets. In addition, past individual stock prices are found to have forecasting power for current individual bond prices, indicating that stocks lead bonds in reflecting firm-specific information.

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References

Kwan, Simon H. 1996. "Firm-Specific Information and the Correlation between Individual Stocks and Bonds." *Journal of Financial Economics* 40, pp. 63-80.

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