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Cost Management in Micro and Small Companies in the Mining Sector

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ABSTRACT

The aim of this article is to analyze the operationality of cost management among the MPEs which operate in the dimension stone mining and processing sector, seeking emphases related to the presence of isomorphism. In order to implement this study, 164 micro and small companies were analyzed; fifty-six of these are from the mining sector and 108 from the dimension stone processing sector. A structured questionnaire was used as the data collection procedure. Three distinct approaches were used in the statistical analysis of the collected data: descriptive statistics, univariate analysis using the Mann-Whitney U test and multivariate techniques, such as Cronbach's alpha, exploratory factor analysis and cluster analysis. The results of this research demonstrate the presence of mimetic isomorphism in cost management practices, independent of the companies' economic activity. Based on this study, it was observed that future research should further develop the characterization of this economic phenomenon and study which resources would be required to improve cost management in micro and small companies in the segment analysed. As a result of the study, cost managers can reduce the repetition of best practices that do not apply to micro and small enterprises. This mere repetition, a simpler path, may become inadequate.

PALAVRAS-CHAVE

Gestão de Custos;
Práticas de Gestão;
Micro e pequenas empresas;
Isomorfismo;
Eficácia do negócio.

RESUMO

O objetivo deste artigo é analisar a operacionalidade da gestão de custos entre as MPEs que operam na mineração de pedras ornamentais e processamento, buscando ênfases relacionadas à presença do isomorfismo. Para realização desse estudo, 164 micro e pequenas empresas foram analisadas; 56 destas são do setor mineiração e 108 são do setor de pedras ornamentais. Um questionário estratuturado foi utilizado como procedimento de coleta de dados. Três abordages distintas foram utilizadas na análise estatística dos dados coletados: estatística descritiva, análise univariada usando o teste *Mann-Whitney U* e técnicas multivariadas, bem como o Alfa de *Cronbach*, análise fatorial exploratória e análise de *cluster*. Os resultados dessa pesquisa demonstraram a presença do isomorfismo mimético nas pátricas de gestão de custos, independentemente da atividade econômica da empresa. Baseado nesse estudo, observou-se que pesquisas futuras devem aprofundar a caracterização deste fenômeno econômico e estudar quais recursos seriam necessários para melhorar a gestão de custos em micro e pequenas empresas no segmento analisado. Como resultado do estudo, os gerentes de custos podem reduzir a repetição as melhores práticas que não se aplicam às micro e pequenas empresas. Como caminho mais simples, essa mera repetição, pode se tornar inadequada.

1 Introduction

In a context of a high level of competitiveness and globalization, in which the market establishes the sales prices, the importance of cost management at organizations becomes greater. When it is noted that there is no space to increase prices because the product or service has lost its competitive edge in the market, one of the paths used by organizations is cost analysis, in an attempt to produce more with less. A reduction in costs and increase in productivity have been used as a solution for a number of organizations to remain in the market. Generally speaking, large and medium sized companies, seeking effective cost management, hire people specialized in this area and encourage the establishment of working groups. However, micro and small companies are not always able to have their own specialized team. Thus, it is the responsibility of the principal manager who, in various cases, manages all areas, to also establish the specific cost management parameters (Callado & Pinho, 2014).

Some research has analyzed external factors of organizational management and which influence the adoption of strategies which often emulate the practices of companies who are market leaders, by adopting their cost management techniques (Delmas & Toffel, 2004; Yoo & Reed, 2015; Venkitachalam & Willmott, 2015; Park & Ghauri, 2015; Garavan et al., 2016; Daddi et al., 2016; Demir, Wennberg & McKelvie, 2017). Therefore, these strategies are not selected based on their own organizational choice but on what other companies in a position of authority practice. Thus, they legitimize attitudes by using a generalized perception that the actions of a specific institution are appropriate or adequate within a social system formed of idiosyncratic meanings (Barreto & Baden-Fuller, 2006). According to a study carried out by the Brazilian Service to Support Micro and Small Companies (Sebrae), entitled "Participação das Micro e Pequenas Empresas na Economia Brasileira" (The Participation of Micro and Small Companies in the Brazilian Economy), it states that (2014, p. 55):

> "Micro and Small Companies (MPEs) have been becoming progressively relevant in the Brazilian economy. It was observed that on aggregate this participation was 21% in 1985, increased to 23% in 2001 and 27% in 2011. This participation increased both in services, such as commerce, having reduced slightly in industrial activity, where medium and large companies which benefit from economies of scale predominate. The importance of MPEs in the period 2009-2011 is highlighted in all dimensions and activities:
>
> - In the Service Sector, MPEs produced 36.3% of the sector's total added value; represented 98.1% of the number of companies; employed 43.5% of workers and paid 27.8% of employees' salaries during the period;
> - In the Commerce Sector, MPEs produced 53.4% of the sector's total added value; represented 99.2% of the number of companies; employed 69.5% of those working in the sector and paid 49.7% of employees' salaries in the sector during the period;
> - In the Industrial Sector, MPEs produced 22.5% of the sector's added value; represented 95.5% of the number of companies; employed 42% of those working in the sector and paid 25.7% of employees' salaries during the period."

In view of the above, in an effort to understand the relevance of cost management to develop micro and small companies, the following research problem emerged: to what extent do the micro and small companies which operate in the mining and processing of dimension stones sector take cost management into account when seeking business effectiveness?

Thus, the aim of this paper was to analyze the operation of cost management in the micro and small companies which act in the mining and processing of dimension stones sector, when seeking emphases on the presence of isomorphism.

The research is justified because it presents an overview of how cost management takes place in that sector, which contributes to improving this important tool to guide decision-making. On account of the fact that many MPE managers do not have knowledge of technical costs, everyday decisions by these companies are taken using intuition. In addition, academia is able to organize and provide materials specifically to orientate these managers, such as: a) developing a costing system for small and medium-sized companies (Fioriolli & Müller, 2013); b) directors' concentrated attention,

to try to explain the depth for developing this type of leadership (Garavan et al., 2016) and c) proposing a research model which appraises the drive for corporate social responsibility (Yoo & Reed, 2015).

In this context, a gap is noted between the best practices of large organizations' cost management and the practice of MPE managers. Generally speaking, it is believed that the same techniques from this activity can be applied to all of these companies. In addition, studies on cost management in MPEs have not been the main focus of researchers. This gap indicates that recent studies on isomorphism have not considered the objectivist epistemology used in this research and, consequently, the positivist paradigm (Gimenez, Hayashi & Grave, 2007; Haunchild, 1993; Haveman, 1993; Mizruchi & Fein, 1999; Rossetto & Rossetto, 2005 and Serralheiro & Rossetto, 2004; Yoo & Reed, 2015)).

This research is structured in the following way: the second section reconstructs literature on the main concepts of cost management using a theoretical framework. The third section specifies the methodological processes and research practices. The fourth section lists the results found. The fifth section closes the debate, analyzing if the results corroborate existing literature and the research findings. The last section suggests new lines of investigation for future studies.

2 Theoretical Framework

Organizational characteristics, with their distinct aspects of competition and legitimization, show that, generally speaking, organizations look to follow successful organizations even when seeking new products or markets. This consideration finds strong evidence of emulation in markets influenced by the presence of successful companies. Thus, the presence of mimetic isomorphism in organizations emerges in an environment which plays a large role in influencing imitation by those of an equivalent size (Haveman, 1993; Battilana et al., 2015; Bogaert, et al., 2016; Abbott, Green, & Keohane, 2016).

In general, accounting has the role of giving rise to information on the various angles required to subsidize the respective managers. However, cost accounting is a specific area which acts as a support to cost management. It emerged at a later date because of the need to evaluate organizations' stock. Thus, new demands appeared, such as the fields of control and decisions and management accounting also emerged in this context (Martins, 2010; Senftlechner, & Hiebl, 2015).

Marcella and Illingworth (2012) and Ainin et al., (2015) clarify that the effective use of information is a benefit to any organization, independent of its size, as it reduces administrative costs, increases the effective collaboration between members interested in improving cost management and enhances customer service through greater efficiency. With regards to MPEs, Berisha-Namani (2009) confirms that these companies need effective information systems which assist decision-making, particularly economic decisions, which take financial information into consideration. This economic information includes technologies which support decision-making and provides an effective interface between users and IT, as well as management information, in order to improve the business' daily operations (Kemp *et al*., 2015).

The main role of an information system is administrative (Abernethy & Bouwens, 2005; Amuna, Shobaki, & Naser, 2017). Better information leads to an administrative decision and this, in turn, improves the organization's performance (Baines & Langfield-Smith, 2003; Hair Jr *et al.*, 2015). The relation between adopting management accountancy practices and performance has been the subject of extensive empirical research. The majority of studies support the understanding that management accountancy practices which provide information with a broad scope are positively related to performance (Hoque & James, 2000; Cravens & Guilding, 2001; Baines & Langfield-Smith, 2003; Mahama, 2006 and Ong et al., 2015; Amuna, Shobaki & Naser, 2017).

The various skills required by businessmen can be categorized in the following way, according to Hisrich and Peters (1998): (1) technical skills (written and oral communication, technical management and organization); (2) business management skills (planning, decision-making and accounting) and (3) personal entrepreneurial skills aiming for internal control, innovation, risk-taking, persistence and orientation for change (Mendes, 2012).

In the current business environment, characterized by intensive competitive pressure, organizations need to implement strategies to manage costs and reduce them, not only in the

short- but also in the long-term (Nimocks, Rosiello, & Wright, 2005; Yang & Meyer, 2015). Strategic cost management is the deliberate alignment of company resources and the cost structure, associated to long-term strategies and short-term tactics (Anderson & Dekker, 2009). It represents an aspect of a higher flow of research dedicated to strategic management accounting (Bromwich, 1990; Roslender & Hart, 2003; Cadez & Guilding, 2008 and Smith, 2017).

Generally speaking, due to a lack of resources, people and knowledge, for example, MPEs tend to follow the best methodologies of management accounting applied to large organizations. The preferred opinion to capture the procedure of institutional homogenization refers to isomorphism, although in a generic way. According to Hawley (1968), isomorphism establishes a process of a socio-environmental nature in which a population will present particular similarities to other integrations which are confronted in a similar way to the same combination of environmental categories. Hannan and Freeman (1977) made advances following Hawley's (1968) concepts. These authors corroborated the idea of the presence of isomorphism, or because those responsible for decision-making at organizations study model responses and, consequently, adjust their organizational conduct isomorphically. The concept of institutional isomorphism is a beneficial instrument to cover the policy and the ceremonial peculiarities which intermediate an important element of contemporary organizational life. Therefore, for Dimaggio and Powell (2005), adopting the characteristics of other organizations as an example is the representation of the response to uncertainty (Dufour, Teller & Luu, 2014; Kung, Cegielski, & Kung, 2015).

The concept which best defines understanding of the process of homogeneous organizational behaviour is isomorphism. This process is characteristic and relevant as an information source to understand the way that organizations share specific equivalent organizational behaviour, although undergoing frequent alterations (Dimaggio & Powell, 1983; Dufour, Teller & Luu, 2014; Smith, Couchman & Beran, 2014). According to Barreto and Baden-Fuller (2006), mimetic isomorphism leads to similar results. Seen in these terms, Lacombe and Chu (2008) present two organizational isomorphisms: competitive, which acknowledges a precept of rationality and highlights market competitiveness and niche diversification and institutional isomorphism, which is able to clarify some of the mechanisms of transformation in further detail and can act in three different ways: coercive isomorphism, mimetic isomorphism and normative isomorphism (Dimaggio & Powell, 1983; Barreto & Baden-Fuller, 2006 and Lacombe & Chu, 2008; Smith, Couchman & Beran, 2014). In these terms, organizations present two dimensions, shown in Table 1.

Table 1. The theoretical dimensions of organizations

Technical Dimension	Institutional Dimension
The technical environment is characterized by an exchange of goods and services.	The institutional environment conducts the establishment and dissemination of standards of practice required to achieve organizational legitimacy.

Obs: Thus, organizations submitted to pressures from the technical and institutional environments are evaluated, respectively, for efficiency and suitability to social requirements.

Source: Machado-da-Silva, C. L., Fonseca, V. S., & Fernandes, B. H. R. (1999). Mudança e estratégia nas organizações: perspectivas cognitiva e institucional (p. 113). In M. M. F. Vieira & L. M. B. Oliveira (Orgs.), Administração contemporânea: perspectivas estratégicas (pp. 102-118). São Paulo: Atlas.

The complexity of the organizational phenomenon supports various types of specific influence linked to ontological suppositions inherent to it, which can be formal or informal. According to this specification, some subjective mechanisms force organizations into an isomorphic procedure. These modifications often take place on account of an imposition by a higher authority, giving rise to coercive isomorphism. Universities, training centres and trade associations play a fundamental role in the technical training of professionals from a specific area. Disseminating patterns of behaviour and procedural regulations to these professionals assists toward normative isomorphism (Barreto & Baden-Fuller, 2006; Gimenez, Hayashi, & Grave, 2007; Dufour, Teller & Luu, 2014; Smith, Couchman & Beran, 2014). The uncertainties which currently surround activities and the lack of available human resource knowledge facilitate the emersion of mimetic

isomorphism, in which organizations tend to reproduce market best practices. (Dimaggio & Powell, 1983; Barreto & Baden-Fuller, 2006 and Gimenez, Hayashi, & Grave, 2007; Smith, Couchman & Beran, 2014).Consequently, Table 2 presents a brief theoretical summary of mimetic isomorphism, according to the following authors:

Table 2. Definition of Mimetic Isomorphism

Author(s)	Description
Hawley (1968)	Isomorphism establishes a socio-environmental process in which a population will present similarities characteristic of other integrations which are comparable to the same set of environmental categories.
Hannan and Freeman (1977)	Isomorphism may arise since non-ideal with are eliminated from a group of organizations or because those responsible for decision-making at organizations study model answers and, consequently, select conducts which are similar to other leading organizations in the respective economic sector.
Dimaggio (2005)	The concept of institutional isomorphism establishes a favourable instrument to incorporate the policy and ceremonial characteristics which intermediate an important element of contemporary organizational life. Adopting the characteristics of other organizations as an example, constitutes a representation of a response to uncertainty.
Callado and Pinho (2014)	Isomorphism should be understood as a set of exceptions which compels a specific organization to resemble others, in compliances which are established in the same set of environmental concerns. Thus, organizational isomorphism is defined as an assisted tendency among organizations responding homogeneously and holding analogous attitudes.

Source: Prepared by the authors, based on their research.

With the due adjustments and consideration of its usefulness by the business community, accounting management, with its managerial focus, assists in improving decision-making and could become one of the main strategic instruments, with a view to micro and small companies increasing and surviving (Lacerda, 2006; Vuorinen et al., 2017). Thus, cost management needs to produce the information required to improve business effectiveness. A review of literature suggests that mimetic isomorphism could lead to negative performance, as the strategic choices could produce consequences arising from the economic impact which they caused on organizations. To summarize, emulation based on legitimization could lead to strategic choices (Barreto & Baden-Fuller, 2006).

3 Methodology

Seeking to achieve the specific aims proposed for this research, the methodological investigation strategy used was positivist, quantitative deductive study. The ontological orientation observed was realistic, considering the existence of a totally objective reality, independent of human perception or, in other words, made up of tangible structures (Gil, 2008 and Saccol, 2009). The objectivist epistemological position in this regard is an extremely useful research lens, as "[...] it presupposes that the meanings of all objects and institutions exist independent of human beings' mental operations (Saccol, 2009, p. 253). Therefore, this study defends that an understanding of everything which exists can take place in a mathematical, rational and objective way.

Thus, according to Saccol (2009) and Creswell (2010), the *modus operandi et argumentandi* of a philosophical stance, which will present the basic assumptions of the view of the world was the positivist paradigm, as it considers explaining and predicting what will take place through regularities and the affinities of cause and effect between the elements which form it.

This paper emphasizes a hypothetical-deductive logic (Gil, 2008) and uses a descriptive, quantitative approach with a cross-section. The use of primary data was selected to perform this research. The target population is made up of micro and small companies which are involved in mining and processing dimension stone activities in the southeast region of Brazil in 2016. A structured questionnaire was selected as the data collection method, formed by a standard set of questions with answers limited to a number of mutually exclusive and previously determined possibilities (Creswell, 2010 and Hair, Babin, Money & Samouel, 2005).

With the aim of optimizing obtaining the answers, the primary source of the statistical analysis of the research data, the structured questionnaires were made available to the respondents in two ways: via technological support (email) and in person, in a printed format, which did not prevent the authenticity of the answers attained of being maintained. As the investigator

was not present while the questionnaires were completed, the research questions were all closed, for easy application and analysis, accompanied by clear and specific instructions (Gil, 2008 and Hair *et al.*, 2005; Creswell, 2010).

We decided to use primary data to investigate cost management practices at micro and small companies from this sector of activity and a structured questionnaire made up of a set of standard questions, with answers limited to a number of mutually exclusive and pre-determined possibilities, was selected as the data collection method (HAIR et al., 2005 and CRESWELL, 2010). The variables of perception set out in Table 3 were measured on a Likert-type or 5-point semantic differential scale (Creswell, 2006 and Gil, 2008). The data collection instrument used was made up of three parts, which were answered by the company's cost manager.

Table 3. Characterization of statistical variables

Categories		Question N.	Category levels	Scale
Managerial Profile				
	Amount of professional experience	1	5	Ordinal
	Level of education	1	5	Ordinal
	Duties carried out at the company	8	Binary	Nominal
Company Profile				
	Company classification	1	3	Ordinal
	Length of time the company has been in the market (years)	1	5	Ordinal
	Number of direct employees	1	2	Ordinal
Characteristics of Cost Management Practices				
a	Cost management practices used by the company (P11 to P21)	11	Binary	Nominal
b	Information source used by the manager for decision-making (P22 to P26)	05	Likert – 5 points	Ordinal
c	The information source's level of importance (P27 to P31)	05		
d	Level of importance given to identifying problems related to the information source (P32 to P36)	05		
e	Actions considered important as the company's current growth strategy in the cost manager's opinion (P37 to P41)	05		

Source: Prepared by the authors, based on SPSS 22 software.

The first part was made up of three questions about the manager's profile. The second part was made up of three questions about the company profile (Table 3) and the third part is formed of thirty-one questions which were adapted and expanded, based on the instrument applied in a study performed by Callado and Pinho (2014). The items on cost management practices (11 questions with a binary response) were considered from this study, and the others were adapted, based on a theoretical reference Likert scale or 5-point semantic differential. Consequently, they were evaluated by a group of management and cost specialists and all the suggestions were considered to suit the reality of this sector of economic activity. The first version of the instrument was applied to a pilot sample of 75 managers from this sector. Following adjustments, the questionnaire was structured for application (Table 3).

The indicators are described as follows: a) the first 11 indicators of the instrument are cost management practices (P11 – P21); b) five indicators focused on the information source used by the manager for decision-making (P22 – P26); c) five indicators related to the information source's level of importance (P27 – P31); d) five indicators related to the level of importance given to identifying problems related to the information source (P32 – P36) and e) the last five indicators are related to the actions considered important as a the company's current growth strategy in the cost manager's opinion (P37 – P41). These research variables are classified according to type and categories, and the data is classified as ordinal on the measurement scale (Hair et al., 2005).

The structured questionnaire was validated before its application, in order to verify if the scale construction correctly represented the respective concepts. As the population's characteristics are inferred from a sample, the error is introduced in process with respect to the real difference between the sample and the population. In these terms, the data was collected at a single point in time and summarized in a statistical manner (Hair *et al.*, 2005). The stratified sample of this study is not probabilistic and for convenience (Gil, 2008 and Creswell, 2010) and is formed of micro and small companies located in the southeast region of Brazil. This sample attained a total of 164 validated responses, with 108 corresponding to processing companies and 56 to companies which mine dimension stones. Table 4 presents the characterization of the sample and Table 5 presents the characterization of the cost manager.

Table 4. Characterization of the research sample

General Characte-ristics		COMPANY'S ECONOMIC ACTIVITY					
		Wholesale Trade		Block Mining		Total	
		Nº	%	Nº	%	Nº	%
Company classification* (P2)	EPP	62	58%	43	77%	105	65%
	ME	26	25%	7	13%	33	20%
	EMP	18	17%	6	11%	24	15%
Length of time the company has been in the market (in years) (P3)	Up to 5	24	37%	0	0%	24	22%
	6 to 10	19	29%	11	24%	30	27%
	11 to 15	15	23%	15	33%	30	27%
	16 to 20	18	28%	10	22%	28	25%
	More than 20	32	49%	20	44%	52	47%
Number of direct employees (P4)	Up to 19	79	73%	37	66%	116	71%
	20 to 99	29	27%	19	34%	48	29%
General Totals		**108**		**56**		**164**	

Note:*Small Company = EPP [Company(ies) with a turnover of between BRL 360,000.01 and BRL 3,600,000.00] Micro-company = ME [Company(ies) with an annual turnover equal to or less than BRL 360,000.00]. Medium-sized company = EMP [Company(ies) with a turnover of between BRL 3,600,000.01 and BRL 12,000,000.00].
Source: Prepared by the authors, based on SPSS 22 software.

In order to prepare the data collection instrument, bearing in mind the aim of investigating cost management practices among the specified sample, distinct groups of variables were considered, namely: the managers and companies' profiles, sector of economic activity and the practice of cost management. The latter group was represented by binary variables. The data was collected during the period 1st June to 5th December, 2016 (Gil, 2008).

Table 5. Characterization of the Cost Manager

General Characte-ristics		COMPANY'S ECONOMIC ACTIVITY					
		Wholesale Trade		Block Mining		Total	
		Nº	%	Nº	%	Nº	%
Length of time in the position (in years) (P8)	Less than 7	45	42%	23	41%	68	41%
	7 to 14	32	30%	14	25%	46	28%
	15 to 21	23	21%	11	20%	34	21%
	22 to 28	4	4%	4	7%	8	5%
	More than 28	4	4%	4	7%	8	5%
	(n)	108		56		164	
Level of education (P9)	Basic Education Incomplete.	13	12%	2	4%	15	9%
	Basic Education Completed.	45	42%	30	54%	75	46%
	Higher Education Incomplete.	15	14%	11	20%	26	16%
	Higher Education Completed.	25	23%	8	14%	33	20%
	Post-Graduation, Master's, Doctorate.	10	9%	5	9%	15	9%
Duties which the person responsible for cost management carries out at the company (P10)	Administration (Director / Management).	74	69%	31	55%	105	64%
	Commercial/Sales.	79	73%	40	71%	119	73%
	Strategic Planning	40	37%	16	29%	56	34%
	Financial	48	44%	19	34%	67	41%
	Human Resources	36	33%	11	20%	47	29%
	Marketing	36	33%	10	18%	46	28%
	Does not carry out any other activities	5	5%	3	5%	8	5%
	Other (s)	14	13%	18	32%	32	20%

Note: Significant association chi-squared test. Prepared by the authors, based on research data
Source: Prepared by the authors, based on SPSS 22 software.

Three distinct approaches were used for the statistical analysis of the collected data: descriptive statistics (Stevenson, 1986; Hair *et al.*, 2005; Levine et al., 2008 and Creswell, 2010) used to present the general characteristics of the sample; two nonparametric hypothesis tests (Levin, 1987 and Levine, Berenson, & Stephan, 1998; Hair *et al.*, 2005; Creswell, 2010) and the Mann-Whitney U

test, used to analyze the statistical significance of the differences found between the variables related to the information sources used and valued by the cost manager and the frequency of problems related to information sources. The Pearson chi-squared test was used to study the association of cost management practices used by the company with the company's economic activity. The level of statistical significance of 5% and level of reliability of 95% were considered to reject the null hypothesis between the variables for cost management practices.

The multivariate approach was adopted to analyze the structure of the internal relations between the variables related to cost management practice. These variables were measured on a Likert-type scale or five point semantic differential (Creswell, 2006 and Gil, 2008). The exploratory factor analysis technique was used, which employed the principal component method of analysis and Varimax orthogonal rotation, with the aim of describing the variable structure, observed from the factors created.

The following procedures were also carried out in this phase: analysis of internal consistency reliability by calculating the Cronbach alpha coefficient; Bartlett's sphericity test significant at the level of 5%; Kaiser-Meyer-Olkin - KMO test (HAIR et al., 2005); two distinct techniques were also implemented for this research, namely: cluster analysis and factor analysis. To this end, this research sought to apply a further multivariate technique, in order to achieve greater robustness, to characterize the relations and standard structures for companies in the dimension stone sector. All the statistical procedures used were carried out using SPSS 22 software.

4 Analysis

The results relating to the company profile revealed a significant association ($p<0.05$) with the nature of the economic activity, that is, they showed that companies in commercial activities are younger than those in mining activities. In relation to the company turnover criterion, 77% are characterized as small companies (EPP), as described in Table 4.

With regards to characterizing the research subject, it is observed that the cost manager in this activity has between 7 and 14 years' experience, independent of the company's economic activity. With regards to the characteristics of the cost manager's duties, the sample reveals that those in mining activities have more cumulative duties in marketing, ($p<0.05$). However, they also simultaneously accumulate sales duties (Table 5). The operational definition of the constructs observed the aggregation pattern and factor reliability indicated by the Cronbach alpha coefficients. The instrument presented a value of 0.897, while the factor coefficients were located between 0.63 and 0.91, indicating the instrument's good internal consistency for an exploratory study (Table 6).

Table 6. Reliability test for the exploratory constructs

Construct	Number of items	Cronbach's Alpha	Consis-tency
Cost management practices used by the company (P11 to P21)	11	0.915	Good
Information source used by the manager for decision-making (P22 to P26)	05	0.631	Tolerable
Information source's level of importance (P27 to P31)	05	0.719	Good
Level of importance given to identifying problems related to the information source (P32 to P36)	05	0.753	Good
Actions considered important as the company's current growth strategy in the cost manager's opinion (P37 to P41)	05	0.914	Good

Source: Prepared by the authors, based on SPSS 22 software.

The sample (n=164) was made up of both male (83.5%) and female (16.5%) respondents. The profile for the most productive age range varied between 26 and 55, forming a total of 82.3% of the sample. The vast majority of the respondents have an average income of between seven and ten minimum salaries and all of them were identified as regularly employed or they performed a formal

activity, such as an administrator. With regards to the level of education, the highest percentage was having completed basic education, representing 46% of those researched. Likewise, the companies presented a framework characteristic of the number of direct employees, in a total of 71% of the sample (Table 7). Thus, a higher male presence is seen in this sector and another finding is that this sector has managers with a limited level of education.

Table 7. Cost management practices used by the company

Cost Management Practices Used By The Company	**COMPANY'S ECONOMIC ACTIVITY**			
	Wholesale Trade (n=108)	Mining (n=56)	Pearson Chi-Squared	p value
Carries out financial analysis of stocks – P11	57.4%	42.9%	3.130a	**0.077**
Makes a calculation to establish the sales price – P12	76.9%	57.1%	6.837	**0.009**
Makes a calculation to analyze the unit costs of products to be sold – P13	69.4%	44.6%	9.533	**0.002**
Makes a calculation to analyze the fiscal contribution margin - P14	56.5%	37.5%	5.315	**0.021**
Calculates the profit margin when preparing the sales price – P15	67.6%	41.1%	10.687	**0.001**
Has a structural analysis of the costs system – P16	37.0%	26.8%	1.739	0.187
Carries out a monthly or half-yearly breakdown of accounting, fiscal and budgetary information – P17	44.4%	37.5%	0.730	0.393
Carries out a monthly cash flow analysis – P18	51.9%	39.3%	2.335	0.127
Uses a method to analyze cost settlement (e.g. costs related to production are calculated and distributed for all products) – P19	45.4%	42.9%	0.094	0.759
Records the operating costs on a monthly basis – P20	47.2%	46.4%	0.009	0.923
Uses specific forms to record the above information – P21	30.6%	21.4%	1.543	0.214

Source: Prepared by the authors, based on SPSS 22 software.

Table 5 reveals that there is no significant difference ($p>0.05$) between the companies' economic activities according to the information sources used by the cost manager for decision-making. In these terms, it should be highlighted that personal contacts and internal company sources were the most commonly used variables. In contrast, (Table 4) they present a similarity in the number of employees with all the companies from the sample having a maximum of 19 members of staff. In this case, commercial activities formed 73.1% of this variable and mining activities 66.1%. In relation to the criteria of company turnover, they are characterized as small businesses (EPP).

Table 8. Information sources used by the manager for decision-making

Currently, As A Cost Manager You Make Decisions Thanks To …		**Company's Economic Activity**			
		Wholesale Trade	Mining	Mann-Whitney U	p value
Personal contacts - P22	Never	10.2%$_a$		2532.	0.067
	Rarely	13.0%$_a$	7.1%$_a$		
	Sometimes	42.6%$_a$	5.0%$_a$		
	Frequently	30.6%$_a$	42.9%$_a$		
	Very Frequently	3.7%$_a$			
Internal company sources – P23	Never	5.6%$_a$	8.9%$_a$	2739	0.280
	Rarely	9.3%$_a$	5.4%$_a$		
	Sometimes	48.1%$_a$	60.7%$_a$		
	Frequently	30.6%$_a$	17.9%$_a$		
	Very Frequently	6.5%$_a$	7.1%$_a$		
PARTNER GROUPS (union, clients and suppliers) – P24	Never	13.0%$_a$	26.8%$_b$	2571.5	0.097
	Rarely	24.1%$_a$	21.4%$_a$		
	Sometimes	47.2%$_a$	39.3%$_a$		
	Frequently	14.8%$_a$	10.7%$_a$		
	Very Frequently	0.9%$_a$	1.8%$_a$		
SPECIALIZED PRESS (media agencies) – P25	Never	34.3%$_a$	44.6%$_a$	2650.0	0.171
	Rarely	32.4%$_a$	30.4%$_a$		
	Sometimes	28.7%$_a$	21.4%$_a$		
	Frequently	4.6%$_a$	3.6%$_a$		
PUBLIC NETWORKS (e.g. Databases - IBGE, SEBRAE and BANDES ...) – P26	Never	34.3%$_a$	41.1%$_a$	2861.0	0.551
	Rarely	31.5%$_a$	25.0%$_a$		
	Sometimes	28.7%$_a$	30.4%$_a$		
	Frequently	4.6%$_a$	3.6%$_a$		
	Very Frequently	0.9%$_a$			

Source: Prepared by the authors, based on SPSS 22 software.

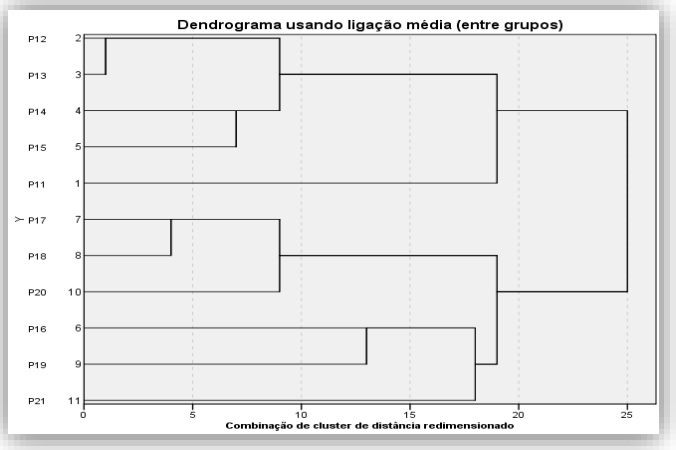
With regards to characterizing the subject of research, it can be confirmed that the cost managers in this activity, on average, have between 7 to 14 years of experience, with no distinction between the activities for this variable, as per Table 4. In relation to the cost managers' functions, the sample reveals that mining activities have a higher cumulative function in marketing ($p<0.05$). However, no correlation was presented but they simultaneously accumulated sales functions. In line with the research carried out by Holatova and Brezinova (2013), this accumulation may contribute to reducing managerial capacity.

In relation to characterizing cost management activities, as per, a significant association in the P13 variable ($p<0.002$) is noted, with unit cost analysis exercised by 69.4% of cost managers in commercial activities. Similarly, a significant association was presented in the P15 variable ($p<0.001$), with calculating the profit margin when preparing the sales price being exercised by 67.6% of commercial activity managers. Thus, expressive data was noted in the P12 variable, in which 76.5% of commercial activity and 57.1% of mining activity managers accumulate the function of performing the calculation to establish the sales price. In addition, other relevant data was noted through the P17 variable, in which 55.6% of commercial activity cost managers and 62.5% from mining activities did not simultaneously break down accounting, fiscal and budget information (Table 7). In contrast, in research performed by Ahmad (2017) in the Malaysian manufacturing sector, the cost evaluation system and performance measurement are the variables most employed by companies. This specific finding and a comparison are further described in the conclusion.

As demonstrated, the data was collected from 164 companies and, after being tested, the answers obtained were validated in order to obtain an overview of this group of analysis. The cost management practices demonstrate that there is no economic association between these activities, that is the research data reveals that the economic activity is independent of economic practices and in order to corroborate the results obtained in this cluster analysis, which, in turn, prove the factor segmentation information presented in Figure 1. Thus, both economic activities analyzed follow the same economic practices with respect to information sources.

Following univariate treatment, to analyze the isomorphic behaviour of the companies investigated, multivariate analysis was performed. A dendogram is presented in Figure 1, which considers the cost management practices which presented isomorphic behaviour between the groups of small and medium-sized companies analyzed. Three groups of factors can be observed. Factor 1 (F1) comprises the sales price variables (P12), unit cost (P13), contribution (P14) and profit margins (P15). Factor 2 (F2) is formed by these four variables: financial analysis of stock (P11), level of detail (P17), cash flow (P18) and cost registration. Factor 3 (F3) comprises three variables: cost system structure (P16), cost appropriation method (P19) and use of specific forms (P21). Thus, the dynamic of the relations using cluster analysis was examined.

Figure 1. Dendogram of the indicators by cluster tree (between groups)



Source: Prepared by the authors, based on SPSS 22 software.

Thus, latent relations between the variables could be suggested, such as relating Factor 1 with variables which perform calculations, as there are high positive correlations between them. However, they are correlated, as they have a high communality value (Table 9). The nature of the relations existing between the practices found in each of the clusters, factor analysis carried out using the variables P11 to P21, according to Aranha and Zambaldi (2008) and Hair *et al.* (2005).

Table 9. Extraction method: Principal component analysis. Rotation Method: Varimax with Kaiser normalization. Rotation converged in eight iterations

	Component		
	1	2	3
(P11) Financial analysis of stock	.370	**.664**	.147
(P12) Analysis of sales price	**.860**	.249	.093
(P13) Calculation of unit cost	**.882**	.197	.199
(P14) Calculation of contribution margin	**.654**	.539	.257
(P15) Calculation of profit margin	**.701**	.468	.198
(P16) Structural analysis of the cost system	.229	.351	**.735**
(P17) Carry out monthly breakdown of accountancy, fiscal and budget information	.299	**.718**	.413
(P18) Monthly cash flow analysis	.287	**.776**	.293
(P19) Cost appropriation analysis	.507	.023	**.746**
(P20) Recording monthly operating costs	.125	**.617**	.607
(P21) Use of specific registration forms	.007	.326	**.797**

Note. Source: Prepared by the authors, based on SPSS 22 software.

The factor analysis carried out using the variables P11 to P21 indicate independence between them, evaluated using Bartlett's sphericity test ($p<0.001$) and presented the Kaiser Measure of

Overall Sampling Adequacy (KMO) measurement in the value of 0.88 or >0.80, confirming the suitability of the size to apply factor analysis to the data. With regards to the total variation explained, Table 8 shows the data variance extraction method: Varimax rotation method principal component analysis, which aims to maximize the data variance in the first factors (HAIR et al., 2005). Thus, separate structure dimensions were identified, which allowed a reduction of eleven variables for three factors, obtained through the main components. Therefore, and according to Aranha and Zambaldi (2008), it was ascertained that 76.194% of the data variance observed is explained by these three factors. Thus, a reduction was observed in the data, with a loss of 23.806% of the total data variance noted in the model under analysis.

In Bruin (2006) and Aranha and Zambaldi's (2008) understanding, the initial eigenvalues presented in Table 10 are values obtained from the correlation matrixes, with the aim of obtaining a set of independent, unrelated vectors, which could explain maximum data variability, which indicate the total variance caused by each factor.

Table 10. Factor Analysis of Data

Component	Initial self-values			Sums of squared mining loads			Rotational sums of squared loads		
	Total	Variance %	Cumulative %	Total	Variance %	Cumulative %	Total	Variance %	Cumulative %
1	6.279	57.085	57.085	6.279	57.085	57.085	3.070	27.908	27.908
2	1.355	12.317	69.402	1.355	12.317	69.402	2.779	25.265	53.172
3	.747	6.792	76.194	.747	6.792	76.194	2.532	23.021	76.194
4	.626	5.687	81.881						
5	.498	4.526	86.407						
6	.330	3.000	89.406						
7	.315	2.862	92.269						
8	.274	2.494	94.763						
9	.234	2.123	96.886						
10	.197	1.787	98.673						
11	.146	1.327	100.000						

Source: Prepared by the authors, based on SPSS 22 software.

It was noted in both the economic activities analyzed that independent of the cost managers' activities, the practices are the same in both areas of activity, concomitant with the same information sources. Moreover, decision-making due to personal contacts (P22) was noted as a characteristic of the sample, which is a relevant variable in this study. However, this characteristic was identified more frequently in mining (42.9%) than commercial activities (30.6%). With regards to decision-making, due to information simultaneously collated by unions, clients and suppliers (P24), both the activities under study describe that they sporadically turn to these information sources, with commercial activities corresponding to 47.2% in this case and mining to 39.3% of the research under analysis.

Thus, it can be confirmed, based on research data, that the cost managers in both activities identify the following information sources as important, independent of association: personal contacts (P27); internal company sources (P28); unions, clients and suppliers (P29); the specialized press (P30) and public networks (P31). The major highlight in this data was shown simultaneously by the variables P27 and P28, which presented the statistical result of 67.6% of cost managers in commercial activities and 76.8% of cost managers in mining activities, respectively, which demonstrated the relevance of this information (Table 12). This data is equally corroborated with Ahmad's (2017) research findings, which revealed that the information generated by cost management is significant and pertinent to determine a company's performance.

Table 11. Actions important as the company's growth strategies

Actions Considered Important As The Company's Current Growth Strategy In The Cost Manager's Opinion		Company's Economic Activity			
		Whole-sale Trade	Mining	Mann-Whitney U	P Value
Improving Collecting Cost Information (P37)	Not Important	0.9%		2970.5	0.831
	Neutral	9.3%	3.6%		
	Important	56.5%	66.1%		
	Very Important	33.3%	30.4%		
Improving The Storage Of Cost Information (P38)	Not Important	0.9%		3007.5	0.947
	Neutral	9.3%	3.6%		
	Important	57.4%	69.6%		
	Very Important	32.4%	26.8%		
Improving The Internal Distribution Of Cost Information (P39)	Not Important	2.8%		2976.0	0.847
	Neutral	10.2%	8.9%		
	Important	60.2%	66.1%		
	Very Important	26.9%	25.0%		
Preparing The Company For Competitiveness, Followed By A Search For New Markets. (P40)	Not Important	0.9%		2725.0	0.247
	Neutral	7.4%	8.9%		
	Important	47.2%	57.1%		
	Very Important	44.4%	33.9%		
Ensuring Internal Sharing Of Cost Experiences In The Company's Other Departments (P41)	Not Important At All	0.9%		2866.5	0.522
	Not Important	0.9%			
	Neutral	8.3%	14.3%		
	Important	63.9%	62.5%		
	Very Important	25.9%	23.2%		

Source: Prepared by the authors, based on SPSS 22 software.

As shown in Table 11, all the actions were indicated as being important as the companies' growth strategies, independent of the economic activity researched. In continuation, the data allowed a significant association in identifying problems with information originating from the specialized press to be noted, according to the variable P35 ($p<0.001$) with, in this case, 40.7% of cost managers in commercial activities occasionally identifying problems and 42.9% of these managers have never identified problems through the specialized press. To summarize, the cost manager identifies the following research variables as being important: improving the collection of information on costs (P37); improving the storage of this information (P38); improving the internal distribution of this cost information (P39) and, as a consequence, improving the company's preparation for competitiveness with the identification of new markets at a later date (P40) and, ensuring the internal sharing of cost management experiences in other departments of the company (P41). Table 11 presents the analysis of valuing information sources used by the cost manager and it is highlighted that the most valued information sources researched are as follows: a) personal contacts – with a percentage by the wholesale trade of 67.6% highlighted as an important information source and the mining sector with 76.8%, equally as an important information source and b) internal company sources – highlighting companies in the mining sector forming a percentage of 57.1% and the wholesale trade with a percentage of 55.6%.

Table 12. The cost manager's valorisation of the information source

HOW MUCH YOU, AS A COST MANAGER, VALUE THE FOLLOWING INFORMATION SOURCES:		COMPANY'S ECONOMIC ACTIVITY			
		Wholesale Trade	Mining	Mann-Whitney U	p value
PERSONAL CONTACTS (P27)	Not important at all	1.9%	3.6%	2911.5	0.626
	Not important	2.8%			
	Neutral	13.0%	7.1%		
	Important	67.6%	76.8%		
	Very important	14.8%	12.5%		
INTERNAL COMPANY SOURCES (P28)	Not important	1.9%	3.6%	2809.0	0.406
	Neutral	23.1%	25.0%		
	Important	55.6%	57.1%		
	Very important	19.4%	14.3%		
PARTNER GROUPS (UNIONS, CLIENTS AND SUPPLIERS) (P29)	Not important at all	0.9%		2630.0	0.137
	Not important	6.5%	16.1%		
	Neutral	25.0%	26.8%		
	Important	53.7%	46.4%		
	Very important	13.9%	10.7%		
SPECIALIZED PRESS (media agencies) (P30)	Not important at all	2.8%		2632.0	0.145
	Not important	11.1%	26.8%		
	Neutral	40.7%	35.7%		
	Important	43.5%	35.7%		
	Very important	1.9%	1.8%		
PÚBLIC NETWORKS (E.G. DATABASES - IBGE, SEBRAE and, BANDES ...) (P31)	Not important at all		3.6%	2846.0	0.503
	Not important	12.0%	21.4%		
	Neutral	38.0%	23.2%		
	Important	47.2%	50.0%		
	Very important	2.8%	1.8%		

Source: Prepared by the authors, based on SPSS 22 software.

In line with these findings, the pertinence of micro and small companies in the economy is observed in various countries. A number of common factors for company insolvency are also highlighted: cost management, business knowledge and capital. Thus, adopting strategic cost management positively impacts performance and, therefore, micro and small companies reproduce the best practices of large-scale companies. Consequently and to reiterate, the results are not adequate, on account of differences, such as: intellectual capital, size, market position, product diversity and culture, among others. In these terms, it is confirmed that every company has its own characteristics and, simultaneously, may be located in distinct regional contexts. Thus, a path adapted to the company and its context should be sought (Dos-Santos, Dorow & Beuren, 2016; Bao & Gong, 2017 and Maziriri & Mapuranga, 2017).

5 Conclusion

The aim of this research was to analyze the operations of micro and small companies which currently act in mining and processing dimension stones sector and verify the result of these organizations with regards to exercising cost management, with a view to the presence, or otherwise, of the practice of mimetic isomorphism. In order to analyze the isomorphic behaviour of the 164 companies investigated, a multivariate analysis was performed. The results demonstrated the presence of mimetic isomorphism in these companies' cost management practices, which were studied in three groups of variables.

With regards to company profiles, it was found that commercial activity accounted for 73.1% and mining 66.1%; they are characterized as small businesses (EPP) and have a maximum of 19 employees. With regards to the respondents, 83.5% were male, aged between 26 and 55; had completed basic education; were employed; exercised management activities for a period of 7 to 14 years and accumulated the function mainly with marketing activities. This fact demonstrates that the perceived reality objectively reflects a sector with a massive male presence and limited level of education.

With regards to characterizing cost management activities, it was noted that unit cost analysis is exercised by 69.4% of cost managers in commercial activities. Thus, it was observed that

calculating the profit margin when preparing the sales price is carried out by 67.6% of commercial activity managers. Consequently, the research revealed expressive data: 76.5% of commercial activity managers and 57.1% from mining activities accumulate the function of performing this calculation, in order to establish the sales price. To this effect, the sector analyzed also indicates a major presence of accumulating duties to carry out activities performed by the cost manager. Thus, it is confirmed, based on research data, that cost management is valued in both activities. The most commonly sought information sources are: personal contact and internal company sources.

Further relevant data noted was that 55.6% of cost managers from commercial activities and 62.5% from mining activities do not simultaneously break down accounting, fiscal and budget information. This finding corroborates the conclusions of Chiodi Filho and Chiodi (2009) who found a similar result in their research on this sector and highlighted that the dimension stone sector is almost completely made up of micro and small companies with a very high level of informality. The emphasis of not breaking down this information suggests continuity of this level of informality in this research.

The research was carried out at companies which are positioned in distinctive production chains, which overlap in this field of economic activity. Based on the research data, despite the accumulation of functions, it can be confirmed that cost management is valued in both activities. The cost manager considers the improved internal collection, storage and sharing of this information to be relevant, preparing the company for competitiveness and a search for new markets at a later date.

The results show the presence of mimetic isomorphism when cost management was practiced by these companies, which were studied in three groups of factors. Both the economic activities analyzed follow the same economic practices for the same information sources.

6 Implications and Further Research

The research was performed at 162 companies positioned in distinct productive chains, which overlap in this field of economic activity. The conclusions are limited to them.

As a result of the study, cost managers can reduce the repetition of best practices that do not apply to micro and small enterprises. This mere repetition, a simpler path, may become inadequate.

Based on this study, it was observed that future research should further develop the characterization of this economic phenomenon and study which resources would be required to improve cost management in micro and small companies in the segment analyzed. Similarly, future studies should analyze the reasons why 55.6% of the cost managers in dimension stone wholesale trade activities and 62.5% in the mining sector do not seek to combine accounting, fiscal and budgetary information with cost management practices at their respective companies.

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