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Applying the Corporate Social Responsibility to the Shipping Industry

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Abstract

Corporate financial distress and cashflow liquidity constraints are seen to intensify during prolonged recessionary business cycle phases. On the other hand, companies that consistently pursue corporate social responsible strategies pay attention to smoothly cater towards their stakeholders even at harsh market times. This study investigates dynamic perspectives of corporate financial distress and social responsibility interactions, in a company life-cycle setting. The shipping industry is taken as an empirical case to study these issues at hand, based on a selected sample of 84 publicly-listed shipping companies, over 2010–2016. The empirical findings indicate that positive corporate social responsibility approaches minimize financial distress probabilities for shipping companies. Furthermore, this inverse interaction between positive corporate social responsibility and financial distress is found to be more robust for shipping companies in their mature stage of their life-cycle path.

Keywords: Financial distress, Corporate social responsibility, Business life-cycle, Shipping industry

GEL: G01, G32, H26

1. Introduction

Corporate social responsibility (CSR) has been a topic of steaming interest for more than two decades among scholars and market practitioners from different perspectives, including agency theory, instrumental stakeholder theory, resource-based theory and reputation theory. A concise CSR definition can refer as 'the responsibility of enterprises for their impact on society. CSR should be company-led. Public authorities can play a supportive role through a smart mix of voluntary policy measures and, where necessary, complementary regulation' (European Commission, 2017).

Paying attention to CSR is important because: i) CSR benefits corporations in certain ways, such as in risk management, cost savings, capital access, customer relationships and HR management, inter alia; ii) CSR makes firms more sustainable and innovative, contributing to a more sustainable economy; and iii) CSR runs on core value principles that can support a solid, value-oriented society operating on a sustainable economic system.

Based on carefully selected sample of (84) publicly-listed shipping companies over the period 2010–2016, the innovative findings of this study demonstrate that corporate financial distress and CSR interact in an inverse empirical relationship. When the company life-cycle path is considered, this outcome is seen to further enhance for companies in their maturity stage. This study contributes to the relevant empirical literature towards three directions. First, it provides solid empirical evidence of an inverse relationship between corporate financial distress and CSR performance. Second, it, furthermore, expands this empirical relationship to also considers the company life-cycle stage. Third, it implements this integrated empirical framework on a corporate sample of a major crucial transportation industry, that is shipping, an exercise that, to the best of the authors' knowledge has not been undertaken previously.

A limited number of past papers in shipping business deals with certain only aspects of this study, including Drobetz et al. (2014) and Yuen and Lim (2016). The first study refers to a comprehensive panel dataset of 111 listed shipping companies during 2002 - 2010. A positive relationship between CSR disclosure and financial performance, as measured by Tobin's Q, is concluded for the shipping company sample. The second study investigates potential barriers to the implementation of CSR strategies in shipping, based on a survey approach covering 600 shipping companies in Singapore. industry-specific barriers are found to be critical determinants that prevent or impede the implementation of CSR in shipping.

The rest of the paper is organized as follows: section 2 presents a concise overview of past literature in the field of interest. Section 3 develops the empirical approach to be implemented in the study and section 4 analyses, infers, discusses and evaluates the empirical findings. Finally, section 5 concludes.

2. Literature Review

The literature review on the topic of interest focuses predominantly on most recent studies. Lee and Faff (2009), for a start, investigate the linkage between corporate social responsibility and financial performance by classifying relative corporate performance into leading or lagging corporate social responsibility portfolios, based on a best-of-sector ratings

approach. El Ghoul et al. (2011), subsequently, argue that firms with higher CSR scores enjoy significantly lower cost of equity capital. This outcome is based on a sample of 12,915 US firm-year observations from 1992 to 2007, controlling for critical firm-specific determinants as well as industry and year fixed effects. Goss and Roberts (2011) contribute a novel perspective on the corporate social responsibility and financial performance relationship. A two-step approach is implemented to generate optimally-scaled principal components on well-defined CSR strength and concern clusters. Based on these CSR measures and incorporating the lenders' (banks') role as a 'quasi-insider' of the firm, the study proceeds to document CSR responses in relation to lenders' motivations. Guiral (2012) examines corporate social performance, focusing on the implications of loan requests for CSR activities as well as on loan requests for increasing innovation intensity to affect loan officers' credit judgments and lending decisions. It is indicated that CSP investment are interpreted as an indicator of superior corporate financial performance by bank loan officers.

Attig et al. (2013) identify significantly positive CSR impact on firm credit ratings in terms of both an aggregate CSR score and the scores on the individual CSR components. By increasing a firm's credit rating, investments in CSR activities can potentially lead to decreases in the firm's financing costs. This can ultimately enhance firm and shareholder market value. In other words, 'CSR investments that matter most for firms' credit ratings are those that are socially desired and that are directly related to a firm's primary stakeholders'.

Hoi et al. (2013), on the other hand, indicate that firms with excessive, irresponsible CSR activities perform a higher likelihood of engaging in tax sheltering activities. Furthermore, Kim et al. (2014) find a significantly negative relationship between firms' CSR performance and one-year-forward stock price crash risk. Oikonomou et al. (2014) incorporate an extensive dataset comprising of more than 3,000 bonds, issued by 742 firms operating in 17 industries. They find that local community support, higher levels of marketed product safety and quality characteristics and avoidance of controversies in the firm's workforce can materially reduce the risk premia associated with corporate bonds. This in turn results to decreases in the cost of corporate debt. Diversity concerns are shown to affect credit spreads negatively but the economic impact is less significant.

Xu et al. (2015) study CSR effects upon the cost of equity capital in Chinese listed firms. investments in improving CSR towards investors are found to contribute most towards reducing corporate equity financing costs. The CSR effects on the cost of capital is seen to more material in recessionary phases rather than in economic booms.

Recent studies that have also influenced this study include Lins et al. (2017), Arouri and Pijourlet (2017), Harjoto (2017) and Huang et al. (2017). Lins et al. (2017) provide evidence that firm-specific social capital, built up through CSR activities, pays-off during a period when the importance of trust increases unexpectedly. Firms with high CSR ratings outperform firms with low CSR ratings during the crisis by at least four percentage points, after accounting for a variety of firm characteristics and risk factors. Arouri and Pijourlet (2017), based on a global sample, argue that the value of cash is significantly superior, if the firm has a high CSR rating. Moreover, the existence of an excess cash premium for firms

exhibiting a high CSR rating is because investors consider that CSR allows managers to increase shareholders' wealth by turning the cash resources to become even more efficient. Harjoto (2017) finds empirical evidence to support the hypothesis that CSR indeed increases firm fixed operating costs which cannot be offset by the increase in their contribution margin, indicated by a positive relation between CSR and degree-of-operating. Furthermore, there seems to be a negative relationship between CSR strengths and degree-of-financial leverage, meaning that CSR reduces firm financial leverage. Huang et al. (2017) investigate the linkage between CSR and bank loan costs and identify an inverse U-shape relationship in China. CSR thresholds for state-owned enterprises (SOEs) are found to be higher than those for non-SOEs. CSR thresholds for SOEs are argued to be lower in regions with high degree of marketization than in regions with low degree of marketization.

3. The Model

CSR performance is the model's independent variable and it represents the level of CSR activity that the shipping firm undertakes. The activity may have a positive or negative sign. Following Cho et al. (2013), Cheng et al. (2014) and Al-Hadi et al. (2017), the core components of CSR activity, on the basis of the Global Reporting Initiative index (Note 1), are divided into 43 positive and 32 negative areas of CSR activity (75 items in total).

The two variables used as a basis are PCSR representing the natural log of the positive items as revealed in the annual report and NCSR denoting the natural log of the negative items. For each of the 75 individual items, a score of one (1) has been allocated for disclosure of a given performance attribute or zero (0) otherwise. The control variables in the regressions models can be shown in Table 1.

Table 1. Definition of variables

Variable	Definition
SIZE	Natural log of the firms' total assets at the beginning of year
LEVER	Leverage, measured as long-term debt (and short-term debt) scaled by total assets
R_D	Research and development expense ratio, measured as research and development expense scaled by lagged assets. Missing values for research and development expense are set to zero
ROA	Profitability of the firm, measured as operating income scaled by total assets
LOSS	Dummy variable that takes a value of 1 if net income is negative in a given year, 0 otherwise
LIQUID	(cash + receivable)/current liability
IND	Dummy variables to control for industry effects

Source: Authors' compilation.

In order to examine the relationship between CSR performance and financial distress, the following OLS regression model is estimated (Eq.1):

$$FD_{it} = \alpha_{0it} + \beta_1 CSR_{it} + \beta_2 SIZE_{it} + \beta_3 LEVER_{it} + \beta_4 CASH_{it} + \\ + \beta_5 ROA_{it} + \beta_6 R\_D_{it} + \beta_7 LIQUID_{it} + \beta_8 LOSS_{it} + \\ + \beta_{9-14} IND_{it} + \beta_{15-21} YEAR_{it} + \varepsilon_{it} \quad \text{(Eq. 1)}$$

where *i* = firm 1 to 48; *t* = financial year, 2010 to 2016; *FD* = financial distress; *CSR* = either PCSR or NCSR; *SIZE* = the total assets logarithm; *LEVER* = short-term and long-term debt divided by total assets; *CASH* = cash holdings; *ROA* = return on assets; *R_D* = R&D expenditure divided by total assets; *LIQUID* = cash plus receivables/current liabilities; *LOSS* = dummy variable scored as 1 if the firm is a loss-making firm in a given year and 0 otherwise; *IND* = industry sector dummy variable, coded 1 if the firm is represented in the particular GICS category and 0 otherwise; *YEAR* = year dummy variable, coded 1 for a particular year and 0 otherwise and ε = the error term.

To model the relationship between CSR performance, financial distress and company life-cycle stage, the following OLS regression model (Eq. 2):

$$FD_{it} = \alpha_{0it} + \beta_1 CSR_{it} + \beta_2 L\_C_{it} + + \beta_3 CSR * L\_C \; + \\ + \beta_4 SIZE_{it} + \beta_5 LEVER_{it} + \beta_6 CASH_{it} + \\ + \beta_7 ROA_{it} + \beta_8 R\_D_{it} + \beta_9 LIQUID_{it} + \beta_{10} LOSS_{it} + \\ + \beta_{11-16} IND_{it} + \beta_{17-23} YEAR_{it} + \varepsilon_{it} \quad \text{(Eq.2)}$$

where *L_C* = life cycle model. This denotes a test to check whether a firm's life-cycle theory can be seen by the mix of earned and contributed capital. This means that we study whether shipping firms with relatively high retained earnings as a proportion of total equity and of total assets are expected to pay dividends to their shareholders. As DeAngelo et al. (2006) argue, 'the earned/contributed capital mix is a logical proxy for the life-cycle stage at which a firm currently finds itself because it measures the extent to which the firm is self-financing or reliant on external capital.'

The higher the value of financial distress (dependent variable), the lower level of financial distress it represents.

To test for the robustness of the empirical findings, the model by Almeida and Campello (2007) (AC_Dis) is incorporated, as it has been found to a perform empirically satisfactory.

The empirical sample in this study was initially constructed on 84 selected global and publicly-listed shipping companies during 2010 - 2016. The dataset has been compiled from Bloomberg database. Certain distinctive sample properties can be discussed: the firms are listed on international stock markets worldwide; more than 55% of company revenue relates to the freight transport business as core activity; and, corporate market capitalization values and free floats are available. After the exclusion of companies with missing data, the final sample includes 48 companies listed on 16 stock exchanges with a total free float adjusted market capitalization in excess of $78 bln. This sample covers at least 80% of the float adjusted market capitalization (USD) of the selected initial sample (Table 2).

Table 2. Data sample

Industry Classification	percent of observations
container	32
others	18
LPG-LNG	17
coastal	4
oil	15
dry	14
Total	*100*

Source: Authors' calculations.

4. Empirical Results

Table 3 summarizes critical descriptive statistics for the dependent, independent and control variables. Subsequently, Table 4 reports the empirical results of the model on CSR performance and financial distress over the period 2010 - 2016. In cases where proxy variables indicate higher values, this is interpreted to reflect lower levels of financial distress.

Table 3. Descriptive statistics

Variable	N	Mean	SD	0,25	Median	0,75
AC_Dis	84	0.301	0.135	0.201	0.311	0.354
PCSR	84	0.224	0.213	0.044	0.168	0.314
NCSR	84	0.179	0.186	0.084	0.128	0.211
RE/TA	84	0.076	0.421	0.026	0.139	0.210
RE/TE	84	0.118	1.816	0.055	0.221	0.418
SIZE	84	6.946	1.744	5.451	6.149	7.664
LEVER	84	0.184	0.144	0.039	0.156	0.219
CASH	84	0.142	0.151	0.042	0.059	0.179
ROA	84	6.447	8.469	2.864	6.215	9.451
R_D	84	0.012	0.005	0.000	0.000	0.000
LIQUID	84	2.339	6.415	0.642	1.124	1.678
LOSS	84	0.135	0.346	0.000	0.000	0.000

Source: Authors' calculations.

As the empirical findings postulate, the NCSR regression coefficient appear to be statistically insignificant for AC_Dis. This means that positive CSR activity is associated in a positive way with the results of financial distress in the model under study. Shipping firms that invest more capital in extensive positive CSR activities appear to contribute to reducing their level of financial distress.

Table 4. Financial distress vs. CSR performance

Financial distress vs. CSR performance	
Variable	AS_Dis
CSR	0.0686*
	(1.76)
SIZE	0.0347***
	(11.56)
LEVER	-0.0151
	(-0.31)
CASH	-0.0544*
	(-1.69)
ROA	0.0002
	(0.17)
R_D	0.5257***
	(4.13)
LIQUID	0.0002
	(0.17)
LOSS	-0.0044
	(-0.28)
Constant	-0.2118***
	(-7.65)
N	84
Adj. R^2	0.3144

Note: *, **, and *** show significance at 1, 5 and 10 percent, respectively (two-tail). Robust t-statistics are in brackets.

Source: Authors' calculations.

The results presented in Table 5 indicate that CSR activity is positively associated with financial distress. In other words, shipping firms that undertake more widespread positive CSR activities can decrease the extent of financial distress. Similar to Al-Hadi et al. (2017) and DeAngelo et al. (2006), it is found that only when (positive) indicators of CSR performance are used one may see a decline in financial distress. This can indicate that shipping firms with high retained earnings to total assets ratios (RE/TA) are mature firms, as regards their life-cycle stage. This in turn implies adequate capital, investments and current assets and are thus less likely to be lead to financial distress. Furthermore, the results show that when CSR performance (positive scheme) and life-cycle maturity are combined, then firms are let to lower levels of financial distress.

Table 5. Financial distress vs. CSR performance and shipping firm life-cycle stage

Variable	AS_Dis
PCSR	0.0188
	(0.79)
RE/TA	0.0441***
	(3.68)
RE/TE	-0.0163**
	(-2.14)
SIZE	-0.0181***
	(-4.87)
LEVER	-0.1345***
	(-3.31)
CASH	0.6447***
	(18.57)
ROA	-0.0011*
	(-1.64)
R_D	0.6744***
	(3.12)
LIQUID	-0.0011*
	(-1.76)
LOSS	0.0247**
	(1.82)
Constant	0.4672***
	(14.64)
N	84
Adj. R^2	0.5356

Note: *, **, and *** show significance at 1, 5 and 10 percent, respectively (Two-tail). Robust t-statistic are in brackets.

Source: Authors' calculations.

Robustness tests

Following Al-Hadi et al. (2017), the positive CSR performance is used as proportion of total CSR (Table 6). Financial distress is found to decline when CSR performance shows positive values ($p < 0.10$).

Table 6. Positive CSR performance as proportion of total CSR

Variable	AS_Dis
PCSR	0.1000*
	(1.77)
SIZE	-0.0114***
	(-3.43)
LEVER	-0.1844***
	(-4.13)
CASH	0.6470***
	(19.46)
ROA	0.0002
	(0.86)
R_D	0.8744***
	(3.71)
LIQUID	-0.0011*
	(-1.86)
LOSS	0.0027
	(0.17)
Constant	0.3448***
	(13.46)
N	84
Adj. R^2	0.5796

Note: *, **, and *** show significance at 1, 5 and 10 percent, respectively (Two-tail). Robust t-statistic are in brackets.

Source: Authors' calculations.

Furthermore, following past practice, CSR performance is classified into five subgroups: environment (EN), social (SO), labor (LA), consumer practices (CP), and human resources (HR). An empirical investigation is then undertaken to identify potential relationship between each one of these CSR subgroups and financial distress; the results are summarized in Table 7.

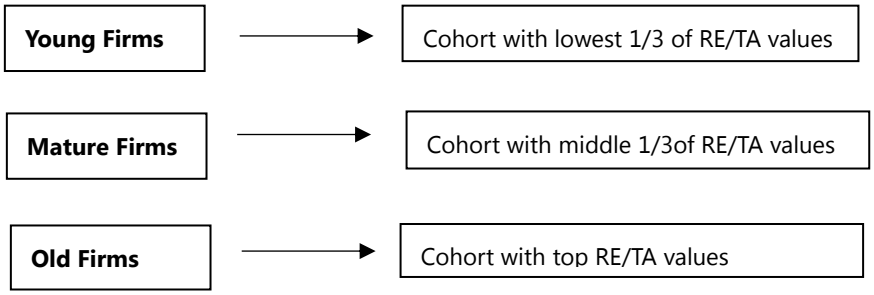
Table 7. CSR categories

CSR categories					
Variable	Model 1	Model 2	Model 3	Model 4	Model 5
EN	0.0211***				
	(4.46)				
LA		0.0114**			
		(2.22)			
HR			0.0068		
			(1.11)		
SO				0.0121*	
				(1.82)	
CP					0.0007
					(0.17)
SIZE	-0.0134***	-0.0075***	-0.0076**	-0.0094***	-0.0073**
	(-3.42)	(-2.46)	(-2.46)	(-2.49)	(-2.46)
LEVER	-0.1946***	-0.1754***	-0.1743***	-0.1765***	-0.1877***
	(-5.46)	(-5.25)	(-5.43)	(-4.46)	(-4.46)
CASH	0.6438***	0.6422***	0.5776***	0.6433***	0.5776***
	(15.67)	(15.46)	(15.46)	(15.78)	(15.89)
ROA	0.0004	0.0004	0.0004	0.0004	0.0005
	(0.70)	(0.83)	(0.82)	(0.87)	(0.82)
R_D	0.7649***	0.9341***	0.9633***	0.9147***	0.9644***
	(2.58)	(3.13)	(2.76)	(3.04)	(2.76)
LIQUID	-0.0013*	-0.0017	-0.0013	-0.0018	-0.0014
	(-1.62)	(-1.52)	(-1.46)	(-1.49)	(-1.38)
LOSS	-0.0019	0.0041	0.0026	0.0016	0.0015
	(-0.14)	(0.28)	(0.11)	(0.17)	(0.15)
Constant	0.3564***	0.3566***	0.3467***	0.3611***	0.3422***
	(12.16)	(12.46)	(12.46)	(13.14)	(12.11)
N	84	84	84	84	84
Adj. R^2	0.5763	0.5646	0.5636	0.5638	0.5628

Note: *, **, and *** show significance at 1, 5 and 10 percent, respectively (Two-tail). Robust t-statistic are in brackets.

Source: Author's calculations.

The empirical findings indicate that EN, LA and SO are significantly positively associated with AC_Dis ($p < 0.10$). Furthermore, to evaluate the interaction between the life-cycle proxy variable with the positive CSR performance, the model proposed by DeAngelo et al. (2006) is estimated; and the sample is divided into three life-cycle stage groups (Owen and Yawson, 2010 & Gavalas and Syriopoulos, 2016), as depicted in Graph 1.



Graph 1. Sample segregation into three life-cycle stage groups

Source: Authors' compilation.

Table 8a summarizes the relevant empirical results. As it is apparent, the PCSR coefficient is positive and statistically significant for mature and old firms. This can imply that financial distress may be reduced through positive CSR performance.

Table 8a. Alternative life-cycle classification (Panel a)

Variable	young firms	mature firms	old firms
PCSR	-0.0943*	0.1146***	0.1547***
	(-1.64)	(3.42)	(4.26)
SIZE	-0.0146**	-0.0211***	-0.0134
	(-2.39)	(-3.46)	(-1.56)
LEVER	-0.0371	-0.1433*	-0.2445**
	(-0.62)	(-1.57)	(-2.15)
CASH	0.5116***	0.8467***	0.4677***
	(9.45)	(11.44)	(8.97)
ROA	0.0007	-0.0014**	0.0006
	(1.27)	(-2.41)	(0.64)
R_D	8.4221***	2.4439**	0.2468
	(4.43)	(2.17)	(0.75)
LIQUID	-0.0007	-0.0143***	0.0026
	(-0.74)	(-3.48)	(0.45)
LOSS	0.0244	-0.0017	0.0433**
	(1.24)	(-0.26)	(2.22)
Constant	0.3442***	0.5112***	0.4688***
	(6.43)	(10.41)	(7.99)
N	19	48	17
Adj. R^2	0.8344	0.4112	0.6464

Note: *, **, and *** show significance at 1, 5 and 10 percent, respectively (Two-tail). Robust t-statistic are in brackets.

Source: Authors' calculations.

Table 8b presents similar empirical results that are produced when incorporating RE/TE as a measure of firm life-cycle stage.

Table 8b. Alternative life-cycle classification (Panel b)

Alternative life-cycle classification (b)			
Variable	young firms	mature firms	old firms
PCSR	-0.3612***	0.1744***	0.1744*
	(-4.54)	(3.55)	(2.04)
SIZE	-0.0016**	-0.0214***	-0.0027
	(-2.47)	(-3.33)	(-0.47)
LEVER	-0.0465	-0.1422*	-0.2140**
	(-0.51)	(-1.47)	(-2.14)
CASH	0.5133***	0.8774***	0.4751***
	(9.45)	(10.45)	(7.23)
ROA	0.0007	-0.0017**	0.0005
	(1.69)	(-2.24)	(0.46)
R_D	6.6698***	2.4778*	0.0864
	(5.39)	(1.84)	(0.25)
LIQUID	-0.0006	-0.0246***	0.0021
	(-0.50)	(-3.45)	(0.39)
LOSS	0.0316*	-0.0009	0.0315
	(1.74)	(-0.27)	(1.21)
Constant	0.3445***	0.5447***	0.4611***
	(6.41)	(10.46)	(8.01)
N	19	48	17
Adj. R^2	0.7643	0.4919	0.5150

Note: *, **, and *** show significance at 1, 5 and 10 percent, respectively (Two-tail). Robust t-statistic are in brackets.

Source: Authors' calculations.

5. Conclusions

The empirical research of critical aspects and related implications for companies implementing CSR strategies remains steamy, timely and challenging. This study has investigated in particular the interrelationships of financial distress and business life-cycle stages on CSR. A carefully selected sample of shipping companies, publicly listed on global stock markets was undertaken as an empirical application on a field case study, over 2010-2016. This is argued to be an innovative contribution of the study, as this topic has not been examined previously for the shipping sector, despite its critical importance as a major global transportation industry.

The empirical results can benefit shipping companies in terms of risk management, cost savings, capital access, customer relationships, HR management, and innovation capacity.

The empirical findings are in line with similar recent studies. A positive CSR activity is seen to be negatively associated with financial distress. This conclusion is further reinforced when considering shipping companies at their maturity life-cycle stage. This empirical outcome integrates potential interactions of financial distress and company life-cycle stages on CSR performance. In other words, firms that promote positive CSR activities can potentially manage to mitigate financial distress risks. This can have useful implications to shipping company management, when designing critical investment, financing and CSR policies, taking also into account their life-cycle stage. This study sets an innovative empirical path for further applied research in the topic of interest., The implementation of larger samples in other industries as well and/or potential investigation in pre- and post-financial crisis time-intervals, for instance, can shed further light upon a topic that remains challenging, albeit has not been research in depth as yet.

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Note

Note 1. The Global Reporting Initiative (GRI) is an international, multi-stakeholder and independent non-profit organization that promotes economic, environmental and social sustainability. GRI has developed Sustainability Reporting Guidelines that strive to increase the transparency and accountability of economic, environmental, and social performance and provides all companies and organizations with a comprehensive sustainability reporting framework that is widely used around the world.

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