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The asymmetric predictability of high-yield bonds

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ABSTRACT

This study examines the relationship between the high-yield bonds market and the stock market and indicates that stock returns lead high-yield bond returns. Specifically, this study further shows that this lead–lag relationship is more solid during bear market periods since a downward trend in the stock market implies a high likelihood of the exercise of the equity put in short position embedded in a high-yield bond at maturity. We also conducted out-of-sample forecast using a VAR model, an AR model and naïve estimation during bear market and non-bear market periods. Our results demonstrate that high-yield bond returns are better predicted by a VAR model that includes past stock returns than by an AR model or naive estimation during bear market periods, but such is not the case during non-bear market periods.

1. Introduction

Whether returns on risky assets are predictable is a central issue for financial economists as it involves how the financial market works and has deep implications for asset valuation. Given its importance, most of the related studies focus on the stock market; fewer on the high-yield bond market. According to Forbes, in the U.S. the full-year total issuance of high-yield bonds for 2012 reached a record high of $346 billion, and the monthly issuance set a record in September 2013 at $47.65 billion. The phenomenon of booming growth in the high-yield bond market indicates that understanding high-yield bonds' valuation is of great urgency for academics and practitioners.

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Theoretically, a straight corporate bond is essentially a combination of a pure default-free interest rate instrument and a short position in a put written on the issuer's equity (see Fridson, 1994; Merton, 1974). For investment-grade bonds, the probability that the equity put will be out of the money at maturity is quite small. So for such a kind of bond, they act more like government bonds. But in the case of high-yield bonds, on the maturity date, default is likely, so the equity put part is far from negligible and plays a role in the valuation of high-yield bonds. Thus, high-yield bonds are bound to fluctuate with the prices of the issuer's equity despite their debt nature.[1]

For high-yield bonds investors, they are like stock put writers. Investors sell the embedded stock put to the issuing firms and obtain the premium (i.e., the excess interest rate) in return. But if at maturity the issuing firms fail to meet the obligation (so that these firms exercise the right to sell their equities to investors), the investors will suffer losses. Therefore, high-yield bond investors bet on the future prosperity of the issuing firms. If the market is efficient, the asset prices will reflect all market information available, including the market expectation for the future economic performance. Hence the asset market performance can lead the actual economic performance just like what we may frequently encounter.

Before maturity, whether the embedded put will be out of the money or not is unknown, but by inspecting the stock market performance, the relevant information is gradually disclosed as time passes. If the stock market is trending upward, it implies that very likely the high-yield bond investors can be repaid in full (and nothing more) at maturity. In this case, as the probability of default declines, the value of high-yield bonds rises, but does not in proportion to the level of increase in the stock market. On the contrary, when the stock market is trending downward, it implies a worsening future economic situation, and the probability of default rises. With the continuous decrease of stock prices, the high-yield bond investors begin to worry not only about the rise in probability of default, but also the loss given default at maturity. So under the bear market condition, with the probability of default and loss given default getting larger, the investors gradually devaluate high-yield bonds as stock prices decline. In this situation, high-yield bonds are more like equities.

In this study, we use the S&P 500 index's market condition as a proxy for identifying whether stock puts embedded in high-yield bonds are deeply in-the-money or not. This is because, during an economic contraction period, even though blue chips (say, S&P 500 components) could also be faced with some financial problems, not to speak of the companies rated below BBB. Thus, it is possible that high-yield bonds could be very likely to default when the S&P 500 index is in a bear market.

The bond market has long been relatively less informationally efficient than stock markets (see Downing, Underwood, & Xing, 2009).[2] Therefore, a lead–lag relationship between common stocks and high-yield bonds has raised concerns in the extant literature, and its empirical evidence is inconclusive. For example, Hotchkiss and Ronen (2002) find no evidence that stock returns lead high-yield bond returns. In contrast, Downing et al. (2009) find that stock returns lead nonconvertible bonds rated BBB or lower, but do not lead safer nonconvertible bonds. Rather than using the individual firm data as can be frequently seen in the past literature, Hong, Lin, and Wu (2012) adopt stock and bond market indices to investigate the predictability of bond market returns. After conducting a series of econometric tests, Hong et al. (2012) conclude that the stock market leads both high-yield and investment-grade bond markets, and the relationship between stocks and high-yield bonds is stronger than that between stocks and investment-grade bonds.

Similar to Hong et al. (2012), we also investigate high-yield bonds' predictability at the aggregate level. If a lead–lag relationship exists between high-yield bond and stock markets, we are interested in realizing whether a high-yield bond return has a better forecasting performance during bear market periods. We hypothesize that a stronger lead–lag relationship exists between high-yield bond and stock markets during bear market periods. Then, we also hypothesize that a high-yield bond has a better out-of-sample forecasting during bear market periods.

[1] Ramaswami (1991) considers the options on underlying equities embedded in high-yield bonds and developed two kinds of hedging strategies against the risks of high-yield bonds: a simple options hedging strategy, and a composite hedging strategy comprising equity and risk-free bonds. He shows that the composite hedging strategy performs better in most cases.

[2] Lee, Huang, and Yin (2013) investigate the lead–lag relationships among stock, insurance and bond markets. They find that the U.S. and U.K. stock markets lead the insurance market, and bond market will be influenced by the insurance market.