



## How Costs are Treated Under Activity-Based Costing in The Chemical Corporation

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**Abstract.** This article describes how to apply costs based on the determination of Activity-Based Costing in a chemical company. Global competition is increasing, causing every company from various fields that are competing to require accurate information and cost calculation methods in assessing the achievement of profitability. This research uses the literature survey method and conclusions are drawn from theoretical analysis and discussion results. This research will add insight into how to apply costs based on the determination of Activity-Based Costing in chemical companies. Cost management methods such as Activity-Based Costing (ABC) are widely applied in companies. By using the Activity-Based Costing method, information and calculation of cost of goods will be more accurate, because Activity-Based Costing describes the value system in the company's activities used by each product. The method of calculating costs with the Activity-Based Costing system based on activities, will generate greater profits than conventional (traditional) systems. Therefore, the Activity-Based Costing system plays a role in measuring and evaluating the level of achievement of company profitability, because the Activity-Based Costing System has better accuracy than using conventional methods to increase profitability and decision making.

**Keywords:** Activity-Based Costing, The Chemical Corporation, profitability, Costs.

### 1. Introduction

Increasing global competition and the increasingly diverse needs of the community have caused the economy in Indonesia to grow rapidly and the higher level of competition between companies, both those engaged in industry, services and trade. Therefore, every company must prepare a strategy that is able to achieve long-term goals. This can be achieved if the company is able to adapt to its environment. Because the environment is an external factor that affects the life and development of the company, including economic, political, socio-cultural, demographic and technological conditions (Supriyono, 1994: 4).

In the face of current global competition, companies must have the right strategy so that the company can survive and compete, by having an advantage in the quality of its products and services compared to other companies that are its competitors. Because basically the main goal of the company is to make a profit and maintain the company's survival. So that the strategy needed by the company to increase profitability is to increase sales volume, selling prices that are not greater than market prices or equal to market prices, good service to customers.

In increasing the profit or profitability of a company, the company must be able to determine the right product selling price. Thus the costs charged to the product are not more than the costs that should be (overcosted) and also not charged less than they should be (undercosted), so that the company can determine the selling price of products that are competitive or even cheaper than competitors with the same quality or even better than competitors.

In determining the right product selling price, the right calculation of the cost of goods produced must also be made. The cost of goods manufactured has a very important role in determining the selling price of the product. More precise costing will result in a more accurate cost of goods/services. Therefore, the company must be really serious about handling its cost of goods produced (Mulyadi, 2007).

Inaccuracy in the calculation of the cost of goods manufactured can be detrimental to the company, because the cost of goods manufactured is the basis for setting selling prices and profits, a tool for measuring the efficiency of the implementation of the production process and the basis for decision making for company management. Therefore, a new method of calculating the cost of goods manufactured has emerged, known as Activity-Based Costing (ABC). Activity-Based Costing is an improvement method from the Conventional (Traditional) System. Activity-Based Costing is a more accurate and relevant cost calculation method.

Activity-Based Costing is a method of charging product costs based on activities that exist in the company (Ginting et al., 2022). There are two important things that underlie the thinking of Activity-Based Costing, the first is that costs have a cause and the cause of costs is activity and the second is that the cause of costs (ie activities) can be managed. Activity-Based Costing can provide a reflection of the company's best estimate of the costs that produce and add value to the product.

## **2. Literature Review**

### **2.1. Cost of Goods Manufactured**

The cost of goods produced is an important thing that needs to be considered by the company, because with the right determination of the cost of goods produced, it will provide benefits to the company. According to Sunarto (2003) the definition of cost of goods is the value of sacrifices to obtain goods or services as measured by the value of currency. According to Drs. Bambang Hariadi (2002: 66-67), cost of goods is very valuable information for producers because this information is the basis for assessing inventory, cost of goods sold, profit calculations and a number of other important decisions.

It can be concluded that Cost of Goods Manufactured is all production costs used to process a raw material into finished goods in a certain period of time (Azzahra, et al., 2022). Determination of the cost of goods manufactured is useful for calculating the company's profit or loss which will be reported to external parties of the company (Muda et al., 2020). In addition, the cost of goods produced has a role in making company decisions for several things such as accepting or rejecting orders and making or buying raw materials. Therefore, the costs incurred by the company to produce a finished product can be calculated to determine the right selling price.

Cost of goods manufactured consists of three elements, namely Raw Material Costs, Direct Labor Costs, and Factory Overhead Costs (Lubis et al., 2022). The cost of goods manufactured is calculated from the production costs associated with the completed product during a certain period. The initial work-in-process must be added to the production cost of the period and the final work-in-process inventory must be deducted to obtain the cost of goods manufactured (Garrison, Noreen, and Brewer, 2006: 60).

### **2.2. Activity-Based Costing Method**

Activity-Based Costing is a method that applies the concept of activity accounting to produce a more accurate calculation of product cost. However, from a managerial perspective, the Activity-Based Costing system offers more than just accurate product cost information, but also provides information about the cost and performance of activities and resources and can accurately trace costs to cost objects other than products, such as customers and distribution channels (Femala 2007).

Activity Based Costing is applied in various fields of companies including companies in the chemical sector. Activity-Based Costing is an accounting method that focuses on the activities performed to produce products or services. Activity Based Costing is a method of determining the cost of production that is intended to present cost of goods information carefully for the benefit of management, by carefully measuring the resource consumption of each activity used to produce products. Activity is a basic unit of work carried out by the company with the aim of assisting planning, control, and decision making for management. Activities are needed to charge costs to cost objects, known as cost activities associated with cost drivers.

Cost drivers are factors that cause changes in activities, can be measured and used as a basis for charging activity costs to certain cost pools.

There are two cost drivers :

- Resource driver  
A measure of the quantity of resources consumed by an activity.  
Example: Percentage of floor area used for an activity.
- Activity driver  
A measure of the frequency and intensity of demand for an activity against a cost object, used to charge from a cost pool to a cost object.  
Example: The number of different component parts is used to measure the consumption of material utilization activities for each product.

The premise of the Activity-Based Costing approach is that the company's products or services are performed by activities, where the required activities use resources that cause costs. Resources are charged to activities, then activities are charged to cost objects based on their use. Activity-Based Costing introduces a causal relationship between cost drivers and activities.

With Activity-Based Costing, factory overhead costs are charged to cost objects such as products or services by identifying the resources required to produce the output. Cost drivers are used to calculate the resource cost of each unit of activity. Then each resource cost is charged to the product or service by multiplying the cost of each activity by the quantity of each activity consumed in a given period. Thus, management can maintain and even improve the quality of products or services while focusing on reducing costs.

### **The foundation of Activity-Based Costing**

- Cost is caused.  
Costs have causes and the causes of costs are activities. Thus, a deep understanding of the activities that cause costs will put company personnel in a position to influence costs. Activity-Based Costing stems from the basic belief that resources provide the ability to perform activities, not just cause costs to be allocated.
- The causes of costs can be managed.
- The causes of costs (i.e. activities) can be managed. By managing the activities that cause costs, company personnel can influence costs. Management of activities requires various information about activities (Mulyadi, 2003)
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### **Dimensions of Activity-Based Costing**

- a. Cost Dimension  
Provides cost information about resources, activities, products, and customers (from other cost objects that may be of concern to the company).
- b. Process Dimension  
Provides information on what activities are performed, why, and how well they are performed. This dimension enables companies to make continuous performance improvements by measuring results.

### **Requirements for the application of Activity-Based Costing**

- Diversification of products produced by the company is high.  
The company produces a wide range of products or product lines that are processed using some of the same manufacturing facilities. Thus, problems will arise to allocate or charge the resources consumed by each product.
- The company faces intense competition.  
Accurate cost of goods information will better support various kinds of management decision-making to compete.
- Measurement costs are relatively low.  
The cost of measurement to generate activity cost information is relatively low compared to the benefits that will be obtained from implementing the system in the future.

### **Benefits of Activity-Based Costing**

- Determining the cost of products more accurately, especially to eliminate cross-subsidies so that there is no more overcosting of certain types of cost of goods and undercosting of other types of products (Firdaus and Wasilah, 2009).
- Improving decision-making by using Activity-Based Costing not only presents more accurate information about product costs, but also provides information for managers about activities that cause costs, especially indirect costs, which are important for management in making decisions both about products and in managing activities so as to improve business efficiency and effectiveness.
- Activity-Based Costing helps management to increase product value and process value and makes it easier for managers to control activities that generate overhead costs.

### **Stages in Activity-Based Costing**

- Identify resource and activity costs.
  - o Work done.
  - o How much time it takes to perform the activity.
  - o Resources required.
  - o Information that reflects activity performance.
  - o The value embodied in the activity for the company.
- Charge resource costs to activities.
  - o Activities incur resource costs.
  - o Charge resource costs to activities.
- Charge activity costs to cost objects.
  - o Determine the activity cost per unit.
  - o Measuring activity drivers.
  - o Charge activity costs to cost objects.

### **Advantages of Activity-Based Costing**

- Activity-Based Costing presents product costs more accurately and informatively, leading to better measurement of product or customer profitability and better decisions about selling prices, product lines, and capital expenditures.
- Activity-Based Costing provides a more accurate identification of activity-driven costs. It can help management to increase product value and process value by making better decisions about product design, controlling costs better.
- Directs the organization to be operations or activity oriented.
- Activity-Based Costing provides information about value-added or non-value-added activities (Hansen, Mowen, 2007: 490).

- Activity-Based Costing can provide information to management about activity analysis, namely activity elimination, activity selection, activity reduction, activity division to calculate kaizen costs (Hansen, Mowen, 2007: 493).

#### **Weaknesses of Activity-Based Costing**

- Activity-Based Costing will only have optimum results if it is organized with the right information technology and empowers all resources in the company (Kusnadi, 2001: 650).
- The design of the Activity-Based Costing System must be able to consider human behavior factors (Supriyono, 2003: 285).
- Some costs are still allocated arbitrarily.

### **2.3. Conventional (Traditional) Method**

The conventional method is a cost accounting method that is oriented towards determining product costs with a focus on costs at the production stage. The conventional method only charges the product at its production cost and there is no separation of product costs so that the product cost determined is a global calculation. Conventional methods cannot provide the facts needed by management to manage the company's operations. This is because the conventional cost system only presents cost information, but little or no information is available.

Once it provides operating information, it only presents cost information based on responsibility centers and only provides inaccurate information about product costs (Supriyono: 1999: 267).

There is a lot of information that the conventional method does not tell management. Conventional methods give management little idea when it comes to reducing expenses at a time of urgency. The system only provides management with a report showing where costs were incurred and no indication of what caused the costs.

#### **Advantages of Conventional (Traditional) Method**

- Easy to implement  
The conventional method does not use many cost drivers, in allocating indirect production costs, making it easier for management to perform calculations.
- Easy to audit  
Indirect production costs are allocated based on volume-based measurement, making it easier for auditors to conduct the audit process.

#### **Weaknesses of Conventional (Traditional) Methods**

- Conventional methods overemphasize the objective of determining the cost of products sold. As a result, it provides relatively very little information to achieve an edge in global competition.
- Conventional methods for overhead costs focus too much on the distribution and allocation of overhead costs rather than striving to reduce waste by eliminating non-value-added activities.
- Conventional methods do not reflect cost causality because they often assume that costs are generated by a single factor such as product volume or direct labor hours.
- Conventional methods produce distorted cost information resulting in conflicted decisions.
- The conventional method of classifying direct and indirect costs as well as fixed and variable costs is based on a single causal factor such as product volume, whereas in a technologically advanced environment this classification method is less effective because costs are affected by a wide range of activities.
- Conventional methods classify a company into rigid accountability centers and overemphasize short-term performance.

- Conventional methods do not use sophisticated tools and techniques in information systems in a technologically advanced environment.

### 3. Methods

This research uses a literature survey method and a qualitative approach. A qualitative approach is research that is descriptive and tends to use analysis. The subject's perspective is more displayed in qualitative research. The theoretical foundation is used as a guide so that the research focus is in accordance with the facts. The method used in this research is a literature survey conducted intensively and in detail. This research will add insight into how costs are applied based on the determination of Activity-Based Costing in a chemical company.

## 4. Results and Discussion

### 4.1. Results

Today, company competition in the global era is of great concern, one of which is a company engaged in chemicals. The need for chemical production is increasing, marked by the increase in companies competing in the chemical industry. So that for companies in the chemical industry to continue to run, the right strategy is needed to increase sales and the sustainability of the company. Where in increasing sales must be done determining the cost of goods. In determining the cost of goods there is a Conventional Method, but in its use it is still not optimal so that another more accurate method is needed, namely the Activity-Based Costing method.

If in the Conventional Method the resources used by a company are considered to be absorbed by products, then in the Activity-Based Costing method the resources used by a company are considered to be absorbed by activities. And all activities carried out by a company are absorbed by various things, such as: products, a certain process, decision making, customers, divisions and certain product lines.

Table 1. Differences in product costing Conventional Method and Activity-Based Costing Method

<b>Cost of Production Determination Method</b>	<b>Conventional Method</b>	<b>Activity-Based Costing Method</b>
Purpose	Inventory level	Product costing
Scope	Production	Design, Production, Development
Focus	Raw Material Cost, Direct Labor	Overhead Costs
Period	Accounting period	Product lifecycle
Technology	Manual Method	Computerized

The Activity-Based Costing method assumes that overhead costs can be traced to various products individually. The costs incurred by unit-based cost drivers are costs that in the Conventional Method are referred to as variable costs. The Activity-Based Costing Method improves the accuracy of the calculation of product cost by recognizing that many of the fixed overhead costs vary in proportion to changes other than by production volume. By understanding what causes these costs to increase and decrease, they can be traced to individual products. This causal relationship allows managers to improve the accuracy of product cost calculations which can significantly improve decision making (Femala, 2007).

### 4.2. Discussion

The Activity-Based Costing (ABC) method emerged as an effort to improve the weaknesses of the Conventional Method. Activity-Based Costing is usually used in companies that have overhead costs more than 5 to 10 times their direct labor costs. The Activity-Based Costing method is a method of charging costs to products based on activities in the company. There are two important things that underlie the thinking of the Activity-Based Costing Method, the first is that costs have a cause and the cause of costs is activity and the second is that the cause of costs (ie activities) can be managed.

With the basic concept of the Activity-Based Costing Method, it can provide a reflection of the company's best estimate of the costs that produce and add value to the product. ABC allows the identification of policies, systems or processes that cause activities that will ultimately generate costs. By finding the cause of costs, it allows us to handle or even reduce if necessary, costs that do not add value to the product.

Calculation of cost of goods manufactured using the Conventional Method compared to Activity-Based Costing in certain cases can provide different vital conclusions. In one particular case, for example, the Conventional Method calculation shows profit or profit on a product. However, after calculating using the Activity-Based Costing system it turns out to be a product - a product that is detrimental. In addition, applying Activity-Based Costing in costing means providing opportunities for companies to set selling prices on competitive products or services to win market competition.

The application of the Conventional Method in this era of globalization has many shortcomings when applied to a company. One symptom that this method is outdated is the distortion of production costs that causes the calculation of costs to be too high or too low charged to the product. Several other symptoms will appear due to the use of the Conventional Method, such as the results of product offerings become uncompetitive, competitors' prices seem unreasonably low, products that are difficult to produce show high profits, profit margins are difficult to explain.

The application of Activity-Based Costing in charging factory overhead costs offers many benefits to overcome the weaknesses arising from the application of the Conventional Method. In the Conventional Method, factory overhead costs are allocated and charged using a single cost driver. In this system, the cost driver used is the amount of direct labor, while Activity-Based Costing traces costs to activities and then charged to each product. Activity-Based Costing charges costs to each product based on the activities consumed by the product using cost drivers that are logically correlated. Therefore, the application of Activity-Based Costing in charging factory overhead costs can produce more accurate cost information than traditional costing systems.

Table 2. Traditional System and Abc System

EXPLANATION	PRODUCT XX	PRODUCT YY
● PRODUCTION VOLUME	5.000	15.000
● PRODUCT SELLING PRICE	\$ 400	\$ 200
● DIRECT MATERIAL COST & LABOR	\$ 200	\$ 80
● DIRECT WORKING HOURS	25.000	75.000

Table 3. Activity Tracking, Activity Driver and Cost Pool

ACTIVITY	COST POOL	ACTIVITY DRIVER
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● ENGINEERING	\$ 125.000	ENGINEERING WATCH●
● SETUP	\$ 300.000	TOTAL SETUP●
● MACHINE SPIN	\$ 1.500.000	MACHINE WATCH●
● PACKING	<u>\$ 75.000</u>	ORDER TOTAL●
	\$ 2.000.000	

Table 4. Consumed Activity:

ACTIVITY TYPE	PRODUCT CONSUMPTION XX	PRODUCT CONSUMPTION YY	TOTAL CONSUMPTION
● ENGINEERING WATCH	5.000	7.500	12.500
● TOTAL SETUP	200	100	300
● MACHINE WATCH	50.000	100.000	150.000
● ORDER TOTAL	5000	10.000	15.000

1. BOP Analysis Through Traditional Approach

Table 5. BOP Analysis

● TOTAL FACTORY OVERHEAD COSTS		: \$ 2.000.000
● TOTAL DIRECT WORKING HOURS (25.000 + 75.000)		: 100.000 JKL
● OVERHEAD CHARGES (\$2.000.000/100.000 JKL)		: \$ 20/JKL
BOP LOADS TO PRODUCTS "XX"		
● TOTAL BOP CHARGED (25.000 X \$ 20)		: \$ 500.000
● PRODUCT BOP RATES "XX" (\$ 500.000 : 5.000 UNIT)		: \$ 100/UNIT
BOP LOADS TO PRODUCTS "YY"		
● TOTAL BOP CHARGED (75.000 X \$ 20)		: \$ 1.500.000
● PRODUCT BOP RATES "YY" (\$ 1.500.000 : 15.000 UNIT )		: \$ 100/UNIT

2. BOP Analysis Through ABC Approach

Table 6. ABC Approach

EXPLANATION	COST	Σ ACTIVITY	RATES
● ENGINEERING WATCH	\$ 125.000	12.500	\$ 10
● TOTAL SETUP	\$ 300.000	300	\$ 1.000
● MACHINE WATCH	\$ 1.500.000	150.000	\$ 10
● ORDER TOTAL	<u>\$ 75.000</u>	15.000	\$ 5
	<u>\$ 2.000.000</u>		

Product "XX" Per Unit

Table 7. Activity Driver

ACTIVITY DRIVERS	RATES	Σ ACTIVITY	TOTAL BOP	BOP/UNIT
● ENGINEERING WATCH	\$ 10	5.000	\$ 50.000	\$ 10
● TOTAL SETUP	\$ 1.000	200	\$ 200.000	\$ 40
● MACHINE WATCH	\$ 10	50.000	\$ 500.000	\$ 100
● ORDER TOTAL	\$ 5	5.000	<u>\$ 25.000</u>	<u>\$ 5</u>
● TOTAL BOP PER UNIT			\$ 775.000	<u>\$ 155</u>

Product "YY" Per Unit



Table 8. Total BOP/Unit

ACTIVITY DRIVERS	RATES	Σ ACTIVITY	TOTAL BOP	BOP/UNIT
● ENGINEERING WATCH	\$ 10	7.500	\$ 75.000	\$ 5,00
● TOTAL SETUP	\$ 1.000	100	\$ 100.000	\$ 6,67
● MACHINE WATCH	\$ 10	100.000	\$ 1.000.000	\$ 66,67
● ORDER TOTAL	\$ 5	10.000	\$ 50.000	\$ 3,33
● TOTAL BOP PER UNIT			\$ 1.225.000	\$ 81,67

Product Profitability Analysis of the Traditional Approachs

Table 9. Product Profitability Analysis

EXPLANATION	PRODUCT XX	PRODUCT YY
● SELLING PRICE	\$ 400	\$ 200
● COST PER UNIT	\$ 200	\$ 80
● MATERIALS & DIRECT WAGES	<u>\$ 100</u>	<u>\$ 100</u>
● OVERHEAD CHARGES	<u>\$ 300</u>	\$ 180
TOTAL COST PER UNIT	<u>\$ 100</u>	\$ 20
MARGINS PER UNIT		

ABC System Profitability Analysis

Table 10. ABC System Profitability Analysis

EXPLANATION	PRODUCT XX	PRODUCT YY
● SELLING PRICE PER UNIT	\$ 400	\$ 200,00
● PRODUCT COST		
● MATERIALS & LIVE TK	\$ 200	\$ 80,00
● FACTORY OVERHEADS		
● ENGINEERING	\$ 10	\$ 5,00
● SETUP	\$ 40	\$ 6,67
● MACHINE SPIN	\$ 100	\$ 66,67
● PACKING	\$ 5	\$ 3,33
	<u>\$ 155</u>	<u>\$ 81,67</u>
COST PER UNIT	<u>\$ 355</u>	<u>\$ 161,67</u>
MARGINS PER UNIT	\$ 45	\$ 38,33

Overhead Cost Comparison of Two Costing Approaches

Table 11. Overhead Cost Comparison

EXPLANATION	TRADITIONAL	ABC-SYSTEM	VARIANCE
<b>PRODUCT "XX"</b>			
● TOTAL FACTORY OVERHEAD	\$ 500.000	\$ 775.000	\$ (275.000)
● OVERHEAD PER UNIT	\$ 100		\$ (55)
● MARGINS PER UNIT	\$ 100		\$ 55
<b>PRODUCT "YY"</b>			
● TOTAL FACTORY OVERHEAD	\$ 1.500.000	\$ 1.225.000	\$ 275.000
● OVERHEAD PER UNIT	\$ 100	\$ 81,67	\$ 18,33
● MARGINS PER UNIT	\$ 20	\$ 38,33	\$ (18,33)

## 5. Conclusion

Activity-Based Costing (ABC) is a method of determining the cost of goods where overhead costs are based on activities carried out in the production process. While the cost of goods is the cost needed to produce a product, it consists of three components, namely raw material costs, labor costs, and factory overhead costs. In determining the cost of goods, there are two approaches that can be used, namely the Conventional (Traditional) Method and Activity-Based Costing (ABC). The benefits of Activity-Based Costing are better measurement of profitability, better decision making and process improvement.

The disadvantages of Activity-Based Costing are that not all costs have activities, identified costs tend to include all related costs and the length of the Activity-Based Costing implementation process. The advantages of Activity-Based Costing are more accurate product costs, Activity-Based Costing pays attention to all activities, Activity-Based Costing recognizes many activities that cause costs, Activity-Based Costing also pays attention to variable costs contained in indirect costs, and Activity-Based Costing is flexible enough to track costs based on various objects.

Based on the results of the study, it can be concluded that the calculation of the cost of production using the Conventional Method produces a lower value than the Activity-Based Costing method, because Activity-Based Costing describes the cost of production more accurately than the Conventional Method.

## Reference

- Azzahra, A. S., & Arini, I. M. (2022). The Accounting Information Systems of Conversion Cycle (Raw Materials, Labor And Overhead) Special In The Pharmaceutical Industry. *Journal Of Pharmaceutical Negative Results*, 4195-4202. <https://www.pnrjournal.com/index.php/home/article/view/5301>
- Bambang, Hariadi. 2002. *Akuntansi Manajemen Suatu Sudut Pandang*. Edisi Pertama, BPFE, Yogyakarta
- Femala, Fieda. 2007. *Penerapan Metode Activity Based Costing dalam Menentukan Besarnya Tarif Jasa Rawat Inap (Studi pada RSUD Kabupaten Batang)*. Fakultas Ekonomi, Universitas Islam Indonesia.
- Firdaus, Ahmad dan Wasilah. 2009. *Akuntansi Biaya*. Jakarta: Salemba empat.
- Ginting, A. P., Fahrezy, I. A., Putra, R. T., Aruan, R. B., & Muda, I. (2022). Activity Based Costing: A Tool To Aid Decision Making In Pharmaceutical Firms. *Journal of Pharmaceutical Negative Results*, 2949-2954.
- Garrison, Ray H., Eric W. Noreen, dan Peter C. Brewer. 2006. *Akuntansi Manajerial*. Jilid 1. Jakarta: Salemba Empat.
- Hansen, Don R., dan Maryanne M. Mowen. 2007. *Management Accounting*, 8<sup>th</sup> edition. South-Western, USA: Thomson Learning.
- Kusnadi. 2001. *Akuntansi Biaya (Tradisional dan Modern)*. Yogyakarta. BPFE
- Lubis, S. S., Maherza, W., Ziwiana, N. D., & Muda, I. (2022). Flexible Budget and Overhead Analysis in Pharmacy Issuers. *Journal of Pharmaceutical Negative Results*, 2931-2936.
- Mulyadi. 2007. *Akuntansi Biaya*. Yogyakarta: STIE YKPN.
- Muda, I, Nurlina, Erlina & Nuradi, T.E. (2020). Stage of Takeoff Based on Rostow's Theory for the Role of Manufacture of Non-metals, Except Petroleum and Coal Manufacture to the Economic Increase. *Research in World Economy*. 11(5). 177-185. <https://doi.org/10.5430/rwe.v11n5p177>
- Sunarto. 2003. *Akuntansi Biaya*. Yogyakarta: Penerbit AMUS Yogyakarta dan Mahenoko

Total Design Yogyakarta.

Supriyono. *Akuntansi Manajemen I: Konsep Dasar Akuntansi Manajemen Dan Proses Perencanaan*. Yogyakarta: BPFE. 2000.

Supriyono. 1994. *Akuntansi Biaya: Pengumpulan Biaya dan Penentuan Harga Pokok Produksi*, Edisi 2. Yogyakarta. BPFE.

Supriyono. 2000. *Akuntansi Manajemen I: Konsep Dasar Akuntansi Manajemen Dan Proses Perencanaan*. Yogyakarta: BPFE.