

The Feasibility Study of Investment on Capacity Expansion of Corrugated Container Plant

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Abstract. The objectives of feasibility study of investment on capacity expansion of corrugated container plant were to investigate on production and marketing conditions of corrugated container industry in Thailand mainly in Eastern region, to investigate any possibilities in investment of capacity expansion of the plant by maintaining plant size and its capability as the existing model, to study income and expenditure process and financial outcome in 10 years period (2009-2018) by using data of cost and averaged marked price information in the year of 2007 for analysis. The study also focused on sensitivity of the project toward kraft paper price, container marked price and corrugated paper marked price. Data was obtained from the user of corrugated paper, manufacturers in Eastern region, Thai Packaging Association, Thai Pulp and Paper Industries Association. The analytical formats used in this study were Net Present Value (NPV), Benefit Cost Ratio (BCR) and Internal Rate of Return (IRR). The general condition of corrugated container industry in Thailand is a continuous industry from the pulp and kraft paper industry. The main materials used for production are short fiber pulp, long fiber pulp, and waste paper pulp. Short fiber pulp and waste paper pulp can be obtained domestically while long fiber pulp has to be imported. Most production capacity of pulp industry is kraft paper which has been used for manufacturing corrugated container. The large, medium and small-sized manufacturers own the market share approximately 60, 20 and 20% respectively. According to financial study, it was founded that this project has a good potential interest for investment where discount rates were 8, 10 and 12% per year, respectively, the NPVB of the project were 382.77, 297.32 and 223.10 million THB respectively and the BCR were 1.0402, 1.0339 and 1.0275 respectively. The IRR was 20.36% per year and PBP was 4.93 years. The sensitivity analysis of this project was founded that the project was capable to be invested in any cases. However, the following cases were found less interest to be invested: kraft paper price is increased by 5% and kraft paper price and marked price of corrugated paper are increased by 5% while corrugated containers' marked price is decreased by 5%. The NPVB in this study showed negative result while BCR less than 1 and IRR less than discount rate (DR) in any cases, suggested that the cost of Kraft paper significantly affects the project. When the Kraft paper price increased, the entrepreneurs have to increase the marked prices of corrugated container and corrugated container paper in order to reduce the impacts. To improve production process with the lowest production cost can help to reduce these impacts. The production capacity, the characteristics of customers and the types of competitors are the important factors which need to be well considered in order to improve the investments as there are many types of corrugated container plants. The increase of supply in the market resulted in high competition for market share acquisition and consequently the marked price decreases. The manufacturers should seek for the methods to distinguish themselves in products and services in order to maintain the price and the numbers of customer.

Keywords: BCR, IRR, NPV, Eastern region, paper price, Thai packaging

1. Introduction

The rapid and continuous expansion of both economic and industrial sectors in Thailand especially in the Eastern region makes a direct impact on the growth of corrugated container industry since corrugated container has been used to pack goods for delivery. Corrugated container has been manufactured from recyclable and biodegradable paper unlike the other types of packages. Apart from that, the growing trend of

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the corrugated container industry in many countries has increased. Hence, the Project of Capacity Expansion of Corrugated Container Plant Production Capacity Expansion is established based on the friendly environmental concept focusing on all current demand and potential growth of corrugated container industry. Together with this, the feasibility study of capacity expansion of corrugated container plant is established in order to achieve the increasing demand as well as enhance competitive potential in expanding more market shares.

1.1. Objectives

1. To study the production and market situation of corrugated container industry in Thailand mainly in Eastern region
2. To study the feasibility of investment in production capacity expansion of corrugated container plant
3. To study the sensitivity of the price of Kraft paper, container, and corrugated container paper

1.2. Scope of work

This study investigated on business opportunity by increasing of investment in the production capacity of corrugated container plant in Eastern Region, Thailand. With the same size and production capacity used in the existing model, this study was aimed on a feasibility the expense and income including financial returns in the 10 year period (2009-2018). The data of costs and average marked price of plant in 2007 (as a base year) was used for analyzing and investigating the sensitivity in this the project.

2. Research Methodology

2.1. Data Collection

The primary data was obtained from interviewing the sample group consisting of 10 customers in the corrugated container industry in Eastern region. The data collected includes the name of company, location, type of business, and the amount of demand for corrugated container. Also, the data was collected through interviewing production department in the company regarding the costs of plant, productions and machine construction.

The secondary data is compiled from the document of Thai Packaging Association, Thai Pulp and Paper Industries Association and related companies. The data obtained includes the name of entrepreneurs related to the corrugated container paper packaging business, the lists of target customer, trend and direction of packaging in Thailand, GDP, and marked price of corrugated container.

2.2. Data Analysis Method

Data Analysis Method includes:

Qualitative Analysis describes general condition of corrugated container industry in Thailand and in Eastern region including project details.

Quantitative Analysis is a financial analysis of the project through KPIs such as Payback Period (PB), Net Present Value (NPV), Internal Rate of Return (IRR), and Benefit Cost Ratio (B/C Ratio).

Project Sensitivity Analysis was carried out by establishing fixed factors and considering by 3 following cases:

The price of kraft paper increases by 5%

The marked price of corrugated container decreases by 5%.

The marked price of corrugated container paper decreases by 5%.

3. Result of Study

The general condition of corrugated container industry in Thailand is a continuous industry from the pulp and kraft paper industry. The main materials used for production are short fiber pulp, long fiber pulp, and waste paper pulp. Short fiber pulp and waste paper pulp can be obtained domestically while long fiber pulp has to be imported. Most production capacity of pulp industry is for kraft paper production which has been used for manufacturing corrugated container. Kraft paper has been occasionally imported and exported in a

minimal volume. The characteristics of the corrugated container industry consist of various sizes of manufacturers: large-sized manufacturers own the most market share approximately 60% and the medium-sized manufacturers account for 20% and small-sized manufacturers 20%. Large-sized manufacturers have a huge benefit due to high quantity production per time whereas small sized manufactures produces less. Medium-sized manufacturers have an advantage in negotiable of material price in comparison to small sized manufactures.

The result of study on the feasibility of investment in the production capacity expansion of corrugated container is that the production capacity instalments include 1 Corrugator Machine with the total capacity of 60,000 tons per year and 4 printers with the total capacity of 40,000 tons per year. The results of financial analysis which was analyzed based on the following KPIs: Payback Period (PB), Net Present Value of Benefit (NPVB), Internal Rate of Return (IRR), and Benefit Cost Ratio (BCR) found that the total amount of money invested to this project was 725,000,000 million THB at the kraft paper cost price of 20,000 THB per ton, corrugated container marked price of 29,000 THB per ton, and the corrugated container paper marked price of 24,500 THB per ton, at the Discount Rate of 8, 10 and 12% respectively. The NPVB was 382,770,000, 297,320,000, and 233,100,000 million THB, respectively. The BCR equals to 1.0402, 1.0339, and 1.0275 respectively. The IRR accounts for 20.36% and the PBP equals to 4.93 years—represented project is applicable to invest.

According sensitivity analysis by variable method, it was stated that the project shows the most sensitive to price of kraft paper. When kraft paper price increased by 5% with other factors were fixed, NPVB was found to be decreased, BCR was found less than 1, and IRR less than Discount Rate and these subsequently cause project not worth to invest. In case, when marked price of corrugated container decreases by 5% and marked price of corrugated container paper decreases by 5%, then the project is worth to invest but less profitable.

According to the sensitivity analysis by account method, it was shown that the project was the most vulnerable when the kraft paper price and the marked price of corrugated container paper increased by 5% while the marked price of corrugated container decreased by 5%. This made NPVB was negative, BCR less than 1, and IRR less than Discount Rate and resulted that it rendered the project not interested to invest. Interestingly, when the kraft paper price, the marked price of corrugated container, and the marked price of corrugated container paper decreased by 5% while the kraft paper price and the marked price of corrugated container paper increased by 5% and the marked price of corrugated container was stable, these conditions showed that the project is worth to invest with less profitable.

Due to sensitivity analysis of the project both through variable method and account method, the observations suggest that the project is too sensitive to the change of kraft paper cost than to the deviation of the box marked price and the corrugated container paper marked price and this can be forecasted that when the marked price has decreased, the project is worth to invest, but the project will give less benefit when the cost of kraft paper price increases.

3.1. Suggestion

1. Due to a significant effect of kraft paper cost to the project and then entrepreneurs try to increase the prices of corrugated container and corrugated container paper, it is recommended that entrepreneurs should try to improve production process with the lowest production cost can help to reduce the impacts.

2. The production capacity should be suitable to the environments of investments including the characteristics of customers, the types of competitors and the types of corrugated container plants.

3. It will be high competition for market share acquisition when the supply increase and subsequently create aggressive competition about the price, and cause the marked price decrease. Manufacturers should seek for the methods to develop and vary their products and services together with maintaining the price of products and services and numbers of customers.

4. References

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