



Revista Brasileira de Gestão de Negócios

ISSN: 1806-4892

gestnegocios@fecap.br

Fundação Escola de Comércio Álvares

Penteado

Brasil

Cardoso Vieira Machado, Maria João

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Revista Brasileira de Gestão de Negócios, vol. 15, núm. 46, enero-marzo, 2013, pp. 129-148

Fundação Escola de Comércio Álvares Penteado

São Paulo, Brasil

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DOI: <http://dx.doi.org/10.7819/rbgn.v15i46.1175>

SUBJECT AREA: ACCOUNTANCY AND CONTROLLERSHIP

## Balanced Scorecard: an empirical study of small and medium size enterprises

*Balanced Scorecard: um estudo empírico sobre pequenas e médias empresas*

*Balanced Scorecard: estudio empírico sobre pequeñas y medianas empresas*

Maria João Cardoso Vieira Machado<sup>1</sup>

Received on December 22, 2011 / Approved on March 05, 2013

Responsible Editor: Ivam Ricardo Peleias, Doctor

Evaluation Process: Double Blind Review

### ABSTRACT

Theory attributes advantages to the Balanced Scorecard as a performance evaluation method, when compared to exclusively financial measures. This study aims at analyzing Balanced Scorecard use and awareness rates amongst small and medium Portuguese industrial companies, researching factors that explain why the method is not familiar to all companies. Interviews were carried out with professionals in charge of management accounting in 58 industrial companies in eleven Portuguese districts. Evidence gathered allow us to conclude that very few enterprises use the Balanced Scorecard, and that most of the professionals interviewed are unaware of it. Research on explanatory factors allow us to conclude that awareness about this method depends on the individual characteristics of those in charge of management accounting, such as education and age; and on company characteristics, such as size.

**Keywords:** Performance evaluation. SME. Portugal.

### RESUMO

A teoria atribui vantagens ao *Balanced Scorecard* como método de avaliação de desempenho, em comparação a medidas exclusivamente financeiras. O presente estudo tem como objetivo analisar as taxas de utilização e a difusão do conhecimento sobre o *Balanced Scorecard* nas pequenas e médias empresas industriais portuguesas, pesquisando a existência de fatores que expliquem por que o método não é conhecido em todas as empresas. Foram realizadas entrevistas com os responsáveis pela contabilidade gerencial de 58 empresas industriais localizadas em onze distritos portugueses. As evidências reunidas permitem concluir que muito poucas empresas utilizam o *Balanced Scorecard* e que a maioria dos responsáveis entrevistados não o conhece. A pesquisa de fatores explicativos permite concluir que o conhecimento desse método está associado a características individuais dos responsáveis pela contabilidade gerencial, como formação académica e idade, bem como características da própria empresa, com tamanho.

**Palavras-chave:** Avaliação de desempenho. PME. Portugal.

1. Doctor in Accounting and Professor at the Instituto Universitário de Lisboa – ISCTE, Portugal. [mjcvvm@iscte.pt]  
Author's address: Av. das Forças Armadas, 1649-026 Lisbon, Portugal

## RESUMEN

La teoría defiende el Balanced Scorecard como un método de evaluación del desempeño, respecto al uso de medidas exclusivamente financieras. El presente estudio tiene como objetivo examinar las tasas de utilización y divulgación de conocimientos acerca del Balanced Scorecard en pequeñas y medianas empresas industriales portuguesas (PYME), analizando la existencia de factores que expliquen por qué el método no es conocido en todas las empresas. Fueron entrevistados los contables de 58 empresas industriales, ubicadas en once localidades portuguesas. El resultado indica que muy pocas empresas utilizan el Balanced Scorecard y que la mayoría de los responsables encuestados no lo conocían. La búsqueda de factores explicativos muestra que el conocimiento de este método está asociado a las características individuales de los responsables de la contabilidad de gestión, tales como el nivel educativo y la edad, así como las características de tamaño de la propia empresa.

**Palabras clave:** Evaluación desempeño. PYME. Portugal.

## 1 INTRODUCTION

Researchers are also concerned to study whether enterprises use the performance evaluation methods considered by the theory as the most adequate – those that simultaneously include financial and non-financial measures, namely the Balanced Scorecard (ALBRIGHT et al., 2010; BANKER; CHANG; PIZZINI, 2004; BUTLER; HENDERSON; RAINBORN, 2011; CARDINAELS; VEEN-DIRKS, 2010; COKINS, 2010; CRABTREE; DEBUSK, 2008; DAVIS; ALBRIGHT, 2004; DILLA; STEINBART, 2005; HERATH; BREMSER; BIRNBERG, 2010; KAPLAN; WISNER, 2009; KRAUS; LIND, 2010; LIBBY; SALTERIO; WEBB, 2004; LIEDTKA; CHURCH; RAY, 2008; MCPHAIL; HERINGTON; GUILDING, 2008; NEUMANN; ROBERTS; CAUVIN, 2010; NORTHCOTT; SMITH, 2011; ROBERTS;

ALBRIGHT; HIBBETS, 2004; SUNDIN; GRANLUND; BROWN, 2010; TAYLER, 2010; VILA; COSTA; ROVIRA, 2010; WIERSMA, 2009; WONG-ON-WING et al., 2007).

Dearman and Shields (2001) mention that, even when using other methods theoretically considered as inadequate, correct management decisions can be made as long as managers are aware of the more adequate methods. These authors' conclusions make it important to study not only the Balanced Scorecard usage rate, but also the transmission of knowledge about it to those in charge of management accounting.

The contingency theory is based on the premise that there is no ideal accounting system that can be applied in the same way in every organization. It all depends on several contingency factors (OTLEY, 1980). Researchers are also interested in studying the contingency variables responsible for the transmission of knowledge about management accounting methods (ABDEL-KADER; LUTHER, 2008; BYRNE; PIERCE, 2007; CADEZ; GUILDING, 2008; CHEN, 2008; GERDIN; GREVE, 2008; HENRI, 2010; HOPPER; EFFERIN, 2007; QIAN; BURRITT; MONROE, 2011; WIDENER, 2004; WOODS, 2009).

The three factors previously mentioned give relevance to the performance of this study on the use and knowledge of the BSC, as well as the contingency variables responsible for making it known to Portuguese companies; since the financing problems currently existing in Portugal demand greater management ability by companies and, consequently, the use of more suitable management accounting methods. Management accounting practices in organizations are very little disclosed in Portugal, given the optional nature of this type of accounting. This justifies the performance of empirical studies in this country as a contribution to the contingency theory, because this theory recognizes that cultural differences between countries are a differentiating factor on the management accounting methods used (YANG; YANG; WEI-PANG, 2006; MACARTHUR, 2006).

The objective of this paper is to increase knowledge regarding the presentation of the Balanced Scorecard (BSC) in small and medium sized Portuguese industrial enterprises (SMEs). Other more specific objectives are as follows: to analyze this method's usage and knowledge spreading rates; to identify contingency variables for the fact that the BSC is known in some companies and not in others.

The empirical studies already performed, reporting BSC usage rates, do not focus on small and medium sized enterprises, which justifies conducting a new study on this type of company. SMEs have an important role in Portuguese corporate fabric. A study performed (INSTITUTO DE APOIO ÀS PEQUENAS E MÉDIAS EMPRESAS E AO INVESTIMENTO - IAPMEI, 2008) mentions that 99.6% of national enterprises are of small and/or medium size. This gives even greater relevance to the study of this type of enterprise when describing the country's situation. However, the high number of SMEs in Portugal – 297,000 enterprises (IAPMEI, 2008) – has made us limit our study to enterprises classified as industry-excellence, since they represent a group of companies that were selected using goals aligned with those of this paper; mentioned classification assesses the economic, financial, and management performances of applicant enterprises (IAPMEI, 2002).

The universe under analysis is made up of 163 enterprises consistently classified, in this century, as industry-excellence SMEs. Data were gathered through interviews carried out with those in charge of management accounting, because we consider they possess all the information on which we intended to collect evidence. We performed 58 interviews in enterprises located in 11 Portuguese districts, generating a 36% response rate. The non-replies were treated, allowing us to conclude that there are no statistically significant differences between responding enterprises and non-responding ones.

## 2 LITERATURE REVIEW

The first performance evaluation models were based solely on financial measures (BANKER; MASHRUWALA, 2007; CORONA, 2009; LUFT, 2009; MARTIN; PETTY, 2000). Over time, countless critics to those models appeared, causing the theory to currently give supremacy to performance evaluation models that simultaneously include financial and non-financial measures (BANKER; MASHRUWALA, 2007; CORONA, 2009; GEER; TUIJL; RUTTE, 2009). Within this type of models the Balanced Scorecard stands out (BUDDE, 2007; DILLA; STEINBART, 2005; ITTNER; LARCKER; MEYER, 2003; JOHANSON et al., 2006; KAPLAN, 1994; KAPLAN; NORTON, 1992, 1993, 1996a, 1996b, 1996c, 1996d, 2001a; 2001b; KAPLAN; NORTON; BJARNE, 2010; SALTERIO, 2000; PANDEY, 2005; ROBERTS; ALBRIGHT; HIBBETS, 2004).

In 1990, the Nolan Norton Institute – KPMG's research unit – sponsored a study on performance evaluation in the organizations of the future, driven by the perception that the use of exclusively financial measures was obsolete (KAPLAN; NORTON, 1996b). Kaplan (1994) defends that excessive emphasis on assessment measures based on short term financial results may drive enterprises to invest in quick solutions instead of in long term value creation. It can, namely, lead managers to try to maximize short term financial, results harming future clients. The conclusions of the Nolan Norton Institute's study led to the elaboration of a new model that became known as Balanced Scorecard (BSC).

This method was presented for the first time in 1992 in the Harvard Business Review (KAPLAN; NORTON, 1992), having however suffered subsequent revisions. Within the evolution of the BSC concept, two fundamental moments were identified: firstly, the BSC was presented as a performance evaluation system (KAPLAN, 1994; KAPLAN; NORTON, 1992, 1993); secondly, the BSC was defended as a strategic management system (KAPLAN; NORTON, 1996a, 1996b, 1996c, 1996d).

Following Nolan Norton's study (KPMG), the BSC was defined for the first time by its authors as a performance evaluation system possessing a set of measures that supply managers with a global view of the business (KAPLAN; NORTON, 1992).

These measures result from the objectives defined in the organization's strategy, and are grouped according to four major perspectives: financial, clients, internal processes, innovation and learning. In this first stage, the BSC is then described by a set of objectives defined according to the strategy, and a set of execution measures for each of those objectives, organized according to the four perspectives. On a second stage, following the experience of implementing the BSC in several enterprises, Kaplan and Norton (1996a) concluded that managers were not using the BSC only as performance evaluation, but also as a strategic management system.

Kaplan and Norton (1996b) presented this new approach and introduced two significant changes: they altered the designation of the last perspective to learning and growth, turning innovation into a component of the internal processes perspective; and they completed the BSC with additional information other than objectives and measures, integrating in it, from then on, a set of goals for established measures, and a set of actions to be developed so that these goals can be met.

The BSC's financial perspective is oriented towards assessing the satisfaction of the stockholders' objectives, and therefore traditional financial measures continue to be used (KAPLAN; NORTON, 1996a). The clients' perspective intends to assess the satisfaction of the clients' objectives. Kaplan and Norton (1996c) consider that, to do so properly, the following is needed: to segment the market, dividing it in groups of clients with similar goals; and to which measures are most suited to each group of clients. To keep clients satisfied, the excellence of internal functioning must be ensured, and this can be assessed through the internal processes perspective, which must be focused on the entire chain of value creation for the clients.

This chain has three stages (KAPLAN; NORTON, 1996c): innovation; operations; after sales service. To ensure the goals of the company can be reached in the future on the three abovementioned perspectives, three key factors must be secured on the learning and growth perspective (KAPLAN; NORTON, 1996b): employee ability; employee motivation; information system capacity. Worker motivation is a key factor to the success of any organization and, as such, it must not be forgotten when building the BSC (KAPLAN; NORTON, 2001a).

One of the BSC's fundamental characteristics as a strategic management system is the need for a cause-effect relation between the various perspectives and the various measures chosen (KAPLAN; NORTON, 1996d). Kaplan and Norton (1996c) state that the BSC is not a simple set of measures, but their definition must follow two fundamental principles: all measures used must be based on the definition of objectives established by the company's mission and strategy; and a cause-effect relation between the measures defined for the four perspectives must be ensured. If these two principles are respected, the BSC describes the company's strategy, because each selected measure is an integrating element in the cause-effect chain of relations.

Thus, the meaning of the strategy can be communicated to all of the company's employees (KAPLAN; NORTON, 2010). Empirical studies performed have shown that the cause-effect relations between BSC measures are one of the most difficult aspects to implement (BANKER; POTTER; SRINIVASAN, 2000; BRYANT; JONES; WIDENER, 2004; ITTNER; LARCKER, 1998; MALINA; SELTO, 2001; MALMI, 2001; LIPE; NORREKLIT, 2000, 2003; SALTERIO, 2002; SPECKBACHER; BISCHOF; PFEIFFER, 2003). Kaplan and Norton (2001b) continue to insist that cause-effect relations are indispensable if the BSC is to be used as a strategic management instrument. To clarify their existence, Kaplan and Norton (2001b) propose the creation of a strategic map: an element that systematizes strategic objectives,



distributed over the four BSC perspectives, and identifies the existing cause-effect relations.

The large experience of implementing the BSC in major enterprises led to the creation of a new management model called Strategy-focused Organization (SFO), described by focusing on and aligning the entire management process with the company's strategy (KAPLAN; NORTON, 2001c).

Empirical studies already carried out in other countries show high usage rates for BSC, namely in companies from Sweden (KRAUS; LIND, 2010), Bahrain (JUHMANI, 2007), and India (ANAND; SAHAY; SAHA, 2005). Krauss and Lind (2010) conducted interviews in 15 large sized Swedish companies, concluding that 53% of them use BSC. Juhmani (2007) collected data from 83 big companies in Bahrain, using a questionnaire, and concluded that 65% of them use BSC. Anand, Sahay and Saha (2005) also used a questionnaire to gather data from 53 Indian companies, reporting a BSC usage rate of 45%. Quesado and Rodrigues (2009) conducted an inquiry to the 250 largest Portuguese companies, obtaining data from 85 companies. Analysis of this data allowed them to conclude that the level of BSC implementation in Portugal is extremely small, unlike what is reported by studies carried out in other countries. None of these studies focused on small and medium sized companies, which justifies performing similar studies on this type of companies.

Several authors consider that it is important to be aware of the variables responsible for spreading the knowledge on management accounting methods. These variables can be split into two groups: company characteristics, such as dimension and capital ownership; characteristics of those in charge of accounting, such as academic education, gender and age. Regarding the first type of variables, company dimension is studied in research by Chenhal (2003), Haldma and Lääts (2002), Joshi (2001), Innes, Mitchell and Sinclair (2000), Clarke, Hill and Stevens (1999), Chenhal and Langfield-Smith (1998), Libby and Waterhouse (1996), and Innes and Mitchell

(1995), Abdel-Kader and Luther (2008), Cadez and Guilding (2008), Woods (2009).

These papers conclude that large enterprises use more sophisticated management accounting methods. Two justifications are presented for this phenomenon: the fact that larger enterprises require formal procedures to ensure coordination of all operations; and the availability of financial resources. Ownership of capital is a contingency variable studied by Ghosh and Chan (1997), Clarke, Hill and Stevens (1999), and Haldma and Lääts (2002), having these authors however obtained contradictory results. The first two articles conclude that the subsidiaries of multinational organizations have more sophisticated management accounting methods, when compared to the enterprises of the region. Haldma and Lääts (2002) studied the same relation in enterprises from Estonia, and did not find any connection between both variables.

Regarding the second type of variables responsible for spreading the management accounting methods, several authors (BLAKE; WRAITH; AMAT, 2000; CLARKE; HILL; STEVENS, 1999; COHEN; VENIERIS; KAIMENAKI, 2005; SHIELDS, 1998) analyzed the characteristics of people in charge of accounting, such as academic education, gender, and age. Education of the person in charge of management accounting is one of the factors that Shields (1998) and Clarke, Hill and Stevens (1999) consider to affect entrepreneurial practices. Clarke, Hill and Stevens (1999) concluded that the very people in charge of accounting are the main barriers to changing methods used by Irish enterprises, due to their insufficient management training. This was also analyzed in Spanish enterprises by Blake, Wraith and Amat (2000). They found a large variety in terms of academic education, with a predominance of higher level education.

Blake, Wraith and Amat (2000) also analyzed the gender variable, reporting a predominance of the male gender in the majority of people in charge interviewed. Cohen, Vanieris and Kaimenaki (2005) expressed surprise regarding the high percentage of those in charge

of management accounting in large enterprises that are unaware of the most modern methods of management accounting, and this led them to research explanatory factors. One of the factors they found was that people in charge are the ones who have worked longest for the company – which, according to the authors, may suggest an older age group without knowledge update.

Based on literature reviewed, we established the following study questions:

Research Question A – Do Portuguese industrial SMEs use the Balanced Scorecard?

Research Question B – Are those in charge of management accounting aware of the Balanced Scorecard?

Research Question C – Is there any relation between spreading knowledge about the Balanced Scorecard and specific contingency variables?

### 3 RESEARCH METHOD

Several authors, namely Chua (1986), defend that the research process is conditioned by three sequential factors. The first has to do with the researcher's assumptions about the real nature of the phenomenon – the characterization of his/her ontological position. The second is the way the researcher considers he can acquire knowledge on the phenomenon under study – the characterization of his/her epistemological position. The third is the methodology the researcher considers most suitable for the collection of valid evidences on the phenomenon. Based on these three factors, several authors classify accounting research by the identification of major paradigms (BHIMANI, 2002).

One of the most commonly used classifications to characterize research paradigms in accounting is Burrell and Morgan's apud (RIAHI-BELKAOUI, 2000), which is based on two criteria. The first defines the researcher's position regarding the nature of social sciences, which must be between two extremes – objectivity and subjectivity. The second criterion translates the perspective the researcher has on society, that

can spread from radical change to regulation. The crossing of these two criteria leads to four research paradigms (RIAHI-BELKAOUI, 2000): functionalism, characterized by an objective view of reality, and by constant striving for social stability, maintaining order; interpretivism, based on the same social balance but presenting a more subjective view of reality; radical humanism, characterized by a subjective view of reality, while assuming, however, the existence of social transformation; radical structuralism, based on the same view of society as humanism but distinguishing itself from it by a more objective perspective of reality.

In the reviewed management accounting empirical studies, these four research paradigms were not identified; instead, another three were observed. Functionalism, also known as positivism, is followed by several authors, namely Watts and Zimmerman (1990), Chambers (1993), and Zimmerman (2001). Interpretivism, or interpretative research, is followed by Scapens (1990), Humphrey and Scapens (1996), Covalleski and Dirsmith (1988), and Burns and Scapens (2000), amongst others. Radical humanism and radical structuralism are normally grouped into a single category: critical research (BAXTER; CHUA, 2003; BHIMANI, 2002; COVALESKI; DIRSMITH, 1996). This type of research is followed by authors such as Miller and O' Leary (1987), Laughlin (1987), and Hopper and Armstrong (1991).

Regarding the choice of the most adequate paradigm for accounting research, Covalleski and Dirsmith (1996) consider that different paradigms treat different types of problems, or even the same problem, with a different perspective regarding its nature. In this study, we have chosen to use the paradigm of positivist research, because we think the type of evidence we want to obtain is compatible with an objective conception of reality – considering external to the researcher – and with the existence of a rational logic in decision-making based on accounting information, all characteristics referring to this research paradigm (CHUA, 1986).

This paper's objectives are incompatible with the subjective view of reality associated

with interpretivism (COVALESKI; DIRSMITH, 1996), and with the need to recognize and analyze existing sources of conflict with accounting referring to critical research (TILLING; TILT, 2004),

Regarding the data collection method, previously defined study questions were reduced to two – questionnaires or interviews –, since data to be collected is not public. The use of interviews to collect evidence on questions presented by this paper has one main advantage: the fact that issues on which we intend to collect data are not normalized in Portugal, which can lead to different names for the same reality in different enterprises. The use of interviews allows the concepts to be explained to the interviewees generating greater response reliability (BELL, 2005). Semi-structured interviews are especially useful to collect information on which there is no certainty that all those in the process understand the concepts the researcher is trying to assess (ABERNETHY et al., 1999).

In this study, we chose to conduct semi-structured interviews in which there is no support questionnaire, but instead a set of topics on which they have to focus (BELL, 2005). Interviews were carried out solely with people in charge of management accounting, because we considered he/she possess all the information on which we intended to collect data, having also - due to the size of the company - a global view of it.

This study intends to analyze the universe of the 163 Portuguese industrial SMEs consistently classified with excellence in this century. Following three contact stages, we scheduled interviews with the person in charge of management accounting in 58 enterprises situated in 11 of the 14 districts in the initial defined range. We considered this good coverage of the universe being analyzed. The 58 enterprises that accepted to participate in this study represent a response rate of 36%, comparable to those of other papers analyzed in the literature review, namely Drury and Tayles (1994) with a response rate of 35%; Haldma and Lääts (2002), with a response rate of 34%; Innes and Mitchell (1995), Innes, Mitchell and Sinclair

(2000), Joshi (2001), with response rates of only 25%, 23% and 24%, respectively.

However, the existence of non-respondents could cause biased results, namely if the enterprises that didn't want to participate had homogeneous and non-dispersed characteristics, thus defining a category with specific characteristics (YOUNG; STEDE; CHEN, 2005). Using a three-factor analysis, we did not find, in this study, any proof of bias caused by non-responding enterprises.

The first factor was the Portuguese geographic territorial coverage, with enterprises from 79% of the districts in the universe being represented, and the three non-covered districts with only one company each. This suggests that geographic representation is not an indicator that can cause biased results. The second factor was the business sector of the responding enterprises, with a great sector dispersion appearing amongst interviewed enterprises, identical to the one found among non-responding ones. This also suggests this is not a factor for biased results.

The third factor was the size of the enterprises, which, according to Young, Stede and Chen (2005), can be measured through the number of employees. We compared respondents with non-respondents in terms of size. The t-student test obtained presents a value of 1.165 for 161 degrees of freedom with a p-value of 0.246, which shows there are no significant differences in the average dimension of both groups. This analysis allow us to conclude the results of this paper, although not valid for all Portuguese industrial SMEs, can characterize the reality of a subset of those enterprises – ones consistently classified with excellence in the current century.

## 4 RESULTS

Regarding Research Question A, evidence collected allows us to conclude that only three enterprises (5%) use performance evaluation tools, with the BSC as the method used in all cases. This usage rate is much smaller than the reported by empirical studies performed in large



companies from other countries, which show rates close to 50% (ANAND; SAHAY; SAHA, 2005; JUHMANI, 2007; KRAUS; LIND, 2010). The usage rate found is also much smaller than that reported by the empirical study already conducted in Portugal, but regarding large companies (QUESADO; RODRIGUES, 2009), suggesting the existence of factors limiting the use of BSC in SMEs.

One of the enterprises is still considering its use. The use of the BSC was already considered and rejected by 18 enterprises (31%). Reasons presented by these enterprises were the following: in 50% of the cases, management considered that the BSC was not useful to the company; the ratio benefit/cost not being favorable was the reason stated by another 22% of those in charge; in 11% of the cases, managers considered that the BSC philosophy was incompatible with the company's internal policy of non-disclosure of management information to the public; the need to comply with rules imposed by the headquarters was the justification presented in 11% of the cases; some of those in charge (6%) considers the company did not have personnel prepared to implement the BSC.

For the analysis of Research Question B, we elaborated a variable that reflects existing knowledge on the BSC, called BSC knowledge. Results allow us to conclude that the majority (62%) of those in charge of management accounting are unaware of the BSC. The remaining people in charge (38%) know the method through different sources: in some, knowledge comes from education; in others, it

comes from postgraduate studies or from reading articles on the subject.

For the analysis of Research Question C, we had to verify if spreading the knowledge about the BSC is or is not influenced by two types of variables: characteristics of those in charge; company characteristics. To study the existence of a relation between knowledge about the BSC and the interviewees' individual characteristics, we had to cross the variable BSC knowledge with other variables reflecting characteristics of the interviewees – such as the hierarchy level they have in the company, education, gender and age.

We found three categories of people in charge of management accounting, which led to the elaboration of the variable hierarchy level. In all enterprises where there is a Chief Financial Officer (CFO), he/she is the person in charge of management accounting. This occurs in most enterprises (52%). In 40% of the cases, the responsibility for management accounting is placed on a Member of the Board. In 8% of the enterprises, those in charge of management accounting are Official Accounting Technicians (OAT).

The results of crossing the variables BSC knowledge and hierarchy level are presented in Table 1. There is some homogeneity in the response categories for both variables, which suggests there is no connection between their behavior. The Pearson Chi-Square test validates this information by presenting a value of 2.271 for one degree of freedom with a p-value of 0.132, which does not allow rejecting the null hypothesis of independence between hierarchy level and BSC knowledge.

**Table 1** – BSC knowledge and hierarchy level variables.

		Hierarchy	Level	Total
		OAT/CFO	Board Member	
BSC knowledge	Does not know	19	17	36
	Knows	16	6	22
Total		35	23	58

**Source:** the author.

Regarding the education of those in charge of management accounting, data collected show a large diversity of categories. In 21% of the enterprises those in charge do not have a university level education. The majority of those in charge (71%) have bachelor's degree level education, with the highest response frequency coming from those with a degree in Management (36%), followed by those with a degree in Accounting (16%), Economy (12%), and finally Engineering (7%). The highest level of education is a master's degree, found in 8% of those in charge. To validate

whether the type of education is connected with BSC knowledge, we had to cross the variables BSC knowledge and education, as presented in Table 2.

Figure 1 shows the connection between the BSC knowledge and education variables, and shows some heterogeneity in response categories, which suggests a connection between the behavior of both variables. The BSC is better known by those in charge who have higher education, regardless of their respective area of knowledge, than by those people in charge with no higher education, of which only 8% know the BSC.

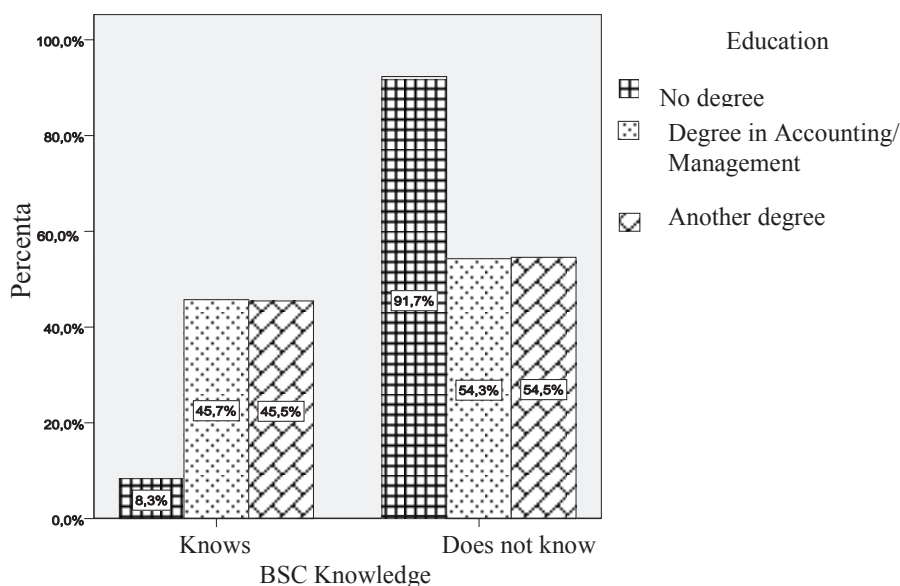
**Table 2** – BSC knowledge and education variables.

		Education			Total
		No degree	Degree in Accounting/ Management	Another degree	
BSC knowledge	Does not know	11	19	6	36
	Knows	1	16	5	22
Total		12	35	11	58

**Source:** the author.

The Pearson Chi-Square test produced a value of 5.630 for two degrees of freedom, and a p-value of 0.060, which allows us to reject the null hypothesis of independence and accept the existence of a connection between BSC knowledge and the education of those in

charge. The Cramer coefficient presents a value of 0.312, with a p-value of 0.060. This allows us to confirm the rejection of the null hypothesis of independence between the variables and consider the existence of a moderate connection between them.



**Figure 1** – BSC knowledge and education variables

**Source:** the author.

The last two variables to connect with knowledge about the BSC are the gender and age of those in charge of management accounting. Regarding the gender variable, results are identical to those reported by Blake, Wraith and Amat (2000), where the majority of those in charge are male (76%). The results of crossing the BSC knowledge and gender variables are presented in Table 3, and show some homogeneity in the

response categories of both variables, suggesting the inexistence of any connection between their behavior. The Pearson Chi-Square test validates this information by presenting a value of 1.142 for one degree of freedom with a p-value of 0.285. This does not allow rejecting the null hypothesis for independence between gender and BSC knowledge.

**Table 3** – Variables BSC knowledge and gender

		Gender		Total
		Female	Male	
BSC knowledge	Does not know	7	29	36
	Knows	7	15	22
Total		14	44	58

**Source:** the author.

Regarding the age variable, in the first category we included those in charge who are below 40, representing 31% of the cases. The second response category includes those in charge who are between 40 and 60 years old - most (53%) of the cases. The third category includes

those in charge who are over 60, representing only 16% of cases. To analyze the connection between knowledge about the BSC and the age group of those in charge, we crossed the BSC knowledge and age variables in Table 4.

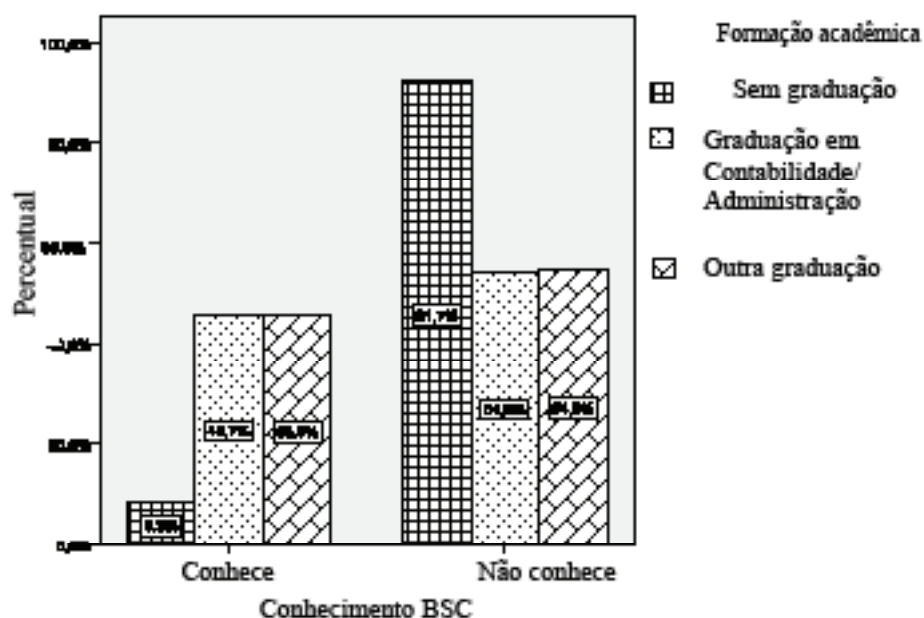
**Table 4** – BSC knowledge and age variables.

		Age			Total
		Below 40	Between 40 and 60	Over 60	
BSC knowledge	Does not know	6	21	9	36
	Knows	12	10	0	22
Total		18	31	9	58

**Source:** the author

Figure 2 shows some frequency concentration in two response categories, thus suggesting a connection between the behavior of both variables. In the age group of those who are below 40, most of those in charge (67%) know the

BSC, whilst in the group of those over 60 none of the interviewees know this method. From the application of the Pearson Chi-Square test comes a result of 12.237 for two degrees of freedom with a p-value of 0.002.



**Figure 2** – BSC knowledge and age variable.

**Source:** the author.

This allows us to reject the null hypothesis of independence, and to accept the alternative hypothesis of a connection between BSC knowledge and the age of the person in charge. To measure the intensity of the relation between both variables we used the coefficient of Cramer, whose value is 0.459 with a p-value of 0.002. This confirms the null hypothesis of variable independence and the possibility of a strong connection between BSC knowledge and the age of the person in charge.

To study the existence of a connection between knowledge about the BSC and the company's characteristics we need to cross the

variable BSC knowledge with other variables that reflect organizational characteristics, such as capital ownership and dimension. Capital ownership is analyzed by Ghosh and Chan (1997), Clarke, Hill and Stevens (1999) and Haldma and Lääts (2002), through the nature of the company capital owners, classifying them as multinational subsidiaries, or 100% national enterprises. For this purpose we created the variable capital. We found only 5% of enterprises with foreign capital participation, of these 2% represented minority ownership and 3% a majority ownership. The connection between this variable and BSC knowledge is presented in Table 5.

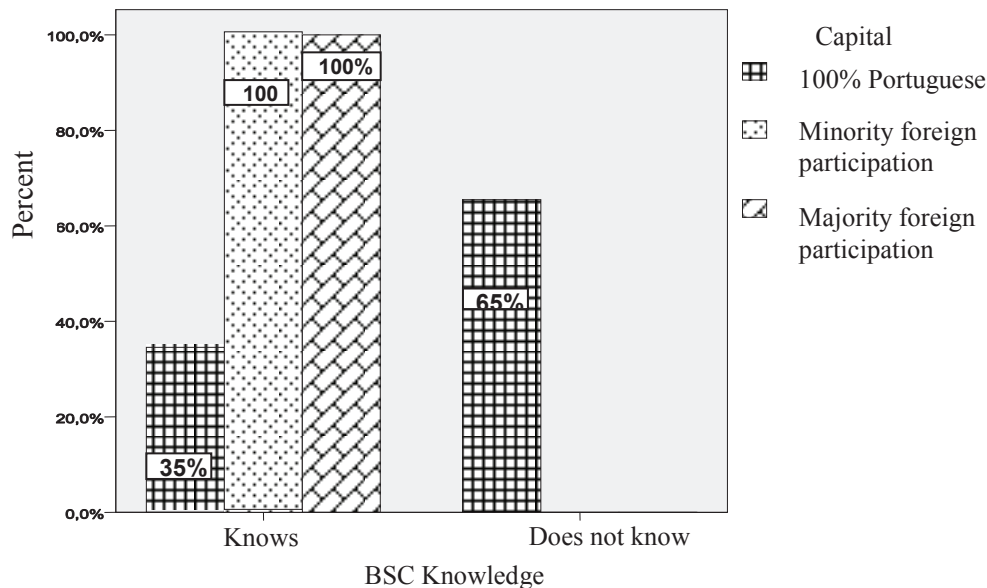
**Table 5** – BSC knowledge and capital variables.

		Capital			Total
		100% Portuguese	Minority foreign participation	Majority foreign participation	
BSC knowledge	Does not know	36	0	0	36
	Knows	19	1	2	22
Total		55	1	2	58

**Source:** the author

Analysis of Figure 3 shows some heterogeneity in response categories, which suggests a connection between both variables. All foreign capital enterprises know the BSC, whilst 66% of the enterprises with capital 100% national do

not know this method. However, this observation cannot be statistically validated because the Pearson Chi-Square test is not valid – following a violation of its assumptions – due to the low response frequency in some categories.



**Figure 3** – BSC knowledge and capital variables.

**Source:** the author.

As a measure for dimension we used the variable mentioned by Chenhal (2003), and Libby and Waterhouse (1996): the number of workers. This variable shows characteristics different from the previous ones due to its quantitative nature, thus demanding the previous description of its behavior and its transformation into a categorical variable so that it can be crossed with the qualitative variable BSC knowledge. The central tendency location measures show the following: the interviewed enterprises have on average 90 workers; the truncated mean at 5% presents a value close to the previous one, about 88 workers; and the median is at 82 workers.

The dispersion measures for this variable present the following values: the number of workers varies from a minimum of 10 to a maximum of 250 workers, which generates a variation range of 240 workers; the interquartile range is 68 workers; and the standard deviation is 53 workers. To better understand the behavior

of this variable we need to analyze the non-central tendency location measures, such as the quartiles: 25% of the enterprises have up to 51 workers, 50% have up to 82 (median) and 75% of the enterprises have up to 119 workers. Looking at this from another angle we can say that 50% of the enterprises have between 51 and 119 workers. To analyze the connection between company dimension and BSC knowledge we need to transform the number of workers into a categorical variable.

According to Hill and Hill (2002) categorization of a continuous variable in two categories – higher values and lower values – can be done using either the average or the median as a split criterion. Being this an asymmetrical variable with outliers susceptible of influencing the average, the most suitable criterion is to choose a strong statistic such as median. The new variable called dimension presents two response categories: the first category is composed by the



enterprises with up to 82 workers; the second includes enterprises with over 82 workers. The

connection between this variable and the variable BSC knowledge is presented in Table 6.

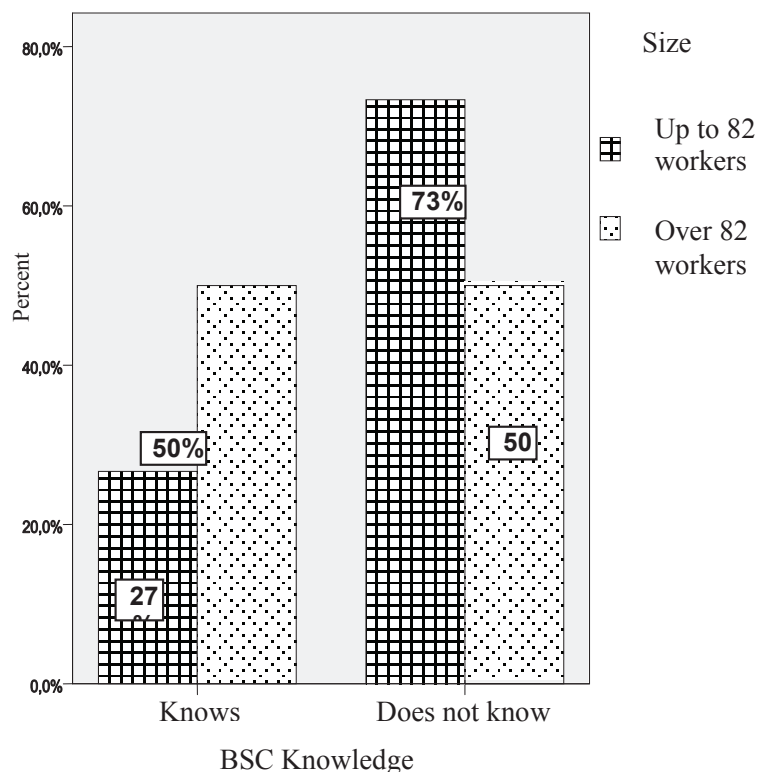
**Table 6** – Variables BSC knowledge and dimension.

		Dimension		Total
		Up to 82 workers	Over 82 workers	
BSC knowledge	Does not know	22	14	36
	Knows	8	14	22
Total		30	28	58

**Source:** the author.

Figure 4 shows that in half the enterprises with more workers, those in charge know the BSC, whilst in enterprises with less workers, most people in charge (73%) do not know this method. From the application of the Pearson Chi-Square test to the relation between both variables results the value of 3.349 for one degree of freedom with a p-value of 0.067, which allows us to reject the

null hypothesis of independence and to accept the alternative hypothesis of a connection between dimension and BSC knowledge. The coefficient of Cramer presents a value of 0.240, with a p-value of 0.067. This allows the confirmation of the rejection of the null hypothesis of independence between both variables, and to consider the existence of a moderate connection between them.



**Figure 4** – BSC knowledge and dimension variables.

**Source:** the author.

## 5 CONCLUSION

The theory gives supremacy to the BSC when compared to performance evaluation methods based exclusively on financial measures. When it comes to the first objective of this study – to analyze BSC usage in Portuguese industrial SMEs – the information collected allows us to conclude that only a residual percentage of the enterprises use it, which is not convergent with the empirical studies already, performed in big companies. The literature reviewed suggests that even when not using it the fact of those in charge of management accounting knowing it is an advantage for the enterprises. This fact makes studying the spreading the knowledge about the BSC to the people in charge of management accounting relevant, which is the second objective of this study.

Evidence gathered shows that the majority of those in charge do not know the method. The reviewed literature suggests, although with no empirical evidence, that knowledge about the BSC may be connectioned with specific factors. These factors can be divided into two groups: company characteristics, and characteristics of those in charge of management accounting. The third objective of this goal is to collect empirical evidence to confirm this suggestion. Regarding the first type of variables, the evidence gathered shows a statistically significant connection between knowledge about the BSC and two individual characteristics of those in charge: academic education and age of the person in charge.

We didn't find any connection between knowledge about the BSC, hierarchy level, and the gender of the person in charge. Regarding the second type of contingency variables, the evidence gathered shows a statistically significant connection between BSC knowledge and company dimension. The data collected suggest the existence of a connection between knowledge about the BSC and the company's capital structure, but the reduced number of foreign owned enterprises does not allow a statistic validation of this connection.

As main limitations of this study we can state the few enterprises that have accepted to

cooperate, which prevents generalizing the results, and also the possibility that the information collection method – interviews – may influence the replies of the interviewees. However, this study contributes for the knowledge on management accounting for two reasons. Firstly, its results show that unlike what was reported by the empirical studies conducted in large companies, BSC is very little used in Portugal in the SMEs classified as excellence. Secondly, the results obtained fill in a gap in knowledge because the empirical data show the existence of a connection between BSC knowledge and some personal characteristics of the people in charge of management accounting, and of the enterprises themselves.

Some of these factors, although suggested by the reviewed literature, had not yet been empirically demonstrated. Evidence gathered suggests a need for further research in order to discover why the SMEs do not use the performance evaluation methods considered as most adequate by theory.

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