Credit risk assessment and the information content of financial ratios: a multi-country perspective

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Abstract: This paper revisits the problem of building a multicriteria additive value model for credit risk assessment, with a particular focus on quantitative criteria. The analysis deals with the information content of financial ratios collected from the European BACH-ESD database, covering aggregate firm data for seven countries – Austria, Belgium, France, Germany, Italy, Portugal and Spain – fifteen sectors and three size classes. A cross-sectional study is conducted employing non-parametric testing in order to look for similarities in the data, according to the multiple dimensions of the sample. Profitability, liquidity and leverage ratios exhibit different patterns of variation across countries, sectors and sizes, but the profitability indicators seem to have the greatest discriminating power, implying more specific benchmarks for credit risk assessment. It is also found that size and sector breakdowns are mostly relevant, while the country factor is somewhat less, for performance benchmarking. Moreover, the fact that the financial indicators show negligible differences across firms in many cases conveys a compelling argument for the accrued value, and central role, of qualitative information –market and management – in the decision making process, notably using a MCDA model.

*Keywords:*Multicriteria assignment; risk assessment; credit scoring; banking; financial ratios; cross-section evidence.

1 Introduction

The financial crisis that hit the world economy since the second half of 2007 brought to light the importance of assessing the risk of credit in the context of bank management. Following the generalised stress tests conducted by monetary authorities, banks have sought to improve the analysis of their portfolios of financial assets and their procedures for assessing credit applications.

The purpose of risk assessment models is to classify the degree of risk associated with each credit transaction in order to suggest the rejection of the transaction or approval with an adequate spread. Several models have been suggested in the literature since the seminal works of Beaver [6] and Altman [2], which are either focused on the risk of bankruptcy or on the risk of credit. Some of them — the credit scoring models — try to encapsulate the assessment of each customer's creditworthiness in a numerical score. First developed for the analysis of residential mortgages, credit cards and small business credit, credit scoring is now also used across the entire credit portfolio of financial institutions, covering firms and sovereigns. In parallel, the credit rating models now have a major impact in the context of the sovereign debt crisis that has swept Europe in 2010 and 2011. Both types of models provide a credit risk assessment, and when scores are gathered into homogeneous risk classes, the result of the score is also a "rating". In practice, credit scoring is mainly referred for internal purposes and credit rating for external purposes, when ratings are made public by specialised rating agencies [20].

If we focus on the technical aspects of the models, we discover that different mathematical approaches support the classification problems implicit in credit analysis. Surveys carried out in [4], [19] or [20], e.g., include discriminant analysis, regressions models classification trees, linear programming, genetic algorithms, expert systems, nearest neighbour methods, and even the combination of models [13]. The Rough Sets Theory [15] [16] and Multicriteria Decision Analysis (MCDA) [22][12] are also applied as tools to support credit granting decisions and, in general, in risk assessment and financial management problems.

The aim of this paper is to develop the work disseminated previously in [7], [8] and [17], which fits into the family of multicriteria additive value models. The original multicriteria model for credit scoring was introduced in the first of the references above; the second paper brought a greater flexibility by enabling the variation of the weights within intervals; the third work validated the hypothesis that the qualitative aspects are of paramount importance in credit analysis, in line with other authors (see [1], [10],[14], [3] and [5]). In this