Research Journal of Finance and Accounting
ISSN 2222-1697 (Paper) ISSN 2222-2847 (Online)
Vol.4, No.5, 2013

Corporate Sustainability in the Estimation of Financial Distress Likelihood –Evidence from the World Stock Markets during the Financial Crisis

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Abstract

This paper investigates the relationship between corporate sustainability as measured by GES ratings and the financial distress likelihood during the period 2003 to 2010. We find that corporate sustainability in both the environmental and social dimension is associated with a lower probability of financial distress. The theoretical explanations for our findings are based on two pillars. First, corporate sustainability, in particular the environmental dimension, is supposed to have a positive effect on firms' cash flows due to increased cost efficiency and revenues from green customers. Second, corporate sustainability, in particular the social dimension, might serve as an effective risk management tool that lowers stakeholder risks.

Keywords: Corporate sustainability, financial distress likelihood, logistic regression, panel data analysis

1. Introduction

Corporate sustainability has many definitions, but all of them have one common ground: the orientation on long-term objectives. In Elkington's (1999) triple bottom line, these are economic, ecological, and social objectives, which have to be balanced and considered simultaneously by the firms' executives. Theoretical frameworks such as stakeholder and legitimacy theory provide explanation why balancing these three pillars instead of focusing exclusively on the economic dimension can be a value enhancing business strategy. To be economically successful, a firm needs acceptance in the society. If its actions are at odds with the norms, values, and beliefs that prevail in society, there is the serious threat that customers or suppliers will refuse to do business with it. Then the firm lacks legitimacy, which implies a decline in profit or even corporate failure (Hybels, 1995). Moreover, Godfrey (2005) developed the theory that corporate sustainability can create shareholder value by generating positive moral capital among communities and stakeholders. This moral capital can serve as insurance-like protection for a firm's relationship-based intangible assets and in turn, may reduce its exposure to stakeholder risks.

In this paper, we build on two main ideas. The first is that corporate sustainability is closely related to the economic objective of going concern (Cunningham, 2011). The principle of going concern is well known from accounting and imposes that the values of assets and liabilities are measured under the assumption that a firm never ceases to exist. Thus, in our definition corporate sustainability is a governance concept that ensures going concern by properly accounting for economic, environmental, and social concerns. The second idea is that the global financial crisis starting with the credit crunch in the United States in 2007 provides the unique opportunity to empirically test whether firms that follow the principles of sustainability indeed gained from their insurance-like protection and were less affected by the economic downturn than less sustainable firms.

To measure the protection that sustainable and non-sustainable firms had during the crisis, we build an econometric model that predicts the financial distress likelihood (FDL), and investigate whether including sustainability proxies provided by the international sustainability rating agency GES (Global Engagement Services) are incrementally informative in these models. Financial distress is defined by the lack of a firm's capacity to satisfy its financial obligations (Pindado et al., 2008). We also contribute to the empirical literature on the benefits of corporate sustainability, which so far only has provided evidence for its effects on profitability, cost of capital, and shareholder value (Orlitzky and Benjamin, 2001; Orlitzky et al., 2003; El Ghoul et al., 2011; Guenster et al., 2011). We are the first

who shed light on relationship between corporate sustainability and financial distress in a global economic crisis. Our results show a significant negative relationship between corporate sustainability and the likelihood of financial distress, which should encourage firms to expand their engagement in sustainability activities.

The remainder of this paper is structured as follows. In Section 2, we develop our research hypotheses, which are based on the theoretical literature describing the potential relationship between corporate sustainability, going concern, and financial distress. Section 3 introduces the data and Section 4 describes the methodology of our analysis. We present our results in Section 5 and provide an outlook on further research in Section 6.

2. Hypothesis Development

In the year 1987, the World Commission on Environment and Development (WCED) released a report on sustainable development. This paper was one of the first commonly accepted standards to define sustainability in the modern context of environment protection and ecology. The report stresses the importance not to separate the terms sustainability and development. In fact, it argues that the economic development is not separable from the environment. Based on this assumption, the report defines sustainable development as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs", while the commission also insisted on recognition of the two inherent key concepts of sustainable development: 1) Needs: the essential needs of the poor that priority should be given to and 2) Limitations: the limitations that technical progress and social order set upon the deployment of the environment to meet present and future needs. The WECD's definition of sustainability can be helpful to understand its inherent meaning, which contains the priority to create lasting values. The interpretation of sustainability given in the report can be transferred to the corporate level. Corporate sustainability is achieved by business and investment strategies that use the best business practices to meet the needs of the current and future stakeholders. This means a change of the traditional value system from creating economic value only for their shareholders also to numerous stakeholders.

Since the emergence of corporate sustainability starting in the late 1980s, many analytical and empirical studies have investigated the effects of corporate sustainability on financial and stock market performance. For instance, Klassen and McLaughlin (1996) find a positive relationship between the environmental management and stock market performance when a firm wins an environmental award or experiences an environmental crisis. These results can be explained by customer preferences for environmentally oriented companies due to differentiation with environmental certifications and environmental sensitivity, or by investments of these firms in environmental management systems and safeguards helping them to avoid potential future environmental spills, crises, and resulting liabilities (Orlitzky and Benjamin, 2001; Orlitzky et al., 2003; El Ghoul et al., 2011; Guenster et al., 2011)

To preserve going concern, a company must maintain its ability to meet the claims of customers and other stakeholders. In the long term that means that cash received from trading or investments and loans (in case of financial companies) should exceed the operational payments for a company to survive (Coyle, 2000, p. 125). Thus, beyond ecologically and socially desirable production processes, corporate sustainability can also be understood as the sustainability of a corporation. In our analysis, we focus on this aspect and investigate whether more sustainable companies are less likely to suffer from financial distress, in particular during the economic downturn that started in 2007. Therefore, our research hypothesis is that a higher level of sustainability is associated with a lower financial distress likelihood.

3. Data

3.1 Sample

Our analysis is based on the companies listed in the MSCI World Index for the period December 2003 to December 2010. The MSCI World represents almost two thousand companies from 24 countries and a wide range of industries. To analyse the relationship between corporate sustainability and financial distress, we utilize the corporate sustainability ratings by GES. This rating is derived from a set of international norms concerned with human rights, job norms, environment protection, and prevention of corruption.

Table 1 displays the annual number of MSCI World firms that are evaluated by GES. This study combines the GES sample with financial data from Thomson Datastream (Worldscope). Not for all companies financial data is available,

which reduces our sample from 10,776 observations to 8,289 during the period 2003 to 2010. From these observations, 180 are classified as financial distress in accordance with the definition given in Section 4.

Table 1. Sample of analyzed companies

	2003	2004	2005	2006	2007	2008	2009	2010	Total
GES Sample	890	994	999	1,000	1,883	1,696	1,659	1,655	10,776
(-) no data available	196	217	196	187	346	211	173	961	2,487
(=) data available	694	777	803	813	1,537	1,485	1,486	694	8,289
Thereof financially distressed	14	22	21	17	39	27	27	13	180

Table 2 shows the annual distribution of financial and non-financial distressed firm observations among the countries during the period 2003 to 2010. Obviously, the United States of America and Japan have a very large share of the sample. The relationship between financial distress and non-financial distress basically achieves a balance for all countries.

3.2 Financial Data

We obtain earnings before interest and taxes (EBIT), financial expenses (FE), and retained earnings (RE) on a annul basis from Thomson Datastream (Worldscope). All financial variables are scaled by the total assets (TA) at the beginning of the year. The descriptive statistics for financial data are shown in Table 3.

For our analysis it is worth mentioning that all the financial variables have reasonable mean values, for instance a mean return on assets before interest and tax of 9.65%, but at the same time extreme maximum and minimum values. Such extreme values are of particular interest in our empirical methodology, which defines financial distress as having low profitability and cash flows.

3.3 Sustainability Data

Based on its analyzing model, GES creates recommendations for sustainable investments in form of scores. In two major dimensions, environmental and social, they assign scores ranging between 1 (poor) and 7 (excellent). The overall environmental score ENV is the outcome of ratings in two sub-dimensions, environmental performance and environmental preparedness. Environmental preparedness captures the relevant efforts by management such as environmental certification, environmental policy and programs, implementation of an environmental management system, screening of suppliers, and environmental reporting. These efforts can, but do not necessarily, result in better environmental performance. Therefore, environmental performance is measured directly using a battery of 21 indicators such as investment in renewable energies, product recycling, decrease in greenhouse gas emissions, and water use. The social ratings SOC are broken down into employee, community, and supplier sub-ratings. There are between three and six direct indicators for each subcategory that are derived from the United Nations' Universal Declaration of Human Rights, the United Nations' Convention on the Rights of the Child, and the International Labor Organization's Core Labor Convention. In this way, the GES risk ratings provide reliable proxies for a reasonable selection of corporate sustainability issues. Although the equal weightings of indicators are arbitrary and the assignment of scores is, at least to some extent, subject to personal judgment, the rating process is highly transparent and reproducible. To make use of the GES ratings, the alphabetical scores are uniformly transformed to an integer scale ranging from 1 (Score C) to 7 (Score A+), and are interpreted as a metric variable. Table 4 contains descriptive statistics for the sustainability scores used in this study.

Table 2. Data of Financial Distress Distributed by Country and Year

Year	2003		2004		2005		2006		2007		2008		2009		2010		Total			
	AV	FD	AV	FD	AV	FD	AV	FD	AV	FD	AV	FD	AV	FD	AV	FD	AV	%	FD	%
Austria	0	0	3	0	4	0	4	1	13	0	9	0	7	0	2	0	42	0.51%	1	0.56%
Australia	19	1	27	0	27	0	28	1	68	2	64	1	69	2	54	1	356	4.29%	8	4.44%
Belgium	5	0	5	0	4	0	6	0	16	1	13	1	11	1	1	0	61	0.74%	3	1.67%
Canada	27	1	31	0	30	4	29	0	67	2	66	2	71	3	20	1	341	4.11%	13	7.22%
China	14	0	14	0	12	1	14	0	30	1	35	1	35	1	5	0	159	1.92%	4	2.22%
Germany	28	0	29	1	31	0	30	0	50	4	50	2	50	0	6	0	274	3.31%	7	3.89%
Denmark	1	1	1	0	1	0	3	0	19	1	14	1	12	0	2	0	53	0.64%	3	1.67%
Spain	1	0	1	0	11	0	13	0	25	1	29	1	29	0	2	0	111	1.34%	2	1.11%
Finland	3	0	4	0	6	0	6	1	23	0	17	0	17	0	6	0	82	0.99%	1	0.56%
France	29	0	31	0	34	0	40	0	59	0	73	0	74	1	7	0	347	4.19%	1	0.56%
United Kingdom	54	1	57	2	57	0	66	1	118	4	104	2	94	2	44	1	594	7.17%	13	7.22%
Greece	1	0	2	0	5	0	6	0	14	0	11	0	11	2	0	0	50	0.60%	2	1.11%
Hong Kong	6	0	7	0	7	0	10	0	32	0	32	1	31	2	9	1	134	1.62%	4	2.22%
Ireland	2	0	3	1	2	0	3	1	9	1	5	1	3	0	1	0	28	0.34%	4	2.22%
Italy	9	1	9	0	17	1	17	0	29	2	35	0	34	0	2	0	152	1.83%	4	2.22%
Jersey	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0.01%	0	0.00%
Japan	113	4	128	8	125	6	126	3	360	11	321	10	323	3	299	7	1,795	21.66%	52	28.89%
Luxemburg	0	0	0	0	0	0	0	0	1	0	2	0	2	0	0	0	5	0.06%	0	0.00%
Netherlands	2	0	5	0	7	0	11	1	18	1	21	0	21	1	3	0	88	1.06%	3	1.67%
Norway	4	0	4	0	4	0	4	0	18	0	8	0	7	0	0	0	49	0.59%	0	0.00%
New Zealand	1	0	1	0	1	0	1	0	9	0	5	0	5	0	5	0	28	0.34%	0	0.00%
Portugal	3	0	3	0	3	0	3	0	8	0	9	0	8	0	0	0	37	0.45%	0	0.00%
Sweden	14	1	19	1	14	0	19	0	41	0	30	0	28	1	13	0	178	2.15%	3	1.67%
Shanghai	1	0	2	0	1	0	3	0	24	2	17	0	16	3	4	1	68	0.82%	6	3.33%
Unites States	357	4	391	9	400	9	370	8	486	6	515	4	528	5	209	1	3,256	39.28%	46	25.56%
Total	694	14	777	22	803	21	813	17	1537	39	1485	27	1486	27	694	13	8289	100.00%	180	100.00%

AV= available observations; FD= financial distress.

Table 3. Descriptive Statistics Financial Data

	Mean	Median	Min	Max	Std.
EBIT/TA	0.0965	0.0794	-0.8571	1.2290	0.1071
FE/TA	0.0134	0.0102	0.0000	2.4235	0.0295
RE/TA	0.2055	0.1852	-22.0140	1.9463	0.4352

EBIT = Earnings before interest and taxes; FE = Financial expenses; RE = Retained Earnings

Table 4. Descriptive Statistics Sustainability Data

	Mean	Median	Min	Max	Std.
ENV	3.0560	3.0000	1.0000	7.0000	1.7354
SOC	2.5657	2.0000	1.0000	7.0000	1.2256

ENV = Environmental rating; SOC = Social rating

4. Methodology

The empirical part of this paper utilizes a logit regression to measure the relationship between corporate sustainability and the financial distress likelihood. In this approach, a priori groupings of either financially distressed or non-distressed firms are made under the following condition: financial distress is defined as a negative operating cash flow in two consecutive years (t and t+1). We follow Pindado et al. (2008) and use the three financial measures EBIT/TA, FE/A, and RE/TA to explain financial distress likelihood. In addition, we include environmental (ENV) and social (SOC) sustainability as measured by the GES score.

EBIT/TA reflects the profitability of a firm, excluding tax and leverage effects. Thus, it should have a negative correlation with financial distress. Financial expenses (FE/TA) are a measure for the exposure to debt financing and therefore should have a positive correlation with financial distress. RE/TA represents balance sheet strength of a firm. A negative correlation to financial distress can be expected.

Following Pindado et al. (2008), we regress financial distress on the financial as well as sustainability variables in a panel data logistic regression framework. Our hypothesis lets us expect a negative relation between corporate sustainability and the financial distress likelihood.

$$Log(Prob(FD)/(1-Prob(FD))) = b_0 + b_1 EBIT_{it} + b_2 FE_{it} + b_3 RE_{it} + b_4 ENV_{it} + b_5 SOC_{it} + \eta_i + \mu_{it} \quad (1)$$

The subscripts i and t indicate firm and time (year), respectively. The variable η_i identifies the firm specific random effects and μ_{it} is the random disturbance term. The Wald-test is applied to test for the significance of the model. All variables are descaled with lagged total assets.

5. Results

5.1 Correlation Analysis

Table 5 confirms the hypothesized correlation between the financial variables and financial distress. Additionally, the positive correlation between environmental and social sustainability scores (0.5438) indicates some degree of collinearity between the corporate sustainability proxies. Therefore, we tested our hypothesis separately for each sustainability proxy as well as simultaneously for both of them.

Table 5. Correlation Matrix

	FD	EBIT/TA	FE/TA	RE/TA	ENV	SOC
FD	1.0000					
EBIT/TA	-0.1362***	1.0000				
FE/TA	0.0829***	0.1229***	1.0000			
RE/TA	-0.1114***	0.2291***	-0.0880***	1.0000		
ENV	-0.0549***	0.0526***	1.0000***	0.0641***	1.0000	
SOC	-0.0316***	0.0050	0.0162	0.0235**	0.5438***	1.0000

FD = Financial Distress (dummy that equals one if operating cash flow is negative in two consecutive years); EBIT = Earnings before interest and taxes; FE = Financial expenses; RE = Retained earnings; ENV = Environmental sustainability score assigned by GES; SOC = Social sustainability score assigned by GES.

5.2 Logistic Regression Analysis

Table 5 and 6 present the computed results. The financial ratios have the expected relation with financial distress. The EBIT/TA and the RE/TA ratios are negative, while the FE/TA ratio is positive related to financial distress. The EBIT/TA and RE/TA ratios have a positive and FE/TA has a negative relation with non-financial distress. Extending the logistic regression model with the sustainability variables we are able to measure a significantly negative relation between environmental sustainability and financial distress in all model specifications. The coefficient for social sustainability is weakly significant if the model only includes SR but not ER.

Table 6. Results of the logistic regression

	Financial Ratios	P > |z|	Financial Ratios & ER	P > |z|	Financial Ratios & SR	P > |z|	Financial Ratios & ER SR	P > |z|
EBIT/TA	-9.528***	0.000	-9.352***	0.000	-9.428***	0.000	-9.353***	0.000
FE/TA	10.043**	0.022	9.358***	0.004	10.085**	0.036	9.355***	0.004
RE/TA	-0.394***	0.007	-0.367***	0.010	-0.387***	0.007	-0.367***	0.010
constant	-5.872***	0.000	-5.112***	0.000	-5.428***	0.000	-5.116***	0.000
ER			-0.250***	0.001			-0.252***	0.005
SR					-0.167*	0.088	0.003	0.978
Wald χ^2	70.41		84.48		74.80		70.41	
Prob > χ^2	0.000		0.000		0.000		0.000	

*, **, *** indicate significance at the 10%, 5% and 1% levels, respectively.

6. Conclusion

By using a sample of MSCI World firms that are evaluated by the international rating agency GES in the period 2003

to 2010, this is the first study that provides evidence for a correlation between corporate sustainability and financial distress likelihood. Our results indicate that firms with higher environmental and social sustainability encounter a lower risk of being financially distressed.

The theoretical explanations for our findings are based on two pillars. First, corporate sustainability, in particular the environmental dimension, is supposed to have a positive effect on firms' cash flows due to increased cost efficiency and revenues from green customers. Second, corporate sustainability, in particular the social dimension, might serve as an effective risk management tool that lowers stakeholder risks.

Our results show that sustainability is relevant for predicting financial distress. Thus, we found a further reason for the engagement of firms in sustainable development. Further research might direct to implementing corporate sustainability measures into credit ratings and achieve an economically significant improvement of the associated tools and processes.

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