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SUMMARY PhD THESIS

***IMPROVING THE MANAGEMENT ACCOUNTING SYSTEM IN THE ROAD
TRANSPORT SECTOR***

PhD Supervisor:

PhD Professor Dan – Ioan TOPOR

PhD student:

PODHORA PATRIZIA PAMELA

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KEYWORDS:

Road transport, managerial accounting, costs, optimisation, value chain, standard cost, historical cost, full cost, direct cost, responsibility centre, social and environmental impact, full cost method, Life-Cycle Costing, cost driver, activity-based cost calculation (ABC).

INTRODUCTION

The circulation of people, goods and information has always represented a fundamental component of human societies. The contemporary economic processes are accompanied by a significant increase in mobility and increasingly high levels of accessibility. There is no transport without geography and there is no geography without transport. Thus, the purpose of transport is to transform the geographical attributes of goods, people or information, from an origin to a destination, giving them added value in the development process.

Transportation is a service activity, so it does not produce anything tangible. But its functional nature and particular characteristics made man compare it to the arteries of the human body. Just as it carries life-giving blood to every part of the human body, transportation facilitates access to the needed products in almost every part of the globe. Also, transport has played a catalytic role in transforming the economic and social geography of many nations, being at the same time a tool of territorial control and exploitation, especially in the colonial era, when resource-based transport systems supported the extraction of resources in developing countries and passed them on to the industrialized nations of that time.

The global economic and health crisis has hindered general economic development and international economic cooperation, except in regions where road/car transport has been promoted and supported to accelerate economic recovery, thus recognizing its efficiency as a prerequisite for economic growth all over the world. Thus, road transport continued to play an indispensable role in the movement of passengers and goods. This is one of the requirements for the socio-economic development of the states.

Different manners of transport contribute in different ways and degrees to the economic development of a country, and these variations must be given important weight in guiding the development of different transport technologies. This thesis assumes that *the development of road transport is of fundamental importance in stimulating the economic development of countries.* However, despite the importance of transport infrastructure, namely roads, in general, economic development, the efficiency of road transport systems is often limited by the high costs of vehicle operation and maintenance, determined by poor road conditions. While the demand for transport infrastructure continues to increase, as a result of high rates of growth in population, urbanization and the development of economic activities, the resources for road maintenance and replacement of road networks continue to be a burden for many governments.

Car transport is vital for economic development, trade and social integration, being focused both on the transport of people and goods. Transport activity has significant implications for all other sectors of activity in the economy. However, transport costs represent one of the determining and significant factors of the total operating costs and, therefore, of the selling price, which affects the competitiveness of the products and the results obtained in business. Constrained by low-profit margins and the need to be active in an extremely competitive market, economic entities active in this sector are looking for innovative multidimensional solutions to reduce their operational costs.

Lowering transport costs promotes specialization, expands markets and therefore allows scale economies to be exploited. Global competition has made the existence of efficient transport and logistics systems in the supply chain an absolute imperative. Ease of accessibility, flexibility of operations, 'door-to-door' type service and reliability have given road transport an even greater weight compared to other modes of transport, both in terms of passenger and traffic of goods.

Therefore, business management is currently faced with a series of problems that arise in a very turbulent business environment, regardless of the business subject. The success of an economic entity is not only determined by the environment in which it carries out its activity but also by the effective use of managerial tools and methods. The situation is also characteristic of *road transport economic entities, which not only need but are also interested in various tools that can support the management process. As part of the value creation management, costing is one such tool.* It is the oldest and, at the same time, the most used. It is constantly evolving to reflect the current conditions that are forming in the business environment.

The purpose of this research is to focus on some of the ways to make cost management more efficient. It is an application of managerial accounting tools that enriches traditional calculation procedures with progressive new forms. A specific measure in this context is the use of ABC calculation, namely life cycle calculation and, in particular, the advantages it offers to support management compared to traditional calculation, highlighted by the full cost calculation method.

This study draws attention to the need to identify the most appropriate ways to increase efficiency and reduce poor performance through effective cost management. Observing and documenting the factors that affect cost dynamics is very important because it can support the managerial decision-making process and, consequently, can contribute to improving the performance of economic entities, in general, not just those in the road transport sector. Knowing this information facilitates the adoption of the best method of managerial planning of the activities specific to the economic entity and provides the optimal way of integrating these activities in a determined and/or dominated context by performance.

The methodological improvement of the calculation of transport costs allows more efficient management of the costs of economic entities that transport goods by road. Service costs become more accurate as the ratio of directly attributable costs increases and the remaining indirect costs are allocated on a transparent, cause-and-effect basis. To be able to use their advantages, the new cost calculation procedures are also accompanied by the expansion of data collection techniques. At the same time, the more sophisticated costing system requires high-quality input data, paying particular attention to differentiated cost components and performance indicators as cost drivers.

Research Motivation

Currently, managerial accounting and cost calculation have become a particularly useful tool for economic entities in the road transport sector. However, due attention is not given to them regarding the models of collection, processing, analysis and provision of information, as a basis for adopting effective decisions. This has a significant impact on the quality and effectiveness of managerial decisions and is also a major barrier to the participation of economic entities from the transport sector in the international market specific to the field. Therefore, to overcome these limitations, accounting and cost management models can allow managers of economic entities in road transport to obtain effective information for decision-making, precisely to improve effective cost management. Clarification of the above-mentioned aspects is the basis of the theory and

practice of corporate governance solutions, improving the efficiency of the operating activity of economic entities in road transport and, at the same time, stimulating economic development and economic integration in the region and the world. For these reasons, I chose the theme "*Improving the management accounting system in the road transport sector*", to carry out theoretical and empirical research to identify the optimal management and cost control solutions in the road transport sector.

Research objectives, research questions and hypotheses

The main objective of this research is to evaluate the impact of the specific models of the managerial accounting system in the road transport sector.

Specifically, the study is based on the following objectives:

O1: Systematization of the theoretical framework and development of cost management accounting models in economic entities from the road transport sector.

O2: Identifying the weaknesses of traditionally used managerial cost accounting systems and demonstrating their impact on decision-making, emphasizing the deficiencies they have in comparison with modern managerial accounting systems;

O3: Studying alternative managerial accounting systems and identifying the most suitable system(s) that will address the shortcomings of traditional cost accounting and allow implementation in the road transport sector.

O4: Identifying and building an appropriate managerial cost accounting model for economic entities in the road transport sector.

O5: Application of managerial cost accounting models for economic entities in the road transport sector.

To achieve the objectives, I used practical examples and empirical evidence to demonstrate, analyse and support the practical approach.

The study is guided by the following *research questions*:

1. How do the characteristics of the activities of economic entities in the transport sector influence accounting and cost management?
2. What managerial cost accounting models can be used to provide useful information to managers in economic entities in the transport sector?
3. Which managerial cost accounting model is suitable for economic entities in the transport sector?
4. What are the solutions for the suitability and application of the managerial cost accounting model/models for economic entities in the transport sector?

Hypotheses on which the present research approach is based are the following:

H1: The road transport activity exerts a direct and positive impact on the economic development of society as a whole.

H2: The technological process specific to the road transport activity formed of a series of cost-generating activities and/or processes, between which there are multiple connections and inter-conditions.

H3: The principles of the Pigouvian regulation of externalities can be applied in the context of road transport for the evaluation of total costs and the establishment of mobility prices.

H4: The methods and techniques of managerial accounting influence the process of adopting managerial decisions in the economic entities in the road transport sector.

I5: The adoption of managerial accounting methods and techniques in the road transport sector supports the reduction of operational costs of economic entities in the field.

Research Methodology

From the strict perspective of the methodology that was used, I considered three types of research: fundamental, applied and empirical. Between the first two types, a relationship of complementarity works, in the sense that fundamental research offers theoretical models of some phenomena, and the applied one comes to validate those models, respectively to offer validation solutions. Therefore, the research directions followed focused on documentary and applied research.

Statistical and econometric modelling is used as a systemic structure in the thesis, being represented by a descriptive part and an analysis, in which efforts were made to use the language specific to systematic models.

The deduction was the basis for establishing the hypotheses, selecting the data and determining the possibilities of validating the hypotheses, under the logical deductions. The induction sought to identify some rules depending on the hypotheses, depending on the observations made.

More than 280 bibliographic sources (primary and secondary) were consulted during the documentary research. The process of studying the specialised literature in this thesis followed the classic protocol, which includes information about the research question, inclusion criteria, search strategy, data extraction, quality assessment and data synthesis¹. The sources of secondary information were collected from libraries, activity reports of institutions with attributions in the field of road transport regulation and of the National Institute of Statistics, and documents placed on websites. In addition, secondary data from published studies were also used, such as scientific articles, conference volumes, books and treatises, theses, etc.

The publications included in the analysis process were full papers in peer-reviewed journals. Of course, there are other resources than scientific journals (e.g. government publications, research, business or industry reports). Our review includes only studies reported in English, as most of these were conducted in native English-speaking countries such as the United Kingdom (UK), New Zealand, the United States of America (USA) and Australia, which minimizes the risk of language bias in the results.

Existing techniques for scoping and literature searching include database searching, reference list checking, citation searching, and hand searching. A single technique is not sufficient to perform a systematic review. A multi-pronged approach is required, with a combination of search techniques to ensure that all relevant research has been correctly identified².

The main method of mapping the specialized literature was searching the databases of original research papers in English-language journals. Well-positioned and highly relevant studies were reviewed to isolate appropriate databases and search terms. I considered the following databases suitable for the initiated search: Google Scholar, Science Direct, Emerald Insight, Wiley Online and Web of Science. The keywords used for the searches in each database were: "managerial accounting", "cost calculation for road transport", "logistic cost calculation", "life

¹ Booth, A., Papaioannou, D., Sutton, A. (2011). *Systematic Approaches to a Successful Literature Review*. Sage, London.

²Petticrew, M., Roberts, H. (2008). *Systematic Reviews in the Social Sciences: a Practical Guide*. Blackwell Publishing, Oxford

cycle cost for transport", "activity-based calculation for road transport", "managerial accounting for road transport", but also a combination of the following terms: "accounting", "external costs", "environmental costs", "road transport". There is no single and universal approach for assessing methodological quality. Therefore, evaluation should be limited to studies of a particular type which best suited to address the research question³.

The combination of different search techniques initially provided a total of 8,716 records. Initial screening and title screening excluded 1,674 records where the issue of management accounting in the road transport sector was only mentioned (book reviews, commentaries or papers unrelated to our research) or was of secondary importance. The full text had to be assessed against the inclusion criteria when the relevance of the study was impossible to assess based on the title and abstract alone. After a more detailed examination, other papers were excluded from the review process. Other studies did not provide sufficient information on management accounting methods (system boundaries) and were also excluded from the review. Finally, for a more detailed study, 536 studies were kept, of which I selected 3 for a more detailed analysis. The selection and analysis were carried out with the help of the specialized software named VOSviewer.

The primary data were collected directly from the financial statements of the analysed economic entity. The contact persons were the managers and head accountants of the economic entity, which operates in the field of road transport. The numerical data were synthesised and analysed using Excel tables and eViews software.

To carry out the analysis of research information, I used a combination of qualitative and quantitative methods, such as material research, practical case studies, synthesis and analysis methods.

SYNTHETIC PRESENTATION OF THE CHAPTERS OF THE PhD THESIS

I structured the thesis into six distinct chapters.

The introductory part aims at the general presentation of the problem, the purpose, the objectives, the hypotheses and the methodology of the research. Also, a separate section is dedicated to the current state of the research, highlighted through a bibliometric synthesis of managerial accounting in the road transport sector. The identified specialist works were studied in depth to provide an overview of managerial accounting and costing in the road transport sector.

In the approach I initiated, I propose managerial accounting as a practical tool to deal with the complexity of decisions in the road transport sector. It embraces both the internal and the external impact on sustainability and translates them into the widely known and accepted business language, that of reducing costs to ensure sustainable financial resources.

Managerial accounting is not a new concept. It has been applied in the energy industry, the oil and gas industry, the chemical industry, urban development, etc. In this context, I set out to validate the hypothesis of its applicability in the specific context of the road transport sector.

This is also the reason why I carried out, through a systematic approach, a review of the specialized literature, the purpose of which is to identify the managerial accounting methods that have been developed so far in the road transport sector. Following a critical analysis of the identified methods, I selected the one that, I believe, fits the specifications and needs of a business in the field of road transport.

³ Denyer, D., Tranfield, D.(2009). Producing a systematic review. In: Buchanan, D., Bryman, A. (Eds.), Organisational Research Methods. SAGE Publications Ltd, London, pp. 671-690

In this sense, I have pointed out some elements that explain the concept of managerial accounting and the related problems that it raises in the road transport sector, followed by a brief description of the problems related to the adoption of decisions in economic entities in the road transport sector and how accounting management can help support these decisions. The following paragraphs describe the research methods used for the literature review. The results are synthesized and their interpretation emphasizes the implications for the road transport sector.

However, due to the diverse information needs of managers, management accounting requires more in-depth studies for the specific sector. Also, these works studied the general issues of accounting and cost management, systematizing the problem only in certain types of economic entities and only through the prism of the content of managerial accounting, not its methods, respectively the construction models of cost calculation systems, that can provide the information requested by managers. The published studies on the topic addressed by us, did not capture in depth the construction model of cost management accounting applied to economic entities in the road transport sector.

The roles of managerial accounting are mainly related to the collection, processing, communication and transmission/reporting of information to managers. Therefore, this implies that the roles of management accounting must be examined concerning these four aspects and in the context of economic entities operating in the road transport sector. It is certain that only when economic entities in this sector set their prices correctly and cover their operations costs, profit can be considered sustainable from an economic, ecological and social point of view. But for this system to work efficiently, the problems related to the limits and the allocation of costs should be solved in a specific manner to the respective activity or economic entity. When using managerial accounting, economic entities must make decisions regarding which cost elements to exclude or take into account.

In this context, the present thesis focused on addressing the following aspects, which are constituted in chapters of the initiated research approach.

Chapter 1: The importance of the road transport sector for the economic development of a state

The analysis of the importance of the road transport sector for the economic development of a state includes a brief account of the historical and cultural context of the field of study, namely the origin and development of the transport sector, the significance and nature of this type of activity, the characteristics of the transport activity and the social impact – the economy through the prism of the advantages and disadvantages of road transport. In the analysis of the historical evolution of what I call the transport industry today, I started from the hypothesis that innovations in transport systems occurred at different speeds and generated impacts of different magnitudes, corresponding to certain historical moments, similar to the assumed so-called point theory of equilibrium in the evolution of species⁴ or the theory of scientific revolutions⁵.

Seen from a managerial perspective, transport must be approached as a system, not just as a result of its operation⁶. A systemic definition of the term includes all the resources (material, human, informational, financial), used to carry out all the processes (physical and managerial activities) and which determine the implementation of the transfer of goods and people. "The

⁴Gould, S., J. & Eldredge N. (1977). Punctuated equilibria: The tempo and mode of evolution reconsidered, *Paleobiology*, 3(2), pp. 115–151

⁵Kuhn, T. (1970). The structure of scientific revolutions, *International Encyclopaedia of Unified Science*

⁶Woxenius, J., ed (1998). Development of small-scale intermodal freight transportation in a systems context. Report 34. Chalmers University of technology. Department of transportation and logistics. Goteborg, pp. 63-72

transport system is that system that creates the utility of time and space"⁷. As a result, understanding transport systems in terms of their technological and economic complexity, respectively their important impact on society is a vast and fascinating field of study.

First of all, one of the most important characteristics of transport demand refers to the fact that it is usually a "derived demand", in the sense that it aims to satisfy the spatial mismatches between demand and supply existing in different markets (e.g. markets of goods, for the transport of goods; the labour and housing market, for commuter traffic at rush hours, etc.). As a result, for example, the benefits of transport infrastructure cannot be seen in isolation from its interaction with the entire economic system.

Second, the costs and benefits of the transport system are generated both by the provision and existence of the infrastructure and by its use. Although it is clear that these two elements are closely related, the distinction between them is important, as it can have important consequences for the development of transport policies. The public benefits of infrastructure in terms of accessibility are often confused with the "external benefits" of transport, thus calling into question the need to regulate the external costs of transport (e.g. those with environmental impact). In turn, these accessibility benefits are highlighted only resulted from the use of the infrastructure. This means that although a large part of the costs of infrastructure provision is concentrated in time (e.g. feasibility study, construction phase, etc.), the benefits will appear over a much longer future period, which causes an imbalance within the timing of the costs and benefits of the transport infrastructure.

Thirdly, it should be emphasized that transport activities generate a variety of costs, which can be internal (fuel, time) or external (pollution, noise, accidents). Also, the costs involved can be variable (fuel) or fixed (purchase of cars, vehicle taxes), and these, in turn, can be instantaneous (congestion, traffic jams) or cumulative (toxic) and can generate a local impact (noise) or global (CO₂) and so on.

Through statistical analyses of the transport market, the main trends shown by the road transport sector at a national, regional and global level are highlighted, request and supply, respectively the effects on the road transport sector exerted by infrastructure and spatial dynamics. The external costs of road transport are approached through the prism of the characteristics and implications of allocative efficiency vs. equity and some theoretical optimization models.

The volume of road transport is increasing globally, it is estimated that by 2026 there will be 7.54 trillion vehicle-kilometres. This represents an average annual increase of 0.1% starting from 2021 when 7.31 trillion vehicle kilometres were recorded. Despite this increase, global demand has decreased since 2016 by 0.9%. The United States leads the way in terms of global road traffic volume, with an estimated 4.75 trillion vehicle kilometres in 2021. Japan, the United Kingdom, and Australia followed in second, third, and fourth place, respectively⁸. Transport trends in the European Union are mostly examined from the perspective of road freight transport. The fundamental principles of the Common Transport Policy (CTP) were established in 1957 by the Treaty of Rome, Chapter IV, Articles 74-78⁹. The future of the region is largely determined by the

⁷Ilieş, L. & Crişan, E. (2010).Transportul de mărfuri. Concepte, internaționalizare și management. Editura Risoprint. Cluj-Napoca, p. 22

⁸ <https://www.reportlinker.com/clp/global/505421>

⁹ <https://eur-lex.europa.eu/>

2011 Carta Alba, whose 40 initiatives will contribute to economic growth, job creation, reducing dependence on imported oil and reducing the sector's CO₂ emissions by 60% by 2050¹⁰.

Human mobility generates multiple negative effects, such as air pollution, greenhouse gas emissions, noise and intensive land use. In other words, mobility causes externalities – costs and benefits that impact others but are not fully reflected in the price paid by the user¹¹. It is actually about the costs or disadvantages that the activity of one economic agent generates on another, in the total absence of financial compensation, respectively a commercial exchange. For example, atmospheric pollution through industrial activities, transport or energy production causes a waterfall of negative consequences on health, materials, and vegetation¹².

The improvement of transportation operations has traditionally been approached through the use of mathematical modelling, operations research and simulation methods¹³. In this sense, in this chapter, an in-depth econometric study is made accordingly, which allows the assessment of the impact of accounting on transport activity, respectively its effect on economic development.

Chapter 2: Conceptual approaches to the information system specific to managerial accounting from the perspective of application in the transport sector

The systematization and synthesis of conceptual approaches related to the information system specific to managerial accounting, from the perspective of application in the transport sector, captures an evolutionary perspective on managerial accounting, with an emphasis on its relevance for the activity of economic entities, but also the specific methods and techniques, with related advantages and disadvantages. The theoretical framework and the methodology for building the accounting model of cost management were interpreted to improve the efficiency of cost management in economic entities from road transport, in close dependence on the typology of costs in the sector and the particularities of the activity in value chain processes.

To manage costs effectively, managers must recognize the types of costs. Therefore, cost classification was an important step in the cost accounting activity, which contributed to determining the adequacy of management accounting information.

The costs of an activity, as a management indicator, represent one of the most important sources of information provided by the accounting information system. The level of costs is a barometer that provides information on the conditions in which a certain productive activity is carried out and that allows the management of the economic entity to follow, analyse and guide the processes that are carried out towards a rational use of economic means and resources.

There have been intense debates and doubts which have been expressed about the usefulness of classical costing methods, considering that these methods cannot generate advantages because they are based on information provided by a system designed for a technological era characterised by local, not global competition. Economic entities produced standardized products and services, and their distribution speed, quality or performance did not represent the basic concern aimed at ensuring organizational success.

¹⁰CARTA ALBA Foaie de parcurs pentru un spațiu european unic al transporturilor – Către un sistem de transport competitiv și eficient din punct de vedere al resurselor. /* COM/2011/0144 final */. <https://eur-lex.europa.eu/legal-content/RO/ALL/?uri=CELEX:52011DC0144>

¹¹OECD (2003). Glossary of statistical terms - externalities - OECD definition. <https://stats.oecd.org/glossary/detail.asp?ID=3215>

¹²Vuță, M., Gherghina, R. (2006). Abordări moderne privind eșecul pieței și externalitățile. <http://www.oconomica.uab.ro/upload/lucrari/820062/53.pdf>

¹³Sternberg, H., Stefansson, G., Westernberg, E., Boije af Gennas, R., Allenstrom, E., & Nauska, M.L. (2013). Applying a Lean Approach to Identify Waste in Motor Carrier Operations. International Journal of Productivity and Performance Management, Vol. 62, No. 1, pp. 47-65. <https://doi.org/10.1108/17410401311285291>

Modern cost calculation methods arose from the need to overcome the disadvantages of traditional methods. They have been adapted to the new market conditions to provide, in addition to financial information on the costs of products/works/services, information on internal processes, to integrate cost analysis into the strategic approach of the economic entity, to contribute both to the process of adopting decisions regarding the portfolio of products and services, as well as to decisions that generate a transformation of the corporate strategy.

Of course, there is no universally valid cost calculation system. It must be designed and implemented considering the concrete realities of the environment in which the economic entity carries out its activity and, in particular, the internal conditions and requirements of the management system. The option for one calculation system or another is conditioned by balancing the cost of errors resulting from wrong estimates, respectively the cost of more precise measurements.

Cost classification is one of the most important aspects of the managerial accounting and cost calculation system. This aims at the concept of causality and provides findings of dependencies on certain developments of the economic entity. In this context, the so-called performance or direct costs can also be identified, these being determined by performance, respectively they directly introduce the concept of performance (of a product, or service) and form the basis of calculation for determining a minimum price. Wages, materials and others can be included in this category. Exploitation or operational costs do not directly relate to performance, so they do not influence the product or service in a direct manner (e.g. advertising costs). Theoretically, these costs represent the greatest risk of loss, because if the company did not produce anything, the recorded loss would be equal to these costs.

The need to limit costs is equally strong in all economic entities, and the search for opportunities to reduce them is increasingly fierce. But there is a major opportunity to reduce costs - through the supply chain. All costs reach the end market and are reflected in the price paid by the final user. The purpose of supply chain management is to optimize the flow of goods, services and information to meet customer requirements while reducing costs and maximizing efficiency. Therefore, economic entities try to make the supply chain as competitive as possible through the value they create and the costs they reduce, in general. Managers have realized that true competition is not entity against other economic entity, but rather supply chain against supply chain accessed by competitors.

By reducing costs, economic entities can improve their results, leading to increased revenues and profits. In addition, cost reduction can help economic entities remain competitive by allowing them to offer lower prices than their competitors or to invest in other related areas.

In addition to improving profitability and competitiveness, cost reduction can also lead to other benefits, such as improved customer service, increased flexibility and better risk management. By reducing costs and optimizing supply chain operations, businesses can respond more quickly to changes in demand or supply chain disruptions, which can help them maintain high levels of customer satisfaction.

Cost reduction can help economic entities achieve their sustainability goals by reducing waste, improving efficiency and reducing the environmental impact of operations. This can not only benefit the environment but also help economic entities meet the expectations of customers and environmentally responsible stakeholders.

Chapter 3: The role and implications of cost accounting systems in the road transport sector

Without a correct and precise calculation of the cost of production, producing economic entities may encounter problems in determining the selling price of a product¹⁴. For economic entities, obtaining an optimal profit depends on the selling price and the realization of production costs, which exert a considerable effect on the measure of success by achieving the objectives of the economic entity and gaining a favourable competitive position over other economic entities or similar industries.

One of the most important factors for achieving these goals is the efficiency of production costs and keeping them as low as possible, to ensure an increase in profits. The strategy of making production costs more efficient and setting the right prices must be balanced by an improved quality of production.

Economic entities must provide timely and relevant information to support management, and the modern techniques of managerial accounting appeared precisely because of this need for information. It is about Activity Cost Method (ABC), Target Cost Method, Economic Value Added, Supply Chain Management, Shareholder Value Management, Total Quality Management - TQM (Total Quality Management), JIT Method (Just in Time), Balanced Scorecard Method, etc. The techniques have been developed and promoted individually, but organizations can benefit from the potential synergies of their combined use.

Analysis of the role and implications of cost accounting systems in the road transport sector focuses on the applicability and sustainability of the full cost method in the road transport sector, respectively of the Life-Cycle Costing (LCC) method.

Through empirical studies, the current situation of the construction and use of managerial cost accounting models at a commercial company active in the field of road transport is studied, in the context of which the reasons for success and the limitations of the two applied methods were highlighted.

The full cost is used to improve the accuracy of how costs are traced back to the cost object, general costs being charged to the finished product or the cost of goods sold based on the rate specified for normal activity or actual activity. The operation of each economic entity in conditions of efficiency and effectiveness requires good management so that the objective to be achieved is that of minimizing production/operational costs, maximizing profits and maintaining business continuity. An important factor is planning. Therefore, adequate management is necessary to plan the future of the economic entity, so that the objectives are achieved.

The full-cost method is an important tool for economic entities that want to make informed decisions. By considering all costs, economic entities can accurately evaluate their products or services, allocate resources more efficiently and increase profitability.

While the full-cost method can provide valuable information about the true cost of creating a product or service, it is not without its challenges. Business entities need to carefully plan and allocate resources to successfully implement this method and be prepared to make changes in reporting practices. However, for those businesses that can overcome these challenges, the full-cost method can provide a more accurate picture of their operations and help them make informed decisions about pricing, production and resource allocation.

Life cycle costing is an important tool for management decision-making. Its importance is based on the quantification of costs throughout the life cycle of the cost object at the applied time value of money, which considers the level of the inflation rate and the interest rate. The purpose of this calculation is to provide the user with important information for making the right decision

¹⁴Sartorello, G. L., Bastos, J. P. S. T., & Gameiro, A. H. (2018). Development of a calculation model and production cost index for feedlot beef cattle. *Revista Brasileira de Zootecnia*, 47. <https://doi.org/10.1590/rbz4720170215>

regarding the strategy. For decisions of this type, information is important but should be accompanied by a minimum level of allocated costs. In the case study presented, the approach is based on the selection of the most suitable alternative to the procurement of transport vehicles under the conditions of the assumed level of the purchase price, the life span of 5 years, the inflation rate of 10.4% and the average rate of return of the industry 2,1%. The approach is based on financial reporting in terms of capturing all real costs and revenues and their management clarity.

Chapter 4: Possibilities for improving the management accounting system in the road transport sector. Implementation of the activity-based costing method (ABC Method)

The purpose of this chapter is to focus on one of the ways to make cost management more efficient. It is an application of managerial accounting tools, which enriches the traditional procedures of management and cost calculation with progressive new forms. A specific method in this context is the use of activity-based costing (ABC) and, which highlights the advantage it offers, compared to traditional calculation, to support the managerial decision-making process. The purpose of the chapter is to clarify the purpose of using the ABC costing model and to determine whether entities in the road transport sector are suitable to operate this model.

At the same time, the methodology of using and implementing the model, improving the efficiency and validation of the model, as well as adjusting the deviations are presented. The ABC model proposed for entities in the road transport sector was evaluated in terms of quality and reliability through a complementary econometric study, which concerns the improvement of the managerial accounting system in the road transport sector.

Unlike the traditional way of assigning indirect costs to final services (based on the assumption that the higher the volume of services provided, the higher the overall costs), the ABC method draws attention to the non-standard cost intensity, small volume services, and on the intensity of their costs. This information is useful for specific price negotiations and can focus long-term managers' attention on eliminating non-standard performance and activities. Thus, the ABC method indirectly affects the efficiency of design and technological works, the management of supply, production and sales processes and the coordination of auxiliary activities and services.

Another significant advantage is the method of separate management of fixed and variable costs, which is based on a critical examination of the conclusions that come primarily for short- and medium-term management. It emphasizes that market share and business effects can be increased primarily by maximizing capacity utilization, which can also be achieved by reducing the selling price of additional volume and assortment to the level of variable product costs. The alternative view of product costs offered by the ABC method emphasizes the cost intensity of the assortment called the generic additional product. This is because the pursuit of maximum capacity utilization leads to a higher share of non-standard activities in the final phase when classifying products with a lower volume. Together with the reduction in the prices of these products, this can lead to a reduction in profit and return on capital.

Knowing the sub-activities that generate costs is of considerable importance in improving the budgets of those general costs, which are not related to changes in the volume of services provided. It makes it possible to process varied budgets for a different range of sub-activities performed, to measure the performance of the departments providing the activities and to influence the economy by spending these costs in the departments that are responsible for their value.

The calculation, based on the allocation of costs by sub-activities, provides some new information, especially for the management of activities and processes, but also for the traditional areas of management along service lines and departments. The new visualization of the

information on the activities allows the evaluation of the intensity of the related costs and a comparison with their benefits. This creates a natural pressure to eliminate activities that either do not have the desired effect or whose added value is negative. From this point of view, the method allows the evaluation of the profitability and benefits of the activities (understood in a broader sense) formed by a systemic combination of partial activities, respectively the analysis of the course of these activities, especially in terms of their coordination.

The costs and prices were determined based on the complete accounting of the incurred costs, which were appropriate to the characteristics of the analysed economic entity's activities. These expense items were aggregated into accounts that facilitated price calculation, production cost reporting and financial statements.

As a basis of information, the calculation by the ABC method draws attention to the cost intensity of non-standard, low-volume services, and to the reasons for their cost intensity. This information can direct managers' attention, in the long run, to the elimination of substandard performance. However, it is necessary to emphasize the relatively conservative approach of managers to changes in regular values. Certain limits are represented by a low awareness of new cost management options and a reluctance to innovate within established methods and tools.

Finally, I want to analyse whether the empirical study has achieved its goal. Depending on the companies included in the sample and the statistical data obtained, I tried to highlight a relationship between some relevant economic indicators for road transport activity in the Western area of Romania. Profit, cost, turnover and road fleet utilization rate are the four economic indicators considered in the empirical study. The sample composed of 10 companies was selected to ensure a minimum representativeness concerning the geographical area and the performances recorded. The goal is to find a functional relationship between the four indicators that will allow us to quantify the impact of the cost, the turnover and the coefficient of use of the (motor vehicle) fleet, on the profit variation.

To find an appropriate econometric model from a statistical and economic point of view, I went through three stages corresponding to the 3 models: OLS, LDSV and PFGLS. First, I organized the statistical observation data into a long panel, according to the theoretical requirements asked by the specialized literature. For each model, I checked the statistical and economic significance of the regression coefficients, corresponding to each variable included in the study. Finally, according to the latest PFGLS econometric model, it can be estimated what is the average impact of each influence factor on profit variation. The impact study must be looked at for the entire long panel, which means that the average impact values refer to the entire sample.

Any empirical study, based on statistical data, must model part of the economic reality predetermined by the economic theory. When the result of the study converges with the scientific provisions of the researched phenomenon, I can count on its relevance. In the following, I will present some arguments in favour of the correctness of the last obtained econometric model, PFGLS.

The sign of each regression coefficient shows us in which relationship the three influencing factors are with profit. The cost regression coefficient has a negative sign, which means that there is an inversely proportional relationship between cost and profit. As a result, with an increase in cost, a decrease in profit is recorded. For the turnover and the coefficient of use of the (motor vehicle) fleet, the regression coefficients have a positive sign. The increase of the two variables brings with it profit increase, which was expected.

First of all, the R statistic² is about 70%. This means that the variation in the cost, the turnover and the coefficient of use of the (motor vehicle) fleet explains in proportion 70% the

variation in the profit. It is a large percentage considering that the major impact on profit is exerted by the three important factors. The remaining 30% is the influence of other unconsidered factors. These factors can be internal, specific to the road transport activity or external, characteristic of the regional economic environment of activity.

The impact of the three independent variables on the dependent variable is statistically and economically significant. Column 5 of the table shows us the level of statistical significance of the impact of the three variables. For a level of 0.05, statistical significance is ensured by $p\text{-value} < 0.000$. Changing the impact variables by one unit of measure leads to a significant variation in profit.

The size of the impact of the cost, the turnover and the coefficient of use of the (motor vehicle) fleet is given by the size of the regression coefficients. For an increase of 1000 lei in the cost, the profit decreases by 914 lei. I observe that the impact of cost variation on profit variation is sufficiently large. The impact of turnover variation on profit variation is positive. This means that for an increase of 1000 lei in the turnover, the profit increases by 927 lei on average. And this variable has a significant statistical and economic impact. The last impact factor, taken into account, is the coefficient of use of the (motor vehicle) fleet. Only in the case of the PFGLS model, does this factor become statistically and economically significant. At a one per cent increase in the level of use of the (motor vehicle) fleet, the profit increases by 437 lei on average.

The regression coefficients for the 10 models, corresponding to the 10 companies, can be found in Table 10. In all companies, the cost harms the profit, with the increase in the cost, a decrease in the profit is recorded. The range of variation of these coefficients is quite large (-0.20; -1.00). This means that the impact of cost on profit variation differs quite a bit from one economic entity to another. Important to note is that the sign of the impact is the same for all the companies in the sample. The turnover has a positive impact for all firms and the variation range of the regression coefficients is (0.19; to 1.00). The impact of the (motor vehicle) fleet utilization ratio on profit differs in sign and magnitude. I have companies where the impact is positive and very pronounced (company 1) and companies where the impact is pronounced negative, as in the case of company 8. This shows us an uneven degree of use of the (motor vehicle) fleet.

The evolution of the main economic indicators must be a permanent concern of the decision-making factors in a company. To ensure adequate profitability, it is important to track the variation of determinants with a significant impact on profit variation. In the presented empirical study, I tried to numerically estimate the impact on the profit, caused by the variation (increase or decrease) of the cost, the turnover and the coefficient of use of the (motor vehicle) fleet. It is obvious that not only the three factors considered have an impact on the profitability of a company. Considering the difficulties encountered regarding data access, I limited ourselves only to the statistical data made available.

Cost is the essential element regarding profit variation. In our case, for a 1000 lei cost increase, an average decrease of 914 lei in profit is estimated. In other words, the ratio of inverse proportionality is roughly from lei to lei. Under these conditions, there must be daily records of the recorded cost level on the dashboard of the decision-making factors. This finding must lead to the improvement of accounting methods of careful cost recording.

We can make a similar comment regarding the impact of turnover. In this case, I have a direct proportional relationship between the two variables. The increase in turnover by 1000 lei leads to an average increase in profit by 927 lei. And in this case, I have a proportionality ratio of approximately lei to lei. Without reservations, I can affirm that this indicator must also be

permanently in the sights of the decision-making factors, regarding the improvement of the accounting records methods.

Always, in any economic entity, the technical condition and degree of use of the equipment at disposal is a determining factor regarding the profitability of the company. The only indicator to which I had access was the coefficient of use of the (motor vehicle) fleet. In the first part of the study, I presented several indicators regarding the quality of the (motor vehicle) fleet. The study can be made more complete by inclusion and other indicators regarding the quality of the (motor vehicle) fleet. At a one per cent increase in the level of use of the (motor vehicle) fleet, the profit increases by 437 lei on average. It seems like a pretty small impact compared to the other two factors. The coefficient of use of the (motor vehicle) fleet is not the only indicator related to its quality, for example, the exploitation time fund.

Chapter 5: general conclusions and assessments

The general conclusions and assessments provide the summary of all the previous chapters to highlight the final synthesized observations. The personal contribution to the development of the research topic and the suggestions for future academic concerns are presented. Also, the practical implications and the limits of the research are highlighted. The field of application of such studies, oriented towards problems at the micro level is at this stage also clearly understood. The bibliography and selected references are presented at the end of the research.

CONCLUSIONS AND FINAL RECOMMENDATIONS

The research results identified the basic problems of developing a managerial cost accounting model, according to the following approaches:

1. In terms of concepts and theories: the research has identified and highlighted the theoretical and scientific aspects of building a managerial cost accounting model in economic entities operating in the road transport sector.

In the thesis, accounting models of cost management were developed, which involved the presentation of the transport cost accounting device and the implementation methods of the basic content of managerial accounting and cost calculation in economic entities in the road transport sector.

At the same time, the thesis presented methods of implementation, use and evaluation of the effectiveness, efficiency and adjustment of the cost management accounting models implemented and applied in the economic entities in the road transport sector.

2. Regarding the practice in the field of managerial accounting: based on the information regarding the dynamics and evolution of the transport sector and analysing the reality at the microeconomic level, the thesis made honest and objective evaluations regarding the results obtained, as well as regarding the limits of the accounting models of cost management in providing information for managers of economic entities in the road transport sector.

Based on the evaluation of the advantages and disadvantages of each cost management accounting model (full cost method, the life cycle costing method, the ABC method), I chose the development of the activity-based costing model and its application in economic entities from the road transport sector. This model included the organizational structure of the accounting apparatus and the cost calculation methodology, including the stages of implementing the ABC method, which was adapted to the characteristics of an economic entity from the road transport sector in our country.

To implement and apply the proposed model, the thesis recommended complete solutions for organizing the accounting apparatus and methods for implementing the basic content of the model. At the same time, the thesis also clarified the necessary conditions for the implementation and application of the ABC model. In parallel with these conditions, the thesis also made some proposals to increase the effectiveness and efficiency of the costs recorded by economic entities in the road transport sector.

3. Regarding application and applicability: The specific models of managerial accounting and cost calculation, respectively the method of full costs, the life cycle costing method and the ABC method were applied to an economic entity in the road transport sector. Moreover, with the help of econometric studies, the impact of accounting on the transport activity and its effect on economic development was evaluated and the specific elements that support the improvement of the managerial accounting system in the road transport sector were identified.

We consider that this study is a topical one, because it addresses a topic of maximum interest for economic entities in the road transport sector, by investigating the relationship between cost management and the implications of cost accounting systems in the road transport sector, using modern methods specific to managerial accounting and cost calculation, descriptive and regression statistical techniques. The main contribution of the thesis is finding a significant association between the management of activity costs and the efficiency of the activity of economic entities in the road transport sector.

First of all, I made a systematization of the theoretical approaches related to the general issue of managerial accounting and cost calculation. The specialized studies were analysed in depth, with the aim of providing an overview of the field and identifying applied and/or applicable trends in the road transport sector. For this purpose, I consulted a number of more than 280 bibliographic sources.

Regarding the overview of the bibliographic references consulted, it should be mentioned that there is a lot of scientific research on managerial accounting and cost calculation, with many different subjects and research fields. However, none of the analysed studies have thoroughly addressed a cost management accounting construction model applied to economic entities in the road transport sector.

The personal contribution in terms of the theoretical approach to the research theme results from the sorting and selection of the results of the studied research and the flexible application of the theory of managerial cost accounting, as follows:

- clearly defining the nature, role and significance of the management and cost calculation accounting model for economic entities in the road transport sector;
- determining and interpreting the theoretical framework and the methodology for building and implementing different models specific to managerial accounting and cost calculation, to improve the efficiency of cost management in economic entities in the road transport sector;
- understanding the real situation of construction and the use of specific methods of managerial accounting and cost calculation in the road transport sector;
- analysis of the reasons for success and the limitations of the specific methods of managerial accounting and cost calculation;
- identifying solutions for selecting the optimal method, specific to managerial accounting and cost calculation, which lends itself to implementation in the road transport sector, corresponding to the needs and requirements of managers.

However, due to the various information needs of managers, managerial accounting and cost calculation require in-depth studies, directed to specific sectors, including the road transport sector.

The implementation of a cost calculation method in economic entities in the road transport sector required an analysis of the internal and international context in which the respective economic entities operate. As such, I developed the following analyses, based on descriptive and regression statistical techniques:

- Statistical analysis of the transport market in our country, at the regional and international level;

- *Econometric model for evaluating the impact of accounting on transport activity and its effect on economic development;*

- *Empirical study on the improvement of the managerial accounting system in the road transport sector.*

Transport activity across Europe is intense and expected to continue growing, with estimates suggesting that passenger transport will increase by 42% by 2050 and freight by 60%. According to INS data, in Romania, road transport remains the main way used to ensure people's mobility. Regarding the road transport of goods, it decreased by 1.0% in 2023 compared to 2022, to the volume of transported goods. Of the total of 321,348 thousand tons of goods transported, 83.1% represented national transport. The route of goods increased by 1.4% compared to 2022, with a 1.5% increase in national transport.

The econometric model for evaluating the impact of accounting on transport activity and its effect on economic development highlights the fact that the transport of goods is influenced by the development of the economy, being in a directly proportional relationship with the growth of the gross domestic product. In other words, a reduction of about 2.3% in the volume of transported goods changes the GDP negatively, the difference being due to another factors. I also concluded that with an increase of 100 tons in the volume of goods transported by car, there is an increase of 9.283738 million lei in GDP.

Regarding the empirical study regarding the improvement of the managerial accounting system in the road transport sector, I tried to numerically estimate the impact on the profit, caused by the variation (increase or decrease) of the cost, the turnover and the coefficient of use of the road fleet. It is obvious that not only the three considered factors have an impact on the profitability of an economic entity. However, considering the difficulties encountered regarding data access, I limited ourselves to those made available by the analysed economic entity.

We demonstrated that the cost is the essential element that influences the profit. For a 1,000 lei cost increase, an average decrease of 914 lei in profit is estimated. In this context, there must be daily records of the recorded cost level on the dashboard of decision-makers, which can lead to the improvement of cost accounting methods.

Also, the technical condition and the degree of use of the machines (the coefficient of use of the (motor vehicle) fleet) in the endowment is a determining factor of the profitability of the economic entities in the road transport sector. At a 1% increase in the degree of use of the (motor vehicle) fleet, the profit increases on average by 437 lei. It seems a rather small impact compared to other factors, but this is not the only indicator related to the quality (motor vehicle) fleet.

According to experimental research combined with the analysis of managerial accounting and cost calculation models applied to economic entities, I proposed and applied three cost calculation methods: the full cost method, the life cycle cost calculation method and the based cost calculation method on activities (ABC method). However, I concluded that the ABC method is the

most suitable for the characteristics of the processes specific to economic entities in the road transport sector.

The differences between the results obtained in the case of applying the ABC method compared to the results offered by traditional cost management methods, respectively by the LCC method can be explained as follows:

- in the case of traditional methods, the deviation in costs is unidirectional, there are overvalued or undervalued products in terms of cost;
- the differences between the approaches highlight a percentage difference, calculated as a ratio between the value of the costs calculated by the ABC method and the other allocation methods;
- the differences between the value of the costs calculated based on the methods approached is significant in terms of LCC and can be attributed to the update with the inflation rate and the rate of return specific to the road transport sector;
- the value of the costs calculated by the ABC method, which exceeds the value of the traditionally calculated costs, can be explained by the inclusion of previously unidentified hidden costs;
- in case the costs calculated by the ABC method are lower than those calculated traditionally, the difference is explained by the inclusion of a hidden profit in the traditional calculation;
- the explanation of the differences, both favourable and unfavourable, can also be attributed to the different configuration of indirect costs within the methods addressed.

Since the analysed economic entity uses two vehicles, whose activity can be exploited to the maximum, it is obvious that the two costs can be correlated. A first piece of information regarding the possibility of making the activity more efficient from the perspective of increasing income is therefore the diversification of routes and the increase in the degree of use of vehicles, as well as finding technological solutions to make fuel consumption more efficient.

To overcome the difficulties involved in the implementation of one or another of the modern models of managerial accounting, economic entities in the road transport sector should employ dedicated people, who must be trained in managerial accounting and who have clear and appropriate tasks and be able to use modern information technology.

The presentation of the answer to the established research questions results in the validation of the research hypotheses, respectively the viability and reliability of the research, as follows:

- The road transport activity exerts a direct and positive impact on the economic development of society as a whole.
- The technological process specific to the road transport activity is made up of a series of cost-generating activities and/or processes, between which there are multiple links and interconnections.
- The principles of the Pigouvian regulation of externalities can be applied in the context of road transport for the evaluation of total costs and the establishment of mobility prices.
- Managerial accounting methods and techniques influence the process of adopting managerial decisions in economic entities from the road transport sector.
- The adoption of managerial accounting methods and techniques in the road transport sector supports the reduction of operational costs of economic entities in the field.

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