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# Corporate governance characteristics and default prediction modeling for small enterprises. An empirical analysis of Italian firms<sup>☆</sup>

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## ABSTRACT

The aim of this paper is to analyze how the relationship between corporate governance mechanisms and business failure changes in small enterprises (SEs) compared to larger firms.

Logistic regression was applied to a sample of 934 Italian SEs, and a SE default prediction model built based on both financial ratios and corporate governance characteristics. The accuracy rates obtained by this model were then compared to those from a second model, based on the same sample of firms, which used only financial ratios as predictive variables.

The findings are the following: i) CEO duality, owner concentration, and a reduced number of outside directors on the board (no more than 50%) are significantly and negatively correlated with small company default and ii) corporate governance variables significantly improve the SE default prediction accuracy rates.

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## 1. Introduction

Much has been written in the literature about corporate default prediction modeling. However, most of the studies are based on economic-financial ratios elaborated on the basis of information gathered from balance sheets (among others, Altman, 1968; Beaver, 1967; Blum, 1974; Grice & Ingram, 2001; Ohlson, 1980; Pindado, Rodrigues, & De la Torre, 2008), or from initial public offerings prospects (e.g., Platt, 1995<sup>1</sup>). Furthermore, this literature aimed to elaborate models developed for large, listed firms or mainly based on samples of large firms. To our knowledge, literature focusing on default prediction modeling specific for small and medium sized enterprises (SMEs) has been published only in recent years (Altman & Sabato, 2007; Ciampi & Gordini, 2008, 2009; Fidrmuc & Hainz, 2010; Vallini, Ciampi, Gordini, & Benvenuti, 2008, 2009), with the exception of an early article by Edmister (1972) even though SMEs are vitally important in all industrialized countries. Moreover, they have their own specific organizational and strategic characteristics, which are unlike those of large firms (Ciampi, 1994; Ciampi & Gordini, 2013a, 2013b; Pompe & Bilderbeek, 2005).

For SMEs, the construction of quantitative models for default prediction based only on financial ratios (accounting data) is particularly

complicated and the results that can be obtained are usually far less accurate than in the case of larger firms. There are many reasons for this, some of which are (Ciampi & Gordini, 2013a):

- the fewer legal obligations of SMEs regarding accounting data disclosure than larger firms: less information is available, and what can be obtained is less reliable and less accurate;
- the greater impact of external events that change company structure or behavior, and that may, for instance, modify a state of crisis, by allowing a firm's weak points to be strengthened (that is, financial intervention by the owners, the appointment of new managers or changes in strategy). When a SME is predicted as being likely to default (or not to default), there is a greater probability that the prediction will be inaccurate because external events might intervene and either save the firm or, alternatively, lead to an unexpected, and sudden, collapse;
- the fact that smaller firms have automatically smaller figures (including accounting figures), and even small changes have a more marked effect on ratios and percentages. To the extent that, in terms of what they can reveal about a firm, some ratios are completely ineffective below certain dimensional levels.

Finding efficient models for company default risk evaluation is obviously crucial for banking institutions in day-to-day banking operations when deciding on credit facilities (and reviewing facilities granted), as well as for credit rating agencies when rating creditworthiness of issuers of debt obligations or of debt instruments. This issue has become increasingly important in recent years, as the Second and Third Basel Capital Accords linked the capital requirements of banking organizations to the level of risk of their customers more directly, and allowed

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<sup>1</sup> Platt (1995) conducts an interesting study to identify variables that help predict the bankruptcy of IPO companies beyond the first three years following the year of issuance. He finds that predicting bankruptcies of IPO companies is difficult at best (only 31% of bankrupt IPOs are correctly classified) "because IPOs are often 'packaged' to sell".

banks to use in-house credit risk evaluation models to quantify their capital requirements, thereby encouraging more accurate monitoring of the quality of their loans (Altman & Sabato, 2007). These regulatory changes in the banking industry, the abovementioned specific characteristics of SMEs, the fact that they play an important role in the world's economy and the lower prediction accuracy rates obtainable from SME accounting data, are all factors which make it essential for both banks and academics to construct and test default prediction models that are (1) specific for SMEs and (2) include other variables, in addition to economic-financial ones, related to other company features.

Effective corporate governance models are vital for both academics and practitioners (firms, banks, investors, regulatory agencies, etc.). Over the years, many studies have analyzed the relationship between corporate governance choices and company performance, arriving at discordant conclusions (e.g., Baysinger & Hoskisson, 1990; Hillman & Dalziel, 2003). Nevertheless, few studies have concentrated on the relationship between corporate governance characteristics and company default and it seems that no study has, as yet, focused on the topic of the potential of corporate governance related variables for default prediction modeling specific for SMEs.

In this study logistic regression was applied to a sample of 934 Italian SEs (firms with a turnover below 5 million Euro), and a SE default prediction model built based on both financial ratios and corporate governance characteristics. The accuracy rates obtained by this model were then compared to those from a second model, based on the same sample of firms, which used only financial ratios as predictive variables.

The primary findings suggest that the relationship between corporate governance mechanisms and the survival of a firm takes on specific connotations in the case of SEs, different from those of medium and/or large enterprises. Most notably, in the case of SEs, CEO duality and a reduced number of outside directors on the board (no more than 50%) are significantly and negatively correlated with small company default. On the other hand, when the number of outside directors remains over 50% of the total board members, thereby depriving the inside directors of the majority vote, the presence of outside directors impacts negatively on the probability of survival of the small firm. Furthermore, ownership concentration is negatively correlated with SE default: the presence of a majority shareholder ensures stability, lowers conflict levels between owners, and is a key element to realizing a broad convergence between strategic behaviors and entrepreneurial motivations, which is one of the main strengths of the SE. Finally, combining economic-financial variables with corporate governance variables improves SE default prediction accuracy rates, compared to prediction based only on economic-financial variables.

The next part of the paper reviews the literature on the relationship between corporate governance and SME default. Following this, six research hypotheses will be proposed and the selected variables described. Subsequently, the research methodology adopted will be illustrated and the structure of the sample analyzed. Finally, research findings will be discussed and conclusions presented.

## 2. Corporate governance variables and SME default prediction modeling: review of the literature

In this section, after reviewing some of the most important works about company failure prediction methodologies based on corporate governance variables, focus switches to the works that have investigated the default prediction potential of corporate governance variables specifically for small and medium sized firms.

### 2.1. Corporate governance variables and default prediction modeling

The relationship between corporate governance variables and company default has been analyzed by a limited number of studies the results of which are, however, not homogeneous.

The first study of the effect of corporate governance variables on company default was carried out in 1985 by Chaganti et al., who had a sample of 42 firms in the retail sector (21 failed and 21 non-failed). As independent variables regarding corporate governance, they used board size, proportion of outside directors and CEO-duality. They find that firms with larger boards were less likely to fail, while CEO-duality and the proportion of the outside directors were not significant for prediction purposes.

Hambrick and D'Aveni (1992) analyze a sample of 114 firms (57 in default and 57 not). They find that a CEO with a "dominant" leadership style goes hand in hand with a greater likelihood of default.

Daily and Dalton (1994a) apply logistic regression to a sample of 114 large industrial firms (57 failed and 57 non-failed) from 1972 to 1982. Their results give CEO-duality and the proportion of outside directors as being significant for company default prediction.

Moreover, Daily and Dalton (1994b) apply logistic regression to a sample of 100 firms (50 failed and 50 not), and find that combining corporate governance variables and financial ratios increases default prediction model accuracy rates (as compared to models with solely financial variables) both 5 years before default (from 61% to 70%) and 3 years before failure (from 62% to 74%). The combined variables did not give significant improvements one year before failure.

Eloumi and Gueyié (2001) with a sample of 92 Canadian firms (46 failed and 46 not) find that adopting a combination of corporate governance variables and economic-financial ratios increases default prediction model accuracy rates (the percentage of correctly classified firms increases from 70.6% to 72.1%). They also find that the following corporate governance factors are especially significant for the likelihood of failure: the composition of the board of directors, if outside directors are owners, and the average number of directorships in other firms held by outside directors.

Parker, Gary, and Turestky (2002) apply a survival technique analysis to a sample of 176 firms in a state of crisis. They show that firms with a higher percentage of shares held by managers and directors are more likely to survive, while firms that change their CEO are twice as likely to fail.

Lee and Yeh (2004) use binary logistic regression on a sample of 133 Taiwanese listed firms (45 failed and 88 not). Their results give the following two corporate governance variables as being significant antecedents of corporate bankruptcy: the proportion of directors appointed by the controlling shareholder and the percentage of the shares held by the controlling shareholder that is pledged for bank loans (pledge ratio).

Deng and Wang (2006) analyze data relating to a sample of 194 Chinese firms (97 in default and 97 not). They apply logistic regression and show that the following corporate governance variables have a negative correlation with default likelihood: ownership concentration, state ownership, and the proportion of independent directors.

Platt and Platt (2012) analyze a sample of 292 firms (87 bankrupt and 205 non-bankrupt) and find that non-bankrupt companies have a larger and older board, one which is more independent, contains more directors who are currently CEOs of other companies, and whose independent directors own less stock.

### 2.2. SME default prediction modeling through corporate governance variables: an unexplored research field

All the abovementioned studies have predominantly included medium and/or large firms in their study sample and, in any case, did not focus on building separate default prediction models for SMEs and large corporates. However, SMEs have specific characteristics, which are unlike those of larger firms. And this is also true from a default risk point of view. Dietsch and Petey (2004), for example, find that small and medium sized enterprises are financially riskier and, at the same time, have a lower asset correlation with each other than large businesses. This underlines the importance of modeling credit risk and

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