THE IMPACT OF BALANCED SCORECARD ADOPTION ON PERFORMANCE OF ALGERIAN MANUFACTURING FIRMS: A CONTINGENCY APPROACH

Salim **HELLAL***
Yazid **TAGRARET****

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Corresponding authors: salimhellal3@gmail.com

ABSTRACT

This study seeks to determine the effect of contingency variables on adopting the balanced scorecard in Algerian manufacturing companies, as well as the impact of these companies adopting the balanced scorecard on their financial and non-financial performance. This study was devised on the presumptions of Contingency theory, and it included a sample of 41 Algerian manufacturing companies. Path analysis models based on Partial Least Squares were relied on in order to analyze data collected by the questionnaire and test study hypotheses using the software SmartPLS 3.

The study reached several results; the most important of them is that there is no statistically significant correlation when it comes to environmental uncertainty and competitive intensity on the adoption of the balanced scorecard. There is, however, a positive correlation between company size and the ability to adopt the balanced scorecard. Furthermore, this work concluded that adopting balanced scorecard does not possess a direct effect on financial performance indicators; it has, however, a positive effect on improving non-financial performance indicators in Algerian manufacturing companies. The study recommends that companies, move towards the integration of modern management approaches, and that based on

* Laboratory of Organizations Economics and Sustainable Development, Jijel University, Algeria, salim.hellal@univ-jijel.dz

** Faculty of Economics, Commerce and Management Sciences, Oum El-Bouaghi University, Algeria, yazidtagraret400504@gmail.com

sound scientific foundations and presumptions in order to improve their performance.

KEYWORDS: Balanced Scorecard, Contingency theory, Financial performance, Non-financial performance, Management accounting.

JEL CLASSIFICATION: M41, G30.

تبني بطاقة الأداء المتوازن وفق النظرية الموقفية للمحاسبة الإدارية وأثره على أداء المؤسسات الصناعية الجزائرية

ملخص

تهدف هذه الدراسة الى تحديد أثر مجموعة من المتغيرات الموقفية على تبني بطاقة الأداء المتوازن في المؤسسات الصناعية الجزائرية، وكذا أثر تبني هذه المؤسسات لبطاقة الأداء المتوازن على أداءها المالي وغير المالي، حيث تم تطوير هذه الدراسة بناء على افتراضات النظرية الموقفية للمحاسبة الإدارية، وشملت عينة من 41 مؤسسة صناعية جزائرية. حيث تم الاعتماد على نماذج تحليل المسار وفق نمذجة المعدلات الهيكلية بالمربعات الصغرى الجزئية لتحليل بيانات الاستبيان واختبار فرضيات الدراسة وذلك باستخدام برنامج SmartPLS 3

توصلت الدراسة الى مجموعة من النتائج يتمثل أهمها في عدم وجود أثر ذو دلالة إحصائية لحالة عدم التأكد البيئي وشدة المنافسة على تبني بطاقة الأداء المتوازن؛ بينما يوجد أثر إيجابي لحجم الشركة على تبني بطاقة الأداء المتوازن، كما توصلت أيضا الى أن تبني بطاقة الأداء المتوازن ليس له أثر مباشر على مؤشرات الأداء المالي؛ بينما له أثر إيجابي على تحسين مؤشرات الأداء غير المالية في المؤسسات الصناعية الجزائرية؛ كما توصي الدراسة بضرورة توجه الشركات الجزائرية لاسيما الصناعية منها نحو تبني

الأساليب الادارية الحديثة وذلك وفق أسس وافتراضات علمية محكمة من أجل الوصول الى تحسين أدائها.

كلمات مفتاحية: بطاقة الأداء المتوازن؛ النظرية الموقفية؛ الأداء المالي؛ الأداء غير المالي؛ المحاسبة الإدارية.

LES EFFETS D'ADOPTER LE TABLEAU DE BORD PROSPECTIF SELON LA THÉORIE DE LA CONTINGENCE SUR LA PERFORMANCE DES ENTREPRISES INDUSTRIELLES ALGÉRIENNES

RÉSUMÉ

Cette étude vise à déterminer l'effet de plusieurs variables liées à la contingence sur l'adoption du tableau de bord équilibré dans les entreprises industrielles Algériennes, ainsi que l'impact de l'adoption du tableau de bord équilibré par ces entreprises sur leurs performances financières et non-financière. Cette étude a été conçue sur les présomptions de la théorie de la contingence, et elle a inclus un échantillon de 41 entreprises industrielles algériennes. Pour analyser les données recueillies par le questionnaire et tester les hypothèses de l'étude, des modèles d'analyse de chemin basés sur la modélisation de chemin par les moindres carrés partiels ont été utilisés à l'aide du logiciel SmartPLS 3.

L'étude a abouti à plusieurs résultats, dont le plus important est qu'il n'y a pas de corrélation statistiquement significative entre l'incertitude environnementale et l'intensité concurrentielle sur l'adoption du tableau de bord équilibré. Il existe cependant une corrélation positive entre la taille de l'entreprise et la capacité à adopter le tableau de bord équilibré. Par ailleurs, ce travail a conclu que l'adoption du tableau de bord prospectif ne possède pas d'effet direct sur les indicateurs de performance financière ; il a, cependant, un effet positif sur l'amélioration des indicateurs de performance non

financière dans les entreprises industrielles algériennes. L'étude recommande aux entreprises algériennes, notamment industrielles, de s'orienter vers l'intégration des approches de gestion modernes basées sur des fondements et des présomptions scientifiques solides afin d'améliorer et d'actualiser leurs performances.

MOTS CLÉS: Tableau de bord prospectif, Théorie de la contingence, Performance financière, Performance non-financière, Comptabilité de gestion.

INTRODUCTION

In recent years, the global business environment underwent significant developments, and it has consequently become characterized by several new features. Most notable of these is the enormous technological advancement that brought about increased competition levels and market openness. These changes in business environments represent actual challenges for the companies seeking staying power and continuity. This led these firms towards trying to find solutions and ways that could improve and develop their performance; Through working to develop and renovate their ways and practices, so that they adapt to the properties of business environments**.**

Therefore, these companies found that conventional practices and methods, particularly those of a management nature, are no longer reliable when it comes to keeping pace with developments in various fields. This contributed to the emergence of many modern management methods; the most of which is the Balanced Scorecard method, which garnered widespread acclaim in both academic and professional circles. The reason behind that lies in the characteristics of such method, which surpasses the traditional methods of management accounting and their limitations. Through incorporating financial and non-financial performance indicators, as well as tackling performance through four main dimensions, this method cemented its place as one of the most important strategic management accounting methods of our time (Kaplan & Norton, 1992, 1996).

Despite, the importance given to modern management accounting methods in general, and the Balanced Scorecard method in particular, at a theoretical level, its appropriation and application by firms, on a practical level, was subject to substantial differences all over the world. As a result, research on these differences gained tremendous importance in several works and studies that sought to explain the disparity between theory and practice. One of the most important approaches that sought to explain the differences in adopting and applying management accounting methods in firms is the Contingency Theory of management accounting (Cadez & Guilding, 2008, 2012). A theory based on the premise that no management system is suitable for all firms in all circumstances and all times, but this system is reliant on the conditions in which each company operates, and is susceptible to a group of contingency variables unique to said particular company. This theory is also based on the premise that adopting this system in accordance with the contingency variables of each company leads to positive results and enhances performance (Otley, 1980, 2016).

Researches that relies on the contingency theory to explain the differences in applying management accounting methods is deemed the dominant researches in the field of management accounting (Cadez & Guilding, 2008). Many studies attempted to interpret the impact of contingency variables on the adoption of management accounting methods, and the extent to which that influences the performance of companies in several countries all over the world (e.g. Abdel-Kader & Luther, 2008; Al-Mawali et al., 2018; Albu & Albu, 2012; Ayadi & Affes, 2014; Aykan & Aksoylu, 2013; Baines & Langfield-Smith, 2003; Bastian & Muchlish, 2012; BRAAM & NIJSSEN, 2011; Cadez & Guilding, 2012, 2008; Ghasemi et al., 2015; Gliaubicasa & Kanapickien, 2015; Haldma & Lääts, 2002; Hendricks et al., 2011; Hoozée & Mitchell, 2018; Hoque, 2011; Hoque & James, 2000; Islam & Hu, 2012; Ismail et al., 2010; R. Jusoh, 2010; Kalkhouran et al., 2017; Leite et al., 2016; Liem & Hien, 2020; Lonbani et al., 2016; Nair & Soon Nian, 2017; Oyewo et al., 2019; Pavlatos & Kostakis, 2018; Petera & Šoljaková, 2019; Pham et al., 2020; Prihastiwi & Sholihin, 2018; Rosli et

al., 2019; Said et al., 2010; Sawalqa, 2011; Sumkaew & Intanon, 2020; Turner et al., 2017; Wadongo & Abdel-Kader, 2014; Woods, 2009;Ali-Belhadj & Benhabib, 2018).

This work, in particular, is an extension of the aforementioned studies, as it aims to tests the premises of the contingency theory of management accounting in Algerian manufacturing companies. Specifically, it tries to touch upon the effect of a group of contingency variables on adopting one of the most prominent methods in modern management accounting, which is the Balanced Scorecard, and the impact of adopting the latter on the performance of Algerian manufacturing companies.

Hence, the main purpose of this study is to identify the most important contingency variables impacting the adoption of the balanced scorecard in Algerian manufacturing firms; based on the contingency theory of management accounting, by examine the influence of environmental uncertainty, the intensity of competition, and firm size on the adopting of the balanced scorecard in Algerian manufacturing firms. Furthermore, this study seeks to examine the effect of adopting the balanced scorecard on the financial and non-financial performance of these companies.

This paper is structured as follow. In Section 1, the theoretical framework for research includes both the conceptual framework, the literature review, as well as the research model and hypotheses development. In Section 2, the methodology of the study and in Section 3, the results of the study. In Section 4, the discussion of the findings, as well as the recommendations, limitations and suggestions for future researches.

1- THEORETICAL FRAMEWORK

In this section, we cover the definitions of the major terms associated with the work, and examine the literature and the results attained before. The goal is an attempt to build a study model and describe the relationship between variables.

1.1-Conceptual Framework

The study includes some basic concepts, where the definition of these concepts was determined as follows:

1.1.1. The Contingency Theory of Management Accounting

The contingency theory of management accounting emerged during the mid-70's of the twentieth century, and was widely used in management accounting research and strategic management (Al-Mawali, 2015a; Cadez & Guilding, 2012); The theory is based on the premise that no management accounting system is complete and suitable for all companies and in all circumstances. The best design for such a system is, therefore, reliant on the conditions in which the company operates (Otley, 1980, 2016). It also assumes that company performance is more effective when its management systems are designed in accordance with contingency variables (Ahmad, 2012; Cadez & Guilding, 2008; R. Jusoh, 2008).

1.1.2. The Balanced Scorecard (BSC)

The Balanced Scorecard is an approach, a modern management tool that garnered tremendous attention from companies and researchers alike; as it combines financial and non-financial performance indicators, and views performance through the lens of four major dimensions, which are as follows: Financial, Customers, Internal Operations, Learning, and Growth(Kaplan & Norton, 1992, 1996;Hoque & James, 2000). The balanced scorecard has received this attention, because it has overcome the limitations of traditional management accounting methods, as well as its support for strategic management in companies (Costantini, Landi, & Bonazzi, 2020).Whereas, the Balanced Scorecard aims to transform strategic objectives into actions, through the establishment of a strategic map with cause-and-effect links(Ali-Belhadj & Benhabib, 2018; Kaplan & Norton, 1996).

1.1.3. Firm Performance

According to Etim (2019) the definition of Firm performance is a problematic topic because it varies depending on the point of view on

which it is evaluated. Therefore, this study adopts the definition presented by Sawalqa (2011), which states that performance reflects the results of the organization according to two main dimensions, the dimension of financial performance and non-financial performance. In addition, many previous literature indicates that performance is the most frequently used dependent variable in management accounting research contingency-based approach(Al-Mawali, 2015b; Alamri, 2019; Cadez & Guilding, 2008; Hoque & James, 2000; Otley, 2016)

1.2- LITERATURE REVIEW

Many studies attempted to explain the difference in the application of management accounting methods in companies in different countries and regions. Most of these studies stem from testing the hypotheses on which the contingency theory of management accounting is based**.**

Where many of these studies have been conducted in developed countries**.** Especially, in the European region including the study of Costantini et al. (2020) who investigated the impact of firm size and industry sector, on the use of the balanced scorecard in Italian companies. They found that firm size correlates positively with balanced scorecard use; in the sense that large companies tend to adopt the balanced scorecard more often in all sectors. The only exception was the manufacturing sector where even small companies tend to use the balanced scorecard. Quesado et al. (2016) also found that company size has a positive impact on the adoption of the balanced scorecard in Portuguese private sector companies.

Speckbacher et al. (2003) investigated the impact of firm size and the manufacturing sector on the adoption of the balanced scorecard in a sample of listed companies in German speaking countries, i.e. Germany, Switzerland, and Austria. The study found that there is a positive relation between firm size and balanced scorecard use. Braam & Nijssen (2011) they also found that company size and environmental uncertainty have an important impact on experimenting and adopting the balanced scorecard in Dutch companies.

One of the first studies to address this issue is Cadez & Guilding (2008) study that dealt with the impact that strategic choices, market orientation, and firm size have on the use of strategic management accounting methods, as well as the effect of strategic management accounting methods on the performance of companies in Slovenia. The study found out that firm size has a positive effect on the use of strategic management accounting methods, not to mention, these methods and performance having a positive relation.

As for the North American region, the study of Hendricks et al. (2011) addressed the impact of business strategy, firm size, environmental uncertainty, investment in intangible assets, and the company's previous performance on adopting the balanced scorecard in Canadian manufacturing companies. The study concluded that there is a positive correlation between adopting the balanced scorecard and firm size and environmental uncertainty; it also reached the conclusion that companies that performed poorly in recent years tend to be more willing when it comes to adopting the balanced scorecard. Islam & Tadros (2012) also found that the use of the balanced scorecard is positively related to various aspects of performance in Canadian and American companies.

In the Australian region, the study of Hoque & James (2000) is one of the first studies that examined the effect of a set of contingency variables; namely, firm size, product life cycle, and market position on the use of the balanced scorecard and its impact on the organizational performance of Australian manufacturing companies. The study concluded that bigger companies with shorter product life cycles are more likely to use the balanced scorecard. Additionally, it noted that there is a positive correlation between using the balanced scorecard and the performance of these companies.

In addition to the studies that have been conducted in developed countries, there are also many studies that have been conducted in developing countries. In the Asian region, there are many studies as Nair & Soon Nian (2017) study that examined the effect of a set of contingency variables on the use of management accounting methods in Malaysia. The study concluded that firm size impact positively the

use of management accounting methods, and that there is no relation between competition intensity and the use of these methods. Ahmad (2012) reached a result consistent with the positive impact of the company size. However, she concluded that the intensity of competition had a positive impact on the use of management accounting methods in small and mid-sized Malaysian companies. Furthermore, the study noted a marginal positive impact for management accounting methods on performance. On the other hand, Jusoh (2010) in Malaysian companies also concluded that environmental uncertainty had a negative impact on the use of financial perspective as well as the perspective of internal processes; While the company's size has a positive effect on the use of a learning and growth perspective of the balanced scorecard.

Sumkaew & Intanon (2020) study found a positive relationship between environmental uncertainty and the use of strategic management accounting information in Thai manufacturing companies. On the contrary Prihastiwi & Sholihin (2018) they found no effect of both environmental uncertainty and the intensity of competition on the adoption of management accounting methods in small and medium-sized companies in Indonesia. However, they found that firm size possesses a positive effect on the use of these methods. While Ghasemi et al.(2015) concluded that the intensity of competition has a direct and indirect impact on improving performance, through the change in management accounting systems and company strategy in the manufacturing companies listed in the Tehran Stock Exchange.

Ojra (2014) concluded that the use of strategic management accounting methods in Palestinian companies is affected by several factors, including environmental uncertainty; the intensity of competition and the company size; It also found that strategic management accounting methods have a positive impact on non-financial performance indicators. However, it does not have a direct impact on the financial performance indicators**.** Gaber Saleh Mahmoud(2014) also concluded that the company size has a positive impact on the adoption of the balanced scorecard with more use of non-

financial indicators in manufacturing companies in Bahrain. Otherwise, Erserim (2012) found that there is no relationship between competition level, environmental uncertainty, and the use of management accounting methods in manufacturing companies in Turkey.

As for the African region, Etim (2019) it was concluded that the use of management accounting systems is positively related to environmental uncertainty and contributes to improving performance in Breweries Companies in Nigeria. Moreover, Ayadi & Affes (2014) also found that environmental uncertainty and company size have a positive impact on the adoption of modern management accounting methods such as balanced scorecard in Tunisian manufacturing companies.

Likewise, many previous literature examined the implementation of management accounting methods such as the balanced scorecard in Algerian companies, however, few of these studies that adopted the contingency theory of management accounting, the most important of which a study Ali-Belhadj & Benhabib (2018) that investigated the impact of a group of contingent variables, including company size and environmental uncertainty, on the layout and use of the balanced scorecard in Algerian companies. Where they concluded that the company size has a significant impact on the layout of the balanced scorecard. However, it has no effect on its usage. On the other hand, they concluded that the environment through technological dynamism has an important impact on the use of the balanced scorecard in Algerian companies.

Despite the aforementioned studies, there is still a lack of evidence from the African region about the adoption of new management accounting methods according to the contingency theory, especially the balanced scorecard method. This is due to the lack of studies that have been conducted in African countries to test the assumptions of the contingency theory of management accounting, in order to provide a greater understanding of the variables that affect the adoption of these methods **.**Therefore, this study will contribute to filling the gap about the insufficient evidence for the assumptions of the contingency theory of management accounting in this region.

Through, focusing on providing new evidence from the Algerian manufacturing sector.

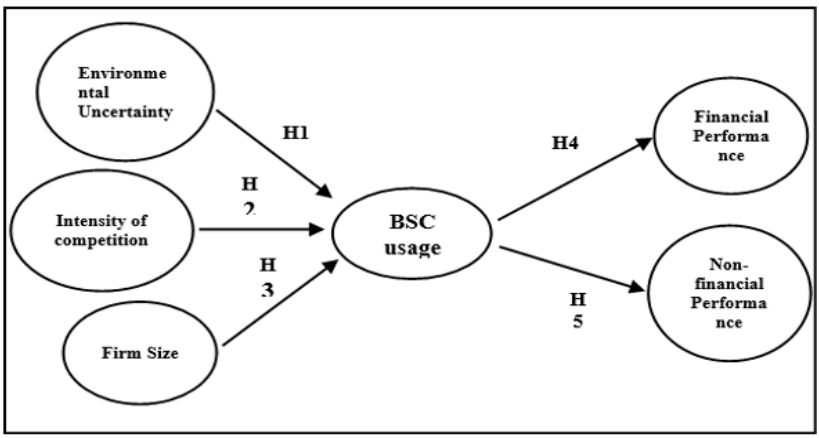
1.3- The Study Model

The literature of management accounting points out that environmental variables tend to be one of the most important factors influencing the design and adoption of management systems in companies (Jusoh, 2008). Therefore, this study deals with three contingency variables that are environmental uncertainty, intensity of competition, and firm size, and these variables' relationship with the adoption of the balanced scorecard. Additionally, it addresses the impact of adopting the BSC on the financial and non-financial indicators in Algerian manufacturing companies, as illustrated in the Figure 1 that shows the structural model of this research.

1.4- Relationship between Variables and Hypotheses Development

1.4.1. Environmental Uncertainty and BSC Usage

Figure 1. The Study Structural Model



Source: Made by the researchers.

Results obtained by most of the prior studies (Ali-Belhadj & Benhabib, 2018; Ayadi & Affes, 2014; BRAAM & NIJSSEN, 2011; Etim, 2019; Hendricks et al., 2011; Ojra, 2014; Sumkaew & Intanon, 2020)

indicate a positive correlation between environmental uncertainty and the adoption of management accounting methods; in the sense that firms operating in an environment that is predominantly uncertain tend to gravitate more towards adopting modern management accounting methods like the balanced scorecard. Based on that, we formulated the following hypothesis:

H1: There is a statistically significant positive correlation between environmental uncertainty and the adoption of the balanced scorecard in Algerian manufacturing firms.

1.4.2. Intensity of Competition and BSC Usage

Results from previous studies tend to be contradictory concerning this variable's relation to adopting modern management accounting methods. Several studies (Ahmad, 2012; Ghasemi et al., 2015; Ojra, 2014), however, remarked that there is a positive correlation between competition intensity and adopting modern management accounting methods. Based on that, the second hypothesis was created, stating that competition intensity positively impacts the adoption of the balanced scorecard, as follows:

H2: There is a statistically significant positive correlation between the intensity of competition and the adoption of the balanced scorecard in Algerian manufacturing companies.

1.4.3. Firm Size and BSC Usage

Most of the results obtained by previous studies (Ayadi & Affes, 2014; Cadez & Guilding, 2008; Gaber Saleh Mahmoud, 2014; Hoque & James, 2000; M. Islam & Tadros, 2012; Prihastiwi & Sholihin, 2018) point out that there is a positive effect of firm size on the adoption of modern management accounting methods. The bigger the company, the more likely it is to integrate the balanced scorecard system. Based on that, the third hypothesis of our study was constructed as follows:

H3: There is a statistically significant positive correlation between firm size and the adoption of the balanced scorecard in Algerian manufacturing firms.

1.4.4. BSC Usage and Firm Performance

Most of the results obtained by previously-conducted studies (Cadez & Guilding, 2008; Etim, 2019; Hendricks et al., 2011; Hoque & James, 2000; M. Islam & Tadros, 2012; Ojra, 2014) indicate a positive impact that stems from using BSC, as the latter tends to improve performance. Accordingly, the fourth and fifth hypotheses were formulated as follows:

H4: There is a statistically significant positive correlation between adopting the balanced scorecard and the financial performance of Algerian manufacturing companies.

H5: There is a statistically significant positive correlation between adopting the balanced scorecard and the non-financial performance of Algerian manufacturing firms.

2- METHODOLOGY

2.1- Population and Sampling

This study's population consists of companies in the manufacturing sector in Algeria. Due to restrictions related to cost, time, and access to the studied cases, we opted to randomly pick manufacturing firms, and design an electronic questionnaire that is, afterwards, distributed among directors in the accounting and finance departments; financial managers, management controls and accountants in a group of Algerian manufacturing companies amounting to 226 firms from the period spanning 25th January to 14th March 2021. The responses we received reached a number of 41, i.e. a response rate of 18.14%.

2.2- The Study Method and Variables Measurement

This study used the quantitative method, where according to the review of the literature conducted by Otley (2016) for the research of the contingency theory of management accounting during the period from 1980 to 2014, which included (236) papers, where they were categorized into, (157) as empirical research and using quantitative method; The other was either theoretical (39), literature review (20), qualitative (10), or methodological (10). Which is considered important evidence for the

dominance of the quantitative approach in the management accounting contingency theory research. Where Otley (2016) also stated that the majority of these quantitative empirical studies have used the questionnaire as a tool for data collection.

Therefore, the questionnaire was the main tool for data collection in this research. It was designed by means of checking previous studies. Measurement grids from some of the aforementioned studies were utilized after adapting them to the requirements of our study. The questionnaire was divided into four main sections; they are as follows:

Section One contains personal information on the study subject such as occupation, sex, age, experiences, education, and some information on the company he or she works in.

Section Two comprises of parts measuring contingency variables in the study; they are as follows:

environmental uncertainty: It was measured through 4 items, drawn from a study Pavlatos & Kostakis (2018). The research subjects are asked to assess on a 5-point Likert's scale the environmental uncertainty facing their firms in recent years.

The intensity of competition: This variable was measured via 4 items drawn from studies by Tuan Mat & Smith (2014), and Waweru (2008). The participants are asked to rate the competition that their firms encountered in recent years on a 5-point Likert's scale.

Firm size: This variable was measured in previous studies through three different scales: employee numbers, annual turnover, and total assets. We relied on this study on the scale of employees' number as used by Hoque & James (2000), and Waweru (2008).

Section Three deals with the usage of the balanced scorecard. It was measured through 6 items drawn from studies by Hou (2015) and Jusoh (2008) in order to assess the extent to which the balanced scorecard was adopted on a 5-point Likert's scale.

Section Four is about performance and it contains 5 items drawn from studies by Baines & Langfield-Smith (2003); Hoque & James (2000); Turner et al. (2017). Two types of performance indicators were used: Financial performance was measured by 3 Financial indicators (Return on Investment; Return on Equity; Margin on Sales). As for

non-financial performance, it was assessed through 2 indicators (Customer Satisfaction and Product Quality). In accordance with content of previous studies, the participants are asked to rate the level achieved by their firms on a5-point Likert's scale.

2.3- Data Analysis Method

Partial Least Squares Structural Equation Modeling (PLS-SEM) was used to construct the path model and for data analysis. According to Hair et al. (2017) Structural equation modeling is considered a second-generation tool of multivariate data analysis. It is used for theory development and testing, as it functions with high efficiency on small samples and complex models, and requires no presumptions about the data used in the study. It requires no normal data distribution due to being nonparametric tests, making it easy to utilize in different research fields depending on their characteristics and features.

3- RESULTS

3.1- Descriptive Analysis of the Study Sample

Table 01 illustrates the descriptive characteristics of participants and the sample of companies includes in the study.

Table 1. The Descriptive Statistics

	Statement	Frequency	Percentages
Occupation	Head of Finance and Accounting Department	08	19.5%
	Financial Manager	04	9.75%
	Accountant	16	39%
	Management Control	11	26.8%
	Other	2	4.87%
Sex	Male	35	85.4%
	Female	6	14.6%
Age	From 20 to 30 years	14	34.1 %
	From 31 to 40 years	22	53.7 %
	From 41 to 50 years	5	12.2 %
Education	License (Bachelor Degree)	16	39 %
	Masters	21	51.2 %
	Magistrate	2	4.82%
	Doctorate or PhD	1	2.4 %

	Other	1	2.4%
Employment Years	From 1 to 5 years	20	48.8 %
	From 6 to 10 years	14	34.1 %
	From 11 to 15 years	5	12.2 %
	More than 15 years	2	4.9 %
Company Type	Joint-stock company (SPA)	21	51.2 %
	L.L.C Limited Liability Company	14	34.1 %
	One-person company EURL	5	12.2 %
	General Partnership (SNC)	1	2.4 %
Firm Size	Large	19	46.34 %
	Mid-sized	15	36.58 %
	Small	7	17.07 %

Source: Made by the researchers using SPSS V26.

Table1 illustrates the descriptive properties of the study sample; the participants consist of 20% heads of finance and accounting departments, 10% financial managers, 39% accountants, and 27% in management control. Moreover, 50% of the participants are holders of a master's degree, 39% a bachelor degree (License), and there are also 3 participants with post-graduate degrees such as Magistrate or Doctorate. As for work experience, 48% of participants possess a work experience of 1 to 5 years, 34% of 6 to 10 years, and the rest 11 years and more. The participants showed high levels of ability to understand and answer the questionnaire. When it comes to the companies includes in the study, 51% of them are joint-stock companies, 34% are limited liability companies, 12% are one-person companies, and only one is a General Partnership. As for size, 46% are large firms, 36% are mid-sized, and 17% are small firms (depending on the number of employees).

3.2- Data Analysis via the Partial Least Squares Structural Equation Modeling (PLS-SEM)

Data was analyzed in accordance with the PLS-SEM and through two major phases: The first phase assesses the adequacy of the measurement model through which the validity and reliability of the tool is confirmed. Afterwards, in the second phase, we assess the structural model and test the hypotheses of the work.

3.2.1. Assessing the Measurement Model

The first step towards analyzing path models according to the PLS-SEM method is testing how adequate the measurement model is; also known as the outer model. It expresses the relationship between variables and indicators (Hair et al., 2017). In this phase, reliability, as well as convergent and discriminant validity are checked and confirmed.

The reliability of the study tool is tested via the Alpha Cronbach Coefficient and the composite reliability, whereas, convergent validity is tested via outer loadings and the average variance extracted. Table 2 shows that both the Alpha Cronbach coefficient and the composite reliability factor indicate that the tool used in the study is highly stable and reliable. According to Chin(1998), composite reliability factors above 0.7 are good, and Alpha Cronbach coefficients are all above 0.7 except for the competition intensity item, which scored between 0.69 and 0.7 which is rather acceptable as well.

Table 2. Reliability and Convergent Validity

Variables	Items	Outer loadings	Alpha Cronbach	Composite Reliability Factor	Average Variance Extracted
Environmental Uncertainty EU	PU1	0.966	0.724	0.860	0.756
	PU2	0.762			
Intensity of Competition IC	IC1	0.724	0.696	0.830	0.621
	IC2	0.758			
	IC3	0.875			
Balanced Scorecard BSCusage	BSC1	0.741	0.874	0.908	0.666
	BSC2	0.877			
	BSC3	0.727			
	BSC4	0.861			
	BSC5	0.860			
Financial Performance FP	FP1	0.928	0.925	0.951	0.866
	FP2	0.934			
	FP3	0.929			
Non-Financial Performance N-FP	N-FP4	0.958	0.876	0.941	0.888
	N-FP5	0.927			
Firm Size	F- Size	1	1	1	1

Source: Made by the researchers using SmartPLS 3

Convergent validity points to how close and in agreement are the items of each dimension. It is examined via the values of outer loadings; which ought to be equal or greater than 0.7 according to (Chin, 1998; Hair et al., 2017). Consequently, items with lower numbers than the requirement are deleted (3 items in section two, and 1 in section three). Average variance extracted values demonstrate a rather high level of convergent validity; the values were all above 0.5, which is the minimum required according to (Fornell & Larcker, 1981; Henseler et al., 2015).

The second phase consists of testing how adequate the measurement model is by assessing discriminant validity which measures how distinct are the dimensions from one another. Discriminant validity is tested via the Fornell-Larcker criterion, the HTMT test, and cross loading coefficient.

In order to achieve discriminant validity according to the Cross-Loading test, the cross-loading coefficients of an index need to be higher in its own item when compared to its coefficients on other indicators.

Table 3 presents the results attained by the cross loadings test, show that cross loading coefficients for all items belonging to the same index are higher than their coefficients in other indicators. This means that discriminant validity is achieved according to the test (Henseler et al., 2015).

Table 3. Cross Loadings

	BSC	IC	PU	FP	N-FP	SIZE
BSC1	**0.741**	**0.244**	**0.299**	**0.144**	**0.632**	**0.054**
BSC2	**0.877**	**0.155**	**0.297**	**0.061**	**0.432**	**0.292**
BSC3	**0.727**	**0.434**	**0.171**	**0.249**	**0.438**	**0.166**
BSC4	**0.861**	**0.062**	**0.197**	**0.059**	**0.338**	**0.386**
BSC5	**0.860**	**0.090**	**0.201**	**0.009**	**0.327**	**0.384**
IC1	**0.187**	**0.724**	**0.255**	**0.096**	0.034	0.022
IC2	**0.165**	**0.758**	**0.046**	**0.082**	0.095	0.219
IC3	**0.254**	**0.875**	**0.179**	**0.339**	0.018	0.104
PU1	0.317	0.126	**0.966**	0.078	0.384	0.194
PU2	0.127	0.246	**0.762**	0.054	0.116	0.151
FP1	0.136	0.240	0.146	**0.928**	0.312	0.086
FP2	0.155	0.199	0.049	**0.934**	0.315	0.091
FP3	0.073	0.259	0.171	**0.929**	0.364	0.140

N-FP4	0.583	0.003	0.346	0.376	**0.958**	0.043
N-FP5	0.447	0.058	0.353	0.266	**0.927**	0.030
SIZE	0.297	0.138	0.204	0.023	0.012	1

Source: Made by the researchers using SmartPLS 3

According to Fornell & Larcker (1981), for discriminant validity to be achieved, it needs to be the square root of the average variance extracted for each variable, bigger than the correlation coefficients of this variable to other variables.

The results of the Fornell-Larcker criterion test shown in Table 4. Indicate that the square root of the variance extracted for the variables is larger than their correlation coefficients. This means that discriminant validity is achieved according to the test.

Table 4. Fornell-Larcker Criterion

Variables	PU	IC	BSC usage	FP	N-FP	Size
PU	**0.870**					
IC	0.177	**0.788**				
BSC usage	0.289	0.216	**0.816**			
FP	0.078	0.243	0.140	**0.930**		
N-FP	0.339	0.029	0.554	0.348	**0.942**	
Size	0.200	0.138	0.298	0.023	0.012	**1**

Source: Made by the researchers using SmartPLS 3

According to Hair et al. (2017), the HTMT test circumvents the limitations of both the Fornell-Larcker test and the Cross loadings test for measuring discriminant validity. As this test measures correlations between model variables; the lower are the correlation coefficients, the higher the discriminant validity is. In the sense that, correlation values should be less than 0.85 or 0.9 maximum for discriminant validity to be achieved according to this test.

Results of the HTMT test shown in Table 5 suggest a high level of discriminant validity, as we note small correlation coefficients that are no higher than 0.4; except for a single correlation coefficient reaching 0.59, which is also rather acceptable according to this test (Henseler et al., 2015).

Table 5. The Heterotrait-Monotrait Ratio (HTMT)

Variables	PU	IC	BSC usage	FP	N-FP	Size
PU	-					
IC	0.282	-				
BSC usage	0.307	0.303	-			
FP	0.148	0.279	0.143	-		
N-FP	0.356	0.090	0.598	0.385	-	
Size	0.229	0.175	0.337	0.118	0.041	-

Source: Made by the researchers using SmartPLS 3

All results obtained via the aforementioned tests indicate that reliability, as well as convergent and discriminant validity were achieved in our measurement model; this is evidence of the latter being highly adequate and suitable. Confirming that is a vital and necessary that precedes the second part of data analysis using Partial Least Squares Structural Equation Modeling (PLS-SEM). This second part includes both assessing the structural model and testing the hypotheses of the study.

3.2.1. Evaluating the Structural Model

This phase is concerned with the path analysis in accordance with PLS-SEM of the study's structural model; also known as the inner model, and it describes the relationship between the latent variables(Hair et al., 2017). This procedure allows us to test the hypotheses of the study.

Table 6. Paths Coefficients

H	Paths	R^2	β	P-Value	Decision
H1	PU ⟶ BSC usage	*0.212*	0.182	0.381	rejected
H2	IC ⟶ BSC usage	0.212	0.270	0.192	rejected
H3	Size ⟶ BSC usage	0.212	0.299	0.033	accepted
H4	BSC usage ⟶ FP	0.02	0.140	0.521	rejected
H5	BSC usage ⟶ N-FP	0.306	0.554	0.002	accepted

Source: Made by the researchers using SmartPLS 3

The hypotheses are tested in path analysis models according to the PLS-SEM, starting from the statistical significance of path coefficients β to the strength and type of correlation that exists between the variables

of the model. We note from the results in table 6, that starting from a significance level of 5%, the following decisions are made:

First Hypothesis H1: (P= 0.381 > 0.05) the first hypothesis is rejected. It states that there is statistically significant correlation between environmental uncertainty and adopting the balanced scorecard in Algerian manufacturing firms.

Second Hypothesis H2: (P= 0.192 > 0.05) the second hypothesis is also rejected. It states that there is a statistically significant positive correlation between competition intensity and the adoption of the balanced scorecard by Algerian manufacturing companies.

Third Hypothesis H3: (P= 0.033 < 0.05) the third hypothesis is accepted. It says that there is a statistically significant positive correlation between firm size and balanced scorecard usage in Algerian manufacturing companies.

Fourth Hypothesis H4: (P= 0.521 > 0.05) the fourth hypothesis is rejected. It states that there is a statistically significant positive correlation between adopting the balanced scorecard and the financial performance of Algerian manufacturing firms.

Fifth Hypothesis H5: (P= 0.002 < 0.05) the fifth hypothesis is accepted. It states that there is a statistically significant positive correlation between balanced scorecard usage and the non-financial performance of Algerian manufacturing companies.

The Coefficient of Determination R^2: The coefficient of determination R^2 expresses the capacity of external variables (independent) to explain the change in the internal variable (dependent). With an (R^2=0.211), the external variables explain 21.1% of the change occurring in the dependent variables, which is balanced scorecard usage. This percentage is deemed rather weak, and interpretable by the existence of other variables that simply are not present in our study. The reason behind that is that according to the contingency theory, there are other contingency variables that can influence the adoption of management accounting methods in firms.

On the other hand, the coefficient of determination (R^2=0.306) points out that balanced scorecard usage explains 30.6% in changes occurring in the non-financial performance indicators of Algerian

manufacturing firms, which is a rather average percentage. As for (R^2=0.02), it indicates that balanced scorecard usage explains only 2% of the changes in the financial performance indicators of Algerian manufacturing companies, which is a very weak percentage and simply unacceptable.

DISCUSSION AND CONCLUSION

This study is an extension of several preceding studies, that depend on the approach of the contingency theory of management accounting in order to interpret the differences in adopting management accounting systems. The study was structured in accordance with the premises of the contingency theory of management accounting and via touching upon a group of contingency variables; namely, environmental uncertainty, intensity of competition, and firm size, as well as their impact on balanced scorecard usage in Algerian manufacturing firms, and the effect of adopting the balanced scorecard on their financial and non-financial performance. The study reached several results; they are as follows:

There is no statistically significant effect of environmental uncertainty on balanced scorecard usage in Algerian manufacturing firms; a result in disagreement with most preceding studies (Ali-Belhadj & Benhabib, 2018; Ayadi & Affes, 2014; BRAAM & NIJSSEN, 2011; Etim, 2019; Hendricks et al., 2011; Ojra, 2014; Sumkaew & Intanon, 2020). It does, however, agree with the results of a couple of studies (Erserim, 2012; Prihastiwi & Sholihin, 2018); the latter two also concluded that there is no relationship between environmental uncertainty and adopting management accounting methods in Turkey (Erserim, 2012), and Indonesia (Prihastiwi & Sholihin, 2018).

The study also found out that there is no statistically significant correlation between competition intensity and balanced scorecard usage in Algerian manufacturing firms; a result opposite of the findings of (Ahmad, 2012; Ghasemi et al., 2015; Ojra, 2014), and in agreement with Erserim (2012) in Turkey, Nair & Soon Nian (2017) in Malaysia, and Prihastiwi & Sholihin (2018) in Indonesia; studies that

discovered no relationship between competition intensity and adopting management accounting methods.

Furthermore, our study found out that there is a positive effect of the variable of firm size on balanced scorecard usage; a result in agreement with most previous studies (Ayadi & Affes, 2014; Cadez & Guilding, 2008; Gaber Saleh Mahmoud, 2014; Hoque & James, 2000; M. Islam & Tadros, 2012; Prihastiwi & Sholihin, 2018) with the exception being the work of (Costantini et al., 2020), which reached the conclusion that in the Italian manufacturing sector, even small companies tend to use the balanced scorecard. In addition, it does not agree with the results of the study of Ali-Belhadj & Benhabib (2018) which found that company size has no effect on the use of the balanced scorecard in Algerian companies.

This work also concluded that there is a statistically significant relationship between adopting the balanced scorecard and the non-financial performance; a result that can be deemed partially in agreement with (Cadez & Guilding, 2008; Etim, 2019; Hendricks et al., 2011; Hoque & James, 2000; M. Islam & Tadros, 2012; Ojra, 2014). These works discovered that the management accounting methods or balanced scorecard possesses a positive effect on the performance of companies overall. However, our study deviates in finding that there is no direct relation between balanced scorecard usage and the indicators of financial performance. These results are, nonetheless, in agreement with the work of Ojra (2014) in Palestinian manufacturing firms; it concluded that there is no direct link between adopting strategic management accounting methods like the balanced scorecard and the indicators of financial performance, while using these methods comes with a positive impact on improving the non-financial indicators in Palestinian manufacturing firms.

In general, the result from the PLS path model supports some of the hypothesised relationships. In particular, BSC usage is positively associated with firm size. In turn, BSC usage is shown to have a positive effect on company performance. This finding confirms the important role of BSC in improving non-financial performance. Furthermore, It is evident from comparing the results of this study to

preceding similar studies that the results are in agreement with several studies (Erserim, 2012; Nair & Soon Nian, 2017; Ojra, 2014; Prihastiwi & Sholihin, 2018) conducted in developing countries such as Indonesia, Turkey, Malaysia, and Palestine. This supports this study's results and can be explained by the similarities in the characteristics and properties in the business environment of developing countries, particularly, the case of environmental variables like competition intensity and environmental uncertainty.

This study contributes to the literature by providing new evidence that supports the assumptions of the contingency theory of management accounting by confirming the impact of contingency variables on the adoption of management accounting methods in companies. Through, the study found an impact of the company's size on the adoption of the balanced scorecard method in Algerian manufacturing companies, as well as the study supports the results about the contribution of the balanced scorecard to improving the non-financial performance indicators in companies.

Based on the results reached by this study, we can offer some suggestions and recommendations that can assist decision makers in firms overall, and manufacturing firms in particular. In addition, it is the need for companies to move towards adopting modern management methods, and that based on sturdy scientific principles whilst also preserving the unique features of these firms. All so that they may improve their performance, take off, and be allowed competitiveness and continuity in light of the challenges imposed by the current business environment. Furthermore, it is necessary for executives and managers in manufacturing firms to grasp the importance of focusing on non-financial performance indicators, as well as the financial ones in the current business environment. With the purpose of achieving a balanced level of performance, which can be done by making use of the principles on which the balanced scorecard is based on. The latter proved capable of enhancing non-financial performance indicators in manufacturing companies, and equally capable of attaining good financial results in the future.

It should be noted that this study has witnessed many limitations, the most important of which are the study included a limited number of contingency variables that could impact the adoption of the balanced scorecard. Therefore, the model can be expanded in future studies to include other contingency variables such as firm strategy, organizational structure… and many others that were proved in the literature to be impactful when it comes to adopting management methods and systems. Moreover, it is possible to conduct similar studies in other sectors, or expand the sample of the study to include even more companies from the manufacturing sector; the sample of this study was rather limited. As well as similar studies can be conducted on other management accounting methods in Algerian companies.

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