

Analyzing the development of Indonesia shrimp industry

L A Wati¹

¹Fisheries and Marine Science Faculty, Brawijaya University, Veteran street, Malang, East Java, Indonesia.

E-mail: linaasmara@ub.ac.id

Abstract. This research aimed to analyze the development of shrimp industry in Indonesia. Porter's Diamond Theory was used for analysis. The Porter's Diamond theory is one of framework for industry analysis and business strategy development. The Porter's Diamond theory has five forces that determine the competitive intensity in an industry, namely (1) the threat of substitute products, (2) the threat of competition, (3) the threat of new entrants, (4) bargaining power of suppliers, and (5) bargaining power of consumers. The development of Indonesian shrimp industry pretty good, explained by Porter Diamond Theory analysis. Analysis of Porter Diamond Theory through four main components namely factor conditions; demand condition; related and supporting industries; and firm strategy, structure and rivalry coupled with a two-component supporting (regulatory the government and the factor of chance). Based on the result of this research show that two-component supporting (regulatory the government and the factor of chance) have positive. Related and supporting industries have negative, firm and structure strategy have negative, rivalry has positive, factor condition have positive (except science and technology resources).

1. Introduction

As an archipelago country, Indonesia has a great potential in the fisheries industry, especially it has a fairly broad sea area of 7.9 million km² and a long coastline of 80.791 km², with extensive aquaculture and fish ponds spread in some parts of the country. Indonesia has a vast 81 percent water area of the total area of Indonesia, so it is not impossible that Indonesia could rule business of fisheries world wide. Since 1987, Indonesia has become one of the most important suppliers of shrimp in the world

[1]. Fresh and frozen shrimp are the main export commodity of marine and fisheries sectors. The contribution of shrimp exports to national income is relatively large, when compared with the biggest export of agricultural commodities such as coffee, tea, spices, tobacco, and cocoa beans. Indonesia is one of the world's largest shrimp exporting countries, especially to the market in Japan, the United States, and the European Union. However, the position of Indonesia in recent years has been declining and outnumbered by Thailand, China, and Vietnam. This is mainly due to the decline in the competitiveness of Indonesian shrimp in the international market, either because of the efficiency of the business, the ability to penetrate the market, as well as the quality and sanitation issues. Therefore, integrated and synergistic measures are needed to improve competitiveness and business efficiency so that the performance of the national shrimp industry can quickly bounce back. Nevertheless, it is estimated that shrimp will still be excellent fishery product in the next decade and it has a very bright market prospects. In the era of globalization, every country cannot avoid the multinational trade in order to survive. Shrimp market is on the rise despite the difficult global economic situation [2]. In



Japan, import of raw frozen shrimp fell in January-July 2011, but increased by 8% for processed shrimp.

In Indonesia, the importance of small shrimp farmers cannot be ignored although their production contribution is less significant. Constraints for shrimp production in Indonesia include low marketing efficiency, limited shipping port, and the lack of optimal government policies related to efforts to improve productivity and quality. In the first 5 months in 2011, Thai shrimp exports earned 552 million USD, a drop of 2.23 % from the same period in the previous year. Export to the EU in that period was recorded at 79 million USD, a decrease of 16 percent due to crisis in the Europe in 2011, Thai shrimp exports were as high as 260 million US dollars, rising 7.9 percent from 2010. Europe has been the third largest shrimp market for Thailand after USA and Japan, while Thai frozen shrimp in 2011 was valued at 1.7 billion dollars [3].

Local constraints for Indonesian shrimp industry are low productivity and quality. Other constraints for Indonesia in global shrimp market is low marketing efficiency, limited shipping port, and lack of optimal government policies related to efforts to improve productivity and quality. Thus, the problem discussed in this research was how the development of Indonesian shrimp industry is.

2. Analysis methodology

2.1. Analysis of porter's diamond theory

The pure competition model implies that risk-adjusted rates of return should be constant across firms and industries. Michael Porter provided a framework that models an industry as being influenced by five forces. A strategic business manager seeking to develop an edge over rival firms can use this model to better understand the industry context in which the firm operates.



Figure 1. Porter's five forces analysis.

Porter's five forces analysis is a framework for industry analysis and business strategy development developed by Michael Porter (figure 1). There are five forces that determine the competitive intensity in an industry, namely (1) the threat of substitute products, (2) the threat of competition, (3) the threat of new entrants, (4) bargaining power of suppliers, and (5) bargaining power of consumers. To determine the factors affecting competitiveness in the liberalized market, Porter's Diamond Theory analysis was used in this study along with the use of qualitative method to complete the second objective of this research. Porter's diamond theory has four main factors, which are factor condition, demand condition, firm strategy, structure, and rivalry, related and supporting industries.

3. Results and discussion

Development of shrimp industry in Indonesia cannot be separated from the influence and development of the international shrimp market. The position of shrimp export from Indonesia in international market is influenced by competitiveness with other exporters and the condition of other exporters, which are considered as competitors. The development of Indonesia's shrimp industry is influenced by many factors, with competitiveness as the major factor. Than to analyze the development of Indonesian shrimp industry can use approach Porter's Diamond Theory. Analysis of Porter Diamond Theory through four main components namely factor conditions; demand condition; related and supporting industries; and firm strategy, structure and rivalry coupled with a two-component supporting (regulatory the government and the factor of chance).

3.1 Factor condition

a. Natural resources

Indonesia, as a tropical archipelago, make up ground water is fertile and contains abundant natural wealth results. In terms of fisheries, Indonesia is supported by a large sea area that covers 5.8 million km² with 0.8 million km² of territorial waters, 2.3 million km² of archipelagic waters / sea, and 2.7 million km² of the Exclusive Economic Zone (EEZ). Fish and shrimp are among the fisheries resources in Indonesia . Shrimp from Indonesia is in demand from domestic and international markets.

b. Human resources

It is known that the employment in shrimp aquaculture reached 494.302 people in 2010. It was projected that in 2013 or 2014, there would be 624,025 people work in shrimp Industry due to the success of shrimp culture revitalization program [6].

Due to the growth of employment in the aquaculture industry, there is an increasing number of shrimp exporting firms that reached more than 200 companies. There are many stakeholders involved in shrimp industry, namely small and large enterprises, shrimp farmers, and government agencies.

c. Science and technology resources

Lack of advanced science and technology in shrimp cultivation and processing has caused the shrimp from Indonesia to have low quality; thus, their price is low and it gets less competitive. Unlike in Indonesia, Thailand, as one of the world's largest shrimp exporter, has implemented food traceability system in the shrimp processing industry since 2006, which traces the trade record based on Radio Frequency Identification (RFID) technology .

d. Capital resources

Capital resource is an important factor in the development of shrimp aquaculture. For all sectors of fisheries, the Ministry of Marine Affairs and Fisheries Resources has formed a partnership with the National Bank to overcome the problem of capital resources.

e. Infrastructure resources

Shrimp industry is one of the fishery sectors that have been equipped with infrastructure facilities. For example, one of the leading shrimp exporters in Indonesia, PT Citra Dipasena Darmaja (PT Aruna Wijaya Sakti) that is now owned by PT Central Protein, has been built since the early 1990s and not it is the largest and highly successful aquaculture company in Indonesia.

3.2. Demand condition

a. Domestic demand

Production of shrimp in Indonesia for domestic consumption is not large, only 5%, while as many as 95% of the production is exported. This trend is due to the preference of Indonesian towards red meat. Domestic Demand of Fresh Shrimp is shown in Figure 2.

b. Export demand

Demand for Indonesia's shrimp export can be measured by the volume and value of the export that tends to increase. According to WTO [7], the economic value of the shrimp worldwide increases by 11.5 % per year in average. There was also an increase in the world's consumption of shrimp from

1,537,967 tons in 2004 to 1,670,925 tons in 2007. Table 2 shows that the average volume and value of Indonesia's shrimp export increased in 2002-2011. It reached 124,765 tons in 2002 and 158,062 tons in 2011, with the value of 836,563 USD in 2002 to 1,309,674 USD in 2011.

3.3. *Related and supporting industries*

a. *Related industries*

Shrimp export-related industries include seed supplier, shrimp supplier, and shrimp feed supplier. Shrimp seed industry is still underdeveloped in Indonesia due to the difficulty of obtaining high-quality *benur* (shrimp seed). Local breeding centers are not able to grow high quality shrimp sees, thus causing them to have fewer buyers. There is a new shrimp breeding brood stock development hall in Situbondo, East Java. However, there are no research centers specializing in shrimp breeding yet. One of the obstacles faced by shrimp breeding centers are the facilities provided including technology to select parent shrimp with good quality. Considering the production system in Indonesia, efforts to meet the quality standard have been the major challenge for Indonesia's shrimp production in the near future. It was reported that there was 380,000 hectares of brackish-water shrimp ponds in Indonesia with 80% of it was cultivated traditionally. Production of Shrimp using this system is vulnerable to virus infestation; thus, the use of antibiotics, such as chloramphenicol, is common.

b. *Supporting industries.*

Processed shrimp has not given significant role in Indonesia's shrimp exports. This is due to the limited ability of shrimp processing industry to create new value-added innovation to increase competitiveness. The existing processed products are limited only to domestic market and cannot be exported. Indonesia's shrimp exports currently consist of frozen shrimp (80 %) and non-frozen shrimp in the form of as fresh shrimp and packaged shrimp (20 %).

3.4. *Firm strategy, structure, and rivalry*

The competitiveness of Indonesia's shrimp in the international market is relatively good and Indonesia is currently one of the largest shrimp producers in the world next to China and Thailand. There are 182 shrimp exporting companies in Indonesia, however, the Southeast Asia domestic market is 50% dominated by the Chakroen Phokphand Group. Unfortunately, Indonesia has not developed any specific strategies to increase the competitiveness of its shrimp industry. This situation may lead to a decline in market and market value of Indonesia's shrimp export as compared to other competitors.

3.5. *Government regulations (role of the government)*

In developing shrimp industry in Indonesia, the government already has prepared some strategies, such as by creating Indonesia High Commission on Shrimp (Komisi Udang Indonesia (KUI)). KUI was formed by the Minister of Marine Affairs and Fisheries (Number.KEP.42/MEN/2004) of Indonesian Shrimp Commission. KUI's duties include establishing special programs such as Health Management of Shrimp and the Environment and Effluent and Solid Waste Management. Shrimp Health Management program is aimed to prevent environment-based diseases. The program describes the steps that must be taken to prevent diseases. Meanwhile, Effluents and Solid Waste Management program aims to improve the quality of wastewater ponds that has been contaminated by waste. Post-harvest management program aims to guarantee quality assurance and food safety.

3.6. *Opportunities*

There is a promising opportunities for Indonesia's shrimp in international market. Indonesia has vast ocean, great fisheries resources, and it is not one of the biggest shrimp exporters in the world, next to China and Thailand. Japan is one of the main market targets for shrimp export from Indonesia due to the local preference towards seafood. Based on the analysis of Porter's Diamond, there are strengths and weaknesses of Indonesia's shrimp industry. Shrimp production in Indonesia is likely to increase each year.

The shrimp industry in Indonesia has created a large number of jobs and it is predicted that it will keep increasing. However, the use of advanced science and technology in shrimp farming is still very minimum and majority of the farming activities are still performed traditionally.

The government of Indonesia has shown great support for the shrimp industry by cooperating with financial institutions to provide loans for those involved in the industry. Similarly, the development of infrastructure needed to support the shrimp industry has also been carried out. Currently, the production of shrimp in Indonesia has covered for domestic demand. Concurrently, international demand is also increasing and it has attracted shrimp exporters from Indonesia and Indonesia's shrimp export value has been increasing. In 2007, Indonesia was second to Thailand in terms of frozen shrimp export.

Unfortunately, the local shrimp market is still largely dominated by the Charoen Phokphand Group. Moreover, the local shrimp farmers still have not found a working strategy to increase their competitiveness in the world market. There are also few other hindering factors for the development of the local shrimp industry, such as the lack of supporting industries and lack of supply of high quality shrimp seeds. Those factors affect the Indonesia's shrimp export.

Indonesia has a great opportunity to increase the competitiveness of the shrimp industry in the world market. Therefore the government needs to take more proactive approach and set regulations that can help in improving the quality of shrimp from Indonesia.

Figure 2 shows the strength and weaknesses of Indonesia's shrimp industry after analysis with Porter's Diamond Theory. Positive sign represents a strong point, while a negative sign shows a weak point.

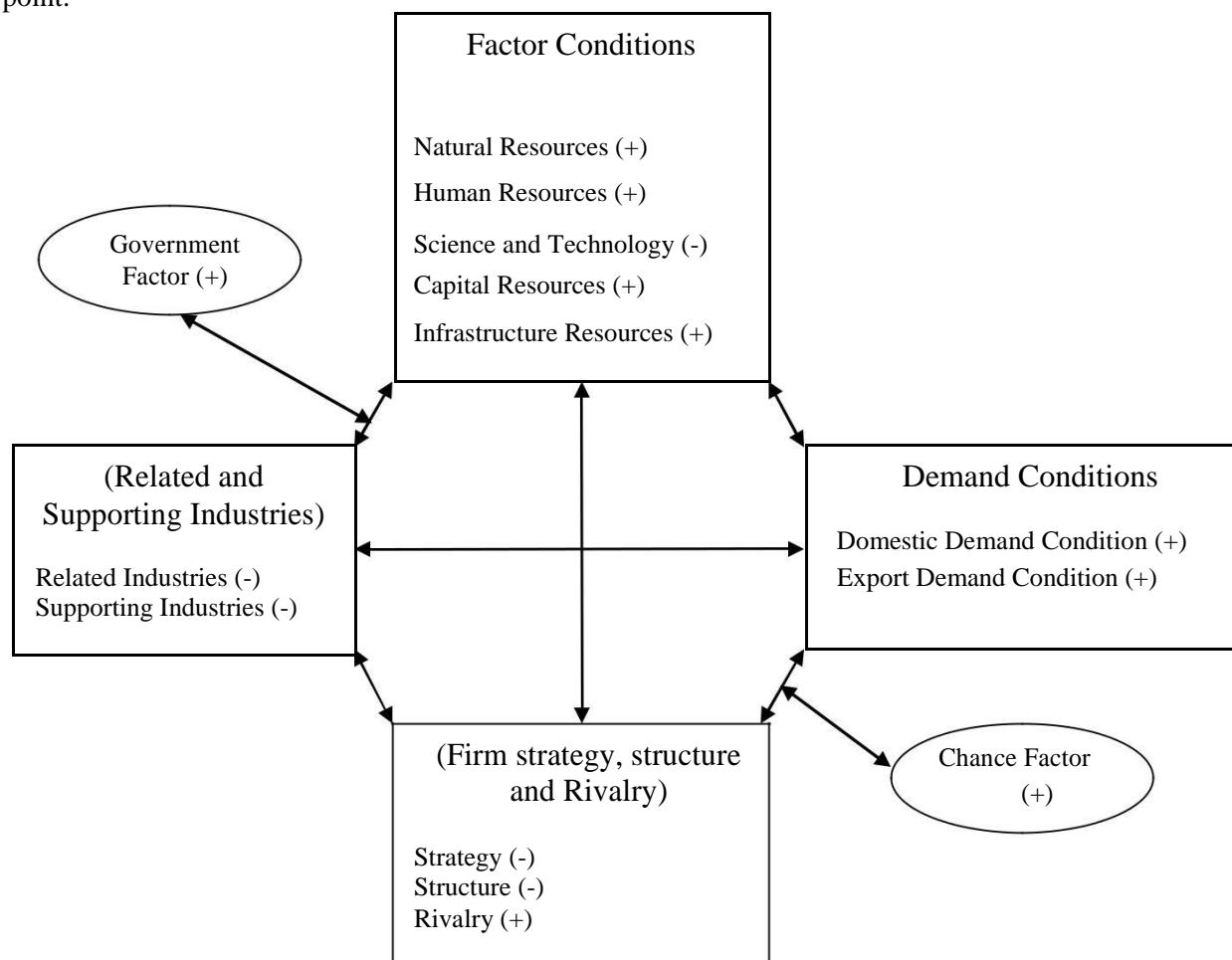


Figure 2. The results of analysis using Porter's diamond theory.

4. Conclusion

As analyzed using Porter Diamond Theory, the Indonesia's shrimp industry can be categorized as 'good'. There were four main components used in the analysis, namely factor condition; demand condition, related and supporting industries, and firm strategy, structure and rivalry, and supported with a two supporting components, which are the government regulations and opportunities. The supporting components were rated as positive, while related and supporting industries were given negative value, similar to firm and structure strategy that also had negative point. Meanwhile, rivalry was considered positive and so was factor condition, except for science and technology resources.

It is necessary for fishery industry to adopt the marketing strategy, structure industry, related support industries and supporting industries from the major shrimp exporter in the world (based on the result of Porter's Diamond analysis and econometrics analysis).

5. References

- [1] Directorate of Agricultural and Forestry Product Export 2012 Indonesian Agriculture for world. Marketing Department of Indonesia Jakarta
- [2] Globefish 2011 The Shrimp Market is on the Rise Despite the Difficult Global Economics Situation Market Reports of Shrimp www.fao.org/in-action/globefish/market-reports/resource-detail/en/c/338087/
- [3] Ministry of Commerce 2014 Proogram for Export Improvement of Indonesia shrimp Ministry of Commerce Jakarta
- [4] Ministry of Marine Affairs and Fisheries Republic of Indonesia 2017 Development of Fisheries Republic of Indonesia 2016 Ministry of Marine Affairs and Fisheries Republic of Indonesia Jakarta
- [5] Ngamsaithong 2012 Thai Shrimp Exports to 6 Main Market to be Expanded The Thai Financial Post Publish on July 6th, 2012 Thailand
- [6] Statistics Indonesia 2015 *Statistical Yearbook of Indonesia 2015* (Jakarta: Central Bureau of Statistics)
- [7] WTO 2012 World Trade Organization. Liberalization Market