



Production Cost Structure And Profit In The Plastic Industry For Packaging In Indonesia

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ABSTRACT

The plastics for packaging industry play an important role in the Indonesian economy. The plastic industry for packaging has experienced relatively high growth along with the growth of the food and beverage sector, pharmaceuticals, cosmetics, and other industries. This study aims to determine and analyze the effect of production cost structure on the profit of the plastic industry for packaging in Indonesia. This study uses secondary data in the form of Time Series from the Indonesian Statistics for the period 1991-2021. The analysis technique used in this research is descriptive quantitative analysis technique. The analysis method used is the calculation of production cost structure, calculation of profit level and multiple linear regression (Ordinary Least Square). The results showed that the production cost structure has experienced significant development, the cost of raw materials is the highest composition of production costs with a percentage of 82.29 percent. The profit of the plastic industry for packaging has grown by 20.75 percent per year. Results of multiple linear regression, the production cost structure has a significant effect on profits, but the capital cost variable does not have a significant effect on in the plastic industry for packaging in Indonesia. The negative coefficient on the capital cost and energy cost variables means that there has been a saving in the use of capital and energy.

INTRODUCTION

Indonesia's economy fluctuates with fast every the year Good influenced by the market in trading nor policy economy national. Industrialization in Indonesia is one of them step in going to level economy prosperous with adopt various nature study theoretical nor development increasingly technology proceed. Industrial sector can be one end spear and spur growth economy with create mark add, absorption power work and also earn fulfil need for society (Putro, 2014). Enhancement level life as well as well-being society and growth economy national can achieved with industrialization. Industrial sector like manufacturing, mining, and production energy, often give great contribution to Product Gross Domestic (GDP), however impact can varies between countries and sectors specific industry.

Industrial sector non-oil and gas this is very important for economic sector in Indonesia This covers various type industry like food and drink, materials and clothing, compounds synthetic, metal, device hard, gadgets, automotive, and others (Khairurrahman, 2023). Commitment and

contribution influenced by variables like innovation, investment, production, and interest domestic. In 2019 contribution non- oil and gas industry to Product Gross Domestic (GDP) was 17.58 percent, trend enhancement This Keep going continues until 2020 industry non-oil and gas This experience improvements that provide contribution amounting to 17.87 percent. Plastic products industry for packaging is one of industry that has potency largest business market share in Indonesia (Haspazah *et al.*, 2023).

The plastic industry is generally considered to be the final industrial group of the petrochemical industry, because it uses natural gas and petroleum products as raw materials and produces plastic-based goods from the petrochemical industry through technical chemical processes. (Kementrian Perindustrian, 2017). Plastic materials have corrosion resistance, low conductivity as an insulator, are easy to shape, and are widely used because they are easy to color and easy to create this producing goods with attractive shapes and colors (Mac Arthur, 2016).

the level data contribution sector industry to sector industry non-oil and gas support growth economy. Contribution industry non-oil and gas to Product Gross Domestic Product (GDP) from 2010 to 2022 shows positive trend Where proportion highest industry - led food and Drink ie with the average proportion is 5 percent in period 12 years time. In industry chemistry, pharmacy and medicine traditional in period time the support sector non- oil and gas industry namely an average of 1.5 percent with percentage highest inscribed in 2021, namely when Covid-19 hit Indonesia.

Industry plastic For Gold processing in Indonesia has experienced rapid expansion as a result of increasing consumption patterns. The food packaging industry remains the end user largest plastic product in Indonesia in 2015. The infrastructure and automotive industries emerged as new industries driving growth, where factor the helps increase sales / consumption of plastic products. Even though it exists good prospects in the industry This is the potential for the plastic business Indonesia is still underutilized because it is too dependent on imported raw materials and investment foreign (Kementrian Perindustrian, 2017).

Consumption rate packaging plastic in Indonesia is also relative tall however, improvement cost production in industry plastic for packaging in Indonesia is one of them possible problems hinder rate growth and performance industry the with problem main that is increase price material standard for more plastic (Danareksa Research Institute, 2023). Study This will see influence structure cost production to profits to the industry goods from plastic for packaging in Indonesia in the period 1991-2021.

LITERATURE REVIEW

Basically, economics which discusses the structure, behavior and performance of a group of similar businesses is a branch of economics, namely industrial organization theory (Nikensari, 2018). According to Church & Ware (2000) the theory of industrial organization is an economic science that explains market structure, performance and behavior of companies in an industry in a market mechanism, both perfect competition markets and non-competitive markets. The aim of this field of study is to develop and implement policy methods related to regulating market mechanisms.

According to Hasibuan (1993) industrial organization theory can be defined in a complex sense which emphasizes in more detail the microeconomic aspects. Microeconomic theory directly discusses the smallest variables in economic components such as prices, wages, production costs, company and industry behavior and consumer behavior. Industrial organization theory is a topic of economic study which can basically be presented using several approaches, namely empirically and theoretically. Organizational theory will discuss specifically

and in detail related to industrial organizations related to performance, market structure or industrial behavior (Teguh, 2020).

The achievements or final results of an industry's activities can be seen in terms of performance. In simple terms, structure and behavior describe how the market operates under market conditions. According to Teguh (2020) performance describes how well (how successful) the industry operates in the market. Overall performance is the final result of work activities which is influenced by form and behavior in an industry, the results of which are generally recognized by the amount of market control or the amount of income in a business organization. Overall performance can also be seen through company efficiency, level of technological innovation, product quality, and employment opportunities (Hasibuan, 1993).

The measure of how well the results have been achieved by companies and industries in achieving economic goals is called performance. The general aim of the economy is to maximize economic welfare. One effort to realize these economic goals is the efficient use of production factors which can be measured based on the profits generated or the cost structure in a progressive industry, which includes improving production quality, product types, improving production techniques, full employment levels, and stability. and price equality (Marbun in Wibowo, 2009).

The costs incurred by a company/business to obtain production variables are production costs (Sukirno, 2016). The production of goods and services requires various production factors, such as raw materials, equipment, employee salaries, land and buildings. Based on their nature, production costs are divided into two types, namely explicit costs and implicit costs. According to Zahara & Anwar (2020), a number of costs incurred by companies which are paid in cash to obtain the required production variables are explicit costs. Implicit costs are the company's economic costs in using production variables that arise due to the production process. This research will discuss in detail production costs based on time periods, namely short-term production costs and long-term production costs.

Profit is the main goal of an entrepreneur in running his company. The production process is carried out as efficiently as possible to obtain maximum profits. A business is an organization that produces goods and services, or is also usually called a company. Businesses or companies carry out operational activities aimed at maximizing profits and maintaining the survival of the company. Every company tries to gain profits or obtain maximum profits. This is because the profits obtained are used as capital in the company's subsequent operations.

In theory, profit is the return obtained by a producer or company that has carried out the production process. Various definitions of profit put forward by economist state that profit is the fruit/result of production/sellers and producers succeeding in serving the needs/desires of their customers where the profit can be calculated from the difference between production costs and income from product sales.

METHODS

Study this will show influence structure cost production to profit on industry plastic for packaging in Indonesia using procedures analysis combined, esp. with technique quantitative descriptive. Structure cost analyze component cost production in industry plastic for packaging in Indonesia which consists of raw and auxiliary raw material costs and auxiliary materials, employment costs/wages, capital costs and energy costs. According to Muslimin & Sarintang (2015) mathematically structure cost is as following:

$$CS_i = \frac{BB_i}{\sum_{t=1}^n TC_i} \times 100 \%$$

$$CS_i = \frac{BU_i}{\sum_{t=1}^n TC_i} \times 100 \%$$

$$CS_i = \frac{BM_i}{\sum_{t=1}^n TC_i} \times 100 \%$$

$$CS_i = \frac{BE_i}{\sum_{t=1}^n TC_i} \times 100 \%$$

Variable CS_i = Production cost structure for year i; BB_i = Raw Raw material costs and auxiliary materials for year i; BU_i = Labor Cost per year; BM_i = Cost of Energy Materials year ith; BE_i = Energy Cost year; And $\sum_{t=1}^n TC_i$ = Total cost amount years. On research This variable profit is variable dependent. Based on theory profit calculated with subtracting Total Revenue (TR) from Total Production Costs (TC). Formula profit can written down as following:

$$\pi = TR - TC$$

Formulation the explain a number of variable ie π = Profit / Profit; TR = Total Income; TC = Total Cost. At the $TR > TC$ level, the Company/ producer obtain good profits, and when mark π positive or ($\pi > 0$) then, company / producer has get profit.

Influence structure cost production to profits to the industry goods from plastic for packaging in Indonesia is analyzed with use analysis multiple linear regression or technique analysis *Ordinary Least Square* (OLS). Analysis techniques multiple linear regression used for makes it easier study This in see influence between variable independent form structure cost to variable dependent in the form of profit. The data has been earned / collected will processed with use *Eviews Software* 10, respectively mathematical multiple linear regression model the presented in Eq as following This:

$$\text{Profit} = \beta_0 + \beta_1 BB + \beta_2 BE + \beta_3 BM + \beta_4 BU + \varepsilon_t$$

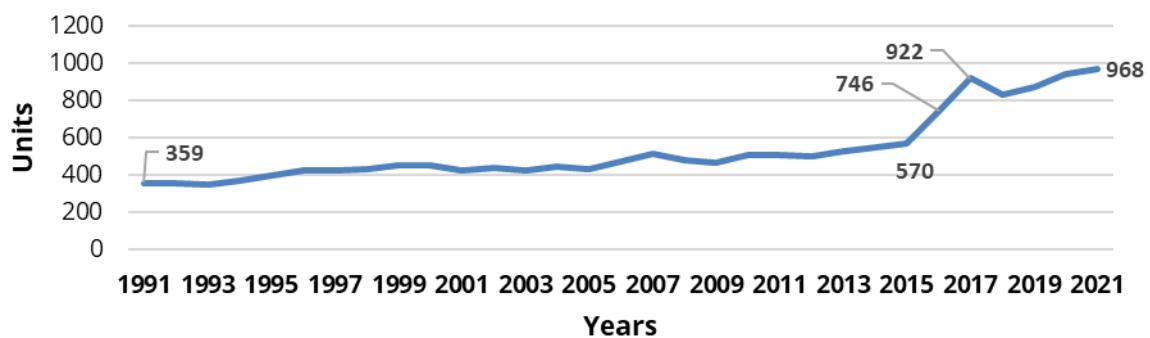
Multiple liner regression model the own variable which means Profit = represents profits to the industry plastic For packaging; β_0 is constant; β_1 , β_2 , β_3 and β_4 are coefficient regression; BB = Raw Raw material costs and auxiliary materials; BE = Energy Cost; BM = Cost of Capital; and BU = Labor Costs; and ε_t = error bully in the model (*error term*) with alpha (0.05 or 5 Percent).

RESULTS

The plastic packaging industry plays an important role in the Indonesian economy and the world in general. Plastic is one of the most commonly used materials in the packaging industry because it is light, durable and relatively cheap. The plastic industry for packaging has grown rapidly in Indonesia along with the growth of the food and beverage, pharmaceutical, cosmetics and other industrial sectors.

The plastic industry for packaging in Indonesia for the period 1991-2021 continues to experience a relatively significant increase. Figure 1 data on the number of companies in the plastic packaging industry in Indonesia has increased by 169.63 percent over a period of 30 years with an average annual growth rate of 3.36 percent. The highest growth occurred in 2015 to 2016. The number of companies in the plastic packaging industry in Indonesia increased by 30.88 percent in that one year period and in 2016 to 2017 the trend continued to increase, namely 23.69 percent.

Figure 1. Development of the Number of Companies in the Plastics for Packaging Industry 1991-2021 in Indonesia

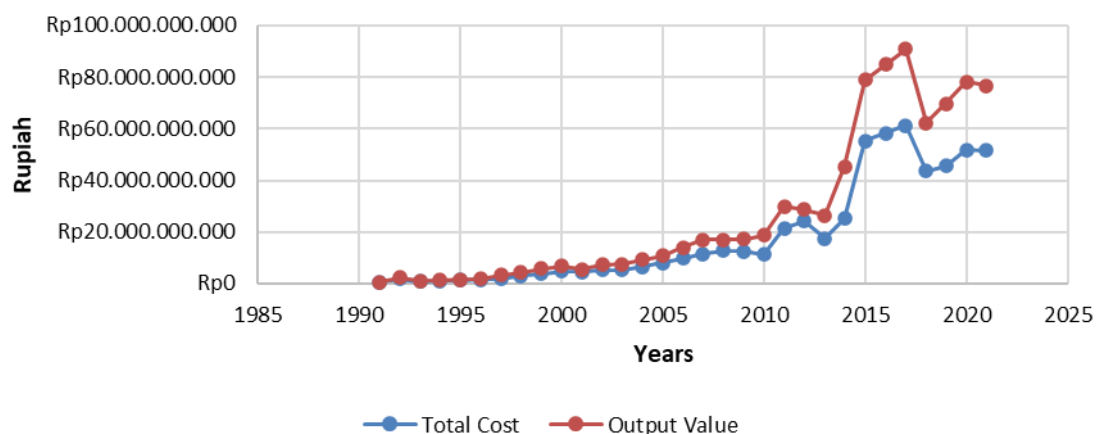


Source: Manufacturing Industry Statistics and Large and Medium Industry Statistics, 1991-2021

This is a positive catalyst for the plastic packaging industry and shows that this industry is still relevant to Indonesian society. Plastic packaging is a product that is still the main choice for manufacturers because it is considered cheap and easy to use packaging. Even though the issue of plastic waste damaging the environment often arises, manufacturers still maintain their choice of single-use plastic as their product packaging. Progress in innovation and technology is an important variable that influences the development of the plastics industry, especially plastic packaging products.

Use cost Raw materials are one of the main components that must be carried out by each manufacturer in carrying out the production process. There is the period 1991 -2021 input costs in industry plastic for packaging experience increase in a way significant that is has experience growth each the year amounting to 16.57 percent. The output value has experienced a significant increase in the 30 years period, which is equal to the respective growth rate I know it's 17.50 percent.

Figure 2. Development of Input Costs and Industrial Output Value Plastic For Packaging 1991-2021 in Indonesia



Source: Statistics Industry Manufacturing and Statistics Large and Medium Industries 1991-2021 (Data processed)

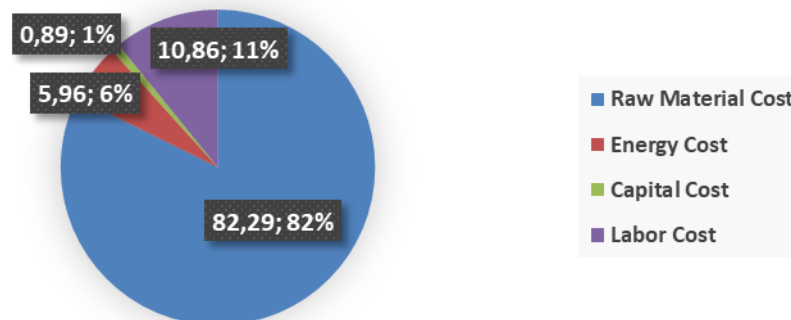
Raw material costs and auxiliary materials standard is component very important costs for the production process that is for provide and fulfill components production principal that produces production output. Raw material costs and auxiliary materials standard Alone consists from a number of component that is cost purchase raw raw material costs and auxiliary

materials standards and costs helper. Raw raw material costs and auxiliary materials have period 1991-2021 has experience growth each the year up to 16.58 percent. Development labor costs power work has experience significant increase over the period 30 years time the labor costs has experience increase level growth each the year amounting to 18.20 percent. Development energy cost in industry plastic for packaging in Indonesia for the period 1991-2021 is relative fluctuating. In 1991 to 2021 costs energy experience growth each the year amounting to 14.81 percent. Capital costs are costs used in the production that consists from cost rent buildings, machines and equipment in industry plastic for packaging in Indonesia. Development relative cost of capital significant and in the 1991-2021 period it has experience growth amounting to 7.42 percent.

DISCUSSION

Industry goods from plastic for packaging is one of industry in need relative production input costs big. Analysis structure costs to industry goods from plastic for packaging in Indonesia seen from a number of component production input costs that is raw raw material costs and auxiliary materials standard, labor costs power work, capital costs (rent, building, land and others) and costs energy in the form of cost electricity, water and gas. Structure Cost is very influential performance from a industry, if use cost for material raw, energy work, capital and energy more small compared to with results production, will give big profits to existing company in a industry.

Figure 3. Industry Cost Structure Plastic for Packaging in Indonesia, 1991-2021



Source: Statistics Industry Manufacturing and Statistics Large and Medium Industries, 1991-2021
(Data processed)

Raw raw material costs and auxiliary materials used for industrial production processes goods from plastic for packaging in the 1991-2021 period is the highest with percentage 82.29 percent of the total use input costs in industry plastic for packaging in Indonesia. Labor/Wage costs power work occupy position second with percentage 10.86 percent, next use energy cost of 5.96 percent and capital costs with percentage relatively lowest that is amounting to 0.89 percent of the total use input costs in industry plastic for packaging in Indonesia. This matter in accordance with study Saragih *et al*, (2018) stated that raw raw material costs and auxiliary materials are the largest component in the production process. Benefits to the industry plastic for packaging in Indonesia for the period 1991-2021 is known that level profits to the industry plastic for packaging has experience enhancement amounted to 287.80 percent and has experience growth amounting to 20.75 percent per year during period 1991-2021.

Estimation results regression show that costs of raw material, energy cost and wages/labor cost influential significant to profit, however variable capital costs do not influential significant to profits to the industry plastic for packaging in Indonesia. Constant value as big as -2.6, mean If

variable raw raw material costs and auxiliary materials, energy cost, capital cost and labor cost worth 0 percent or No experience change so mark profit by - 26 percent. Based on results testing assumption classic or feasibility of the model No There is violation of the Assumption Test Classics, p This prove that model is selected Already nature *Best Linear Unbiased Estimator (BLUE)*. The following is a *time series* data regression model that has been developed obtained from data analysis:

$$\text{Profit} = -2.600945 + 3.088885\text{BB} - 0.336678\text{BM} - 8.343980\text{BE} + 0.935553\text{BU} + \epsilon_t$$

Coefficient raw raw material costs and auxiliary materials standard as big as 3,088, that is If BB variable (Raw Raw material costs and auxiliary materials) increases equal to 1, then matter the will increase profit amounting to 3,088. The positive influence of raw raw material costs and auxiliary materials on profits shows that the greater the level of use of raw raw material costs and auxiliary materials in the production of plastics for packaging industry in Indonesia, the greater the profits. This shows that if a company increases the cost of raw materials in the production process, production output will increase and allow producers to increase their profits or business profits (Agustin & Rijanto, 2022). Factor important one influence raw raw material costs and auxiliary materials standard in industry plastic for packaging in Indonesia is supply material available raw materials. High raw raw material costs and auxiliary materials standard and helper cause cost the highest from cost other. in 2017-2022 materials standard import Still become mainstay in the industry plastic in Indonesia. In 2017 materials standard imports dominate up to 52.52 percent with total ingredients standard import as much as 3.5 million tons and in period 5 years time has experience increase until material standard import dominate around 63.88 percent in 2022 with total materials standard import as much as 4.8 million tons.

Table 2. Results Analysis Multiple Linear Regression

Variable	Coefficient	t-statistic	Prob.
Constant	-2.600.945	-3,330017	0.0026
BB	3.088.885	31,82509	0.0000
BM	-0.336678	-3,576690	0.7235
BE	-8.343.980	-2,868193	0.0081
BU	0.935553	10,854940	0.0000
Coefficient of Determinaton			
R ²	0.998210		
Adjusted R ²	0.997935		
Prob (F- Statistics)	0.000000		
Assumption Classic Test			
Multicollinearity	Centered VIF		
BB	8,509584		
BE	5,385751		
BM	1,230291		
BU	8,341920		
Autocorrelation			0,7558
Heterocedasticity			0,7746
Normality			0.0591

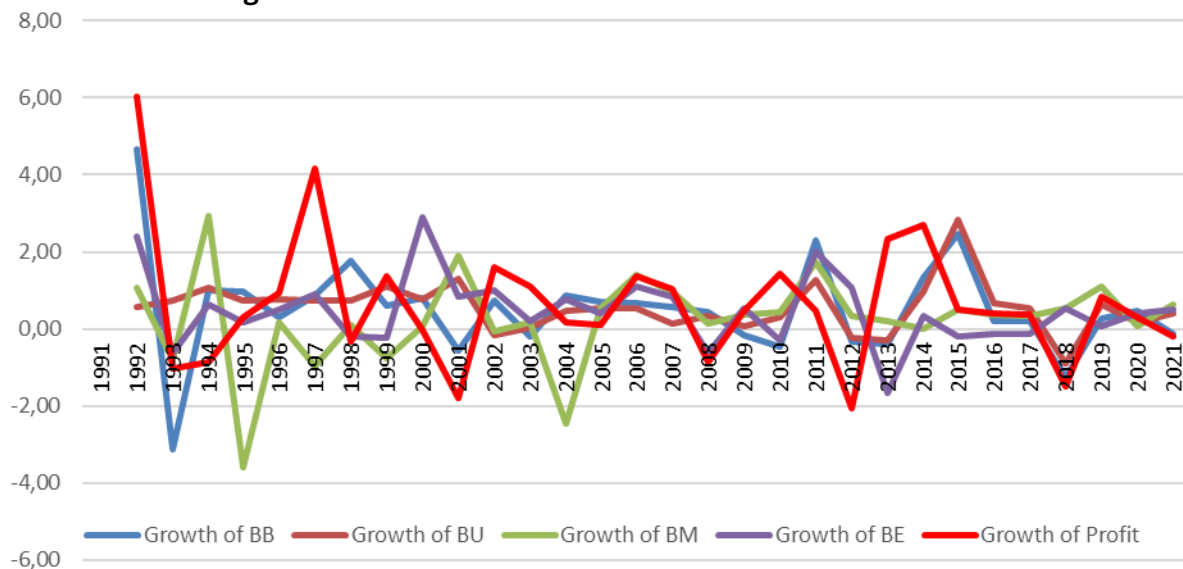
Source: Data processed by researchers (2023)

The coefficient value of the labor cost variable is 0.93, so this value illustrates that if there is an increase in wage costs by 1, profits will increase by 0.93. The positive and significant

influence of labor costs on profits in the plastic packaging industry in Indonesia shows that the higher the wage costs, the higher the profits. Efficiency theory wages state that the more tall wages so the more tall productivity (Handoyo, 2018). That matter Already in accordance with theory that states that cost power Work influence in a way direct production, according to Carter and Usry which was discussed by Krista (2004) costs variable is costs in total will be changed to portion increase nor decrease in production output. This result in line with study Virnayanti & Darsana 2018, where labor costs have a significant influence on profits.

The energy cost coefficient, which is -8.34, illustrates that every increase in energy costs by 1 will reduce profits by -8.34. Energy costs own influence negative and significant to profit, energy cost form cost electricity, diesel, petrol, gas etc. Result of study This in line with research conducted by Sanjaya (2018), shows that energy costs in the form of partial electricity costs have a significant influence on production output. In this study, the energy cost coefficient is negative, which indicates that when energy cost growth increases and profit growth decreases, this indicates that there is waste in energy use and vice versa, if energy cost growth decreases, profit growth will increase, this indicates that there are savings. energy in the plastics industry for packaging in Indonesia.

Figure 4. Growth in Production Costs and Profits 1991-2021



Source: Processed Data Researcher (2024)

Capital costs consisting of from cost rent building, equipment and supplies, and costs other own influence negative However No significant to variable profit with mark coefficient variable of -0.35 with probability value $0.7235 > 0.05$. Negative coefficient value on the variable capital cost shows that If happen an increase in the cost of capital of 1 then profit will down of -0.35. Capital costs in the form of cost rent buildings, machines and equipment No own influence significant to profit. In this study, the energy cost coefficient is negative, which indicates that when the growth of capital costs increases and profit growth decreases, this indicates that there is waste in the use of capital and vice versa, if the growth of capital costs decreases, profit growth will increase, this indicates that there are savings. use of capital in the plastics industry for packaging in Indonesia.

Comparison study This with research that has been done previously namely, this research does not only analyze/look at one production cost variable that influences profits, but this research uses several production cost component variables so that the results obtained are more detailed and complex. Apart from that, this research also shows the development of production costs and profits over a relatively long period, namely 1991-2021, so that this

research can explain the phenomena, trends and historical patterns of the plastic industry for packaging in Indonesia from time to time to the maximum extent. This research is in line with that conducted by Hindi & Yasa, (2023), Windyata *et al*, (2021) and Ramadhan, (2020), which shows that component cost production highest is raw raw material costs and auxiliary materials standard.

Based on research conducted by Rohmat & Suhono, (2021) and Asmara *et al*, (2019) production costs have a positive effect on net profit and costs material standard domestic own greatest influence to performance industry compared to variable cost other. Influence raw raw material costs and auxiliary materials standard and helper from source more domestic big compared to variable cost other caused by structure cost industry indeed share the biggest is raw raw material costs and auxiliary materials standard domestic nor international. According to Widyawati, (2020) and Saragih *et al* (2018) production costs have a significant influence on profits, where the higher the production costs, the lower the level of profit. This is also in line with the results of this research. Capital costs consisting of rental costs for buildings, equipment and machines are included in the lowest production cost components and do not have a significant effect on the plastic packaging industry in Indonesia, these costs are not directly related to production quantity (Sari & Munandar, 2022).

CONCLUSION

Based on results analysis influence structure cost production to profits to the industry plastic for packaging of the period 1991-2021, obtained conclusion as following This namely, Structure cost production in industry plastic for packaging in Indonesia has experience significant developments, based on analysis structure cost component raw raw material costs and auxiliary materials standard is composition cost production highest with percentage 82.29 percent. Benefits to the industry plastic for packaging has experience growth amounting to 20.75 percent per year. Influence structure cost production significant to profit, however variable capital costs do not influential significant to profits to the industry plastic for packaging in Indonesia. Coefficient negative on the variable capital costs and expenses energy means has happen savings capital and energy use material burn, so profit increase.

LIMITATION

This research has limitations in its preparation, namely that there is one research object, namely the plastics industry for packaging in Indonesia, while other industries in the plastics industry are relatively numerous and varied, so the analysis in this research is only concentrated on one research object. This can be used as a reference for future researchers so that similar research can explain more than one research object and obtain broader and more complex results.

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