Research in International Business and Finance 34 (2015) 233–250

Contents lists available at ScienceDirect

Research in International Business and Finance

journal homepage: www.elsevier.com/locate/ribaf

Accounting data and the credit spread: An empirical investigation

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ARTICLE INFO

Article history:
Received 7 September 2014
Received in revised form 7 December 2014
Accepted 2 February 2015
Available online 12 February 2015

JEL classification:
C52
G12
G33
M41

Keywords:
Credit spread
Credit risk analysis
Distance-to-default
Accounting data
Value relevance

ABSTRACT

Measures of credit risk based on Merton (1974) rely upon information available in the market prices of securities. Under the Efficient Market Hypothesis market prices should reflect all available information and, hence, make redundant all other information in the analysis of credit risk. This paper examines whether accounting data are fully reflected in the market-based measures of credit risk and therefore has no role in explaining variations in the credit spread on corporate bonds. We use a sample consisting of over 11,000 firm-quarter observations with matched equity, bond and accounting data. The results suggest that equity volatility and Merton's distance-to-default outperform accounting variables in explaining variations in the credit spread. However, accounting variables are incrementally informative in explaining variations in the credit spread when considered in conjunction with market-based measures. Within the set of accounting variables considered, we find that the profitability ratio is by far the most incrementally informative accounting variable.

1. Introduction

Financial accounting data has traditionally played a major role in credit risk analysis. In his seminal paper, Beaver (1966) finds that the leverage and cash flow ratios of non-default firms differ significantly from the ratios of defaulting firms well in advance of, and leading up to, the default date. Beaver's paper

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http://dx.doi.org/10.1016/j.ribaf.2015.02.013
0275-5319/

has since inspired a number of studies attempting to extract credit sensitive information from financial accounting data. This line of research has culminated in a number of summary accounting measures which combine multiple accounting ratios, and which have been proposed by authors to group firms into different credit risk categories.

One major limitation of using accounting data to assess credit risk stems from the fact that such data is in general backward looking. Accounting indicators reflect past performance and in general do not capture expectations concerning future performance. Furthermore, accounting data do not contain all of the relevant information required for the measurement of credit risk. Hence, accounting-based measures arguably do not provide a complete picture for the purposes of gauging credit risk.

One of the first authors to address these limitations is Merton (1974) who proposes a method for assessing credit risk based on the forward looking information inherent in the market prices of securities. By considering debt and equity as derivative securities written on the value of a firm's assets, he employs options pricing theory to derive a measure of credit risk that reflects all credit sensitive information contained in the market prices of securities. Since all available information is expected to be reflected in such prices, this method provides a comprehensive measure of credit risk. Put differently, securities prices are a measure that cannot be improved theoretically with the addition of further information, hence rendering accounting data redundant in the measurement of credit risk.

The empirical testing of this implication is important from a theoretical as well as a practical perspective. Theoretically, it sheds light on the performance of the Merton (1974) class of credit risk models and the integration of equity and credit markets. Practically, it shows whether accounting information, or market information, or both should be taken into account when making investment and credit decisions. The existing literature focuses on examining the relevance of accounting data to equity market investors (e.g. Amir et al., 1993; Collins et al., 1997; Lev and Zarowin, 1999; Brown et al., 1999). A handful of studies which focus on the relevance of accounting data in credit markets examine the incremental information value of such data in explaining bankruptcies, credit ratings and credit default swap premiums (e.g. Hillegeist et al., 2004; Demirovic and Thomas, 2007; Batta, 2011). However, to the best of our knowledge, the relevance of accounting data in explaining variations in the credit spread on corporate bonds has not been studied before. Our paper aims to fill this gap in the literature. A closely related paper to ours is Campbell and Taksler (2003), though they focus exclusively on the role of equity volatility in explaining the credit spread.

Our main conclusions are twofold. First, market-based measures consistently outperform accounting-based measures in explaining the credit spread. Second, and consistent with existing research, market-based measures do not fully reflect all relevant information available in the accounting data.

The rest of the paper is organized as follows. The subsequent section reviews existing credit risk studies and develops the main hypotheses. Section 3 presents the methodology for deriving the market/accounting based indicators and panel data models and describes the data. Section 4 presents the main results on the performance of the two types of measures considered in this paper. We also consider in this section whether accounting variables have incremental value when considered in conjunction with market-based measures. The paper summarizes and concludes in Section 5.

2. Literature review and development of hypotheses

2.1. Accounting-based indicators of credit risk

Traditionally, credit risk analysis has relied exclusively on accounting data. The earliest studies employed discriminant analysis to classify firms depending on their accounting characteristics. In his pioneering research, Beaver (1966) examines 14 individual accounting ratios for their power to predict firm default. He reports that the leverage and cash flow ratios of non-default firms are significantly different from those of firms that defaulted. Furthermore, he finds that these ratios are significant predictors of a firm's failure to service its contractual obligations. A subsequent study by Deakin (1972) models the same ratios in a series of multiple discriminant models and finds that they are able to predict firm failure well as early as three years in advance.