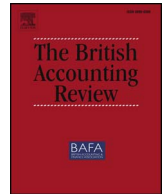




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Predicting unlisted SMEs' default: Incorporating market information on accounting-based models for improved accuracy

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ABSTRACT

The risk associated with lending to small businesses has become more important since regulations started obliging banks to use separate procedures in assessing SMEs' credit worthiness. However, current accounting-based models for SMEs do not account for the impact of market information on default prediction. We fill this gap in the literature by introducing a hybrid default prediction model for unlisted SMEs that uses market information of listed SMEs (comparable approach) alongside existing accounting information of unlisted SMEs. Our results suggest that the accuracy of this default prediction modelling approach in the hold-out sample, during the period of the financial crisis 2007-09 and for the entire sample-period, improves considerably. We conclude that the proposed hybrid model is a good replacement for existing standard accounting-based methods on SMEs' default prediction.

1. Introduction

Credit risk refers to the risk created by unexpected changes in the credit quality of a counterparty or issuer and its quantification is one of the major challenges in modern finance.¹ Traditionally, it is measured as the firm's likelihood of default on its contractual or required obligations and the monetary losses imposed if such default occurs. Although SMEs are the most active economic units representing the backbone of a nation's economy, due to their special characteristics, their credit and operational risks are perceived to be higher. These risks are especially prevalent during periods of prolonged financial crises as they pose a significant threat to the real economy given the potential negative impact on companies' profits, sales and investment (Claessens, Tong, & Wei, 2012).

In a recent study, Gupta and Gregoriou (2015) show that the proportion of US SMEs under financial distress in their sample had increased from 19% in 1990 to 31.61% in 2013. At the same time, the proportion of actual bankruptcies had fallen from 1.39% to 0.5% for the corresponding period with micro-SMEs being the companies worst affected.² A similar picture is portrayed in the UK where according to the Office for National Statistics (ONS), the average death rate for new businesses in the period 2009–14 is reported as 10.35% with a five-year survival rate of only 41.7% (ONS, 2015). In an attempt to explain this trend, Guariglia, Spaliara, and Tsoukas (2016) demonstrate a statistically significant link between debt-financing cost and corporate survival rates for young and non-exporting firms, especially during the period of the 2007–09 financial crisis when borrowing rates had increased dramatically. This reduced survival rate for SMEs was amplified by the considerable difficulty in obtaining the necessary finance for their

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¹ Since it is not certain whether the firm's obligation will be fulfilled or not, the potential borrower's creditworthiness affects all aspects of the firm's cost of capital, the lending decision, the credit spread and the prices and hedge ratios of relevant credit derivatives.

² Of all the bankruptcies reported in this study, 40% were attributed to the micro-SMEs sample. A similar pattern is reported for the case of financially distressed firms where micro-SMEs comprise 41.49% of the total sample.

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operations. Government statistics in the immediate aftermath of the 2007–09 financial crisis show that only 74% of those SMEs seeking finance in the year 2010 indeed managed to obtain some form of it as compared to a rate of 90% in the period 2007/08 (BIS Economics Paper, 2012). This decreased ability of SMEs to access short-term capital is mainly attributed to the supply of bank lending as banking and financial institutions became more risk averse as well as being legally obliged, by new financial services regulations, to increase their liquidity by holding more capital.³ Extant literature shows that unlike their large-size counterparts, SMEs' applications for financing tend to be rejected more frequently, with the evidence for this being consistent across the entire spectrum of SME activity, industrial classification and their ability to innovate (Lee, Sameen, & Cowling, 2015).

The severity of this problem in the UK setting has been extensively highlighted over the years in a series of governmental reports. For example, Cruickshank (2000) suggests the existence of systemic problems affecting the quality of lending services for SMEs such as the possible overcharging for such services by banks, the lack of available information regarding alternative banking products, and the existence of significant weaknesses in the systems of redress when things go wrong for the borrowing firms. As the report concludes, these problems are exacerbated by the presence of a complex monopolistic structure in the UK banking environment (Cruickshank, 2000, pp.161–167). A more recent joint-study by the Competition and Markets Authority (CMA) and the Financial Conduct Authority (FCA) further supports such claims. It points out that high barriers to entry and expansion in the supply of business current accounts (BCAs) and general business loans to SMEs for newer and smaller credit providers are a major weakness of the UK bank lending system (CMA & FCA, 2014). This study also reports a significant widening of the difference in the interest rate charged by banks to SMEs for term loans and the Bank of England (BoE) base rate. For example, from an annual average of less than 2.5% in the period prior to the financial crisis, interest rates have increased to 4% or more in the period 2008–2012. Hence, all prior policy literature unanimously highlights the need for improving market competition in UK banking. Allowing smaller credit providers to enter the market will most certainly improve lending services, thereby reducing both the cost of such services for SMEs and the rate of insolvencies for such firms.

This large increase in SME insolvencies during and after the 2007–09 financial crisis, alongside the introduction of the Basel II capital requirements for banks, have led to a renewed interest in the SME credit risk assessment literature with the main focus on accounting-based default prediction models designed specifically for SMEs.⁴ Nonetheless, although these models are easy to use in a practical sense, they ignore the important role of market factors in predicting potential default events. In terms of credit risk quantification using market-based information, one of the most widely-used models in academic literature and practice alike is the one introduced by Merton (1974) and further developed by the KMV Corporation.⁵ Although this model has significant advantages over the accounting-based approaches, including better predictability during financial crises and over short-term horizons, the unavailability of market information in the case of unlisted companies deems it inapplicable for the majority of SMEs (Bilderbeek & Pompe, 2005; Lin, Ansell, & Andreeva, 2007; Richardson, Kane, & Lobingier, 1998). To the best of our knowledge, there is no prior literature regarding the effect of market-based factors on the accuracy of the unlisted SMEs' default prediction models and especially no elaborate default prediction models that can use market information for predicting their potential default.

Hence, our study addresses this important gap in the literature by introducing a new modelling approach that can utilise market information for predicting unlisted SMEs' default using an average sample of 181 UK listed SMEs (L-SMEs thereafter) and 19,681 unlisted SMEs (U-SMEs thereafter) over the period 2004–2013. This is accomplished by combining market and accounting information in a way that takes into account the association between U-SMEs' accounting ratios and the Merton's distance-to-default (DD) for L-SMEs. Our hybrid default prediction model exhibits superior predictive power compared to its existing accounting-based counterparts when tested across our entire sample of U-SMEs.

The rationale behind this approach is simple. Prior studies in the field of corporate finance highlight the benefits of adopting a comparability method in equity valuation of unlisted/private companies using industry-level data (Alford, 1992; Baker & Ruback, 1999; McCarthy, 1999).⁶ In a similar manner, we show that such a method has important benefits in default prediction. If the use of a market-based valuation approach is a reliable way for deriving firm value for unlisted/private companies (Alford, 1992; Baker & Ruback, 1999), then there is no theoretical reason why this approach cannot also be used for the purpose of default prediction in the case of such firms. Bhojraj and Lee (2002) further suggest that the use of market-based valuation multiples usually functions as a “satisficing” device for the professional community, trading off methodological complexity and completeness for the purpose of convenience and cost efficiency. Likewise, from the perspective of a large and highly-diverse bank engaging primarily in transaction lending technologies, lending to informationally ‘opaque’ SMEs poses significant risks and costs. Assuming a decision to lend to a L-SME or an U-SME is mutually exclusive, a bank will most likely be inclined to lend to the former type of company as the cost of accessing all relevant ‘soft’ information for the U-SMEs can be relatively high.⁷ Our proposed approach solves this problem, by allowing U-SMEs to be treated as if they are of a ‘quasi-listed’ status and be judged in terms of credit ability on an equal basis to the former type of firms. Furthermore, under conditions of market efficiency⁸ the use of market-based information can be considered as a credible source of anticipated economic conditions, as the latter will affect not only the L-SMEs but the U-SMEs as well.⁹

³ This is an inevitable consequence of the credit crunch period and the global economic crisis that followed.

⁴ According to Dullmann and Koziol (2013), since small firms are more likely to default due to their idiosyncratic risk, accounting information is the essential tool in SME default prediction models.

⁵ This study follows the modelling approach of Chen et al. (2010). In line with their study we also refer to this modelling approach as the Merton-KMV model.

⁶ This approach is typically used for the purposes of fundamental analysis or multiple-based valuation in IPOs.

⁷ Such higher costs typically lead to higher interest rates on borrowing for the case of SMEs (Baas & Schrooten, 2006).

⁸ Meaning that stock prices “fully reflect” all available information, i.e. company- and non-company-specific.

⁹ As market prices are a function of anticipated future cash flows, wider economic events such as potential economic recessions or financial crises will be reflected in

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