

COST-BASED PRICING: A CASE STUDY

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RESUMO: Este estudo apresenta uma metodologia de precificação baseada no custeio por absorção, adaptada para uma grande corporação brasileira. Para isso, nosso problema de pesquisa é o desenvolvimento de um modelo de precificação baseado na contabilidade para uma empresa de logística, permitindo a consideração das diretrizes de receita dos stakeholders e garantindo a lucratividade, dada a estrutura do produto vendido (frete). Para alcançar esse objetivo, o estudo envolveu a criação de um banco de dados abrangente de custos utilizando o sistema de custeio por absorção em uma empresa de logística do Brasil. O modelo de precificação foi projetado para considerar as diretrizes de receita dos stakeholders e garantir a lucratividade dentro da estrutura do produto de frete. Baseando-se em teorias de contabilidade de custos e gerencial, bem como em teorias de precificação baseada em custos, a pesquisa estabelece uma fórmula de precificação que alinha as expectativas de receita dos stakeholders, assegurando a cobertura adequada dos custos. O estudo revela um aumento substancial na lucratividade em comparação com os modelos existentes. Ao medir o rendimento entre tarifas, demonstra-se a eficácia da fórmula proposta em atender às demandas de retorno dos stakeholders, mantendo a competitividade econômica. Este estudo contribui com uma métrica baseada em custos para precificação no setor de logística, fundamentada em dados de um estudo de caso real. Ele fomenta discussões contínuas e potenciais aprimoramentos nas estratégias de precificação, oferecendo insights valiosos para empresas de logística e estudiosos da contabilidade de custos.

PALAVRAS-CHAVE: Formação de preço; Custo de absorção; Contabilidade de custos.

ABSTRACT: This study introduces a pricing methodology based on absorption costing tailored for a major Brazilian corporation. To this end, our research problem is the development of an accounting-based pricing model for a logistics company, allowing for the consideration of proper stakeholder revenue directives as well as the assurance of profitability given the structure of the product sold (freight). To achieve this, the study involved creating a comprehensive cost database using the absorption costing system within a logistics company in Brazil. The design ensures the pricing model considers stakeholder revenue directives and guarantees profitability within the freight product structure. We draw on cost and managerial accounting theories and cost-based pricing theories, the research

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establishes a pricing formula that aligns with stakeholder revenue expectations while ensuring adequate cost coverage. The study reveals a substantial increase in profitability compared to existing models. By measuring the yield between tariffs, it demonstrates the effectiveness of the proposed formula in meeting stakeholder return demands while maintaining economic competitiveness. This study contributes a cost-based metric for pricing in logistics, grounded in real case study data. It facilitates ongoing discussions and potential refinements in pricing strategies, offering valuable insights for logistics companies and cost scholars.

KEY-WORDS: Price formation; Absorption cost; Cost Accounting.

1. INTRODUCTION

Pricing formation is a complex process, involving numerous variables, both controllable and uncontrollable by the entity, making measurement challenging. Entities often delegate price formation responsibility to the market (De Souza, Noveli, Minello, Endrici, & Avelar, 2006). Despite accounting tools such as cost accounting facilitating measurement and proper tracking of values for pricing, their utilization is not a straightforward practice.

According to Courcoubetis and Weber (2003), one of the main challenges in creating a cost-based pricing system is recognizing that cost values are not allocated solely to a service or product. Subjective judgment is required for allocation, as seen in the case of allocation. This subjectivity is evident in the term "cost" itself, adapting its meaning to each company or situation, directly related to the entity's subjectivity in seeking information to meet its needs (Garrison, Noreen, Brewer, & Mardini, 2003).

As stated by Bruni and Fama (2008), the undervaluation of a service or product can lead to an entity's bankruptcy due to its lack of profitability. Therefore, it is crucial to focus on accurately measuring the value to be charged for the service or product provided, providing cost information beneficial for the company's management and survival. Obtaining cost information is not easy due to the required volume and intrinsic subjectivity, but it can positively contribute to structuring the company's pricing and monitoring its profitability.

Given the initial concepts and focusing on the cargo transportation sector in the road modal, which is the subject of this study, there are limitations regarding the available information on pricing or costs. Castro (2003) asserts that the scarcity of studies extends

beyond the secretive nature of entities operating in free markets, also due to the lack of observance of tariffs in regulated markets, given discounts, parallel contracts, and the like. The logistics sector remains crucial in the current economic situation.

Logistics is credited with enabling the final customer to obtain a desired product at the desired moment, considering its systemic participation in the supply chain reality. Besides its economic importance, the sector holds strategic significance for the country. This is evidenced by the Federal Government's concern, announcing investments of R\$ 66.1 billion in the road sector in 2015, highlighting the sector's strategic value in the national economy (Brazil, 2015).

The case study under analysis focuses on a logistics company with an annual revenue of approximately R\$ 100 million. However, within this company's context, the absence of cost and profitability-related information management is evident, hindering decision-making based on reliable data. In this scenario, the application of a costing method that could meet this need without requiring an extensive amount of information was chosen. The Absorption Costing method was selected, allowing for proper price formation, and meeting the company's demands.

Considering the need for information to trace activities with costing data, measures for cost measurement were structured, and the logic of producing this information was developed. These procedures were essential to achieve the proposed objective. Various data sources were used, and interviews with key members of the operation, including managers, operators, and engineers, were conducted to obtain the necessary information. These measures allowed for a proper understanding of the collected data, which had not been structured until then. The information was collected and organized to reflect the company's reality, aiming for a balance between variables and ensuring the correct application of cost logic. It was defined that the tariff formula should be dynamic and capable of predicting all possible operational variables.

For the studied reality, the described study becomes relevant, as the activities undertaken in the case study reflect the knowledge acquired in academia applied to a real case. This study has the potential to contribute to various users in the future, such as students interested in better understanding the practical application of academic knowledge, logistics companies seeking an understanding of profitability measurement, and government agencies, considering the national logistics sector involves many concessions and a

considerable infrastructure framework. Therefore, studying the profitability of companies becomes interesting, as it allows for the continuity of businesses.

2. THEORETICAL FRAMEWORK

According to Garrison et al. (2003), managerial understanding of cost can vary in each case, necessitating detailed knowledge for each situation. In this study, cost is considered as all expenses necessary for service provision, including direct and/or indirect costs, such as labor costs, which can be subdivided into direct or indirect labor, depending on their nature. Additionally, according to Kinney and Raiborn (2011), in cost management, information is commonly segregated into direct costs, direct labor, and indirect costs. Shillinglaw (1982) defines direct cost as related to the material or value allocated directly to the service or final product and easily traceable to its origin. Similarly, direct labor represents the value of labor that can be allocated directly to the service or final product.

However, not all cost values can be easily measured for each individual unit of product or service, as pointed out by Kinney and Raiborn (2011). When this occurs, they are classified as indirect costs. For values that are not easily traceable but are indirectly related to the value of the product or service and involve labor usage, the term "indirect labor" is applied. This logic follows the interpretation of allocating production or service values to the manufactured product or service.

The subjectivity of the term "cost" implies that there is not just one way to measure and use its information (Garrison et al., 2003). Among the most common methods are Absorption Costing, Full Costing, and ABC (Activity-Based Cost), among others. According to Epple (2016), cost information can serve various managerial purposes, from product cost to identifying inefficiencies in resource use. Shillinglaw (1982) states that one of the main reasons for using cost as a basis for pricing is its use as a foundation for creating the selling price to ensure profitability. However, by assuming fixed cost characteristics, an impression of profitability can be created, even though it may not necessarily be true. One of the reasons behind this impression could be the inadequate allocation of values to each product or service. Therefore, using cost as a basis is not sufficient to justify the use of cost-based pricing. This use must be associated with reliable allocation and distribution criteria reflecting the entity's reality.

2.1 COSTING METHODS

According to Garrison et al. (2003), costs are attributed to cost objects for various reasons, with the main idea being to quantify the cost object into something manageable. Cost is the amount or equivalent paid or charged for something, making it a subjective term used independently in different entities and data arrangements. The adaptation of the term to certain cost measurements may be appropriate, especially considering management, where there is no standard to follow. Supporting this understanding, Kinney and Raiborn (2011) emphasize that cost data as management tools provide the company using them with a strategic advantage, as their use can summarize the entity's profitability panorama succinctly and comprehensibly.

Although not ideal, the absorption costing method is still widely accepted due to its ease of application and acceptable results. Additionally, it is the cost measurement endorsed by the Brazilian Federal Revenue Service for tax reporting purposes. This method treats all productive costs as product costs, regardless of whether they are variable or fixed. Therefore, the cost of a product in absorption costing is composed of direct material values, direct labor, manufacturing overhead costs, and fixed costs. Thus, each product contributes to a portion of the incurred fixed expenses (Garrison et al., 2003).

For Martins and Rocha (2003), the basic absorption costing appropriation scheme can be described in three major steps: separation between cost and expense; allocation of direct costs directly attributed to products or services, and allocation of indirect costs through allocation. It is evident that the allocation of costs, in the first place, occurs through direct costs, and then the judgment of the cost professional is necessary for the allocation of indirect costs, done through allocation, to have criteria faithful to the entity's reality.

2.2 COST-BASED PRICING

According to Pimentel, Braga, and Casa Nova (2010), the concept of profitability refers to the measure of the economic success of an entity, usually determined by the value of net profit. It is important to note that price increases do not necessarily result in increased margins, contribution, or income, as equivalent or higher cost or expense increases can make the price change unprofitable. Therefore, any change in price structure should focus on the demands of decision-makers. This logic is supported by Sardinha (1995), who defines price as the amount of money the buyer pays to acquire the product or service offered by the

company in exchange for its performance or cessation, as well as by Bernardi (1996) and Cogan (1999), who define profit as the difference between price, costs, and expenses.

Therefore, according to Calado, Machado, Callado, Machado, and Almeida (2007), it is possible to understand an improvement in margin as a favorable result resulting from the mentioned equation, which does not necessarily mean higher prices but can also signify lower costs and/or expenses. According to Biermann (2012), approximately 75% of logistics companies are unable to charge the necessary price for their services, with the main reasons being market aggressiveness and the sale of standardized products. In other words, not only does the market force lower prices, but it also offers standardized products, making it difficult for companies of various sizes and methods of operation to offer under favorable conditions. In this regard, Biermann (2012) also points out that the reality in the sector is that 77% of international correspondents attempted to raise their prices in 2011, with 20% of them failing completely in the effort, while only 66% of those who managed to increase prices achieved a favorable margin growth. In other words, approximately 31% of the 77% that attempted to raise prices obtained better margins.

For Garrison et al. (2003), the most common pricing approach is the use of a markup value applied to the necessary cost value for the production or provision of the services or products that the entity offers. Therefore, for price formation, cost information is necessary, given its dependency for the notion of operational profitability. Bernardi (1996) and Cogan (1999) believe that the service itself should depend on a price based on its cost, as well as on a previously established profitability. Otherwise, there is concern about the possibility of providing a service that "does not pay for itself," meaning it cannot cover its execution costs. Additionally, we employ a clear focus on a cost-based market strategy, yet, given Cressman (1999) understanding of Marketing Theory, we also go beyond strict cost-based pricing, by providing an alternative pricing model based upon market expectancy, known as "closed cargo", where the entire cargo capability of an vehicle is sold to one customer, and, due to the nature of such product, we expect a higher value not due to the cost structure, but due to the logistical implication and market practices.

Part of this work is based on points highlighted by Shillinglaw (1982), who discusses the use of cost-based pricing based on four main arguments:

1. Cost-based pricing is a method of uncertainty absorption. Due to the dynamism of the market, companies naturally seek a management tool that deals with uncertainties and provides predictability.
2. Cost-based pricing may seem to be the only viable measure for the survival of the company. The guarantee of survival occurs when a minimum volume and price are established, making the operations of an entity sustainable. An example is the theory of the break-even point.
3. Cost estimates can provide management with information about the long-term price goals of the competition. By obtaining cost information, it is possible not only to calculate and extrapolate market trends but also to understand the competitive environment in which the company operates.
4. Formulating pricing based on costs allows management to delegate authority to subordinates to set prices. This contributes to internal organizational control, as discounts, for example, are restricted to a select group of people with the authority to do so.

Additionally, the process of creating cost-based pricing can be divided into four stages:

1. Description of the product or service, including relevant information such as time and actors involved.
2. Insertion of specific values for each case, such as driver's daily rates and distance between company branches.
3. Application of the markup, which should be obtained after observing the market and the product in question to ensure the appropriate profit margin.
4. Market adaptation, which is only possible after verifying the model on practical bases and making fine adjustments by consumers or stakeholders at various hierarchical levels.

However, it is important to note that economic pricing models have limitations, as pointed out by Shillinglaw (1982). In this case, such difficulty was found due to the aggregation and treatment of information based on numerous data sources, confirming a considerable limitation, whether based on the quantity or quality of the information found.

Thus, for the creation of the database, it is necessary to consider the presence of bias resulting from the inherent subjectivity in cost allocation, even if minimized by interviews

with key members of the operation. Moreover, it is essential to verify a factor that incorporates profitability and the necessary expenses for the product's sale during price formation. In the studied case, indirect labor and taxation are elements forming the markup. According to Pradhan (2006), the markup is defined as the difference between the selling price and the cost, but it is important to add the relevant variables to ensure the information desired by the entity that conceived it. Therefore, it is an extremely variable and subjective factor, as it is strategically defined by each company, especially as a profit margin.

Regarding the market factor, it is crucial to consider it in price definition, as emphasized by Biermann (2012). Aggressive competition often frustrates the evolution of prices in the logistics sector since the market in the sector maintains self-monitoring of prices, preventing the use of a pricing basis that reflects institutional needs. This fact ensures a considerable margin for industry giants while limiting the ability of smaller companies to compete to ensure coverage of their basic needs or return aspirations (Castro, 2003).

2.3 PREVIOUS STUDIES

The subject of cost accounting methods is widely discussed in academic circles. Calado et al. (2007) conducted a study in the agribusiness sector and found that most companies have cost systems or some form of cost structure, while others claim that their needs are met by general management accounting information. In studies on the application of the RKW costing method in the hospital sector, Beuren and Schlindwein (2008) discuss the advantages of applying a costing method in a hospital but highlight existing difficulties, such as the inherent subjectivity in operations, particularly the need for judgment in allocating routine sector activity branches. Souza, Firpo, Ponczek, Zylberstajn, and Ribeiro (2012) adopt a different perspective, observing the costing methods used by the ceramics industry. The results show that the RKW or full costing method predominates among sector companies, although in some cases, there are cost management systems that work in parallel but are generally used as a metric to assess profitability rather than to improve internal practices. In their studies, Beuren, Sousa, and Raupp (2003) conclude that most Brazilian companies using costing methods use absorption costing, attesting not only to its ease of application but also to the managerial gains possible after implementation. As for the reality of the dairy and oilseeds sector, Scramim and Batalha (1998) observe that dairy companies face slower advances in costing methods due to their competitive reality, unlike the situation

RAGC, v.18, p. 38 - 56 /2025

in the oilseeds sector, where, given the market size, regulations, and company size, there is greater adaptation to costing methods that offer more effective control and management tools.

The variety of costing methods means that there is no perfect method for all situations but rather methods that best suit each entity, as demonstrated by Eyerkauser, Costa, and de Faria (2007) in their study on a sheep farming company. In this study, both variable and absorption costing methods were employed, and it was found that the former was more useful for the company in question, as the segregation of information between variable and fixed costs provided management with more viable short-term information.

It is evident that there are many approaches when it comes to costs and costing methods, including proposals such as the study by Zorlescu, PENEOLAS, and Negoescu (2015), which evaluated the usefulness of information from the ABC costing method in decision-making. This demonstrates the broad scope that is possible in the study of costs and costing methods. For the Logistics sector, specifically in the field of road freight transportation, as mentioned by Castro (2003), studies on pricing in the field are, as far as we could verify, scarce. There is a strategic barrier that limits some companies from making their cost and pricing information public, while others, as observed, only apply competitive prices, and then apply a discount rate deemed appropriate by management.

3. METHODOLOGY

The entity under study corresponds to a logistics operator "Company Alpha," operating throughout Brazil with headquarters in Natal, Rio Grande do Norte. The company's annual revenue is approximately 100 million reais. The company chosen for this study was selected based on convenience, as it is the workplace of one of the researchers, and the availability of data. Nevertheless, identifiable information has been removed.

This work consists of a case study, characterized as an empirical investigation of a specific phenomenon and its interaction with the context (Yin, 2015). The study has a descriptive and qualitative nature, aiming to observe the reality of the company, its practices, and strategies adopted for the establishment of a cost control system using the absorption method, as well as the creation of a mathematical formula for pricing the service to be provided, considering the management's expectation of this measurement.

3.1 DATA COLLECTION

To create a database that could be appropriately analyzed, it was necessary to gather various information from various sources within the company, if each manager in each specific area would have more accurate information about their management area. To unite all the data into a common database, a cutoff period was defined, set for October 2016. The reason for this choice lies in being a date close to the beginning of the study, and because all the data would be consolidated.

Starting from the concept of cost, it becomes essential to verify data related to the fleet, keeping in mind that these are the "production" machines of the company, i.e., they are cost objects and revenue generators. Vehicle tracking costs, fuel, maintenance, and distance traveled, among others, were obtained from the fleet manager, with the vehicle plate being the most suitable metric. This is because if the data were in the same database, the information for each vehicle would be substantially closer to reality.

The purchasing management is responsible for assuming the responsibility for various expenses, such as fleet insurance, property tax (IPVA), and tracking, making it also a vital part of building a database for the analysis of fleet costs and expenses. The data is also stored and stratified by vehicle plate.

The human resources department holds information related to labor costs. In the case of the study, all salaries of all employees were raised, categorized between direct or indirect labor, and subsequently allocated per base. The raised salary was its net value, and a multiplication factor of 2.8 was applied to this value to provide better information about the actual cost of a recent employee in a company. This is due to a statistical assumption to apply this factor to all employees, and the value of 2.8 was used based on the work of Souza et al. (2012). This factor includes, in addition to charges, general expenses, training costs, and lower productivity at the beginning of the activity, among others. This value is also treated as the "maximum" value of an employee under certain conditions, providing a margin of coverage over the value if it is lower.

The main financial management data, taken from the company's financial sector, used is information on fixed costs and Electronic Freight Knowledge (CTE) issuances, which serve as guidance for the allocation of expense value, i.e., administrative labor, which works with issuances of transport documents, mostly.

3.2 DATA PROCESSING

After data collection and the prior definition of the cut-off, direct costs were linked to cost objects, in this case, the vehicles, identified by their license plate numbers in the distribution.

The allocation of information to license plates allows obtaining vehicles with allocated bases, if necessary, or by committed project. However, due to the lack of complete information, it is more prudent to use statistical averages to create cost values per category. The categories used in the Fleet Management industry, such as Van, Trailer, Light, Light Cargo Truck (VUC), Trucks and Semi-trucks, segregate based on load weight, number of axles, and total vehicle characteristics, among others. Each vehicle has its limitations and uses, possessing not only individual costs but also its own revenue potential.

After linking the information, the linked cost data was segregated by vehicle category, resulting in an average per category. This is the first step of the formula, the linking of direct cost values, including spent fuel, paid property tax (IPVA), maintenance costs, investment made, insurance, tracking, and risk management, as well as the driver's salary, as direct labor cost. It is essential to note that the term "investment" used by the company refers to maintenance costs and not an actual investment. The segregation in the formula and the database occurs because this is a metric used by the company and information available in the data, and it is not possible to segregate without loss of information.

The result of this sum was divided by the distance traveled to know the cost per kilometer traveled per vehicle category. Then, this value was multiplied by the distance to be traveled to obtain the total cost of the distance. However, as the load does not correspond to the total vehicle capacity, a way to measure the participation of each load within the vehicle was created, and this value is called the occupied percentage. The occupied percentage is the result of dividing the weight of the load by the total weight that the vehicle can carry.

During the interviews, specificities of the industry were identified, such as the sale of fractional cargo, where only one load is charged within the vehicle, or closed, where the entire vehicle is charged, regardless of the cargo it carries. Another specificity is the practice of measuring cubed weight, which made it interesting to create the variable "practical weight," since the price should be based on the actual weight, product weight, or cubed weight, whichever is higher.

Considering that labor conventions in the transport industry provide daily allowances for drivers under certain conditions, which vary according to the distance traveled, the daily

rate was added to the formula. For this value to be assigned to each load, it is necessary to follow the same participatory logic as the occupied percentage since each load will have its charge related to its participation in the vehicle.

Once the logic of the formula is completed, the Indirect Labor Factor is added, referring to R\$ 0.95 per transported kilogram. This value is obtained through the ratio of the total load capacity of the company and its expenses with indirect labor, such as unloaders and the like. It is important that the mathematically formulated reality is faithful to the operational reality of the company. Therefore, it is necessary to think of a structure rigid enough to prevent the manipulation of values that only cover the minimum service costs but flexible enough to allow discounts for certain levels of reach to remain economically competitive.

Additionally, it is necessary to address additional price factors, which are diverse and vary from the Electronic Freight Knowledge (CTE) issuance rate to the Risk Management Value (GRIS). There are also details contained in the additional factors category, such as the difficult delivery fee (TDE), an additional charge when the delivery of the transported volume occurs in a difficult-to-access location, or the vehicle retention fee, charged when a vehicle is detained for reasons beyond the transport company's control in serving a customer, among others.

It is important to note that certain values, such as the calculation of Ad Valorem and GRIS, are calculated based on the invoice, which must be declared for the transportation of goods. However, it is important to emphasize that this is not an immutable truth, as companies in the air freight mode only request a declared value for insurance calculation, depending on the client's choice of whether to be covered.

After structuring the formula that aims to obtain the cost of the service provision, a markup is used to adjust the price to the profitability values expected by the company's stakeholders and a tax assumption. This process starts from cost formation to the formation of the price itself.

4. RESULTS

In the reality of freight transportation services, there are two approaches to measure the freight value. The first method consists of calculating the freight based on the "practical weight," while the second is based on the invoice value of the product. The most common RAGC, v.18, p. 38 - 56 /2025

method is calculating the freight by practical weight, which corresponds to the higher value between the cubed weight and the actual weight. The cubed weight is obtained by multiplying three dimensions of the load and the cubing factor according to Equation 1:

$$CubedWeight = Width(m) \times Height(m) \times Depth(m) \times CubingFactor \quad (1)$$

The cubing factor varies according to the transportation sector. For the road transport mode, a cubing factor of 300 is commonly used. This factor is essential for converting the cubic measurement into a weight value, enabling the comparison with the actual weight of the product to be transported. The adoption of "practical weight" is motivated by the need to ensure the best profitability of service provision through calculations based on the highest calculation base, whether it is the cubed value or the actual weight. In many cases, weight is indispensable for calculating the freight of a load. To calculate the weight cost, a formula is used that considers the load's participation in the total weight of the vehicle, as expressed in Equation 2:

$$\%Ocu = \frac{PW}{C_{av}} \quad (2)$$

Where:

- %Ocu –Percentage occupied
- PW - Practical weight (Cubed or actual Weight, of the two, the larger)
- C_{av} – Vehicle carry capacity

The calculation of the occupancy percentage aims to determine the cost value that more accurately corresponds to the space used by the cargo in the transport vehicle. This measure is achieved through a formula that considers the cargo's participation in the available space in the vehicle. This approach aims to provide a more accurate cost value for each transported load.

4.1 INDIRECT COSTS CALCULATION

By integrating all information related to kilometers traveled, liters of fuel used, cargo capacity, fuel expenses, tax payments, maintenance costs, investments made, insurance, and the driver's salary, which varies according to the category of their driver's license (A, B, C, D, or E), it becomes possible to estimate the total transportation cost of a load. This logic can be mathematically expressed through Equation 3:

$$C_v = \frac{G_c + G_{IPVA} + G_m + I + G_s + G_r + G_{gr} + S_m}{Km_r} \quad (3)$$

Where:

- C_v – Average total cost by vehicle by milage
- G_c – Fuel expense
- G_{IPVA} – IPVA expense
- G_m – Maintenance expense
- I - Investments
- G_s – Insurance expense
- C_r – Tracking expense
- G_{gr} – Risk management expense
- S_m – Driver pay
- Km_r – Average milage by vehicle category

The goal is to obtain average values for each type of expense related to the vehicles of each category per kilometer traveled. This way, it is possible to determine the cost per kilometer for each vehicle.

4.2 TOTAL FREIGHT COST

To calculate the freight cost, it is necessary to consider various factors that directly impact the final value of the service provided by the company. Among the inputs to be considered, we can highlight the fuel cost, vehicle maintenance, driver's salary, among others. These factors are mathematically combined to arrive at the total cost of freight, as presented in Equation 4:

$$C_f = \%Ocu \times [(\times C_v \times Dist) + (\times V_c \times T_s)] + C_{Mol} \quad (4)$$

Where:

- C_f - Freight cost
- $\%Ocu$ - Percentage occupied
- C_v - Average total cost by vehicle by milage
- $Dist$ – Distance needed for delivery
- V_c – Class convention pay
- T_s - Time to delivery (in days)
- C_{Mol} - Coverage factor for Indirect Labor (Fractional Load)

4.3 MARKUP CALCULATION AND PRICING FORMATION

During the process of formula creation, the development of two distinct models was necessary, as the reality of the markup varies depending on the selected model. This is due to the subjectivity of the situations anticipated by the formula and the need for adaptation to the end user.

One formula is used to determine the freight value when the vehicle is dedicated to a single client. The other formula is used for fractional loads, meaning the transport of various small-volume cargoes, requiring more than one shipment to fill the vehicle's load capacity.

The need for two aspects of the formula arises to adapt to different realities. In the case of dedicated vehicles, the value is specific to dedicated service, regardless of the transported volume, thus only the direct labor part is used.

For shared services, it is necessary to foresee a percentage that covers the cost of each volume independently to ensure the coverage of its own expenses and costs. In the fractional load model, it is necessary to create a value that covers the expenses with the cargo from the perspective of indirect labor. This value corresponds to the coverage factor for indirectly allocated labor, represented in the formula above as C_{mol} . The value of R\$ 0.95 is obtained through the ratio between the sum of cubic meters that the company can transport (2,065,024) and the amount spent on indirect labor (R\$ 1,970,881.02), creating the ratio of real per cubic meter.

$$C_{mol} = 0,95 \times PW \quad (5)$$

For application in the formula resulting in the freight value, the application of the markup is necessary. In this specific case, as mentioned earlier, there are two variations: for closed cargo (equation 6) or fractional cargo (equation 7). In the closed cargo formula, a value of 0.25 is estimated for the margin of Indirect Labor. This value was obtained after verifying that, on average, a closed truck uses a quarter of the workers compared to a vehicle with fractional cargo for unloading and related tasks.

$$M_{uf} = \frac{1}{1 - (Tax + ProfitMargin + IndirectLabourMargin)} \quad (6)$$

$$M_{ufr} = \frac{1}{1 - (Tax + ProfitMargin)} \quad (7)$$

4.4 FINAL FREIGHT VALUE

By combining the previous formulas, the freight value equation is derived, already covering costs, markup, and mandatory price additions, as well as various optional ones that can be included, as shown in equation 8:

$$V_f = (C_f \times M_{ux}) + V_n \times (AdValorem + GRIS) + TEC + A_n \quad (8)$$

Where:

- V_f - Freight value
- C_f - Freight cost
- M_{ux} - *Markup* (Closed or fractional load)
- V_n - Product value
- *AdValorem* - Obligatory insurance over product value
- *GRIS* - Obligatory risk management over product value
- *TEC* - CET emission cost.
- A_n - Price additives

The TEC is a value frequently charged in the cargo transport sector and is fixed, aiming to cover general administrative labor expenses and related costs. This value is applied to each loaded product and is considerable, becoming a relevant aspect in determining the freight price. Thus, it is possible to arrive at a dynamic formula that can be fed by a database and, above all, presents a freight value proportional to the loaded weight without the need to use common weight bands in the sector.

5. CONCLUSION

The aim of this study was to analyze the impact of a pricing strategy based on absorption costing to measure the profitability of a road cargo transport company. Initially, the study sought to identify the direct and indirect costs involved in price formation. Subsequently, a markup factor was calculated to meet the expected profitability of stakeholders, ensuring a managerial price that secures the profitability of the service provided.

The proposed formula proved to be suitable for the initial objectives of measuring freight costs through absorption costing and, consequently, determining the freight price according to the expected profitability. A possible gain in profitability was observed, along

with the need for measuring the company's performance, assisting users in making decisions regarding market prices to meet demand.

Despite the obtained results, limitations were encountered during the elaboration of this work, such as the limited amount of information available in the company and the lack of studies in the area. Therefore, it is suggested for future studies to use other costing methods and conduct broader studies in the sector, considering the scarcity of available material.

The employment of marketing theory provided the study with consideration towards alternatives pricing strategies, and while cost data have been employed as to guarantee profitability, an alternative model able to adhere to market expectancy allows the final product, the formula, to be readily employed by the company towards a larger variety of customers.

Notwithstanding the limitations found, this research serves as a case study using cost information, acting as practical literature, indicating how companies in a similar situation can act to understand and create their pricing systems. It also contributes to theoretical literature, providing researchers and students with a case study on how accounting and cost information can be used and observed in practice.

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