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Default Risk and Firm Value of Shipping & Logistics Firms in Korea *

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ABSTRACT

As shipping and logistics industry is one of the core industries in Korea, the volume was ranked in the fifth highest in the world. However, shipping and logistics industry of Korea has suffered from default risk since Global Financial Crisis in 2008. This study examines the relationship between the default risk, as measured by the Altman K-Score, and firm value, as measured by the Return on Assets (ROA), of shipping and logistics firms in Korea and compares the impact of default risk on firm value between good financial health firms and poor financial health firms. As the trends of K-Scores over a ten-year periods, shipping and logistics firms in Korea register weak-to-moderate financial healthy rage. We find that Altman K-Score is significantly linked with firm value and also higher performing firms as measured by the ROA exhibit higher financial health as measured by K-Score. Although nine years have been passed since Global Financial Crisis 2008, Korean shipping and logistics industry is still under the financial depression. This study proposes that systematic financial alert system of Korean shipping and logistics industry should be required to decrease default risk reflecting significance of Korean economy.

1. Introduction

As shipping and logistics industry is one of the core industries in Korea, the volume is ranked in the fifth highest in the world. However, shipping and logistics industry of Korea has heavily suffered from default risk since Global Financial Crisis in 2008. Specifically, major shipping companies of Korea such as STX PanOcean and Daehan Shipping were bankrupt due to severe financial problems caused by Global Financial Crisis and Hanjin shipping, the 7th biggest container shipping company in the world was forced liquidated as of 2017. Likewise, Hyundai Merchant

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Marine, the 12th biggest container shipping company in the world is being under the liquidity crisis despite governmental supports.

This study examines the relationship between default risk as measured by the Altman K-Score and firm value as measured by the Return on Assets (ROA) of Korean shipping and logistics industry as well as compares the impact of the default risk on the firm value between good financial health firms and poor financial health firms.

This study expects to contribute the literature and practice on shipping and logistics industry in several ways. First, this study investigates default risk of Korean shipping and logistics industry. Even though Korean shipping and logistics industry has been heavily affected by global economic recession, very limited study examines default risk of Korean shipping and logistics industry. Thus, this study provides empirical evidence to support Korean shipping and logistics industry by analyzing financial health and firm value. Second, most previous researches on Korean shipping and logistics industry focus on firm performance, investment activity, and competitiveness. In addition, previous researches just focused on coastal shipping firms (Lee and Ahn, 1999) with short sample period. However, this study examines whole Korean shipping and logistics firms registered with the Korean Ship Owner's Association including both firms listed on the Korean Stock Exchange (KSE) and non-listed firms for 10 years (2003 to 2012). This study provides comprehensive results of financial status for Korean shipping and logistics industry. Finally, this study proposes the necessity of financial alert system for Korean shipping and logistics industry to control financial risk. Although nine years have been passed since Global Financial Crisis 2008, Korean shipping and logistics industry is still under the financial depression. Accordingly, systematic management of Korean shipping and logistics industry should be required to reflect significance of Korean economy.

The reminder of this paper is organized as follows. Chapter 2 outlines previous researches and proposes research questions. In Chapter 3, sample selection procedure and research methodology will be addressed. The empirical results are presented in Chapter 4. The summary of the research and suggestions of further research will appear in Chapter 5.

2. Literature Review

The most population model of predicting going concern or default is Altman Z-Score model using multiple discriminated analyses (MDA). Altman Z-score model is appropriate for both public and private firms as well as both manufacturer and service firms. The bankruptcy predictor of Altman Z-Score combines several of the most significant variables in a statistically derived combination. There are four categories of financial ratios: Solvency, Coverage, Leverage, and Profitability. Solvency ratios measure of the quality and adequacy of current assets to meet current obligations as they come due. Coverage Ratios measure of the firm's ability to service debt. Leverage ratios measure of the vulnerability of a firm to business downturns due to its leverage. Profitability ratios assist in the evaluation of management performance. In 1996, Altman revised Z-Score model to make it applicable for Korean firms called as K-Score model. The expectation accuracy of default risk is 97.1% and 68.8% before one year and five year of bankruptcy, respectively.

Kim, Yoon and Lee (2015) examine the influence of agency costs on default risk in the construction industry using Altman's K-Score. They find the better asset utilization, the better stable financial structure for default risk in construction industry. Ham and Seo (2012) test financial soundness of advertising firms. The default risk measured as Altman's Z-Score of advertising firms reached to the highest in 2008, due to Global Financial Crisis in 2008.

Kim (2014) investigates financial performance of Korean shipping and logistics industry by conducting financial statement analysis. After Global Financial Crisis 2008, its financial performance is significantly worse than other industries.

Kim, Shin and Choi (2013) analyse the effect of tonnage tax on vessel investment and find tonnage tax positively affects firm's financial performance and investment activities. Choi and Song (2010) provide evidence that Korean shipping and logistics firms procure long-term debt to avoid financial risk when they invest vessels due to high economy fluctuation of shipping and logistics industry. Lee, Kim and Ahn (2013) explore the relationship between Korean shipping and logistics firms' investment and debt-ratio characteristics.

The result comes up with leverage is negatively associated with firm's investment. In addition, leverage is more sensitive to firm's investment during the economic recession while financial expenses to sales is more linked with firm's investment during an economic boom. In the whole, shipping and logistics industry closely correspond to economic fluctuation, thus Global Financial Crisis in 2008 will act as an important default risk factor for Korean shipping and logistics industry.

3. Methodology

3.1. *Sample*

This study uses shipping and logistics firms registered in the Korean Ship Owner's Association. Financial statements data is obtained from both *DART* (http://dart.fss.or.kr) provided by the Korean Financial Supervisory Commission (KFSC) which is the equivalent to the SEC in Korea and the Korean Ship Owner's Association. The final sample consists of panel data of 281 Korean shipping and logistics firms including listed and non-listed firms and a total of 2,755 firm-year observations over the ten-year periods (2003-2012).

3.2. *Measure of Variables*

Even though Altman Z-score (1968) model is widely accepted in the academic society to determine default risk, Altman Z-score model is not suitable for this study. Forth variable (X_4) of Altman Z-score score model is only available for listed firm, but many Korean shipping firms are unlisted on the Korean Stock Exchange. Thus, Altman Z-score (1968) model cannot be applied to this study. Alternately, this study adopts Altman's K-Score model for Korean firms developed by Altman (1996) in order to examine default risk of Korean shipping and logistics firms.

The Altman K-Score model is below.

$$K - Score = -17.862 + 1.472X_1 + 3.041X_2 + 14.839X_3 + 1.516X_4$$

.....Equation (1)

where, X_1 = Log (Total Assets)
X_2 = Log (Total Sales/Total Assets)
X_3 = Retained Earnings/Total Assets
X_4 = Net Equity/Total Assets

According to Altman K-Score model, the firm is probably in strong financial health when firm's total score is higher than 0.75 whereas K-score that is lower than -2.00 indicates poor financial health.