



The determinants of credit spreads changes in global shipping bonds



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ABSTRACT

This paper investigates whether bond, issuer, industry and macro-specific variables account for the observed variation of credit spreads' changes of global shipping bond issues before and after the onset of the subprime financial crisis. Results show that conclusions as to the significant variables of spreads depend significantly on whether two-way cluster-adjusted standard errors are utilized, thus rendering results in the extant literature ambiguous. The main determinants of global cargo-carrying companies' shipping bond spreads are found in this paper to be: the liquidity of the bond issue, the stock market's volatility, the bond market's cyclical, freight earnings and the credit rating of the bond issue.

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1. Introduction

Public debt became popular as a source of funds for the ocean-going shipping industry from the mid-90's onwards – see for e.g. [Stopford \(2009\)](#). This has reflected: First, the increasing move of many shipping companies from family to corporate entities, providing thus the structure which can facilitate corporate bond issues; second, the realization that there are tax advantages in raising funds through bonds. This is because, accounting wise, interest coupon payments are considered as costs and are thus reducing the tax-bill, and as a consequence the cost of capital for the shipping company; third, access to capital markets through this channel can provide an alternative to traditional bank finance, particularly in periods when the banking sector has been struggling to provide funding. This has been particularly a problem following the onset of the banking-financial crisis of 2007. As discussed in [Albertijn et al. \(2011\)](#), utilizing data from [ABN AMRO \(2011\)](#), before the subprime financial crisis of the years 2007–2009, 75% of the external funding in shipping came from banks, while bonds and public equity provided only about 5%. However, alternative sources of funding, including bond issues has assumed an increasing role during the bank-funding shortage periods.

Public debt then is a multi-billion dollar source of capital for the maritime industry – see for e.g. [Stopford \(2009\)](#) and [Albertijn et al. \(2011\)](#). A major issue that determines the final cost of capital to the shipping company issuing bonds as well as for the return that investors make by placing their money in them, is the spreads that such bonds bear. Bond spreads are premiums above the risk free rate, which investors require as compensation for the risks undertaken when investing in them. These “extra” returns compensate bondholders for undertaking several types of risks associated with the bond issue. They include: default risk, defined as the probability of default of a bond issue; liquidity risk, representing the risk that a

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bondholder cannot sell a bond at will within a short period of time or without a substantial discount in its price; and market risk, which refers to the risk of there being a significant discount in the market price of a bond as a consequence of a depressed market.

The identification of the determinants of shipping bonds spreads is of primary interest to participants in the market, such as to shipowners, banks, and individual or institutional investors. A number of finance professionals, such as bond portfolio managers working for hedge or mutual funds, are interested in the pricing of shipping bonds, since many of them consider investments in shipping as an alternative investment category. Holding shipping bonds enables them to create well diversified portfolios – see for e.g. [Drobotz et al. \(2010\)](#). Moreover, the identification of the determinants of shipping bond spreads, provides shipping companies with a better indication of the factors that eventually determine the cost of capital for funds which emanate from public debt. In this way, shipping companies can compare more effectively the cost of capital arising from issuing public debt with that from alternative sources of capital and thus allow for more accurate estimations of the Weighted Average Cost of Capital (WACC) they face.

1.1. Corporate bonds pricing

Efforts, to understand the pricing of corporate bonds have been made amongst others by [Fridson and Garman \(1998\)](#), [Collin-Dufresne et al. \(2001\)](#), [Longstaff et al. \(2005\)](#), and [Ericsson and Renault \(2006\)](#). Typically, the factors proposed fall into three categories: bond, industry and macro-specific ones. For instance, [Fridson and Garman \(1998\)](#), using a sample of high yield bonds for the US market over the period 1995–1996, investigate the determinants of bond spreads for the high yield segment¹. The factors they find significant are credit ratings and terms to maturity. In another study, [Collin-Dufresne et al. \(2001\)](#) utilize a sample of investment-grade corporate bond issues for the US market over the period 1988–1997. They show that there is an unknown common factor which affects all bond issues and creates a large unexplained component of credit spreads. [Longstaff et al. \(2005\)](#) use credit default swap (CDS) data for the US market over the period 2001–2002. They show that the majority of the variation in corporate spreads is due to default risk, whereas the non-default component is time varying and is strongly related to measures of bond-specific illiquidity as well as to macroeconomic measures of bond market liquidity. [Ericsson and Renault \(2006\)](#), using data for corporate bonds in the US market for almost a decade, suggest that liquidity risk is the missing factor for the unexplained component of bond spreads variation, but they could not explain much of the variation observed in credit spreads. [Chen et al. \(2007\)](#) utilize a sample of corporate bonds for the US market over the period 1995–2003 and show that liquidity risk is a major determinant of corporate bond spreads both in investment and non-investment grade bonds. They conclude that default risk measures cannot fully explain the variation of corporate bond spreads in levels or in changes. [Dick-Nielsen et al. \(2012\)](#) investigate the liquidity of bond spreads before and after the onset of the subprime crisis and show evidence that liquidity risk measures account for a large part of the observed variation in corporate bond spreads after the onset of the crisis.

1.2. Shipping bonds pricing

The majority of corporate bonds issued by the cargo-carrying shipping companies fall into the high yield segment, bearing relatively higher spreads compared to issuers in other segments of the economy. The same holds for the sample utilized in this paper, which comprises 83% high-yield and only 17% investment grade bond issues. The mean spread of shipping bond issues for the sample period 2003–2010, used in this paper, is 676.19 basis points. For the period before the subprime financial crisis, covering the period January 2003–July 2007, the average spread is 426.58 basis points, while for the period after the onset of the crisis, covering the period August 2007–June 2010, the average spread is 963.95 basis points. In comparison to these, [Friewald et al. \(2012\)](#) report a mean spread of 287 basis points for a sample that includes the great majority of corporate bonds traded in the US market, covering the period 2004–2008, while [Helwege et al. \(2014\)](#) report a mean spread of 334 basis points for a wide sample of US corporate bonds over the period 2002–2010.

The underlying reason for the majority of the shipping bonds being classified in the high yield segment and as a consequence for the high spreads displayed, is that the potential cash flows of shipping companies are subject to substantial volatility ([Kavussanos, 2003](#)), pronounced cyclicity ([Stopford, 2009](#)) and distinct seasonality ([Kavussanos and Alizadeh, 2001](#)). The main reason for these is that, shipping companies operate in extremely competitive international markets, where the freight rates of the vessels are determined on a day-to-day basis by prevailing demand and supply conditions. Supply for freight services is relatively flat at low levels of freight rates as there is a surplus capacity in the market in terms of laid up vessels and slow steaming of the vessels that are at sea; as a consequence increases in demand can be absorbed by raising speeds and taking vessels out of lay up to satisfy the increased demand without the need for overly increase in freight rates. At higher freight rates, supply is inelastic, as it takes two to three years to build new vessels and put them into the market in response to increases in the demand for freight services; as a consequence, freight rates respond sharply to clear the market. On the demand side, the demand curve is inelastic, as typically the freight cost is only a small proportion of the final value of the commodity carried; as a consequence, changes in freight rates have a small impact on the demand for freight services. Both global and local demand for freight services can fluctuate substantially over short time intervals and contain seasonal

¹ These are bond issues rated BB+ and below in the Standard and Poor's credit rating scale.

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