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A photograph of a modern building's interior, showing a complex, white, geometric ceiling structure with a grid of beams and lights. The text 'CONFERENCE PROCEEDINGS' is overlaid in large, white, bold, sans-serif letters with a black outline.

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Published by
IATED Academy
iated.org

ICERI2023 Proceedings
16th International Conference of Education, Research and Innovation
November 13th–15th, 2023
Seville, Spain

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DOI: 10.21125/iceri.2023
ISBN: 978-84-09-55942-8
ISSN: 2340-1095

Book cover designed by J.L. Bernat

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These proceedings are published by IATED Academy. The registered company address is Plaza Legión Española 11, 46010 Valencia, Spain.

Bibliographic Information

| | | |
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| Book Title 16th International Conference of Education, Research and Innovation | Book Series ICERI Proceedings | Editors Luis Gómez Chova Chelo González Martínez Joanna Lees |
| Publication Year 2023 | Publisher IATED Academy | Publisher Address Valencia, Spain |
| Book ISBN 978-84-09-55942-8 | Series ISSN 2340-1095 | DOI 10.21125/iceri.2023 |
| Conference Name ICERI2023 | Dates November 13th–15th, 2023 | Location Seville, Spain |
| Copyright Information This work is subject to copyright. All rights reserved. | Topics Education Educational Research Educational Technology | |

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THE ROLE OF MANAGEMENT ACCOUNTING INDICATORS IN PERFORMANCE ASSESSMENT OF PORTUGUESE HIGHER EDUCATION INSTITUTIONS

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Abstract

The assessment of quality and performance in Higher Education Institutions (HEIs) is a multifaceted task, which needs a holistic approach that encompasses various dimensions. This article focuses on the role of some management accounting indicators, namely, the relevance of both financial and non-financial indicators when evaluating the quality and performance of HEIs. In today's era of globalization, HEIs continually grapple with ongoing challenges. Competitive landscapes are increasingly taking shape across various markets, elevating the creation of value and financial sustainability as critical objectives within their purview. HEIs performance has undergone significant transformation, given that these educational establishments are now compelled to seek alternative funding sources, aligning more closely with the characteristics of a competitive market. As such, HEIs aspiring to establish a strong presence in these markets must direct their attention toward strategic objectives that ensure financial sustainability, much like organizations in other sectors. For this purpose, HEIs must develop an in-depth understanding of their business processes, adopting a management approach that allows them to assess their quality and performance, both at the national and international levels. These institutions aim to bolster their competitiveness by implementing management strategies centered on quality and financial sustainability. These strategies incorporate performance measurement systems encompassing a wide array of financial and non-financial metrics. The literature highlights the advantages of non-financial performance measures, emphasizing their particular focus on long-term perspectives, which contribute to enhanced organizational performance. Such measures facilitate comprehension of the interplay between various strategic objectives, enhance communication between employee actions and defined goals, and aid in resource allocation and priority setting relative to those objectives. Regarding the methodology, the data were obtained through an online survey developed by the authors to evaluate the different dimensions of the proposed research model, using for this purpose a sample of convenience constituted by members of the management boards of Portuguese universities and polytechnics. In the treatment of quantitative data, a structural equation model (SEM) was used through the SPSS software (Statistical Package for the Social Sciences), to investigate the possible relationships between the different dimensions incorporated in the model. The main conclusions of the study, considering the conceptions of the respondents, point towards that the use of financial indicators significantly improves the financial performance of HEIs ($B=0.199$, $p=0.006$) and, on the other hand, the use of non-financial indicators significantly improves the operational ($B=0.487$, $p < 0.001$), financial ($B=0.265$, $p < 0.001$) and market ($B=0.479$, $p < 0.001$) performance of HEIs.

Keywords: Higher Education, Management Accounting, Financial Indicators, Non-financial Indicators, Quality.

1 INTRODUCTION

This article aims to highlight the role of management accounting indicators in performance assessment of Portuguese HEIs. The literature highlights the advantages of financial and non-financial performance measures, within the scope of management accounting, highlighting their particular focus on long-term perspectives, which contribute to enhanced organizational performance, focusing this article on the context of Portuguese higher education. Considering a model proposed by the authors and the statistical treatment using a structural equation model, the results presented below demonstrate the importance of these indicators for the organizational improvement of these institutions.

2 THEORETICAL FRAMEWORK

HEIs exhibit distinctive features that set them apart from other types of institutions. These characteristics not only mirror the overarching strategy of the entire educational system but also encapsulate the developmental strategy of each individual educational institution. Assessing performance in alignment with the organizational objectives, whether for diverse organizations or higher education institutions, assumes paramount importance in management practices. Without the presence of suitable performance indicators, organizations will likely struggle to navigate efficiently and effectively in the face of new challenges and the inherent uncertainty of their operating environments. Consequently, the probability of making strategic errors and misallocating resources significantly increases in the absence of both financial and non-financial indicators [1-3].

From the broad set of organizations, those of an educational nature gain increased importance because of their direct and indirect impacts on society. Education stands as a resource of immense value for the advancement of any society, and the acknowledged quality of education imparted by institutions constitutes a pivotal aspect of the administrative management within HEIs [4-5]. In striving for success, HEIs must embrace business concepts intrinsic to profit-oriented enterprises, encompassing the appraisal of their performance. However, delineating their business objectives proves elusive and subjective, presenting challenges in pinpointing critical success factors and performance metrics. Given the nature of activities undertaken within HEIs, performance evaluation relies heavily on a multitude of qualitative indicators that resist easy quantification. Hence, for the enduring sustenance of their operations, heightened competitiveness, and the allure of partnerships and investments, establishing an evaluation system founded on both financial and non-financial performance indicators becomes imperative for HEIs. Conventional methods of business assessment primarily rely on financial indicator computations and assessments, often overlooking various influential factors that steer institutional development. Solely relying on financial indicators for evaluating the performance of any educational institution offers an incomplete assessment, as it overlooks immeasurable and intangible elements intrinsic to this domain, which embody the institution's latent potential and future prospects [4-5].

Quality also plays a very important role, and nowadays one of the primary goals of any institution is to achieve excellence in its area of expertise. However, the complexity escalates when attempting to evaluate something intangible, like education systems and processes within HEIs, necessitating a clear definition of appropriate assessment tools for these intangible assets. Once again, emphasizing the measurement of quality underscores the need to delineate both financial and non-financial indicators to discern cause and effect relationships. Presently, paramount elements in higher education encompass learning, dynamic structures, flexibility, and quality. Consequently, the higher education system must remain adaptive to constant shifts and emerging requisites to attain success and the outlined objectives. This implies an inherent necessity for the entire education system to envelop itself in elevated levels of quality. Numerous variables can impact the quality of HEIs, including organizational culture and the rapid contextual changes that invariably influence all organizations, HEIs included [6-10].

In this scope, management accounting is a specialized branch of accounting that focuses on providing financial and non-financial information to the management of an organization to assist in their planning, decision-making, and control processes. Understanding and applying management accounting principles and techniques are crucial for organizations to optimize their resources, improve decision-making, and achieve their strategic objectives. It involves a blend of financial expertise, strategic thinking, and operational understanding to provide valuable insights to management [11].

The performance of institutions depends on the quality of the decisions that are made by their directors. These decisions relate to a constant need for information that ensures a rational management of resources and strategies. Systems for evaluating performance, encompassing both financial and non-financial indicators, assume a pivotal role in shaping the organization's strategic direction by linking value creation to strategic objectives [5].

Various factors, such as the globalization phenomenon, increasingly fierce market competition, evolving management methodologies, and technological advancements, have heightened the emphasis on performance assessment systems within companies. To gauge, assess, and comprehend the overall well-being of organizations, managers frequently resort to financial indicators, providing insights into the economic and financial landscape. Nonetheless, an escalating number of theorists and practitioners ardently advocate for the significance of non-financial indicators—a trend intrinsically linked to the embrace of novel management approaches [5-8]. Consequently, there has been a surge of interest in leveraging both financial and non-financial performance metrics, as well as exploring the outcomes derived from integrating these two categories of measures [5-8].

The strong market competition has led organizations to implement strategies and management systems to address weaknesses felt by managers in the information provided by financial measurement systems and their traditional short-term perspective. Organizations strive to improve their competitiveness by implementing quality and innovation-oriented management strategies using performance measurement systems that include a wide range of financial and non-financial measures [8-10].

According to Hoque [12], the concurrent utilization of financial and non-financial metrics compels managers to give heightened attention to critical success factors like quality, service, timeliness, reliability, innovation, and meeting customer needs. The literature underscores the benefits of non-financial performance metrics [5], accentuating their focus on a long-term perspective, ultimately enhancing overall organizational performance. Research predicated on performance metrics posits that integrating non-financial measures into measurement systems empowers managers to gain deeper insights into the interplay of diverse strategic objectives, streamlining communication between employee actions and defined goals, as well as optimizing resource allocation and prioritization while considering these strategic objectives.

Moreover, aligning management processes and internal goals with the organization's external objectives can be facilitated by defining and implementing strategies and information systems that emphasize value creation [5-10]. However, it's vital to acknowledge that the concept of organizational performance lacks a universally objective definition. Several studies underscore financial performance, while others emphasize market performance or operational performance. In this study, we approach organizational performance from three perspectives: financial, operational, and market [5].

In this way, it is relevant to approach this relation to the HEIs context, which presupposes the definition of the following research hypothesis:

- H1:** *The use of financial indicators provides an improvement in the operational performance of HEIs.*
- H2:** *The use of financial indicators provides an improvement in the financial performance of HEIs.*
- H3:** *The use of financial indicators provides an improvement in the market performance of HEIs.*
- H4:** *The use of non-financial indicators provides an improvement in the operational performance of HEIs.*
- H5:** *The use of non-financial indicators provides an improvement in the financial performance of HEIs.*
- H6:** *The use of non-financial indicators provides an improvement in the market performance of HEIs.*

Completed the description of the fundamentals that led to the construction of the initial issues, it is now presented the proposed research model as illustrated in the figure 1:

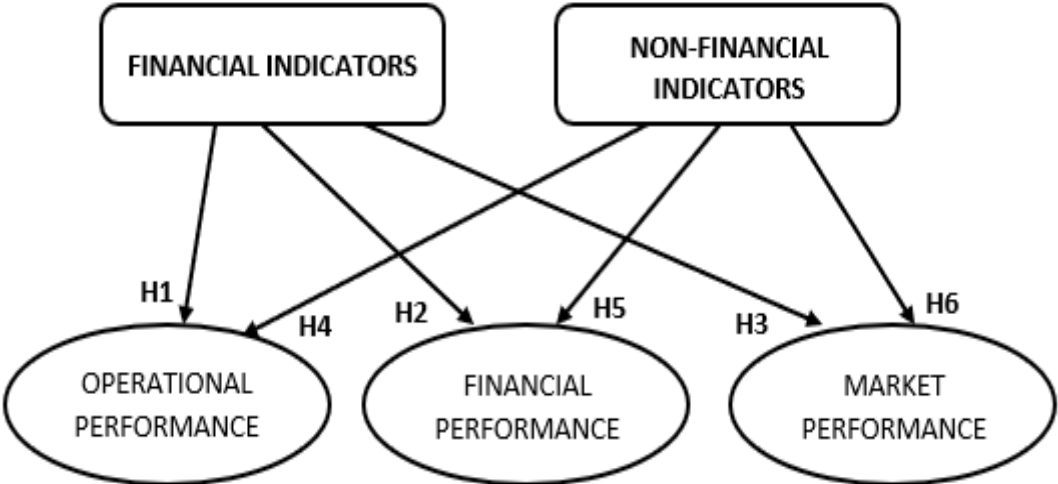


Figure 1. Conceptual Model and Research Hypotheses

3 METHODOLOGY

Regarding to methodology, this research is of a quantitative nature and the data were obtained through the application of a survey elaborated by the authors to evaluate the different dimensions of the proposed conceptual model, using a five-point Likert scale to evaluate the respondents' conceptions about the dimensions considered, where 1 represents "strongly disagree" and 5 represents "strongly agree". For the characterization of respondents and institutions, nominal and ordinal scales were used [5].

The survey was sent via email, which contained a brief explanation of the investigation and an access link to it. The survey was addressed to higher education teachers, namely from public and private universities and polytechnic institutes who, in addition to their teaching activity, simultaneously perform other institutional functions, such as belonging to the presidency or rector, being members of the scientific council, members of the pedagogical council, directors of undergraduate or master's degrees, etc.

In this study, the independent variable is the concept of learning organizations while the dependent variable is innovation strategies (products/services innovation and processes innovation), and internationalization strategies. In the treatment of quantitative data, a model of structural equations (SEM) was used, to investigate the possible relations between the different dimensions incorporated in the model.

4 RESULTS

According to the methodological framework, the results of the investigation are presented, resulting from a descriptive analysis of the data obtained with the application of the survey. The following Table 1 presents the socio-biographical characterization of the respondents.

Table 1. Socio-biographical characterization of respondents

| GENDER | Fr. | % |
|-----------------------------------|------------|----------|
| <i>Female</i> | 170 | 53,8 |
| <i>Male</i> | 146 | 46,2 |
| AGE | Fr. | % |
| <i>Until 30 years old</i> | 1 | 0,3 |
| <i>Between 31 - 40 years old</i> | 32 | 10,1 |
| <i>Between 41 - 50 years old</i> | 122 | 38,6 |
| <i>Between 51 - 60 years old</i> | 113 | 35,8 |
| <i>More than 61 years old</i> | 48 | 15,2 |
| TEACHING EXPERIENCE - HEIS | Fr. | % |
| <i>Less than 5 years</i> | 6 | 1,9 |
| <i>5 - 10 years</i> | 32 | 10,1 |
| <i>11 - 20 years</i> | 89 | 28,2 |
| <i>More than 20 years</i> | 189 | 59,8 |

n= 316

For the statistical treatment of the data, a structural equation model (SEM) was used to investigate the possible relationships between the different dimensions incorporated in the model. SEM is a multivariate statistical method that involves estimating parameters for a system of simultaneous equations. SEM is used to estimate a system of linear equations to test the fit of a hypothetical "causal" model [13-15].

In this way, the first step involves visualizing the hypothetical model or creating a “path diagram” based on previous knowledge or theories. In path diagrams, rectangles represent directly observed or measured variables, and circles or ovals usually represent latent or unobserved constructions that are defined by measured variables. Unidirectional arrows represent causal paths, where one variable directly influences another, and double arrows represent correlations between variables.

We opted for this methodology in the treatment of data from our research since SEM allows researchers to answer a series of interrelated questions in a simple, systematic, and comprehensive way. It achieves this goal by simultaneously modeling the relationships between multiple dependent and independent constructs [13-15].

Therefore, the independent or exogenous variable is one that acts only as a predictor or cause of an effect on another variable/construct in the theoretical model. It is determined outside the model and its causes are not specified in it. On the other hand, the dependent or endogenous variable is one that results from at least one causal relationship [13-15].

In this way, statistical treatment was started, and the 6 hypotheses presented in the model were analyzed:

Table 2. Regression Weights: Standardized estimates and unstandardized estimates Hypotheses 1 to 6

| | | <i>Estimate</i> | <i>S.E.</i> | <i>C.R.</i> | <i>P</i> |
|----------------------|------------------------------|-----------------|-------------|-------------|------------------|
| Operational | <--- Financial | ,056 | ,082 | ,677 | ,499 |
| FinancialPerf | <--- Financial | ,199 | ,072 | 2,762 | ,006 |
| Market | <--- Financial | -,002 | ,100 | -,021 | ,983 |
| Operational | <--- Non_Financial | ,487 | ,091 | 5,344 | <0,001 |
| FinancialPerf | <--- Non_Financial | ,265 | ,073 | 3,636 | <0,001 |
| Market | <--- Non_Financial | ,479 | ,102 | 4,677 | <0,001 |

Observing Table 2 we can see that hypotheses H2, H4, H5 and H6 are confirmed.

Thus, the use of financial indicators significantly improves the financial performance of HEIs (B=0.199, p=0.006), the use of non-financial indicators significantly improves the operational performance (B=0.487, p <0.001), financial performance (B=0,265, p<0,001) and market performance (B=0.479, p <0.001) of HEIs.

After a brief adjustment of the model, the estimates decreased a little, but on the other hand there was an improvement in the adjustment values (Table 3), with the RMSEA being within acceptable reference values (RMSEA=0.073 <0.08).

Table 3. Adjustment Measures of the Final SEM Model

| Model 1 | CMIN/DF | TLI rho2 | CFI | RMSEA |
|---------------|--------------|-------------|-------------|-------------|
| Default model | 2,656 | ,874 | ,888 | ,073 |

Finally, through Figure 2, the factor analysis of the model is presented.

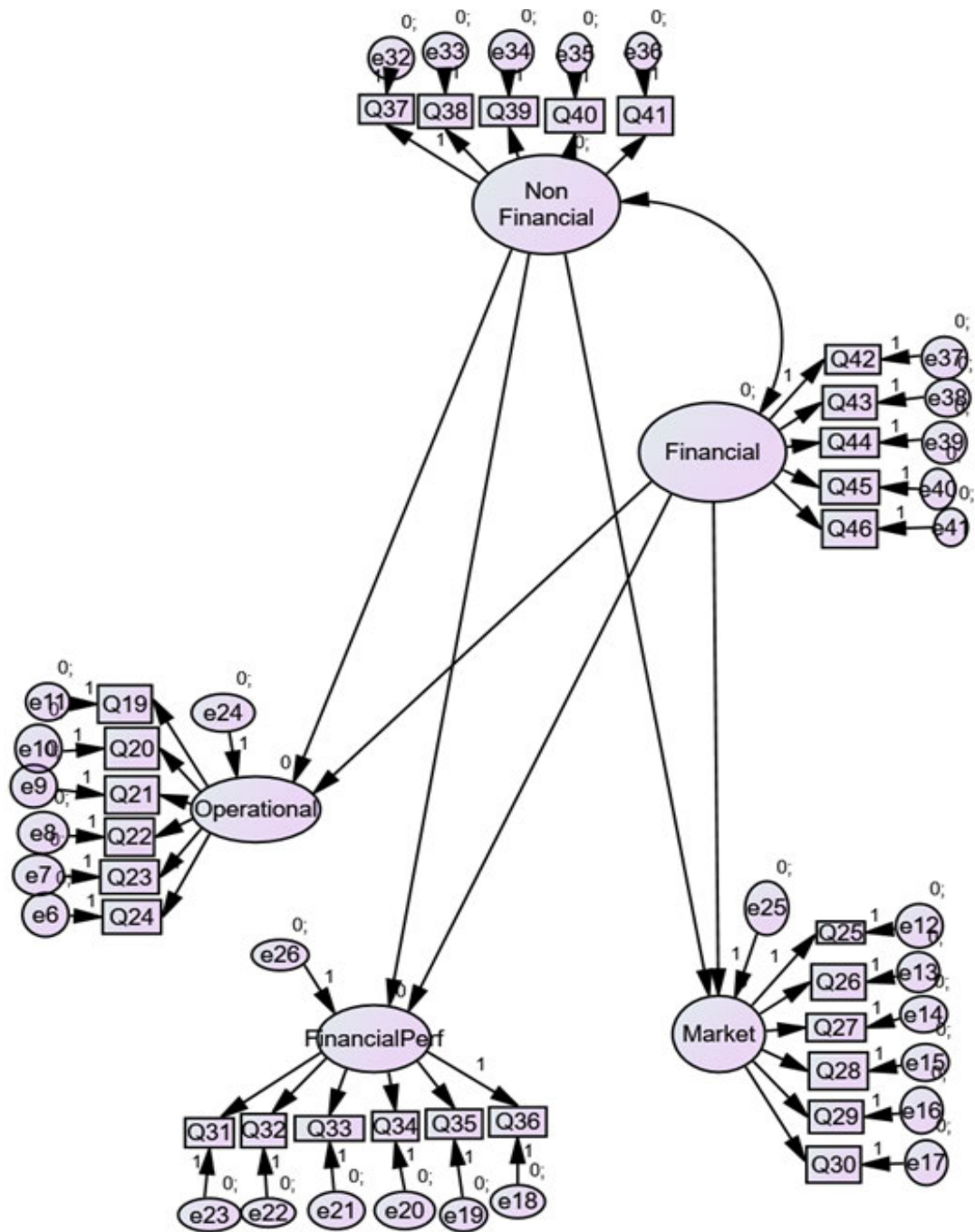


Figure 2: Standardized Regression Weights

As can be seen, through the factorial weights, financial and non-financial indicators influence the performance of Portuguese higher education institutions, confirming 4 of the 6 hypotheses presented in the model.

5 CONCLUSIONS

The performance of institutions depends on the quality of the decisions that are made by their directors. These decisions relate to a constant need for information that ensures a rational management of resources and strategies. Performance evaluation systems, composed of financial and non-financial indicators, play a key role in the strategic definition of the organization because they provide value creation associated with the strategic objectives.

The main conclusions of the study, considering the conceptions of the respondents, point towards that the use of financial indicators significantly improves the financial performance of HEIs ($B=0.199$,

p=0.006) and, on the other hand, the use of non-financial indicators significantly improves the operational (B=0.487, p <0.001), financial (B=0.265, p <0.001) and market (B=0.479, p <0.001) performance of HEIs.

We consider this research of enormous importance for the study of HEIs, considering their role in the development of any country and its impact on society as creators of knowledge and science, and also in order to assist the decision-making of these institutions to achieve the strategic objectives.

ACKNOWLEDGEMENTS

This work was financially supported by Centro de Investigação do ISCE (CI-ISCE), ISCE – Instituto Superior de Lisboa e Vale do Tejo, Odivelas, Portugal.

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