

**MINISTRY OF EDUCATION
“1 DECEMBRIE 1918” UNIVERSITY OF ALBA IULIA
FACULTY OF ECONOMIC SCIENCES
DOCTORAL SCHOOL OF ACCOUNTING**

SUMMARY OF THE DOCTORAL THESIS

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**THE IMPACT OF COST CENTERS EVALUATION MODEL
ON THE DECISION-MAKING PROCESS IN THE
AUTOMOTIVE INDUSTRY**

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INTRODUCTION

Research context

Businesses face an uncertain world that is constantly changing due to the social environment, consumer demand and product competitiveness, representing the determining factor of competitive pressures in the market. To choose between alternative business opportunities, managers require information about future costs and revenues and how they may vary at different levels of activity. Managers are constantly making daily operational decisions that affect revenue, costs, and profit. In the decision-making processes, the information from the internal and external environment must be considered, in order to identify all the opportunities and threats specific to the activity. For efficient and fruitful use of this information in the business environment, management accounting systems are used in providing the performance reporting, planning, budgeting and forecasting processes fundamental to management.

An analysis of the specialized literature on managerial accounting reveals that the field has evolved over time, with an increasing emphasis on the role of accounting information in strategic decision-making. Important information can also be obtained by analyzing the dependence of costs and their behavior against different factors, from which prognostic models useful for cost estimates can be derived. So, the lack of knowledge regarding the behavior of costs and their dependence, can lead to erroneous assessments. This is why there is increased pressure to research cost variability and how to project these findings into cost systems or decision-making, resulting in the determination of the appropriate price of a product.

Accounting is a language that communicates information of an economic nature to people who have an interest in a company: managers, shareholders and potential investors, employees, creditors and the government. Managers require information that will assist them in their decision-making and control activities. Information systems are of fundamental importance in daily managerial activity and enable managers to make decisions about planning, directing and controlling the activities for which they are responsible, in a timely and efficient manner (Iacoviello G., 2013).

A condition for successful decision-making and management is a functional planning of economic indicators. The plan is based on the results of previous periods and sets future goals, including external factors affecting the company (Látečková A.,2016). Predicting costs and developing cost management methods has become one of the most important factors in the industry (Favi C. și colab., 2016).

With the ongoing pandemic and war, companies face increased risks of property damage, disruption of operations, and increased financial risks, such as decreased cash flow and reduced profitability. Management must assess these risks and take steps to manage them. Widespread economic uncertainty is the result of the COVID-19 pandemic, which has led to reduced demand for goods and services leading to cost management measures such as downsizing, consolidating operations or outsourcing certain functions. The COVID-19 pandemic represents one of the major events impacting the economy and managerial accounting so that no economy, industry or business has been exempted from its effects. The COVID-19 crisis continues to have a negative impact on households, businesses and financial markets. In this context, scientific research advocates a framework that can cushion and offset its effects in future health, financial or industrial crises

For at least 50 years, the concept of managerial control has been linked to strategy, the link between strategy and control has been mainly linked to the budgeting process, and strategic objectives have been quantified through the budget (Nilsson F. et al., 2011). Vidaković N. et al. (2021) point out that EU economies had very different structures and starting points with the onset of COVID-19 and that different economies will need different specific policies, but the general framework may be similar for all economies. Baric R. (2021) investigates the issues of financial crisis management where recent economic cycles have focused more on the financial sector rather than the real economy precisely because emergency financial management has become prominent.

Some industries are experiencing supply chain issues as most workers are forced to stay at home and industry connections are disrupted (Kraus S. et al., 2020). However, some IT businesses and online businesses have grown in the context of the COVID-19 pandemic. The literature proves that the COVID-19 pandemic was different from the 2008–2009 crisis by generating not only a demand shock, but also a supply shock, exacerbated by containment policies (Brinca P. et al., 2020). In order for Romanian micro and small enterprises to better cope with the disruptions created by the COVID-19 pandemic, they must, first of all,

demonstrate openness to innovation in production and adaptability to new demand, as well as provide strong support clients and communities (Păunescu C. et al, 2020)

The war launched by Russia has had a significant impact on management accounting practices around the world, causing significant economic and political instability, leading to changes in the way organizations operate and plan their financial strategies. One of the main effects of the war is the increase in uncertainty in the global economy, influencing companies to become more cautious in their financial planning and management practices, placing greater emphasis on risk management. The war also had a significant impact on international trade and investment, causing many companies to reconsider their plans for global expansion. Russia is a major supplier of key metals and minerals, and export sanctions have severely affected demand and commodity prices.

Managers must take appropriate and beneficial decisions about every activity they undertake. One of the essential managerial skills is the ability to allocate and use limited resources appropriately to achieve optimal performance and, ultimately, to use the most appropriate scientific tools to achieve desired goals. Therefore, by identifying and measuring the costs of the company's core activities, activities are instituted that help improve organizational performance.

Accounting regulations make a substantial contribution to effective decision making by actively participating in resource allocation decisions, cost control and efficiency improvement. This fact is particularly important for organizations pursuing financial sustainability, as it allows them to make informed decisions about how to achieve their financial goals and benefit from opportunities that arise.

The importance of detailed analysis and decentralization of decision-making is increasing in today's complex business operations. Responsibility accounting was introduced to meet the need for decentralization, accurate information and analysis. Understanding the relationship between responsibility centers provides an organized flow of information that can improve decision making and cost control (Mahmud I. et al., 2018).

Cost management is one of the most important issues for any company and at any stage of its development, becoming a more relevant topic after the global financial crisis. Every company experiences cost reduction in all areas of responsibility, from administration to production, but cost management is not just about cost reduction. Cost management is a process that should lead to better utilization of costs and higher production volumes and

revenues. We can argue that cost management could be considered one of the basic activities in the economic practice of industrial companies.

Savings can have a significant impact on an organization's hourly rate. By reducing costs, organizations can increase their profits, which can lead to lower hourly rates. This can make the organization more competitive because lower hourly rates can attract more customers and also lead to lower prices for goods and services.

The determinants that influence the variation of total production costs can have an important connection to managerial decision-making because production costs can have a significant impact on the profitability and success of an organization. Production costs are the costs incurred in the production of goods or services and can be influenced by various factors such as raw material prices, labor costs, technological advances and government regulations, among others.

Research motivation

To survive in a competitive environment, it is essential that managers identify and understand emerging problems as a prerequisite for strategic changes. Based on this fact, managerial accounting represents a key role in strategic decision-making, evolving from the role of recording data on cost calculation to that of informational support in the decision-making process. The scientific approach brings to the fore the role of managerial accounting in making strategic decisions, thus ensuring the efficient and effective acquisition and use of resources in order to achieve the organization's objectives.

The argument for choosing the research topic is based on the importance of managerial accounting and its interdependencies, both from the personal desire to deepen knowledge regarding the decision-making role of managerial accounting, and from the desire to develop a cost center evaluation model in the industry context automotive. The reason for choosing this area derives from the fact that the automotive industry is a subject of considerable interest in economic scientific research, through its significant contribution to the global economy. As an important participant in international trade, the automotive industry generates important effects on global supply chains and trade relations between countries and is known for its focus on innovation, especially in areas such as safety and environmental sustainability. Continued research in these areas can help inform decision-making and shape the future of this important industry.

Researchers in this field have explored the importance of managerial accounting in decision making and its impact on the performance of organizations. Studies have shown that this provides relevant and accurate information for management to make informed decisions starting from the design and development phase. This information includes data on costs, benefits, market trends, customer preferences, competition and resource requirements, which are critical in determining the feasibility and viability of new projects. Management accounting also supports the efficient use of resources, including the allocation of resources for different stages of the project and the optimization of their use. Another area of research has focused on the impact of management accounting on organizational performance, arguing that the effective use of management accounting information in decision-making leads to improved organizational performance, such as increased efficiency, effectiveness and profitability.

From the point of view of the theoretical composition, the motivation for choosing the research topic is proven by the desire to determine the current state of understanding regarding the field of managerial accounting. Through the bibliometric analyzes undertaken, from the point of view of scientific research, we argue that this scientific approach is fundamental to interested researchers because it presents the analysis and mapping of research directions in the studied field and undertakes future research approaches. Regarding the statistical research and the empirical study carried out, the impact of the determining factors on the variation of the total cost is analyzed in the context of cost center accounting. Analyzing the specialized literature, it is observed that the level of scientific research in this field is not as popularized as other subjects in the field of managerial accounting research.

The relevance of the research theme denotes the emphasis on the major tasks of management accounting to support management in decision-making by providing information, analysis and recommendations, a theme of great importance because it is an integrated part of the decision-making, managerial and budgeting process and has an extremely important mission to support management in making the best decisions, providing information aimed at effective asset management.

Managers are interested in estimating past patterns of cost behavior because this information can inform accurate cost forecasting, planning, and decision making. The importance of better analytics and decentralization of decision-making is increasing in today's fast-paced, complex business operations.

Research objectives

Since in recent decades the structure of the economy, production, operations and customer requirements have changed, the view on cost management has also had to change, we believe that the proposed research topic "*The impact of cost centers evaluation model on the decision-making process in the automotive industry*", deals with important, current topics, which have an impact both in economic theory and in practice.

In order to achieve the proposed goal and facilitate the research process, the following objectives are set:

Table no. 1.1 Research objectives

Main objectives	Secondary objectives
1. Assessing the current state of knowledge regarding managerial accounting using qualitative and quantitative literature review methods	Descriptive analysis of the influence of specialized journals, authors, publications, institutions and countries.
	Scientific mapping and their analysis.
2. Theoretical-empirical examination of the use of managerial accounting systems	Deepening the concepts regarding the users and information of management accounting systems.
	Theoretical research and scientific mapping on management accounting systems.
	Presentation of the results of the empirical study of the use of management accounting systems through the lens of information quality and the size of the systems.
3. Theoretical exploration of management accounting relevance in its implementation in organizational culture	Knowledge of general accounting frameworks on global, European and national level, on managerial accounting.
	Deepening the knowledge about the participation of organizations in the managerial, decision-making and budgeting process.
4. Explaining the impact of cost management on managerial performance and decision making	Debating the conceptual framework on cost management and the effects of macroeconomic developments.
	Deepening the concepts regarding accounting by responsibility centers.
	Knowledge of the relationship between cost management, managerial accounting and responsibility centers.
	Exemplifying the influence of the hourly rate related to a cost center on managerial decisions.
5. Carrying out the empirical study on the impact of the determining factors on the variation of the total cost in the context of cost center accounting	Presenting influencing factors of the total cost.
	Descriptive and graphical analysis of panel data.
	Creation of econometric models and presentation of results.

Source: own processing

The research in question aims to obtain answers to current problems in the field of managerial accounting, by conducting a study on organizations, pursuing two research directions: a conceptual one, through the contribution brought to increasing the degree of knowledge of managerial accounting, of the conceptual framework regarding cost management and performance, investigating the relationship between cost management, managerial accounting and responsibility centers, and an exploratory one both by analyzing the importance of information quality and the dimensions of system quality, from the perspective of users of managerial accounting systems, and by conducting an empirical study on the impact of internal determining factors on total cost variation in the context of cost center accounting.

According to the final aim of the research, this scientific approach is based on the following research questions:

- Q1: What are the topics of interest to management accounting researchers for the period 1975-2022?*
- Q2: What is the feedback from users of management accounting systems, considering both the quality of the information and the dimensions of the systems?*
- Q3: Globally, what are the most used management accounting accounting frameworks?*
- Q4: Is management accounting the cornerstone of decision-making?*
- Q5: What are the cost management tasks arising from macroeconomic developments?*
- Q6: Is there an interdependence between management accounting, cost management and responsibility accounting?*
- Q7: Given responsibility accounting, how can cost centers influence managerial decision making?*
- Q8: In the context of cost center accounting, what are the internal factors that impact the total cost variance?*

These questions are addressed during the scientific approach, being considered relevant both in the analysis of specialized works and in statistical modeling.

Research methodology

The versatility of the studied phenomenon denotes the obligation of an appropriate methodological approach, combining fundamental and quantitative research through modern and classic research tools. We consider the scientific approach undertaken to be

fundamental, observational and descriptive, using different methods and techniques: review of specialized literature, research structuring method, documentation, analysis and chronological study, comparative analyses, case studies, thematic syntheses, data collection, econometric analysis and the exemplification. We used these methods by consulting specialized works, articles and various publications, information databases and normative acts in force, as well as direct documentation.

In the context of this scientific work, from the point of view of theoretical research we use as methods: documentation, observation, document analysis and comparative study. For example, these techniques are used in the analysis of the current state of knowledge on management accounting and in the theoretical analysis of cost and performance management. Considering the fact that in this endeavor we contribute to the field of research, through comments on comparisons, ideas for improvement and conclusions, we highlight the participatory aspects of our research.

Using deductive reasoning and synthesis, the studied information was then processed and interpreted with the help of complex methods of systematization, analysis and comparison. The basic source for documentation and information is represented by databases with encyclopedic content (Web of Science, Emerald Insight, Google Scholar, SpringerLink), articles published in journals indexed in international databases that have an impact factor, and specialized books. Based on the collected data and information, the bibliometric analysis was outlined using relational mappings as a figurative support in order to present the conclusions from an analytical and synthetic point of view.

Taking into account the perspectives offered by academic research and professional organizations, at the beginning of each chapter, we rely on a qualitative research method, reporting the issues that are discussed. In the first chapter, we use a quantitative and qualitative examination, based on the analysis based on the applied questionnaires, Likert-scale coding of the level of agreement of the answers, to expose the results obtained. In the third chapter, we use exemplification as a method, outlined through a practical study, based on professional reasoning that requires knowledge of the practical reality within a company. In the last part of the scientific approach undertaken, panel data analysis and their econometric modeling are used to determine the impact of the determining factors on the total cost variation.

SYNTHESIS OF THE SCIENTIFIC APPROACH

In pursuit of a logical exposition of the research topic, the structure of the thesis was developed starting with a section that provides an overview of the research problem, background information, research design, as well as the objectives and significance of the study by reviewing the existing knowledge on the topic and the presentation of theoretical concepts through the lens of specialized literature analysis, followed by the results of data analysis and econometric modeling, including tables, figures and statistical analyses. The scientific approach also interprets the results and assesses their implications for the research questions and objectives, summarizes the main findings and implications of the study, and makes recommendations for future research. In the last part, all the sources cited in the paper are listed, using a standardized citation format, according to the guide for preparing the doctoral thesis.

In order to ensure an integral representation of the content, the work is structured in four chapters, briefly related, as follows:

The first chapter titled: *"Strategic management accounting practices: a literature review and opportunity for future research"* focuses, in the first part, on the concept of management accounting and presents different approaches regarding the role of management accounting, its performance, strategy, offering a holistic perspective based on exploratory analyzes of specialized papers and the results of bibliometric analysis and scientific mapping. The second subchapter increases the degree of knowledge of information, users and management accounting systems and is realized through an empirical research on their use in economic practice, presenting relevant conclusions based on the answers, related to the addressed questionnaire. The last part of the chapter captures future research directions identified based on the literature and empirical study.

The second chapter entitled: *"Exploring the relevance of accounting frameworks in the pursuit of financial sustainability from the perspective of managerial accounting"*, presents the general legislative aspects regarding managerial accounting and outlines the three fundamental processes of managerial accounting, such as: the decision-making process, the managerial process and the process of budgeting.

The third chapter named: *"The importance of macroeconomic developments regarding cost management on managerial performance and decision-making"* presents the

conceptual framework of the studied field, as well as delimitations regarding cost management tasks as a result of macroeconomic developments, the concept of cost information and reviews cost management in times of crisis. The second sub-chapter completes the scientific approach by presenting the relationship between cost management, managerial accounting and responsibility centers, in the context of responsibility center accounting and presenting general aspects regarding the organizational policy of cost center management. The influence of cost centers on managerial decisions is demonstrated in the last subchapter, through an example regarding the influence of the hourly rate.

The fourth chapter of the scientific approach takes the form of an *"Empirical study on the impact of the determining factors on the variation of the total cost in the context of the automotive industry"*, by identifying and quantifying certain influencing factors, as well as analyzing the sensitivity of the total cost in relation to the variation them, by modeling and studying panel data. The study is based on a database with 630 statistical observations, related to the period January 2017- March 2022.

The impact on the dependent variable (C_{total}) of the following determining factors is analyzed: costs with personnel ($C_{personal}$), general costs ($C_{generale}$), energy costs ($C_{energie}$), costs allocated to the implementation of new software and hardware technologies (C_{it}), costs for increasing quality management ($C_{management}$) and transport costs ($C_{transport}$).

The last part of the scientific research summarizes the main findings and implications of the study, presents the author's own contributions and limitations of the research, and provides perspectives for future research.

FINAL CONCLUSIONS, OWN CONTRIBUTIONS, LIMITATIONS AND FUTURE RESEARCH PERSPECTIVES

To understand the role of management accounting today, it is important to understand its history. The development of managerial accounting is due to the use of additional techniques that change the general idea from elementary to complex. The adoption of innovative techniques is possible due to the subjective nature and concepts of management accounting. However, the main purpose remains to facilitate decision-making for planning, control, evaluation and communication within organizations.

The scientific approach entitled "*The impact of an evaluation model of cost centers on the decision-making process in the automotive industry*" sought to obtain answers to current problems in the field of managerial accounting, considering two research directions: a conceptual one (through the contribution brought to increasing the degree of knowledge of managerial accounting, knowledge of the conceptual framework regarding cost and performance management, investigating the relationship between cost management, managerial accounting and responsibility centers) and exploratory (both by analyzing the importance of information quality and the dimensions of system quality from the perspective of users of managerial accounting systems, as well as by carrying out the empirical study on the impact of the internal determining factors on the variation of the total cost in the context of cost center accounting).

In the first part of the research, the 5 main proposed objectives, 14 specific objectives and 8 research questions were detailed, their fulfillment being successfully achieved within this scientific endeavor.

Structured conclusions based on chapters

Through the chapter "*Strategic management accounting practices: a review of the literature and opportunity for future research*" made possible the full fulfillment of both the first two main objectives, regarding the assessment of the current state of knowledge regarding managerial accounting using qualitative and quantitative methods of reviewing the specialized literature and the theoretical-empirical examination regarding the use of managerial accounting systems, as well as the related specific objectives. Following the study of specialized literature, through bibliometric analysis of the influence of specialized

magazines, authors, publications, institutions and countries and their scientific mapping, main topics of interest for researchers were identified, such as: managerial accounting and control systems of management, management accounting practices and strategic management accounting. Through this part of the research, the research question was answered: *Q1: What are the topics of interest of researchers in the field of managerial accounting, related to the period 1975-2022?*

The second sub-chapter, studies the need and role of decision-making systems provided by management accounting and increases the degree of knowledge of management accounting information, users and systems, successfully fulfilling the second main objective and related specific objectives. In the bibliometric analysis undertaken regarding the specialized literature, we notice that the terms: management, system, research, development, analysis and accounting, had a much higher intensity than the other terms, being closely related and the most intense relationship starts from the key term "system". In the context of our research this relationship represents a significant impact as it is consistent with the research theme. Based on a synthesis of the bibliometric analysis results from the specialized literature, we can conclude that management accounting systems and the data provided by them are fundamental in ensuring the quality of information and the protection of company resources through early detection.

The study continues with a qualitative research, through a statistical survey, in the form of an interview. Through this study it was possible to identify the answers related to the research question *Q2: What is the feedback of the users of management accounting systems, considering both the quality of the information and the dimensions of the systems?*

The answers of those interviewed are briefly presented as follows: the information to which the users have access is not enough, there is a discrepancy between the operational and strategic planning information, and information is needed to help build scenarios, analysis tools, integrated visualizations and reports management; the information is not provided in real time, and the degree of actuality achieved by the information processed and analyzed through the managerial accounting systems is average; users understand and can interpret information from the systems they use; the management accounting systems used by the respondents, provide them with easy access to information, which serve as a basis for subsequent discussions regarding changes in the organization's environment, opportunities and associated threats; the level of integration of the systems used is medium with a

decreasing trend and the systems used do not provide sufficiently consistent links between operational performance and long-term strategies.

The last part of the chapter captures future research directions in management accounting, the need for decision-making systems and strategic management accounting practices identified based on the literature and empirical study. Management accounting research is undergoing significant changes and there is a dire need for innovation in strategic management accounting decision-making systems and practices. The development of advanced decision-making systems, the use of artificial intelligence, and the integration of non-financial indicators into the decision-making process are all critical directions for future research. By focusing on these areas, researchers can help organizations remain competitive in the dynamic business environment of the future.

The second chapter entitled "*The importance of macroeconomic developments regarding cost management on managerial performance and decision-making*" addresses the main objective no. 3, consisting in the theoretical exploration of the relevance of managerial accounting in its implementation in the organizational culture. The fulfillment of this objective and the relevant specific objectives was possible by researching the general accounting frameworks at global, European and national level regarding managerial accounting and researching how it can be implemented in the organizational culture by outlining its three fundamental processes, such as: the process decision-making, the managerial process and the budgeting process.

From a managerial accounting perspective, accounting frameworks provide a set of guidelines, concepts and principles for financial reporting that ensure that organizations present accurate, reliable and consistent information to stakeholders. Information is used to evaluate performance and make informed decisions, which are essential to achieving financial sustainability. International management accounting legislation promotes transparency, comparability, consistency and reliability in financial reporting. IFRS standards provide a common framework for financial reporting, and the regulatory environment provided by IOSCO ensures that these standards are used effectively (Servais J., 2020).

In Europe, the legislation governing management accounting varies by country, but there are several key laws and regulations applicable to organizations operating in the European Union (EU). Organizations operating in the EU must comply with EU-wide laws

and regulations such as the Accounting Directive, the Statutory Audit Directive, GDPR and IFRS. In addition to national legislation (OMF no. 1826/2003, Law no. 82/1991, Law no. 227/2015, OMFP No. 2844/2016), Romania is also subject to EU directives that regulate the field of managerial accounting. Thus, by studying regulatory accounting frameworks, research question Q3 was answered: *Globally, what are the most used accounting frameworks regarding managerial accounting?*

Managerial accounting is a branch of accounting focused on providing information to managers within an organization to help them make decisions. It is often referred to as the cornerstone of business decision-making because it provides a framework for analyzing financial data, monitoring performance, and making decisions about the future of the business. Through cost analysis, budgeting, performance measurement and strategic planning, managerial accounting provides managers with the information they need to make informed decisions that lead to the long-term success of the organization. Based on the previously mentioned arguments, the answer to the research question Q4 is given: *Does managerial accounting represent the cornerstone in the decision-making process?*

By means of the third chapter entitled ***"The importance of macroeconomic developments regarding cost management on managerial performance and decision-making"***, the main objective is fulfilled, consisting in explaining the impact of cost management on managerial performance and decision-making, through the full fulfillment of its specific objectives, such as debating the conceptual framework regarding cost management and the effects of macroeconomic developments, deepening the concepts regarding accounting by responsibility centers, knowing the relationship between cost management, managerial accounting and responsibility centers and exemplifying the influence of the hourly rate related to a cost center on managerial decisions.

The global environment is often characterized by dynamic innovations and technologies, which can result from stakeholder demands for economic, social and environmental performance, and organizational resilience and sustainability are often associated with quality management principles such as improvement initiatives of business, technological progress, emphasis on the quality of products and services or on relations with customers and employees (Buys P., 2021).

Macroeconomic developments such as changes in interest rates, inflation and economic growth have a significant impact on the cost structure of a business and require

managers to take a proactive approach to cost management. Emerging as a result of macroeconomic developments, cost management tasks are complex and require cost managers to adopt a proactive approach to cost management. By monitoring and analyzing economic trends, managing interest rate and inflation risk, assessing the impact of economic growth and managing currency risk, cost managers can help their business remain competitive and achieve cost efficiency. The COVID-19 pandemic and the ongoing conflict in Ukraine have both had a significant impact on the economy creating a challenging environment for cost management. However, through careful planning and the implementation of cost-saving measures, businesses can continue to operate successfully. In this sense, the research question Q5 was answered: *What are the cost management tasks arising due to macroeconomic developments?*

Also, the scientific approach is completed by presenting the relationship between cost management, managerial accounting and responsibility centers, concretized by a practical example regarding the influence of the hourly rate related to a cost center on managerial decisions. In the last decade, there have been some studies on the international diffusion of the implementation of responsibility accounting. For example, Fowzia R. (2011) studied the usage and satisfaction level of service organizations in Bangladesh and found that three factors determine the resulting satisfaction level, namely: attribution of responsibility, performance measurement technique and reward system. In universities in Uganda, the application of responsibility center accounting has been found to increase efficiency and create more satisfaction in decision making (Owino P. et al., 2016). Another recent research result on the subject is Vietnam, where Tuan T. (2017) investigated textile manufacturing organizations regarding the level of application of responsibility center accounting and concluded that it was not applied accordingly among organizations.

Responsibility center accounting is closely related to cost accounting because cost accounting must assign responsibility for expenditures. Responsibility accounting, cost management and managerial accounting are interrelated concepts that play a crucial role in the financial management of organizations and help organizations monitor and control their costs, make informed decisions and evaluate their performance. By using these concepts in an integrated manner, organizations can achieve their financial goals and maximize their profitability. In this regard, the question Q6 is answered: *Is there an interdependence between management accounting, cost management and responsibility accounting?*

The cost center represents one of the most important responsibility centers and its manager is responsible for achieving operational efficiency, minimizing product cost and maximizing efficiency (Marjanović V. et al., 2014). By assigning costs to centers, organizations can project more accurate budgets and forecasts. This information can then be used to make informed decisions about how to allocate resources and plan for the future (Sopta M. and Slavica A., 2017).

A cost center's hourly rate is a critical factor that can influence managerial decisions and have a significant impact on product pricing. The aspects of saving can be approached from several perspectives when a technical improvement of a machine is required, an economic analysis being necessary that must include all the cost elements. The example presented in chapter 3 shows that, thanks to finding an internal solution, managers are allowed to allocate funds to other investments. It is clearly observed the avoidance of the tariff increase on the cost center by approximately 5.9%, due to the decrease in current expenses.

Savings can have a significant impact on an organization's hourly rate. By reducing costs, organizations can increase their profits, which can lead to lower hourly rates. This can make the organization more competitive because lower hourly rates can attract more customers and also lead to lower prices for goods and services. In addition, they can improve the financial stability of the organization, which can lead to increased job security and better employee benefits, thus answering the question Q7: *Given responsibility accounting, how can cost centers influence, managerial decision making?*

The last chapter of the paper aims at a major objective related to the realization of an ***"Empirical study on the impact of the determining factors on the variation of the total cost in the context of the automotive industry"***, considering the managerial accounting organized in cost centers. The fulfillment of this objective and related secondary objectives was possible by outlining a research methodology that included the definition of the research purpose and the presentation of the selected influencing factors, the collection and structuring of the data, the presentation of the statistical methodology, the analysis and graphic mapping of the panel data and the presentation empirical results regarding econometric models.

The results of the analysis of the specialized literature presented in the scientific approach, provided us with a solid basis of empirical research, through which we identified

and selected the research direction used in econometric modeling, and the results obtained from the statistical analysis practically confirmed the main purpose of the approach . We analyzed the impact on the dependent variable (C_{total}) of the following determining factors: personnel costs ($C_{personal}$), general costs ($C_{generale}$), energy costs ($C_{energie}$), costs allocated to the implementation of new software and hardware technologies (C_{it}), costs for increasing quality management ($C_{management}$) and transport costs ($C_{transport}$). Considering the results obtained, the question Q8 is answered: *In the context of accounting organized by cost centers, what are the internal factors that impact the variation of the total cost?*

At the same time, we consider that the proposed model is of interest both to researchers in the field of economic sciences and managerial accounting, as well as to practitioners or managers of organizations, because it offers the opportunity to better understand the use of resources. Ultimately, this will help them in making the best use of resources, and accounting for resources in such detail allows a company to forecast and calculate more accurately based on expected future changes. In this sense, the empirical study helps us to estimate the numerical impact of the factors considered, on the variation of total costs through the lens of the analyzed cost centers. Cost centers are essential in structuring a company that needs or intends to reduce its expenses. Thus, it is possible to reduce or eliminate the costs related to some factors with a pronounced numerical impact on the total expenses.

In conclusion, through our research, we believe that we have pursued and achieved all the objectives proposed in the introductory part of the paper. We also believe that through our research we contribute significantly to the development of the chosen research area, both theoretically and empirically.

Own contributions related to the research

The own contributions related to the research are formulated taking into account the aspects developed and analyzed within the scientific approach, such as theoretical, economic-statistical arguments and those resulting from qualitative research through a survey, in the form of an interview. Therefore, during the 3-year period, the scientific contribution related to the research can be summarized as follows:

- Highlighting the importance of managerial accounting both through the review of specialized literature and the bibliometric analysis of the influence of

specialized magazines, authors, publications, institutions, countries, as well as through the identification of opportunities for future research;

- The theoretical-empirical examination regarding the use of management accounting systems both through theoretical research and scientific mapping regarding management accounting systems and by presenting the results of the empirical study of the use of management accounting systems through the prism of the quality of information and the size of the systems;
- Theoretical exploration of the relevance of managerial accounting considering its implementation in the organizational culture, deepening the knowledge related to the participation of organizations in the managerial, decision-making and budgeting process and synthesizing the main milestones;
- Explaining the impact of cost management on managerial performance and decision-making both by debating the conceptual framework regarding cost management and its relationship with responsibility centers and managerial accounting, as well as by exemplifying the influence of the hourly rate related to a cost center on managerial decisions;
- Carrying out the empirical study on the impact of the determining factors on the variation of the total cost in the context of cost center accounting through the descriptive and graphic analysis of panel data, the development of econometric models and the presentation of the relevant results.

Limitations of scientific research

Researchers often face research limitations in their scientific endeavours, which are important to recognize and understand in order to ensure that scientific results are used in a responsible and ethical manner. A limitation in the implementation and improvement of management accounting is due to the "proprietary" quality that management accounting information acquires. Data availability may limit the scope of scientific research; thus, our study data, being protected by confidentiality agreements, are not available for future research purposes.

The selected research methodology can constitute another limitation in scientific research, offering the possibility of studying other methods. Regarding the empirical interview research, we consider the sample size as a limitation of the research in terms of the number of respondents to that scientific call. Another reason for limiting the

improvement of management accounting is that most management accounting systems seem to work well in general. Therefore, it is difficult for an entity to gain a competitive advantage by implementing a better management accounting system than its competitors. However, this remark does not imply that management accounting systems cannot be adapted and improved taking into account the specifics of each entity. Conversely, a poor management accounting system can significantly affect stakeholders' perceptions of an organization's perspective.

Scientific research often requires significant resources and the lack of these resources can limit the scope and impact of scientific studies. A limitation of the research can also be considered the size of the sample used in the last chapter, from the point of view of the number of cost centers that were the object of the study. This limitation may result in a selective presentation of the data. Another limitation of the research is given by the area of applicability, the study being congruent only to organizations that have organized their managerial accounting in cost centers in the automotive industry.

Also, the focus of a scientific study can limit the scope of the results. The factors considered in our study may limit the scope and accuracy of the scientific results because personnel costs, general costs, energy costs, IT costs, costs for increasing quality management and transportation costs, represent internal factors of the organization that can affect the variation of the total cost. It is important to carefully consider the typology of factors when designing scientific research and interpreting the results, thus ensuring that the results are valid and can be used to make informed decisions.

Future research directions

The limits of scientific research identified do not represent limitations in the traditional sense, thus becoming opportunities for exploration and expansion of future research. In other words, the limits of scientific research provide new perspectives for future research that can lead to a deeper understanding of the studied field and its complexity.

Based on the specialized literature undertaken, in the last part of the first chapter, the scientific approach identifies, based on the specialized literature, opportunities for future research to explore and deepen new fields, such as: the development of advanced decision-making systems, the use of intelligence artificial and the integration of non-financial metrics in the decision-making process.

Limitations of scientific research methodology, such as small sample sizes and experimental design, provide opportunities for future research to refine and improve these methodologies. Although it may be difficult to eliminate all forms of bias in the scientific endeavor, future research can attempt to minimize it by using larger sample sizes, controlling for variables, and using rigorous methods to ensure the validity of results.

We propose as a future direction of research, through the lens of the sample used in the econometric study, its expansion to the level of several cost centers, as well as the expansion to other areas of applicability, such as organizations that structure their managerial accounting in other categories of responsibility centers but also on other important industries. Regarding the sample of the empirical study on the use of management accounting systems, we propose to try to expand the number of respondents. On the other hand, it would be interesting to analyze the results of the questionnaire also by other methods other than Likert scale commensuration.

Based on the previously mentioned, factors considered in a scientific study, such as the population studied and the focus of the research, can limit the scope of the results. However, it can also lead to interdisciplinary research that considers multiple factors and explores new areas of inquiry. Considering the current context due to the pandemic and the current conflict in Ukraine, we propose as a future research direction the inclusion of certain external factors in the econometric study on the sensitivity of the total cost in relation to the determinants.

Considering the complexity of the information presented in the scientific approach, we conclude that the scientific research undertaken has achieved the fulfillment of all the proposed objectives and the results obtained will make a positive contribution in terms of the business and academic environment.

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