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The time-varying leading properties of the high yield spread in the United States

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ABSTRACT

We propose a comprehensive empirical examination of the time-varying leading properties of two high yield spreads in the United States, and compare them with the leading properties of the term spread between the mid-1980s and the end of 2011. In a large set of in-sample and out-of-sample forecast exercises, we show that high yield spreads are not reliable predictors of future economic activity, as measured by the real gross domestic product and industrial production. Their predictive content for economic growth, which is statistically and economically significant between the end of the 1980s and the beginning of the new century, vanishes in the second half of the 2000s. This disappearance is coincident with (i) structural breaks in the relationship, which largely occurred in the early years of the past decade and during the 2007–2009 financial crisis, and (ii) the reappearance of the leading properties of the term spread in recent years. In general, despite the recent deterioration of much of their predictive content, high yield spreads still tend to outperform the term spread for predicting economic growth at horizons of up to one year in both the in-sample and out-of-sample exercises, even after accounting for time-varying parameters in the model specifications.

1. Introduction

One of the most frequently cited leading indicators for real economic activity is the slope of the term structure of interest rates, defined as the difference between a long-term nominal interest rate and a short-term nominal rate on government-issued bonds.[1] Gertler and Lown (1999) and Mody and Taylor (2003, 2004) are among the first authors to argue that, in principle, the high yield spread — a financial variable defined as the difference between an interest rate associated with *high yield* or *junk* bonds and an interest rate on government debt, AAA-rated corporate bonds, or other highest rated commercial debt — should also be able to forecast real economic activity.[2] They show that the high yield spread had greater forecasting power than the term spread between the mid-1980s and the beginning of the new century, a period during which the leading properties of the term spread first declined and then disappeared.

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[1] See for example Stock and Watson (1989, 1992, 2003), Dotsey (1998), and, more recently, Kucko and Chinn (2010) and De Pace (2013). Wheelock and Wohar (2009) provide a comprehensive review of the relevant literature on the topic.

[2] High yield spreads are sometimes called junk bond spreads. Junk bonds are bonds that have received below investment-grade ratings from a rating agency.

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Knowing the characteristics of the relationship between the high yield spread and economic activity is important for both policymakers and investors, who often wish to formulate macroeconomic predictions from nominal interest rates. The empirical association between nominal spreads of this kind and future economic growth is expected to be negative: if high yield spreads widen, macroeconomic conditions are anticipated to deteriorate. One of the most compelling theoretical explanations for this link draws on the concept of the *financial accelerator* (see Bernanke & Gertler, 1995; Bernanke, Gertler, & Gilchrist, 1999; and references cited therein), according to which the effects of several types of negative economic shocks may be amplified by deteriorating conditions in the financial markets, through mutually reinforcing propagation mechanisms, eventually leading to a macroeconomic downturn.

In this work we conduct a comprehensive empirical exploration of the in-sample leading properties of two high yield spreads for the growth rates of gross domestic product (GDP) and industrial production (IP) in the United States between the mid-1980s and the end of 2011. In addition, we offer a comparative assessment of the out-of-sample forecasting abilities of two corresponding baseline high yield spread models. Following Mody and Taylor (2003, 2004), the term spread is analyzed both for comparison purposes and as a useful benchmark leading indicator. We extend the existing empirical literature and our knowledge of the association between high yield spreads and economic growth in several directions. We begin by examining two baseline ordinary least squares (*OLS*) regressions for modeling the basic predictive content of high yield spreads for future economic activity up to two years in advance. All previous empirical studies assume this predictive content to be constant over predetermined subperiods of time. Our baseline investigation, however, is extended to encompass the possibility of time-varying predictive content by means of a breakpoint analysis, time-varying parameter (*TVP*) models, and a real time dataset. The use of real time data is a particularly novel contribution of this work. In addition, we assess the relative out-of-sample forecast performances of the baseline high yield spread models, using a modified version of the Diebold–Mariano test to deal with short forecast samples better and to characterize the (in)stability of the relationships under investigation further using out-of-sample forecast breakdown and fluctuation tests. Finally, we compare the out-of-sample forecast performances of the baseline regression models with those of matching *TVP* models.

To the best of our knowledge, we are the first to document the statistical disappearance of the predictive content of high yield spreads around the 2007–2009 global downturn, following a long-term decline that began in the first half of the 2000s. We show that this occurrence coincided with the reappearance of the leading properties of the term spread, which have reemerged after a long absence that started at the beginning of the 1990s. In contrast, using different techniques and smaller samples, the earlier literature on this topic had found evidence that high yield spreads were reliable leading indicators in the United States. Their leading properties were interpreted as an empirical validation of the existence of a financial accelerator mechanism. In this paper, we provide evidence of structural changes in the (forecasting) link between high yield spreads and economic growth between the early 2000s and the end of the decade. We also demonstrate that, despite the recent deterioration of much of their predictive content, high yield spreads are generally able to predict economic growth better than the term spread at horizons of up to one year in both the in-sample and out-of-sample forecast exercises, even after accounting for time-varying parameters in the model specifications.

2. High yield spreads and real economic activity

Economists all agree that our ability to forecast the economy is generally very limited. Using the information set that is available today and appropriate statistical models, we can usually construct predictions for the current quarter, and possibly the next. However, the predictive power of even the best models and leading indicators is fundamentally modest, and declines as the forecast horizon extends beyond a few quarters.

Most of the empirical research on the predictive content of interest rate spreads has been based on interest rates associated with Treasury securities, for the sake of convenience, as the pricing of Treasury securities is not affected significantly by credit risk premia, which may change with maturity and other factors. In general, however, interest rates and spreads depend on the reliability and riskiness of the issuer of a bond, i.e., the borrower. The difference between the interest rates charged for loans to high- and low-risk borrowers contains information about the financial risks that are perceived by economic agents. The basic mechanism behind the financial accelerator — one of the theories that explains why high yield spreads are able to predict economic activity — relies on this principle.

Financial markets, and high yield bond markets in particular, are characterized by imperfections — such as limited and asymmetric information — which determine the discrepancy between the cost of external funds and the opportunity cost of internal funds for many firms. This discrepancy, known as the premium for external funds, is expected to be countercyclical with respect to output, as was discussed by Mody and Taylor (2003, 2004), for example. For at least two reasons, high yield spreads are likely to be good proxies for the premium for external funds. First, the firms that are looking for external funds in high yield bond markets usually face the typical frictions and imperfections that characterize this kind of financial market and are specified by the theory of the financial accelerator. Second, the opportunity cost of internal funding is close to the *risk-free* rate of interest on government issued bonds or AAA-rated debt. The expected negative relationship between high yield spreads and future economic activity is based on both the information contained in firms' balance sheets and the idea that financial frictions are able to amplify the business cycle following specific shocks. In a broad sense, the existence of such leading properties could be seen as evidence of a financial accelerator mechanism at work. From another perspective, changes in high yield spreads are often thought to reflect variations in the default risk of