



Interest rate risk management with debt issues: Evidence from Europe

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ABSTRACT

In comparison to bank financing, public debt market may allow firms to more readily match maturity and risk structures between their assets and liabilities. We test whether new issuers on the European corporate bond markets experience a change in their interest rate sensitivity upon their bond issuance. We find that stock returns have become significantly less sensitive to interest rate fluctuations for firms that enter the publicly traded bond market. Our findings support the notion that firms manage their interest rate risk with new debt issues.

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“... it is important to note that in a number of countries, the debt securities market for long-term maturities in their own currency was close to non-existent in the past. For example, 20 or 30 year debt issuance was available only in some currencies, at least with a fixed interest rate. These types of debt securities are now available across the euro area”

Speech by William F. Duisenberg, President of the European Central Bank, June 14, 1999

1. Introduction

While interest rate risk management is mostly studied within banking industry, non-financial firms also view interest rate exposures and hedging of them to be of utmost importance (Graham and Harvey, 2001; Bodnar et al., 2013). Fast growth of the European corporate bond markets since the euro introduction has provided European firms with an expanded set of opportunities to manage their interest rate exposures (Korkeamäki, 2011). We study whether European firms' interest rate sensitivity changes when they enter the corporate bond market.

Banks have traditionally been the dominant source of debt financing for European non-financial firms. In a bank-dominated financial market, firms' access to fixed rate funding tends to be

limited, as bank financing comes predominantly in floating rate (Altman et al., 2010; Vickery, 2008; Faulkender, 2005).¹ Limited access to fixed rate financing complicates firms' efforts to match the interest rate sensitivity of their liabilities with that of their assets.

Our work is related to the literature regarding the choice between bank financing and arm's length financing via public markets. Diamond (1991) and Bolton and Freixas (2000) emphasize the monitoring role of bank lenders. Both papers predict that high quality firms choose to use arm's length debt, whereas lower-quality firms use bank debt due to its monitoring benefits. In a more recent paper, Rauh and Sufi (2010) explore the parallel use of bank debt and public debt. Their results provide further support for the importance of bank monitoring. They find that firms with public debt access continue to use bank debt. However, bank lending may also change its character when banks face increased competition from public market lending. Boot and Thakor (2000) model suggests that with increased competition from the public capital market, banks reduce their investment in information acquisition. Part of that may be driven by banks' need to cut costs as they face pressure to lower the cost of their lending, due to capital market competition (Hale and Santos, 2009) Boot and Thakor (2000) even question

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¹ Beatty et al. (2012) report that US banks commonly require their corporate loan customers to obtain external protection against interest rate risk, which suggests both that interest rate risk is a concern, and that banks are reluctant to carry it on their own balance sheets.

whether relationship-based European banking model will survive the growth in corporate bond market.

Korkeamäki (2011) reports a significant change in interest rate sensitivity at the market level in Europe following the euro introduction, and he attributes the observation to the corporate bond market. We explore this issue further. Whereas Korkeamäki (2011) studies interest rate sensitivity of the European market indices and notes that a reduction in their interest rate sensitivity coincides with growth of European corporate bond issuance, our main contribution is that we use an identification strategy that specifically relates changes in interest rate sensitivity to bond IPOs at the firm level.

We measure firms' interest rate sensitivity by observing the connection between their stock returns and interest rate fluctuations. Smith and Stulz (1985) suggest that a firm's hedging activity is reflected in lower stock return sensitivity to the state variable, in our case interest rate changes. We thus focus on the absolute value of the coefficient that reflects stock returns' sensitivity to interest rate changes. If firms manage interest rate sensitivity when they enter the public debt market, then we should observe a reduction in their interest rate sensitivity upon bond issuance. We make two identifying assumptions. First, we assume that interest rate sensitivity of the asset side of the balance sheet is unaffected by the decision to use bond financing. Second, we assume that changes in interest rate sensitivity of the liability side of the balance sheet are reflected in stock return sensitivity to interest rates.

Several empirical features generate potential biases against findings when using our research design. First, entrance to the public bond issuance market rarely entails a full shift from bank financing to bond financing (Rauh and Sufi, 2010). This is particularly important in European markets, where banks have retained an important role in the financial system (Langfield and Pagano, 2016). Second, firms can use derivative contracts such as swaps to manage their interest rate risk, and those markets experienced a growth pattern parallel to that of corporate bond market (Remolona and Wooldridge, 2001). A reduction in interest rate sensitivity of stock returns could thus reflect increased use of derivatives, and such use could weaken the connection between loan types and interest rate risk. Third, as we note above, growth of public debt market affects banks' lending behavior as well, as they face capital market competition (Hale and Santos, 2009; Boot and Thakor, 2000). Thus, even the firms that continue to use banks as their exclusive choice of debt financing may experience a shift in their financing choices.

We observe changes in interest rate sensitivity of stock returns for bond issuers from EU-15 countries excluding Luxembourg, and Norway and Switzerland. We find that firms' interest rate sensitivity experiences a marked change when they enter the public debt market. Our results are robust to controlling for various firm-, industry-, time-, and country variables. Besides panel regression results, we present diff-in-diff evidence, and placebo tests that consider interest rate sensitivity of country-, industry-, and size-matched non-bond issuers. We further document that firms that commence bond issuance during our sample period tend to come from industries with greater exposure to interest rate fluctuation, which is consistent with the argument that bond issuance decision is made for hedging purposes.

The rest of the paper is structured as follows. Section 2 provides a brief background on measurement of interest rate exposure. Section 3 introduces the data sources used in this study. Section 4 the main results of this study, while section 5 concludes.

2. Interest rate exposure and its measurement

We study interest rate risk among European firms by using a market model regression similar to Stone (1974), Flannery and

James (1984) and many others, where interest rate sensitivity is measured by the regression coefficient of a factor for interest rate changes. Some authors refer to the estimate as equity duration (e.g. Leibowitz, 1986). In U.S. studies, the use of this method to estimate interest rate exposure is almost exclusive to studies of financial institutions. The few notable exceptions include Sweeney and Warga (1986), Ehrhardt (1991), and Reilly et al. (2007). Their results could explain why interest rate sensitivity is sparsely studied among non-financial firms in the U.S., as they find sensitivity of stock returns to interest rates to be concentrated only to utility and financial sectors. Interestingly, Bartram (2002) detects significant interest rate exposures for non-financial firms at the firm level during the late 1980s and early 1990s among German firms.

The most commonly used specification for regression-based detection of interest rate sensitivity follows the form given in Eq. (1).

$$R_{i,t} = \alpha_i + \beta_i R_{m,t} + \gamma_i R_{A,t} + \varepsilon, \quad (1)$$

where $R_{i,t}$ is the stock return, $R_{m,t}$ is the return on the market portfolio, and $R_{A,t}$ is the return on the underlying risk factor. In our case, the risk factor represents fluctuation in short term interest rates, and the regression is run for 36-month lagged rolling windows. The model in Eq. (1) is sometimes referred to as a two-factor APT model, or an augmented CAPM model. The use of this type of analysis is motivated by Stone (1974) for interest rate sensitivity and Adler and Dumas (1984) for foreign exchange exposure.

While the regression method is admittedly a noisy way to detect the extent of corporate hedging, it also has benefits over the method of observing the use of derivatives. As Guay and Kothari (2003) point out, operational hedges may play a bigger role than derivative usage in corporate financial management. By only observing derivative usage, researchers thus overlook a potentially important element in corporate risk management programs. Also, Chernenko and Faulkender (2011) report that interest rate swaps are often used for speculative rather than hedging purposes, especially among firms with performance sensitive executive compensation contracts. Kim et al. (2006) study the use of both operational hedging and derivatives in foreign exchange risk management of U.S. firms. Their findings support a hypothesis that the two hedging methods complement, rather than substitute, each other.

Graham and Harvey (2001) report survey evidence of importance of operational hedging in interest rate risk management. Among their respondents, 63.25% felt that matching debt and asset maturity was important. Consistent with the presence of economies of scale in hedging with derivatives, managers of small or non-public firms found operational hedging to be more important than what their colleagues in large or public firms responded. However, Covitz and Sharpe (2005) provide conflicting evidence in their study of interest rate risk management practices among U.S. firms. They find large firms to more commonly use debt issues to match asset and liability structures, whereas small firms tend to use derivatives more often in their data set. This may be explained by the less frequent new debt issues by small firms.

3. Data

We study interest rate sensitivity of stock returns at the firm level. Our sample contains the Datastream universe of firms from the EU-15 countries (excl. Luxembourg), and Norway, and, Switzerland. For these firms, we obtain monthly stock returns from Datastream. We then limit our sample to firms for which we can estimate interest rate sensitivity at the end of each year by having at least 12 months of returns available in the three-year period preceding each year-end. Our sample period runs from 1990 to 2007, so that 1992 is the first year end for which we estimate interest

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