

Factors Affecting Business Failure of Small and Very Small Greek Family Enterprises

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Abstract

This article investigates the factors that lead small and very small Greek businesses to financial failure using financial and accounting ratios as well as corporate governance characteristics. Our data set consists of 136 small and very small firms that went bankrupt, which were matched with a sample of 472 non bankrupt enterprises formed by random selection based on year, sector and sub-sector determinants, from 2003 to 2014. The total firm-year observations for bankrupt and non bankrupt companies were 940 and 5,041 respectively. Applying a Logit model for panel data, the results showed a significant impact on the likelihood of small and very small firms failing due to factors such as the type and the amount of bank lending, the level of profitability, cash flows, and liquidity. The data also support a statistically significant correlation of the probability of failure with non-financial factors such as Duality on the Board and CEO gender. The results of this paper will be useful for both banks and managers of small and micro businesses.

JEL Classification: C33, G32, G33

Keywords: financial and accounting ratios, corporate governance, business failure, small and very

1. Introduction

Small and very small (micro) enterprises are the majority of businesses and play a key role in the economy of each country, offering jobs, added value and growth opportunities, while the economic and social impact of their financial failure is significant. These reasons have led us to examine the determinants of the failure of these businesses, focusing primarily on corporate governance parameters and also on the impact and characteristics of bank lending. Representing these factors in a relevant model can be easily done with variables derived from published company information.

According to Eurostat data, the overwhelming majority of European Union enterprises (Note1) 98.8% consisted of small and micro enterprises in 2015 (excluding financial sector firms), employing 49.3% of all employees, while their added value at European Union level was 37.9%.

The financial contribution of small and micro-enterprises is particularly important, especially in the smaller countries of the European Union, providing much of the added value to their respective economies.

In recent decades, research into the factors that cause business failure and bankruptcy, on the one hand, and predictability, on the other, have generated a great deal of interest in the global scientific community.

Research focusing on the investigation of factors and the prediction of financial failure of small and very small enterprises is limited, e.g. Edmister (1972); Argenti (1976); Keasey and Watson (1987); Laitinen (1991); Altman & Sabato (2007); Rikkers & Thibeault (2009); Ciampi (2015); Nur Adiana Hiau Abdullah et al. (2016); Muhammad M. Ma'aji (2019), if compared to their counterparts focusing on large companies and listed companies. Important studies that have been published in the past, such as Beaver (1966), Altman (1968), Meyer & Pifer (1970), Ohlson (1980), Zmijewski (1984), Frydman, Altman and Kao (1985), Altman & Sabato (2007), Hartzell & Peck (1995), Kahya & Theodossyoy (1999), Charitou et al. (2004), Agarwal & Taffler (2008), Richardson et al. (2015), refer to samples which include large enterprises, listed or not on the stock market, or to samples that include a set of small and large businesses without differentiation. An important element in investigating the factors that drive small and

micro-businesses to financial failure, but also for the successful prediction of bankruptcy, is the homogeneity of the samples related to both size and the industry in which they operate, (Arnis et al., 2018).

The company's path to financial failure and bankruptcy, especially in small and micro-enterprises, is mainly due to factors that are directly related to the internal environment of the business.

Financial information that is captured through financial indicators may be more suitable for controlling and predicting the financial failure of large companies. However, there are a number of contributing factors and causes that lead the small and micro businesses on their way to financial failure.

One of the main causes that drive small and micro businesses, in particular, to financial failure is the lack of strategy and sound governance by their leaders.

Owners-founders often serving as CEOs and a lack of management capacity, appropriate experience and specific skills may lead to wrong decisions, such as improper use and mismanagement of funds, inadequate management of cash flows, overtrading, mismanagement of human resources and operating costs, etc.

A number of other factors, such as their overall organizational structure, the degree of influence from external factors, the smaller legal and financial obligations that lead to less information, the high cost of borrowing and the difficulty of accessing borrowing due to their small size, the lack of genuine communication with customers, the lack of differentiation and innovation from the rest of the market are important elements differentiating small from large businesses.

In addition, the above factors are the causes of the short life of small and micro enterprises. In a survey commissioned by the European Commission's "Small Business Act", small and medium-sized startups that survive up to 5 years since their establishment constitute 50%, and as regards the remaining 50% for which there is a shutdown, bankruptcy procedure is only followed by about 15%. (Note 2)

International news agency Bloomberg reports that in markets not hit by a sharp decline in consumption, such as the Greek one, 8 out of 10 small businesses cease operating before they reach 18 months of age.

A large number of small firms prefer not to follow the formal (Note 3) bankruptcy procedure, mainly due to the cost of administrative procedures and also because of the time required for their completion.

According to the World Bank's official Doing Business 2014 report (Note 4), Greece ranks 87th out of 189 countries in completing bankruptcy proceedings on an international scale, while a medium-sized business bankruptcy requires 3.5 years on average, with the cost of this process amounting to 9% of the business property.

The majority of small and very small Greek businesses can be characterized as family owned, based on their shareholder structure, while in most cases the President of the company is also the CEO.

The peculiarity of Greek small and micro family businesses, unlike those of other countries, is that the values that characterize the Greek family also influence the business vision.

Given the specific characteristics of small and micro family-owned businesses, it is not clear whether an adequate model for predicting financial failure could be based solely on financial information.

In addition, only the use of financial ratios sometimes leads to less reliable results, due to the application of creative accounting practices by the management, especially of small and micro family businesses (Arnis et al., 2019), which are on the path to failure trying to hide their bad financial situation from their creditors, since in these businesses the internal control mechanisms and systems are limited.

The purpose of this paper is to investigate the factors that lead small and micro family enterprises to failure. The structure of bankrupt companies in Greece is suitable for this type of analysis because, according to the data, the overwhelming majority relates to companies with revenues below € 8 million, while almost all of the equity is concentrated by related persons or by one person who usually has the role of Chairman and Chief Executive Officer at the same time.

For the purpose of this research, a small and micro business forecasting model was used which included non-financial variables, such as the status of duality in the position of CEO and Chairman of the Board, the gender of the CEO and the variables that represent the bank loan funds that companies have received and also demonstrate their use, such as the percentage of short-term bank loans in total outstanding short-term liabilities, total bank loans (short-term and long-term) to total acquisition cost of tangible fixed assets.

This paper will help banks develop credit risk models that will lead to more efficient and safer management of their funds when their financing is directed to small and micro family businesses. In addition, the fact that the conclusions of

this paper are derived from the analysis of data that can be readily derived from published company statements and reports makes our study even more important to research on business failure.

The paper is organized as follows:

Section 2 provides an overview of the relevant literature. In section 3, the database is described. Section 4 presents the selection of independent variables, the methodology followed, and the econometric analysis. Section 5 presents the results and their interpretation, while section 6 presents the conclusions.

2. Literature Review

Studies in organizational behaviour determine internal factors such as strategy, resources and abilities, leadership, administrative knowledge, management decision making and organizational inactivity as key elements to corporate success or failure (Heracleous and Werres, 2016). Although there is no general theory of business failure, there is a model that is useful for understanding the causes of failure. This model was first conceived by John Argenti (1976) adding a new dimension to the theory of corporate failure (bankruptcy), attempting to interpret the dynamics of events that may lead businesses to failure. According to the author, the vast majority of business failures and bankruptcies concerns small businesses. He argued that businesses follow various "trajectories" to failure and that these "trajectories" are related to the causes of their failure. There are three "trajectories" that companies may follow before they end up in a state of financial failure - bankruptcy.

The first includes elements of organizational structure, ineffective management, and fundamental financial and non-financial problems. The second includes incorrect management decisions related to capital structure, financial strategies, planning and implementation of unprofitable investments, and to future cash flows. The third shows the first signs of a downward trend in the business, related to liquidity, over-borrowing, debt servicing difficulties and reduced profit margins.

2.1 Hypothesis Development

2.1.1 Hypothesis (1): CEO Duality will Significantly Impact the Probability of Firm Distress

One of the most important non-financial factors associated with a lack of management capacity, appropriate experience, and specialized skills, leading to wrong decisions and ultimately to the financial failure of small and, mainly, micro Greek family businesses is Duality in the Board of Directors (the Chairman also having the role of the Chief Executive Officer). Argenti (1976) stated that factors such as one person's sovereignty (autocrat) without the contribution of other board members are non-financial factors related to business failure. Lakshan & Wijekoon (2012), investigated the impact of corporate governance characteristics on corporate failure, and using, inter alia, the CEO Duality as an independent variable, concluded that CEO Duality was positively related to the probability of corporate collapse. Ciampi (2015), analyzes the relationship between corporate governance mechanisms and bad decision-making of small businesses compared to larger firms. He applied the logarithmic regression model, and developed two models, drawing data from a sample of 934 small Italian companies. The variables of the first model consisted of financial indicators and corporate governance features, while the second model included only financial indicators as independent variables. Ciampi states that the models for predicting failure related to small and medium-sized enterprises, whose independent variables are financial indicators (accounting data), are less accurate than those referring to large firms.

The results have shown that corporate governance variables such as CEO duality significantly improve the forecasting ability of the model in predicting their financial failure.

Kolias et al (2019) report that the likelihood of a business going bankrupt is increased if the Chairman of the company is also the CEO.

Keasey and Watson (1987), investigating the impact of non-financial variables on predicting the failure of UK small businesses, using the Logit model found that in 56% of the firms surveyed, managers were members of the same family and possessed a significant percentage of equity. Researchers find that using financial and non-financial variables is capable of predicting the failure of small businesses more accurately than a model that includes only financial variables. Ciampi (2015) reports that the degree to which owners' equity is concentrated is related to the failure of small businesses and significantly improves the model's forecasting ability in predicting their financial failure.

Serving as both CEO and Board Chairperson in small and micro family businesses is often accompanied by ownership concentration and in particular by shares being held by members of the same family. For Greek enterprises, this percentage in almost all cases exceeds 50% of the share capital. Ownership concentration in the

family environment and the absence of internal and external control systems facilitate creative accounting, enhance arbitrariness and reduces effective control by the minority.

To examine the impact of CEO duality on financial distress of small and very small businesses we use in our model a binary variable which indicates the state of the Board of Directors, namely duality or not.

2.1.2 Hypothesis (2): CEO Gender will Significantly Impact the Probability of Firm Distress

The gender factor of the CEO (male or female) is related to the probability of failure. Nur Adiana Hiau Abdullah et al. (2016) report that in the case of men holding the above position there is a positive relationship with the financial failure of small and medium-sized enterprises. Faccio et al. (2016), also, in their study on the impact of the CEO's gender on the business risk assumed, report that when the CEO is female, the risk is lower than in the case of men.

Jalbert, Jalbert & Furumo (2013) investigated the relationship between the gender of CEO and performance and financial management in a sample of US listed companies. The results showed that female CEOs generate higher sales and higher returns, and female-led businesses are valued higher in the market than companies having a male CEO.

To investigate the effect of the CEO gender on firm distress we introduce to our model a dummy variable representing the gender of CEO.

2.1.3 Hypothesis (3): the Type and the Amount of Bank Lending will Significantly Impact the Probability of Firm Distress.

Excessive borrowing of small and micro family enterprises, combined with improper management of debt funds and excessive business activity is often a major factor contributing to failure. Edmister (1972), the first to investigate the prediction of small business bankruptcy by applying the Discriminant Analysis (MDA) method, to samples of 281 bankrupt and 281 healthy US businesses from 1954 to 1969, concluded that one of the most important factors of failure are loan funds. Argenti (1976), Keasey & Watson (1987) and Laitinen (1991), among others, arrive at the same conclusion, investigating the bankruptcy prediction for small and medium-sized companies in various industries, operating in Finland. In another study, Laitinen (1992) reported that 50% of startups went bankrupt within the first five years of their establishment, due to excessive initial debt and large-scale business activities. Nur Adiana Hiau Abdullah et al. (2016), investigating the factors of small business financial failure in Malaysia, report that most small business activities are due to borrowing, as access to the capital market is not feasible and is a major cause of failure.

High levels of leverage are linked to the failure of small businesses in Nigeria, according to research by Muhammad M. Ma'aji (2019).

In order to investigate the effect of both short and medium term bank loans, we used two variables in the present study: 1) The ratio of short-term bank loans to total operating short-term liabilities and 2) The ratio of total bank loans (short-term and long-term) to the total acquisition cost of tangible fixed assets.

According to the relevant literature, in addition to the above variables, we have also investigated the effect of various *control variables* like total assets turnover ratio, EBITDA to total assets, current ratio, operating cash flows to total assets, retained earnings to total assets (Altman and Sabato, 2007; Muhammad M. Ma'aji, 2019; Nur Adiana Hiau Abdullah et al., 2016; Arnis et al., 2019; Ikpesu, 2019).

3. Data Description

Bankruptcy data for small and micro family enterprises were compiled by the Hellenic Statistical Authority and include businesses that cover the whole country, while searching for the financial data of their financial statements was conducted by ICAP GROUP SA.

The data and characteristics of the final sample of the bankrupt companies are as follows:

- The number of small and micro enterprises in the sample was 136 and refers to companies that went bankrupt in the period 2003 - 2014.
- A random control sample was created, comprising 472 non-bankrupt companies, which were matched to the bankrupt ones, based on year, industry and sub-industry.
- The total firm-year observations for bankrupt companies were 940, while for healthy ones 5,071.
- The total net sales of the sample companies range from € 100,000 to € 8,000,000.
- All companies in the sample have the legal form of a public limited company (PLC).

- The vast majority of the sample companies are characterized as family enterprises, as is clear from the shareholder composition and the members of the Board, who are related to each other. In the vast majority of the sample companies, the Chairman of the company is also the CEO. In addition, the equity percentage of bankrupt companies in the sample is owned by members of the same family, exceeding in almost all cases 50% of the share capital.
- Bankruptcy is the result of the formal bankruptcy process.
- All companies in the sample adhered to the same accounting principles and their published financial statements were prepared in accordance with the principles of the Greek General Accounting Plan.
- The sample companies are active in the manufacturing industry of the Greek economy.

4. Methodology -Econometric Analysis

4.1 Selection of Independent Variables (Financial and Non-Financial Variables).

As discussed in the literature review section, the following independent variables cover a wide range of information and highlight the qualitative and quantitative characteristics of small and micro family enterprises.

Table 3. Definition of the variables of interest

<i>Description</i>	<i>Variable</i>
1. Binary Depended Variable indicates bankruptcy or not	<i>bankr</i>
2. Duality on the Board of Directors	<i>duality</i>
3. Gender of CEO	<i>genderceo</i>
4. Ratio of operating cash flows to total assets	<i>cfo_ta</i>
5. Retained earnings to total assets	<i>retain_to_ta</i>
6. Ratio of short term bank loans to operating current liabilities	<i>Short_turm_loan_ratio</i>
7. Ratio of total bank loans to fixed assets	<i>Fixed_assets_financed</i>
8. Total assets turnover	<i>sales_ta</i>
9. EBITDA / total assets	<i>ebitda_ta</i>
10. Debt / total assets	<i>DebtRatio</i>
11. Current ratio	<i>currentratio</i>

The variables Duality on the Board and CEO Gender are defined as follows:

Duality on the Board (*duality*) = 1, if CEO and Chairman is the same person and 0 in a different case.

CEO gender (*genderceo*) = 1, if the CEO is female and 0 if otherwise;

Whereas *bankr* is used as a dependent variable which takes the value of 1 if the company has gone bankrupt and 0 otherwise.

Table 4. Sample distribution based on *bankr* and *duality on Board* variables

		<i>Bankrupt</i>		
		<i>0</i>	<i>1</i>	<i>Total</i>
Duality	0	1,324	211	1,535
	1	3,747	729	4,476
	Total	5,071	940	6,011
Pearson	chi2(1)=	5.5938	Pr=	0.018

Table 3. Sample distribution based on *bankr* and *CEO gender* variables

		<i>Bankrupt</i>		
		<i>0</i>	<i>1</i>	<i>Total</i>
Gender of CEO	0	4,415	723	5,138
	1	656	217	873
	Total	5,071	940	6,011
Pearson	$\chi^2(1)=$	65.795	Pr=	0.000

Table 4 shows Pearson correlation coefficients of the variables of interest revealing the relationship between them in each model. Tables 5 and 6 present the descriptive statistics of the variables for non fail and bankrupt sample, respectively.

Table 4. Table of correlations of the model variables

	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>8</i>	<i>9</i>	<i>10</i>	<i>11</i>	<i>12</i>
bankr	1										
duality	0.0305*	1									
genderceo	0.1046*	-0.0455*	1								
cfo_ta	0.0018	-0.0109	-0.017	1							
retain_to_ta	-0.4947*	-0.0484*	-0.1121*	-0.0505*	1						
Short_turm_loan_ratio	0.0803*	0.019	0.0102	-0.1618*	-0.0641*	1					
Fixed_assets_financed	0.1158*	0.0521*	-0.0175	-0.1690*	-0.1060*	0.2022*	1				
sales_ta	-0.0459*	0.0361*	-0.0734*	0.0533*	-0.1336*	-0.1011*	-0.0181	1			
ebitda_ta	-0.3663*	0.0323*	-0.0158	0.2410*	0.3584*	-0.0491*	-0.0622*	0.2424*	1		
DebtRatio	0.4200*	0.0831*	0.0189	0.0801*	-0.6643*	0.1162*	0.2765*	0.2377*	-0.1922*	1	
currentratio	-0.0920*	-0.0203	-0.0156	-0.0653*	0.2856*	-0.0913*	-0.0781*	-0.0997*	-0.0333*	-0.4551*	1

Table 5. Descriptive statistics of the variables for non bankrupt firms

<i>Variable</i>	<i>Obs</i>	<i>Mean</i>	<i>Std. Dev.</i>	<i>Min</i>	<i>Max</i>
duality	5,041	0.739	0.439	0	1
genderceo	5,041	0.129	0.336	0	1
cfo_ta	5,041	0.076	0.166	-0.604	0.840
retain_to_ta	5,041	0.170	0.158	0.001	0.750
Short_turm_loan_ratio	5,041	1.441	3.486	0.000	46.490
Fixed_assets_financed	5,041	1.123	3.188	0.000	43.397
sales_ta	5,041	1.064	0.918	0.009	11.990
ebitda_ta	5,041	0.112	0.105	-0.432	0.694
DebtRatio	5,041	0.537	0.239	0.009	0.994
currentratio	5,041	2.458	3.701	0.143	48.662

Table 6. Descriptive statistics of the variables for firms going bankrupt

<i>Variable</i>	<i>Obs</i>	<i>Mean</i>	<i>Std. Dev.</i>	<i>Min</i>	<i>Max</i>
duality	940	0.776	0.417	0	1
genderceo	940	0.231	0.422	0	1
cfo_ta	940	0.077	0.201	-0.490	1.160
retain_to_ta	940	-0.125	0.305	-1.977	0.381
Short_turm loan_ratio	940	2.218	3.603	0.000	27.270
Fixed_assets financed	940	2.167	3.593	0.000	37.127
sales_ta	940	0.951	0.720	0.085	4.237
ebitda_ta	940	-0.002	0.107	-0.412	0.269
DebtRatio	940	0.850	0.281	0.075	2.311
currentratio	940	1.532	3.327	0.067	36.745

4.1.1 Multicollinearity

Table 4 above presents the correlation matrix of the variabes of interest. None of the correlation coefficients between each pair of independent variables is large. The rule of thump is that when the correlation coefficient exceeds 80% there needs to be additional investigation (Gujarati, 2008). Therefore, we can conclude that multicollinearity is not a concern for our study.

4.2 Econometric Analysis

The model chosen to investigate the prediction of the financial failure of small and micro Greek enterprises is the Logit model for panel data. The Logit model is a nonlinear regression model designed specifically for estimating binary dependent variables. It gives the probability that the dependent variable will get a value of 1 given the values of the independent variables, adopting techniques that drive the estimated values to move in the range (0,1). This is precisely the main point of superiority over the linear probability model which does not provide the range (0,1).

4.2.1 The Logit Probability Model

Logit models use the cumulative standard logistic distribution function to predict the probability that the dependent variable will get a value of 1:

The probability of a positive outcome is assumed to be determined by the logistic cumulative distribution function. For ith observation the function is (see Greene, 2003, pp. 611-612):

$$f(y_{it}, \dots, y_{iT}) = \int \left[\prod_{t=1}^T \Lambda(\alpha_i + x'_{it}\beta)^{y_{it}} \{1 - \Lambda(\alpha_i + x'_{it}\beta)\}^{1-y_{it}} \right] g(\alpha_i | \sigma^2) d\alpha_i$$

With this specification we estimate the following model:

$$bankr_{it} = \alpha_i + x'_{it}\beta + \varepsilon_{it}$$

where x' : (*duality,genderceo,sales_ta ,ebitda_ta, DebtRatio, currentratio , Short_turm_loan_ratio, Fixed_assets_financed, cfo_ta*) as they defined in Table1

α_i : individual

ε_{it} : the disturbances

$i=1, \dots, n$ with $n= 608$ sample firms and $t=1, \dots, T$ with $T=11$ the total number of years of the sample.

We consider the constant term α_i to be unrelated to the independent variables so that the model will be estimated by random effects methods. The random effects are fitted via maximum likelihood model.

After the estimation we test the significance of the panel-level variance component to conclude if the panel estimator is not different from the pooled estimator.

For our analysis, the STATA 15.1 program was used.

5. Results and Discussion

The results of the model estimation developed in the previous section are presented in Table 7.

Table 7. Logit model estimation results:

$$\mathit{bankr}_{it} = \alpha_i + \mathbf{x}'_{it}\boldsymbol{\beta} + \varepsilon_{it}$$

<i>bankr</i>	<i>Coef.</i>	<i>Std. Err.</i>	<i>z</i>	<i>P>z</i>	<i>[95% Conf.</i>	<i>Interval]</i>
duality	2.951	1.278	2.310	0.021	0.446	5.457
genderceo	4.587	1.303	3.520	0.000	2.034	7.140
cfo_ta	-7.961	3.310	-2.410	0.016	-14.448	-1.475
retain_to_total	-59.978	4.472	-13.410	0.000	-68.743	-51.212
Short_term_loan_ratio	-0.390	0.070	-5.607	0.000	-0.175	0.097
Fixed_assets_financed	0.255	0.080	3.200	0.001	0.099	0.412
sales_ta	-3.257	0.924	-3.530	0.000	-5.067	-1.446
ebitda_ta	-75.483	6.002	-12.580	0.000	-87.246	-63.720
DebtRatio	25.858	2.744	9.430	0.000	20.481	31.235
currentratio	0.286	0.113	2.550	0.011	0.066	0.507
$\ln(\sigma_v^2)$	5.757	.129			5.504	6.009
$\sigma = \sqrt{\exp^{2\ln(\sigma)}}$	17.783	1.147			15.671	20.181
$\rho = \sigma_v^2 / (\sigma_v^2 + \sigma_\varepsilon^2)$.990	.001			.987	.992

LR test of $\rho=0$: $\chi^2 = 2293.57$ ($Prob > \chi^2$) = 0.000

Notes : σ_v^2 is the panel-level variance component, σ is the standard deviation, while σ_ε^2 represents the residual variance

The likelihood-ratio compares the pooled estimator (logit) with the panel estimator. With estimated value of LR=2293.57 (p_value<0.001) we cannot accept the hypothesis of no differences between the panel estimator and the pooled estimator and thus we conclude that the panel-level variance component is important to our model.

The *duality* variable was found with a positive sign and statistically significant at 95% confidence interval (pvalue: 0.021) confirming the results of other researchers such as Argenti(1976), Lakshan & Wijekoon(2012), Ciampi(2015), Nur Adiana Hiau Abdullah et al., (2016), Koliass et al., (2019), Muhammad M.Ma'aji (2019). Therefore, hypothesis (1) is accepted.

The *genderceo* variable was found to be statistically significant (pvalue<0.001) and with a positive sign. In contrast to other studies, such as Nur Adiana Hiau Abdullah et al. (2016), Faccio et al. (2016) our results have shown that women are positively related to the probability of failure. We believe that this differentiation is observed mainly in small and micro enterprises, as opposed to the big ones and is due to the intentions that derive from the culture and values that characterize the Greek family and small scale Greek entrepreneurship. Hence, our data supports hypothesis (2)

The coefficient of the *Short_term_loan_ratio* variable was found to be statistically significant (pvalue <0.001) and with a negative sign. High index values indicate that bank lending is used instead of accepting suppliers' credit terms. The terms of credit that can be offered to businesses generally have three key elements, the discount rate, $y\%$, the period during which the account must be repaid in order to receive the discount, (period i) and the period of credit, (period j) within which the account must be repaid, without discount. In short, these terms are referred to as "y/i net j". An arithmetic example in the usual terms found in the relevant literature is "2/10 net 30", meaning that the business is either able to pay the invoice within 10 days at a 2% discount on its value or pay the full amount of the value of the invoice (i.e. with no discount) within 30 days.

The choice, keeping all other factors constant, can be based on comparing the rate of interest that equates the net present value of cash to be paid on the 10th day with cash to be paid on the 30th day.

If the company refuses to accept the discount and chooses to repay its obligations on the 30th day, this means it will need to use alternatively the liquidity available by investing in a plan that will yield (annualized basis) equal to or greater than the implicit interest rate. In terms of "2/10 net 30", the interest rate is calculated:

$$\text{implicitrate} = \left\{ \left(\frac{1}{1 - 2\%} \right)^{365/30 - 10} - 1 \right\} = 44,6\%$$

Clearly, it is extremely difficult, if not impossible, for commercial companies to achieve such returns, so any refusal to accept a discount on the above terms certainly indicates a liquidity problem. Finally, we find a positive and statistically significant correlation (pvalue=0.001) between the *Fixed_assets_financed_ratio* and the probability of bankruptcy, which is interpreted as follows:

This ratio indicates that intensive bank credit has been used to finance the investment in fixed assets, which may mean the absence of equity participation in the implementation of the investments. This tactic increases the cost of capital for small and micro enterprises to unmanageable levels which can lead to business failure. Consequently, hypothesis (3) is confirmed.

The control variables *retain_to_total*, *cfo_ta*, *DebtRatio*, *currentratio* and *sales_ta* were found to be statistically significant and with the expected signs based on the theory. The *EBITDA/ Total Assets* variable is statistically significant and negatively impacts the probability of financial failure of small and micro-enterprises, indicating that the size of profitability is an important factor for business survival (Altman&Sabato, 2007), Nur Adiana Hiau Abdullah et al., 2016).

6. Conclusions

This study investigates the hypothesis that, in small and very small family businesses, whose characteristics differ from those of large firms, in addition to financial variables (information), non-financial variables (corporate governance variables), such as CEO duality and CEO gender, play also an important role in the path of business to financial failure.

Our data support the hypothesis that CEO duality in small and micro and mainly family-owned enterprises is in most cases linked to a lack of administrative capacity, appropriate experience and specific skills, leading to incorrect decisions.

Such businesses enjoy the confidence and trust of the banks in which they maintain credit lines that allow for beneficial negotiations with suppliers. If the company does not have the necessary liquidity, it should turn to short-term bank lending in order to benefit from the discount. Therefore, a greater ratio of short-term bank loans to accounts payable, *ceteris paribus*, eliminates the likelihood of failure. This case was investigated using the variable, *ratio of short-term bank loans to total operating short-term liabilities*.

Using the variable, *total bank loans to total acquisition cost of tangible fixed assets*, it was found that intensive bank borrowing, and in particular medium-term bank loans to fully finance investment in fixed assets, is a tactic that increases the cost of capital for small and microenterprises at unmanageable levels that can lead to business failure. Of course, excessive borrowing is not only the result of the wrong decision of the company to accept it, but also of the wrong decision of the banks to extend such loans. This situation was common until the end of 2009, highlighting the pathogenesis of the Greek banking system.

Finally, banks need to develop credit risk models and internal control systems in order to manage their funds better, and more efficiently and safely, when their financing is directed to small and very small (micro) family enterprises. Due to the specific characteristics of small and micro businesses, banks should also include non-financial variables, such as corporate governance variables, in their models.

References

- Agarwal, V. & Tafler, R. (2008). Comparing the performance of market - based and accounting-based bankruptcy prediction models. *Journal of Banking and Finance*, 32(8), 1541-1551. <https://doi.org/10.1016/j.jbankfin.2007.07.014>
- Altman, E. & Sabato, G. (2007). Modeling credit risk for SMEs: Evidence from US market. *Journal of Accounting, Finance and Business Studies (ABACUS)*, 43(3), 332-357. <https://doi.org/10.1111/j.1467-6281.2007.00234.x>
- Altman, E. (1968). Financial Ratios, Discriminant Analysis and the Prediction of Corporate Bankruptcy. *The Journal of Finance*, 23(4), 589-609. <https://doi.org/10.1111/j.1540-6261.1968.tb00843.x>

- Altman, E., Hartzell J. & Peck, M.(1995). *A scoring system for emerging market corporate bonds*, Salomon Brothers High Yield Research.
- Argenti, John (1976). Corporate planning and corporate collapse. *Long Range Planning*, 9(6), 12 - 17. [https://doi.org/10.1016/0024-6301\(76\)90006-6](https://doi.org/10.1016/0024-6301(76)90006-6)
- Arnis, N., Chytis, E. & Koliass, G. (2018). Bankruptcy Prediction and Homogeneity of Firm Samples: The Case of Greece. *Journal of Accounting and Taxation*, 10(9), 110-125. <https://doi.org/10.5897/JAT2018.0321>
- Arnis, N., Karamanis, K. & Koliass, G. (2019). Detecting Creative Accounting in Businesses in Financial Distress. *Accounting and Finance Research*, 8(2), 232-244. <https://doi.org/10.5430/afr.v8n2p232>
- Beaver, W. (1966). Financial Ratios as Predictors of Failure. *Journal of Accounting Research*, 4, 71-111. <https://doi.org/10.2307/2490171>
- Charitou, A., Neophytou, E. & Charalambous, C. (2004). Predicting corporate failure: empirical evidence for the U.K. *European Accounting Review*, 13(3), 465-497. <https://doi.org/10.1080/0963818042000216811>
- Ciampi Francesco (2015). Corporate governance characteristics and default prediction modeling for small enterprises. An empirical analysis of Italian firms. *Journal of Business Research*, 68(5), 1012-1025. <https://doi.org/10.1016/j.jbusres.2014.10.003>
- Edmister O. Robert (1972). An empirical test of financial ratio analysis for small business failure prediction. *The Journal of Financial and Quantitative Analysis*, 7(2), 1477-1493. <https://doi.org/10.2307/2329929>
- Faccio, M., Marchica, M. T. & Mura, R. (2016). CEO gender, corporate risk-taking & the efficiency of capital allocation. *Journal of Corporate Finance*, 39, 193-209. <https://doi.org/10.1016/j.jcorpfin.2016.02.008>
- Frydman, H., Altman, E. & Kao, D. (1985). Introducing Recursive Partitioning for Financial Classification: The Case of Financial Distress. *The Journal of Finance*, 40(1), 269-291. <https://doi.org/10.1111/j.1540-6261.1985.tb04949.x>
- Gujarati, D. (2008). *N. 2003*. Basic econometrics, 4.
- Greene, W. H. (2003). *Econometric analysis*. Pearson Education
- Heracleous, L. & Werres, K. (2016). On the road to disaster: Strategic misalignments and corporate failure. *Long Range Planning*, 49(4), 491-506. <https://doi.org/10.1016/j.lrp.2015.08.006>
- Ikpesu, F. (2019). Firm specific determinants of financial distress: Empirical evidence from Nigeria. *Journal of Accounting and Taxation*, 11(3), 49-56. <https://doi.org/10.5897/JAT2019.0333>
- Jalbert, T., Jalbert, M. & Furumo, K. (2013). The relationship between CEO gender, financial performance and financial management. *Journal of Business and Economics Research*, 11(1), 25-33. <https://doi.org/10.19030/jber.v11i1.7520>
- Kahya, E. & Theodossiou, P. (1999). Predicting Corporate Financial Distress: A Time-Series CUSUM Methodology. *Review of Quantitative Finance and Accounting*, 13(4), 323-345. <https://doi.org/10.1023/A:1008326706404>
- Keasey, K. & Watson, R. (1987). Non-financial symptoms and the prediction of small company failure: a test of Argentis hypotheses. *Journal of Business Finance and Accounting*, 14(3), 335 - 354. <https://doi.org/10.1111/j.1468-5957.1987.tb00099.x>
- Koliass, G., Arnis N. & Kypriotelis E. (2019). CEO Duality and Firm Distress. *Open Journal of Accounting*, (8), 19-34. <https://doi.org/10.4236/ojacct.2019.82002>
- Laitinen, K. Erkki (1991). Financial ratios and different failure processes. *Journal of Business Finance and Accounting*, 18(5), 649 - 673. <https://doi.org/10.1111/j.1468-5957.1991.tb00231.x>
- Laitinen, K. Erkki. (1992). Prediction of failure of a newly founded firm. *Journal of Business Venturing*, 7(4), 323 - 340. [https://doi.org/10.1016/0883-9026\(92\)90005-C](https://doi.org/10.1016/0883-9026(92)90005-C)
- Lakshman, A.M.I. & Wijekoon, W.M.H.N. (2012). Corporate governance and corporate failure. *Procedia Economics and Finance*, (2), 191 - 198. [https://doi.org/10.1016/S2212-5671\(12\)00079-2](https://doi.org/10.1016/S2212-5671(12)00079-2)
- Meyer, P. A. & Pifer, H. W. (1970). Prediction of bank failure. *Journal of Finance*, (25), 853-868. <https://doi.org/10.1111/j.1540-6261.1970.tb00558.x>
- Muhammad M. Maaji (2019). Modelling Business Failure Among Small Businesses in Nigeria. *Journal of Economics, Finance and Accounting*, 6(2), 72-81. <https://doi.org/10.17261/Pressacademia.2019.1046>

- Nur Adiana Hiau Abdullah, Muhammad M. Maaji & Karren Lee Hwei Khaw (2016). The Value of Governance Variables in Predicting Financial Distress among Small and Medium-Sized Enterprises in Malaysia. *Asian Academy of Management Journal of Accounting and Finance*, 12(1), 77-91. <https://doi.org/10.21315/aamjaf2016.12.S1.4>
- Ohlson, J. (1980). Financial Ratios and the Probabilistic Prediction of Bankruptcy. *Journal of Accounting Research*, 18(1), 109-131. <https://doi.org/10.2307/2490395>
- Richardson G., Taylor G. & Lanis R.(2015). The impact of financial distress on corporate tax avoidance spanning the global financial crisis: Evidence from Australia. *Economic Modelling*, 44(C), 44 - 53. <https://doi.org/10.1016/j.econmod.2014.09.015>
- Rikkers F. & Thibeault A. (2009). A structural form default prediction model for SMEs, evidence from Dutch market. *Multinational Finance Journal*, 13(3/4), 229-264. <https://doi.org/10.17578/13-3/4-4>
- Zmijewski, M. (1984). Methodological issues related to the estimation of financial distress prediction models. *Journal of Accounting Research*, 22, 59-86. <https://doi.org/10.2307/2490859>

Notes

Note 1: <https://ec.europa.eu/eurostat/en/web/products-eurostat-news/-/EDN-20181119-1>

Note 2: The Small Business Act (SBA) initiative, created by the European Commission in October 2007, aims to support and develop small and medium-sized enterprises by creating the right entrepreneurial environment (simplifying the legal and regulatory framework, removing various obstacles, etc.)

Note 3: Icap, Press Release 28/11/2016

Note 4: World Bank, Doing Business: Measuring Regulatory Quality and Efficiency, 2016, <http://www.doingbusiness.org/reports/global-reports/doing-business-2016>