BALANCED SCORECARD:
EMPIRICAL STUDY ON SMALL AND MEDIUM SIZE ENTERPRISES

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The theory states the Balanced Scorecard has several advantages as a performance evaluation method, when compared with exclusively financial measures. The objective of the present study is to analyze the usage rates and the knowledge spreading about the Balanced Scorecard in Portuguese industrial small and medium size enterprises, while researching the existence of factors that explain why the method is not known in all enterprises. We have interviewed people in charge of management accounting in 58 industrial enterprises, from eleven Portuguese Districts. The evidence gathered allowed us to conclude that very few enterprises use the Balanced Scorecard, and that the majority of those in charge interviewed does not know about it. Research on explanatory factors led us to conclude that knowledge about this method is linked with individual characteristics of those in charge of management accounting, such as academic education and age; and with characteristics of the company, such as dimension.

Keywords: Performance evaluation, SME, Portugal
1 – INTRODUCTION

It is also a concern of the researchers to study whether enterprises use the performance evaluation methods considered by the theory as more adequate, those that simultaneously include financial and non-financial measures, namely the Balanced Scorecard (Davis and Albright, 2004; Libby et al., 2004; Banker et al., 2004; Roberts et al., 2004; Dilla and Steinbart, 2005; Wong-On-Wing et al., 2007; Crabtree and DeBusk, 2008; Liedtka et al., 2008; Mcphail et al., 2008; Kaplan and Wisner 2009; Wiersma, 2009; Sundin et al., 2010; Tayler, 2010; Vila et al., 2010; Herath et al., 2010; Kraus and Lind, 2010; Cokins, 2010; Albright et al., 2010; Neumann et al., 2010; Cardinaels and Veen-Dirks, 2010; Northcott and Smith, 2011; Butler et al., 2011).

Dearman and Shields (2001) mention that even using other methods theoretically considered as inadequate, correct management decisions can be taken as long as managers know about the more adequate methods. The conclusions of these authors 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). The researchers are also interested in studying the contingency variables responsible for the transmission of knowledge about management accounting methods (Widener, 2004; Byrne and Pierce, 2007; Hopper, 2007; Abdel-Kader and Luther, 2008; Gerdin and Greve, 2008; Cadez and Guilding, 2008; Chen, 2008; Woods, 2009, Jean-Francois, 2010; Quan et al., 2011).

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 et al., 2006; MacArthur, 2006).

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

We have narrowed the universe of study to SMEs due to their high weight in the national entrepreneurial fabric. A study performed in Portugal (IAPMEI, 2008) mentions that 99.6% of national enterprises are of small and/or medium size. This gives a greater relevance to the study of this type of enterprises in order to characterize the country’s situation. However, the high number of SMEs in Portugal – 297,000 enterprises (IAPMEI, 2008) – has required us to limit our study to the enterprises classified as industry-excellence, since they represent a group of companies that were selected using goals aligned with those of this paper; the mentioned classification assesses the economic, financial, and management performances of the applicant enterprises (IAPMEI, 2002).

The universe under analysis is composed by 163 enterprises consistently classified, in the current century, as SMEs industry-excellence. Data were gathered through interviews made to 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 Districts of Portugal, generating a response rate of 36%. The non-
replies were treated, allowing us to conclude that there are no statistically significant differences between the responding enterprises and the non-responding ones.

2 - LITERATURE REVIEW

The first performance evaluation models were based solely on financial measures (Luft, 2009; Martin and Petty, 2000; Banker and Mashruwala, 2007; Corona, 2009). 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 and Mashruwala, 2007; Van der Geer et al., 2009; Corona, 2009). Within this type of models the Balanced Scorecard stands out (Kaplan and Norton, 1992, 1993, 1996a, 1996b, 1996c, 1996d, 2001a; 2001b, 2010; Kaplan, 1994; Lipe and Salterio, 2000; Roberts et al., 2004; Dilla and Steinbart, 2005; Budde, 2007; Johanson et al., 2006; Ittner et al., 2003; Pandey, 2005).

In 1990, the Nolan Norton Institute – the KPMG’s research unit – sponsored a study on performance evaluation in the organizations of the future, which was driven by the perception that the use of exclusively financial measures was obsolete (Kaplan and Norton, 1996b). Kaplan (1994) defends that an excessive emphasis on assessment measures based on short term financial results may drive the enterprises to invest in quick solutions to the detriment of 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 lead to the creation 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 and Norton, 1992), having however suffered subsequent revisions. In the evolution of the BSC concept two fundamental moments were identified: firstly, the BSC was presented as a performance evaluation system (Kaplan and Norton, 1992, 1993; Kaplan, 1994); secondly, the BSC was defended as a strategic management system (Kaplan and 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 the managers with a global view of the business (Kaplan and 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 characterized 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 the managers were not using the BSC only as a performance evaluation system but also as a strategic management system. Kaplan and Norton (1996b) presented this new approach and introduced two significant changes: they changed the designation of the last perspective to learning and growth, turning innovation into a component of the internal processes perspective; and they complete the BSC with additional information other than objectives and measures, integrating in it from then on a set of goals for the established measures, and a set of actions to be developed so that those goals could be met.

The BSC’s financial perspective is oriented towards assessing the satisfaction of the stockholders’ objectives, and therefore the traditional financial measures continue to be used (Kaplan and Norton, 1996a). The clients’ perspective intends to assess the satisfaction of the clients’ objectives. Kaplan and Norton (1996c) consider that to do it properly the following is needed: to segment the market, dividing it by groups of clients with similar goals; and to find the measures more suited for each group of clients. To keep the clients satisfied the excellence of the internal functioning must be ensured, and this will 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 and Norton, 1996c): innovation stage;
operations stage; after sales service stage. To ensure the goals of the company can be reached in the future on the three above mentioned perspectives, three key factors must be secured on the learning and growth perspective (Kaplan and Norton, 1996b): employee ability; employee motivation; information system capacity. Worker motivation is a key factor for the success of any organization and, as such, it must not be forgotten when building the BSC (Kaplan and 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 and Norton 1996d). Kaplan and Norton (1996c) defend that the BSC is not a simple set of measures, but their definition must follow two fundamental principles: all measures used must originate from 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 of the cause-effect chain of relations. Thus the meaning of the strategy can be communicated to all employees of the organization (Kaplan and Norton, 2010). Empirical studies performed have shown that the cause-effect relations between the BSC measures are one of the more difficult aspects to implement (Ittner and Larcker, 1998; Banker et al., 2000; Malina and Sello, 2001; Malmi, 2001; Lipe and Salterio, 2002; Norreklit, 2000 and 2003; Speckbacher et al., 2003; Bryant et al., 2004). However, Kaplan and Norton (2001b) continue to insist that the 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 the strategic objectives, distributed by 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), characterized by focusing on and aligning the entire management process with the company’s strategy (Kaplan and Norton, 2001c).

Several authors consider that it is important to know 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 the works of Chenhal (2003), Haldma and Lääts (2002), Joshi (2001), Innes et al. (2000), Clarke et al. (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 dimension enterprises use more sophisticated management accounting methods. Two justifications are presented for this phenomenon: the fact that larger enterprises require more formalized procedures to ensure the coordination of all operations; and the availability of financial resources at their disposal. The ownership of capital is a contingency variable studied by Ghosh and Chan (1997), Clarke et al. (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 link between both variables.

Regarding the second type of variables responsible for spreading the management accounting methods, several authors (Shields, 1998; Clarke et al., 1999; Blake et al., 2000; Cohen et al., 2005) analyzed the characteristics of people in charge of accounting, such as academic education, gender, and age. The academic education of the person in charge of management accounting is one of the factors that Shields (1998) and Clarke et al. (1999)
consider as affecting entrepreneurial practices. Clarke et al. (1999) have concluded that the very people in charge of accounting are the main barriers to change of the methods used by the Irish enterprises due to their deficient training in management. This factor was also analyzed in Spanish enterprises by Blake et al. (2000). They found a large variety in terms of academic education, with a predominance of higher level education. Blake et al. (2000) have also analyzed the gender variable, reporting a predominance of the male gender in the majority of the people in charge interviewed. Cohen et al. (2005) have expressed surprise regarding the high percentage of those in charge of management accounting in large enterprises that do not know the most modern methods of management accounting, and this led them to research for explanatory factors. One of the factors they found was the fact that those people in charge are the ones with the longest permanence in the company, which according to the authors may suggest an older age group without knowledge update.

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

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

Research Question B – Do those in charge of management accounting know the Balanced Scorecard?

Research Question C – Is there a relation between spreading the 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 assumptions taken by the researcher about the real nature of the phenomenon – the characterization of his/hers ontological position. The second is the way the researcher considers he can acquire knowledge on the phenomenon under study – the characterization of his/hers epistemological position. The third is the methodology the researcher considers more 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 used classifications to characterize research paradigms in accounting is Burrell and Morgan’s (Belkaoui, 2000) which is based on two criteria. The first defines the researcher’s placement 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 originates four research paradigms (Belkaoui, 2000): functionalism, characterized by an objective view of reality, and by the constant search for social stability in the sense of maintaining the 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 only distinguishing itself from it by a more objective perspective of reality.

On the reviewed management accounting empirical studies these four research paradigms were not identified, but three instead. 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), Covaleski and Dirsmith (1988), and Burns and Scapens (2000), among others. Radical humanism and radical structuralism are normally grouped into a single category, critical research (Covaleski and Dirsmith, 1996; Bhimani, 2002; Baxter and Chua,
2003). 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 more adequate paradigm for accounting research, Covaleski and Dirsmith (1996) consider that different paradigms treat different types of problems, or even the same problem, with a different perspective regarding its nature. We have chosen in this study to use the paradigm of positivist research, because we think that the type of evidence we want to obtain is compatible with an objective conception of reality – considering it as something external to the researcher – and with the existence of a rational logic in decision making based on accounting information, which are all characteristics linked to this research paradigm (Chua, 1986). The objectives of this work are not compatible with the subjective view of reality associated with interpretivism (Covaleski and Dirsmith, 1996), nor with the need to recognize and analyze the existing sources of conflict with accounting linked with critical research (Tilling and Tilt, 2004).

Regarding the data collection method, the previously defined study questions have reduced the options to two – questionnaires or interviews – since the data to be collected are not public. The use of interviews to collect evidence on the questions presented by this paper has a main advantage: the fact that the issues on which we intend to collect data are not normalized in Portugal, which can give origin to different names for the same reality in the various 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 for which there is no support questionnaire for the interview, but instead a set of topics on which it has to be focused on (Bell, 2005). The interviews were directed solely to the person 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 dimension 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 the current century. After 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 universe. We considered this to be a good coverage of the universe being analyzed. The 58 enterprises that have 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) have a response rate of 34%, Innes and Mitchell (1995), Innes et al. (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 have homogeneous and non-dispersed characteristics, thus defining a category with specific characteristics (Young et al., 2005). Using a three factor analysis we have not found in this study any proofs of a bias caused by the non-responding enterprises. The first factor was the Portuguese territory geographic coverage, with enterprises from 79% of the districts in the universe being represented, and the three non-covered districts had only one company each. This suggests the 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 among the interviewed enterprises, identical to the one found among the non-responding ones. This also suggests this is not a factor for biased results. The third factor was the dimension of the enterprises, which according to Young et al. (2005) can be measured through the number of employees. We compared respondents with non-respondents in terms of dimension. 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 – the ones consistently classified with excellence in the current century.

4 – RESULTS

Regarding Research Question A, the evidence collected allows the conclusion that only three enterprises (5%) use performance evaluation tools, being the BSC the method used in all those cases. One of the enterprises is still considering its use. The use of the BSC was already considered and rejected in 18 enterprises (31%). The reasons presented by these enterprises for its non-implementation are the following: in 50% of the cases management considers the BSC is not useful for the company; the ratio benefit/cost is not favorable to this method’s implementation, is the reason stated by 22% of those in charge; in 11% of the cases, managers consider the BSC philosophy is not compatible with the company’s internal policy of non-disclosure of management information to the public; the need to comply with the rules imposed by the headquarters is the justification presented in 11% of the cases; some of those in charge (6%) consider the company does not have personnel prepared to implement the BSC.

For the analysis of Research Question B we built a variable that reflects the knowledge existent on the BSC, called BSC knowledge. The results obtained allow us to conclude that the majority (62%) of those in charge of management accounting do not know about the BSC. The remaining people in charge (38%) know the method through different sources: for some the knowledge comes from their academic education; for others it comes from the frequency of post-graduation courses 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; characteristics of the company. 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, academic education, gender and age. We found three categories of people in charge of management accounting, which led to the creation 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 happens in the majority of the 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 isn’t any link 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>
<thead>
<tr>
<th>Hierarchy Level</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>OAT/CFO</td>
<td>35</td>
</tr>
<tr>
<td>Board Member</td>
<td>23</td>
</tr>
<tr>
<td>Total</td>
<td>58</td>
</tr>
</tbody>
</table>

Table 1 – Variables BSC knowledge and hierarchy level
Regarding the academic education of those in charge of management accounting, the 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%) has an academic education at bachelor’s degree level, 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 academic education is a master’s degree, found in 8% of those in charge. To validate whether the type of academic education is connected with BSC knowledge we had to cross the variables BSC knowledge and academic education, such as presented in Table 2. Figure 1 translates graphically the link between the variables BSC knowledge and academic education, and shows some heterogeneity in the response categories, which suggests a link between the behavior of both variables. The BSC is better known by those in charge with a higher academic education, regardless of their respective area of knowledge, than by those people in charge with no higher academic education, of which only 8% know the BSC.

<table>
<thead>
<tr>
<th>BSC knowledge</th>
<th>Academic education</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Without degree</td>
<td></td>
</tr>
<tr>
<td>Does not know</td>
<td>11</td>
<td>19</td>
</tr>
<tr>
<td>Knows</td>
<td>1</td>
<td>16</td>
</tr>
<tr>
<td>Total</td>
<td>12</td>
<td>35</td>
</tr>
</tbody>
</table>

Table 2 – Variables BSC knowledge and academic education

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 link between BSC knowledge and the academic 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 link between them.

![Bar chart showing the distribution of academic education and BSC knowledge](image)

Figure 1 – Variables BSC knowledge and academic education
The last two variables to link with knowledge about the BSC are the gender and age of those in charge of management accounting. Regarding the variable gender the results are identical to those reported by Blake et al. (2000), where the majority of those in charge are male (76%). The results of crossing the variables BSC knowledge and gender are presented in Table 3, and show some homogeneity in the response categories of both variables, suggesting the inexistence of any link 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>
<thead>
<tr>
<th>BSC knowledge</th>
<th>Gender</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Female</td>
<td>Male</td>
</tr>
<tr>
<td>Does not know</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>29</td>
<td></td>
</tr>
<tr>
<td>Knows</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>14</td>
<td>44</td>
</tr>
</tbody>
</table>

Table 3 – Variables BSC knowledge and gender

Regarding the variable age, in the first category we have included those in charge with less than 40 years old, representing 31% of the cases. The second response category includes those in charge with between 40 and 60 years old and holds the majority (53%) of the cases. The third category includes those in charge with over 60 years old and represents only 16% of the cases. To analyze the link between knowledge about the BSC and the age group of those in charge, we crossed the variables BSC knowledge and age in Table 4.

<table>
<thead>
<tr>
<th>BSC knowledge</th>
<th>Age</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Less than 40 years</td>
<td></td>
</tr>
<tr>
<td>Does not know</td>
<td>6</td>
<td>36</td>
</tr>
<tr>
<td>Knows</td>
<td>12</td>
<td>22</td>
</tr>
<tr>
<td>Total</td>
<td>18</td>
<td>58</td>
</tr>
</tbody>
</table>

Table 4 – Variables BSC knowledge and age

Figure 2 shows some frequency concentration in two response categories, thus suggesting a link between the behavior of both variables. In the age group of less than 40 years old the majority of those in charge (67%) knows the BSC, while in the group of those over 60 years old none of the interviewees knows 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. This allows us to reject the null hypothesis of independence, and to accept the alterative hypothesis of a link 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 link between BSC knowledge and the age of the person in charge.
To study the existence of a link 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 et al. (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 link between this variable and BSC knowledge is presented in Table 5.

<table>
<thead>
<tr>
<th>Capital</th>
<th>Does not know</th>
<th>Knows</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>100% Portuguese</td>
<td>36</td>
<td>19</td>
<td>55</td>
</tr>
<tr>
<td>Minority foreign</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>participation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Majority foreign</td>
<td>0</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>participation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>36</td>
<td>22</td>
<td>58</td>
</tr>
</tbody>
</table>

Table 5 – Variables BSC knowledge and capital

The analysis of Figure 3 shows some heterogeneity in the response categories, which suggests a link between both variables. All foreign capital enterprises know the BSC, while 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.
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 link 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 link between this variable and the variable BSC knowledge is presented in Table 6.

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Up to 82 workers</td>
</tr>
<tr>
<td>BSC knowledge</td>
<td></td>
</tr>
<tr>
<td>Does not know</td>
<td>22</td>
</tr>
<tr>
<td>Knows</td>
<td>8</td>
</tr>
<tr>
<td>Total</td>
<td>30</td>
</tr>
</tbody>
</table>

Table 6 – Variables BSC knowledge and dimension
Figure 4 shows that in half the enterprises with more workers, those in charge know the BSC, while in enterprises with less workers, most people in charge (73%) do not know this method.

![Fig 4](image)

**Figure 4 – Variables BSC knowledge and dimension**

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 link 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 link between them.

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. 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. The 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 linked 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 link 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 link 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 link between BSC knowledge and company dimension. The data collected suggest the existence of a link 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 link. As main limitations of this study we can state the number of enterprises that have accepted to cooperate, and 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 defended by the theory, 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 link 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 been empirically demonstrated yet. The evidence gathered suggests a need for further research in order to detect the causes for the fact the enterprises do not use the performance evaluation methods considered as more adequate by the theory.

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