

Common Products, by-Products, Accounting and their Impact on Sales Revenue and Methods of Processing them as Additional Revenues for the Company in Addition to the Revenues of the Main Products

Khaleel Radhi Hasan Alzly, Taher Mohammed Abdalamer

Al Furat AlAwsat Technical University

Article Info

Volume 83

Page Number: 962 - 975

Publication Issue:

May-June 2020

Abstract:

There are some companies that produce many non-similar products at the same time by using one raw material (raw) in a single production process, called these products (joint products) .Consequently, this process entails costs called common costs, since many management decisions (pricing, selling, product cancellation, disposal) depend largely on the accuracy of cost allocation and measurement among these products. The joint process is called "spin-off products", which have very little value, where companies calculate the revenue of these by-products (spin-off) within the revenues of the industrial company and how to account for them and the methods used to calculate them . economic units mostly produce and sell more than one product from the products, there are economic units that use several production processes to produce various products, and some of these units use a single production process such as oil refining companies, which generate several products (gasoline, gas, oil,. ... etc.) from one supplier or one substance which is (crude oil).

Keywords: common products , By-products , Sales revenues and main products.

Article History

Article Received: 11 August 2019

Revised: 18 November 2019

Accepted: 23 January 2020

Publication: 09 May 2020

Introduction

All economic units mostly produce and sell more than one product from the products, there are economic units that use several production processes to produce various products, and some of these units use a single production process such as oil refining companies, which generate several products (gasoline, gas, oil,. ... etc.) from one supplier or one substance which is (crude oil). The only process that no product can produce without other products is called a joint process and the products that are produced from this process are called joint products, which are not identical and are produced from a single joint material and one manufacturing process and that their production process Other products are automatically generated. Among these products that produce automatically products called (by-products) such as (tar, asphalt) in some companies. Here in this

research, a spotlight was shown on the by-products (secondary) and how to account for them by addressing the clarification of common products in industrial companies and their costs, how to allocate costs to the joint products that result from the joint process, and what are the costs and revenues of the by-products. The research was divided into several topics, where the first topic was divided into two axes, where the first axis related to common costs in general and what are their characteristics and distributions. The second axis has been devoted to talking about spin-off products(By- products) that are produced alongside major products, how to account for them, and some examples of them. As for the second topic, it has been devoted to the applied side, so a special questionnaire has been developed and distributed to specialized industrial companies such as Al-Samawah Refinery, Al-

Diwanayah Refinery, and some companies of an agricultural and animal wealth nature in the country. Through the questionnaire and the results that will be reached, it is determined whether the revenues accruing to occasional products add additional income to the company, which is used to raise the company's revenues compared to the costs spent on its production.

Research problem:

The research problem lies in how to distinguish between the main common products and by-products in industrial, agricultural and animal companies. How to conduct accounting treatments for by-products in these products, the extent to which the revenues of these products affect the companies' budget and how they affect the net activity.

Research importance:

The importance of the issue lies in addressing the revenues generated from by-products, which can add additional revenue to the net activity of companies.

Research objective:

The research aims to shed light on the term accidental products in companies and the accounting treatment methods for these products and the extent of the impact of these revenues on the net activity of economic units in a manner consistent with accounting assumptions and principles.

Research hypothesis:

The research is based on a basic hypothesis that the accounting treatments for by-products will help in measuring the results of companies' activities accurately by showing the net financial position of companies by adding additional revenue by selling these spin-off products.

Research Methodology:

The researcher relied on the descriptive approach through adopting the theoretical study method by

relying on some Arab and foreign books and sources, as well as adopting the survey side through a questionnaire that was prepared and distributed to some industrial and agricultural companies and through the use of the Likert pentagon scale using the statistical (SPSS) program.

First Topic**First axis: Common Costs, Characteristics and Distribution.**

Some companies produce several products that are not the same at the same time using one type of material in the production process. These products are called (common products), and the costs arising from this process are called (shared costs), and that many management decisions depend on the accuracy of these costs in pricing, selling, and other decisions.

First: Allocating the common costs:

Sometimes the economic unit produces and sells more than one product, and this economic unit uses several production processes to produce different products.

Like the petroleum refining process in which economic units use one process from which several products such as (gasoline, gas, oil, etc.) are generated from a single substance, which is crude oil. The process that cannot produce a single product is called a joint process. The products that are produced from this process are called joint products. Among the characteristics of these products is that they are not similar and are produced from one common raw material and one production process. It is not possible to produce a specific product without the appearance of other products. (Nassif and Jalila, Advanced Cost Accounting, 2008, Iraq, Baghdad).

Common products are classified into the following:

- **The main products .**

- **By-products .**
- **Waste (scrap) .**

Common products are the primary or original products or outputs of the joint process. Classifying products into these three categories depends on the sales value.

***Main Products:**

They are the products that are essential and gain importance from their selling value, so that their selling value is large and high compared to other products and items.

It is possible that the economic unit can produce one main product or several products at one time (shredded chicken, table eggs) from one input, and the fish production company produces (Fresh fish, frozen fish, canned fish) are all major products, as well as in petroleum companies (gasoline, motor oil, kerosene) are all major products.

***By-products:**

They are products that are accidentally produced for the combined operation. These products are less important than the main products because their value is less than the value of the main products, such as asphalt in the petroleum refining process and soil fertilizer in livestock, and sawdust in the wood and bone manufacturing process in the meat and cotton seed production process in the yarn industry .. Etc.). (Nassif and Abd Khalaf, Cost Accounting, 2012, second edition, Iraq, Baghdad.)

And that these products cannot be excluded from the production process or their production cannot be abandoned because they are among the common process outputs of the main products.

***Waste (scrap) :**

They are emergency and secondary outputs, which are residual outputs or residues that have no sales value and are often unavoidable products in some industries, and some economic units seek to reduce them by changing production process techniques in order to create value Sales of these products.

Below is an illustrative table of common products (Nassif and Abdel Khalaf, Cost Accounting, Second Edition, 2012, Iraq, Baghdad) .

Seq	Main products	Industrys	By-products
1	Petroleum refining	Gasoline ,kerosene, motor oils, greases, etc.	Tar , asphalt .
2	Produce white and red meat .	steaks	Bone skin
3	Dairy production	Fresh cheese , canned cheese , curd .	Buttermilk
4	Metal prospecting for copper	Silver , lead , zinc .	Blue stone , malachite(mollusks).

Second: Characteristics of Common Costs:

There are characteristics of common costs as follows:

1. It occurs before the point of separation.
2. There are more than one product classified within the joint production process with these costs.
3. Common products cannot be distinguished with these costs until we reach the point of separation.
4. Common costs appear in the analytical industries.
5. The cost accountant must perform the process of allocating costs or distributing them between the common products before the point of separation.

• Common Costs and Disconnection Point:

The following figure shows the point of separation and allocation of costs for each type of product, whether it is major or incidental products or waste, as follows: (Nassif and Abd Khalaf, Cost Accounting, 2012, second edition, Iraq, Baghdad).

Third: Methods for allocating common costs:

There are several methods for allocating shared costs, including:

A) The physical output method:

This method is considered one of the easiest ways to allocate joint costs, which are based on the number of units produced or sold as a basis for allocation.

This method is used in the case of using a single unit of measurement for all outputs, and among these measures:

1. Ton of raw metal in the exploration industry.
2. A barrel is a derivative in the petroleum refining industry.
3. Kg or ton in the canning industry.
4. The number of units in the electronics industry.
5. meters in the manufacture of yarn and threads.

Where the common costs are distributed and the share of each product is extracted through the use of two methods, as follows:

First method:

Calculating the percentage of common costs as follows:

1. The ratio of joint costs of a product = the number of units produced or sold from the product \ total number of units of the joint products
2. Calculating the product share of the joint costs as follows:
3. Product share = Shared costs * Ratio of shared costs of a product

Second method:

The average common costs per unit of the common products as follows:

1. Average unit shared costs = shared costs \ total number of units for shared products
2. The producer's share of the common costs, as follows:

Product share = average common cost * number of units produced or sold for a common product

B) Financial method:

The advantages that can be obtained from the financial (monetary) methods through the overall method of allocating the joint costs are that the financial methods take into consideration the relative ability of each product to generate profits from the sales revenue. There are three methods under the financial (cash) method:

1. Method of selling value at the point of separation:

According to this method, the joint costs to the joint products are determined on the basis of the percentage of the selling value of these products at the point of separation. For the purpose of using this method, all joint products must be salable or can be settled at the point of separation, as the product whose selling price is lower relative to other common products results in allocating the lowest unit costs in the overall method.

3. Method of net verifiable value at the point of separation:

Under this method, shared costs are assigned or allocated based on the proportionate, verifiable value of each common product at the point of separation. The net realizable value is equal to the unit sale price of each product at the point of separation minus any cost necessary to prepare and sell that product.

For the purpose of applying this method, all products must be salable or marketable at the point of separation. That is, it takes into account the costs that must be borne at the point of separation to achieve the estimated sales revenue.

When the costs of selling or marketing are relatively high, the distribution of the joint costs based on the selling value at the point of separation and based on the realizable value will be fundamentally different. (Nassif and Jalila, Advanced Cost Accounting, 2008, Iraq, Baghdad).

3. Approximate net realizable value method at the point of separation:

There are some or all of the common products that may have no selling value at the point of separation. That is, it cannot be marketed because it needs additional manufacturing processes after separation.

This method requires calculating the net realizable present value at the point of separation to distribute the shared costs, and this value is calculated for each product based on the final selling price of the unit minus the different costs of separation.

Second Axis :

Concept of By-Products and their characteristics:

Concept of By-Products:

The tracker notices that there is a difference between the spin-off products and the main co-products.

Accidental products, or as they are called secondary, are products that are produced incidentally, or in a healthier sense, they are products that are produced alongside major products.

There is a main product with full ingredients, and there is an accidental (secondary) product that supplements the main product, and the main one is intended for the establishment of the project. (Almqsid, 1998) .

Also, by-products can be defined as (products that result from joint production stages, but they have little selling value compared to the product or major products and examples of many by-products such as (bitumen, kerosene in petroleum industries) (Hornsgorn, 1986).

In agriculture, for example (the production of hay as animal feed is a by-product (by-product) along with wheat and barley crops) .

Accidental products are defined as (products that result from an operation or group of industrial processes of inputs or uses and cannot be distinguished before this process and none of them can be ignored at the same time, because each of them has an economic value and the relative importance varies. (Baligh, 1985) .

Characteristics of By-products:

Occasional products are considered to have low material value compared to the main products, and therefore they are often sold as they are when separated from the main common products at the point of separation.

Accounting for By-products:

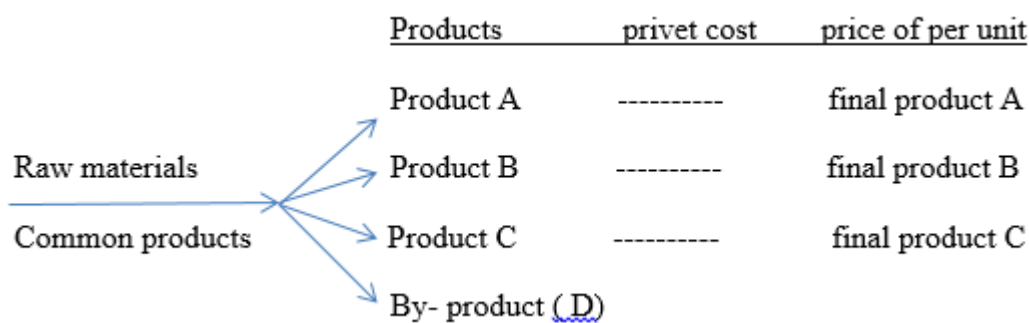
Spin-off products are common products, but their selling value is negligible compared to major products, such as cotton seeds from the common scoop.

The incidental products are not charged any share or part of the joint costs. In other words, the common costs are distributed only to the main products, but the occasional products are charged at any cost spent on them if additional manufacturing operations are required after the point of separation.

By-products have little selling value, so there are several ways to handle sales revenue from incidental products, which are as follows:

1. The method of net product sales revenue as an additional sales revenue to the main product sales, and the net product of the accidental product is equal to the sales revenue minus costs due to additional manufacturing operations or selling the product. This treatment is only in the income statement.
2. The method of net revenue of incidental product sales as a reduction of the common costs of the main products. Under this method, the net product sales revenue is lower than the total common costs of the main products. In the event of a stock of the by-product, it is valued in two ways:
 - A) Inventories are valued based on total co-production costs.
 - B) Inventory is valued based on net co-production costs (after downloading the accidental product revenue).

Example of common and By- product costs:



Here, (By-product) sub product is treated as revenue as follows:

- 1.Reducing the common costs by importing the by-product and distributing the net on the common products.
2. Failure to reduce joint costs and distribute them entirely to common products, and to place the incidental product income in the income statement as a sub-income.

Example:

Company (S) applies the method of realizable net realizable value to allocate joint costs, knowing that product (D) is a by-product (incidental), and the following are the data associated with this company:

Products	Production units	Sold units	Price of unit	Operation cost
A	5000 units	4500 units	15 /d	10000/d
B	6000 units	5800 units	13/ d	7000/d
C	4000 units	3000 units	10/d	6000/d
D	300 units	300 units	4/d	-----

If you know that the shared costs include 25,400 dinars as raw materials, 15,250 dinars, wages for workers and 14,100 other additional costs, and that the revenue generated from the incidental product (D) is not treated within the occasional revenue in the income statement.

The required: allocating the joint costs, then calculating the percentage of gross margin for the

three products and for the company as a whole, respectively:

Solution :

Materials 25400
+ wages 15250
+ add cost 14100
Total 54750

Processing By-product revenues :

Sale value to product (D) = $300 * 4/d = 1200 /d$

Common costs = 54750 / d

Common costs after deducting the value of By-product
= $54750 - 1200 = 53550 / d$

The net selling value of the main common products :

Products	Selling value	Privet cost	Net selling value
A	$5000 * 15 = 75000 / d$	10000	$65000 / d$
B	$6000 * 13 = 78000 / d$	7000	$71000 / d$
C	$4000 * 10 = 40000 / d$	6000	$34000 / d$
Total	-----	-----	$170000 / d$

- Allocating common costs after reducing them by accidental revenue :

Product A = $53550 * (65000/170000) = 20475 / d$

Product B = $53550 * (71000/170000) = 22365 / d$

Product C = $53550 * (34000/170000) = 10710 / d$

- Determine the cost of the stock at the end of the period :

First : Determine the stock quantity at the end of the period :

Products	Production	Sales	Stock quantity
A	5000 units	4500 units	500 units
B	6000 units	5800 units	200 units
C	4000 units	3000 units	1000 units

Second : Determine the cost of the stock at the end of the period :

Inventory cost is the last period for each product = [(joint costs + special) ÷ the amount of its production] x the amount of the stock from it

Product A = [(20475 + 10000) / 5000)] * 500 = 3048 / d

Product B = [(22365 + 7000) / 6000)]* 200 = 979 / d

Product C = [(10710 + 6000)/ 4000)]*1000 = 4178 / d

- Extraction of the gross margin ratio :

Paragraphs	product A	product B	product C	total
The sales amount is	4500	5800	3000	
×Unit sale price	15	13	10	_____
Sales revenue	67500	75400	30000	172900
Subtracts the cost of sales:				
Production costs:				
Common costs	20475	22365	10710	53550
Special costs	10,000	7000	6000	23000
Total production costs	30475	29365	17710	76550
During the period				
+Cost of inventory at the beginning of the period				
_ Stock cost last period (3048)	(979)	(4178)		(8205)

Cost of sales	27,427	28,386	13532	43797
Gross profit	40073	47014	16468	103555

Profit margin ratio	59%	62%	54%	59%

Second Topic : Applied Side (questionnaire)

In this topic, a questionnaire was prepared with a number of one hundred papers, each paper contains ten questions, where it was distributed to the oil refinery in Samawa with twenty-five papers and Al-Fao Oil Products Company numbered twenty-five papers and fifty papers were distributed to Diyala

Company for Livestock Products and the number of valid papers was seven ninety-paper and three papers are not valid as the following analysis, which was through the use of the program (SPSS) and the use of the five-Likert scale and the results were as follows:

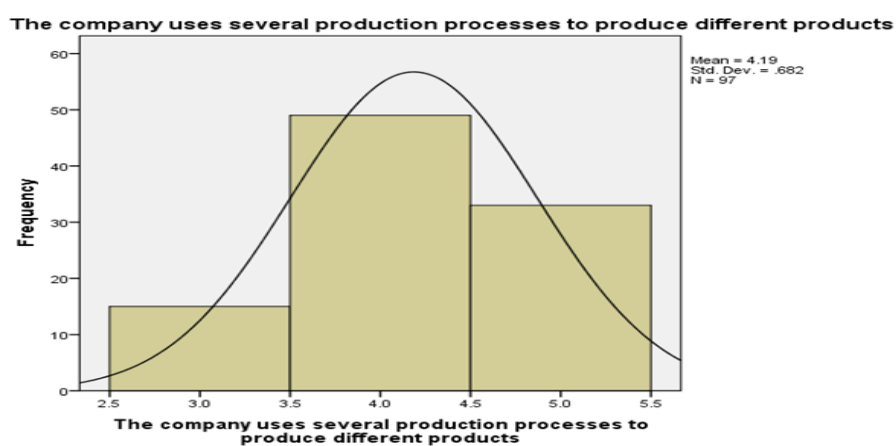
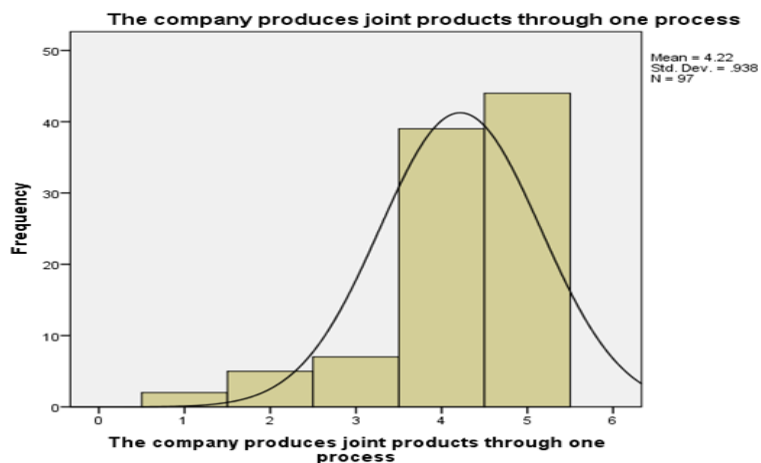
sex :			
Male and Female			
Valid Percent	Percent	Frequency	
3.0	3.0	3	valid
71.0	71.0	71	male
26.0	26.0	26	Female
100.0	100.0	100.0	Total

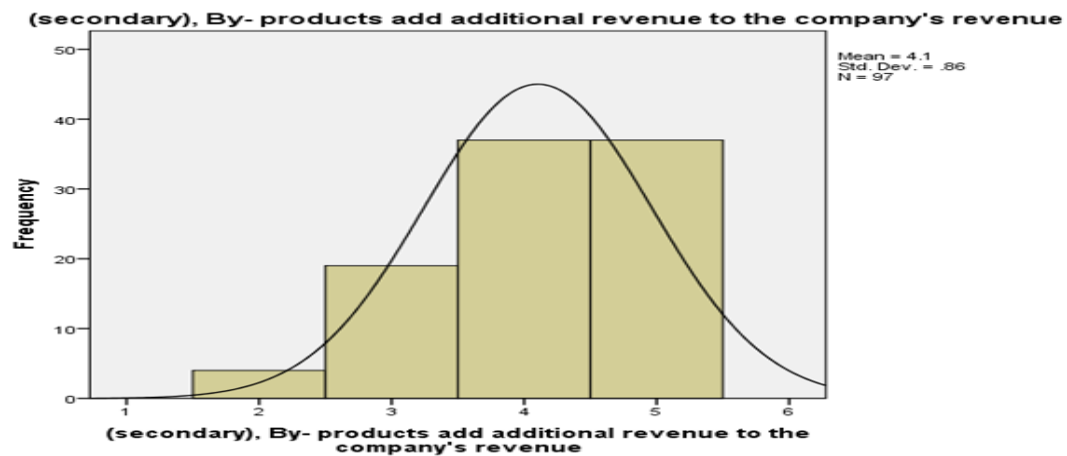
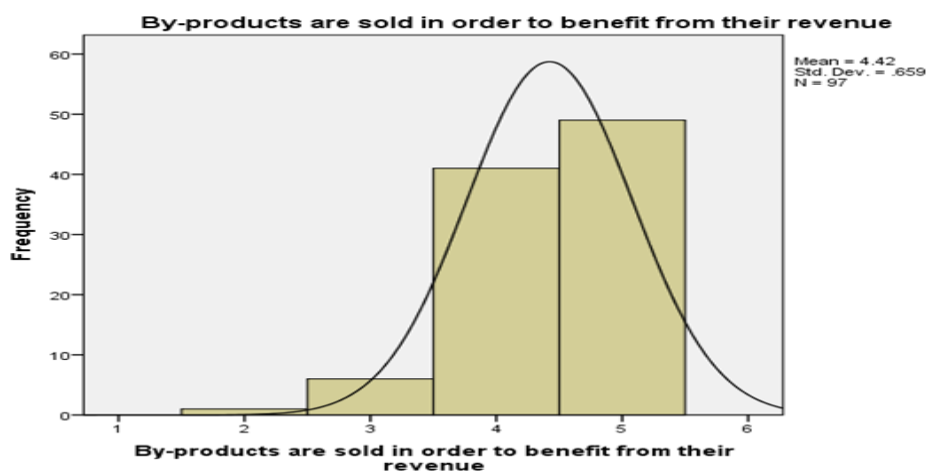
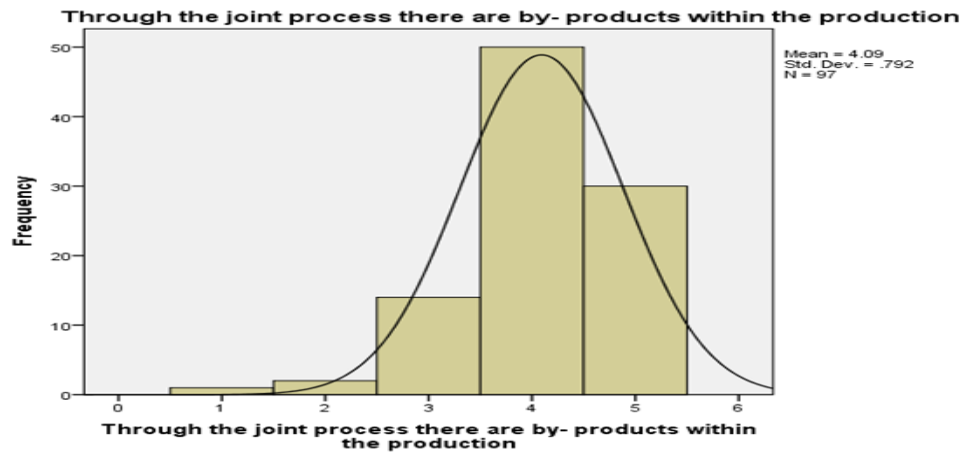
age and service and degree			
	service years	age of partner	academy degree
Valid	97	97	97
Missing	3	3	3
Mean	1.38	2.59	2.55
Minimum	1	1	1
Maximum	3	4	4

Analysis of Questionnaire						
seq.	paragraphs	Mean	Std. Deviation	Range	Median	percent
1	The company produces joint products through one process	4.22	0.938	4	4.00	45.4 agree strong
2	The company uses several production processes to produce different products	4.19	0.682	2	4.00	50.5 agree
3	The company produces several main products through the joint process	4.16	0.717	3	4.00	52.6 agree
4	Through the joint process there are by- products within the production	4.09	0.939	4	4.00	51.5 agree
5	By-products are sold in order to benefit from their revenue	4.42	0.659	3	5.00	50.5 agree strong
6	(secondary), By- products add additional revenue to the company's revenue	4.10	0.86	3	4.00	38.1 agree strong
7	The value of the by-products is not significant and does not generate revenue for the company	2.48	0.876	4	2.00	45.4 no agree
8	Income of by- products is separated by a separate list upon verification	4.06	0.801	4	4.00	56.7 agree
9	By-product revenues are combined into the Company's income statement list when they are recognized	3.61	1.066	4	4.00	34.0 agree
10	By-products are useful and do not burden the company and can be used	4.39	0.861	4	5.00	57.7 agree strong

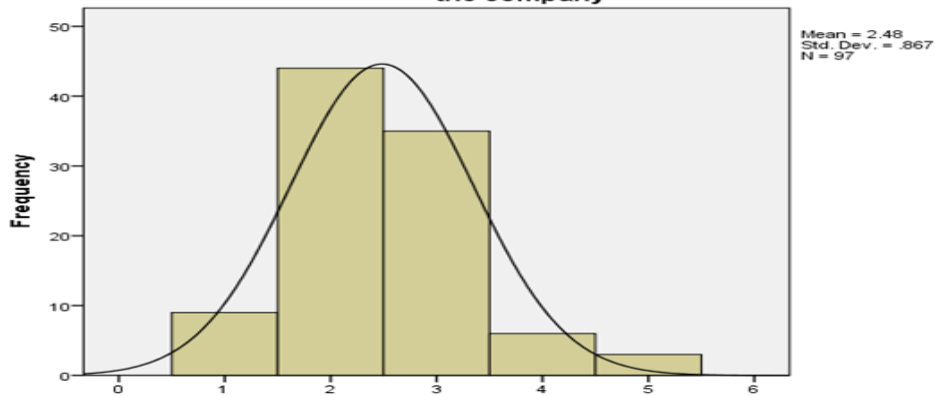
Through the questionnaire it was found that the occasional products that are produced during the joint operation of the main products are of interest to the company and achieve revenue that is added to the company's revenues to reduce the costs that were spent on the main products and thus the research hypothesis that says that the occasional products is

important and revenue is added to the company's revenues in companies Industrial companies such as petroleum companies, animal and agricultural companies.



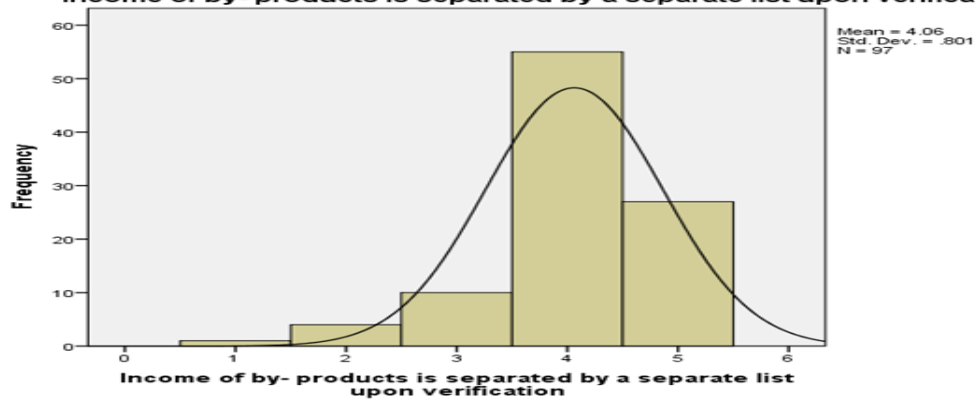


The value of the by-products is not significant and does not generate revenue for the company



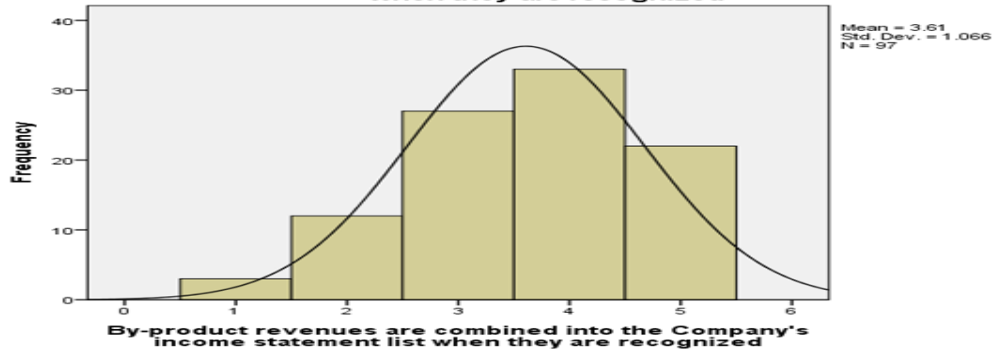
The value of the by-products is not significant and does not generate revenue for the company

Income of by- products is separated by a separate list upon verification



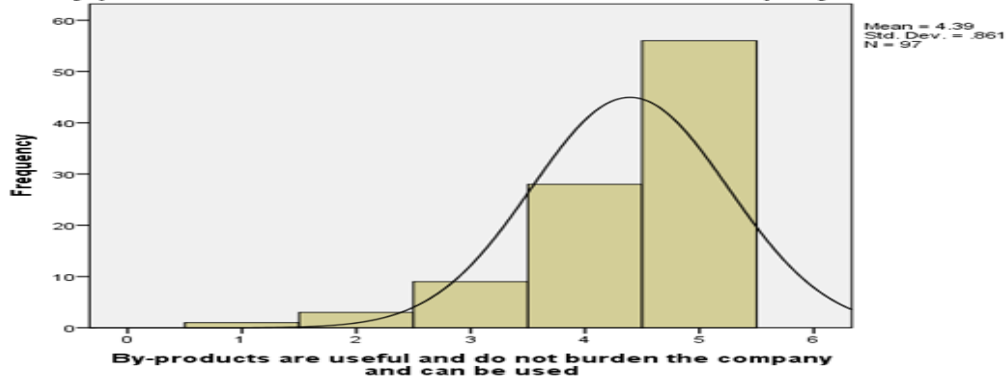
Income of by- products is separated by a separate list upon verification

By-product revenues are combined into the Company's income statement list when they are recognized



By-product revenues are combined into the Company's income statement list when they are recognized

By-products are useful and do not burden the company and can be used



By-products are useful and do not burden the company and can be used

Conclusions:

1. Through research it was found that by-products are important in achieving additional revenue for the company and achieve the hypothesis established.
2. The industrial activity is considered one of the important activities, especially in the oil refining sector, and therefore it is considered an important source of the national economy and is divided into sub-activities, which are the oil refining activity and the activity of by-products and scrap .
3. The process of raising poultry passes through stages that help in achieving income from the main products, and during these stages there are by-products that the company introduces and benefit from its revenue.
4. Companies use the revenue of by-products to reduce the expenses that companies spend on producing the main products.
5. There are two directions to treat revenue from by- products, one of which is to reduce the costs of major products directly, and the other is to add this revenue to the company's income statement.

Recommendation :

The most important recommendations reached by the researchers can be listed as follows:

1. Due to the difference in accounting treatment for the expenditures and revenues of by-products, as there are two directions for dealing with them, the first direction deals with the income of by-products by selling them and reducing them directly, and the second trend is by adding the income of by-products to the income statement list. Here the units must add the revenue to the income statement as additional revenue for the company.
2. The necessity of giving the subject of discrimination between types of expenditures

(capital or revenue) more importance, because of its impact on the company's net income.

3. Given the importance of the oil sector, the agricultural sector, and livestock, the importance of these sectors, and the many characteristics that characterize these activities and the accompanying many accounting problems, many sound accounting processes are required. Researchers should be interested in writing about these issues and their treatment.
4. Increasing research and studies that are interested in studying the accounting problems that these sectors suffer from and trying to reach the best possible accounting solutions so that they do not contradict the accepted principles, principles and accounting rules.

REFERENCES

1. Dr. Nassif Jassim al-Jubouri and d. Jalila Idan Al-Thahabi, Advanced Cost Accounting, First Edition, 2008, Iraq, Baghdad.
2. Dr. Nassif Jassem Al-Jubouri and Abdul Khalaf Abdul-Janabi, Cost Accounting, Second Edition, 2012, Iraq, Baghdad.
3. Mahmoud Muhammad Al-Maqasid, Cost Accounting, Al-Falah Library for Publishing and Distribution, Kuwait, 1998.
4. Muhammad Tawfiq Baligh, Cost Accounting, Youth Library, Cairo, 1985,
5. Mahdi Juma Al-Rashed, Cost Accounting, Basra University Press, 1986.
6. Mohamed Adel Al-Hami, Actual Cost Accounting and Scientific and Practical Principles, Arab Renaissance House, Cairo, 1978.
7. Charles, T., Horngorn, translated by Ahmed Hamid Hajjaj and Muhammad Hashem Al-Badawi, Cost Accounting, Administrative Entrance, Al-Merikh Publishing House,

Kuwait, 1986.

8. Dror Klewen, Management and Cost Accounting, Fifth Edition, Business Press, Thompson Learning, 2000.
9. Hilton Ronald W., Management Accounting, Fourth Edition, New York, USA, 1999.
10. Horne Denn et al., Cost Accounting, 11th Edition, New Jersey, 2006.