Forecasting growth and stock performance using government and corporate yield curves: Evidence from the European and Asian markets

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A R T I C L E   I N F O

A B S T R A C T

Past research has shown that the government yield curve and credit spreads can predict future macroeconomic parameters such as the growth rate. However, it has focused mostly on the US government yield curve. In this study we extend the existing notion by using both government and corporate yield curves to predict economic growth and stock market behavior in three main markets outside the US.

The results we obtained from the British, European and Japanese markets reveal that government and corporate yield curves can indeed predict future economic growth and stock market trends.

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1. Introduction

Past research has shown that government yield curves and credit spreads can be used to predict the behavior of macroeconomic indicators such as the growth rate. One of the leading papers that investigated this phenomenon is that of Estrella and Hardouvelis (1991), which followed the earlier studies of Fama (1984, 1990) and showed a significant positive relationship between the slope of the yield curve of US government bonds and the future growth rate of the economy. In other words, the greater the spread between the yields on long-term and short-term bonds the higher the anticipated future growth rate.

A few years later, Bernanke et al. (1999) formulated the financial accelerator theory which supplies the basis for utilizing the marginal spreads of corporate yield curves when predicting future macroeconomic behavior. These marginal spreads include both credit parameters and expectations about the future expected interest rates.

The current study employs the most recent data available, which also include the crisis year of 2008 and the time period surrounding it, in order to investigate whether corporate yield spreads can serve as explanatory variables when forecasting macroeconomic performance in three markets outside the US. This issue, as far as we know, has not been investigated in prior studies. We believe that the greater volatility of corporate yield curves improves their ability to predict macroeconomic parameters such as the future growth rate. The results we provide confirm our beliefs.

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While Estrella and Hardouvelis (1991) focused on the US market, an additional study that investigated the predictive ability of the government yield curve (Estrella et al., 2002) extended the earlier research to Europe by examining data from the German market. The researchers used regular and binary models with data about German government bonds to predict economic activity and the inflation rate. Their results indicate that the predictions are more accurate when estimating the real growth rate rather than the inflation rate. In addition, the researchers also found that binary models were more effective than regular models. The current research differs in that it adds corporate bonds to the prediction as well as data from the Japanese market, which is considered the most developed market in Asia.

Other papers, integrated in our study, that investigate various aspects of the yield curve and credit spreads issue include those of Cox et al. (1985), Gertler and Lown (1999), Chan-Lau and Ivaschenko (2001, 2002), Drakos (2003), Brandt and Kavajecz (2004), Berardi and Torous (2005), Duffee and Hopkins (2011), Goyenko et al. (2011), Lettau and Wachter (2011), Kim and Orphanides (2012) and Pace (2013). The findings of these studies indicate that the government yield curve can be employed for predicting the future economic performance.

In the past few years, however, studies that question the predictive ability of the government yield curve have also been voiced. Some of these studies, such as Rudebusch et al. (2006), Backus and Wright (2007), Craine and Martin (2009) and Goda et al. (2013), focus on the US bond yield conundrum which started in 2004 when US long-term yields began to drop, and no recession was in sight. These studies, investigating the conundrum, yielded contradicting results when trying to explain the reason for the conundrum.

Additional studies that relate to the behavior of corporate bonds and are relevant to our study are those of Merton (1974), Altman (1987), Fons (1994), Jarrow et al. (1997), Duffie and Singleton (1999), Helwege and Turner (1999), Zhou (2001), Becker and Milbourn (2011), Bar-Isaac and Shapiro (2013) and Huang and Huang (2012). These papers show that the slope of high-rated corporate yield curves is expected to be positive, meaning that, like government bonds, the longer the time to maturity of the bonds the higher their yields. This finding underpins the formulation of our hypotheses in this study.

In our research we follow the suggestions of Ang et al. (2008) and Chernov and Mueller (2012) and use variables in real terms in order to neutralize inflation and its influence on the predictive ability of the yield curves.

In addition to the GDP growth rate we also attempt to predict stock market behavior by using the government and corporate yield curves. Our hypothesis regarding stock market behavior is based on the studies of Campbell (1987), Campbell and Cochrane (1999) and Chen et al. (2009).

Our results indicate that the greater volatility of corporate bonds and the credit risk that characterizes them improve the forecasting ability of macroeconomic parameters because their movements are more rapid and drastic than those of government bonds.

The structure of this paper is as follows. Section 2 presents the theoretical framework. Section 3 describes the data used in the study. Sections 4–6 examine the British, European and Japanese markets, respectively. Finally, Section 7 concludes the study.

2. Theoretical background

The shape of the government yield curve is determined by expectations about the future interest rates of the central bank. This argument is supported by the expectations theory, which is one of the building blocks for the current research. The theory claims that a long-term investment should be considered as a chain of short-term investments.

When the economy is expected to slow down, central banks usually lower the interest rate in order to ease the expected recession by stimulating consumption and growth.

In line with the expectations theory, the anticipation of a reduction in the interest rate causes the government yield curve to flatten and at times even to flip and decline from left to right. This result occurs because long-term investments are considered to be chained short-term investments, and the yields on future short-term investments are expected to be lower than their current yields. This behavior was evident in 2008 when the US government yield curve flipped to a declining state. On the other hand, the anticipation of an interest rate increase causes investors to demand higher returns for their long-term investments because the interest rate in the long run is expected to be higher than its current level.

This relationship was identified by economists that used the US government yield curve to predict future macroeconomic data including the growth rate. Their results show a positive relationship between the slope of the government yield curve, estimated as the spread between yields in the long and short terms, and the future GDP growth rate. These results are in line with the expectations theory described above because an improved macroeconomic state should cause the central bank to increase the interest rate in the future.

The financial accelerator theory argues that the business cycle is affected by credit market frictions which impact the ability of corporations to raise funds for their activities, thereby affecting their profitability and even solvency. On a larger scale, these frictions can influence macroeconomic performance. As a result, we argue that by using corporate bonds, which are more exposed to changes in the credit markets, compared with US government bonds, we can improve the prediction results.

While credit spreads mainly deal with credit risk and are only relevant for a specific term, the marginal spreads used in our study deal with multiple terms which allow us to facilitate future interest rate expectations, and forecast the future state of the economy with higher accuracy.