Forecasting sectorial profitability and credit spreads using bond yields

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ABSTRACT

While previous research has focused mainly on government bonds as economic predictors we provide evidence that corporate bonds can act as predictors as well. By analyzing data from the financial and industrial sectors, which are the main pillars of the economy, we show that corporate bonds can predict changes in corporate profits and stock price behavior in the sector they are affiliated with. In addition, the examination of the relationship between sectorial credit spreads and various states of the economy shows that the financial sector is more sensitive to economic deterioration than the industrial sector.

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1. Introduction

Sectorial diversification is one of the common approaches in portfolio management. While previous research showed that government bonds could be employed as predictors of macroeconomic parameters (the leading one being Estrella & Hardouvelis, 1991, hereafter E&H), we attempt to use corporate bonds from various sectors to predict sectorial behavior. E&H established that the yield curve (YC) on US government bonds could help predict the future state of the economy. Basing their work on Fama (1984, 1990) who showed that the forward interest rate could forecast future changes in short-term interest rates, E&H's results imply that the greater the spread between the yields of long-term and short-term bonds, the higher the expected growth rate.

These results provide the foundation for the current research, which focuses on predicting sectorial behavior by using sectorial corporate bonds. Given that corporate bonds are considered more volatile than government bonds, we believe they can provide a more refined approach to predicting sectorial behavior thereby enabling the improvement of sectorial diversification. The results we obtained, shown later in this study, support this argument.

Before formulating our hypotheses we examined papers that focused on government YC behavior, including those of Cox, Ingersoll, and Ross (1985), Brandt and Kavajecz (2004), Tkacz (2004), Berardi and Torous (2005), Chun (2011), Duffee and Hopkins (2011), Goyenko, Subrahmanyam, and Ukhov (2011), Lettau and Wachter (2011), Kim and Orphanides (2012) and Lange (2013).

Prior studies that examined the behavior of corporate bonds include the following: Merton (1974), Altman (1987), Fons (1994), Jarrow, Lando, and Turnbull (1997), Duffie and Singleton (1999), Helwege and Turner (1999), Zhou (2001), Becker and Milbourn (2011), Bar-Isaac and Shapiro (2013), Huang and Huang (2012) and Pericoli and Taboga (2012). They find differences in the conception of credit risk and its implications for the slope of the YC of corporate bonds. We investigate this issue by using sectorial YCs and sectorial credit spreads as predictors of changes in corporate profits and the behavior of stock indices.

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While previous research attempts to predict macroeconomic behavior largely by using the government YC and its derivatives, we argue that by using sectorial corporate YCs and credit spreads we can predict sectorial behavior. We investigate this argument in the context of the financial and industrial sectors in the US economy. These two sectors are the main pillars[1] of the economy and have usually the richest available data. The findings in this study support the argument just stated above.

Finally, we use sectorial credit spreads to predict sectorial stock performance.

The relationship between the government YC and stock market behavior was examined in studies such as those of Campbell (1987), Campbell and Cochrane (1999) and Chen, Collin-Dufresne, and Goldstein (2009). These studies serve as a basis to examine the relationship between sectorial bonds and sectorial stock indices in this study.

We find that by using government and sectorial corporate YCs we are able to predict changes in corporate profits in both sectors. We also find that in weaker economic states, credit spreads are wider than in stronger economic states. Another result indicates that by using sectorial credit spreads we can predict substantial movements in the sectorial stock indices.

This study is organized as follows. Section 2 presents the theoretical framework. Section 3 describes the data used in the study. Section 4 examines whether sectorial corporate YCs are effective for forecasting changes in sectorial corporate profits in the relevant sector. Section 5 shows the behavior of sectorial corporate credit spreads in different states of the economy. Section 6 determines whether sectorial credit spreads are effective for predicting sectorial stock performance. Finally, Section 7 concludes the study.

2. Theoretical background

The basis for forecasting economic parameters by employing government bonds and the government YC stems from the direct relationship between the interest rate[2] and bond yields. The expectation for a drop in the interest rate causes bond yields to drop and YCs to flatten or even to flip to a declining state. Indeed, towards the end of 2008 expectations of a reduction in interest rates caused the US government YC to flip and decline from left to right before the US central bank reduced the interest rate to its lowest level ever in order to stimulate the growth of the economy. This relationship, which is documented in several papers, such as that of E&H, caused economists to use the YC of government bonds as a tool for forecasting the future macroeconomic state. E&H show that the slope of the government YC, representing the spread between yields in the long and short terms, has a positive relationship with the future growth rate. This relationship follows when a favorable macroeconomic state usually causes the central bank to increase the interest rate. Consequently, investors will demand higher returns for their long-term investments because the long-term interest rate is expected to be higher than its current levels.

While previous research utilized mainly government bonds in order to predict future economic parameters, we argue that by using corporate bonds we can refine our predictive ability. This refinement stems from the additional characteristics of corporate bonds such as credit risk and sectorial affiliation.

Bonds fall into three main groups: government bonds, investment grade bonds[3] and junk bonds.[4] We argue that one of the most important factors for bonds is the issuer's credit risk[5] — defined as the ability to repay one's obligations. The higher the credit rating, the lower the rate of return and the volatility of the bond (Altman, 1987). In a strong economic environment, investors are willing to take greater risks, so they invest in riskier instruments that offer a higher rate of return, such as low-rated bonds. In contrast, when they are concerned about the economic outlook, they seek refuge in less risky instruments such as high-rated bonds.

In addition, while government bonds are relevant for the entire economy, by using sectorial bonds we can estimate the behavior of a specific sector. This characteristic may enable a more refined approach that might help optimize the sectorial diversification of portfolios. The two sectors investigated in this study are the financial and industrial sectors, which are considered to be the main pillars of the economy and also have the richest available data.

3. Data description

3.1. Data

We collected data about the sectorial economic parameters and the sectorial yield curves from Bloomberg. The system includes consistent and reliable data about the sectors used in this study. In our research we used data from Q3/91 up to Q4/13 because the data for the sectors examined, which are the main pillars of the economy, is available since 1991. Yield curve data was collected from Bloomberg's fair market yield curves, which are considered to be option-free as they exclude regular callable bonds and include only make whole callable bonds.

Regular callable bonds entail prepayment risk (Bleaney, Mizen, & Veleanu, 2012) and therefore might impact the results we find. However, make whole callable bonds have a floating call price that is determined by a spread from the relevant Treasury bond. As a result, they make the bond holder "whole" when called, thereby eliminating most of the prepayment risk (Fabozzi, 2005). By using Bloomberg's option-free fair market yield curves we obtained a proper filtration of the data and eliminated potential prepayment risks.

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[1] The financial and industrial sectors have the largest number of companies in the S&P 500 index, represented by 85 and 76 companies, respectively.

[2] The Federal Funds Rate, the overnight interest rate at which depository institutions lend funds to one another, is determined by the Federal Reserve.

[3] Investment grade bonds are considered low risk bonds, and are rated *BBB* − (by S&P or Fitch) or *Baa3* (by Moody's) and above.

[4] Junk bonds are considered high risk bonds, and are rated lower than *BBB* − (by S&P or Fitch) or *Baa3* (by Moody's).

[5] The credit risk represents the probability that the issuer will not be able to pay all of its obligations when due.