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LEARNING FROM HANJIN SHIPPING'S FAILURE:
A Holistic Interpretation on its Causes and Reasons

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Abstract

Recent years have observed that the world shipping industry is reflected by the developments of unprecedented dynamism, instability and uncertainty. These developments in the industry have led its stakeholders to take such a counter-balancing measure as merges and acquisitions, and more aggressive and bigger scaled alliance establishment. One of the most striking incidents happened in the shipping industry was the bankruptcy of Hanjin Shipping. More frightful is the fact that the process and speed of Hanjin's collapse was remarkably brief and short given the size and scale of the company. The Hanjin case is unique in a sense that the company had been grown in line with its nation's economic development, which was (and still is) made by the export-oriented economic policy: the late shipping company had been evolved as having moved the nation's wealth. This paper aims (i) to holistically examine *what* and *why* it was happened as it was, by reviewing available literature as a way to synthesise, (ii) to interpret intrinsic and extrinsic causes, and internal and external reasons by establishing an interpretative structural model, and (iii) to discuss provisional findings as a way to offer an implication to transport policy in general and shipping policy in particular. In doing so, this paper attempts to provide industrial stakeholders with an insight from the failure as a lesson to be learned.

Keywords

Shipping policy, Bankruptcy, Hanjin, Interpretive structural model, Korea.

1. Introduction

It is well noted that maritime transport (viz. shipping and ports) has played a key role in promoting trade of major economies over the globe – in particular, it is the case for Asian economies such as Japan, Taiwan and Korea (UNESCAP, 2005) when they had remarkably made their respective economic development and growth in the early to late 1980-90s. These phenomena were feasible by having their shipping and port sectors facilitated the movement of goods among nations as part of their trading pattern. Recent years have, however, observed that the world shipping and port industries are reflected by the developments of unprecedented dynamism, instability and uncertainty. These developments or trends in the industry (especially in the shipping side) have led its stakeholders to take such a counter-balancing measure as merges and acquisitions, and more aggressive and bigger scaled alliance establishment.

One of the most odious incidents happened in the shipping industry was, however, the bankruptcy of Hanjin Shipping in Korea, which used to be among top players in the field over the last few decades (Pauli and Wolf, 2017). More frightful is the fact that the process and speed of Hanjin's collapse was remarkably brief and short given the size and scale of the company. Given the very nature of shipping business and market mechanism being volatile and cyclic, the industry has historically experienced a number of fallouts over the long period of time. It can be, however, claimed that the recent Hanjin case is different, more preciously unique, in a sense that the company had been grown in line with its nation's economic development, which was (and still is) made by the export-oriented economic policy (Chenery et al., 1986). In other words, the late Hanjin Shipping had been evolved as having moved the nation's wealth.

In the shipping history, collapses of large shipping companies were not vey new. The biggest bankruptcy event in the liner shipping history before Hanjin Shipping's collapse was probably the case of U.S. Lines (American Shipper, 2016). This company has filed for bankruptcy in 1986 and eventually been dissolved in 1992. The major reasons for the bankruptcy were attributed to two factors: (i) investment in twelve "Jumbo Econships (equivalent to 4,482 TEU) and (ii) the fall of oil prices in 1985 (Port Development International, 1987). The fuel economy of Jumbo Econships came from slow speed of the vessels; the historic low oil price undermined the justification for fuel economy and rather aggravated the speed of shipping services. Medium-sized global shipping firms have also collapsed after the global recession since 2008 and its subsequent impacts on the shipping industry. Toisa Limited, Rickmers Group and Enzian-SCT-SCL group in 2017 are some of the examples of the recent bankruptcy. One major difference between these examples and Hanjin Shipping's bankruptcy is that the impacts of Hanjin Shipping's case on the global logistics landscape was catastrophic due to its vessel operating size (7th largest in the world) and its joint operations within an alliance with COSCO, K-Line, Yang Ming and Evergreen.

There are common causal factors between the bankruptcy of a shipping company and companies in other industries. Two types of bankruptcy risks in organisational theory, namely environment risks and internal risks (Miller, 1992), are also valid in describing shipping companies' collapse. The former type refers to external factors beyond a firm's control, such as competition, globalisation, regulations, market demand and technology (Benedittini et al., 2015). For instance, the failure of Monarch Airlines, UK's 5th largest airline in 2016, was often attributed to the fierce competition, adverse events in major flight destinations and the

fall in the value of the British Pound (The Economists, 2017). On the other hand, the second type, internal risks, refers to mistakes in the decision-making of top management or to internal constraints inhibiting adequate actions (Sharma and Mahajan, 1980). The demise of Comet Group in the UK has made 240 stores and 6,500 employees redundant, mainly due to financial losses stemming from strategic failure in understanding multi-channel online marketing (BBC, 2012). These two overarching risks can also explain the bankruptcy of shipping companies, but a holistic approach to understanding the interactions of policy factors as well as business factors will surely provide more valuable lessons for shipping companies and policy makers.

This paper is a preliminary attempt (i) to holistically examine *what* and *why* it was happened as it was, by reviewing available literature (predominantly, industrial and trade magazines) as a way to synthesise, (ii) to interpret intrinsic and extrinsic causes, and internal and external reasons by establishing an interpretative structural model, and (iii) to discuss provisional findings as a way to offer an implication to transport policy in general and shipping policy in particular.

In doing so, this paper is organised as follows. After this introduction, the section 2 makes a brief review on shipping policy in Korea as a starting point from which the discussion moves on to the Hanjin as a particular case. The history of the case shipping company is succinctly described in the section 3, followed by synthesising the identified reasons for the failure in the section 4. Section 5 attempts to make those reasons organised and structured using an interpretative structural modelling, so as to see their existential causal relationships – that is, overviewing 'which factors caused what incidents'. Finally, the section 6 summarises the findings and provides an insight from them as a way to offer a lesson to be learned from the failure.

2. Korean shipping policy in general

A World Bank report (1993) expresses that Korea has achieved what is widely acclaimed as 'the economic miracle of the Han River' in such a short period of time. This success can be attributed to a trade (export)-oriented economic policy implemented by the Korean government. The importance of shipping and ports for national economic development (in particular, trade-based one) is widely recognised, for example, by UNCTAD (1985) and Lee (1996, 1990). Notably, Lee (1990) did thoroughly examine the growth of Korea's shipping sector between 1962 and 1981 by reviewing Korean shipping policy and government's role in it. Krause (1981) classifies the trade promotion strategies in an Asian context, according to the degree of government intervention. Table 1 shows the Krause framework, which clearly indicates that Korea follows an interventionist strategy.

(Insert Table 1 here.)

The nation's industrialisation has consequently depended upon imports of raw materials for the manufacturing industries, and the export of processed and finished products (Amsden, 1989). There is a close relationship between shipping development and the prospects for economic development. This is particularly true to the Korean case. Shipping and national fleets are regarded as a necessity to get materialised the nation's overall economic development and policy – that is, shipping as a medium to fulfil the nation's trade. As a result,

shipping has been treated as a public goods. Hanjin was born as an off-spring from such an economical philosophy and policy.

3. Hanjin Shipping in history

Container shipping in South Korea was in its infancy until mid-1970s; there were only 3 container vessels in Korea in 1972, and the first international shipping service merely started in 1975 (Thanopoulou et al., 1999). As one of the pioneers in the market, Hanjin Shipping (hereafter HJS) has been in line with the development of Korean shipping industry, creating a global shipping network to serve shippers in Korea and around the world. Having been ranked at world's top 10 carrier in terms of total vessel capacity for more than 20 years, it operated 110 container vessels with the capacity of 648,000 TEUs by end of 2015 (UNCTAD, 2017). In addition to this HJS' business encompassed transporting bulk, oil and liquefied gas, employing more than 6,000 people in 60 countries (Hill, 2014). Therefore, it was a great shock to the shipping industry and its stakeholders that HJS ceased its operations from July 2016 and eventually went bankrupt in February 2017. This section briefly reviews the history of HJS, identifying how it flourished and declined in the fluctuated container shipping market.

For this purpose, the history is analysed by four stages according to orgnisational life cycle model. Although many researchers proposed varied stages for the cycle (i.e., see Quinn and Cameron 1983; Kazanjian 1988), this research adopts a four-stage cycle model consisting of start-up, emerging growth, mature and decline stages (Jawahar and Mclaughlin, 2001). Transitions from one stage to another require different types of business focuses, resources, organisational structure, marketing and etc. For instance, whilst the main concern at the start-up stage is survival with cash flow and customer acceptance (Dodge et al., 1994), the emerging growth stage considers expansion strategies, backed by demand exceeding supply and strong cash flows (Dodge and Robbins, 1992). Mature stage starts when the growth is slowed down; in this stage firms proactively deal with stakeholders including customers and employees (Jawahar and McLaughlin, 2001). If a firm enters decline stage, shrinking demand forces the firm to re-structure its traditional products and services for its survival. In accordance with the theoretic discrepancies of the four stages, this research divided HJS' 40-year history into four phases to understand how the firm flourished and why it has collapsed.

3.1 Start-up (1977-1987)

HJS was established in 1977 by Choong-Hoon Cho, the founder of Hanjin Group which were then dedicated to land and air transportation. Shipping business in Hanjin Group started from 1967 as Daejin Shipping whose main role was a regional feeder service provider as well as an exclusive agency of Sea-Land's. This experience and know-how led to an establishment of an international shipping company, Hanjin Shipping, which launched its first Middle East service in 1978 and Trans-Pacific service in 1979, jointly with Sea-Land (Lee, 2015). By 1983, it was able to deploy six new vessels to complete a weekly shipment service to U.S. West Coast.

The second oil crisis in 1979 and the subsequent shipping recession in 1980, however, were massive blows to a new shipping company. Korean government offered direct government aids to shipping companies for five years since 1979, but ended up with initiating its Shipping Industry Rationalisation Plan in 1984 (Thanopoulou et al., 1999). This plan restructured the

Korean shipping industry, reducing the number of companies from 70 to 20 by forced mergers and acquisitions. HJS was not affected by this plan mainly due to its corporate nature of a joint venture with Sea-Land, but it had to cope with the turmoil without governmental support. Moreover, US Shipping Act of 1984 weakened the bond of shipping conferences and their cartel-based pricing power over customers. HJS eventually opted for being an outsider of conferences along with Sea-Land (Thanopoulou et al., 1999). In 1986, Korean Air, a sister company of HJS, started trusteeship management to rescue HJS by integrating back offices of both companies to reduce administration costs and by implanting advanced aviation operations into shipping operations. HJS saw its deficit was turned into monthly surplus after a year, thus restoring its independent status (Lee, 2015).

3.2 Emerging growth (1987-1997)

During this period, Korea's international trade exponentially increased from 100 billion dollars to 300 billion dollars. The stable increase of shipping demand enabled Korea-based shipping firms to make a strong presence, particularly in the East-West bound and Intra-Asia markets. On the other hand, Korean shipping market was constantly deregulated and liberalised since 1989 when foreign carriers were allowed to open their branches in Korea. In particular, Korea's entry into OECD sparked more liberalization by repealing shipping waiver system in 1995, cargo reservation system in 1999 and by changing the licensing system for shipping routes in 1996 (WTO, 1996; Lee, 1999).

In 1987, HJS opened its first overseas terminal at Seattle, U.S. The success of this terminal led it to further investment in overseas terminals for reliable and cost-efficient services. The merger of financially-struggling Korea Shipping Corporation (KSC) in 1988 greatly increased its profile as the market leader in Korea as well as the 13th largest carrier in the world. Between 1986 and 1990, HJS's capacity became more than doubled from 24,856 TEU to 53,140 TEU, hugely surpassing its national competitors like Hyundai Merchant Marine (HMM) and Cho Yang (Lee, 2015). Its service scope has gradually expanded to all-water pendulum service, Trans-Atlantic service, Mexico service and Singapore-Australia service (Hill, 2014).

Since birth, HJS was a low-cost and independent shipping company which effectively penetrated the market in the shipping conference era. However, emergence of new low-cost carriers, such as COSCO, forced HJS to consider forming an alliance for taking advantage of economies of scale and scope (Thanopoulou et al., 1999). In 1996, HJS along with Cho Yang, DSR-Senator and United Arab Shipping Company launched the United Alliance. The joint capacity of this alliance reached 194,250 TEU in 1996, which is compatible with other global alliances. HJS made another big expansion decision in February 1997; the target was its alliance partner DSR-Senator, the second largest carrier in Germany. By acquiring 75% of share of DSR-Senator, HJS became the world's fourth largest container carrier only behind Sea Land, Evergreen and Maersk (Hill, 2014). By end of 1997, HJS added an exclusive container terminal at Long Beach, the largest U.S. marine terminal at that time, to its portfolio.

3.3 Maturity (1997-2008)

The rapid expansion of HJS was halted by Asian financial crises in 1997. Korea was one of the victims receiving emergent funds from IMF. A government-led business restructuring

policy forced that large conglomerates must meet a debt-equity ratio under 200% regardless of business characteristics. As a result, Korean shipping companies liquidated 35 vessels (1,436,000 gross ton) in 1998 and 29 vessels (390,000 gross ton) in 1999 respectively. In 1999, HJS sold 17 vessels to secure its operational cash flow and to satisfy the government policy (Hill, 2014). Even during the peak of the shipping market in 2000, Korea shipping firms had no option but to sell and charter back their owned vessels, or to charter highly-priced vessels from ship owners. The high proportion of chartered vessels has been the main cause of high operational costs of Korean shipping firms, which significantly lowered profit margins.

Whilst HJS managed to survive in the Asian financial crises, its alliance partner and the third-largest shipping company in Korea, Cho Yang, was destined to be insolvent in 2001. This ignited forming of a new alliance led by COSCO, K-Line, Yang Ming and HJS in 2002. Contrary that the United Alliance merely operated 85 vessels with 277,000 TEU capacity in 2000, the new CKYH Alliance expanded its operational scope to 354 vessels and 1 million TEU by 2006 (Panayides and Wiedmer, 2011). Some of the major advantages of shipping alliances are described as wider geographical scope, economies of scale, increase in frequency of service, risk and investment sharing, and entry in new market (Midoro and Pitto, 2000). The CKYH alliance focused on economies of scale and efficient operations in shipping routes from/to Far East, thus providing more services with less ports of call and less transit time than those of rival alliances (Panayides and Wiedmer, 2011). Without massive vessel investment during this period, HJS' presence at the trans-pacific market remained strong due to joint operations.

Along with the service expansion and the confidence in reliable services, HJS also started to increase customer service experience, particularly via online. HJS had already pioneered an electronic booking system since 1990. After launching a website in 1997, HJS adopted a global IT system in 1998 and established an IT subsidiary in 2000 (JOC, 2016). In 2005, HJS launched an ambitious project called 'Process Innovation' for integrated information management and enterprise resource planning (Oracle, 2007). This system did not just provide managers with revenue and cost analysis information even at a container level, but also offer accurate information on cargo location and logistics schedules to the customers. It resulted in a more comprehensive information system, such as Advanced Logistics Pathfinder System launched in 2010 (JOC, 2016).

Whereby its business being matured, the management of HJS experienced turbulent times. The death of HJS (and Hanjin Group) founder in 2002 led to the division of business groups by his four sons. In 2003, HJS announced doubled profits of USD 628 million under the new chairman, Soo-Ho Cho (Hill, 2014). But weakened relationships with former business divisions, such as ship building and finance groups, as well as disputes between siblings forced HJS to survive on its own. Sammy Ofer's attempt to a hostile foreign takeover by taking 12% share of HJS in 2006 showed that HJS' corporate structure was still vulnerable. Although this takeover bid was halted by an agreement with K-Line to buy each other's equity stake, Soo-Ho Cho passed away leaving only 6.9% of HJS stake to his wife, Eun-Young Choi (Hill, 2014). Furthermore, it is alleged that Choi did not have any distinctive managerial experience when she took over the presidency of HJS in 2007.

3.4 Decline (2009-2017)

Year 2008 was a year of two extremes; it showed a modest growth within the trend line of growth in the first half, but the global credit crisis badly hit the international trade slashing 10% decrease in traffic between Asia and US in the second half (CI, 2009). The situation was even worse in 2009, described by CI that "2009 was the worst year on record and the only one since the first containership sailed in 1957 that global container traffic actually fell" (CI, 2010: 5). HJS was not alone to make deficits during the financial crisis; big players like Maersk and CMA-CGM recorded deficits of USD 2,088 million and USD 889 million respectively (Ha and Seo, 2017). Even, several large bulk carriers in Korea, such as Daehan Shipping and STX Pan Ocean, couldn't avoid court receivership followed by the collapse of their charter chains (Nam and An, 2017).

According to the DEA analysis by Bang et al. (2012), financial and operational efficiencies of HJS in 2008 were not very pessimistic, showing 0.885 and 0.821 compared to the productivity of market leaders. The debt-equity ratio had been also maintained around 200% since 2005. However, market recovery in 2007/08 and the success of Maersk's Triple E vessels stimulated shipping lines to order mega-ships at a bad timing. The order on TEU of HJS was 240,495 TEU as of November 2008, which was expected to increase its capacity by 40.3% to 596,949 TEU (CI, 2010). HJS contracted both owned and chartered vessels in 2008 with several times more expensive price than the market price after 2008, which worsened the financial burdens on HJS. Despite the market circumstances of low shipping demand and overcapacity, HJS received its first 10,000 TEU container ship in 2010 and two 13,100 TEU vessels in 2012 (Marketline, 2016). To alleviate overcapacity issues, the CKYH alliance implemented slow-steaming claiming fuel efficiency and CO2 reduction, which was heavily criticised by its customers for lengthened transit time and increased in-transit inventory costs (Maloni et al., 2013).

In 2014, HJS encountered initial crises. Accordingly, it attempted to implement own salvation, but in a long run, it has aggravated the situation. That time, Hanjin shipping focused on selling profitable assets, whereas other rival shipping companies rather ordered new ships at reasonable price. It has sold domestic/oversea container terminals and special purpose vessels which can generate stable profits. Activities and assets of bulk and LNG shipping divisions were divested to H-Line from 2014; bulk shipping almost removed from HJS' portfolio by April 2016 (Zeng, 2016). As a result, its container business, which is sensitive to the market fluctuation, accounted for 92.7% in terms of revenue (Sisain, 2016).

On the 31st August 2016, HJS filed for court receivership. This was followed by the refusal of HJS' restructuring plan on 29th August 2016 by the Korea Development Bank (KDB), the largest creditor of HJS (JOC, 2016). The record low spot rate in the trans-pacific market at the early of 2016 and its subsequent impacts on service contracts tightened operating capital of HJS. The situation was similar for HMM, another Korean shipping giant; therefore it was alleged that the KDB would support only one shipping company which is better in asset liquidation, financial contribution of company owners, negotiations with vessel owners to reduce charter rates, reduction of the debt-equity ratio and etc. Contrary to HMM, HJS couldn't meet these conditions due to company governance structure, lack of sellable assets and failure in the negotiations with vessel owners. Without an additional influx of operating finance from the creditors, HJS' insolvency was unavoidable because it already missed payments to suppliers.

The impacts of HJS' receivership exceeded anyone's expectations; the flow of more than

540,000 TEU containers stopped in the ocean (JOC, 2016) to avoid capture of vessels at ports by creditors. The international trade from/to Korea was jeopardised by lack of shipping spaces during the peak season in October. HJS' 60-year history has faded out when the court decided its bankruptcy in February 2017.

4. Reasons for Hanjin Shipping's failure

HJS' collapse has been explored from various angles in the literature. As it happened recently, few academic journal articles have reviewed the reasons to the authors' knowledge. However, articles in trade journals, magazines and newspapers have suggested plausible but diverse reasons, resulting in that they are multi-faceted.

The reasons for HJS' closure can be broadly classified into *two categories*. The one is external factors that couldn't be easily controlled by HJS; for instance, global shipping environments and shipping policies in Korea will fall into this category. The other is internal factors that HJS' decisions have created and/or influenced. Financial flows of HJS and corporate strategies are more internal than external to HJS.

Additionally, there are *two perspectives*, despite their being not always clear-cut, to analyse this case. The articles written 'outside' Korea often focused on very obvious reasons that can be easily understood from data and figures. Prolonging overcapacity and low demands in the global shipping market are clear threats to HJS as well as to other liner companies. Financial issues, such as insufficient operating finance, failure in rate recovery and high operating costs, can be read in the company annual reports and market intelligent reports. On the other hands, literature written 'within' Korea does not only focus on the above reasons, but also proposed the influences of domestic shipping policies and of strategic decisions made by HJS in the past. These are often explained by interviews with market experts in Korea and with academics in maritime studies who know the situation of HJS for a long time.

The reasons for HJS' foundering discussed in the literature can be categorised as shown in Table 2, having these above points in mind. Each category will have more detailed reasons to fully explain why HJS has ended up with bankruptcy.

(Insert Table 2 here.)

4.1 Global shipping environments

Global Low Demand – Due to China's WTO participation, the world has experienced enormous demand for maritime transport since 2002, which also results in very high freight rate until financial crisis 2009. After that time, the world container throughput growth rates slowed down, but the fleet kept entering into the market. In turn, both freight rate and chartering rate drastically collapsed. On the other hand, three major shipping alliances accounting for approximately 95% of cargo throughput emerged, and M&A between large liner companies makes competition fiercer.

Global Overcapacity – Liner shipping firms have invested in ordering mega container vessels, and recently many firms received them from shipbuilders. The reliable source showed that global idle container fleet was equivalent to the 330 vessels of a total capacity of 1.36 million

TEUs at the end of 2015, and excess capacity may grow between 2 to 3.3 million TEUs by the end of 2020 (Morley, 2016). Hermansson (2016) pointed out that owing to global overcapacity the vessels taken out of operation with very low freight rate.

4.2 Shipping policies in Korea

Debt-equity Ratio Enforcement – As one of major reasons of failure of Korean shipping industry's restructuring might be attributed to the regulation in regard to debt-equity ratio, which does not well fit with the shipping industry (ChosunBiz, 2016). Korean government announced on December 2015 that it would only offer the shipping finance to the shipping companies that have less than 400% debt-equity ratio. This forces the shipping companies to sell their vessels and possess more chartered vessels in order to reduce debt-equity ratio. For reference, Korean government asked less than 200% debt-equity ratio in 1998-1999, which resulting in selling their vessels (Lee, 1999). However, shipping industry generally has high debt-equity ratio, as it is considered as an infrastructure industry for the international trade. For example, it can be commonly found that some shipping companies have over 1,000% owing to ordering new ships and buying second-hand ships.

Liberalisation of Domestic Market – The liner shipping market in Korea is a very competitive market. Although the capacity of carriers can matter to some shippers with big transport volume, shipping lines compete with price and service regardless of their nationalities. Even government-owned Korea banks support foreign carriers to order vessels to the yards in Korea without any discriminations. The deregulation and liberalisation trends started since 1989, which was followed by repealing shipping waiver system in 1995, changing the license system for shipping routes in 1996 and repealing cargo reservation system in 1999 (WTO, 1996; Lee, 1999). There have been urges from Korean shipping companies that some protection or campaign will be needed to support national shipping firms, but the government have declined them, because IMF forced Korean government to open several industries to foreigners, removing most red tapes. Shipping industry might be one of them.

Lack of Government Support - After financial crisis in 2008, Korean shipping companies were not the only one who suffered the crisis of shipping industry. Some countries regarded the shipping as a key national industry, so they came up with various support measures since 2011. For example, Danish government lent 6.2 billion USD to the Maersk in 2011, while German government offered payment guarantee up to 1.8 billion USD to the Hapag-Lloyd (EconomytalkNews, 2016). French government supported CMA CGM with 660 million USD (EconomytalkNews, 2016). In a case of Chinese government, it provided COSCO and China shipping with 9.5 billion USD for five years since 2012 (EconomytalkNews, 2016). However, in 2016, Korean government decided not to provide financial support to the Hanjin shipping. On the other hand, Taiwanese government has decided to provide 2.2 trillion USD to the Taiwanese shipping companies, Evergreen and Yang Ming who have financial loss in the 4th quarter of 2016 after recognizing HJS' case as a lesson (ChosunBiz, 2016).

4.3 Financial Flows

Insufficient Working Capital – Working capital is essential to every business. Shipping firms also have to pay terminals for using berth and unloading cargoes, and pay bunker suppliers for the fuel. Failure in this payment will lead to undesirable consequences, such as arrest of a vessel by creditors. When HJS filed for court receivership, it needed at least US$ 272 million

to discharge cargoes from vessels (Shen, 2016). According to the restructuring plan proposed by HJS, only US$ 100 million could be sourced from its owner groups and its parent company. According to the report by NICE (2015), annual charter rates and annual finance payment of HJS in 2015 reached KRW 1 billion and KRW 30 million respectively.

High Operating Cost – The freight rate is determined by the balance between supply and demand, so the individual shipping firm cannot control it. If the shipping firm operates the vessels with low operating cost, it can still earn some profit despite low freight rate. In a case of the largest container shipping companies, Maersk, its strategy is likely to operate its owned vessels rather than chartered ones so as to endure market volatility and low freight rate. Employing the state-of-the-art mega owned vessels that have a high level of fuel efficiency and transport capacity can lower operating costs.

Failure in Freight Rates Recovery – The reduction of demand for maritime transport resulted in collapse of freight rate. Besides, the most determinant factors to the collapse of the freight rate were attributed to the overinvestment in world container fleets. The new container ships delivered these days are much larger and more efficient, leading to oversupply of the world fleet capacity. HJS has attempted several GRI (General Rate Increase), but the consequences were not satisfactory due to the market situations and competitors.

Loss of Customers – Sales function of HJS was known to be one of the weakest links in the organisation (Pauli and Wolf, 2017). Since the global credit crisis in 2008, shippers in Korea have consolidated their global cargoes and requested 'all-inclusive' freight rates which cover charges and surcharges. Process Innovation enabled HJS to calculate profit margin over operating costs per each container, which negatively affected its flexibility in pricing, particularly to shippers which are sensitive to price. Also, HJS' heavy involvement in slow-steaming and port skips has lowered its service level and made some customers disappointed with the schedule reliability.

4.4 Corporate strategies

Top Management – The reasons of Hanjin were complicated, but one of major reasons was attributed to the unprofessional and unexperienced owner's management. In 2006-7, the group ownership has been moved from the late president and CEO to his spouse who was not very familiar with the shipping industry. The essence of shipping business is to absorb the difference between chartering fee and freight, but the new decision maker has little clue about the shipping's characteristics. Some articles in Korea noted that Hanjin should have hired a professional CEO (Hankooki, 2017; Sisain, 2016).

Company Governance Structure – Between 2008 and 2014, the shareholding structure of Hanjin Group was changed seven times (NICE, 2015). In 2014, Hanjin Shipping Holdings has restructured the shareholding structure by spinning off HJS as a new entity under Hanjin Shipping Holdings (later Yusu Holdings) while appointing Yang-Ho Cho, the chairman of Korean Air, as a new CEO. This meant that Korean Air stepped into the management of HJS as its daughter company by financial investment. When the crisis was looming in 2016, however, Korean Air couldn't fully support HJS due to their shareholders while the subsidiaries of Yusu Holdings, which was once the subsidiaries of HJS, didn't support failing HJS.

High Ratio of Chartered Vessels – By the time Korea receives IMF's support, in order to modify financial structure, HJS re-shaped its main vessel acquisition methods from buying the ships towards chartering them. HJS has spent 1.01 trillion won on chartering payment in 2015. The sales during 2015 were 7.7 trillion won, so the portion of chartering payment is extremely high for HJS. Its high chartering cost is blamed for the losses they have been logging over the past several years (Yoon, 2016).

Issues of Corporate Bonds – After the financial crisis in 2008/9, HJS issued corporate bonds more mainly because investors like banks became prudent to lend money to shipping industry. Between 2009 and 2012, the average face value of corporate bonds reached KRW 700 million per annum. This short-term finance aggravated the financial structure of HJS, making HJS' total liabilities to continuously increase every year.

Bad Timing for Ship Investment – The Hanjin shipping has made many ship chartering contracts with about 2-3 times expensive chartering fee than market price right before trough of shipping cycle in 2008. After 2008, such chartering fee is approximately equivalent to the 5 times of that of market price. Besides, it failed to come up with own strong salvation. In turn, it significantly worsened its financial status.

Pricing Strategy – After the Process Innovation, HJS was capable of the analysis of operating and marginal costs of each container movements. A new pricing strategy has begun based on this analysis to fully cover operating costs and to make a sound profit. This worked well when the market was flourished, but posed serious problems when the market was plummeted. Also, the general pricing trend in the shipping market moved to 'all-inclusive' rates which include charges and surcharges. Traditional charges and surcharges, such as bunker adjustment charges and peak season surcharges, have reduced any financial risks at shipping companies, but under the 'all-inclusive' rates, pricing strategy has become more important to alleviate financial risks and maintain the price base.

Fleet Operating Strategy – Since financial crisis in 2008, maritime economists noted that liner shipping firms need to identify a new breakthrough for profit under sustained recession. As West-East route (e.g. East Asia-US, East Asia-EU) for container market has reached a saturation point, many container shipping experts now pay attention to North-South routes. They argued that preoccupying the North-South route that includes developed and emerging markets with high potential for the economics growth such as Australia, Central and South America and Africa would be a solution for the future container shipping market. Accordingly, the mega container shipping firms have already entered this route as a niche market, but HJS did not recognize the importance of diversified route, just maintaining its strong East-West bounds.

5. Interpretive structures of reasons for Hanjin Shipping's bankruptcy

The discussions made so far imply that the reasons for HJS' bankruptcy are multi-faceted as well as inter-related. For example, several articles argued that the enforcement of debt-equity ratio by Korean government has increased the ratio of chartered vessels with high chartering fees at HJS, which in turn caused a chronic effect on high operating costs of HJS. However, most articles focused on several major reasons, mainly lacking a holistic perspective to understand HJS' bankruptcy from the interactions of those multi-reasons. This section adopts

an interpretive structural modelling method towards analysing the reasons so that the structural hierarchies among those identified factors can be graphically demonstrated and better understood in a holistic manner.

5.1 Interpretive structural modelling as an analytical tool

Interpretive structural modelling (ISM) is a methodology to define a problem by identifying and analysing relationships among elements in a complex system (Thakkar et al., 2007). This method is 'interpretive' in that the discussions of expert groups will interpret elements in a complex system and their interconnectedness (Pfohl et al., 2011). Also, it is 'structural' because it will describe a complex system in a structured manner by a step-wise process based on a graph theory (Faisal et al., 2006). In essence, ISM is an appropriate method to transform mental interpretations of a certain phenomenon to a graphical display by a group discussion. The elements and their relationships can be easily captured by an ISM-based model, thus providing an explanatory power to holistically understand a system.

This method has been widely used in a number of studies on logistics and supply chain management, but not in research on transport policy. Some prior literature include supply chain risks (Pfohl et al., 2011; Kwak et al., 2018), performance measurement (Thakkar et al., 2007; Azevedo et al., 2013), sustainable supply chain management (Faisal, 2010; Luthra et al., 2011) and supplier issues (Govindan et al., 2012; 2010) were analysed by ISM. The application of ISM to policy studies will be useful because policies and their various consequences in the industry can be understood by a graphical mapping. The ISM process differs slightly across the literature, but there are seven core steps to be followed (Pfohl et al., 2011; Diabat et al., 2012). The process will change the contextual relationships among elements in a complex system to one structural mapping with hierarchies and interactions. The process and steps are fully depicted in Figure 1.

(Insert Figure 1 here.)

5.2 Analysis

Section 4 has identified and discussed 16 internal and external reasons for HJS' bankruptcy from literature review. These reasons were used as elements in the ISM analysis by being given a specific number from 1 to 16 for the analysis purpose. 120 contextual relationships between two elements were carefully evaluated based on the literature to assess as to whether one element directly led to another element. The relationships were depicted as V, A, X and O symbols in the structural self-interaction matrix. The matrix was later converted to the initial reachability matrix by showing a direct effect of one element on another as 1. Any indirect effect or transitivity was reflected in the final reachability matrix, also flagging 1 in the relevant entry. The final reachability matrix generated reachability, antecedent and intersection sets of each element; by comparing reachability and intersection sets, level partitioning was conducted by several iterations. The structural self-interaction matrix, the initial reachability matrix, the final reachability matrix and the level partitioning table can be found in the Appendix. In a directed graph, 16 elements were vertically and horizontally located by the 7 levels resulted from the level partitioning, and then linked by arrows according to the initial reachability matrix. The final ISM-based model replaced the element numbers with element titles and organised the element structure for a graphical demonstration. The ISM-based model is illustrated in Figure 2.

(Insert Figure 2 here.)

5.3 Discussion

This ISM-based model provides a holistic understanding of HJS' bankruptcy. Firstly, the direct causes are interactions of lack of governmental financial support, insufficient working capital and company governance structure. They create an enhancing loop, influencing each other to make the situation worse. There is no doubt that shrinking profits and prolonging deficits for many years has made HJS to financial struggles missing payments to suppliers and ship owners. Unlike HMM, another nation's representative shipping line, which had sufficient working capital from the sale of its sister companies, sufficient capital could not be injected to HJS when it was in threat; its holding company has already given up its management right to the Korean Air, but the Korean Air was unable to make a decision to harm its shareholders even more. The lack of efforts from owner groups perceived by Korea Development Bank (KDB) led to the cease of governmental financial support, one of whose conditions was owners' financial contributions. Lack of financial support worsened the risks of HJS and Korean Air, which in turn jeopardised HJS' negotiations with ship owners to reduce the charter rates and additional finances from other creditors. Under the traditional 'too big to fail' perception, a certain type of support from the government should have been made. However, KDB decided to refuse additional financial support to the HJS by reflecting Korean government's intention (HUFFPOST Korea, 2016). From the government's view, court receivership might be a better choice than M&A between HJS and HMM, because M&A between them inevitably results in having HJS's debt, which is a great burden (HUFFPOST Korea, 2016).

Secondly, a series of failures in freight rate recovery was generated by the combination of external environments, finance flows and the government policy. One clear explanation is the imbalance between global supply and demand in the shipping market; overcapacity has been a serious issue since many shipping firms placed orders of mega vessels before the recent financial crisis. However, the global trade volume and shipping demand couldn't rebound to meet the capacity, which often declined HJS' efforts of freight rate increases. In addition, HJS has lost many profitable customers that can constitute the base demand due to its expensive cost base and campaigns like slow steaming. Liberalisation of Korean shipping market has left HJS in a fierce competition in its home market, eventually losing customers to foreign carriers or to freight forwarders using foreign carriers.

Thirdly, high operating cost, one of the direct causes of insufficient working capital, can be mainly attributed to corporate strategies like a high ratio of chartered vessels, issues of corporate bonds and bad timing for ship investment. Expensive charter rates, interests and short-term repayment were all incurred by financial decisions, but vastly influenced sales and operations. Since the freight rate should be higher than operating costs to make profits, the freight rate of HJS was relatively high to other carriers' owing to high operating costs. It led to loss of customers as well as relatively low profit margins even though the market was buoyed from time to time.

Fourthly, corporate strategies were found to be fundamental reasons of HJS' collapse in the changing market situations. A series of strategic decisions made by top management was proved to be a failure either due to its timing or due to a deficiency of liner shipping know-

how. The top management of HJS experienced a transition period after the death of the second president in 2006. Also, an attempt of Sammy Ofer to a hostile acquisition may have affected HJS' finance strategy. Even the governance structure of HJS became vulnerable to dealing with financial difficulties; the holding company can easily eradicate the world's top 10 shipping company from its portfolio, just announcing to its shareholders that HJS' contributions to its revenue has been decreasing and is now negligible.

Lastly, the impacts of each transport policy played at a different level. The enforcement of debt-equity ratio of 200% has long affected HJS' fleet portfolio strategy, by increasing the chartered vessels and, in turn, pushing up operating costs. The liberalisation of the market reduced the customer base of HJS by introducing foreign competitors while leaving HJS still under the national regulations. Governmental financial supports did not fully consider the importance of a national shipping company for a highly export-driven country like Korea; the consequence was the chaos in cargo flows from/to Korea and benefits for non-national carriers although KDB declared that they have expected all the results before making a decision. Every policy had direct and indirect impacts on various causes of HJS' failure although policy makers will not be liable for this disaster at all.

6. Concluding remarks

Several lessons can be learned from the analysis on the case of Hanjin Shipping's sudden bankruptcy. Firstly, a carefully designed governance structure is critical for shipping companies in terms of risk mitigation. Shipping industry has obvious market cycles. Among various risk mitigating measures to avoid or minimize the possible impact of market cycles, shipping companies could choose a hedging strategy having maintained a portfolio of relevant businesses which can annihilate shocks from a specific market. HJS's collapse can be attributed to the failure in restructuring of its business units in parallel with HJS under a holding company. In the situation where supporting business units have become separate business entities, HJS was in a weak position in the financial market as well as in a plea for government support due to lack of assets. This has created a vicious loop along with lack of working capital and failure in getting timely government support. Secondly, external environments are not always the root causes of a shipping company's collapse. Rather, companies' decisions, such as when and how to buy vessels and pricing strategies, are the foremost factors to determine revenue and cost bases, which will eventually decide to what extent the external environments can affect the company's finance. Shipping companies and investors ought to be aware that simply accusing market supply and demand for making losses may overlook fundamental problems within the company's decisions. Finally, the knowledge and experience of top management in the shipping industry is second-to-none, since they are the one holding ultimate responsibility for any action and decisions made.

In addition, there exist implications for governmental agencies responsible for the shipping sector, particularly for the developing economies. Chen (1995, p.151) has argued that *"close governmental relationships with priority industries and related big businesses are also quite commonly seen elsewhere in the world. For many developing countries, these phenomena are more sources of trouble than of strength. This is because they contributed to widespread favouritism, corruption and suffocation of competition".* Shipping in Korea was until quite recently recognised as a core industrial sector for the nation's economy. Its subsequent policy was all geared towards supporting the country's national fleet in a way or the others. However, it turns out to be that the previously effective measures, such as a public policy

viewing shipping as a public goods, do not necessarily remain effective over the years to come. As Jensen (2017) indicates, all stakeholders in the field need to have and hold a clear understanding of where they want to be in the future, not as much in terms of precise cargo volumes and fleet size, but more in terms of what their fundamental business model will be and what it will require for the business model to be profitable and/or sustainable. In doing so, they do also need a solid and sound public policy towards their shipping; an analysis *of* and *for* public policy (Hill, 2013) ought to be distinguished and constantly reviewed and better reflected to the ever-changing business circumstances. Moreover, the policy process is to be clearly outlined towards *either* trying to control the economy as a counter measure against market failure *or* aligning with market mechanism as an alternative to government failure, *or* going even somewhere in the middle as a hybrid approach.

Since the bankruptcy was fairly recently happened, the present research has a series of limitations to scientifically investigate the true reasons behind and to better understand those causes in a chronical manner with publically available data sets. Methodologically, one drawback of the ISM-based model is that it cannot fully explain why HJS' court receivership in August 2016 has so rapidly resulted in the bankruptcy in February 2017 without giving any chance of rehabilitation. It could be a 'black box' that would be attributable to the complex networks of national and international shipping entities, which is worth further examinations in near future.

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APPENDIX

(i) Element identification

No	Elements	No	Elements
1	Global low demand	**9**	Loss of customers
2	Global overcapacity	**10**	Top management
3	Debt-equity ratio enforcement	**11**	Company governance structure
4	Liberalised domestic market	**12**	High ratio of chartered vessels
5	Lack of government support	**13**	Issues of bond
6	Insufficient working capital	**14**	Bad timing for ship investment
7	High operating costs	**15**	Pricing strategy
8	Failure in freight rate recovery	**16**	Fleet operations strategy

(ii) Structural self-interaction matrix

		← *j* →															
		1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
i ↑↓	**1**		O	O	O	O	O	O	V	V	O	O	O	O	O	O	O
	2			O	O	O	O	O	V	O	O	O	O	O	A	O	O
	3				O	O	O	O	O	O	O	O	V	O	O	O	O
	4					O	O	O	V	V	O	O	O	O	O	O	O
	5						A	O	O	O	O	X	O	O	O	O	O
	6							O	A	O	A	X	O	O	O	O	O
	7								O	V	O	V	A	A	A	O	O
	8									A	O	O	O	O	O	A	O
	9										O	O	O	O	O	A	A
	10											O	V	V	V	V	V
	11												O	O	O	O	O
	12													O	O	O	O
	13														A	O	O
	14															O	O
	15																O
	16																

(iii) Initial reachability matrix

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0
2	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0
3	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0
4	0	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0
5	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0
6	0	0	0	0	1	1	0	0	0	0	1	0	0	0	0	0
7	0	0	0	0	0	0	1	0	1	0	1	0	0	0	0	0
8	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0
10	0	0	0	0	0	1	0	0	0	1	0	1	1	1	1	1
11	0	0	0	0	1	1	0	0	0	0	1	0	0	0	0	0
12	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0
13	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0
14	0	1	0	0	0	0	1	0	0	0	0	0	1	1	0	0
15	0	0	0	0	0	0	0	1	1	0	0	0	0	0	1	0
16	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1

(iv) Final reachability matrix

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	1	0	0	0	1	1	0	1	1	0	1	0	0	0	0	0
2	0	1	0	0	1	1	0	1	0	0	1	0	0	0	0	0
3	0	0	1	0	1	1	1	1	1	0	1	1	0	0	0	0
4	0	0	0	1	1	1	0	1	1	0	1	0	0	0	0	0
5	0	0	0	0	1	1	0	0	0	0	1	0	0	0	0	0
6	0	0	0	0	1	1	0	0	0	0	1	0	0	0	0	0
7	0	0	0	0	1	1	1	1	1	0	1	0	0	0	0	0
8	0	0	0	0	1	1	0	1	0	0	1	0	0	0	0	0
9	0	0	0	0	1	1	0	1	1	0	1	0	0	0	0	0
10	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1
11	0	0	0	0	1	1	0	0	0	0	1	0	0	0	0	0
12	0	0	0	0	1	1	1	1	1	0	1	1	0	0	0	0
13	0	0	0	0	1	1	1	1	1	0	1	0	1	0	0	0
14	0	1	0	0	1	1	1	1	1	0	1	0	1	1	0	0
15	0	0	0	0	1	1	0	1	1	0	1	0	0	0	1	0
16	0	0	0	0	1	1	0	1	1	0	1	0	0	0	0	1

(v) Level partitioning

No	Rs	As	Is	Level
1	1,5,6,8,9,11	1,	1,	**4**
2	2,5,6,8,11	2,14	2,	**3**
3	3,5,6,7,8,9,11,12	3,	3,	**6**
4	4,5,6,8,9,11	4,	4,	**4**
5	5,6,11	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16	5,6,11	**1**
6	5,6,11	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16	5,6,11	**1**
7	5,6,7,8,9,11	3,7,10,12,13,14	7,	**4**
8	5,6,8,11	1,2,3,4,7,8,9,10,12,13,14,15,16	8,	**2**
9	5,6,8,9,11	1,3,4,7,9,10,12,13,14,15,16	9,	**3**
10	5,6,7,8,9,10,11,12,13,14,15,16	10,	10,	**7**
11	5,6,11	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16	5,6,11	**1**
12	5,6,7,8,9,11,12	3,10,12	12,	**5**
13	5,6,7,8,9,11,13	10,13,14	13,	**5**
14	2,5,6,7,8,9,11,13,14	10,14	14,	**6**
15	5,6,8,9,11,15	10,15	15,	**4**
16	5,6,8,9,11,16	10,16	16,	**4**

Figure 1. The Process of Interpretive Structural Modelling

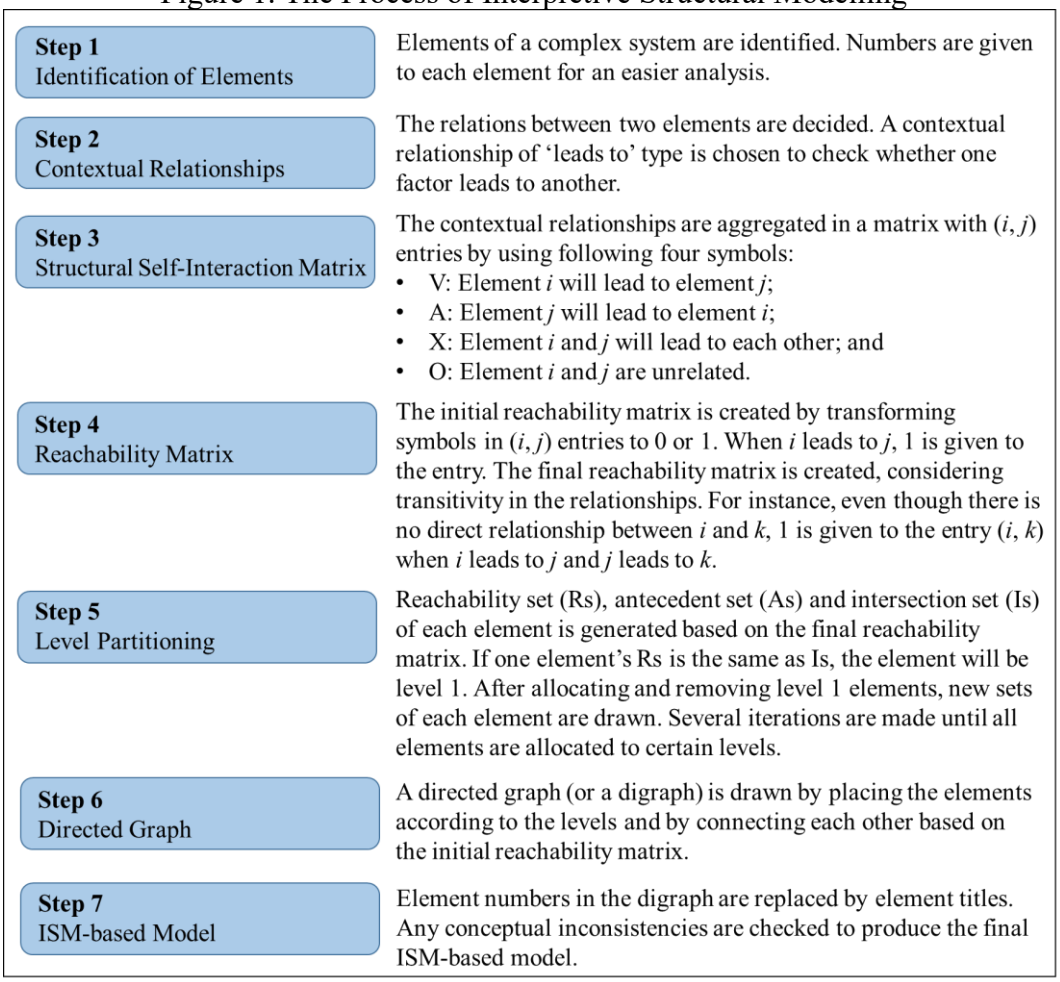

Figure 2. The ISM-based Model

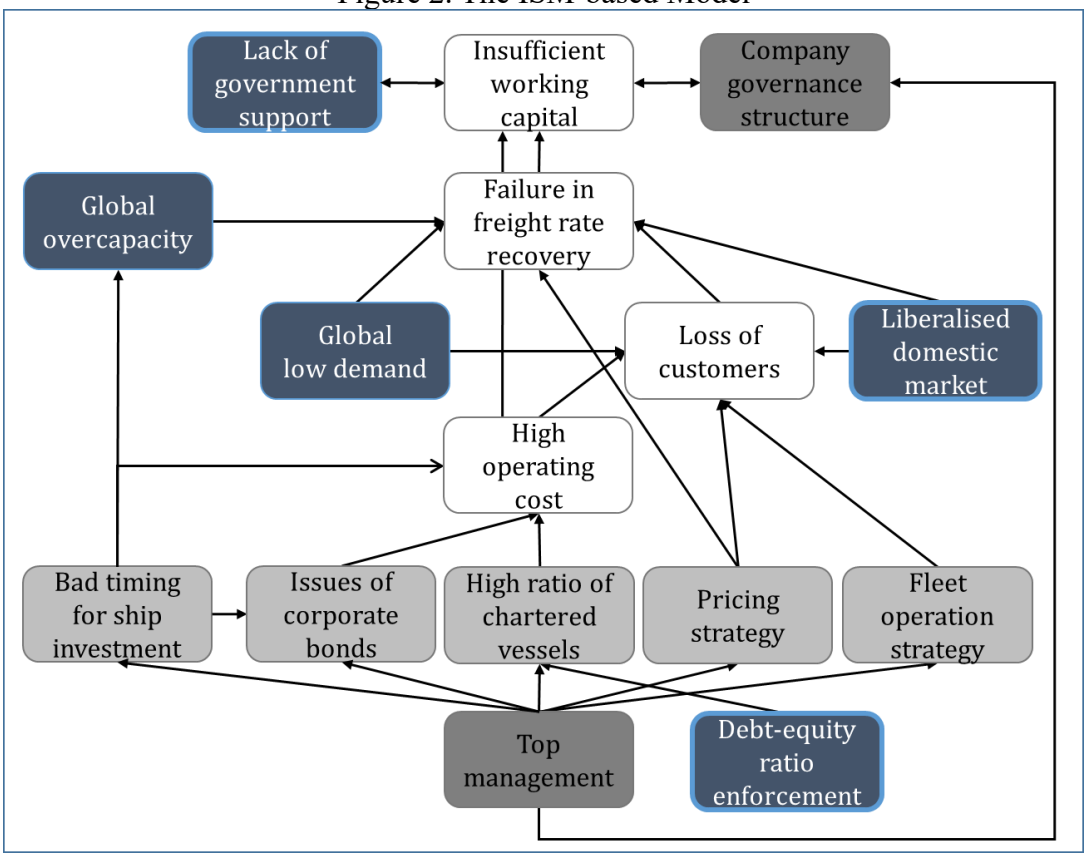

Table 1. Types of Trade Strategy and Government Intervention

Type	Free Trade	Deviation
Interventionism	Singapore	Taiwan, Korea
Laissez Faire	Hong Kong	-

Source: Krause (1981)

Table 2. Reasons for Hanjin's Failure

	Outside Perspective	**Inside Perspective**
External Factors	Global Shipping Environments	Shipping Policies in Korea
Internal Factors	Financial Flows	Corporate Strategies