Research Paper

Productivity Enhancement Strategy of PT PIL in Belawan

Hotma Tambunan[1], Nazaruddin[2], Isfenti Sadalia[2]

[1]Master of Management Study Program, Postgraduate School of University of Sumatera Utara
[2]Master of Management Study Program, Postgraduate School of University of Sumatera Utara

Corresponding Author: Hotma Tambunan

ABSTRACT

Productivity is the ratio of total output to total input. This reflects the influence of all inputs in producing output in a certain time. The purpose of this study is to plan a productivity system improvement strategy that can be applied in accordance with the internal conditions of the company. This study uses a causal method, using the Kendrick Creamer Model which measures the total and partial productivity indices of labor, materials, energy, and capital. Measurement with the determination of 2015 as the base year (base), the Total Productivity Index of PT PIL based on the base year price shows a positive value until 2016, but from 2017 to 2019 it has decreased on average. equal to - 0.17. The fluctuation of the productivity index based on the basic annual price indicates that the partial productivity of materials increases, compared to the partial productivity of labor, energy, and capital. The results of the evaluation of the factors in the fishbone diagram show that there is a cause for the decline in productivity from year to year. Increasing the capital productivity index can be done by increasing the utilization of invested tools and facilities to improve their performance. The best way is to relocate equipment to work areas that have good potential income, and increase the use of landfills by improving facilities and leveling so that they avoid flooding and standing water. Information technology is used to supervise the performance of tools that are far from being monitored so that it can be evaluated every operational activity carried out by the equipment.

Keywords: Total Productivity Index, Fishbone Diagram, Increased Utilization, Utilization of Information Technology.

INTRODUCTION

The role of logistics services will be increasingly visible with the existence of economic cooperation in the regional area in 2016. It is known that ASEAN member countries have agreed to implement the ASEAN Economic Community (AEC), and in 2020 free trade will be implemented between countries that are members of the WTO. The AEC activities were preceded by the implementation of the liberalization of logistics services in the ASEAN region in 2013. The logical consequence of the implementation of the agreement is the large opportunity for foreign companies engaged in providing logistics services to carry out logistics activities in Indonesia. With these conditions, it is certain that the competition in the logistics business is getting sharper and tougher. Therefore, every company engaged in the logistics sector needs to continue to increase its overall productivity in order to face this competition, so that it can survive in this logistics business.

Measuring one's own productivity is a must for every company, so that management knows its condition if it is measured from the inside or from the outside. In addition, measuring one's own productivity is carried out in an effort to increase resilience and high competitiveness, by implementing and implementing any predetermined strategies. As one of the subsidiaries of State Owned Enterprises (BUMN), which is engaged in logistics services operating in Belawan, PT PIL is demanded in terms of achieving

predetermined profit targets. PT PIL strives to be able to keep running and has benefits by developing its core business, namely the provision of container depots and leasing equipment for loading and unloading ports.

PT PIL in the management and achievement of company profits can be seen in Table 1, where in 2015 the profit was not achieved according to the target of almost more than 50%, this shows that the company's performance is not very good. In 2016, it was achieved and even exceeded management's expectations, however, it should be noted that the setting of profit targets was very much reduced compared to 2015, this shows that there is management concern about not achieving the realization in accordance with the target. Furthermore, in 2017 it was achieved but from 2018 to 2019 the achievement of the target was not achieved and tended to show the inability of management to achieve the predetermined profit target.

Table 1: Comparison of the company's profit target and realization of profit in 2015 – 2019 (In million rupiah)

Year	Profit Target	Profit Realization	Percentage(%)	Conclusion
2015	16.180	8.694	53,73	not achieved
2016	12.268	17.506	142,70	achieved
2017	25.094	25.155	100,24	achieved
2018	42.297	30.855	72,95	not achieved
2019	34.115	7.858	23,03	not achieved

Achievement of productivity levels can be seen in Table 2, where the company has been doing well with productivity growth from 2015 to 2018 growing with an average percentage rate of 4.3%. Meanwhile in 2019, the company experienced a decrease in productivity by 45% with an illustration that there was a decrease in revenue but an increase in the amount of company costs. It is necessary to do research to prevent the occurrence of even greater losses in the following year so that the company can increase revenue and reduce costs that arise.

Table 2: List of company revenues and expenses in 2015 – 2019 (In million rupiah)

Tahun	Capaian Realisasi Anggaran Perusahaan			Keterangan
	Pendapatan	Biaya	Produktivitas(%)	
2015	30.834	22.140	139%	-
2016	53.774	36.259	148%	Kenaikan 9%
2017	71.845	46.690	154%	Kenaikan 6%
2018	86.106	55.251	156%	Kenaikan 2%
2019	79.561	71.703	111%	Penurunan 45%

One of the efforts to overcome the decline in company production is to measure productivity. Productivity measurement as a basis for planning is very important in the company. This is due to the demands of companies to develop competitiveness against other companies in addition to increasing productivity. Productivity measurement needs to be done to plan a better productivity system by taking into account the factors that affect company performance, as well as efforts to increase productivity to determine the company's strategy in the future. Kaydos (1991) in Hassanali, Kevin, et.al (2011) suggests that to improve performance it is necessary to measure performance through a productivity model and is the most important part and requirement for continuous improvement. Develop, build and monitor the use of a fully functional productivity model at Harsco Infrastructure West Indies Limited, used to measure worker productivity performance with the primary consideration in improving customer satisfaction.

This study uses an index approach using the Kendrick-Creamer model where this productivity index model was introduced in 1965 through his book entitled Measuring Company Productivity. According to Gaspersz (1998), the index number is a quantity that shows variations in changes in time or space regarding a

particular matter. The common use of index numbers, especially in the economic sector, is the price index and the production index. It is usually used to measure changes in prices or changes in production over time. In order to measure the rate of change, a series of price or production figures are standardized based on a certain base year period or base time period. Thus the index figures obtained can be compared against the condition of the base period. From this it will be seen whether the changes are increasing, constant or decreasing.

Productivity

According to Sinulingga (2019) that in managing a business that is commercial and non-commercial, the terms productivity, efficiency and effectiveness are often used as indicators of how well performance in managing company resources is carried out. Wainai (1992) as follows: The term production and productivity need to be differentiated. Production refers to the output generated by the enterprise, without considering the amount of resources used. Productivity on the other hand relates the output generated to input used. The above opinion suggests that the meaning of productivity is different from production which only examines the output factor. Productivity refers to a level of comparison between the amount of output and the amount of input.

Productivity Measurement Classification

There are 4 (four) measures of productivity which are grouped as follows:
1. Total Productivity, namely the ratio of total output to total or all input factors used to produce the output. Total productivity measures the joint impact of all production resources in producing output.
2. Total factor productivity measures the amount of output produced by one unit of labor together with capital, because labor and capital are basically the main conversion factors in production operations, so total factor productivity is

basically a measure of production conversion.
3. The definition of partial productivity is a ratio (ratio) between output to one of several input factors used in producing the output of the process. This productivity is useful for measuring the relationship between the output value relative to the particular input value used.
4. Product productivity

Productivity Cycle

Research on the productivity cycle conducted by Mahassan (2011) states that productivity can be increased through the application of mathematical models of traditional methods for industrial manufacturing and service activities. Productivity management develops a productivity program plan that is based on four stages called the productivity cycle. The productivity cycle consists of four stages consisting of Measurement, Evaluation, Planning, and Improvement. If the productivity of this system can be measured, the next step is to evaluate the level of actual productivity to be compared with the predetermined plan. The gap that occurs between the actual level of productivity and the plan (productivity gap) is a productivity problem that must be evaluated and the root causes that have caused the productivity gap to be found.

Productivity Measurement

Sumanth (1984) developed a productivity measurement model by taking into account the main effect of all input factors on tangible output. This model can be used not only at the aggregate level but also at the operational level such as the departmental level. The uniqueness of this model is not only to measure the total productivity index but also to show certain inputs or resources that require improved utilization. The simplest productivity measurement model is the Productivity Index approach, one of which is the Kendrick-Creamer Model. Through his

book entitled Measuring Company Productivity, the measured productivity index can be divided into 3 (three) types, namely: Total Productivity Index, Total Factor Productivity Index and Partial Productivity Index.

Deflator or often called the price index is a conversion factor from the current price to the base price or often called constant prices. To be able to calculate the deflator value, it requires Gross Domestic Product (GDP) data for each year and type of expenditure, which is then compared with the value of real income.

$$Deflator = \frac{Nominal\ Gross\ Domestic\ Productl}{Real\ Gross\ Domestic\ Product}$$

Strategy to Improve Productivity System
1. Implement a Cost Reduction Program. Increased productivity through a cost reduction program means that output remains divided by less input. Cost reduction program refers to eliminating unnecessary costs or costs incurred for activities that do not add value to the product.
2. Managing Growth. Increasing productivity through growth management will be effective if market demand is increasing, so that the output produced needs to be increased.
3. Work More Agile. This strategy is carried out when market demand increases so that output needs to be increased, but the increase in output is achieved through the use of a fixed quantity of input, because the workforce has been working smarter or smarter.
4. Work More Effectively. In a more effective working strategy, increased productivity is achieved through increasing output in accordance with an increase in market demand and a decrease in the use of inputs.
5. Reducing Activity. This strategy is implemented by reducing production and eliminating or reselling unproductive assets.

Conceptual framework

The research wants to see and analyze how much the calculation of Partial Productivity where the lowest value of Partial Labor, Partial Materials, Partial Energy and Partial Capital will further be evaluated to formulate a strategy to increase its productivity. In accordance with the description on the background of the problem, literature review and previous research, a conceptual research framework is prepared as follows:
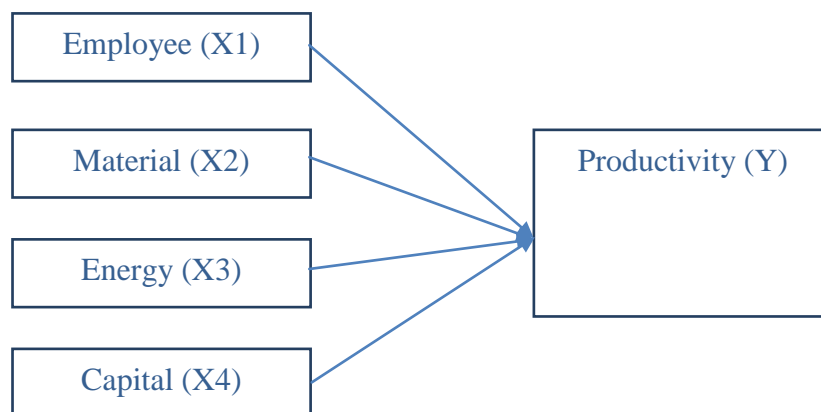

Figure 1: Research conceptual framework

RESEARCH METHOD

The research was conducted at PT PIL, located at Jalan Raya Pelabuhan, Pos II Road VI, Ujung Baru Belawan-20411, North Sumatra.

This type of research is included in the type of cause and effect research where the

independent variable (cause) is the variable that affects and the dependent variable (effect) is the variable that is affected. The study used the Kendrick-Creamer model with the determination of 2015 as the base year (base).

RESULT AND DISCUSSION
Data collection

Table 3: Recapitulation of data collection at PT PIL

No	Description	Year				
		2015	2016	2017	2018	2019
1	Total income	30.834	53.774	71.845	86.106	79.561
2	Personnel expenses	4.404	4.655	4.589	7.419	7.821
3	Material Load	640	484	527	646	437
4	Total Energy	1.580	2.085	2.793	3.988	3.857
5	Total Capital	15.516	29.035	38.781	43.198	59.588
6	Total Expenses	22.140	36.259	36.259	55.251	71.703

Table 4: Recapitulation of deflator calculations

Description	Year									
	2015		2016		2017		2018		2019	
	PDB	Defl	PDB	Defl	PDB	Defl	PDB	Defl	PDB	Defl
Output	93.569,8	1,00	104.693,1	1,12	119.721,0	1,28	131.109,3	1,40	144.545,8	1,54
Employee	190.267,9	1,00	211.623,6	1,11	238.217,0	1,25	267.094,0	1,40	294.279,0	1,55
Material	220.511,0	1,00	236.558,9	1,07	246.916,1	1,12	260.986,8	1,18	245.551,8	1,11
Energy	100.645,2	1,00	112.792,3	1,12	132.975,9	1,32	144.437,10	1,44	146.937,6	1,46
Capital	290.943,1	1,00	327.378,2	1,13	353.059,7	1,21	375.333,9	1,29	395.397,4	1,36

Productivity Measurement

Productivity measurement uses the Kendrick-Creamer Model. This model contains:

1. Total Productivity Measurement

2. Partial Productivity Measurement
To be able to calculate Total and Partial Productivity, it is necessary to calculate the constant price of each output and input.

Table 5: Recapitulation of total and partial productivity index calculations

NO	ELEMENT	2015(Base)	2016	2017	2018	2019
1	OUTPUT	30.834,00	48.060,69	56.151,57	61.451,94	51.502,75
2	INPUT	22.140,00	32.300,46	38.207,84	42.094,99	51.937,32
	A. Employee Index	7,00	11,48	15,32	11,63	10,19
	B. Material Index	48,18	106,53	119,31	112,59	131,24
	C. Energy Index	19,52	25,83	26,56	22,11	19,49
	D. Capital Index	1,99	1,86	1,76	1,84	1,17
3	Productivity Index Total	1,39	1,49	1,47	1,46	0,99

The progress of the increase in the total productivity index of PT PIL based on the base year price shows a positive value until 2016 but from 2017 to 2019 it has decreased by an average of - 0.17. This shows that there was an increase in cost expenses in 2017 but was not followed by an increase in income. To evaluate these causal factors, it can be seen from the evaluation conducted on the partial productivity index from 2015 to 2019.

In 2015 to 2017 the partial productivity index of the workforce increased by an average of 4.16, while 2 (two) years later it decreased. The decrease was due to the addition of equipment from 2016 to 2019 which was very significant so that the company had to pay for the provision of operators / drivers of these tools and employees who recorded field reports, and there was a change in the organizational structure so that it increased the burden on employees, especially the addition of secretaries of commissioners, board of directors and officials. structural in 2018.

It is known that there is a decrease in energy productivity from 2018 to 2019 with the following explanation:
1. Additional energy requirements are due to additional equipment.

2. There is a loading and unloading tool that is over 9 (nine) years old.

3. Utilization of fuel oil (BBM) in non-operational devices to generate income.

4. Equipment is in different locations (Dumai, Pekanbaru, Sei Mangkei and Tanjungpinang) without any supervision from the company.

In 2015 to 2017 there was an increase in the partial capital productivity index; however from 2018 to 2019 there was a decrease in the partial capital productivity index. The results of the data obtained are the additional cost of using capital, namely the addition of insurance costs for equipment, additional depreciation value for each tool, additional tax payments and equipment worthy certification fees, additional burden on loan costs for purchasing container loading and unloading equipment and additional costs for maintaining loading and unloading equipment container.
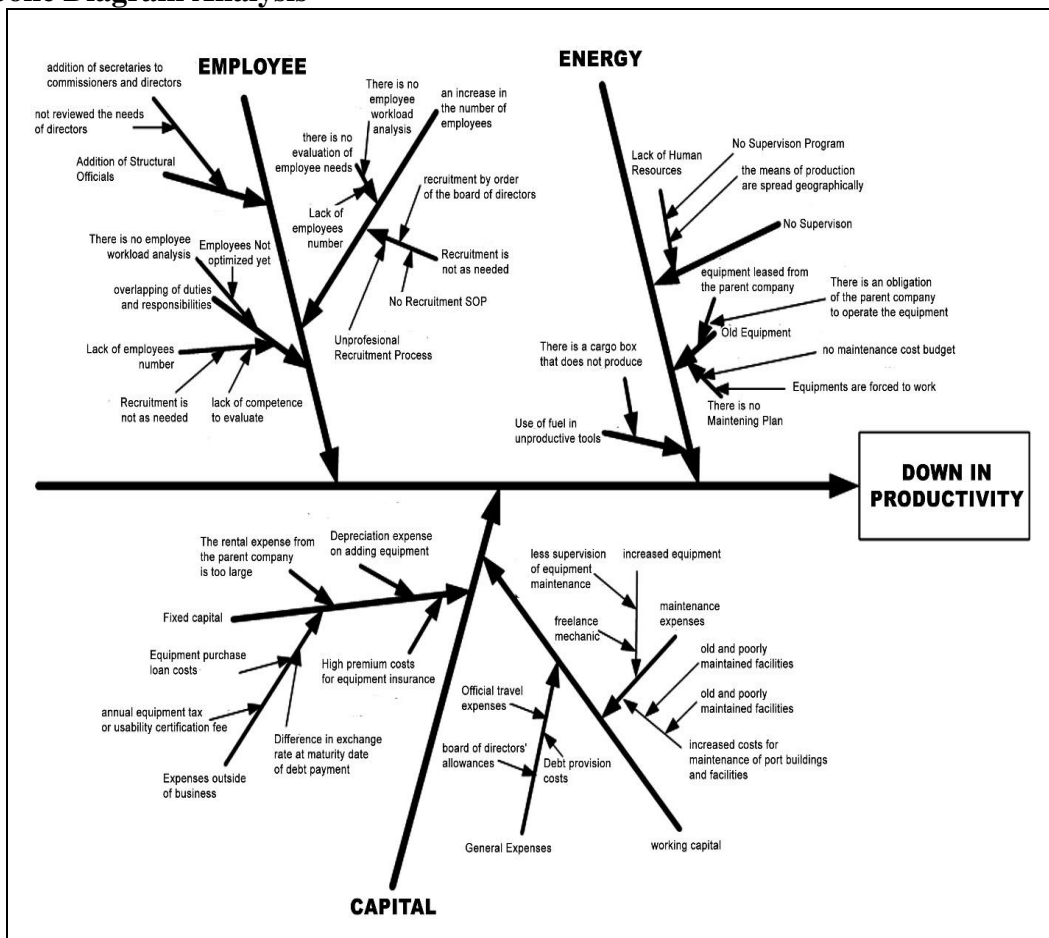
Fishbone Diagram Analysis

Figure 2: Fishbone diagram of the lowest partial productivity in 2015 - 2019

Productivity Improvement Strategy

Improvements to all work systems need to be communicated with all related parties. Instructions are carried out by the top leaders so that all parties are involved in this activity, the implementation of improvements requires good cooperation between the company management and employees in accordance with the duties and responsibilities of each party. It is also very important for the management's courage to negotiate with the parent company and to creditors who have provided loans in the procurement of transportation facilities at the port.

Five strategies to improve the company's productivity system, namely implementing cost reduction programs,

managing business growth, working more agile, working more effectively and reducing activities are steps that companies need to take to increase productivity.

CONCLUSION

1. Total Productivity Index (IPT) for each year, namely: IPT in 2015 = 1.39, IPT in 2016 = 1.49, IPT in 2017 = 1.47, IPT in 2018 = 1.46 and IPT in 2019 = 0 , 99. The fluctuation of the total productivity index of PT PIL based on the base year price shows a positive value until 2016 but from 2017 to 2019 it has decreased by an average of - 0.17.
2. The partial productivity index of the material shows a good increase in productivity from 2015 to 2017 and 2019. In 2018 it decreased with a value of - 6.72. The sum of the material partial productivity index for 5 years shows a positive value of 83.06.
3. The partial productivity index of labor, energy and capital shows a decline in 2019. The sum of the partial capital productivity index is the lowest compared to the other 4 (four) productivity indices. The total value for 5 years is 0.81, so it is necessary to make improvements to the use of capital to generate company revenue.
4. The results of the evaluation of the factors in the fishbone diagram show the causes of the decline in productivity from year to year:
   a. Manpower, in the form of adding structural officials, increasing the number of employees excessively and Overlapping duties and responsibilities.
   b. Energy, in the form of no supervision, old machines and unproductive use of fuel oil in equipment
   c. Capital
   1. Fixed capital, in the form of depreciation costs for additional equipment, high costs in payment of insurance premiums for equipment and costs for leasing facilities from

the parent company are too large and expenses outside the business
   2. Working capital, in the form of general expenses (expenses for the allowance for accounts receivable, travel expenses, directors' allowances) and maintenance expenses.
5. Increasing the capital productivity index can be done by increasing the utilization of invested tools and facilities to improve their performance. The best way is to relocate equipment to work areas that have good potential income, and increase the use of landfills by improving facilities and leveling so that they avoid flooding and standing water.
6. Utilization of information technology to supervise the performance of tools that are far from being monitored so that it can be evaluated every operational activity carried out by the equipment.

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