MANAGING THE COST OF UNUSED CAPACITY: AN INTEGRATIVE AND COMPARATIVE ANALYSIS OF THE ABC, TABC AND UEP METHODS

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ABSTRACT:

Costing systems play a key role in the process of measuring and understanding idle capacity. However, costing models and systems have gaps and shortcomings that need to be overcome in order to achieve this objective. Sophisticated costing methods such ABC (Activity-Based Costing), TDABC (Time-Driven Activity Based Costing) and UEP (Production Effort Units) might be good approaches to give answers to this question. In a complementary basis or combined, these methods can be a very valuable framework to deal with the problem of unused capacity. In this research project, the three methods were used to compute the unused capacity properly.

Keywords: Costing Systems, Idle Capacity, Activity Based Costing, Time-Driven ABC, Production Effort Units.

INTRODUCTION

Costing systems play a key role in the process of measuring and understanding idle capacity. Indeed, the International Accounting Standards - IAS 2 (IASB), emphasise the importance of cost accounting for the understanding of theoretical (or installed), actual and normal production capacities, since the knowledge of these is required to determine the cost to be attributed to the products stocked or sold and also to develop a correct performance measurement which needs to take into account the idle capacity.

However, costing models and systems have gaps and shortcomings that need to be overcome in order to achieve this objective. On the one hand, traditionally, the computation of production costs, for financial accounting purposes, has been made using the procedure recommended by the Absorption Costing. However, this method does not adequately address the problem of idle capacity. Accordingly, more sophisticated approaches have been proposed namely, ABC (Activity-Based Costing), TDABC (Time-Driven Activity Based Costing) and UEP (Production Effort Units, also known as UVA: Value Added Units).

In a complementary basis or combined, these methods can be a very valuable framework to deal with the problem of unused capacity which is not independent from the central problem in operations and production systems: capacity optimization (which goes beyond the traditional objective of capacity maximization). Nevertheless, these three methods are characterized by some differences both in terms of procedures and in relation to the concepts they employ or rely. In fact, for this reason they lead to different results in terms of product unit costs and idleness estimation. In fact, only TDABC explicitly highlights the cost of unused capacity. ABC and UEP methods need to be modified to conveniently include this dimension.

In this research project, the three methods were compared and their modification discussed in order to use them to manage the unused capacity properly. To facilitate the comparative analysis, an equivalence has been made among the operational workstations (in UEP), activities as defined in the ABC and resources as considered in TDABC. The integrative model was applied in a small company particularly suitable to discuss the research problem presented here namely, the high level of requirements in assets (machinery, equipment and working capital) in a context of high uncertainty.

In this article it is shown that the application of the three methods, separately, results in different unit costs for each product. In particular, the results of TDABC differ significantly when compared to the other two costing methods. To a large extent, this difference can be explained by the way as each method deal with idleness. While in TDABC only the capacity cost effectively used is allocated to products, in the UEP and ABC methods this does not occur. In this work it is shown that it is possible to compute and manage the idle capacity in the three costing methods. Nevertheless, for this purpose, the ABC and the UEP methods were adapted. Furthermore, the consideration of TDABC allows the triangulation and integration of the three different costing methods. Several simulations and relationships were made and established.

These modified models open several opportunities for the development and application of more cost-effective and cost-sensitivity models in both conceptual and applied terms. This article discusses some of these possibilities and highlight interesting research opportunities.

LITERATURE REVIEW

Absorption costing has been a common practice in companies for years, but ABC, TDABC and UEP methods have been studied by academics and applied in companies with the aim of improving the costing of products. Being more reliable for this purpose, it is reasonable to assume that these are also more interesting to determine idleness and support a better management of capacity. However, the three methods have very distinct characteristics that require analysis.

ABC, TDABC and UEP Methods

ABC prioritizes the identification of the most relevant organizational activities in order to improve the organization's cost and profitability (Kaplan & Cooper, 1998). Staubus (1990) conceptualizes ABC as a costing model where activities

are in the first place and not the products. The same author points out that in this method the consumption of different types of resources is considered, in addition to the traditional allocation of just production costs (i.e. direct material and direct labor, indirect labor and other production overhead). Kaplan and Cooper (1998) list four steps to implementing ABC: developing a dictionary of activities, determining how much the organization spends with each activity performed, identifying the products and the clients that consume the activities, and choosing the drivers that allow associating the costs of these to cost objects. However, Wegmann and Nozile (2008) consider that ABC suffers from a great difficulty in identifying and treating productive bottlenecks considering the high number of activities and the complexity of the activities that typically characterize an ABC model.

Regarding the UEP method, Slavov (2013) states that this focuses on the cost of transforming homogeneous operations executed in workstations, applied primarily in factories with diversified production mix. In the same sense, Gantzel and Allora (1996) emphasize that this method allows, through a single unit of measure, to measure any type of production system. Bornia (2009) asserts that the UEP makes it possible to monitor production through the use of physical measures. In the same line Wernke and Lembeck (2009) emphasize that the UEP allow to measure through the use of non-financial indicators, to determine the production capacity of the company and of the workstations, to identify production bottlenecks, to know the level of idleness of the installed capacity, among other possibilities. However, the UEP method also has some limitations. In this sense, Pereira (2015) lists the following aspects: it does not identify the portion of costs associated with process losses, it needs constant revision of the calculus and about the production structure, it presents difficulties of application in companies where products vary regularly, it needs relatively standardized operations, it presents subjectivity in the choice of the base product, it does not consider some important overhead costs (such as supply logistics, quality control, etc.), among others.

The third method studied in this research is the TDABC proposed by Kaplan and Anderson (2007). Everaert and Bruggeman (2007) affirm that TDABC requires the following procedures: to identify the resources provided to the activities, segregating them into groups, to determine the amount spent on resources, to measure the practical capacity of the activities, to determine the unit cost of each resource dividing the amount of resources by the practical capacity of the activity, measuring the time consumed to perform an activity and multiplying the unit cost by the time required by each cost object. In order to implement a TDABC system, Barret (2005) states that equations of time should be used to identify the activities related to the process to be measured. Therefore, besides identifying the activities, it is also necessary to estimate the time, which acts as a driver of the cost of each activity - Kaplan and Anderson (2007), Cardenas and Labro (2008), Ratnaunga, Tse and Balachandran (2012), Campanile, Cinquini and Tenucci (2014) and Kaplan (2014). From these authors we can say that the most relevant disadvantages of TDABC are the difficulty in obtaining estimates of precise times and the need to use a large database to determine the times of each activity performed and its variations in companies with many production stages. On the other hand, these authors mention advantages related to the following aspects: simplification in relation to ABC, ease to be adapted to

management software, allows to determine the use of installed and idle capacities, easily adaptable to complex and changeable business contexts, supports the identification of opportunities for improvement, speed of data processing, among other benefits.

Comparison between methods

In the literature on management accounting it have been prioritized comparative studies involving the most known methods such as Absorption Costing, Variable or Direct Costing and ABC. Newer or lesser known methods, such as TDABC and UEP, have not received equal attention in comparative studies.
In the Brazilian case there are some recent studies, in line with similar ones that have been carried out over the years, which have a focus on this question. For example, Pereira (2015) studied the similarities, differences and complementarities between the ABC and UEP methods, using a fictitious numerical example. Wernke, Junges and Lembeck (2015) compared TDABC versus UEP in a garment company. Pinzan (2013), Gonçalves, Cruz, Morais, Meireles, Barbosa, Lima and Peixoto 2014 and Ambrogini, Albuquerque and Souza (2014) analyzed the application of Absorption, Variable, and ABC Costing. Fontoura (2013), in addition to these three methods, also studied the UEP method. Pacassa and Schultz (2012) compared TDABC, ABC and Absorption Costing.
However, studies that compared simultaneously ABC, TDABC and UEP methods in terms of idleness measurement and management have not been identified in the literature. The studies that are closest to this research question are listed in Table 1.

Table 1: Studies that relate idle capacity and costing methods

Article	Description
Buchheit (2003)	Experiment with 68 students on the effects of disclosing or not idle capacity, without using specific costing method.
Giri and Moon (2004)	They focused on the question of the cost of idle capacity in the definition of the economic lot, without using any costing method in the cases presented.
Tse and Gong (2009)	Present a conversion model of ABC to TDABC and RCA (Resource Consumption Accounting) and showed results in terms of allocated cost and cost of idle capacity.
Popesko (2009)	Linear programming method to estimate the value of an airline's idle cost, considering ABC, without using a numerical example or real data in this proposition.
Duarte, Pinto and Lemes (2009)	Use Queue Theory to compute the “real” system’s idleness, eliminating the subjectivity associated with the practice in TDABC of assigning 80% -85% to the practical capacity.
Schmidt, Santos and Leal (2009)	Use a fictitious numerical example to comparing ABC and TDABC, with only one example of calculation of the idleness in TDABC.
Ewer,	They discuss aspects related to capacity utilization or not in the

Keller and Olson (2010)	calculation of costs from changes in Financial Accounting Standards Board (FASB) standards related to the Statement of Financial Accounting Standards (SFAS) 151.
Bettinghaus, Debruine and Sopariwala (2012)	Without mention any specific costing method and using data from 2002 to 2008 of the US automaker GM, stressed the importance of a good knowledge of idle capacity as important information for internal and external users of the financial statements.
Silva and Leite (2013)	Based on the Cost Centres Method (RKW) and with real data from a Brazilian factory of flexible plastic packaging, they computed cost values of the products with and without the calculation of the idle capacity.
Eckert *et. al.* (2013)	Apurou o percentual de ociosidade em quantidade e em valor, numa empresa de calçado, sem menção a método de custeio. He determined the percentage of idleness in quantity and value, in a footwear company, without mention of costing method.
Wernke, Cláudio and Junges (2013)	Non-financial indicators such as productivity and idleness were measured in a small plant using the UEP method.

Source: prepared by the authors.

As shown, there is a research gap related to the comparison and integration of the three methods targeted in this study. Particularly at the level of the measurement of production idleness using this approach.

Cost accounting and idle capacity

Bettinghaus, Debruine and Sopariwala (2012) argue that the cost of idle capacity is a key information for managers and investors.

Horngren, Foster and Datar (2000) state that the term "capacity" can be defined as a limitation or upper limit, and that they can be considered two categories of denominators: one related to installed capacity and another to capacity utilization. The denominators focused on the installed capacity are divided into two: (i) theoretical or nominal capacity and (ii) practical capacity, which reduces theoretical capacity due to unavoidable interruptions in the operation, such as scheduled maintenance, non-operation on holidays etc. In turn, Guerreiro and Christians (1992) defined idle production capacity as unused production potential, i.e. resources totally or partially without use. These authors state that it can be measured in several ways: potential production quantities, available manufacturing hours, etc.

In Brazil, the adoption of International Accounting Standard (IFRS) led to the adoption of standard CPC-16-Inventories, whose content is in line with IAS 2-Stocks, and led to the adoption of cost-accounting concepts that consider total capacity, normal capacity and actual capacity. This standard emphasizes, verbatim, that the allocation of indirect fixed costs of manufacturing to the units produced must be based on the normal capacity of production. Normal capacity is the average output expected to be achieved over several periods under normal circumstances. As a consequence, the value of the fixed cost allocated to each

unit produced cannot be increased because of a low volume of production or idleness. Fixed costs not allocated to products should be recognized directly as an expense in the period in which they are incurred. In periods of abnormal high production volume, the fixed cost amount allocated to each unit produced must be decreased, so that inventories are not measured above cost. Variable production overheads should be allocated to each unit produced based on the actual use of variable production inputs, i.e. actual capacity utilized.
In his doctoral thesis, Bornia (1995) already manifested the importance of Ideal or Rational Absorption Costing. In this case, waste and factory idleness should not be incorporated into the cost of the products, acting differently as in the case of Integral Absorption Costing.

METHODOLOGY

This research can be classified as a case study because, according to Yin (2010), this type of procedure is equivalent to an empirical investigation of a contemporary phenomenon within its real-life context, especially when the boundaries between the phenomenon and the context are clearly defined.
Scapens (1990) argues that in the context of Management Accounting, case studies can be descriptive, illustrative, experimental or explanatory. In this case, this search can be classified as descriptive.
The choice of the company occurred for two reasons. The first reason is linked to the possibility of access to the necessary data by the researchers, provided by the owner of the company. The second reason is that it has a production structure with only ten sectors and produces only five products. This production configuration made it easier to collect the data, develop the necessary calculus, analyze and present them.
In this research, the data collection procedures were performed in November 2015, with previous contacts and preparation visits in October 2015. For this purpose, informal conversation techniques (open and unstructured interviews) were used with the entity's manager and with the accountant complemented by a documentary analysis (of internal documents and outsourced accounting) was carried out with the intention of knowing the situation of the company. After that, the data required was collected, in addition to other more specific reports that were obtained from the manager and the firm's accountant.
Due to the characteristics of its activity, the company requires investments in assets (machinery, furniture, equipment and working capital) that may remain partially idle during a certain period, depending on the existing demand. As a result.
In this study the following steps were taken:
1) collection of the necessary data: this step initially involved procedures related to the segmentation of the company’s production system in workstations, activities and sectors to suit, respectively, the UEP, ABC and TDABC methods;
2) calculation of the cost of each product and production idleness by the three methods and then measure the idleness of the period with the available data;
3) analysis and interpretation of the results: this step consisted in evaluating the results obtained in terms of the unit costs attributed to the products and the calculated values for the idleness according to the UEP, ABC and TDABC methods and to compare them.

ANALYSIS OF RESULTS

Calculation of the Unit Cost according to the UEP, ABC and TDABC methods

The starting point of the field work was identifying the costs of the 10 production organizational units in which the company was structured. In order to facilitate the comparative analysis, it was assumed that these would have the same subdivision in the context of the three methodologies, that is, that workstations (in UEP) would be equivalent to activities (in ABC) and to the sectors (in TDABC), identified here generically by [x1 ... xn]. Subsequently, the monthly cost values (in Brazilian Real) were allocated (considering 198 hours available per month), as expressed in Table 2.

Table 2 - Hourly cost of workstations, activities and sectors (Brazilian Real)

	Deprec	Rentals	Wages	Energy	Maint	General	Hours	Cost/Hour
X_1	155	321	1.651	28	70	2.226	198	11,24
X_2	27	11	505	0,41	-	543	198	2,74
X_3	-	594	270	-	-	864	198	4,36
X_4	475	290	405	142	301	1.613	198	8,14
X_5	208	280	405	706	119	1.719	198	8,68
X_6	180	453	1.080	497	105	2.316	198	11,70
X_7	52	132	270	13	35	503	198	2,54
X_8	120	537	67	8	70	804	198	4,06
X_9	69	457	202	-	-	729	198	3,68
X_{10}	66	321	1.148	4	-	1.540	198	7,77
Total	1.354	3.400	6.005	1.402	700	12.861	-	-

In terms of production volume, they were produced five product types during the period under study: P_1 (295 parts), P_2 (413 pieces), P_3 (166 pieces), P_4 (374 kg) and P_5 (292 kg). From this initial data, the costs of each product were calculated by the three costing methodologies as reported, synthetically, in the sequence.
For the UEP method, the following steps were carried out: calculating the hourly cost (in Brazilian Real) of each workstation (last column of Table 2), measurement of the time of passage of the products in each workstation, definition of the base product (P_1), determination of the production potentials (in UEP per hour) of the workstations, calculation of the equivalent UEP for each

product, computation of total UEP produced in the period, calculation of the unit value of UEP for the period (which was 13.0974 Brazilian Real) and calculation of the unit cost of processing each product, multiplying the respective equivalent UEP by the monetary value of one UEP.
In order to use ABC, the following steps were followed: calculation of the monthly cost of each activity, selection of activity drivers, computation of cost drivers, allocation of the costs of the activities to the products, calculation of the unit cost of each product by dividing the attributed cost by the volume produced of each item (in pieces or kilos, depending on the type of product).
Regarding the use of TDABC, the following procedures were adopted: calculation of the monthly cost of installed capacity of each sector, computation of the "practical capacity of the sectors", determination of the practical capacity cost rate (by dividing the monthly cost of each sector by the number of minutes available in the period), definition of the consumption of minutes in each sector, by product in order to compute the unit cost of the products (by multiplying each capacity rate by the number of minutes spent in each sector to produce each item).
From the application of these three methods, different unit cost values were computed for each product, as shown in Table 3.

Table 3 - Comparative of product unit cost (Brazilian Real) using ABC, TDABC and UEP

Products	UEP	TDABC	ABC
P1	13,097	3,925	11,139
P2	5,363	1,607	7,797
P3	7,672	2,299	8,872
P4	9,557	2,864	8,391
P5	6,628	1,986	5,975

Source: prepared by the authors.

The scenario outlined in Table 3 showed that unit costs computed through the UEP and ABC methods presented similar values, while the results obtained by the TDABC diverged significantly, when compared to the other two costing methods. It should be noted that it is not the focus of this research to explain the reasons for the discrepancies found in these values. However, a relevant part of this difference can be explained by the way they deal with idleness, as it will be explained in next section.

Measurement of idleness by the three methods

In this study it was intended to measure the production idleness in a comparative way, based on the assumptions required by the UEP, ABC and TDABC methods. In this sense, the calculations based on this comparison are presented, starting with the confrontation between UEP and TDABC.
Under these two methods, the measurement of idleness can be performed from the installed capacity information for a given period. In the case of UEP, the step that measures the "production potential" in terms of UEP per hour at each

workstation provides the main information required to obtain the manufacturing idle capacity, as described in Table 4. In relation to TDABC, the measurement of inactivity prioritizes the time (in minutes) of the practical capacity of the sector (equivalent to the available monthly hours) and the consumption of time necessary to obtain the monthly production. From the installed, used and idle capacity volumes it was possible to assign a monetary value to the activity levels.

Table 4 – Idle capacity by workstation and total in Brazilian Real (UEP and TDABC Methods)

	TDABC	UEP
X_1	1.274,98	4.254,59
X_2	533,79	1.781,25
X_3	638,38	2.130,25
X_4	655,55	2.187,55
X_5	1.252,51	4.179,60
X_6	1.450,39	4.839,92
X_7	425,47	1.419,77
X_8	765,15	2.553,28
X_9	670,70	2.238,11
X_{10}	1.340,61	4.473,58
Idle Capacity	9.007,52	30.057,90
Production Capacity	12.861,86	42.919,76
Idle Capacity (%)	70%	70%

Source: prepared by the authors.

In the TDABC model, the cost of practical capacity available in the period covers all costs of maintaining the production structure. In this case, this amount was 12,861.86 Brazilian Real. However, the volume produced in the period consumed only a part of this installed practical capacity (28,039.84 minutes implying a cost allocation in the amount of 3,854.34 Brazilian Real or 30% of the total of the month). Thus, the idleness was equivalent to 9,007.52 Brazilian Real or 70% of the total cost of the factory structure.

In the UEP method, the amount calculated for the capacity used reached 12,861.86 Brazilian Real and 30,057.90 Brazilian Real for the level of idleness. The latter is an inconsistent monetary value, since it is "detached" from the reality of the company by exceeding the total cost of the factory in the period. Therefore, it is necessary to analyze this result in more detail, as it will be explained.

The calculated values revealed a divergence between the two methods under analysis. While total capacity levels used and idle (in terms of minutes) present the same percentages in both methodologies, the monetary values attributed to idleness were quite different: 30,057.90 Brazilian Real using the UEP method and 9,007.52 Brazilian Real in the case of TDABC.

The main cause of this difference is related to the way the two methods allocate costs to products. In TDABC, firstly, we compute the minute cost of the installed practical capacity. Subsequently, these costs are allocated to the products as a

result of the number of items produced in the period, whose volume of the month is that determines the amount of minutes spent in the same time span.
In the UEP method, the costing procedure is different: the total amount of costs of the period is fully allocated to the volume produced of UEP in the month. Thereafter, a cost value is assigned to products based on their respective equivalents in UEP.
That is, in TDABC the unit cost of the product is reached first and then the cost of the total of the period is determined by the volume of production and the number of minutes consumed (capacity used), which may not be the total amount of time available (practical capacity installed). In the UEP method, in the opposite way, the value of the total cost of the month is fully allocated to the production of the period, even if the production potential of the plant has not been effectively reached. These two inherent characteristics of the costing methods are responsible, a priori, for the differences verified in the values of product unit costs found in this study between the two methods in evidence.
In summary, in the UEP method, the calculation flow starts from the value of the total cost of the period towards the unit value of the UEP, as expressed in the left side of Figure 1. In the case of TDABC, the flow goes through an inverse path, that is, it is computed first the capacity cost rate of each sector per minute, to later reach the value of the total cost of the period.

UEP (from the total cost to the unitary cost)	TDABC (from the unitary cost to the total cost)
1: Total cost of the period ($R) 2: Total quantity produced (UEP) 3 = 1/2: Unit cost of the UEP ($R)	a: Capacity cost rate of the sector ($R/min.) b: Total amount consumed (min.) c = a x b: Total cost of the period ($R)

Figure 1 - UEP and TDABC calculation roadmap (source: prepared by the authors)

Comparing the ABC with the UEP, the calculated values for product unit costs of the five products were different. In this sense, Table 5 presents a detailed composition of the unit cost of the base product computed through the ABC and also the UEP methods, by way of example.

Table 5: Unit Cost UEP and ABC (Brazilian Real)

	UEP	ABC	
X_1	1,2510	1,4460	-0,195
X_3	0,3640	0,5610	-0,197
X_4	6,7988	3,2909	3,508
X_5	3,6219	3,5062	0,116
X_7	0,4241	0,5758	-0,152
X_9	0,2050	0,7593	-0,554
X_{10}	0,4326	1,0002	-0,568
Total	13,0974	11,1394	1,958

Source: prepared by the authors.

Although the final value of the unit cost for the two methods differed by 15%, it is pertinent to point out that the values related to each workstation (UEP) or activity (ABC) had very different percentage variations. While in X_5, the difference was only 3%, in the other manufacturing stages the percentages ranged from -15.59% (X_1) and -270, 46% (X_9).

As for the differences in values, these are mainly derived from the assumptions behind the computation in each method. In the UEP, the values calculated per product are linked to the manufacturing effort ratios and are based exclusively on the "time-of-way" factor at the workstations. On the other hand, in ABC the total costs of activities are allocated to the costing objects by the selected activity drivers, who tend to do not consider the execution time of the activities and prioritize the number of times that activity was executed in the month. Therefore, while in the UEP method only one criterion is used (time), in ABC, several parameters (one for each activity) are used to allocate the costs of the activities to the products (not necessarily closely linked to the time spent in these activities). These different mechanisms of allocation (time versus other cost drivers), a priori, are the main cause of the different calculation of product unit costs.

CONCLUSION

This research aimed to compare the ABC, TDABC and UEP methods with regard to the evidence of production idleness. In summary, it was possible to reach three relevant conclusions.

The first one is that product unit costs calculated by the three methods are different, as shown in the previous tables. A significant part of this difference can be attributed mainly to the way in which these methods deal with idleness. While in TDABC only the capacity actually used (in minutes) is allocated to the products produced in the period, in ABC and the UEP methods this does not occur. These latter two, a priori, assume that the expenses of the period are attributable to the totality of the respective production (by the volume of UEP produced or by the volume of activities performed).

While in ABC the costs of activities are fully absorbed by the activities performed in the month (as in the UEP method), in TDABC this does not happen, as already commented. In ABC, the product will receive a portion of the total cost of the activity, proportional to consumption of that activity in the period, regardless of whether there is idleness or not (full absorption). In turn, in TDABC only the cost of time effectively used is considered.

In the UEP method, the calculation flow starts from the total cost value of the period towards the unit value of the UEP. On the other hand, in TDABC, the route goes through an inverse path, that is, the capacity cost rate of each sector per minute is used to reach the total cost of the period. From these different paths, we can verify the two costing principles mentioned by Bornia (1995).

Under the UEP method, the value of total monthly expenditure is fully allocated to the production of the period (measured in UEP), according to the concept of full absorption cost, regardless of whether or not the production potential of the company is idle.

In TDABC, the total cost of the production of the month is determined based on the number of minutes actually consumed by the respective production (the capacity used), which tends to be smaller than the installed practical capacity, which entails factory idleness. This equates to the inherent characteristics of ideal absorption costing.

In addition, it is pertinent to point out the validation of the results found in Wernke, Junges and Lembeck (2015) research on the similar and identifiable divergences in these two methods, as described below:

• exclusive use of the "time of production" factor to allocate costs to the products: minutes per unit (TDABC) and time of passage (in fraction of hours) of the products by the work stations (UEP);

• definition of production capacity: practical capacity in minutes (TDABC) and production potential in UEP per hour (production potential);

• Priority in determining the value of an abstract unit: in TDABC it is the sector capacity cost rate and in the UEP method the unit cost of UEP;

• they allow to measure the idle production capacity: minutes not consumed (TDABC) and level of unused UEP in the period (UEP);

• allocation of costs: prioritizes minutes of installed capacity in the case of TDABC, while the focus is the total production of the month of UEP in the UEP method.

Finally, it is pertinent to point out that a case study, by its nature, circumscribes the conclusions coming from the scope of the organization investigated. However, the procedures adopted and the description made throughout the text allow further research to be applied to other business contexts. Therefore, it is recommended that future studies address this issue in companies of other segments and sizes, in order to corroborate or deny the findings reported in this article.

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