International Review of Financial Analysis 48 (2016) 303–311

Contents lists available at ScienceDirect

International Review of Financial Analysis

Time-varying risk premium yield spread effect in term structure and global financial crisis: Evidence from Europe[☆]

Taufiq Choudhry [*]

School of Business, University of Southampton, Southampton, UK

ARTICLE INFO

Article history:
Received 26 January 2015
Received in revised form 19 July 2015
Accepted 4 August 2015
Available online 29 August 2015

JEL classification:
E4
E44

Keywords:
Time-varying
Risk premium
Crisis
GARCH
Term structure
Interest rates

ABSTRACT

The global financial crisis had a significant effect on the interest rates and the term structure of interest rates around the globe. In this paper we apply the GARCH-in-mean (GARCH-M) to study the effect of the global financial crisis on the term structure volatility, persistence of volatility, risk premium, and effects of the yield spread in five European markets; Portugal, Ireland, Italy, Greece and Spain (PIIGS). To the best of our knowledge this is the first such study in the field, and thus represents the main contribution of the paper to the literature. We investigate both the longer end and the shorter end of the term structure. We study two versions of the longer end based on the 10-year bond (long-term rate) and the two short-term rates, (three- and six-month rates). The shorter end of the term structure is based on the two short-term rates. Results indicate a substantial change in the term structure volatility, persistence of volatility, risk premium, and the effects of the yield spread due to the financial crisis. These results are found for both the longer end and the shorter end versions of the term structure.

© 2015 Elsevier Inc. All rights reserved.

1. Introduction

The term 'structure of interest rates' may be defined as the relationship between maturity of a bond and the interest rate on the bond, holding constant other factors such as coupon size, tax treatment, and transaction costs among others.[1] According to Gurkaynak and Wright (2012); Mankiw and Summers (1984), and Lee and Tse (1991), term structure is connected with the pricing of bonds of different maturities and is also critical in the evaluation of the effects of alternative macroeconomic policies. These studies further assert that term structure provides information about the inter-temporal arbitrage opportunities, management of the risk of interest rate derivatives, portfolio management, correct pricing, identifying the price of time, and the efficiency of financial markets. Zhong (2009) posits that capturing the characteristics of the interest rate change and constructing corresponding term structure has become more and more important in financial modeling. The term structure of interest rates has been extensively investigated (Gurkaynak & Wright, 2012) and this paper contributes to the vast body of literature by empirically investigating the effect of the global financial crisis on European term structure of interest rates. The effects of financial crisis on interest rates corresponding to different maturity horizons are different and these differences can be observed through the term structure of interest rates (Dabos & Bugallo, 2000). Given the importance of the term structure in finance and economics, it is of empirical interest to study the effect that crisis has on it.

According to Bollerslev, Chou, and Kroner (1992), as the degree of uncertainty for the different interest rates varies through time, so will the compensation required by a risk-averse investor, and a time-varying risk premium might therefore reconcile with market efficiency.[2] According to Mankiw and Summers (1984), the risk premium in the term structure may represent the extra compensation required to induce a lender to hold the longer-term instruments, and also the risk premium is the deviation of the market long-term rate from the long rate based upon fundamentals and expectations.[3]

The global financial crisis adversely affected the term structure of interest rates across the globe (Bech & Lengwiler, 2012; Medeiros &

[☆] The author thanks an anonymous referee for several useful comments. Any remaining errors or omissions are the author's sole responsibility. This paper was funded by the financial grant (UMO-2014/13/B/HS4/01556) provided by the National Science Centre, Poland.

[*] Corresponding author at: School of Business, University of Southampton, Southampton SO17 1BJ, UK. Tel.: +44 2380599286.
E-mail address: t.choudhry@soton.ac.uk.

[1] Gurkaynak and Wright (2012) provide an excellent review of the term structure of interest models as they are addressed in the literature.

[2] Risk premium is defined as any increase in the expected rate of return of an asset as it becomes more risky.

[3] The nature of this trade-off depends on the risk preferences of the traders (Engle et al., 1987).

http://dx.doi.org/10.1016/j.irfa.2015.08.012
1057-5219/© 2015 Elsevier Inc. All rights reserved.

Rodriduez, 2011). According to Bech and Lengwiler (2012) the crisis period resulted in high-yield volatility, shifting downwards the level of term structure, and considerably changing the slope and curvature of the term structure. Similarly Muir (2013) shows that, during crisis, the term structure slopes sharply downward as risk and risk premia are more concentrated in the near term. Guildolin and Tam (2013) empirically show significant effect of the crisis on the yield spread in the US bond market. Muir (2013) shows large spikes in risk premia during and around financial crisis but not around other disasters such as wars. Studying several different financial crises, Dabos and Bugallo (2000) show that term structure of Argentina and the US suffered big fluctuations during several different financial crises. Cenesizoglu, Larocque, and Normandin (2013) investigate the effect of the crisis on the term structure of the US. They show a reduction in the effectiveness of the monetary policy on the term structure during the crisis period. There is a lack of research involving the European term structure during the global financial crisis.

The motivation behind this paper is based on the calls by Bollerslev et al. (1992) and Gurkaynak and Wright (2012) for further research in this field. We extend this call by investigating the influence of the crisis on the term structure of the five main financially-stressed European economies. We apply the GARCH-in-mean (GARCH-M) to study the effect of the global financial crisis on the term structure volatility, persistence of volatility, risk premium and effects of the yield spread in Portugal, Ireland, Italy, Greece and Spain (PIIGS).[4]In this paper (similar to Engle, Lilien, & Robins, 1987) the risk premia are measured by the conditional variance of the period excess holding yield..

The theme of the paper is based on three main research questions involving these five European markets. First, did the crisis change the risk and excess holding-yield trade-off? Second, did the relationship between yield spread and excess holding yield change during the crisis period? Third and last, did the crisis change the effect of the yield spread on the risk premium? To the best of our knowledge no previous study has conducted such an empirical investigation for any market, and this is the main contribution of the paper to the vast existing body of literature.

These five European markets are applied because of the severe adverse effects of the current financial crisis they experienced. The current financial crisis is considered to be as the worst financial crisis since the Great Depression of 1929–33 (Guildolin & Tam, 2013). This crisis engulfed most fixed income markets, both in the US and internationally, where persistently high, often historically abnormal yields and yield spread between different instruments have been observed (Guildolin & Tam, 2013). According to Djukic and Djukic (2009); Aristei and Gallo (2014) and Werner (2014) the crisis had dramatic effect on the short-term interest across Europe and the global. The gap between the long term rates and the short term rates widen dramatically during the crisis. With the default by Lehman Brothers in September 2008 the TED spreads jumped to an extreme high level.[5] This made investors even more wary about the risk, and it became more difficult for banks to raise capital via deposits and shares. Major centre banks in the US and Europe in response cut official short term interest rates to historical lows so as to contain funding cost of banks. Lowering the short term rates demonstrated the will of the European Central Bank to provide liquidity at exceptionally low cost, to support the banks in the process of financing of the real economy and to allow them to by-pass money market tensions (Aristei & Gallo, 2014).

Summarising our results, there is a substantial increase in the risk-premium coefficient from the pre-crisis period to the crisis period for most countries. All effects of the yield spread on the excess holding yield are positive and significant in all tests during both periods. There is also a substantial increase in the size of the effect from the pre-crisis to the crisis period. The direct effect of the yield spread on conditional variance during the pre-crisis period is insignificant in all markets except Spain. During the crisis period, there is a significant effect of the yield spread on the conditional variance in all tests. Thus, during the volatile crisis period, yield spread may have become important in predicting risk premium. For the short-term rates during both periods, the risk premium conditional variance is significantly influenced by the yield spread, implying importance of yield spread in forecasting the short-term risk premium.

The paper is set out in the following manner. Section 2 outlines the basic term structure hypotheses and the concept of risk premium in the term structure. Section 3 describes the data and the methodology of empirical investigation. The empirical results are presented in Section 4, and Section 5 concludes the paper.

2. Term structure hypotheses

Essentially, four hypotheses regarding the term structure have been put forward (Gurkaynak & Wright, 2012; Lee & Tse, 1991; Nelson, 1979). The expectations theory implies a formal relationship between long- and short-term interest rates. Assuming zero transaction cost and identical forecast of future interest rates by all investors, this theory leads to the conclusion that the long-term rate is an average of current and expected short-term rates. According to Campbell and Shiller (1991), if the expectation theory is an adequate description of the term structure, then rational expectations of future interest rates are the dominant force determining current long-term interest rates. On the other hand, if the expectations theory is very far from accurate, then predictable changes in excess returns must be the main influence moving the term structure. An approximately equivalent form of the hypothesis state is that the expected one-period holding returns on bonds of all maturities are the same, or differ by constant risk premiums.[6]

According to the liquidity-preference theory in a world of uncertainty, short-term issues are more desirable than long-term issues because the former are more liquid. If short-term rates were expected to remain unchanged in the future, the long-term bonds ought to yield more than short-term bonds by the amount of a risk premium. Thus, according to the liquidity theory, if the general level of interest rates does not change, long-term bonds can be expected to fluctuate in price to a far greater extent than short-term bonds. The main thrust of the liquidity theory is that the long-term bonds ought to offer the investor a greater return than short-term bonds because of their greater potential price volatility.

According to the segmented market theory, investors and borrowers choose securities with maturities that satisfy their forecasted cash needs. Investors or borrowers would shift from the long-term market to the short-term market – or vice versa – only if the timing of their cash needs changed. Thus, segmented market theory states that the choice of long-term versus short-term maturities is predetermined according to need rather than expectations of future interest rates. A more flexible perspective of the segmented markets theory, referred to as preferred habitat theory, offers a compromising explanation for the term structure of interest rates. This theory suggests that while investors and borrowers may normally concentrate on a particular natural maturity market, certain events may cause them to wander from their natural maturity habitat. In other words, natural maturity markets may influence the term structure but interest rate expectations could entice market participants to stray from preferred maturities.[7]

---

[4] Halkos and Papadamou (2007), Koutmos and Philippatos (2007), Mahdavi (2008) and Juneja (2012) provide empirical studies of term structure of the European countries, but none of these studies investigates the effect of the global financial crisis.

[5] TED is the spread between Libor and the Treasury bill rate.

[6] One of the implications of the expectation theory is the stationarity of the interest rate spreads. But over the years there has been a lack of empirical evidence supporting the stationarity of the interest rate spreads. Strohsal and Weber (2014) using the new mean-variance cointegration test show that the lack of evidence is due to nonstationary term premium modelled by means of a stochastic discount factor. This result advocate's further research in this field.

[7] See Nelson (1979) for a more detailed description of these hypotheses.

Download English Version:

https://daneshyari.com/en/article/5084624

Download Persian Version:

https://daneshyari.com/article/5084624

Daneshyari.com