A study of systematic review: counterpoint to the understandings of the increasing returns to scale

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Abstract

The reasoning behind the increasing return to scale is that by increasing the scale of the production, the quantity of the goods or service increases and, as a consequence, the cost per unit produced decreases. In this regard, the objective of the study was to investigate the economic effect of the increasing returns to scale, and if this reduces the cost per unit with the production scale increase. It was used the type called systematic review with bibliographic bias. The conclusion suggests that the economic effect of the increasing returns to scale is not absolute truth when the desired information is routed to the internal user of the company.

Keywords: Increasing return to scale, Defrayal by absorption, Cost, Absorption costing, Variable costing

1 INTRODUCTION

The Academy has the responsibility to discuss and advance themes committed with the social and economic advances in that sense, and in the area of social sciences, the search for the correct cost of the product or service having as a basis for calculating the absorption costing method, and the consequent cost calculation committed to the competitiveness of the companies seemed to have been exhausted, because it was thought that the understanding about the information to management, as the basis of the absorption costing method, at least it was recognized as partial or incomplete.

On the other hand, it is observed that in the academic environment, it is disclosed the effectiveness of the calculation of the costs for management information based on the absorption costing method, in this way, what it was considered as surpassed, it was not, so there is still an understanding of the effectiveness of the calculation of the costs for the management based on the absorption costing method.

It is understood, however, that the user of the cost information has the most diverse interests, in this sense two major aspects of users are highlighted: those who use the organization for internal decisions, as for example, the production manager and those that use for external decisions as a potential investor.

The author of this research, as a militant of the academic world, have heard from the fellow teachers that the cost cannot be reduced and this understanding means that it is based on the reasoning that the composition of the cost of the product or service by means only of the variable costs does not allow reduction, so this cost does not change per unit, because to produce a unit it is indispensable the consumption of the same amount of resources, for example, materials.

The economists understand what they call "increasing return to scale", that to increase the scale of production, the quantity of the good or service increases in greater proportion and, as a result or effect, the cost per unit produced (average cost) decreases with the increase of the production scale and call this effect as economy of scale (FIANI, 2011).

The theme of the research also permeates through the field of knowledge called the Economy of the Organizations, in this sense, Barney and Hesterly (2014) explain that the Economy of the Organizations has two things in common with the way of thinking of the Organizational Analyses: (i) continuous interest in the organizations or firms; (ii) focus between competition and organizations.

The theme becomes interesting because the theory of the production and the theory of the production costs constitute the theory of supply and its principles are important for the analysis of prices, employment of the factors and their allocation, therefore it serves as the basis for the analysis of the relationships between the production and cost of production (VASCONCELLOS; GARCIA, 2009).

The research presents the understanding expressed by Fiani (2011), when he says that the companies operating with increasing returns to scaleincrease the profits if they expand the production to levels higher than the normal, because, with this, unit costs would reduce.

The challenge of this research is also encouraged by the understanding of Winter (1993) when asking about what the economy has to say about therole of firms in a market economy, he concludes that the answerwould be the silence, followed by a "Babel of responses significantlyconflicting".

A research done by Negri (2003) has identified that Brazil for being a developing country and having a plenty of natural resources and human capital could become competitive on the export of goods which requires greater appropriation relating to these factors. The study has found evidences that the size of the Brazilian market allows the firms located in the

national territory to reach scales of competitive production. In this way, the Brazilian firms are also competitive in the production of goods in which growing yields of scale are one of the factors that determines the competitiveness of the firms in the international market.

On the other hand, and prompting contradictory reasoning for the developing countries, Gerschenkron (1962) found that the greater the delay of a country, the greater the emphasis of its industrial segment of large enterprises in relation to the way to enjoy the increasing returns to scale.

The relevance of research is also highlighted when Araújo e Pinho (2004) claim that an important characteristic of the capitalist industrial production is related with the exploitation of the scale economies generally by the companies with the purpose of enjoying the best economic results.

In this regard, it is examined the effects of increasing returns to scale and, in particular, the so-called economies of scale, which expressed that the greater the volume of production, the lower will be the unit cost. In this context the research problem is: **It is theoretically sustainable the economic effect that the unit cost is reduced with the increase of the quantity produced?**

The context above induces to the proposed objective for this research, so the purpose is to research the economic effect of the increasing returns to scale, and if this reduces the cost per unit with the increase of scale of the production.

2. THEORETICAL FRAMEWORK
2.1 DEFRAYAL BY ABSORPTION

The terms costs and defrayals are not synonymous. Cost can be understood as the monetary value derived from the measurement of the consumption of resources applied in the production of a good or service. Iudícibus (2013, p. 114) summarizes that "product cost is the value assigned to inputs contained in the production that it is finished, but kept in stock". On the other hand, defrayal is the way or as the cost object receives the costs, so there is the defrayal by absorption, direct or variable defrayal, defrayal based on the activities, etc. For timely, the cost object is explained by Atkinson et al. (2015) when they say that it is something for which a cost is calculated as activities, products, product line, departments or even whole organizations.

Jiambalvo (2009) explains that the methods of defrayal, if used, provide a lot of information generated to determine the value of the products, reduce costs, improve processes, eliminate waste, decide between produce or outsource, delete, create, increase or decrease the production line, among many other benefits.

In this sense, Frezatti et al. (2009) explain that the cost information allow to the managers the decision-making process with greater efficiency, so, each defrayal system should be applied based on the particular characteristics of each company and in accordance with the level of information required by it.

Therefore, there is a close relationship between the ascertained cost and the defrayal method, in this sense Cardoso et al. (2007, p. 86) explain that "depending on the object of defrayal, the costs are classified as fixed or variable and direct and indirect", and these ratings affect the measurements of the costs differently and in accordance with the defrayal method. When the costs rise in the proportion in which there is an increase in the level of activity, these are called variable costs, on the other hand, fixed costs do not vary at short term in a specific activity (ATKINSON et al., 2015).

In addition, Da Silva et al. (2016) argue that the methods of defrayals are essential instruments for the generation of information relevant to the aid in the decision making

process of the organizations. By the understanding of Abbas, Gonçalves and Leoncine (2012), the methods of defrayals are formed by the direct labor and direct materials that, until the 1970s, were the factors of predominant production. However, from this decade, there have been changes in the environment in which organizations are inserted, which began to invest heavily in technology, engineering, *marketing*, product development, customer service and training, thereby causing a significant increase in the indirect costs.

The defrayal by absorption is explained by Fess, Reeve and Warren (2001) when they say that in this defrayal method all production costs are absorbed by the finished product and then they remain as assets until they are sold. This is necessary to establish the costs when the cost information is directed to meet the informational aspirations of the external users.

The defrayal by absorption is considered traditional because the difference between cost and expenditure, thus according to this method, the costs incurred, as a rule, at the level of the factory floor or in the manufacturing area and expenditure outside the area of the plant, so this may incur, for example, in the administrative area or sales, but other features also stand out when Crepaldi (2012) affirms that the defrayal by absorption originated from the application of the Accounting Principles and is adopted by the commercial and tax legislation, on the other hand, Martins (2010) says that the defrayal by absorption is the appropriation of all production costs directly or indirectly on products purchased and produced or the services provided.

With complement understanding to authors before cited, Nakagawa (1994) explains that the defrayal by absorption takes the following premise: the products consume the resources needed to manufacture them or market them, so all the costs (direct and indirect) should be absorbed by them. Concerning the direct costs, they are assigned to the cost object, generally, the common direct costs are the direct materials and the labor, and the indirect costs depend on the appropriation. The appropriation of the indirect costs, as these cannot be allocated as direct or objective to the cost object, is made by means of mathematical calculation called apportionment, so it is up to the administration to propose appropriate measures for each procedure of apportionment.

It is evident that the channeling of the indirect costs to the object that you want to assign costs by means of an apportionment, makes that the products or services receive the costs proportionally equal, but the reality of the resource consumption in the production process is not equal to the one determined by the apportionment, furthermore, for every new apportionment chosen, new cost values are calculated! As example:

I - The bicycle industry produces two models, which are "A" and "B", the direct costs represented by raw material and by the labor do not cause problems and are absorbed by their products according to the Table 1 explanations:

Table 1. Ownership of the direct costs

PRODUCTS	MATERIALS	LABOR	TOTAL
A	5 kg x $30.00 = R$150.00	1:h x $40.00=R$40.00	$ 190.00
B	3 kg x $ 30.00 = R$ 90.00	0.5 x $ 40.00 = R$ 20.00	$ 110.00

Source: Prepared by the author, 2017.

II - The problem arises when it is directed to the cost object, product A and B the indirect costs, whose basis of apportionment chosen may be anyone as long as it keeps with some constancy to encourage the comparability of the results;

III - it is possible to simulate that the indirect costs per month from the factory of bicycles are of $60,000.00 and the administration, along with the professional costs, decide that the basis of apportionment to be used is the consumption of raw material (5 kg for A and 3 kg for B), thus the calculations are the following:

$ 60,000.00 : 8 = 7,500 this called apportionment coefficient.

5kg x 7,500 = $37,500.00 : 500 u = 75.00

3 kg B x 7,500 = $22,500.00 :500 u = 45.00

Total........   = $60,000.00

IV - considering that 500 bikes were produced in the period for each model, the costs will be as follows:

Table 2. Calculation of the costs

PRODUCTS	MATERIALS	LABOR	CIF OR GGF	TOTAL COST
A	150.00	40.00	75.00	**265.00**
B	90.00	20.00	45.00	**155.00**

Source: Prepared by the author, 2017.

V - When considering new basis of apportionment, as the amount of hours of labor - 1.0 h for product A and 0.5 h for product B, other values of costs will be calculated:

R$ 60,000.00 : 1.5 = 40,000

1 h A = 1.0 h x 40,000   = $ 40,000.00 : 500 u = 80.00

0.5 h B = 0.5h x 40,000 = $20,000.00 : 500 u = 40.00

Total $60,000.00

So, the costs are as follows:

Table 3. Calculation of the costs

PRODUCTS	MATERIALS	LABOR	CIF OR GGF	TOTAL COST
A	150.00	40.00	80.00	**270.00**
B	90.00	20.00	40.00	**150.00**

Source: Prepared by the author, 2017.

VI - it is possible to observe that, when the calculations considered the consumption of raw materials as the basis of apportionment, the costs of products A and B were respectively $265.00 and $155.00 and, when considering as the basis of apportionment the amount of hours of labor, the costs of products A and B were respectively $270.00 and $150.00.

In this regard, it is understood that for each base of apportioned used, a different cost is calculated, a fact which induces to the absence of logic of the cost information generated by the method of defrayal by absorption. It is noteworthy that this defrayal method, when applied, means that the result of the company is a function of greater or lesser volume of production, therefore, to achieve the result, the sales volume is not so relevant, a fact which contradicts, in large part, the reality of the business world.

The organization when adopting the defrayal by absorption in the calculation of the costs and consequent result, should found the management of the indirect costs which will be the target in the process of apportionment, because a poor contract or renewal of a leasing contract of manufacturing sector , or even a unrealistic reasoning of the depreciation of machinery and equipment, will penalize the cost object that will receive these costs as reduced, fact that will harm the competitiveness of the organization.

It is understood that the traditional defrayals as by absorption were appropriate while the organizations worked with small varieties of products and simple processes. However, at the end of the 20th century, the indirect costs began to be representative within the organizations bringing the need to consider them also in the decision-making (TSIFORA; CHATZOGLOU, 2016).

Rosa Filho et al. (2016) identify the following criticism to the defrayal by absorption: (i) The costs for not relating to this or that good or service, are almost always distributed based on criteria for apportionment with great degree of arbitrariness; (ii) The fixed cost per unit still depends upon the production volume and the cost of a product may vary depending on the change in volume of another product; and (iii) The fixed costs exist, regardless of the manufacture or not of this or that unit, and they are present in the same amount, even if oscillations occur (within certain limits), therefore these fixed costs should not be allocated to goods and services; (iv) The result of the company is a function of the greater or lesser volume of the production but not the sale.

As an alternative to the informational weaknesses provided by the defrayal by absorption, and when you want logical information to the management, there is the Direct or Variable Defrayal.

2.2 VARIABLE DEFRAYAL

The policy is that the direct or variable defrayal is called simply variable defrayal, leaving aside the word "right", because the main feature of this defrayal method is that the object you want to fund receives only the variable costs - cost of the product - therefore, the fixed costs are treated as expenses - cost of the period.

In the variable defrayal method only the variable costs and expenses are considered, being the fixed costs and expenses accounted directly to the result of the period (VARTANIAN, 2000). In the variable defrayal it is highlighted the contribution margin which plays an important role in various management decisions. In this sense, Olesiak et al. (2016) believe that, by discounting from the sale revenues the costs and variable expenses, the result is the contribution margin that, in the production units, is the value that each unit brings as leftover between its revenue and the costs incurred in its production.

Among the information and analyses that the variable defrayal provides it is the result of the relationship between cost, production volume and the profit from this relationship, which allows evaluating results concerning the defined targets (ABBAS; GONÇALVES; LEONCINE, 2012). In this analysis the evolution patterns of the costs are also evaluated, allowing predict costs that can be applied to the performance analysis and decision-making (BUSAN; DINA, 2009).

The usefulness of this analysis is conditional upon the occurrence of the following assumptions: (i) the changes in the costs and revenues occur only due to the variations in the volume of production; (ii) the costs can be separated into fixed and variable costs; (iii) the increases in the revenues and costs increase in proportion to the volume of production; (iv) the selling prices, variable unit cost and fixed costs are known and constant ; (v) the analysis refers to a single product; (vi) the revenues and expenditures can be compared without considering the value of money in time (BUSAN; DINA, 2009).

In contrast to the previous understanding, Yuan (2009) explains that the traditional calculation ignores the risk and uncertainty of the operations, proposing a model that brings results with different scenarios, helping the managers in the decision-making.

The margin of contribution results from the difference between the sales revenue and the variable costs and expenses and, for Collatto and Reginato (2005), the margin of

contribution represents how much each product helps to cover the fixed costs and expenses, so this can be represented as follows:

1. Sales revenue...................$100,000.00
2. (-) Variable costs........... $40,000.00
3. (-) Variable Expenses $20,000.00
4. (=) Contribution margin $40,000.00

It is possible to identify the following advantages of the adoption of variable defrayal in the monetary measurement of the cost object: (i) The fixed costs exist independently of the production or not of a particular good or service or the increase or decrease (within certain installed capacity) of the quantity produced, they are considered costs of the period and, therefore, they are not allocated to goods or services; (ii) There is not the practice of the apportionment; (iii) It identifies the goods or services more profitable; (iv) It identifies the quantity of goods or services that the organization needs to produce and sell to pay its fixed costs, fixed expenses and generate a profit; and (v) The data needed for the analysis of the cost/volume/profit are quickly obtained from the system of accounting information; (vi) The result of the company is according to the volume of sales, so as a general rule, the higher the sales, the greater the result and, the smaller the sales, the lower the result (MEGLIORINI, 2012; Barbosa et al., 2011; Leone, 1997).

The following disadvantages are identified: (i) It is accepted neither by the external audit of the public held corporations nor by tax legislation, because the reason for this is that the variable defrayal goes against the fundamental principles of accounting - in particular the one relating to the competence - comparison of revenues, expenses and costs when correlated; (ii) no conversion to the object of the costs, the costs arising from the growth of fixed costs in the cost structure of the organizations motivated by ongoing investments in technological and production capacity; and, ((iii) In practice, the separation of the fixed and variable costs is not as easy as it seems, since there are semi-variable and semi-fixed costs. This method is useful to intervene in the process of planning and decision making (MEGLIORINI, 2012; BARBOSA et al., 2011; LEONE, 1997). In the face of this, there has been a development towards to the theory of increasing returns to scale.

2.3 INCREASING RETURNS TO SCALE

The subject towards to the increasing return to scale is not recent, as it is identified by Petty (1690), in a work of his authorship called *Political Arithmetick,* which explains the productivity gains from the specialization in the North American textile and naval industry.

Adam Smith (1776) in the classic work "The Wealth of Nations" explained that when a productive unit is expanded, this results in growth in greater proportion in the production by the effect of the increase in the division of the labor among the workers in relation to the productivity.

It is also identified the understanding that the activity of the Research and Development (R&D) of new products introduces increasing returns to scale and, with the increasing of the volume of this activity, the initial investment costs will be reduced (NELSON; WINTER, 2005). With the same understanding, Rodrigues et al. (2016, p. 103) explains that "the economy of scale is perceived when there is an increase in the volume of the production of a good or service, reflecting in the reduction of the costs in a given period. This reduction results from the use of the production methods more automated or more advanced."

Fiani (2011) confirms the non-modernity of the subject towards to the increasing return to scale and how the subject is problematic because it is underlying to the competitive market and so he recognizes that the increasing return has always been challenging theme when the company acts in a market characterized by the competitiveness. Hicks (1939) also recognized the challenge to express that the apparent solution would be to waive the possibility of perfect competition.

It is deduced that the interests by the companies and the competition underpin the economic and accounting studies directed to the organizations, therefore, one of the forms of the companies become competitive in the competitive economic environments is through lower costs and prices. Porter (2005) teaches that the leadership based on lower costs allows offering products and services with also lower prices.

In this scenario of competition, based on lower costs and prices, the term referred to by the economists arises as Increasing Return to Scale. This concept advocates that the unit cost decreases when the amount produced increases, in this sense Fiani (2011, p. 39) explains:

> The increasing returns to scale have an important economic effect: the cost per unit produced (average cost) decreases with the increase of the production scale. To understand how this happens, let's consider that the amount of funds invested in production was duplicated, this means that the total costs of production of the company must have duplicated. However, the production amount triplicates, as the costs per unit are the total costs divided by the quantity produced, they would reduce to 2/3 of the initial costs, before duplicating the resources applied by the company in the production. Therefore, with the increase in the scale of production, the costs per unit are reduced.

Before the understanding of Fiani (2011) it is possible to deduce that the greatest volume of production enables lower unit cost, in this way, the higher the supply and lower the costs the competition also will fall and so it will not occur a panorama of competitive market. In this regard it is possible to note that the general understanding is that the increasing return to scale benefits the large enterprises, since these ones, when compared with small and medium-sized, produces at lower cost and with it, the market will no longer be competitive.

In addition to this line of reasoning, Fiani (2011) expressed that given the presence of increasing returns to scale it is reasonable to assume that the companies will have "market power" which is the ability of a company to establish its price above the price that normally would apply if the market were perfectly competitive.

The previous understanding induces that the functioning of the market based on the expansion of supply of the large enterprises, on the basis of the lowest costs, and consequently lower prices, ends up harming the competition.

To study the classical and neoclassical theory, since Adam Smith when he explained that the economy could be coordinated by a price decentralized system what he named as "invisible hand", it can be seen how the labor markets are skilled to coordinate the economic production and make transactions with low costs and without the interference of the government (HILL, 1985).

Many economies, since the publication of the classic "Wealth of Nations" are involved in the challenges arising from the influence of the market and, with it, seeking to identify alternatives to the effective use of the invisible hand, therefore, planning changes where they are necessary (DEMSETZ, 1990).

On the other hand, the market is not as sovereign as we can think when the interest is to form price. At this sense, Couse (1937) stated, at that time, what he called as transaction

costs and expressed the understanding that, beyond the market there are the organizations, these are alternatives to manage the transactions between the various actors present in the markets.

Therefore, it is understood when considering the increasing returns to scale, that the greater is the volume of production the lower is the cost and, consequently, the price will also be lower; therefore, large companies understand that significant increases in the amount they produce have a great impact on the market price, reducing it (FIANI, 2011).

3. METHODOLOGY

One of the ways that stands in the scholarly researches is the one that adds evidences to develop studies that synthesize the literature, but this is not the only one. There are systematic reviews that are used as a source of data to the existing literature on a given topic. In this way, the research is the type denominated of systematic review with bibliographic bias.

The systematic review is the type of research that provides a summary of the evidence related to a specific intervention strategy in an object. In the case under study, it is the increasing returns to scale, through the application of systematized and explicit methods of searching, critical appraisal and synthesis on the selected theme, due this, good systematic reviews are important resources compared to the accelerated growth of scientific information (SAMPAIO; MANCINI, 2007).

3.1 RESEARCH OUTLINE

This research, under the method of systematic review, identified classical and contemporary authors on the various themes that permeate the object of study, according to the Table 4 below that identifies them:

Table 4. Themes and authors surveyed

THEMES	AUTHORS
Defrayal by absorption	Nakagawa (1994); Fess, Reeve and Warren (2001), Cardoso et al. (2007); Frezatti et al. (2009); Jiambalvo (2009); Martins (2010); Abbas, Gonçalves and Leoncine (2012); Crepaldi (2012); Iudícibus (2013), Atkinson et al. (2015); Da Silva et al. (2016); Tsifora and Chatzoglou (2016); Rosa Filho et al. (2016).
Variable Defrayal	Leone (1997); Vartanian (2000); Negri (2003); Collatto and Reginato (2005); Busan and Dina (2009); Yuan (2009); Barbosa et al. (2011); Megliorini (2012); Abbas, Gonçalves and Leoncine (2012); Olesiak et al. (2016).
Increasing returns to scale	Petty (1690); Adam Smith (1776); Hicks (1939), Couse (1937); Hill (1985); Nelson and Winter (2005); Porter (2005); Fiani (2011); Barney and Hesterly (2014);

Source: Prepared by the authors, 2017.

Based on the understandings of many authors before emerging, we sought to interpret and analyze them in the context of the research with the aim of responding to the research question and, as a consequence, seek to achieve the proposed objective.

4. ANALYSIS OF THE RESULTS

The main aspects will be analyzed and summarized underlying to the themes that are part of the research and how the authors are positioned in relation to these themes. For this, it will be simulated the production and sales of a single product for three consequent periods, whose results initially will be determined by means of the defrayal by absorption, and then by the variable defrayal.

Table 5. Quantity produced and sold - Determination of the stock and result by Defrayal by Absorption

Period	Quantity Produced	Quantity sold	Final Stock
X1	1,000	800	200
X2	2,000	800	1,400
X3	600	2,000	0

Source: Prepared by the authors (2017).

Additionalinformation:
a) Unit Price: $200.00;
b) The raw material (variable cost per unit) used is $70.00/unit;
c) The variable expenditure is 5% of the price;
d) The fixed costs in the period total $96,000.00;
e) The fixed expenses in the period total $32,000.00.

The result of each of the three periods simulated by means of the characteristics of the defrayal by absorption and by adopting the method of registration of the stock called First in, First out (FIFO) and, without considering tax impacts, it is displayed in the Table 6:

Table 6. Results by means of the Defrayal by Absorption

PERIODS	X1	X2	X3	TOTAL
1. Sales Revenue...... 800 u x $ 200.00	160,000.00	160,000.00	400,000.00 2,000 u x $200	720,000.00
2 (-) CMV	132,800.00	104,000.00	303,200.00	540,000.00
Initial Stock = 0		+ 33,200.00	+ 165,200.00	
+ Fixed Cost = 96,000.00		+ 96,000.00	96,000.00	
+ Cost variable=70,000.00 166,000.00		+ 140,000.00 236,000.00	+ 42,000.00 303,200.00	
Unit cost 166,000,00: 1.000 u = **166.00**		Unit Cost 236,000.00: 2000 u = **118.00**	Unit Cost 303,200.00 : 600 = **505.33**	
Final Estimate = 33,200.00 200 u x $166.00		- **165,200.00** 1,400 x $ 118.00	Final Estimate = 0	
3 = Gross Profit	**27,200.00**	**56,000.00**		**180,000.00**

			96,800.00	
4(-)Operating Expenses Sales.........$8,000.00 $160,000x 5% Fixed costs $32,000.00	40,000.00	40,000.00	52,000.00 $20,000.00 $400,000.00 x 5% Fixed Expenses $32,000,00	132,000.00
5 (=) Operating Result	(12,800.00)	16,000.00	44,800.00	48,000.00

Source: Data from the survey, 2017.

The Table 6 prior expressed allows the following raids on the verification of the inventory and final result by the defrayal by absorption:

1st - In the periods X1 and X2 although the sales volume is equal, in X1 was found prejudice of $12,800.00 and in the X2 a profit of $16,000,00. This fact is due to the cost of the goods sold (COGS) that in X1 was greater than X2;

2nd - The fact before identified is the consequence of the quantity produced in X1 have been less than the period X2, in this way, the fixed costs of the period X2 were diluted or were allocated by a larger amount produced what resulted the lower unit cost and as a result, the greater profit.

In this simulation, it is possible to understand that the outcome determined by means of the defrayal by absorption is influenced by the volume of production and not by the volume of sales (JIAMBALVO, 2009; ROSA FILHO et al., 2016), and this fact contradicts the logic of management that encourages the increase of the sales to obtain positive results. This fact also identifies the irrationality of the apportionment that allows the consumption of unequal resources to become equal before the mathematical calculations present (NAKAGAWA, 1994; TSIFORA & CHATZOGLOU, 2016).

Figure 1. Behavior of the sales volume
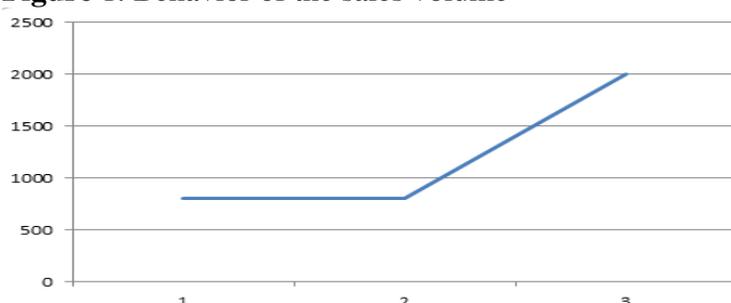
Source: Data from the survey, (2017).

The Figure 1 shows the behavior of the sales volume which was static on 800 units in the first two periods and then it increased to 2000 units. In this sense the Figure 2 demonstrates that the behavior of the result of the organization, when adopted the defrayal by absorption, does not have the similar behavior of the quantity sold (ROSA FILHO et al., 2016).

Figure 2. Behavior of the result
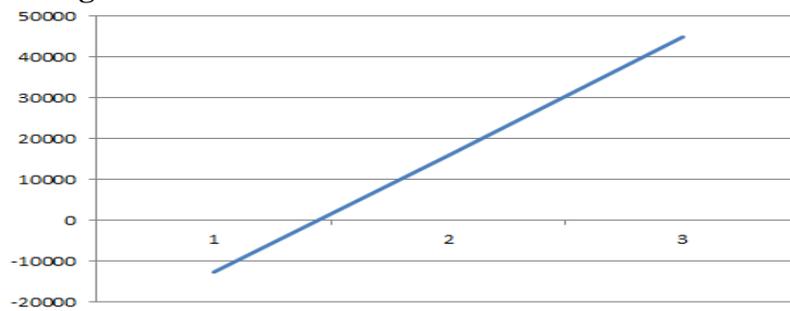
Source: Data from the survey, (2017).

It is possible to observe that in the 1st period the result, when adopted the defrayal by absorption, is negative, but in the second period and with the same volume of sale, it becomes positive at $16,000.00 and in the third and final period the profit is $44, 800.00, so the Figure 2 shows full lack of similarity between the calculated results and the sales volume in the three periods simulated.

The same data that formed the basis for the simulation of the calculation of the result by means of the defrayal by absorption will be the targets for the calculation of the result and final stock when adopting the variable defrayal.

Table 7. Result by means of the Defrayal by Absorption.

| Periods	X1	X2	X3	Total
1. Sales revenue 800 u x $200	160,000.00	160,000.00	400,000.00 2,000 u x $200	720,000.00
2 (-) COGS	56,000.00	56,000.00	140,000.00	252,000.00
+ Initial Estimate	0	14,000.00	98,000.00	
+ Variable Costs 1,000 x $70	70,000.00	140,000.00 2,000 u x $70	42,000.00 600 x $70	
(-) Final stock 200 u x $70.00	14,000.00	98,000.00 1,400 x $70.00	0	
3 = Gross Profit	104,000.00	104,000.00	260,000.00	468,000.00
4 (-) Variable expenses	8,000.00	8,000.00	20,000.00	36,000.00
5 = Contribution margin	96,000.00	96,000.00	240,000.00	432,000.00
6 (-) Cost and fixed expenses	128,000.00	128,000.00	128,000.00	384,000.00
7 - = Result for the period	(32,000.00)	(32,000.00)	112,000.00	48,000.00

Source: Data from the survey, 2017**.**

The Table 2 prior expressed allows the following raids on the verification of the inventory and final result by the variable defrayal:

1st - In the periods X1 and X2, considering the same volume of sales - 800 units - the results are equal (-$32, 000, 00). In the period X3, when the volume of sales has grown to 2,000 u, came the profit of $112,000.00.

The evidences before cited enable assert that in the variable defrayal, the result is a consequence of the sales volume (MEGLIORINI, 2012; BARBOSA et al. 2011); LEONE, 1997). This fact restores the logic that the sales should be encouraged to obtain positive result of the organizations.

The Figure 3 below shows the behavior of the recipe with the objective of identifying if the result of the three periods established by means of the variable defrayal has a similar result, otherwise, if there is an identity between the volume of sales and the result.

Figure 3. Behavior of the sales volume
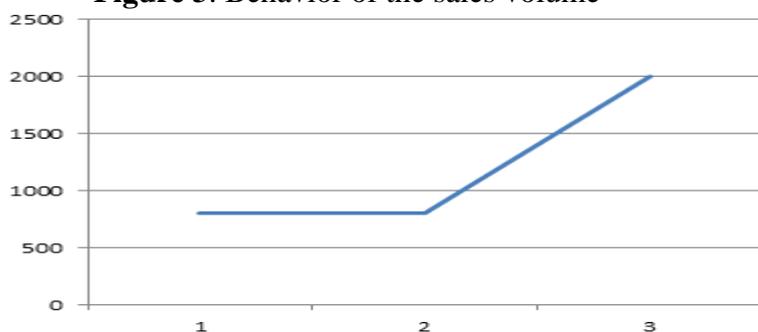
Source: Data from the survey, 2017.

The behavior of the straight line shows that in the periods X1 and X2 the sales volume was the same - 800 u - however, in X3 there was an increase in the sales, a fact that calculated the sales of 2000 units and as a result the straight line becomes ascendant.

The Figure 4 then will demonstrate the result found in the three periods by means of the variable defrayal:

Figure 4. Behavior of the result
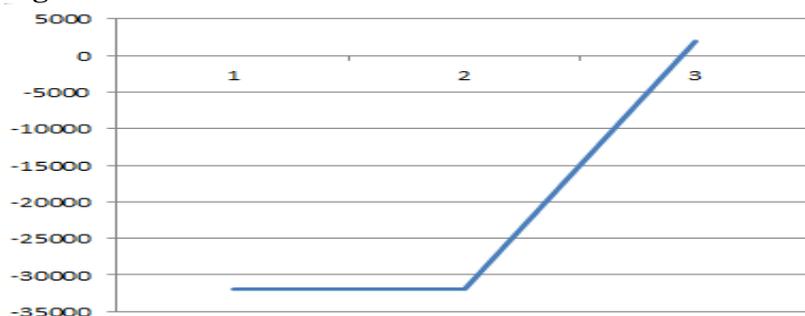
Source: Data from the survey, 2017.

There is a likeness of the straight line of the figures 3 and 4, fact that allows us to infer that in the variable defrayal the result of the company is according the volume of the sales (MEGLIORINI, 2012; BARBOSA et al. 2011; LEONE, 1997). In this regard, it is understood that the variable defrayal allows logical analysis of the information, specially, because it does not use the mathematical calculation called apportionment and it allows the analysis of the information of the result, once this results from the sales volume, so the information to the

management for this defrayal method are more consistent than those established by the defrayal by absorption.

With respect to the increasing return to scale, we return to Fiani (2011) when he states that the greatest volume of production enables lower unit cost. This statement is not confirmed when it is used to determine costs and results of the variable defrayal and when the information is the base of the management decisions. The increasing return to scale can be confirmed when the company adopts the defrayal by absorption and, in accordance with the proven, it is partial or incomplete. The information provided has no logic when it is targeted to the management decisions (TSIFORA; CHATZOGLOU, 2016).

5. CONCLUSION

The information obtained by the variable defrayal and directed to the managers of the organizations in the various types of internal decisions has greater logic than the information from the calculation by means of the defrayal by absorption.

In the face of the reality before proven, there is no support to the theory that the economic effect, caused from the increase of the quantity produced, reduces the unit cost of the product, because the variable costs incurred equally whatever is the volume of the production, otherwise, the unit variable costs do not change with the volume of the production.

Therefore, the economic effect of the increasing returns to scale is not absolute truth when the desired information is routed to internal decisions as: purchase volume of materials and production, margin of safety and contribution, produce internally or buy among others.... On the other hand, this can even be confirmed if the company adopts the defrayal by absorption and the consequent apportionment of indirect costs; however this information is not logic when the information is directed to internal decisions.

Finally, this research demystify any informational logic when the economic entity adopts the defrayal by absorption, and uses the information to management decisions, moreover ratifies the understanding of researchers when they claim that the unit costs are unyielding when these underpin their understandings in the calculation of the costs and stocks through the variable defrayal.

It is suggested empirical researches with the objective of identifying the outcome and the measurement of the inventory by the defrayals that were included in this study, so if you can confirm the economic effect caused from the increase of the quantity produced and, if this reduces the unit cost of the product, in this way, the economic effect of the increasing returns to scale could be tested empirically, and this research could have its result confirmed or not.

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