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**Standardization**

Leandro Pinheiro CRB-14/1340  
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**Journalist in charge**

Leonardo Fagundes DRT 4470/18/110-PR

**Barter and mailing address:**

Revista Catarinense da Ciência Contábil  
Santa Catarina State Board of Accountancy  
Av. Osvaldo Rodrigues Cabral, 1900 – Centro  
88.015-710 Florianópolis/SC

Phone: 48 3027-7006

Email: [revista@crcsc.org.br](mailto:revista@crcsc.org.br)  
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Revista Catarinense de Ciência Contábil is a four-monthly publication by Santa Catarina State Board of Accountancy, whose mission is to disseminate the scientific production, in the area of Accounting, of professors, researchers, students and professionals from Brazil and abroad, who are selected according to the quality and contribution to the development and dissemination of knowledge in this field.

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# Editorial

The constant evolution of Accounting brings new challenges, obligations and opportunities to the accounting class. In view of this scenario, the studies, researches and analyzes, carefully selected for this edition, aim to promote reflections and debates to contribute to learning and development of our readers.

The articles cover topics of great relevance. They address practical and behavioral issues that can interfere with the professionals' daily lives. An example deals with the implementation of block K, registration book required by the Public Digital Bookkeeping System (SPED), which, as we know, has been generating doubts in organizations.

However, if one of the difficulties faced by your company is to determine the economic value of intangible assets, I recommend reading the second article of this edition, which presents a very interesting case study on the subject.

In the scope of work relations, another study shows that the psychological contract influences the satisfaction of the activities performed by the auditor. In turn, the CEO's overconfidence can influence the results management practices, according to a survey of 127 Brazilian companies listed on the BM & FBovespa.

Have you ever stopped to think about the usefulness of accounting information specifically for the electric sector? Another survey revealed the perceptions of financial analysts who work in the area.

Overbilling, maladministration, fraud, and irregularity in bids. These were the main issues pointed out in a study on the PAC (Growth Acceleration Program). Finally, there is a proposal of financial indicators referring to the expenditures with medicines originating from the judicialization of health in the municipality of Chapecó. Good reading!

**Marcello Alexandre Seemann** - Accountant  
President CRCSC

## ADJUSTMENTS REQUIRED FOR DEPLOYMENT OF BLOCK K IN THE SPED FISCAL IN ORGANIZATIONS

### DÉBORA ALLINE DE MELLO

*Undergraduated in Accounting from the University of the West of Santa Catarina (UNOESC). Postgraduate degree in Tax Management from the UNOESC. Address: Rua Dirceu Giordani, 696 | Jardim Tarumã | Xanxerê/SC | Brazil.*

**E-mail:** [debora.allinedm@hotmail.com](mailto:debora.allinedm@hotmail.com)

### DAVID RODRIGO PETRY

*Doctoral Candidate in Administration from the University of the West of Santa Catarina (UNOESC). Professor of UNOESC. Address: Rua Cel. Passos Maia, 919 | Centro | Xanxerê/SC | Brazil.*

**E-mail:** [david.petry@unoesc.edu.br](mailto:david.petry@unoesc.edu.br)

### JORGE CARLOS PALUDO

*Master in Administration from the University of the West of Santa Catarina (UNOESC). Professor and coordinator of the undergraduate course in Accounting Sciences of UNOESC, in Xanxerê. Address: Rua Dirceu Giordani, 696 | Jardim Tarumã | Xanxerê/SC | Brazil.*

**E-mail:** [jorge.paludo@unoesc.edu.br](mailto:jorge.paludo@unoesc.edu.br)

### IEDA MARGARETE ORO

*Doctor in Accounting Sciences and Administration from the Regional University of Blumenau (FURB). Professor of the Accounting Sciences Course and the Master's Degree in Administration of University of the West of Santa Catarina (UNOESC). Address: Av. Nereu Ramos, 3777D | Seminário | Chapecó/SC | Brazil.*

**E-mail:** [ieda.oro@unoesc.edu.br](mailto:ieda.oro@unoesc.edu.br)

## ABSTRACT

Block K is the record book of production and inventory control in the digital version required by the SPED in Brazil, which deals with the detailed tax information of the establishments of legal entities. The requirement of this new set of information by the tax authorities has shown some difficulties in organizations for its deployment. Thus, this article aims to identify what are the main administrative and managerial adjustments required for the change in the inventory control system of products in the companies in relation to the deployment of block K in the SPED Fiscal. As for the methodological procedures is characterized as a descriptive research with a qualitative approach performed through a questionnaire applied in the tax department of five companies in Santa Catarina. The results show that the block K influences directly and positively in companies that are finding difficulties in its deployment, such as problems with the internal system, configuration failures, incomplete records and lack of knowledge to work with Block K. The study also allowed conclude that even considering the difficulties listed for the deployment of Block K, the system brings benefits that positively impact on company management, as it strengthens the internal control system and it provides greater reliability in information generated. Factors related to the high cost of deployment were also shown. This result reinforces the importance of the company is improving to the most by investing in knowledge and technology, to be prepared for evolution.

Submission on 06/13/2017. Revision on 08/19/2017. Accepted on 02/02/2018.



**Keywords:** SPED Fiscal. Block K. Production and inventory control.

## 1 INTRODUCTION

The Production and Inventory Record Book Model 3, created by the SINIEF 02, of 1972, was born with the possibility of being replaced by reports that show the real movement of the companies' inventories. Since its inception, this book had as its sole purpose to inform the federal and state tax authorities the movements of inventory, the tree of products and control the average cost of goods and products.

This fiscal book has recently returned to the scene, due to the addition of the compulsory books of the Public Digital Bookkeeping System, SPED Fiscal, in accordance with the SINIEF nº 18, of October 11, 2013, incorporating another block of information to the existing complex obligation delivery work (Rocha & Almeida, 2014).

The Public Digital Bookkeeping System project (SPED), established by Decree No. 6,022, of January 22, 2007, is part of the Federal Government's Growth Acceleration Program (PAC) 2007-2010 and constitutes a further advance in computerization of the relationship between the tax authorities and the taxpayers. This decree began with three major projects: Digital Accounting Bookkeeping, Digital Fiscal Bookkeeping and NFe National Environment.

Among SPED's projects, Digital Fiscal Bookkeeping, EFD, consists of a bookkeeping set of tax documents and other information of interest to the tax authorities of the federated units and the Department of Federal Revenue of Brazil, as well as records of calculation of taxes related to operations and benefits practiced by the taxpayer. This file must be digitally signed and transmitted, via the Internet, to the SPED environment (Receita Federal do Brasil, 2015).

With this new requirement established by SPED, including the Production and Inventory Control Record Book in SPED Fiscal, federal revenue will have access to the complete movement of each item of the inventory, as well as knowing the production process of each company. Oliveira (2014) and Rocha and Almeida (2014) argue that the inclusion of Block K will enable the supervising agent to qualitatively cross the balances verified electronically by Sped with those informed through the inventory balance of the industries.

This block is intended to present monthly information on the production and respective consumption of inputs, as well as on the carrying inventory, related to the provisions contained in the SINIEF Adjustment 8, of October 2, 2015. If the company has in any of its establishments any of the processes that characterize an industrialization, according to the legislation of ICMS and IPI, and whose resulting products are taxed by ICMS or IPI, even if at zero or exempt rate, if it has CNAE, even if secondary, of divisions 10 to 32; and if the gross sales revenue of all its establishments in the national territory, industrial or not, excluding sales canceled, sales refunds and unconditional discounts granted, equal to or greater than R\$300,000,000.00, in the second year prior to the effective date of the obligation, then, it shall present Block K as of 01/01/2016 (Ajuste Sinief Confaz 8, 2015).

For the other wholesale establishments classified in groups 462 to 469 of the National Classification of Activities, and those assimilated to industrial, the obligation to keep record Block K was as of January 1, 2018.

Therefore, the records to be reported in Block K correspond to the data of the technical data sheets of the products, the losses occurred in the production process, the production orders, the consumed inputs and the quantity produced, including the industrialization, performed in third parties.

In this context, in order to meet fiscal obligations, companies needed to invest in continuing education and in systems that enable the calculation and integration of production costs by implementing a reliable production control to meet the term offered by the government. Companies needed to adjust and, in some cases, restructure their work procedures.

Concurrently, organizations' concerns about the use of reliable information systems are increasing. Somasundaram and Shrivastava (2011) point out that the control and storage of information has become a highly sophisticated technology, allowing a diversity of solutions for

protection, security and optimization of digital information, however, the use of these tools is still little explored.

According to Young (2009), in the deployment of a SPED project, several areas, processes and systems of the companies must be revised, altered or even created, aiming to make available to the tax authorities the information required by the new legislation in force.

With the deployment of Block K of SPED fiscal, there was a change in the form of recording accounting operations. As it is a recent decree and until now little publicized, mainly in literary sources, there is a great demand for clear and specific information on the subject. In order to assist in this process of adjustment to SPED, it is necessary to identify the main points where there are difficulties, so that the competent bodies can provide the necessary clarifications, thus seeking, in the companies surveyed, to identify the determinants for success in the process of deployment and adjustment to Block K, which can serve as a basis for other companies that have not yet deployed or do not use the system.

Given this context, the question that will guide the development of this study arises: what are the main adjustments resulting from the deployment of Block K in the Fiscal SPED in the operational management of companies?

As a result of the proposed questioning, this study aims to verify the main changes and adjustments resulting from the deployment of Block K in the SPED Fiscal, in the operational management.

Thus, this research is justified by the possibility of contributing to the knowledge of the difficulties that are being faced by the companies with the deployment and adjustment to the new system, allowing the expansion of knowledge about what is Block K and also the positives and negatives points that this system brought in the companies surveyed inferring new information that could contribute to the development of future research related to this topic.

The study is structured starting with this introduction. In the sequence, a theoretical incursion is made presenting in general terms the concepts, legal aspects and obligations. They involve topics related to the different delivery times by activity and billing, basic information for Block K, penalties applicable to SPED, cost control, organization and adjustment of information for Block K.

Then, the methodological procedures of the research, the results with the interpretation of the information collected by means of a questionnaire, and, finally, the conclusions and recommendations pertinent to the topic addressed are pointed out.

## **2 THEORETICAL FOUNDATION**

Various changes and adjustments will be required to meet the K Block introduced in the SPED Fiscal for companies. The understanding of what is Block K can not be dealt with simply by the interpretation of the legal rule, since it goes far beyond this important technical context. It should encompass the systemic understanding of the organization and the impacts that may arise.

This chapter presents the development of the study, a brief review of the literature that will serve as a basis for the study's progress and analysis, basing and explaining the theoretical bases concerning the subject addressed.

### **2.1 Different delivery times by activity and billing**

With the publication of SINIEF Adjustment 8/2015, in the DOU of 10/8/2015, different delivery times were established by activity and billing, according to the National Classification of Economic Activities, CNAE.

As of January 1, 2016: For industrial establishments classified in divisions 10 to 32 of the CNAE belonging to the company with annual billing equal to or greater than R\$300,000,000.00, among which the following stand out: Manufacture of Food Products , CNAE section 10; Manufacture of Textile Products, CNAE section 13; Manufacture of Wooden Products, CNAE section 16; Manufacture of Pulp, Paper and Paper Products CNAE section 17; Metallurgy, CNAE section 24; Manufacture of Metal Products, except Machinery and Equipment, CNAE section 25; Manufacture of Computer Equipment, Electronic and Optical Products, CNAE section 26; Manufacture of machinery and equipment, CNAE section 28; Manufacture of motor vehicles,

trailers and bodywork, CNAE section 28; and Manufacture of Other Transport Equipment, except Motor Vehicles, CNAE section 30.

As of January 1, 2017, the record delivery of Block K is due to the industrial establishments classified in divisions 10 to 32 of the CNAE belonging to the company with annual billing equal to or greater than R\$78,000,000.00.

As of January 1, 2018, for the other industrial establishments and equivalent to industrial, as well as wholesale establishments classified in groups 462 to 469 of the CNAE, among which stand out:

- a) Wholesale Trade in Raw Agricultural and Live Animals, CNAE section 462;
- b) Wholesale Trade of Machinery, Equipment and Supplies, except for Information and Communication Technologies, CNAE section 466.

According to Paragraph 8 of the Second Clause of the SINIEF Adjustment No. 8 (2015), it is considered an industrial establishment that has any of the processes that characterize industrialization under ICMS and IPI legislation, in which the resulting products are subject to these taxes, even with a zero rate or exemption.

Finally, the changes introduced by the SINIEF Adjustment No. 8 (2015), for billing purposes, should be observed. It is considered billing the gross sale revenues of goods of all the company's establishments in the national territory, industrial or not, excluding canceled sales, sales refunds and unconditional discounts granted. The billing reference period should be the second fiscal year prior to the effective date of the obligation.

Taxpayers who are obliged to provide Block K should be aware, as the non-presentation, omission or inaccuracy of information may entail penalties.

## 2.2 Base information for Block K

Block K information consists of information about the materials within the company, from the position of the inventory to the inputs for production. The inclusion of Block K, which is found in Section 7 of Chapter III, Record of the EFD ICMS / IPI, is intended to provide monthly information on the production and respective consumption of inputs, as well as on the book inventory:

| Block | Description  | Reg. |
|-------|--|------|
| K     | Block K Opening  | K001 |
| K     | ICMS/IPI Calculation Period                                  | K100 |
| K     | Carrying Inventory   | K200 |
| K     | Other Internal Transactions between Goods                    | K220 |
| K     | Produced Items   | K230 |
| K     | Consumed Inputs  | K235 |
| K     | Industrialization performed by Third Parties –Produced Items | K250 |
| K     | Industrialization in Third Parties – Consumed Inputs         | K255 |
| K     | Block K Closure  | K990 |

**Figure 1.** Composition of Block K

Source: Ajuste SINIEF nº 2/2009, cláusula primeira, §§ 3º, VII, e 7º; Minuta do guia Prático da EFD, versão 2.0.14.

According to the SINIEF Adjustment nº 17/2014, which redrafted paragraph 7 of the third clause of the SINIEF Adjustment nº 2/2009, which establishes on the Digital Fiscal Bookkeeping (EFD), which is in Section 7 of Chapter III, Record of the EFD -ICMS/IPI, this new block is composed of the following records:

- Record K001 - Block K Opening. It must be generated to open Block K, indicating if there are information records in the block;

- Record K100 - ICMS/IPI Calculation Period. Inform the calculation period of ICMS or IPI, with shorter periods. Taxpayers with more than one calculation period in the month declare a K100 record for each period in the same file;
- Record K200 - Carrying Inventory. The final inventory by type (goods for resale, raw materials, packaging, products in process, finished products, by-products and other inputs) shall be carried for each reporting period in K100;
- Record K220 - Other Internal Transactions between Goods. Inform the internal movement between goods, which does not fit those already informed in the Records K230 and K235: finished production and consumption in the production process, respectively.
- Record K230 – Produced Items. Inform the production of product in process and finished.
- Record K235 – Consumed Inputs. Inform the consumption of merchandise in the production process, linked to the resulting product informed in the Record K230 - Items Produced.
- Record K250 - Industrialization performed by third parties - Produced Items. Inform the products that were industrialized by third parties and their amount.
- Record K255 - Industrialization in Third Parties - Inputs Consumed. Inform the amount of consumption of the input that was sent to be industrialized in third party, linked to the resulting product informed in the Record K250.
- Record K990 - Block closure K. Identify the Block K closure and inform the number of lines in the block.

This information, related to the control of the company's inventory, for Martins (2015), it will be restricted to the production process and the quantities of raw material, inputs, packaging, finished product, third party production, inputs consumed in this process, reclassification of products, inputs substituted in the process, among others.

According to Leão (2015) it is necessary to analyze and plan in detail the adequacy of the production management processes to the requirements of the tax authorities, to study all the requirements of Block K, to map every detail of the industrialization processes, outsourcing and storage, to evaluate the software that meet the requirements, to prepare and train your internal staff in the operation and information records, make tests to confirm that the information collected in the system corresponds to reality.

The integrated view of this obligation, for Fernandes (2015), contributes to an efficient tax management, which aims to not waste resources, since the inventory concentrates the company's greater strategic energy, by the decision to buy cheap or on account and sell on account or cash.

However, Alves (2015) points out that it is important to mention, in production order, all manufactured items and items consumed, with the respective quantities and dates, manufactured by the establishment itself or by third parties. It is imperative that the company system is implemented and parameterized to obtain this data.

According to Bompan (2015, p.12):

The movement of inventory adjustment, movement of internal consumption of inputs not appropriated to production orders, will not be carried in Block K, these movements must be carried in another block, because a fiscal note must be issued for these outputs.

This information will be made available by the taxpayer, in this way, they should be aware of its structure, since the tax authorities will be able to control the inventory in parallel to the company, making the companies slaves of what they inform.

Jesus (2015, p. 2) observes that:

The Federal Revenue will have recorded in the Block K of SPED Fiscal, the amounts produced and the inputs consumed in each intermediate material or finished product, being able, through this information, to project the inventory of raw material and finished product of the taxpayer, and the information of industrialization performed by third parties.

Due to the great complexity of this record, Martins (2015) observes that it is essential for companies a technological solution that has structure for the compliance with the legal obligation. They must record all operations, with a sheet for each species, brand, type and model of the merchandise, besides understanding the records of the block and visualizing how to serve them, based on the information in its operating system.

### **2.3 Penalties applicable to SPED**

The delivery of Block K will be performed, accompanied by SPED ICMS / IPI, on the 25th day of the month subsequent to the calculation (Receita Federal, 2015).

Thus, if the term established by the Federal Revenue is not met, Law No. 12,873, of October 24, 2013, will be applied, establishes the following penalties: A taxable person who fails to comply with the accessory obligations required under art. 16 of Law No. 9,779, of January 19, 1999, or that to comply with any inaccuracies or omissions shall be required to comply with them or to provide clarification regarding them within the time limits stipulated by the Department of Federal Revenue of Brazil and shall be subject to the following fines as established by Law No. 12,873 of October 2013:

- a) for an extemporaneous presentation: R\$500.00 (five hundred reais) per calendar month or fraction, in relation to legal entities that are in the beginning of activity or that are immune or exempt or which, in the last statement presented, have reported presumed profit or Simple national; R\$1,500.00 (one thousand and five hundred reais) per calendar month or fraction, in relation to other legal entities; R\$100.00 (one hundred reais) per calendar month or fraction, in relation to individuals.
- b) for noncompliance with the Department of Federal Revenue of Brazil's order to comply with an ancillary obligation or to provide clarifications within the time limits stipulated by the tax authority: R\$500.00 (five hundred reais) per calendar month.
- c) for compliance with an ancillary obligation with inaccurate, incomplete or omitted information: 3%, not less than R\$100.00 (one hundred reais) of the value of commercial transactions or financial transactions, specific to the legal entity or third parties in respect of which is responsible for tax, in the case of information omitted, inaccurate or incomplete; 1.5%, not less than R\$50.00 (fifty reais) of the value of commercial transactions or financial transactions, specific to the individual or third parties for which it is responsible for tax, in the case of information omitted, inaccurate or incomplete.
- d) In the case of a legal entity opting for the Simples Nacional, the values and percentage will be reduced by 70% (seventy percent). The fine shall be reduced by half when the ancillary obligation is complied with before any officio procedure.

Joaquim (2015, p. 1) observes that:

Finally, Revenue served the clamor of entrepreneurs, professionals and class entities for the exorbitant collection that was previously of R\$5,000.00 per month or fraction for not delivering the SPED programs on time and not distinguishing the size of the companies and their capacity which are, in fact, selected by the tax authorities for collection purposes, for example for real profit purposes such as: banks, factoring, legal entities that enjoy tax incentives, billing in the previous calendar year, etc.

Care must be taken with the preparation and delivery of all SPED programs, since the Tax authorities already has electronic control systems to apply these penalties more efficiently.

### **2.4 Cost control and deployment costs**

In order for the accounting cost to be implemented efficiently, internal realignment will be required in regard to changes in culture, as well as the support of all employees directly or indirectly linked to production. Therefore, any differences between the balances may be justified;

otherwise it will be configured as tax evasion and will suffer the penalties, according to Law No. 12.873, of October 24, 2013, brought by this new reality.

In an environment of new accounting standards and electronic inspection and control, taxpayers should perform a detailed work of reviewing the cost structure and configuration of the enterprise management system - ERP and fiscal management (Rocha, 2012, p. 7).

Responsibility for the information generated by Cost Accounting is not exclusive to the Accountant. It involves tax professionals, costs, and other areas directly or indirectly linked to production.

With so much information passed on by taxpayers, the Tax authorities will be able to perform the quantitative cross-checking of the balances verified electronically by the SPED with those informed by the companies, through the inventory.

The information for Block K in the SPED Fiscal file does not involve monetary amounts, only the quantities of the products

Thus, for Jesus (2015), this control is aimed at eradicating any differences in the balances, if not justified, which may constitute fiscal evasion, contribute to the extinction of the practice of a mirrored, sidewalk, dubbed invoice or half invoice, besides the manipulation of the quantities of inventories during the physical inventory.

Although the tax authorities require detailed information in their favor, it is a fact that organizations indirectly also benefit from the demands on cost controls. The simple fact of being able to measure the cost of the productive process allows the organizations to draw new strategies and to look for new markets in order to improve their performance.

However, this deployment process still has a factor that must be analyzed with great care. According to Passos (2010), one of the main criticisms of the deployment of SPED is precisely the costs for its deployment and the adjustment to the new rules established by this system. The organizations are cautious with regard to the investments made, since, in the short term, only the government benefits from this system.

Despite this, the insertion of SPED is still very recent in organizations. More recent still is Block K, whose implantation is still in the beginning. It will be during the beginning of the 2020s that its consolidation can be better measured and analyzed comparatively, since then the actual deployment costs will be known. During this period, it will also be possible to identify the first benefits that Block K will bring to companies.

## **2.5 Control, organization and adjustment of information to Block K**

In the last decades the control and storage of information has become a highly sophisticated technology. They provide a diversity of solutions for the protection, security and optimization of digital information (Somasundaram & Shrivastava, 2011). Combined with this technology, Block K appears as a control tool, both for organizations and for the tax authorities. It can not be seen merely as an ancillary obligation to be filled in order to avoid administrative fines, but rather as a demand for the integrated vision of the whole group involved.

The creation of strategies, formalized through a well-structured planning, is a process that takes into account the strengths and weaknesses of organizations, as well as the threats and opportunities of the environment, to produce and articulate the results, establishing objectives, strategies and actions in the form of an integrated system of decisions that make possible an increase in business competitiveness (Cruz, Librelotto, Ferrolli, Bonatti & Zanin, 1998).

In this sense, information systems should be distinguished from the strategic level to senior managers, who focus on the problems of decision making. These first can be used by all levels of the organization and are still of greater reach and depth than other classes of systems.

For Bompan (2015), responsibility is shared among the production planning team, the accounting team, specifically linked to costs, and the tax, fiscal and legal team. However, for Gomes (2014), in the face of the opening of production secrets, companies will be directly impacted by the need to improve quality in the control of inventories and production. Absence or lack of quality in these controls may expose companies to questions or even assessments by the tax authorities.

For Jesus (2015, p. 1):

The industrial production process is not always executed on the basis of production order, some products by their characteristics have a continuous flow of production and others are long lasting, sometimes exceed the fiscal year, others are produced for inventories and remain unchanged, others are produced to order with technical specifications defined by customers.

Due to this vast productive chain of industries, Gomes (2014) emphasizes that the healthiest measure is to have the assistance of experienced and committed professionals to analyze and review the data collected, in order to avoid incoherence in the information passed to the Tax authorities through Block K of the SPED Fiscal, avoiding fiscal action.

Normative Instruction No. 86/2001 of the Department of Federal Revenue provides that legal entities that use electronic data processing systems to record business and economic or financial activities, bookkeeping books or prepare documents of an accounting or tax nature, are obliged to maintain, at the disposal of the SRF, the respective digital archives and systems, for the decadential period established in the tax legislation.

In order to meet IN-86, companies must be able to deliver the files requested by the inspection within the requested term.

For Fernandes (2015, p. 1):

Because the quantity and diversity of files is large and the delivery time is very short, the company should preferably prepare the files in advance, that is, leave the files prepared, and properly validated, before a possible inspection.

In order for the company to be sure that its files are 100% correct and to the required specifications, Bompan (2015) points out that there is a need to perform a series of validation tests before they are delivered for inspection. These tests should be done well in advance so that there is enough time to make any corrections.

In the same scenario, Gomes (2014) argues that the company's system must have a program to generate the files that can transform the data in the format required by the legislation, so that they can then be validated, that is, to meet IN- 86 the company must have trained employees and invest in a suitable operating system to deliver the files requested by the inspection within the requested term, to avoid problems with the tax authorities and manage the company effectively.

### **3 METHODOLOGY**

The methodology aims to capture and analyze the characteristics of a set of basic rules that seeks to develop observable evidence in order to obtain, organize, systematize and produce knowledge. According to Gil (2010, p.261), methodology "is the organization of parts or elements that forms a whole".

The approach to the problem is characterized qualitatively. For Richardson (1999), this methodology differs in both the forms of information collection and its treatment, through content analysis techniques, from the simplest to the most complex.

The research is also characterized as relational descriptive. Cooper and Schindler (2011) point out that, through the descriptive research, it is sought to identify the frequency with which a certain phenomenon occurs, the relation and connection that it has with others, besides its nature and characteristics. Researches of this nature have the characteristic of observing, recording, analyzing and correlating facts or phenomena without manipulating them (Cooper & Schindler, 2011).

From the point of view of technical procedures, research is characterized as a collection, For this, the tool used to collect data in this study was a structured questionnaire, considering that it is one of the most important techniques for obtaining data in social researches (Gil, 2010). The author adds that:

A questionnaire can be defined as the investigative technique composed of a greater or lesser number of questions presented in writing to the people, aiming at the knowledge of opinions, beliefs, feelings, interests, expectations, situations experienced, etc. (Gil, 2010, p.125).

The questionnaires were sent via e-mail to 6 companies, to the care of professionals working in the tax department. The questionnaire was composed of 14 questions, 3 open and 11 closed questions. For Gil (2010), in the open questions the interviewees talk about their own opinions, while in the closed ones they respond based on a list of alternatives previously offered.

After data collection was performed by means of questionnaires, bibliographical review of the topics related to the research, a condensation of data extracted from the summary of answers was performed. According to Marconi (2009), it is through the data analysis that is the details resulting from the statistical work, with the purpose of searching the answers to the questions of the study, as well as clarifying the necessary relationships between the data obtained.

Data analysis was performed using a comparative method, defined as "the comparison of a number of organizations in order to establish relationships among their characteristics" (Gil, 2010, p. 18).

Thus, the next section presents the analyzes performed in the study as well as the main results regarding the perception of respondents about the deployment of Block K in organizations.

#### 4 ANALYSIS OF RESULTS

The questionnaire was designed with intuitive and practical questions for easy-to-understand answers. Additionally, it was found that most had e-mail, which defined the form of communication, both sending and receiving the questionnaires. Thus, it began by questioning whether the respondent is aware of the need to implement Block K in the Public Digital Bookkeeping System - ICMS/IPI, as shown in Table 1.

Table 1

##### The company is aware of the obligation to present Block K

| Option       | Aware of the obligation to present Block K |             | Compliance with term for presentation |             |
|--------------|--|-------------|---------------------------------------|-------------|
|              | Interviewees                               | Frequency   | Interviewees                          | Frequency   |
| Yes          | 5  | 100%        | 4                                     | 80%         |
| No           | 0  | 0%          | 1                                     | 20%         |
| <b>TOTAL</b> | <b>5</b>                                   | <b>100%</b> | <b>5</b>                              | <b>100%</b> |

**Note.** Source: Research Data.

It can be seen in Table 1 that all respondents are already aware of the mandatory presentation of Block K. At the same time, it was questioned whether the company is organizing itself to meet the terms established by the legislation. As shown in Table 1, it is verified that 20% of the respondents will not be able to meet the requirement to present Block K within the term, however, the majority, or 80% answered that they will be able to comply with this requirement.

Among the 5 companies interviewed, 40% are classified as industrial establishments classified in divisions 10 to 32 of the CNAE (manufacturing industries), belonging to the company with annual billing equal to or greater than R\$78,000,000.00. It was mandatory as of January 1, 2017. 60% are classified for other industrial establishments and equated to industrial, as well as wholesale establishments classified in groups 462 to 469 of the CNAE, with mandatory starting on January 1, 2018.



Table 2  
**Classification in which the company fits**

| Classification of the Company  | Interviewees | Frequency |
|--|--------------|-----------|
| Industrial establishments classified in divisions 10 to 32 of the CNAE (manufacturing industries) belonging to the company with annual billing equal to or greater than R\$300,000,000.00; | 0            | 0%        |
| Industrial establishments of company authorized to the Special Customs Regime of Industrial Warehouse under Computerized Control (Recof) or to another alternative regime;                 | 0            | 0%        |
| Industrial establishments classified in divisions 10 to 32 of the CNAE (manufacturing industries) belonging to the company with annual billing equal to or greater than R\$78,000,000.00;  | 2            | 40%       |
| Other industrial establishments, Wholesale establishments classified in groups 462 to 469 of the CNAE  | 3            | 60%       |

**Note.** Source: Research Data.

The results are presented in this form because the organizations do not characterize themselves as being large.

Next, the professionals were asked if the operating system they use in the production and inventory control processes is prepared to present the required information in the Block K records. The results are shown in Table 3.

Table 3  
**Adjustment of the ERP system to Block K**

|     | Interviewees | Frequency |
|-----|--------------|-----------|
| Yes | 4            | 80%       |
| No  | 1            | 20%       |

**Note.** Source: Research Data.

Among the respondents, only one had a system that does not meet the requirements of Block K, that is, that 80% of respondents state that the systems used to control inventory guarantee the support required for the delivery of the obligation.

From the point of view of most companies, information systems are now considered as a strategic resource for companies, and consequently seek and manage information, and thus guarantee support for decision making.

Regarding the respondent who said that his system does not have the capacity to assist them in the management of the company, it is emphasized that this data is due to the fact that it is a family business and they do not see at that moment the acquisition of an operating system as an essential instrument, because they say they have their own means of control.

It was questioned if the volume of information added with the record of Block K may cause difficulties in the generation of the file for transmission to the Federal Revenue. All answered that the details required for the presentation are many and that the difficulties are inevitable.

Respondents also point out that the difficulties occur due to major modifications and forms of interpretation, since, for the most part, laws are exposed to users, but their functionality or applicability is not detailed. Time for adaptation is a major villain for completion Block K. It corroborates with Alves (2015) that the need to measure Production by Production Orders can make the process difficult, since the adjustments of what came doing so far are very labor intensive and most companies left to adjust themselves at the last moment. This has generated disorders.

Through the research, it was also verified that the professionals do not believe that this new system gives them less bureaucracy and reduce the workload. On the contrary, they emphasized that in the first moment there will be a considerable increase of work due to the requirements and, as the intersection of information is increasingly consistent, the attention tends to be more strongly demanded.

The second respondent stands out:

It is a new challenge that must be complied with, giving them information and adapting their systems according to the required layout. The same can be said about the bureaucracy, because it will not diminish in the beginning, because, even if everything is digitized, it is still necessary to hold a conference of all the data and information that must be passed on to the Tax authorities.

When asked whether to meet the new rules of Block K are using specialized company advice, to support employees in order to meet the needs and priorities of the company in relation to the requirement, all pointed out that it is still early for this, and opted to perform the process of adjustment initially with tools and own resources. However, what concerns organizations and converges to those factors pointed out by Bompan (2015) and Gomes (2014) is the exhibition of production secrets. This factor should still be extensively discussed internally, so that such information is not made public with the deployment of Block K.

The seventh questioning sought to identify whether the employees were provided training targeted to the use of the operating systems of the internal processes for the correct completion of the product technical data, the losses occurred in the production process, the production orders, the consumed inputs and the quantity produced, including industrialization, mandatory data to be presented in Block K. The results are shown in Table 4.

Table 4

**Providing training to employees targeted to the use of the operating systems of the internal processes for the correct completion of the product technical data**

|     | Interviewees | Frequency |
|-----|--------------|-----------|
| Yes | 4            | 80%       |
| No  | 1            | 20%       |

**Note.** Source: Research Data.

It is verified that 80% provide the use of automated technological solutions to improve all the processes that involve the team, considering the immense amount of information and the data to be completed.

For these respondents, the training targeted to the use of technological solutions that aim to give greater agility and safety to the internal processes, besides guaranteeing the updating of the professionals, also favor the leveling of the knowledge of the team on the treated topic. They facilitate common understanding and the adoption of working standards.

The respondents point out that the method used was the qualification of employees through specific training courses. In this context, the updating of professionals has become a basic necessity, in order to allow employees to act in an active and safe, without failures, in order to minimize impacts and risks, as well as guarantee adherence to new mandatory processes.

Companies unanimously believe that it is essential to invest in updating and training their employees to ensure the formation of high-performance teams that need prior preparation to comply with the new rules in a correct way, as well as ensuring image and reputation building from the company.

Thus, it was questioned whether there is the use of the company's internal communication channels, in order to keep employees updated, such as distribution of relevant materials, articles and news on the topic, in an ongoing process of learning. The results are shown in Table 5.

Table 5

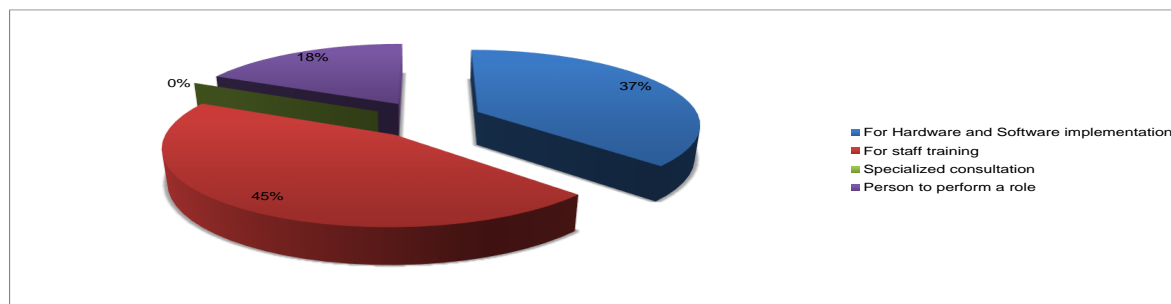
**Use of the company's internal communication channels**

|     | Interviewees | Frequency |
|-----|--------------|-----------|
| Yes | 3            | 60%       |
| No  | 2            | 40%       |

**Note.** Source: Research Data.

It can be noted that, for 60% of the interviewees, it is interesting to use the company's internal communication channels, to keep employees updated, with the distribution of materials, articles, and relevant news, which favors the creation of a culture focused on professional development. According to Table 5, 40% of companies do not use training and internal communication.

It was then questioned whether there had been any contracting of third party services in order to meet Block K. The result can be seen in Figure 2.



**Figure 2.** Contracting third-party services

Source: Research Data.

It can be noted that more frequently than the contracting for the deployment of training of personnel that totaled a percentage of 45%. For 37% of the interviewees, the contracting of Hardware and Software deployment was of greater necessity. 18% of the respondents described that it is necessary to hire people to perform the function. In this questioning the respondent had the possibility to mark more than one alternative.

In the sequence, it was argued that they pointed out the difficulties encountered in the deployment of Block K regarding inventory control. Likewise, respondents could point to more than one alternative. The results are shown in Table 6.

Table 6

**Difficulties encountered for the deployment of Block K regarding inventory control**

|   | Interviewees | Frequency |
|---|--------------|-----------|
| Mapping Inventory Movements                     | 5            | 27%       |
| Softwares adjustment                            | 4            | 21%       |
| Existing transactions with third parties        | 2            | 10%       |
| Company culture in relation to a committed team | 2            | 10%       |
| Review of goods and products register           | 5            | 27%       |
| Suitable systems to meet SPED requirements.     | 1            | 5%        |

**Note.** Source: Research Data.

Based on the data collected by the questionnaire, it can be verified that the mapping of the productive process, which includes the movement of the inventory and the losses or breaks of the products, revision of the register of the goods and products and the adjustment of the software of inventory control, as to the purchase and sale of products, are the greatest difficulties that companies have had, or have, for the deployment of Block K.

This is related to the complexity that organizations have in relation to the productive process and that, in fact, contributes to difficult the correct presentation of the data to the federal and inspection bodies. The results are in line with the assumptions presented by Leão (2015) and Alves (2015), who propose the need for planning regarding processes and business organization. Based on the detailing of these processes, it is possible to order the internal actions that will culminate in the good performance for the deployment of this tool.

Finally, it was sought to identify by open question the existence of difficulties encountered, in addition to those cited. 20% of the respondents answered that they are not facing difficulty regarding the questioned situation.

Another 60% answered that one of the main difficulties they are facing is the lack of information and training by the inspection bodies regarding the execution of the procedures required by Block K.

They also pointed out that the change in process ends up being one of the main difficulties encountered. The other 20% of respondents answered that the difficulty is related to the financial situation of the company, due to the lack of resources provided to implement this new process, as well as to the deployment of suitable software to proceed with the process required by Block K.

With regard to the benefits brought about by this requirement, it was verified that 80% of the respondents state that there are already positive impacts, mainly on the part of internal controls, such as inventory control.

The third respondent points out that:

Adjustments have mainly taken place in the inventory part, in the typing of the quantity of products, invoice and taxation, if the user does not correctly register the system will accuse error, [...] today the thing is more loving, with this it is sought and it is necessary to have a good and effective control.

The remaining 20% of the respondents stated that they had not had any kind of benefit with the deployment of Block K. They affirm that the company already had internal control over the movement of the inventory.

It can be noted, in this context, that the results diverge, in part, from the studies of Fernandes (2015) and Jesus (2015). Both point out the deployment of Block K as a tool that can contribute to tax management in organizations. Thus, despite allowing greater control of taxes, due to the need for detail, the possibility of tax savings can not be seen in its deployment.

This section presented the data collected in this research, as well as its tabulation and analysis. The following section addresses the study's findings and recommendations for future studies.

## 5 CONCLUSIONS

In the current scenario it is clear that the technology guides and it performs great changes. And these required in companies of the most varied areas almost instant improvement.

This study aimed to identify the adjustments required for the deployment of Block K in the SPED Fiscal in companies. For this, it was investigated through questionnaires applied to the person responsible for the fiscal sector of each company, which composes the research sample. Questionnaires were sent by e-mail to six organizations. Of these five returned with the instrument fully answered.

The companies noticed difficulties in the deployment of Block K in SPED. These difficulties stand out, for example, problems with the internal system, configuration failures, incomplete registers and lack of knowledge to work with SPED. The support to overcome these difficulties was found in training courses

It was verified that the mapping of the productive process and the inventory movements were pointed out as the main difficulty. This difficulty is directly linked to inventory control, which in many cases is not done in an orderly manner. Another important factor to be highlighted is the review of the register of goods and products. This event is often not efficient and accurate. It entails the counting error and, consequently, difficulty in performing the delivery of the data to Block K.

In the process of deployment companies needed to invest mainly in training of the personnel involved and in technology, business management software. Thus, it is inferred that Block K brought greater need for evolution and adjustment to new requirements and companies needed to invest in knowledge and technology, which are the basis for the evolution.

Systems must be prepared and able to generate the information at the level of detail of Block K and this information must be generated safely. Those responsible for the area must run against time so that the information can be transmitted consistently and be consistent with the company's balance sheet figures. A good management system will certainly help to make this control, companies will have more accurate information about their production, and will, in fact, know the costs of their production processes.

The perception of the responsible for the deployment of the project was decisive in order to be successful in the process of deployment and adjustment to Block K. It is possible to note prominence in the existing database, internal controls and training of the employees involved in the process. It can be noted with this the importance of working with internal controls, investing in infrastructure, improving the existing database in the company.

Other highlights are investments in information technology and operating system, as well as improving and professionalizing the team involved. It can be noted the importance that the interviewees gave in investing in the systematization of the company with investments in internal controls and with the intention of forming a consistent and reliable database. After the formation and maintenance of this secure database, the company will be able to succeed in the deployment of Block K, in addition to enjoying this formed base, for the sake of its performance.

It is concluded, even considering the difficulties listed for the deployment of Block K, that the system brings benefits that positively impact the management of companies, as it strengthens the system of internal controls, and provides greater reliability in the information generated. This result reinforces the importance of the company is improving to the most by investing in knowledge and technology, to be prepared for evolution.

Block K refers to working with prevention and control of losses from the most diverse origins, made possible by the lack of more rigorous control. The cost of this adjustment and the deployment of this obligation will be smaller if compared to the benefits of the organization of the company, thus providing a control tool.

Block K should be seen as a business opportunity and no longer seen as a new obligation imposed by the tax authorities for companies.

As limitations of the study it is highlighted that, due to the tax diversity applicable to the states, the results can not be generalized. Another limitation is the number of respondents, which can generate some distortions in results and analyzes.

It is recommended, for future works, observed the results obtained, that research in this area be continuous. Thus, they present as suggestions for future works focusing on Block K:

- Reapply the questionnaire into a larger sample;
- Conduct a study as soon as all companies are fitted in Block K;
- Conduct a study on the adjustment and compatibility of the information systems regarding the deployment of Block K;
- Conduct a study to verify the benefits that SPED has brought to companies.

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## COMPANY VALUATION: OBJECTIVES ASPECTS IN THE VERIFICATION OF ECONOMIC VALUE OF INTANGIBLES ASSETS\*

**NIVALDO JOÃO DOS SANTOS**

*Doctor in Production Engineering from the Federal University of Santa Catarina (UFSC). Accountant, Partner-Director of Peritia Contadores Associados S/S. Address: Rua Araújo Figueiredo, 119, sala 1104 | Centro | 88010-520 | Florianópolis/SC | Brazil.*

*E-mail: [nivaldo@peritiacontadores.com.br](mailto:nivaldo@peritiacontadores.com.br)*

### ABSTRACT

This article discusses objective aspects in determining economic value to the intangible assets created by the company. Such assets, housed under the name of intellectual capital or goodwill, are represented by the brand, the good customer service and the prime location of business, among others. This is a case study of company and business valuation within the auto industry, located in southern Brazil, involving judicial determination. The methodological procedures involved the economic valuation of the company in two ways: a) as a set of equity assets and b) as a business generator of free cash flow over the years. It was shown that the refinement of information about the operating assets and the proper understanding of the relevant costs and expenses to particular business are essential for determining the fair value of the company and offers more objectivity to the calculation of the related economic value to the set of intangibles assets created.

**Keywords:** Company valuation. Intellectual capital. Goodwill valuation. Goodwill. Intangibles assets.

### 1 INTRODUCTION

The economic valuation of closely-held companies is a complex activity, usually requested by experienced professionals. Often it presents itself with questionable numbers and, often, it ends up submitted to the judicial decision. In part, according to Ornelas (2003), this situation stems from the fragility of the information source for the valuation work, essentially originating from the accounting system of companies, especially when it comes to small and medium size enterprises. Such a contingent of mercantile companies, in general, does not have a sufficiently structured accounting system to efficiently respond to the demands of information and data required by the work involving the company valuation.

An important factor generating controversies about the results of valuations refers to the value attributed, or lack thereof, to the intangible assets created, called intellectual capital, or goodwill, which are perceived by the brand, commercial name, good customer service, prime location and know-how. In relation to such assets, the retiring partners, heirs, widows and procurators have high expectations, in the sense of being cherished with large sums. Such expectation does not always materialize. To a great extent, this hope is fueled by the abundant literature in the field of corporate management and corporate law, which sometimes exacerbate the economic importance of such intangible assets, without, however, associating them with business profitability, and absent from linking to assets, revenue and profit (Damodaran, 2007).

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The purpose of this article is to discuss objective aspects in the determination of economic value for the intangible assets created by the company, within the scope of the process of valuation of closely-held companies, especially small and medium size enterprises (PME). The main contribution of this study consists of gathering and synthesizing concepts and demonstrating a well-founded alternative to the calculation of goodwill. The importance of initiatives of this nature consists mainly in approaching and relating the theoretical basis to the observation of reality.

## 2 REVISION OF THE LITERATURE

The main concepts and theoretical discussions used in the practical applications of this work, specifically the valuation of companies by the approaches of assets and income, determination of the discount rate, the concept of economic value of the business and the question of the intangible created, known as goodwill.

### 2.1 Intangible assets

In relation to the equity of the company, an intangible asset must be identifiable and cannot be confused with the gain derived from the expectation of future profitability of the business, called goodwill, as required by Technical Pronouncement CPC 04 (R1) (Comitê de Pronunciamentos Contábeis, 2010).

Several intangible assets are created throughout the existence of the company and eventually become economic benefits, such as brand name, brand, list of customers, trained team, prime location (point), among others. Such set of attributes is also called goodwill (Santos, 2011). However, they are not recognized in the financial statements, unless they are acquired (Churyk & Mantzke, 2008).

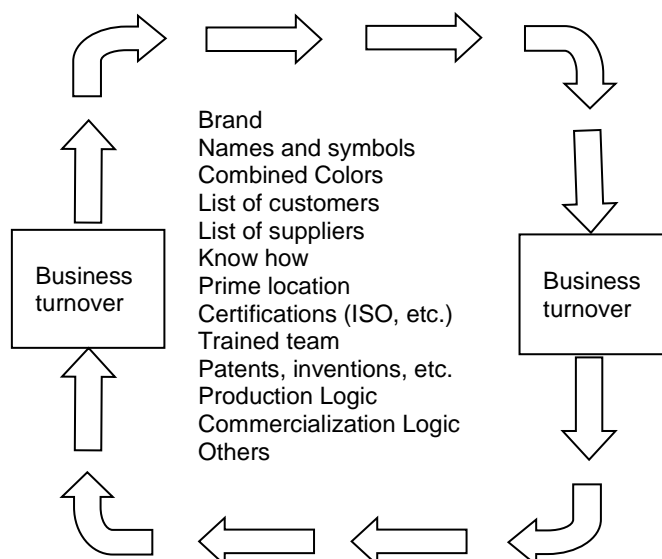
Brazilian corporate law, specifically the Civil Code, Law 10,406/2002, Article 1,031, provides that in the company valuation, for the purposes of settlement of the equity interest, all tangible and intangible assets acquired or created must be considered, shown by means of a special balance sheet. For Sá (2000), the intangible assets result from the increase of functions of the material capital itself and the agents that act on it to boost it and increase the capacity of utility or effectiveness, for the benefit of the business. On the complexity of the isolated measurement of created intangible assets, Clarkson (2000) argues that possibly accounting for identifiable intangible assets does not offer as much insecurity as the isolated valuation of intellectual capital, which is regarded as a comprehensive set of factors of human creation.

According to Watson (2010), many authors consider individualized monetary valuation of intangibles as an effort with debatable benefits. Considering that the amounts cannot be portrayed in financial statements, they are not accepted as collateral for loans and investors are essentially interested in the net leftovers that the business can provide.

In order to evaluate people's opinions about the importance of the components of intellectual capital within their organizations, Axile-Ortiz (2013) performed a survey based on attitudinal tests and concluded that the perception of the economic value of the components of intellectual capital varies in magnitude, depending on the context, which is determined by the geographic area in which it operates, the industry sector, the operational particularities and the size of the organization.

The author states that only human beings can develop intangible assets. The only possible way to manage them is by awareness of their composition and recognition of their value in the organization. They are intrinsic to the human being. Companies cannot incorporate them as external agents, transfer them, package them, market them or buy them in isolation.

The business establishment, constituted of tangible patrimonial assets, by itself, is not the source of creation and sustentation of value for the intellectual capital. The intangible assets are created, strengthened, or destroyed by the dynamics or turnover of the business, as illustrated in Figure 1.



**Figure 1.** Creation and strengthening of intangible assets

Source: Prepared by the author.

Most of the intangible assets that drive the company's profitability are created by the development of the thriving business and have strong interrelationships (Chareonsuk & Chansa-ngavej, 2010). Because of this dependence, most of the intangible assets disappear or lose monetary expression if the company goes bankrupt. In this condition, the brand and name are stigmatized before the market, the list of customers empties, suppliers are afraid to sell and, naturally, the staff dissolves and pursues a career in other companies. This movement compromises the synergies and corporate advantages settled over the years.

Unprofitable or deficient businesses do not direct monetary expression to the intangible assets created because they emerge economically from profits. It should be emphasized that the profits of an efficient business must be higher than that of the proceeds from tangible assets if they are liquidated and invested in low risk financial assets.

## 2.2 Company valuation approaches

The most commonly cited valuation methodologies and approaches are: valuation based on asset value, valuation based on income, valuation based on multiples of comparable transactions and valuation based on options. According to Rabiński (1996), the valuation of a going concern should reflect the value of real estate, machinery and equipment, working capital and all other assets that contribute to the exploration of the business, including the intangible assets created. For the purposes of this review, the focus of discussion will be limited to valuations based on assets and business income.

### 2.2.1 Valuation based on the value of the assets

According to Harris (1997), the ways to measure monetary assets that stand out most are: valuation based on equity value; valuation based on the adjusted equity value; valuation based on the replacement value; valuation based on the settlement value. The equity value method is the simplest of valuations (Robert, 2006). Hawkins (2002) explains that the weak point of the equity value method is its subordination to accounting standards, specifically those that guide the records of operations at their historical cost.

In the valuation based on the adjusted equity value, it is necessary to review and adjust the equity assets, including determining the real value of the intangible assets, such as gain and patents. Any goodwill and premium value records for the acquisition should also be examined and expunged in order to make the special balance sheet value more realistic (Robert, 2006).

In the valuation method based on the replacement value, also referred to as the depreciated replacement cost method, the asset is valued at the cost of its acquisition or reproduction, net of depreciation. Depreciation is defined as the expected useful life of the asset

(Harris, 1997; Lorenz & Lützkendorf, 2008).

The valuation based on the settlement value adopts the market value and consists of determining the balance amounts in terms of net amounts that would be reached in a quick sale or forced sale (Robert, 2006). Helfert (2000) warns that the adoption of the settlement value method applies to an abnormal situation, influenced by time pressures and other constraints, as in the case of sale of bankrupt assets.

The new Brazilian Code of Civil Procedure, Law no. 13,105/2015, art. 606, which became effective in March 2016, establishes a criterion for the indemnification of equity interests to a retiring partner, in determining that "the tangible and intangible assets and rights of the asset, at the exit price, in addition to the liability also to be calculated in the same way" In addition, he expressed concern about the competence of the valuator in determining that the "appointment of the expert would fall preferentially on a specialist in company valuation".

When evaluating a company considering only the identified inventory, the valuation expert disregards the knowledge of the monetary expression of assets that form the intellectual capital, such as goodwill, brand, business synergies and other intangibles created. To avoid such partiality in the company valuation, it is necessary to determine the economic value of the business.

### *2.2.2 Valuation based on the value of the income*

According to Leitner (2005), the value of a closely-held company is based on the return on capital invested and the market perception about its future. For Verginis & Taylor (2004), the income capitalization approach captures the value of a society better than any other approach. Two methods of company valuation are more employed when determining future incomes: valuation based on the value of discounted free cash flow and valuation based on the value of the dividends. In this study the discussion will focus on the valuation based on the discounted free cash flow.

According to Luerhman (2006), Robert (2006), the discounted cash flow method (CDF) is a valuation process in which future free cash flows, including the residual value of the assets, are converted to present value, using a discount rate.

Another key point in the application of the FCD method is the definition of the discount rate. Clarkson (2000) states that the company's cost of capital is represented by the individual cost of capital sources, weighted according to their importance in the capital structure of the company.

In a conceptual simplification, Ross, Westerfield & Jaffe (2007) state that the discount rate is a kind of interest rate used to discount cash flows at their present value and that should be the one that best reflects the opportunity cost and the risks.

## **3 METHODOLOGY**

This study is characterized as a case study. It deals with the company and business valuation within the auto industry, located in the Southern Region of Brazil, involving judicial determination. The methodological procedures for company object valuation of the present case study were based on the system described by Santos (2011).

As a result of research in company valuation reports, the systematics consists of gathering and synthesizing concepts about business and company valuation, making the valuation provisions compatible with Brazilian corporate law standards, specifically those recommended by the Civil Code and Brazilian Code of Civil Procedure. Also, according to Santos (2011), the search for the assets that contribute to the determination of the value of the company revealed three fundamental aspects that should be examined in isolation. These aspects are:

**a) Relations of society:** this aspect deals with the examination and consideration of contractual or statutory provisions; of the dates of the events (exclusion, retirement or death); of the advances and loans of partners, as well as being guided by the main legal and accounting systems for determination of partner or stockholder's assets.

**b) Business establishment:** he business establishment houses the tangible and intangible assets acquired or created by the company, such as cash equivalents, receivables, inventories, real estate, machinery, equipment, brands and use rights, among others. These elements give the support to the realization or exploration of the business.

**c) Business:** this is the object that the company proposes to undertake, operate or explore, with the purpose of generating economic profit. It is the business that creates or destroys value for the partner or stockholder. The criterion of valuation of the business is based on the measurement of the expectation of profits (income).

In order to determine the value of the company, it is necessary to evaluate the equity assets (assets) and measure the expectation of profits, benefits and revenues of the business, in terms of free cash generation. Table 1 lists the activities to determine the value of the company and equity interests.

Table 1

**Activities to determine the value of the company and equity interests**

| Specification |   |
|---------------|---|
| 1             | Setting the base date   |
| 2             | Identification of goods and rights                              |
| 3             | Valuation of identified goods and rights                        |
| 4             | Identification of non-operating assets                          |
| 5             | Measurement of the potential of net profit and cash surpluses   |
| 6             | Determination of the economic value of the company              |
| 7             | Measurement of goodwill   |
| 8             | Identification and measurement of company debts and obligations |
| 9             | Preparation of the determination balance sheet or special       |
| 10            | Determination of the value of the quotas or lot of shares       |

**Note.**Source: Adaptada de Santos. N. J. (2011) *Metodologia para determinação do valor econômico de empresas de capital fechado em processos de apuração de haveres de sócio*. Tese de Doutorado em Engenharia de Produção, Universidade Federal de Santa Catarina (UFSC), Florianópolis, SC, Brasil.

**1) Definition of the base date:** the value of a company is specific to a certain date. The base date or valuation date is the time point, chronological delimiter of the existence of the equity assets.

**2) Identification of assets and rights:** refers to the inventory activity of tangible and intangible assets, susceptible of objective monetary expression that will be submitted to the valuation.

**3) Valuation of assets, rights and debts identified:** the valuation of the assets must adopt different monetary measurement criteria, considering their typology and the operational characteristics. Table 2 presents the guidelines or criteria for the valuation of assets, rights, debts and obligations.

Table 2

**Criteria for equity asset valuation**

| Equity assets                    | Valuation criteria                    |
|----------------------------------|---------------------------------------|
| <b>Assets and rights</b>         |                                       |
| Cash and cash equivalents        | Book value.                           |
| Credits                          | Book value adjusted to present value. |
| Inventories                      | Market value less marketing expenses. |
| Expenditure for subsequent years | Book value.                           |

**To be continued**

Table 1 (continued)

| Equity assets   | Valuation criteria  |
|---|---|
| <b>Assets and rights</b>                              |   |
| Investments   | Book value, equity accounting value or market value.                                |
| Fixed assets  | Land - market value.  |
|   | Buildings, furniture and equipment - Value of reproduction (replacement) or market. |
| Intangible  | Economic value.   |
| Financial leasing                                     | Cost. Record the installments to be paid as debt.                                   |
| <b>Debts and obligations</b>                          |   |
| Suppliers payable, taxes payable and salaries payable | Book value.   |
| Loans and financing payable                           | Present value, as if they were settled at the valuation date.                       |
| Tax, labor and civil risks                            | Value based on specific surveys.  |

**Note.** Source: Adaptada de Santos, N. J. (2011) *Metodologia para determinação do valor econômico de empresas de capital fechado em processos de apuração de haveres de sócio*. Tese de Doutorado em Engenharia de Produção, Universidade Federal de Santa Catarina (UFSC), Florianópolis, SC, Brasil.

**4) Identification of non-operating assets:** Assets and rights that have no influence on the generation of operating revenues, such as leaseholds, redundant equipment and installations without justification, among others, should be segregated. For the purpose of valuing the company, such assets may be made available for sale immediately (Damodaran, 2007).

**5) Measurement of profit potential and net cash surplus:** this includes the estimate of billing, costs, expenses, taxes and net cash surplus, using the discounted cash flow methodology, which is summarized as follows:

Profit before interest and taxes (EBIT)  
 (-) Taxes on profit  
 (+) Depreciation and other charges that do not involve cash outflows  
 (-) Need for additional working capital  
 (-) Thefts with enlargement or replacement of assets (CAPEX - *capital expenditure*)  
 (+) Residual value of assets  
**= Free cash flow**

The discount rate on future earnings should be stipulated with the consent of partners and stockholders, so that variables can be found without major difficulties. Santos (2011) proposes the following formula:

$$TD = (I + R + P) \times (1-T) \quad (1)$$

On what:

TD = Discount rate  
 I = Rate of remuneration in application of low risk  
 R = Business risk premium  
 P = Country risk premium  
 T = Income tax rate on financial investments

The rate resulting from this formula refers exclusively to the expectation of remuneration of equity capital. This is justified because in this valuation methodology, the debts and obligations of the company are considered at their valuation date, according to Law 13,105/2015. Therefore, it does not matter the cost of third-party capital.

**6) Determination of the economic value of the company:** it is composed of specific elements identified and previously measured, as follows.

Potential for profits and net surplus cash

(+) Cash and cash equivalents

(+) Non-operating assets

**(=) Economic value of the company**

The economic value found in this expression should be compared with the value of the assets valued and adopted as the value of the company, the largest.

**7) Measurement of goodwill:** the value of the intangible asset created - goodwill - is contained in the economic value of the company. This monetary expression is obtained by the difference between the economic value of the company and the value of the identified assets valued.

Economic value of the company

(-) Value of assets identified and valued

**= Value of goodwill**

In the situation where the value of the equity assets identified is equal to or greater than the economic value of the company, it is then said that there is no monetary expression for the goodwill.

**8) Identification and measurement of debts and obligations of the company:** In the system in presentation the debts and obligations are identified and valued as if they were settled at the base date of the valuation of the company.

**9) Preparation of the determination balance sheet:** this is a specific balance sheet, which will contain:

Value of assets identified and valued

(+) Intangible assets created (*goodwill*)

(-) Debts and obligations

**= Net balance corresponds to the total value of the equity interests**

**10) Determination of the value of the quotas or lot of shares:** the value of the individual equity interest will be calculated based on the percentage of the capital that the retiring partner owns.

#### 4 ECONOMIC VALUATION OF THE COMPANY GAMA – CASE STUDY

The case presented below refers to a real situation of company valuation, prepared in compliance with the judicial determination. Company Gama was one of the assets that constituted the bankrupt estate of a business group. At the valuation date it was operating normally, and at full capacity, but should be sold to clear debts from the bankrupt. The name of the company as well as the values involved are not characterized by confidentiality issues.

##### 4.1 Valuation procedures

The company Gama is a closely-held company, of medium size, was established in 1978 and is located in Santa Catarina, Southern Region of Brazil. Its business is to provide solutions in projects and technology in the market of thermosets and thermoplastics, destined mainly to the auto industry.

The assumptions and valuation guidelines were defined by the valuation expert, listening to the directors and executives of the company, as presented in Table 5, below. Based on the

data provided and information provided by the Company Gama, the procedures and the calculations recommended in the systematic of the economic company valuation, available in Santos (2011), were performed:

**1) Definition of the base date:** the base date of the company valuation was defined as 03/31/2016, when the valuation work began.

**2) Identification of assets and rights:** the procedure for identifying the collection of assets and rights adopted the balance sheet prepared at the base date, received administrative and production data to complete the inventory.

**3) Valuation of identified assets and rights:** the assets included in the accounting balance sheet were reviewed and valued, respecting the guidelines and criteria presented in Table 2. The revision of the values consisted in confirming the existence of the asset or right and verifying the realization capacity in cash of the equity asset. After these procedures, the special balance sheet, presented in Table 3, was prepared.

Table 3

**Special Balance Sheet –Company Gama- \$ 1.00**

| Asset  | Value         | Liabilities                    | Value         |
|--|---------------|--------------------------------|---------------|
| <b>Current assets</b>                                    | <b>42,548</b> | <b>Current liabilities</b>     | <b>25,263</b> |
| Cash and cash equivalents                                | 18,260        | Suppliers payable              | 15,372        |
| Accounts receivable from customers                       | 12,450        | Taxes to pay                   | 9,891         |
| Taxes recoverable  | 3,219         | <b>Non-current liabilities</b> | <b>26,811</b> |
| Other values to be performed                             | 1,891         | Taxes in installments          | 9,432         |
| Inventories  | 6,564         | Financing payable              | 17,379        |
| Expenditure for subsequent years                         | 163           |                                |               |
| <b>Non-current assets</b>                                | <b>52,248</b> | <b>Net position</b>            | <b>42,722</b> |
| <b>Long-term receivables</b>                             | <b>4,640</b>  |                                |               |
| Long-term receivable credits                             | 3,171         |                                |               |
| Compulsory deposits                                      | 1,469         |                                |               |
| Investments  | 12            |                                |               |
| Fixed assets   | <b>47,596</b> |                                |               |
| Real Estate  | 19,184        |                                |               |
| Buildings and improvements                               | 12,468        |                                |               |
| Vehicles   | 83            |                                |               |
| Machinery, equipment, facilities, furniture and utensils | 15,861        |                                |               |
| <b>Total assets</b>                                      | <b>94,796</b> | <b>Total liabilities</b>       | <b>94,796</b> |

**Note.** Source: Elaborated by the author with modified data of the company Gama.

**4) Identification of non-operating assets:** Long-term receivables, equity investments and a portion of Production Unit II land were treated as non-operating assets. This understanding was reached after analyzing the essentiality of these assets for the achievement of operating revenues from the business being exploited.

Table 4

**Non-operating assets – Company Gama - \$ 1.00**

| Description                        | Value R\$    |
|------------------------------------|--------------|
| Long-term receivable credits       | 3,171        |
| Compulsory deposits                | 1,469        |
| Investing in shares                | 12           |
| Part land Unit II - Compound Plant | 3,623        |
| <b>Total</b>                       | <b>8,274</b> |

**Note.** Source: Elaborated by the author with modified data of the company Gama.

**5) Measurement of the potential of profits and net cash surplus:** this part of the valuation comprised the following activities:

- critical analysis of revenues, costs and expenses;
- definition of the growth rate of revenues and projection horizon;
- identification of the form of taxation of profit;
- examination of compliance of documents and accounting books;
- identification of the need for additional working capital;
- identification of the need for replacement and expansion of fixed assets;
- determination of the terminal or residual value of fixed assets;
- definition of the discount rate.

A set of information, assumptions and guidelines for composing discounted cash flow (FCD) was defined in agreement with the company's managers, as shown in Table 5.

Table 5

**Information, assumptions and guidelines for composing the FCD**

| Specification   | Data/Information               |
|---|--------------------------------|
| EBIT 2016   | \$ 16,650                      |
| EBIT 2017   | \$ 17,775                      |
| EBIT 2018   | \$ 19,725                      |
| EBIT 2019   | \$ 20,130                      |
| Projection horizon  | 4 years, with perpetuity.      |
| Form of taxation of profit                                | Real profit                    |
| Depreciation/ Amortization allocated to cost and expenses | \$ 2,122                       |
| Income tax and social contribution on net profit          | 34%                            |
| Compliance of accounting documents and books              | Without reservations           |
| Need for additional working capital 2016                  | \$ 469                         |
| Need for additional working capital 2017                  | \$ 869                         |
| Need for additional working capital 2018                  | \$ 197                         |
| Need for additional working capital 2019                  | 0                              |
| Need to replacement and expansion of assets               | 9% on depreciable fixed assets |
| Terminal or residual value of assets                      | 0                              |
| Discount rate   | 17.10%                         |

**Note.** Source: Elaborated by the author with modified data of the company Gama.

The projection of operating revenues considered sales growth in the years 2017, 2018 and 2019, based on the sector study commissioned by the valuation expert. No new gains in productivity or savings were considered for productive efficiency.

For the establishment of the discount rate, the Brazilian government bond yield rate (SELIC), increased by 50%, was adopted, corresponding to the risk premium of the business. The percentage corresponding to country risk was considered implicit in said SELIC rate.

The calculation of the discounted cash flow was performed in two procedures. The first consisted of gathering the values that generate free cash in the periods, as shown in Table 6. The second procedure included calculating the present value of these free cash, using the discount rate stipulated in 17.10%.



Table 6  
**Calculation of Free Cash Flow - \$ 1.00**

| Specification  | 2016          | 2017          | 2018          | 2019 onwards  |
|--|---------------|---------------|---------------|---------------|
| EBIT   | 16,650        | 17,775        | 19,725        | 20,130        |
| (-) Income and social contribution taxes on net profit | (5,661)       | (6,044)       | (6,707)       | (6,844)       |
| (+) Depreciation of fixed assets                       | 2,122         | 2,122         | 2,122         | 2,557         |
| (-) Replacement and expansion of assets (CAPEX)        | (2,557)       | (2,557)       | (2,557)       | (2,557)       |
| (-) Need for additional working capital                | (469)         | (869)         | (197)         | -             |
| <b>Free cash flow</b>                                  | <b>10,085</b> | <b>10,427</b> | <b>12,386</b> | <b>13,286</b> |

**Note.** Source: Elaborated by the author with modified data of the company Gama.

As specified in Table 7 below, the final cash balances in the projected periods were translated to present value. From the fourth year the depreciation value was equal to the value of CAPEX. Also from the fourth year the values were transformed into perpetuity, which is also understood as the residual or terminal value of the operating assets used in the cash generation.

Table 7  
**Discounted cash flow - \$ 1.00**

| Specification        | 2016   | 2017   | 2018          | 2019 onwards |
|----------------------|--------|--------|---------------|--------------|
| Free cash flow       | 10,085 | 10,427 | 12,386        | 13,286       |
| Discount factor      | 0.89   | 0.76   | 0.65          | 3.79         |
| Discounted cash flow | 8,959  | 7,910  | 8,024         | 50,334       |
| <b>Total</b>         |        |        | <b>75,227</b> |              |

**Note.** Source: Elaborated by the author with modified data of the company Gama.

**6) Determination of the economic value of the company:** based on the values found in previous provisions, the economic value of the company was established. Table 8 shows the assets that make up this value.

Table 8  
**Economic value of the company – \$ 1.00**

| Specification                             | Value          |
|---|----------------|
| Potential of profits and net surplus cash | 75,227         |
| Cash and cash equivalents                 | 18,260         |
| Non-operating assets                      | 8,274          |
| <b>Economic value of the company</b>      | <b>101,762</b> |

**Note.** Source: Elaborated by the author with modified data of the company Gama.

It should be emphasized that by adopting the income approach to evaluate equity interest, using the discounted cash flow methodology, the evaluator is not attributing future profits to the retiring partner or the seller of the company. Discounted cash flow complies with the task of measuring the benefits and monetary income arising from a profitable business left to the acquiring or remaining partners.

**7) Measurement of goodwill:** it is determined by the difference between the economic value of the company and the value of the assets identified and valued, as shown in Table 9.

Table 9  
**Value of goodwill – \$ 1.00**

| Specification                    | Value        |
|----------------------------------|--------------|
| Economic value of the company    | 101,762      |
| (-) Assets identified and valued | (94,796)     |
| <b>Value of goodwill</b>         | <b>6,965</b> |

**Note.** Source: Elaborated by the author with modified data of the company Gama.

**8) Identification and measurement of debts and obligations of the company:** have been confirmed and are expressed in values of the date of the company valuation, as specified in Table 10.

Table 10  
**Value of debts and obligations of the company – \$ 1.00**

| Specification                  | Value         |
|--------------------------------|---------------|
| <b>Current liabilities</b>     | <b>25,263</b> |
| Suppliers payable              | 15,372        |
| Taxes to pay                   | 9,891         |
| <b>Non-current liabilities</b> | <b>26,811</b> |
| Taxes in installments          | 9,432         |
| Financing payable              | 17,379        |
| <b>Total</b>                   | <b>52,074</b> |

**Note.** Source: Elaborated by the author with modified data of the company Gama.

**9) Preparation of the determination balance sheet:** this procedure consists of demonstrating all assets and rights, tangible and intangible, including the value of goodwill, as well as the debts and obligations in current values, basis of calculation of the equity interest, according to the new Brazilian Civil Procedure Code. Table 11 shows the main values of the determination balance sheet or special.

Table 11  
**Determination balance sheet or special summary - \$ 1.00**

| Specification                      | Value          |
|------------------------------------|----------------|
| Cash, credits and inventory        | 42,548         |
| Achievable in the long run         | 4,640          |
| Investments                        | 12             |
| Immobilized                        | 47,596         |
| Intangible (Goodwill)              | 6,965          |
| <b>Total assets and rights</b>     | <b>101,762</b> |
| <b>Total debts and obligations</b> | <b>52,074</b>  |
| <b>Net position</b>                | <b>49,688</b>  |

**Note.** Source: Elaborated by the author with modified data of the company Gama.

**10) Determination of the value of quotas or lot of shares:** The purpose of the valuation under study was to determine the total value of the company, specifically the new value of the total capital quotas, as specified in Table 12.

Table 12  
**New value of capital quotas**

| Specification                      | Value          |
|------------------------------------|----------------|
| Assets identified and valued       | 94,796         |
| <i>Goodwill</i>                    | 6,965          |
| <b>Subtotal</b>                    | <b>101,762</b> |
| (-) Debts and obligations          | (52,074)       |
| <b>New value of capital quotas</b> | <b>49,688</b>  |

**Note.** Source: Elaborated by the author with modified data of the company Gama.

It can be seen that the new value of the capital quotas contains a relevant portion of 14%, which refers to the value of goodwill. Thus, it is true to say that profitable deals provide attractive remuneration to the invested capital and at the same time value the individual equity interests.

#### **4.2 Analysis of results: objective aspects in the verification of the economic value of intangible assets**

The effort employed in the calculations previously presented aimed at reducing the subjective character of the procedures that culminate in the economic value of the company. Coincidentally, the monetary expression attributed to goodwill resulted from accounting and mathematical treatments. It involved primarily billing revenue, costs, operating expenses and taxes pertaining to the business specifically.

The value of the goodwill added to the other equity assets of the company Gama corresponds to the excess portion that the profitable business is capable of generating when faced with the value of the respective assets required to achieve the business being exploited. The number found did not depend on personal qualitative perceptions or views of interest groups. The method used exclusively representative values of the generation capacity of profits, considering sector factors, national economic and social variables, as well as the history of production and sales.

The valuation process of the company Gama did not consider the individualization of values concerning the intangible attributes, such as brand name, brand, know-how, prime location and trained team. The positioning was due to the lack of interest of the managers for such information, considering that the procedures for the disposal of the company do not include this detail. Also contributing to such a decision was the fact that the valuation methods then available were essentially subjective and frankly debatable. Intangible attributes are interrelated and depend on each other; they argue (Chareonsuk & Chansa-ngavej, 2010). Under these conditions, such elements have value for the set. In isolation they lose objective monetary expression.

## **5 CONCLUSION**

The purpose of this article was to discuss objective aspects in the determination of economic value for the intangible elements created by the company. A case study was carried out involving a medium size private enterprise, which operates in the auto parts area. The valuation process of the company Gama adopted two traditional and widely considered approaches: asset approach and income approach.

The measures concerning the approach to the assets included the valuation of the patrimonial elements identified. They involved tangible and intangible goods and rights. The properties were valued at market values and the debts were raised and valued at the valuation date of the company. Such treatment fully complied with the Brazilian laws, in relation to the valuation of mercantile companies. However, under these conditions, it would be absent to measure the monetary expression of the intangible elements created by the turnover of the business.

The purpose of the income approach was to determine the value of the business, in which the numeric expression corresponding to the expected future profits, benefits and economic income was presented. The result found in this procedure was used to determine the value of goodwill, considering that such number can only be found indirectly, by comparing the values found in the two approaches. Thus, in the valuation of the economic value methodology, the value of goodwill is a positive difference arising from the profitable business, whose present value exceeds the value of the goods and rights identified (Hendriksen & Breda, 1992).

The study revealed that certain valuation measures are essential for an adequate survey of the monetary expression of the business. They refer to the critical examination of revenues, costs, expenses and taxes, in order to refine the numbers that relate to the business being valued. The accounting reports naturally contain values that are independent of the business,

such as non-operating revenues, court indemnities, fines and attorneys' fees, among others, which have been expurgated from the calculations under discussion.

Knowledge of industry performance indicators, national economic perspectives, and the company's own strategic planning under valuation served as a basis for estimating revenue growth.

The form of valuation adopted in the case of the company Gama provided objectivity to the calculations and values found because it was determined from numbers directly related to the business explored. The monetary expression of goodwill did not depend on personal scores or representative concepts of interest groups, except for business planning estimates.

The individual economic value of intangible elements, such as name, privileged location, trained team and know-how, among others, was not calculated, due to the lack of interest of the managers. In addition, research indicates that such elements are interrelated and dependent on each other to generate business advantage and competitiveness.

As a suggestion for the next studies, it is proposed to apply the valuation methodology by economic value in companies that operate in other economic activities, with the purpose of verifying their applicability in general. Research should also be performed aiming at the formulation of objective criteria for calculating the individual monetary expression of the intangible elements created by the turnover of the business.

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## EFFECTS OF THE PSYCHOLOGICAL CONTRACT ON AUDITORS' AFFECTIVITY AND JOB SATISFACTION

### VANDERLEI DOS SANTOS

*Doctoral Candidate in the Accountancy Post-graduation Program of Federal University of Santa Catarina (UFSC). Professor at Santa Catarina State University (UDESC). Address: Campus Reitor João David Ferreira Lima, s/n | Trindade | 88040-900 | Florianópolis/SC | Brazil.*

**E-mail:** [vanderleidossantos09@gmail.com](mailto:vanderleidossantos09@gmail.com)

### CELLIANE FERRAZ PAZETTO

*Master Candidate in the Accountancy Post-graduation Program of The Federal University of Santa Catarina (UFSC). Address: Campus Reitor João David Ferreira Lima, s/n | Trindade | 88040-900 | Florianópolis/SC | Brazil.*

**E-mail:** [cellianeferraz@gmail.com](mailto:cellianeferraz@gmail.com)

### NICOLLE RAITZ WILVERT

*Bachelor in Accounting Sciences by The Federal University of Santa Catarina (UFSC). Address: Campus Reitor João David Ferreira Lima, s/n | Trindade | 88040-900 | Florianópolis/SC | Brazil.*

**E-mail:** [nicolleraitzw@gmail.com](mailto:nicolleraitzw@gmail.com)

### ILSE MARIA BEUREN

*Doctor in Controllershship and Accountancy by FEA/USP. Professor in the Accountancy Post-graduation Program of The Federal University of Santa Catarina (UFSC). Address: Campus Reitor João David Ferreira Lima, s/n | Trindade | 88040-970 | Florianópolis/SC | Brazil.*

**E-mail:** [ilse.beuren@gmail.com](mailto:ilse.beuren@gmail.com)

## ABSTRACT

In addition to formal contracts between employees and employers, there are psychological contracts regarding individual beliefs on reciprocal obligations. The goal of this study is to verify the effects of the psychological contract on job satisfaction, mediated by the auditors' perception of affectivity. A survey was carried out with a population of auditors in *Big Four* companies, where a sample of 116 valid answers was obtained. Structural Equation Modeling (SEM) technique was applied to the data of the research. The results show that the perceptions of employee's obligations towards the company do not present significant relationship with any variable of the research (positive affectivity, negative affectivity and job satisfaction), while psychological contracts, in the perspective of employer's obligations, influences the positive affectivity and the job satisfaction. It was also observed that positive affectivity mediates the relationship between psychological contract of employer's obligations and job satisfaction. Thus, it is confirmed the belief that obligations in the contractual relationship can provide stability and develop the auditor's professional side, resulting in positive feelings and satisfaction in performing the activities, which is supposed to lead to better individual and organizational results. It is concluded that the psychological contract in the perspective of employer's obligations triggers positive affects in the auditors' work environment which, in turn, is reflected in higher levels of satisfaction, but instigates non-significance for the employee's perceptions of obligations towards the company, which may be the subject of future investigations.

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**Keywords:** Psychological contract. Affectivity. Job satisfaction. Auditors.

## 1 INTRODUCTION

Psychological contract represents "individual beliefs on mutual obligations between employees and employers" (Rousseau, 1990, p. 389). Beliefs are considered contractual when individuals believe they owe the employer contributions in the form of obligations (heavy duty, loyalty sacrifices) in exchange of incentives (high wages, performance rewards), thus posing as behavior drivers. Obligations perceived are outlined by promises and beliefs. This concept of psychological contract, restructured by Rousseau (1989), is different from the general concept of expectations created in a causal relationship, where contracts are promissory and reciprocal.

The psychological contract is one of the most useful and popular concepts for understanding the employment relationship (Conway, Guest & Trenberth, 2011). Posing as an *explanatory framework* for comprehending this relationship, a central element is constituted in order to understand employee's attitudes and behaviors, however, it remains theoretically undeveloped, and empirical efforts present a rather limited scope. (Conway & Briner, 2002). Overall, studies focus on the development of the concept, the contents of psychological contracts and the investigation of its effects on the behavior of individuals at the workplace (Menegon & Casado, 2012).

According to Rousseau (1990), the psychological contract is determinant of behaviors present in organizations. The organizational environment demands permanent review on the behavior and attitude of staff members (Rousseau, 1989). This study examines the psychological contract from the employee's perspective, based on the movement initiated by Rousseau (1989) that the contract varies according to the reader's perspective, therefore abstract entities cannot establish a psychological contract, only their representatives or agents, which may even be their owners, but that are acting as representatives and become a party in the psychological contract (Rousseau, 1989).

Insofar as individuals adapt to new structures in response to the social, political, economic and technological changes, the formal employment contracts are no longer suitable, given the way these affect the organizational behavior (Menegon & Casado, 2012). This has triggered a change in employment relations and their relevant psychological contracts established by the perceptions of employees regarding what they owe their employers and what employers owe them, in line with the inclusion of subjectivity in construing psychological contracts (Rousseau, 1989), conceiving contractual unilaterality (non-mutuality). Such changes make the parties less likely to understand the agreements. Therefore, organizations may reduce their ability to fulfill all their promises (Robinson, 1996).

This exposure to arbitrary acts is an intrinsic characteristic of the contracts. Each party believes there is an agreement, but it does not necessarily imply the existence of a real agreement where they share the same understanding of the contract (Menegon & Casado, 2012). In this sense, this study seeks to investigate the consequences (affectivity and satisfaction) of psychological contract present within the context analyzed hereunder, in addition to addressing the existing contracts. There are several analysis of breach of contract in literature, but only few address the fulfillment of the contract; and empirical studies, in general, are limited to affirm both possibilities have similar, but opposite effects (Conway, Guest & Trenberth, 2011). A more extensive knowledge of both analysis is of utmost importance to manage psychological contracts.

The possibility to manage psychological contracts may explain their inclusion in organizational research. Accordingly, the following research question is sought to be answered: What are the effects of the psychological contract on job satisfaction mediated by the auditors' affectivity perception? To this end, the study aims to evaluate the effects of psychological contract on job satisfaction mediated by the auditors' affectivity perception. The psychological contract, which represents the auditors' beliefs regarding obligations towards their companies arising from formal contracts, are believed to influence their job satisfaction and affectivity (both positive and negative).

Relationships between job satisfaction and affectivity measures are confirmed by several

studies, as clarified in the meta-analysis by Connolly and Viswevaran (2000). However, no reference is made to the psychological contract, and none of them had auditors as object of analysis. Several studies support a relationship between psychological contract and job satisfaction. But short-term affective responses have been neglected in empirical researches (Conway & Briner, 2002). In recent study, Jusoh, Ahmad and Omar (2014) present a theoretical model with three aspects (psychological contract, affectivity and job satisfaction) for the work-family relationship context as regards the benefits of dealing with the imbalance thereof. This study proposes that psychological contracts mediate the relations between affectivity and job satisfaction.

Affectivity is defined by how people experience emotions as a reaction to environmental conditions, which can be either positive or negative (Watson, Clark & Tellegen, 1988). This study uses the aspect conveyed by these authors to capture positive and negative affectivity dimensions, a model developed in the form of a scale to measure the two primitive dimensions of the mood; aspect validated by several studies, such as Zhai, Smyth, Nielsen and Luan (2009), which also relate affectivity to job satisfaction and validate the aspect in non-original language, within the Chinese context.

In order to enable the measurement of job satisfaction, Brayfield and Rothe (1951) have developed a tool that aims to capture this feeling, using it as measurement criterion in behavioral studies. This study uses said tool and shares the same approach of said authors, that is, "this study assumes that job satisfaction can be deduced from the attitude of individuals towards their work"; the expression of a feeling towards an object, making it possible to quantify such expression of a feeling (Brayfield & Rothe, 1951, p. 307).

Most studies on psychological contract were carried out in United States or United Kingdom, with students, without considering their working experiences (Antonaki & Trivellas, 2014). However, no researches were found investigating the relationship proposed in this study. Flower, Demir, McWilliams and Johnson (2015) have examined the relationship between the components of the psychological contract, the organizational justice and the negative affectivity with the organizational commitment, job satisfaction, depression and psychological distress of health auxiliary professionals.

Previous studies have also not investigated psychological contracts with auditors, although this is a very representative context with highly qualified professionals. Masihabadi, Rajaei, Koloukhi and Parsian (2015) have analyzed the effects of stress on auditors' organizational commitment, satisfaction and work performance. They have found that job satisfaction is negatively affected by stress, and the stress, in turn, lead to negative effects in the work performance mediated by satisfaction and organizational commitment.

## **2 THEORETICAL REFERENCE**

### **2.1 Psychological Contract**

According to Rousseau (1989, p. 124), "a psychological contract emerges when individuals believe the contributions made obliges the organization to reciprocity (or the other way around)". The belief that reciprocity will occur may be the trigger to a psychological contract. However, the individual's belief in such reciprocity obligation is what establishes the contract. The belief in a contract also emerges when a promise prepares the way for the employee's contribution. It is the belief in a promise of future return, a contribution is offered, and an obligation of future benefits is established. Every contract is intrinsically subjective; accordingly, psychological contracts are perceptions of each of the parts in a relationship (Rousseau, 1989).

Rousseau (1989) unleashed several criticisms for this understanding of psychological contract, under the argument of not considering the mutuality aspects, since the perception of mutuality is what gives rise to the psychological contract, and not the mutuality itself, in the conception of reciprocity (Menegon & Casado, 2012). Unlike formal or implicit contracts, the psychological contract depends on the perception; therefore, the understanding of one party may not be shared by the other (Robinson, 1996). Jusoh, Ahmad and Omar (2014) suggest that the exchange relationship depends on psychological, social and interpersonal mechanisms instead



of formalities arising from legal provisions.

Rousseau (1989) has analyzed psychological contracts between employees and employers in research applied to recently selected MBA candidates. In the study, the obligations empirically found were divided in two categories: (i) transactional obligations of high payment and promotions in exchange of heavy-duty work and (ii) relational obligations of employment stability in exchange for loyalty and the guarantee of continuing in the company. The study has found that promises of future behaviors by employers are generally contingent upon the employee's reciprocal actions and, moreover, that companies stimulate the establishment of different psychological contracts, suggesting that contractual issues may play a key role in the employment relationship (Rousseau, 1990).

Robinson (1996) has investigated the relationship between the employees' trust in their employers and their experiences of breach of psychological contract by the employer. Trust was found to be a mediator of the relationship between the breach of the contract and the employees' contributions to the company. When analyzing the performance of the psychological contract in daily routines, Conway and Briner (2002) have found that broken or supplanted promises occur regularly and in relation to any aspect of the work, and the importance of the promise significantly contributes to emotional reactions thereafter. Moreover, the effects of promises that exceed expectations are substantially lower on emotional reactions compared to broken promises.

As regards researches on psychological contracts in Brazil, Menegon and Casado (2006) have addressed the psychological contract as a tool for managing people based on investigation of the relationship between the breach of the psychological contract and levels of voluntary employee turnover in consulting companies. Menegon and Casado (2012) propose a discussion on the concept of psychological contract and its relevance for understanding the working relations through a review on literature and focus on international authors. The study by Agapito, Cardi, Vicente, Guimarães, Lacerda and Freitas (2013) also stands out, which have analyzed psychological contracts and job satisfaction.

Currently, the topic most widely discussed in the psychological contract literature is the breach thereof, with most productions originated in the USA (Menegon & Casado, 2012). There are three ways to operationalize the standardized and quantitative measures of the contract (Menegon & Casado, 2012). The conditions, in the form of obligations that the individuals perceive to owe (such as extra hours) their employers, must reward them (with, for example, a promotion). Composed of conditions, are measurements of the contents of a global contract, a scale of contractual conditions. And nominal rating, are typologies where respondents indicate the category that represents their understanding of employment relationship. The nominal rating has been widely used within this context, including in this study.

Conway, Guest and Trenberth (2011, p. 274) argue that, "there is an urgent need to discuss and to identify concepts within the Theory of psychological contracts that lead to positive results". In this sense, this study seeks to contribute to the observed gap identified by analyzing to which extent the fulfillment of a psychological contract (employer-employee obligations) can be used to promote, rather than merely maintaining, affection, positive behaviors and attitudes, which are referenced as the exercise of the psychological contract as part of a positive psychology to increase the organizational well-being and to enable organizational productivity.

## **2.2 Affectivity and job satisfaction in psychological contracts**

Based on the premise that the psychological contract takes place at the individual level, as a belief on exchanges within a relationship, its fulfillment becomes a mutual belief on obligations (duties and rewards). Such beliefs and obligations comprised in the psychological contract emerge from the moment of selection of employees and their start in the company (Rousseau, 1990). The Psychological contract theory suggests that employees constantly assess whether or not their contributions are mutually awarded by the organization. (Antonaki & Trivellas, 2014).

Robinson (1996) has studied the role of personality factors existent in this relationship, seeking to contribute to the construction of psychological contract literature as regards the role trust plays in such experience, and its effects on the breach of psychological contracts. The research results indicate that trust can regenerate trust, not only because it stimulates a

trustworthy behavior on both parties, but also because it influences the perception of each party on the behavior of the other. Moreover, the impacts of the breach of a psychological contract exceed the loss of expected rewards.

After employees fulfill their obligations in a mutual promise, these assume the organization will likewise fulfill its obligation, as a reward. However, it is unlikely that the employee feels too satisfied with the fulfillment of the obligation by the employer. Employees tend to be upset when the organization fails to keep its promise (Conway, Guest & Trenberth, 2011). In this case, the contractual satisfaction is upheld and do not result in unexpected behavior and attitudes, while the breach implies disappointment. However, Conway, Guest and Trenberth (2011) have investigated the affective well being within anxiety-comfort and depression-enthusiasm dimensions, providing an example of a different approach to the same aspect proposed in the present study.

This study addresses affectivity as a dual aspect, positive and negative, according to Watson, Clark and Tellegen (1988), for whom although the terms *positive affect* and *negative affect* may suggest that these two moods/states of mind are opposites, they have in fact arisen as two distinct dimensions. The positive affect reflects the extent to which a person feels enthusiastic, active, and alert. A high positive affect is understood as a state of high energy, high concentration, and pleasurable engagement, while a low positive affectivity is characterized by sadness and apathy. Negative affect is defined as a generic dimension of subjective distress and unpleasant engagement. It involves aversive state of mind like anger, contempt, aversion, guilt, fear, and nervousness. A low negative affectivity is understood as a state of calmness and serenity.

Employees with positive affectivity tend to have positive perceptions of their psychological contract. Thus, they are more likely to believe their organization will reward them for fulfilling their obligations. Employees with negative affectivity, on the other hand, have negative perceptions of their psychological contract. They may develop negative perceptions of their organization, as well as of the mutual obligations within the work environment. Employees with negative affectivity pay attention to what they do not earn or that they earn less than they think they deserve and, consequently, tend not to have positive beliefs about the organization. They develop distress and anxiety feelings, which are likely connected with negative perceptions of the contract (Jusoh, Ahmad & Omar, 2014).

As the contract is analyzed from the employee's perspective, in this study the auditors, it depends on several factors, including the subjectivity of its reader (Rousseau, 1989). The psychological contract established and experienced by the auditor is assumed to unfold (positive and/or negative) affects in the employer-employee relationship. Therefore, the first hypothesis of the research is formulated on the grounds of the foregoing theoretical assumptions.

H1: The beliefs of auditors regarding the psychological contract are reflected in affects on their employer-employee relationship.

In turn, the job satisfaction refers to the employees' assessment of their working conditions (Antonaki & Trivellas, 2014). The psychological contract provides a mechanism in which the relationships between personal factors and job satisfaction can be analyzed (Jusoh, Ahmad & Omar, 2014). In the empirical study of the psychological contracts aimed at understanding and clarifying their impacts on satisfaction and commitment in the workplace, Antonaki and Trivellas (2014) have addressed the application of the psychological contract as a framework, in order for employers to effectively manage the negative outcomes that may arise.

In the research conducted by Conway, Guest and Trenberth (2011), job satisfaction behaved in a significant and opposite way, in comparative analysis between breach and fulfillment of the psychological contract. The results also show that the extent of the increase in job satisfaction and organizational commitment have presented similar behaviors in the two situations. This reinforces the conclusion that the different effects in the two situations are related to the psychological contract, at least when compared to changes in job satisfaction.

According to Antonaki and Trivellas (2014), several researches have found a negative relation between the breach of psychological contract and attitudes, job satisfaction and organizational commitment, whose studies have been mostly prepared from the perspective of social exchange and equity theory, suggesting that individuals seek balanced trust relationships. In a sample with bankers, Antonaki and Trivellas (2014) have confirmed the mediating role of job

satisfaction between specific elements of the breach of psychological contract and the organizational commitment. The awareness of the negative results of job satisfaction elements by managers (employers) shall enable them to take decisions aimed at promoting the feeling of stability and motivating employees to carry out their tasks (Agapito *et al.*, 2013).

Zhai *et al.* (2009) have investigated the relation between positive affectivity, negative affectivity, job satisfaction and life satisfaction. The results show that affectivity is the source of both satisfactions, that job satisfaction is positively related to life satisfaction and that it partially mediates this relationship. Moreover, the results also indicate that the positive affect is positively related to job satisfaction and life satisfaction, while negative affect is negatively related thereto. Affectivity and job satisfaction represent a difference of 25% in life satisfaction.

Researchers have been trying to connect the individual characteristics with job satisfaction. A characteristic widely studied is the affective disposition (Connolly & Viswesvaran, 2000). Researches carried out based on the Role Theory indicate that affectivity reflected in job satisfaction is pertinent and can take part in the theories of such satisfaction. Affective predispositions provide the basis for the perception by which needs are construed, perceiving them as fulfilled or not (Connolly & Viswesvaran, 2000). Thus, it is assumed that the inclusion of affectivity and job satisfaction is grounded on the context of psychological contracts and, therefore, the second hypothesis is formulated.

H2: Affect feelings expressed by auditors regarding their relationship at work influence job satisfaction.

The positive affectivity is related to the job satisfaction and frequency of pleasant events, while the negative affectivity is related to personal stress, low cooperation, health issues and frequency of unpleasant events (Watson, Clark & Tellegen, 1988). The research conducted by Conway, Guest and Trenberth (2011) have showed that breach of contract is a trigger of negative affect and negative attitudes by employees, while the fulfillment of the contract has less sharp effects. The intensity of affective reactions to promises perceived as broken depends on the interpretation process and on the several elements of such promise (Conway & Briner, 2002). The results show that 10 to 25% of the variations in job satisfaction are due to individual differences in affectivity.

In their research, Connolly and Viswesvaran (2000) have expected positive affectivity to be positively related to job satisfaction, negative affectivity to be negatively related to job satisfaction, and that affectivity would be greater in the positive relation than in the negative relation. All correlations were sustained, and the positive affectivity was higher than the negative. The results show that job satisfaction is more influenced by positive affect than negative affect, suggesting that positive and negative affectivity should be independent aspects. These results lead to another research assumption hereunder: that the relationship triggered by positive affectivity is greater than the negative affectivity. This study assumes that the dimensions of these correlations suggest that several variables affect job satisfaction, considering that the highest correlation (positive affectivity and job satisfaction) represented 25% of the variation.

The affectivity can influence the individual perception on such situations, and these perceptions impact the job satisfaction. A high perception of positive affect makes individuals more likely to perceive situations at work compared to low positive affect. Individuals remember good things about their work. A high perception of negative affect occurs when individuals have more bad perceptions of situations at work than in the case of low negative affect. Individuals who may be in unfavorable work situations tend to remember unpleasant events in their workplace (Zhai *et al.*, 2009). Based on the theoretical assumptions and the two dimensions of affectivity (positive and negative), these are assumed to influence the satisfaction of the auditors at work in opposite ways, as described in the two hypotheses set out below:

H2a: Positive affectivity has a positive influence on job satisfaction.

H2b: Negative affectivity has a negative influence on job satisfaction.

Affectivity is related to job satisfaction and the personal life of employees, with the job satisfaction representing an important predictor of life satisfaction even when affectivity is controlled (Zhai *et al.*, 2009). The affectivity (both positive and negative) represents the tendency to undertake experiences that trigger pleasant and unpleasant emotions, while job satisfaction is an internal state of the assessment of its experience (as a favorable or unfavorable measure). According to the authors, the implication of such results is that by increasing people's job

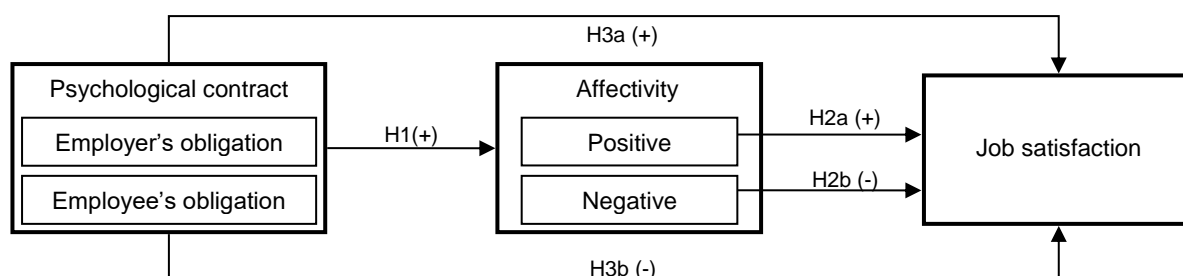
satisfaction, their quality of life increase. However, Zhai et al. (2009, 1188) point out that, "as job satisfaction is related to affective personality, it is not easy to increase the people's satisfaction through the improvement of situations at work".

Robinson (1996) supports that employees' dissatisfaction with the current situation of their contributions to the organization is an attempt to restore the perceived imbalance in the exchange relationship held with the organization. Antonaki and Trivellas (2014) have demonstrated the negative impact between the specific aspects of the breach of the psychological contract in job satisfaction and in organizational commitment, supported by the mediating role played by job satisfaction between this relationship of breach of contract and organizational commitment. They have found that employee's positive perceptions on psychological contracts seem to result in more satisfied employees, especially those with positive assessments of their relationships and the content of work, which causes employees to be more committed. Based on the foregoing, the psychological contract is considered to inversely influence the job satisfaction, mediated by opposite affectivity aspects.

H3a: From the authors' perspective, the psychological contract positively influences job satisfaction mediated by positive affectivity.

H3b: From the authors' perspective, the psychological contract negatively influences job satisfaction mediated by negative affectivity.

Based on the assumptions provided by the literature on psychological contracts, the theoretical model of Figure 1 presents the mediating effect of (positive and negative) affectivity perception in the relationships between the psychological contract – consisting of the (auditor) employee's beliefs regarding the promises assumed by him or by the employer – and the job satisfaction.



**Figure 1.** Theoretical Model

Source: prepared by the authors.

The underlying assumptions of the psychological contract are social exchanges between the two parties, expressed in the form of promises, translated into obligations reflecting in the individual's affectivity. Similarly to the study by Connolly and Viswesvaran (2000), this research expects that positive affectivity is positively related to job satisfaction, and that negative affectivity is negatively related to job satisfaction. Several studies have further emphasized the results of the breach of the contract positively related to undesirable consequences at work – such as *turnover* intention – and negatively related to desirable results, such as job satisfaction, grounded on the premises of the Social Exchange Theory (Antonaki & Trivellas, 2014).

### 3 RESEARCH METHODOLOGY

Descriptive study was carried out from a survey with independent auditors. In order to determine the study population, the auditors of *Big Four* companies (Deloitte, Ernst & Young, KPMG and PricewaterhouseCoopers) were selected, once these are the world leaders in auditing and consulting. The search in *LinkedIn* was made using the term "auditor", in addition to specifying the names of the organizations, which had been previously mapped.

Initially, a request was sent to auditors inviting them to integrate a network created in *LinkedIn*. After the request was accepted, on august 2017, a *link* of the questionnaire was sent through *Google Docs*. The final sample of the survey comprised 116 respondents. The sample

size was calculated using the G\*Power software (Faul, Erdfelder, Buchner & Lang, 2009), which resulted in at least 85 valid respondents, considering the following parameters: number of predictor variables (employer's obligation under the psychological contract, employee's obligation, positive affectivity and negative affectivity) on the dependent variable (job satisfaction), effect extension (average effect of 0.15), level of significance of  $\alpha=0.05$  and sample power of  $1-\beta = 0.8$ .

Most respondents are men (85 respondents), representing 73.28% of the sample. As regards the age, 50.86% (59 respondents) are between 20 and 25 years old; 48.28% (56 respondents) between 26 and 35 years old and only one respondent is older than 50. As regards schooling, 90 respondents (77.59%) have bachelor degree; 20 post-graduation/MBA degree; 4 masters' degree and 2 doctoral degree. Respondents were graduated in several areas of knowledge, including: Accounting Sciences (82 respondents), Administration (22 respondents) and Economics (5 respondents). It is worth noting that 10 respondents reported having two bachelor degrees.

As regards function/job position in the company, the titles that can be classified were: assistant (17 respondents), auditor (30 respondents), senior auditor (54 respondents) – which presented the highest representativeness, comprising 46.55% of the sample –, supervisor (5), manager (6) and director (1). The time in the company ranged from 10 months to 25 years, with an average of 3 years and 2 months. It is further highlighted that 81.90% of respondents did not have previous experience in other auditing companies and that 21 respondents (18.10%) had from 8 months to 7 years experience in other auditing companies, with an average of 2 years and 5 months.

In the research tool, the aspect of the psychological contract related to the obligations of employers was evaluated in seven different aspects, where respondents were requested to indicate their perception of the extent to which certain elements (promotions, high salaries, payment in line with current performance, training, safety at work with long-term vision, career development, support in the event of personal problems) actually represent the obligations of their employer under the contractual relationship in a 5-point scale, where 1 represents no obligation and 5 represents high obligation. Within the aspect of the psychological contract related to the obligations of employees, respondents were requested to express their perception of the extent to which certain elements (overtime, loyalty, willingness to do tasks that are not assignable to them, notice of dismissal if joining another company, willingness to accept a transfer, refusal to support the employer's competitors, and protection of the auditing and audited company information) represent their obligations towards their employers in a 5-point scale ranging from no obligation to high obligation. The assertions of these aspects were translated from the research conducted by Rousseau (1990) and adapted, in some cases, to the auditors' work context.

The affectivity was measured based on scale developed by Watson, Clark and Tellegen (1988). A set of words representing different feelings and emotions were presented (such as: interested, distressed, upset, inspired, determined), and respondents were asked to indicate to which extend they experienced these feelings in the last week, considering a scale from 1 to 5, where 1 represents none or very slightly and 5 represents very strongly.

In order to measure the job satisfaction, respondents were presented 12 assertions taken from the research by Brayfield and Rothe (1951), where they were asked to indicate their level of agreement, in a scale from 1 to 5, where 1 represents Total Agreement and 5 represents Total Disagreement. Some assertions were presented with reverse scales. Examples of assertions are: (i) most days I am enthusiastic about my work; (ii) I definitely don't like my job (R).

The data analysis used the Structural Equation Modeling (SEM) technique, estimated from the Partial Least Squares (PLS). O PLS enables testing a set of variables aimed to assess the level of explanation of the predictive variables against the dependent variables (multiple regression elements), indicating the most important predictive variable (factorial analysis) (Klem, 2006). In addition, a step-by-step analysis of the paths was used to examine the effects of mediation, as recommended by Baron and Kenny (1986).

## 4 DESCRIPTION AND ANALYSIS OF RESULTS

PLS-SEM model is usually assessed in two stages, the first referred as measurement model and the second as structural model (Hair, Hult, Ringle & Sarstedt, 2014). The results of each of these stages are presented below.

### 4.1 Measurement model

The measurement model analyzes the reliability (both individual and composite) and the validity (convergent and discriminant) of the measurement of the aspects of the contract (Ringle, Silva & Bido, 2014). The convergent validity evaluation was performed by the *Average Variance Extracted* (AVE), where the values of each latent variable were higher than the threshold value of 0.50 (Hair *et al.*, 2014).

Then, the *Cronbach's alpha and composite reliability* indicators were observed. All variables presented values higher than 0.70 in composite reliability – what is considered appropriate, according to Hair *et al.* (2014). In *Cronbach's alpha*, latent variables of psychological contract of employer's obligations and psychological contract of employee's obligations presented values of 0.607 and 0.625, respectively. According to Hair *et al.* (2014), values lower than 0.70 and higher than 0.50, for reliability coefficients, can be accepted for exploration models, as in the case of this research. The individual reliability of each assertion was also assessed through factor load analysis. Assertions containing factor load lower than 0.55 were eliminated. Fávero, Belfiore, Silva and Chan (2009) have recommended factor load of at least 0.55 for samples containing 100 to 119 respondents.

Another element analyzed in the validity and adequacy of the model is the discriminant validity, which was assessed at the level of indicators (Chin, 1998) and of latent variables applying the criterion used by Fornell and Larcker (1981), which seem to be appropriate. According to the criterion by Fornell and Larcker (1981), the discriminant validity is confirmed when the square root value of AVE is greater than the absolute values of correlations with other latent variables, both vertically and horizontally (Ringle, Silva & Bido, 2014). In view of Table 1, it can be observed (diagonally, in bold) that latent variables meet this condition, that is, there is discriminant validity in the analyzed data. Therefore, it is reasonable to conclude that the measurements are reliable (individual reliability of items and aspects of the contract) and valid (convergent and discriminant validity) (Barclay, Thompson & Higgins, 1995).

Table 1  
Results of the measurement model

| Variables | AVE > 0.50 | Cronbach's alpha > 0.70 | Composite reliability > 0.70 | Discriminant Validity |              |              |              |              |
|-----------|------------|-------------------------|------------------------------|-----------------------|--------------|--------------|--------------|--------------|
|           |            |                         |                              | CPOE                  | CPOF         | PA           | NA           | JS           |
| CPOE      | 0.554      | 0.607                   | 0.782                        | <b>0.744</b>          |              |              |              |              |
| CPOF      | 0.551      | 0.625                   | 0.782                        | 0.267                 | <b>0.742</b> |              |              |              |
| PA        | 0.655      | 0.924                   | 0.938                        | 0.421                 | 0.131        | <b>0.809</b> |              |              |
| NA        | 0.518      | 0.844                   | 0.881                        | -0.117                | -0.060       | -0.415       | <b>0.720</b> |              |
| ST        | 0.561      | 0.912                   | 0.927                        | 0.252                 | 0.138        | 0.514        | -0.459       | <b>0.749</b> |

**Note.** Keys: CPOE= psychological contract of employer's obligation; CPOF= psychological contract of employee's obligation; PA= Positive Affectivity; NA= Negative Affectivity; JS=Job satisfaction.

Source: Research data.

In Table 1, the convergent and discriminant validity and the reliability indicate a positive assessment of the measurement model, in accordance with Hair *et al.* (2014). Therefore, it is possible to carry out the evaluation of the structural model. It is further found that greater correlations have occurred with positive affectivity and job satisfaction (0.514), negative affectivity and job satisfaction (-0.459), psychological contract of employer's obligations with positive affectivity (0,421), psychological contract of employer's obligations with job satisfaction (0,252). There are also relations between psychological contract of employer's obligations with psychological contract of employees' obligations (0.267). Such results indicate that affectivity can act as mediator in the relationship between psychological contract of employer's obligations and job satisfaction. Baron and Kenny (1986) have argued that, as the independent variable is assumed to cause the mediation, these two variables must be correlated.

## 4.2 Structural model

After checking the adequacy of the measurement model, estimates of the structural equations were carried out through *Bootstrapping* analysis, with a sample of 110 cases and 1000 re-samplings in order to evaluate the significance of the relationships between latent variables used in the study (Hair et al., 2014) and to test the hypothesis of the research. Evaluation of the structural model was also carried out based on the (i) Pearson Coefficient of Determination (R<sup>2</sup>), which substantiate the predictive validity of the model and (ii) predictive relevance (Q<sup>2</sup>) or *Stone-Geisser* indicator, where the values of endogenous variables must be higher than zero (Hair et al., 2014).

For assessing the measurement, as recommended by Baron and Kenny (1986), several regression models were estimated. The first equation was the independent variable (psychological contract) with the mediator (affectivity); the second was the independent variable with the dependent variable (job satisfaction) and the third included the research model, shown in Figure 1, where the effects of the independent variable were tested on both mediator and dependent variables. All models were tested and estimated.

Baron and Kenny (1986) sustain that the mediating effect takes place when: (i) the independent variable affects the mediator (Model 1); (ii) the independent variable affects the dependent variable in the absence of the mediating variable (Model 2) and (iii) the mediator affects the dependent variable (Model 3). If these conditions maintain the expected direction, the independent variable effect on the dependent variable must be smaller in the third equation than it was in the second. A perfect mediation is valid if the independent variable produces no effects when the mediator is inserted. The results of tests performed are shown in Table 2 by model tested, where the path coefficients, the significance and the R<sup>2</sup> and Q<sup>2</sup> statistics of the endogenous constructs are presented.

Table 2

### Path Coefficients and evaluation of the structural model

| Path from:                             | Path to: |         |         |          |        |           |
|--|----------|---------|---------|----------|--------|-----------|
|  | Model 1  |         | Model 2 | Model 3  |        |           |
|  | PA       | NA      | JS      | PA       | NA     | JS        |
| CPOE                                   | 0.420*** | -0.216* | 0.259** | 0.416*** | -0.109 | 0.049     |
| CPOF                                   | 0.015    | -0.162  | 0.075   | 0.020    | -0.031 | 0.059     |
| Positive Affectivity                   | -        | -       | -       | -        | -      | 0.361**   |
| Negative Affectivity                   | -        | -       | -       | -        | -      | -0.300*** |
| Job satisfaction                       | -        | -       | -       | -        | -      | -         |
| R <sup>2</sup>                         | 0.180    | 0.092   | 0.067   | 0.178    | 0.015  | 0.344     |
| Predictive Relevance (Q <sup>2</sup> ) | 0.103    | 0.025   | 0.036   | 0.108    | 0.001  | 0.176     |

**Note.** N=116. \*\*\*p < 0.001, \*\*p < 0.01, \*p < 0.05.

Keys: CPOE= psychological contract of employer's obligation CPOF= psychological contract of employee's obligation; AP= Positive affectivity; AN= Negative affectivity; ST= Job satisfaction.

Source: Research data.

Contrary to expectations, the results of Table 2 do not show significant relationships between the psychological contract of employee's obligations and affectivity or job satisfaction. However, significant relations can be observed between the psychological contract of employer's obligations and positive affectivity (0.420, p < 0.001 – Model 1) (0.416, p < 0.001 – Model 3), as well as negative affectivity (0.216, p < 0.05 – Model 1). These results serve as basis for the partial acceptance of H1 that, auditors' beliefs regarding the psychological contract are reflected in affects in the employer-employee relationship. It is further observed that 34.4% (R<sup>2</sup>) of the job satisfaction can be explained by the direct effects of positive affectivity (0.361, p < 0.01) and negative affectivity (-0.300, p < 0.001), and by the indirect effects of the psychological contract of employer's obligations. Thus, these results contribute to supporting H2, which predicts that affection feeling expressed by auditors towards their work influence the job satisfaction.

Moreover, a total mediation of the positive affectivity is found in the relationship between the psychological contract of employer's obligations and job satisfaction, considering that: (i) psychological contract of employer's obligations are significantly and positively related to the

positive affectivity (Models 1 and 3); (ii) psychological contract of employer's obligations affect job satisfaction in the absence of mediating variable (Model 2); (iii) positive affectivity influences job satisfaction (Model 3) and (iv) the relationship between psychological contract of employer's obligations and job satisfaction was zero in the presence of positive affectivity (Model 3). This indicates that PA has absorbed all effect of psychological contract of employer's obligations on job satisfaction, that is, there is a complete mediation, which makes the relationship non-significant, according to Baron and Kenny (1986). However, since there were no positive relationships with the psychological contract of employee's obligations, the H3a, which states that from the auditors' perspective the psychological contract has a positive influence on job satisfaction mediated by positive affectivity, is partially accepted. While H3b – which states that from the auditors' perspective the psychological contract has a negative influence on job satisfaction mediated by negative affectivity – is rejected, once there are no significant relations between the psychological contract of employer's obligations and the negative affectivity in Model 3. In the model tested, 17.8% of the positive affectivity is explained by the psychological contract of employer's obligations, while there has been no explanation for the negative affectivity in the proposed model. This indicates that psychological contract of employer's obligations may influence the negative affectivity (Model 1), but the consequent ones are others, which sets the ground for future studies.

It should be further highlighted that the total effect of the psychological contract of employer's obligations on the job satisfaction has presented a path coefficient of 0.232 ( $p < 0.05$ ), where 0.183 ( $p < 0,01$ ) are indirect, by positive affectivity. Therefore, based on the model tested, the psychological contract of employer's obligations are also noticed to influence the positive affectivity and the job satisfaction mediated by positive affectivity. Which indicates the affection feelings expressed by the auditors in their relationship with work influence the job satisfaction, both positively (positive affectivity) and negatively (negative affectivity).

### 4.3 Discussion

The theoretical-empirical evidences (Rousseau, 1990; Flower et al., 2015) point out that employee's beliefs regarding mutual responsibilities between them and their employers (psychological contract) are reflected in behaviors and results in the workplace, such as trust (Robinson, 1996), job and life satisfaction (Zhai et al., 2009), organizational commitment (Antonaki & Trivellas, 2014, Conway, Guest & Trenberth, 2011), affective well-being (Conway, Guest & Trenberth, 2011), as well as motivation to pursue a career in the company (Rousseau, 1990). This study has focused on the effects of psychological contract (obligations) on the auditors' affectivity and job satisfaction.

The results show that: (a) the employee's perceptions of their obligations towards the company have not presented significant relationships with any of the variables (positive affectivity, negative affectivity and job satisfaction). The coefficients of the correlation of this variable (Table 1) with others were very poor; (b) employer's perceptions of their obligations towards the employees, from the auditors' perspective, influence the positive affectivity and the job satisfaction, with greater the effect on positive affectivity; (c) positive affectivity mediates the relationship between the psychological contract of employer's obligations and the job satisfaction; (d) in individual models and correlations, a negative association of the employer's perceptions of obligations with negative affectivity is observed; (e) positive affectivity increases job satisfaction, while the negative affectivity decreases job satisfaction.

However, positive affects are greater predictors of this *outcome*, if compared to negative affects, in line with the results of the research by Connolly and Viswesvaran (2000), where the job satisfaction was more influenced by the positive affectivity than by the negative affectivity – suggesting that positive and negative affectivity must be considered different aspects. These results are also consistent with the study by Watson, Clark and Tellegen (1988), where positive affectivity relate to job satisfaction and frequency of pleasant events, while negative affectivity relate to personal stress, low cooperation, and health complications.

Therefore, the study results indicate that auditors are more satisfied in the workplace when they notice that employers owe them promotions rather than when they felt they owe obligations (for example: overtime, loyalty) to their employers. The feeling of being in debt does not promote



job satisfaction, but the belief that the company owes them an obligation triggers positive feelings and make individuals more satisfied. In this sense, it is possible that obligations the employees, in the case hereof the auditors, believe to owe can reflect in other behaviors, such as organizational commitment and commitment to goals.

The mediation found in this research indicates that the psychological contract promotes positive feelings and triggers positive affects, such as persistence, interest, commitment, which, in turn, increase job satisfaction. In this sense, the perception that the employer is responsible for promotions and for the development of their careers results in more inspired auditors that strongly seek organizational goals. This makes them more active, thus increasing their job satisfaction. Therefore, the belief that there are obligations in the contractual relationship whose fulfillment can provide stability and develop the auditors' professional carrier result in positive feelings, as well as individuals more satisfied with their work, constantly searching goals to be achieved.

Locke (1969) supports that job satisfaction represents a pleasant emotional condition that results from the evaluation an individual makes of their work. Moreover, Masihabadi *et al.* (2015) have demonstrated that job satisfaction is associated to several behaviors related to the workplace, such as the work performance and the organizational commitment. The work environment in auditing companies is always very intense and dynamic, even out of the busy season. Usually, the budgets are tight, the time is tight, and the *Big Four* must compete with smaller audit firms for getting clients. However, job satisfaction is a very important element in the work relation and shall be taken into account by auditing companies. Auditors are constantly under pressure, either because of deadlines, commitment to goals, knowledge needs, preparation to deal with clients, reliability of the auditing company, update needs, lack of time and so on. These aspects may give rise to stress in the workplace and reflect negatively on performance and satisfaction, as found by Masihabadi *et al.* (2015).

Therefore, the results of this research indicate that the fulfillment of the psychological contract as regards the employer's obligations is a way to increase job satisfaction and trigger positive affectivity. Antonaki and Trivellas (2014) state that positive perceptions of the psychological contract seem to result in more satisfied workers, with positive evaluations of their relationships and their work content. They lead to a greater commitment and make individuals more willing to develop behaviors and tasks that strengthen their bonds to the organization. In this sense, it is reasonable to conclude that the managers of these companies must be cautious and fair when establishing policies and procedures for promotions, salary and career plans. The auditors' perspective of internal growth and career development provides positive affects and, consequently, is reflected in the job satisfaction. Thus, the breach of this contract, even if at individual and perceptual/proportional level, can have opposite effects. This causes organizations to rethink, re-evaluate, and revise their view of the exchange relationship existing with their employees, as reflected in their psychological contract (Antonaki & Trivellas, 2014).

## 5 CONCLUSIONS

The study addresses the effects of psychological contract on job satisfaction mediated by the auditors' perception of affectivity. The findings of Rousseau (1990), reinforced by Flower *et al.* (2015), that the psychological contract is a set of beliefs of the individual on the mutual responsibilities existing between them and the employer, were used as a starting point. The employer, however, may not award these beliefs. Overall, the psychological contract is established when the employees, at the individual level, believe to have the obligation to behave or to perform activities in a certain way, and also believe the employer have certain obligations towards them.

In this context, the results evidence that the obligations that auditors believe to have with the auditing companies, such as loyalty, willingness to do tasks that are not assignable to them and protection of the auditing and audited company information, do not present significant relationships with affectivity and job satisfaction. This result suggests that the auditors' belief to owe an obligation the company may be reflected in other behaviors, such as performance of tasks, which sets the ground for future studies aimed thereto.

However, the results indicate that the belief that the auditing companies owe certain

obligations (such as promotions, training, payments related to current performance) is reflected in the positive affectivity (interested, enthusiastic, committed employee) and, therefore, in the job satisfaction. Moreover, affectivity was observed to have direct influence on job satisfaction, whether negatively, by means of negative affects (disappointed, upset, anxious employee), or by expressing positive affects; these are greater predictors compared to negative affectivity.

The research results suggest certain prudence by audit firms in establishing internal policies and procedures regarding promotions, career plans, variable remuneration, relational obligations, since they can interfere in the perception of the psychological contract and, consequently, in the affectivity and job satisfaction, as they reflect in other organizational results, such as commitment and performance – as already indicated in the literature. The employees' view of the structure established by the company (promotions, for example) stimulates the construction of different contracts. Rousseau (1990) argues that employees with beliefs aligned to the expected standard of a relational contract report specific obligations to their employers, such as loyalty and commitment to the performance of work, which is reflected in a long-term relationship. Overall, it is concluded that the employer's obligations under the psychological contract triggers positive affects in the auditors' work environment, which, in turn, results in higher levels of satisfaction.

The main contribution of the study is to point out that taking the psychological contracts into consideration is of utmost importance within the auditors' organizational environment, once they influence subsequent results and behaviors; in the case hereof, the positive affectivity and job satisfaction. In this sense, this study contributes to the literature on psychological contract, particularly as regards the job satisfaction when addressing the affectivity mediating effect. Bouckenoghe, Raja and Butt (2013) warn that both positive and negative affectivities influence the main work results, as well as satisfaction, performance and turnover intention. According to the authors, affectivity is a source of energy capable of motivating people to perform well or discouraging them from doing so. In addition, this research has applied the psychological contract concepts to the auditing area, whose employees are constantly exposed to internal and external pressure, including social pressure, in view of the procedural emphasis in their area of activity.

However, as this is a cross-sectional study, the interpretation of results should be cautious, once the research strategy used is grounded on the respondents' perceptions of the formulated questions. Subjective elements may occur in the moment of the answer, and may direct it to a desired situation in the organization. Also, the moment when the survey was made may interfere in the answers, and results may differ if the survey is applied during the *busy season*, as during the closing of annual statements. Thus, carrying out longitudinal studies can contribute to the insights of this research regarding the object hereof and its consequences in the organizational environment. Finally, this study has analyzed the elements of the obligations under psychological contracts, and future studies can include compliance and violation concepts.

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## OVERCONFIDENT CHIEF EXECUTIVE OFFICER AND EARNINGS MANAGEMENT PRACTICE

### CRISTIAN BAU DAL MAGRO

*Doctor in Accounting Sciences and Administration at Universidade Regional de Blumenau (FURB). Address: Servidão Anjo da Guarda, 295-D | Efapi | 89809-900 | Chapecó/SC | Brazil.*

*E-mail: cristianbaumagro@gmail.com*

### MARCELLO CHRISTIANO GORLA

*Doctor in Accounting Sciences and Administration at Universidade Regional de Blumenau (FURB). Address: Rua Antônio da Veiga, 140 | Itoupava Seca | 89030-903 | Blumenau/SC | Brazil.*

*E-mail: gorlacontabil@yahoo.com.br*

### ROBERTO CARLOS KLANN

*Doctor in Accounting Sciences and Administration at Universidade Regional de Blumenau (FURB). Professor in the Accounting Sciences Post-Graduation Program of FURB. Address: Rua Antônio da Veiga, 140 | Itoupava Seca | 89030-903 | Blumenau/SC | Brazil.*

*E-mail: rklann@furb.br*

### ABSTRACT

Several studies have suggested that overconfidence leads to expectations of future performance, and managers can develop predisposition to earnings management. The objective of the study is to identify the influence of overconfident managers on Brazilian companies' earnings management practices. The methodology of the research is descriptive, with quantitative approach, through documentary research. The statistical methods used were: entropy, TOPSIS and multiple linear regression. The sample consisted of 127 Brazilian companies listed on the BM&FBovespa. It is concluded that lower overconfidence has a positive impact on earnings management, suggesting that less confident managers believe with less intensity in their abilities, and, in order to guarantee organizational results that satisfy the expectations of analysts, they conduct the earnings management in an opportunistic way so as to increase organizational results.

**Keywords:** Overconfidence. Earnings management. Behavioral theory.

### 1 INTRODUCTION

Behavioral experts have discussed overconfidence as an important factor for the financial market. It can affect the human behavior in many organizational decision-making (De Bondt & Thaler, 1995). In this sense, the behavioral theory is used to explain the existence of tendencies in the behavior of agents that may lead to decision-making based on irrational aspects and, therefore, interferes in the structuring of the organizational capital (Thaler, 1999).

Recent studies demonstrate that irrational aspects of the human behavior affect operational investment and financing decisions, as well as the discretionary behavior as to accounting choices. Excessive confidence may lead to biased behaviors capable of triggering

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managers to believe in abilities that are beyond the normal course of business (Weinstein, 1980; Baker, Ruback & Wurgler, 2004). Therefore, individuals can overestimate their skills, believing their decision power is more assertive compared to those of others (Svenson, 1981; Taylor & Brown, 1988; Alicke, Klotz, Breitenbecher, Yurak & Vredenburg, 1995).

Managers who tend to overvalue their skills, judgment and forecasts have characteristics that bring out their excessive confidence (Barber & Odean, 2001; Simon & Houghton, 2003; Malmendier & Tate, 2005; Dushnitsky, 2010). Managers with these characteristics tend to overestimate their capabilities to achieve results, underestimate random events, and seem to be more susceptible to tendentiously optimistic forecasts (Hribar & Yang, 2015). Psychological factors, personal characteristics and limited rationality can be used to explain opportunistic behaviors, thus helping to clarify possible managerial distortions occurring in organizations (Lin, Ho & Chen, 2005).

Results reported by organizations in their financial statements can arise from opportunistic behavioral biases of their the *Chief Executive Officers* (CEOs). This factor derives from accounting choices of a discretionary nature that are not related to the economic reality of the business. The opportunistic behavior, at the discretion of accounting choices, may be motivated by the firm's exogenous influences and by the behavior of individuals, which warp executives towards earnings management practices (Martinez, 2008).

Managers' overconfidence may lead to decisions that involve more or less discretionary accounting choices. The impacts of overconfidence on the quality of the accounting information, under the aspect of earnings management, were examined in two studies with US companies. Hribar & Yang (2015) argue that overconfidence influence CEOs to announce earnings forecasts based on exorbitant expectations of future results. Schrand & Zechman (2012) suggest that companies managed by overconfident CEOs can carry out earnings management, whether intentionally or by accident.

The study conducted by Li & Hung (2013), with Taiwanese companies, suggests that overconfidence increases managers' opportunistic behavior. It can result in more intense earnings management practices to increase profits. Empirical studies suggest that overconfidence increases the expectation of future performance, and managers with such characteristics are more likely to practice earnings management in order to satisfy the expectations of analysts (Malmendier & Tate, 2005; Hribar & Yang, and Schrand & Zechman, 2012, Li & Hung, 2013).

Based on the foregoing, a problematic was created: What is the influence of managers' overconfidence on the earnings management in Brazilian companies listed on BM&FBovespa? The purpose is to identify the influence overconfident managers have on the earnings of Brazilian companies listed on BM&FBovespa.

This study seeks to include in the literature on the quality of accounting information the behavioral biases that may affect decisions of corporate officers on accounting choices that aim the distortion, notwithstanding the standards for reporting accounting information. The empirical literature on earnings management has examined economic, personal, and corporate incentives. However, it is necessary to add the behavioral factors in incentives to earnings management practice.

Only few studies have included evidences of individual psychology on opportunistic accounting choices (Hribar & Yang, 2015). According to Martinez (2013), it is necessary to integrate behavioral aspects of agents, managers and auditors with the opportunistic practices involving earnings management. The contributions of the study addresses the theoretical gap in the literature on the quality of accounting information, adding evidences of the human individual behavior on opportunistic practices.

In practical terms, the research provides for indications that behavioral factors must be observed in the evaluation as to the quality of the accounting information. Thus, analysts, investors and other stakeholders must observe the attitudes of managers in the evaluation of earnings reported by firms, mainly seeking to segregate the companies managed by overconfident managers from those that are more cautious in organizational actions and attitudes.

The difference of this research compared to the study by Hribar & Yang (2015), Schrand & Zechman (2012) and to Li & Hung (2013), is that it presents different metrics for measuring

overconfidence allied to opportunism in accounting choices. Previous studies were conducted in developed countries, with strong stock market characteristics; therefore, a study with Brazilian companies can add opposite perspectives on the effect of overconfidence on the quality of accounting information.

## 2 THEORETICAL REFERENCE

### 2.1 Behavioral aspects of excessive confidence by managers

Heaton (2002) and Malmendier & Tate (2005) point out that overconfident managers tend to overvalue the future returns of investments. Other studies have documented that excessive confidence affects the investments, financings and dividend policies of organizations (Malmendier & Tate, 2008; Deshmukh, Goel & Howe, 2013, Malmendier, Tate & Yan, 2011).

Literature indicates the existence of, at least, three types of overconfidence. According to Hilary and Hsu (2011), the first occurs when individuals often have an exaggerated belief in their own capacity and evaluate their management, decision-making, ability, and responsibility skills as being better than others. Overconfidence is not only perceived in the finance and accounting areas. Peterson (2007) reports, for example, that 70% of people believe they are better drivers than the rest.

The second involves exorbitant beliefs in a standard objective. For example, an event is estimated to have 90% chance to happen, when, in fact, a lower chance must be estimated. Finally, the third is associated to the effect of weighting, which encompasses the relationship between private and public information (Hilary & Hsu, 2011). In this respect, overconfident individuals believe that their private information is more accurate than it actually is, and therefore, assign more weight thereto.

This research is covered within the overconfidence attribute established by Hilary & Hsu (2011), where managers underestimate their managerial ability in organizational decisions. The literature on overconfidence in the decision-making process has presented empirical evidences related to the overconfident behavior of business people, according to Cooper, Woo & Dunkelberg (1988), compared to officers, by Russo & Schoemaker (1992), and to managers, by Dittrich, Güth & Maciejovsky (2005). The research represents an empirical progress in overconfidence studies and adds an overview on the accounting choices that impact the quality of accounting information.

### 2.2 Overconfident Managers and earnings management

For Watts & Zimmerman (1990), the earnings management may be a characteristic of opportunistic practices, given the discretion condition, for its *ex post* benefit with wealth redistributive effects between the parties to a contract. The flexibility of standards and regulations make the financial earnings management possible, thus allowing different alternatives for accounting for the same event (Matsumoto & Pereira, 2009).

Santos & Grateron (2003) state that the term *earnings management* can be understood as the management or handling of results aimed at demonstrating a different image (better or worst), according to the relevant interests.

Moreover, psychological factors must be considered when analyzing the behavior of managers in organizational decisions, also covering the reporting of financial statements. Behavioral experts have been considering overconfidence as an important factor of managers' human behavior when reporting information to the stock market (Ko & Huang, 2007).

Hribar & Yang (2015) have analyzed the impacts of overconfidence on the increased probability of excessively optimistic releases for earnings management. CEOs were classified based on how many times they were described as confident compared to how many times they were described as prudent, cautious, conservative, practical and/or frugal. The sample comprised 640 companies listed on Fortune 500. The results suggest that overconfidence increases the optimistic biases in voluntary forecast. Leading, therefore, to greater earnings management.

Li & Hung (2013) have investigated the moderating effect of corporate family control on the relationship between overconfidence and earnings management. They used a sample integrated by companies listed in the Taiwan stock market. Their premise establishes that overconfident managers tend to engage in earnings management behaviors, and the family control negatively moderates the positive relationship between overconfidence and earnings management.

The study by Hsieh, Bedard & Johnstone (2014) have analyzed the relationship between overconfident CEOs and earnings management based on real activities, and also on targets to meet the forecasts prepared by analysts. The overconfidence of CEOs was determined by treasury stock / share buyback. The results suggest that, prior to the Sarbanes-Oxley Law (SOX), 2002, companies with confident CEOs would be more likely to opportunistic earnings management practices for real activities. After SOX Law, the results indicate that confident CEOs are more likely to use discretionary accruals for earnings management. The results are in line with the more confident CEOs, feeling less constrained by the application of the SOX Law, since earnings management by discretionary accrual is more likely to be found out.

### 2.3 Construction of hypotheses

The study by Banerjee, Humphery-Jenner & Nanda (2014) demonstrate that the decisions of overconfident CEOs are inconsistent in different moments of the application of SOX Law. They claim that companies with confident CEOs take risky decisions that distort investments, and further suggest that regulatory restrictions imposed by SOX have been effective in reducing the opportunistic behavior of CEOs presenting overconfidence tendencies.

The results of the research conducted by Banerjee et al. (2014) demonstrate that SOX Law was effective in reducing earnings management opportunistic behaviors. However, they point out that confident CEOs can probably continue exploring opportunities in certain earnings management practices.

According to Malmendier & Tate (2005), Jin & Kothari (2008), Hribar & Yang (2015), Li & Hung (2013), Hsieh et al. (2014), Banerjee et al. (2014), there is a premise of possible impacts of the managers' overconfidence on the earnings management practice as to accounting choices, what sets the ground for the construction of the general hypothesis that guides the study:

*Hypothesis 1: Overconfident managers are more likely to engage earnings management opportunistic practices to increase profits.*

Based on behavioral research, the excess of confidence can be measured from secondary data obtained from proxies previously used, such as: treasury stock, volume of dividends paid, financial leverage and family companies. Studies substantiate proxies of psychological attributes that can be used to measure managers' overconfidence.

Studies have demonstrated that companies managed by founding CEOs have different behavior compared to those managed by professional CEOs (Dalton & Daily, 2001; Nelson, 2003). Moreover, entrepreneurs are considered to be more overconfident than non-entrepreneurs, that is, companies whose managers are family members of founders or are the founders themselves are more overconfident than those managed by hired professionals (Lowe & Ziedonis, 2006; Hmieleski & Baron, 2009; Landier & Thesmar, 2009). Anderson & Reeb (2003) suggest that the behavior of CEOs who belongs to the founding family differs from those with no family relations, to the light of the competition in the labor market and the compensation plans, and therefore, these factors can lead to overconfidence in decision-making.

Lee, Hwang & Chen (2014) provide evidences that founding CEOs are more confident than their counterparts (professional CEOs). The results suggest that founding CEOs make use of a rather more optimistic language in their statements during teleconferences for the presentation of results. Founding CEOs prepare higher profit forecasts compared to hired CEOs. In this sense, it is reasonable to suggest that family-controlled companies have representatives/managers with greater overconfidence in comparison to those controlled by professionals.



The conclusion that the family control can moderate the effects of overconfidence on earnings management occurs for the following reasons: the family wealth is connected to the value of the company (Anderson & Reeb, 2003); family members are concerned about the company's reputation (Miller, Breton-Miller & Scholnick, 2008) and the long-term prospects for the business; they expect to transfer their assets to future generations (Gómez-Mejía et al., 2007). Therefore, we have the first sub-hypothesis of the study:

*Hypothesis 1<sub>a</sub>: There is a positive relation between family control and earnings management opportunistic practices to increase profits.*

Another variable used to measure managers' overconfidence relates to the payment of dividends. Ben-David, Graham & Harvey (2007) point out that companies with overconfident CFOs are less likely to pay dividends, more likely to engage in market timing, and more likely to issue voluntary disclosures. Ben-David et al. (2007) consider that companies managed by optimistic CFOs present greater volume of investments, lower volume of payment of dividends and greater level of leverage.

Deshmukh et al. (2013) developed a dynamic interaction model between the CEOs' overconfidence and the dividend policy. The model has demonstrated that an overconfident CEO perceives external financing so costly that it builds a financial slack for future investment needs; however, this financial slack is made by reducing the volume of payment of dividends. Thus, the level of payment of dividend is lower in companies managed by CEOs with higher overconfidence. The literature establishes that the lowest level of payment of dividend is consistent with the presence of overconfident managers. Based on the foregoing, the second sub-hypothesis is established:

*Hypothesis 1<sub>b</sub>: There is a negative relationship between the payment of dividends and the earnings management opportunistic practices to increase profits.*

Ben-David et al. (2007) and Deshmukh et al. (2013) have determined that companies managed by overconfident CEOs have higher levels of financial leverage. Likewise, Barros & Silveira (2009) have investigated the determinants of the capital structure by introducing the behavioral perspective. The main prediction of the work was that companies managed by overconfident individuals are more indebted than the others, besides providing indications that managers' overconfidence can determine the capital structure of firms, as both in static and dynamic formulations the estimated coefficient for excessive confidence was positive and generally significant to the leverage. Accordingly, companies with higher financial leverage would characteristically have overconfident managers and, therefore, would tend to earnings management opportunistic practices, giving rise to the third sub-hypothesis:

*Hypothesis 1<sub>c</sub>: There is a positive relationship between financial leverage and earnings management opportunistic practices to increase profits.*

Finally, as regards the buyback variable (treasury stock), Andriosopoulos, Andriosopoulos & Hoque (2013) have demonstrated that the disclosure of information and the CEOs' overconfidence are strong determinants in the share buyback. They suggest there is a clear relationship between information disclosure, CEO's overconfidence and the completion rates of buybacks.

Hsieh et al. (2014) have used the treasury stock volume as proxy to determine overconfident CEOs. In view of the aforementioned studies, it is reasonable to infer that companies with higher treasury stock volumes have overconfident CEOs, as they retain shares or buybacks based on their confidence in future results, which lead to higher valuation of the company's own shares. On that basis, the fourth sub-hypothesis of the study is established:

*Hypothesis 1<sub>d</sub>: There is a positive relationship between treasury stock volume and earnings management opportunistic practices to increase profits.*

Table 1 shows the theoretical development of the hypothesis presented above.

Table 1  
Theoretical development of the hypothesis

| Assumptions of Overconfidence Variables   | Assumptions of Overconfidence | Hypothesis                        | Theoretical Basis   |
|---|-------------------------------|-----------------------------------|---|
| Entropy/TOPSIS of variables: Family business, payment of dividends, accounting leverage and treasury stocks | +Excessive Confidence         | + Earnings management<br>$H_1$    | Malmendier & Tate (2005); Bhandari & Deaves (2006); Malmendier & Tate (2008); Wong (2008); Jin & Kothari (2008); Schrand & Zechman (2012); Hribar & Yang (2015); Li & Hung (2013); Banerjee <i>et al.</i> (2014); Hsieh <i>et al.</i> (2014). |
| + Family Business   | +Overconfidence               | + Earnings management<br>$H_{1a}$ | Anderson & Reeb (2003); Lowe & Ziedonis (2006); Landier & Thesmar (2009); Hmieleski & Baron (2009); Lee <i>et al.</i> (2014).   |
| - Payment of Dividends  | + Overconfidence              | + Earnings management<br>$H_{1b}$ | Ben-David <i>et al.</i> (2007); Deshmukh <i>et al.</i> (2013)   |
| + Accounting Leverage   | + Overconfidence              | + Earnings management<br>$H_{1c}$ | Ben-David <i>et al.</i> (2007); Barros & Silveira (2009); Deshmukh <i>et al.</i> (2013).  |
| + Treasury Stocks   | + Overconfidence              | + Earnings management<br>$H_{1d}$ | Heaton (2002); Malmendier & Tate (2005); Andriosopoulos <i>et al.</i> (2013); Ahmed & Duellman (2013); Hsieh <i>et al.</i> (2014).  |

**Note.** Source: Prepared by the authors.

Table 1 evidences that higher volume of treasury stock is a characteristic of companies with managers who are more overconfident. Managers who are more overconfident (measured by the higher volume of treasury stocks) tend to a more intense use of earnings management. The lower payment of dividends is a characteristic of companies with managers who are more overconfident. And, finally, the higher accounting leverage is a characteristic of companies with managers who are more overconfident, according to literature.

### 3 METHODOLOGICAL PROCEDURES

A descriptive research was carried out with a quantitative approach, through documentary survey, in order to reach the objective of the study.

#### 3.1 Research Population and Sampling

The survey population comprised the Brazilian publicly traded companies with data available in the Economatica® database. The sample was outlined covering the companies that had the information necessary to operate the variables. First, companies that did not have information for the regression model that could evidence the dependent variable of earnings management, were excluded. Subsequently, companies that did not have information to calculate the independent variables were excluded. The final sample of the survey consisted of 127 companies, in the year 2014.

#### 3.2 Procedures for Data Collection and Analysis

Data collected are related to variables used to conduct the study, and are shown in Table 2.

Table 2  
Composition of the study variables

| Variables         | Description                                  | Metrics  | Theoretical Basis   |
|-------------------|--|--|---|
| Dependent         | Earnings management (Discretionary Accruals) | Model KS Chart 3   | Model KS (1995)   |
|                   | Treasury stocks (buyback)                    | Natural logarithm of the treasury stocks of the company <i>i</i> in year <i>t</i> .  | Andriosopoulos <i>et al.</i> (2013); Ahmed & Duellman (2013)  |
| Independent       | Volume of payment of dividends               | Natural logarithm of the volume of payment of dividends of the company <i>i</i> in year <i>t</i> .   | Ben-David <i>et al.</i> (2007); Deshmukh <i>et al.</i> (2013)   |
|                   | Financial leverage                           | $\frac{Total Liabilities}{Total Assets}$   | Barros & Silveira (2009); Ben-David <i>et al.</i> (2007)  |
|                   | Family Business                              | <i>dummy variable equal to 1 for family-controlled / managed companies, and 0 otherwise.</i>   | Anderson & Reeb (2003); Lowe & Ziedonis (2006); Landier & Thesmar (2009); Hmieleski & Baron (2009); Lee <i>et al.</i> (2014)  |
|                   | Ranking of Overconfidence                    | Ranking determining the excessive confidence of each organization using and TOPSIS through variables: family business, payment of dividends, financial leverage and treasury stocks. | Malmendier & Tate (2005); Bhandari & Deaves (2006); Malmendier & Tate (2008); Wong (2008); Jin & Kothari (2008); Schrand & Zechman (2012); Hribar & Yang (2015); Li & Hung (2013); Banerjee <i>et al.</i> (2014); Hsieh <i>et al.</i> (2014). |
|                   | ROA  | $\frac{Net Profit}{Total Assets}$  | Balsam, Haw & Lilien (1995); Dechow & Dichev (2002); Doyle, Ge & Mcvay (2007); Barth, Landsman & Lang (2008); Dechow, Ge & Schrand (2010)   |
| Control Variables | ROE  | $\frac{Net Profit}{Equity Capital}$  | Balsam <i>et al.</i> (1995); Dechow & Dichev (2002); Doyle <i>et al.</i> (2007); Barth <i>et al.</i> (2008); Dechow <i>et al.</i> (2010)  |
|                   | ST Indebtedness                              | $\frac{Current Liabilities}{Total Assets}$   | Labelle (1990); Malmquist (1990); Balsam <i>et al.</i> (1995); Minton & Schrand (1999)  |
|                   | LT Indebtedness                              | $\frac{Non - Current Liabilities}{Total Assets}$   | Labelle (1990); Malmquist (1990); Balsam <i>et al.</i> (1995); Minton & Schrand (1999)  |
|                   | Size   | Natural Logarithm of Total Company Assets <i>i</i> in year <i>t</i> .  | Francis, Khurana & Pereira (2004); Dechow <i>et al.</i> (2010); Gaio (2010)   |

**Note.** Source: prepared by the authors.

Table 2 evidences that the dependent variables consist of *discretionary accruals and independent* variables consist of financial leverage, volume of treasury stocks, family control and volume of payment of dividends. For the soundness test, the control variables related to the return on assets, return on equity capital, short & long-term indebtedness and size of companies were added later. These control variables were selected since they were included in other studies on the matter as incentives for earnings management practices.

Moreover, the independent variables (treasury stocks, financial leverage, family business), which served as characteristics of manager's overconfidence, were gathered in a single ranking to determine the general level of overconfidence. This ranking was prepared using the Technique for Order Preference by Similarity to Ideal Solution (TOPSIS), using entropy to define the weight of each vector. TOPSIS is based on the ranking of alternatives to obtain the best alternative selection, which is close to the ideal solution, considering the distances from the ideal solution and the anti-ideal solution (Bulgurcu, 2012).

Figure 1 shows model KS (1995) used to identify the *Discretionary Accruals*.

**Model KANG & SILVARAMAKRISHMAN (1995)**

$$TA_{it} = \phi_0 + \phi_1 [\delta_1 Rev_{it}] + \phi_2 [\delta_2 Exp_{it}] + \phi_3 [\delta_3 Fixed A_{it}] + \varepsilon_{it}$$

$$AD_{it} = AT_{it} - \{ \phi_0 + \phi_1 [\delta_1 Rev_{it}] + \phi_2 [\delta_2 Exp_{it}] + \phi_3 [\delta_3 Fixed A_{it}] \}$$

$TA_{it}$  = Total Accruals = (CGL – Depreciation & Amortization)<sub>t</sub>

$Rev_{it}$  = Net Revenue (tax excluded)

$Exp_{it}$  = Operational Costs and Expenses before Depreciation & Amortization

$NWC$  = Net Working Capital, excluded financial provisions of S.T. and Prov. of Payable Tax

$Fixed A_{it}$  = Intangible Fixed Asset

$Receivables_{i,t-1}$  = Receivables for the period  $t - 1$

$Deprec_{i,t-1}$  = Depreciation Costs

$$\delta_1 = Receivables_{i,t-1} / Rec_{i,t-1}$$

$$\delta_2 = (\Delta WC - Receivables_{it}) / Exp_{i,t-1}$$

$$\delta_3 = Deprec_{i,t-1} / Fixed A_{i,t-1}$$

$Rev_{it}, Exp_{it}, Fixed A_{it}$ , These variables are escalated in terms of total assets

**Figure 1. Model KS to identify discretionary accruals**

Source: Adapted from Martinez (2008).

The earnings management data and the independent variables made possible to apply the linear regression model using SPSS software. After applying this model, it was possible to verify if the independent variables of overconfidence influence the level of earnings management. Equation 1 is used to illustrate this regression model:

$$EM = \beta_1 + \beta_2 TS + \beta_3 PD + \beta_4 FL + \beta_5 FB + \varepsilon \quad (1)$$

Where:

EM = Discretionary Accruals - Earnings management;

TS = Treasury stocks;

PD = Payment of dividends;

FL = Financial leverage;

FB = Family business.

Subsequently, the attributes (family business, treasury stocks, payment of dividends, financial leverage) were gathered in a ranking using TOPSIS, in order to determine an indicator of excessive confidence of the CEO of each organization. An additional regression model was established to explain the level of earnings management, consisting of the explanatory variable ranking of overconfidence and the control variables related to performance, indebtedness and company size. Equation 2, below, represents the regression model described:

$$EM = \beta_1 + \beta_2 RO + \beta_3 ROA + \beta_4 ROE + \beta_5 ST \text{ Ind.} + \beta_6 LT \text{ Ind.} + Size + \varepsilon \quad (2)$$

Where:

EM = Discretionary Accruals - Earnings management;

RO = Ranking of Overconfidence;

ROA = Return on Assets;

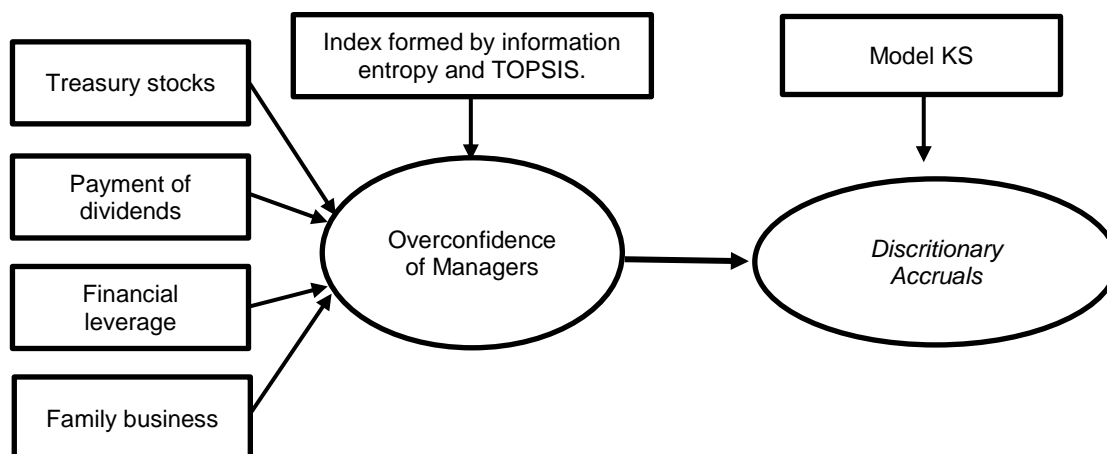
ROE = Return on Equity Capital;

ST Ind. = Short-term Indebtedness;

LT Ind. = Long-term Indebtedness;

Size = Natural Logarithm of Total Assets.

Figure 2 shows how variables were gathered in a single variable to measure overconfidence of managers, as well as the preliminary overconfidence test associated to the earnings management practice.



**Figure 2.** Model to explain the construction of the overconfidence variable and its relation with earnings management

Source: Prepared by the authors.

#### 4 PRESENTATION AND ANALYSIS OF RESULTS

This item presents the findings obtained applying the methods established in the research methodology in order to meet the objective proposed by the study. In this sense, Table 3 presents the descriptive statistics of the variables used in the research.

Table 3  
**Descriptive Statistics**

| Variable                      | Minimum | Maximum        | Average      | Standard Deviation |
|-------------------------------|---------|----------------|--------------|--------------------|
| <i>Discretionary Accruals</i> | -3.8281 | 2.2083         | 0.000        | 0.8944             |
| Treasury stocks               | 0.0000  | 2,104,524.00   | 41,089.70    | 198,062.58         |
| Payment of dividends          | 0.0000  | 249,037,996.00 | 4,811,945.63 | 22,465,880.41      |
| Financial leverage            | 0.0061  | 0.6074         | 0.2995       | 0.1519             |
| Family business               | 0.0000  | 1.0000         | 0.4803       | 0.5016             |
| ROA – Return on Assets        | -0.124  | 0.558          | 0.048        | 0.071              |
| ROE – Return on Equity        | -1.250  | 0.805          | 0.090        | 0.227              |
| ST Ind.                       | 0.014   | 0.623          | 0.212        | 0.124              |
| LT Ind.                       | 0.000   | 0.705          | 0.330        | 0.149              |
| Size (Total)                  | 48,601  | 752,966,638    | 17,181,136   | 68,488,989         |

**Note.** Source: Research Data.

Table 3 shows that the minimum *Discretionary Accruals* was -3.8281, while the maximum was 2.2083, with standard deviation of 0.8944. As regards the treasury stocks variable, the minimum was 0.000 – explained by the existence of companies that held no treasury stocks –, while the maximum was R\$ 2,104,524.00. As regards the payment of dividends, it is noticed that some companies presented no payment of dividends for the period, as per minimum of 0,00; while the maximum value of payment of dividends was R\$ 249,037,996.00.

Regarding the financial leverage, the average is found to be 0.2995, and the maximum is 0.6074. When it comes to family companies, among the 127 companies studied hereunder, 61 are family controlled and 66 are not. Therefore, the family companies represent a percentage of 48.03%. As regards the control variables, the companies present average return on assets of 0.048, average return on equity of 0.090, short-term indebtedness of 0.212, long-term indebtedness of 0.330, and company size by total of assets of R\$ 17,181,136.00.

Attention should be drawn to the high variation of data, which can compromise the parameters estimation, once they are estimated by the average. Subsequently, the proposed regressions were applied to answer the hypotheses in the theoretical construction. In addition,

with the variables shown in Table 3, the assumptions of normality, absence of autocorrelation, heteroscedasticity, multicollinearity and linearity were statistically proved.

Table 4 shows a summarized linear regression model of independent variables comprised of treasury stocks, payment of dividends, accounting leverage and family business in relation to the dependent variable of Discretionary Accruals.

Table 4  
**Regression of the overconfidence measurement variables in relation to the Discretionary Accruals**

| Model                | Non-standardized coefficients<br>B | T      | Sig.    | VIF   | Model R <sup>2</sup> | Durbin Watson | Model Sig. |
|----------------------|------------------------------------|--------|---------|-------|----------------------|---------------|------------|
| (Constant)           | 0.578                              | 2.382  | 0.019*  |       |                      |               |            |
| Treasury Stock       | -0.044                             | -2.887 | 0.005*  | 1.099 |                      |               |            |
| Payment of Dividends | 0.035                              | 1.770  | 0.079** | 1.082 | 0.194                | 1.660         | 0.000*     |
| Accounting Leverage  | -0.007                             | -3.573 | 0.001*  | 1.052 |                      |               |            |
| Family Business      | 0.009                              | 0.059  | 0.953   | 1.066 |                      |               |            |

**Note.** \* significance at 5%

\*\* significance at 10%

Source: Research Data.

As observed in Table 4, treasury stocks, payment of dividends, financial leverage and family business represent 19.40% of total earnings management variability (Discretionary Accruals). According to the theoretical basis, variables may represent the managers' overconfident behavior. Therefore, a possible influence of CEO's overconfidence is demonstrated on the earnings management level.

The regression model presented significance at 5%, with p-value of 0.000. It is possible to prove that managers' overconfidence represent 19.40% of the variability of Discretionary Accruals, measured by the individual variables of treasury stocks, payment of dividends, financial leverage and family business.

The coefficients of the regression model demonstrate that the higher volume of treasury stocks negatively influences the earnings management opportunistic practice to increase profits, at a significance level of 5% (0.005). The finding is not consistent with the literature, which provides that the higher the volume of treasury stocks, the greater the overconfidence, and, consequently, the higher the level of earnings management to increase profits, rejecting H1d.

As regards the payment of dividends, the literature provides that lower volume of payment of dividends represents greater overconfidence by managers. In this sense, the result found indicated the opposite: higher payment of dividends (less overconfident managers) influences higher level of earnings management to increase profits, at a significance level of 10%, contrary to H1b.

Moreover, the literature provides that higher financial leverage is the characteristic that establishes higher overconfidence of managers and, therefore, the findings show that lower leverage (less overconfident managers) positively influences the level of earnings management to increase the profits, contrary to H1c.

Finally, the results indicate that the family business presents no impact significance at earnings management level, thus not allowing to influence H1a. The findings contradict previous hypotheses. However, they demonstrate important evidence that less overconfident CEOs tend to earnings management opportunistic practices to increase profits. The contradiction in the hypotheses may have occurred because the theoretical basis is from countries with well-developed equity markets and strong auditing and corporate governance legislation, like countries where companies are monitored under the Sarbanes-Orley Law. Table 5 summarizes the assumptions of the sub-hypothesis and their findings.

Table 5

**Research results related to the construction of the sub-hypotheses**

| Results of the overconfidence variables | Results according to overconfidence attributes | Results with dependent variable |
|---|--|---------------------------------|
| - Treasury stocks                       | - Overconfidence                               | + Earnings management           |
| + Payment of Dividends                  | - Overconfidence                               | + Earnings management           |
| - Accounting Leverage                   | - Overconfidence                               | + Earnings management           |

**Note.** Source: Prepared by the Authors.

Table 5 shows that the results contradict those indicated by literature. These results suggest that lower overconfidence – measured by the attributes of lower volume of treasury stocks, higher volume of payment of dividends and lower financial leverage – influence the earnings management opportunistic practice to increase profits. It should be observed that interest rates and credit policies of the Brazilian market may have interfered to the findings, regarding factors related to leverage and dividends. As to the volume of treasury stocks and family companies, the results may have been influenced by the equity culture, as well as by the large proportion of family businesses that make up the Brazilian market.

The factors hereof are strongly contrary to those found in the U.S. and Taiwan markets, thus bringing complementary results for researches in markets with characteristics similar to those of the Brazilian context. Table 6 evidences the regression model using the overconfidence ranking and the inclusion of control variables in the impact on the Discretionary Accruals.

Table 6

**Coefficients of the regression model using the overconfidence ranking**

| Model          | Non-standardized coefficients<br>B | T      | Sig.    | VIF   | Model R <sup>2</sup> | Durbin Watson | Model Sig. |
|----------------|------------------------------------|--------|---------|-------|----------------------|---------------|------------|
| (Constant)     | 1.290                              | 1.728  | 0.087** |       |                      |               |            |
| Overconfidence | -2.610                             | -3.963 | 0.000*  | 1.286 |                      |               |            |
| ROA            | -2.012                             | -1.405 | 0.163   | 2.673 |                      |               |            |
| ROE            | 0.286                              | 0.635  | 0.527   | 2.690 | 0.417                | 1.664         | 0.000*     |
| ST Ind.        | -4.056                             | -7.734 | 0.000*  | 1.086 |                      |               |            |
| LT Ind.        | -0.189                             | -0.390 | 0.697   | 1.353 |                      |               |            |
| Size           | 0.068                              | 0.611  | 0.542   | 1.252 |                      |               |            |

**Note.** \* significance at 5%

\*\* significance at 10%

Source: Research Data.

Table 6 shows that the overconfidence ranking and the control variables represent 41.70% of the total variation of earnings management. Thus, the evidence from preliminary analysis, stating that overconfidence influences the earnings management, is confirmed. In addition, the regression model showed significance at 5%. They show that overconfidence and control variables can explain the earnings management practice in the organizations studied.

The results corroborate the evidences presented in Table 1 (first model) that the confidence ranking negatively influenced the earnings management. It can be confirmed that the lower overconfidence by managers influences the earnings management opportunistic practice to increase profit. The results confirm the evidences of Schrand & Zechman (2012) on the possible influence of overconfident managers on earnings management. On the other hand, the results contradict the evidences of Hribar & Yang (2015) Li & Hung (2013) and Hsieh et al. (2014) supporting that the higher overconfidence by managers influence the earnings management opportunistic practice to increase profits.

The divergence to previous studies may result from the manager's insecurity towards the Brazilian stock market, considering that the related researches were conducted in developed countries, with solid stock market reliable to investors. Managers with lower overconfidence would tend to earnings management opportunistic practices given the insecurity in presenting financial results that do not meet the expectations of market analysts, shareholders and investors. Unsatisfactory results could cause organizational instability and damages to the

reputation of managers, causing those with lower overconfidence to take advantage of discretionary accounting choices.

The contradiction in the hypotheses has contributed to the literature, since it demonstrates contrary effects of the overconfidence on the quality of accounting information in the emerging market, with less developed capital market and lower effectiveness of corporate governance mechanisms.

Furthermore, as regards the control variables, it was possible to conclude that lower short-term indebtedness leads to higher earnings management practice through accounting choices, contradicting the evidence of Labelle (1990), Malmquist (1990) and Balsam et al. (1995) that higher levels of indebtedness would be associated with opportunistic accounting choices to increase profits.

Finally, the findings indicate that the return on assets and return on equity do not impact on the level of earnings management. Such evidence is not in line with the stated by Balsam et al. (1995) and Doyle et al. (2007) that the low organizational performance may serve as an incentive to earnings management opportunistic practices. Finally, the long-term indebtedness and organizations opportunistic practices pose no influence on the earnings management opportunistic practices.

## 5 CONCLUSIONS

The objective of the study was to identify the influence of overconfident managers on earnings management in Brazilian companies. Initially, companies with treasury stocks were found to present lower earnings management, which allows to conclude that lower overconfidence, characterized by lower values in treasury stocks, influences the higher level of earnings management.

Similar conclusions can be obtained regarding the higher payment of dividends (characterized by the literature as managers with lower overconfidence), which presented positive impact on earnings management. Thus, the higher remuneration by dividend is positively related to earnings management, evidencing that companies with less confident managers, who distribute results instead of leaving them in the organization, present earnings management opportunistic practices.

The findings suggest that the family business is not related to the level of earnings management. In this sense, conclusions about overconfident managers cannot be inferred. And, finally, lower financial leverage presented positive influence on earnings management, suggesting that lower overconfidence has a positive effect on this management. In general, the variables determined by the literature to measure the overconfidence are found to influence the earnings management opportunistic practice, although the results were controversial to those pointed out in the literature (Malmendier & Tate, 2008; Jin & Kothari, 2008, Hribar & Yang, 2015, Li & Hung, 2013, Hsieh et al., 2014, Banerjee et al., 2014).

The consistency for the findings was obtained from the overconfidence ranking, where the results corroborate that lower overconfidence influences the increase of earnings management opportunistic practices to increase the profits. It is reasonable to argue that the differences found can be based on the characteristics of the Brazilian financial market, presenting different levels on the volume of treasury stocks, the financial leverage, the payment of dividends and the percentage of companies with family control.

The inconsistent result found in the Brazilian context, compared to the international findings, can be explained by the fact that less confident managers may make use of earnings management to demonstrate a financial result that boosts their reputation within the capital market and the organization itself. Additionally, less confident managers assume their skills are poorer than those of competitors and, therefore, manipulate earnings management to meet expectations that have been prospected, thus satisfying their self-esteem. This fact corroborates the study by Lin et al. (2005), defending that individuals' behavioral aspects may help to explain their financial choices.

The studies conducted by Malmendier & Tate (2008), Jin & Kothari (2008), Hribar & Yang (2015), Li & Hung (2013), Hsieh *et al.* (2014) and Banerjee *et al.* (2014), with US managers,



suggest that higher overconfidence leads to higher earnings management. In this sense, US companies are monitored under *Sarbanes-Oxley Law*, which may be preventing less confident managers from carry out the earnings management out of fear to be caught. On the other hand, overconfident managers would not be intimidated by stricter monitoring mechanisms and would act according to their interests. The factors provided hereunder may offer arguments for the divergent results found in the Brazilian context, with cultural, personal and macro-economical factors proving to be very specific in each country, also impacting the behavior of individuals.

Finally, the individual psychology may affect the opportunistic accounting choices (Hribar & Yang, 2015), and contribute to a better integration between behavioral aspects of managers (CEOs) and earnings management opportunistic practices to increase profit. The findings further demonstrate that analysts, investors and other *stakeholders* must observe the behavior of corporate agents when evaluating the results reported by firms, also considering the characteristics of the stock market, the auditing, the corporate governance and, specially, the cultural aspects for investment in the capital market.

Future researches that apply a questionnaire capable to identify the overconfidence of managers, directors and officers of organizations are recommended. Additionally, a list of researches considering the overconfidence from other perspectives (premises) of accounting information quality (conservativeness, timing, relevance value, persistence, among others) is rather important. Finally, additional variables can be used to express CEOs' overconfidence, such as age, schooling, and time of office.

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## PERCEPTION OF FINANCIAL ANALYSTS ABOUT THE RELEVANCE OF INFORMATION IN THE ELECTRIC SECTOR

### AMANDA MEDEIROS MARTINS

Master in Accounting from Universidade Federal do Rio de Janeiro (UFRJ). **Address:** FACC – PPGCC, Av. Pasteur, 250 | Urca | 22290-240 | Rio de Janeiro/RJ | Brazil.

**E-mail:** amedeirosmartins@gmail.com

### ADOLFO HENRIQUE COUTINHO E SILVA

Doctor in Controllershship and Accounting from Universidade de São Paulo (USP). Associate Professor of FACC-UFRJ. **Address:** FACC – PPGCC, Av. Pasteur, 250 | Urca | 22290-240 | Rio de Janeiro/RJ | Brazil.

**E-mail:** adolfocoutinho@uol.com.br

(Free translation of the original version in Portuguese)

### ABSTRACT

*The main objective of this research is to analyze the perceptions of investment analysts and credit analysts regarding the information of the corporate and regulatory accounting information of the electricity sector. Questionnaires were sent, in the period of February until April 2017, to 56 financial analysts indicated on the websites of the electric energy firms. The response rate was 46%, that is, a survey obtained 26 respondents of which 14 are investment analysts and 12 credit analysts. The results showed that: i) the items in the income statement are more relevant than the balance sheet items; ii) investment analysts consider a regulatory income statement more suitable for their analyses and credit analysts; iii) a perception of impairment for an analysis, due to the delay in disclosure of regulatory statements, was greater for investment analysts than the credit analyst; and iv) the current format for disclosure of financial information of electricity firms is not considered ideal for financial analysts.*

**Keywords:** *Relevance of accounting information. Regulatory accounting. Corporate accounting. Electrical sector.*

### 1 INTRODUCTION

In November 2009, Brazilian entity Accounting Pronouncements Committee (CPC, in the Portuguese abbreviation) prepared technical interpretation ICPC 01 – Concession Contracts, which regulated the accounting method for concessionaires. After approval by the Securities and Exchange Commission of Brazil (CVM, in the Portuguese abbreviation) no. 611/2009, ICPC 01 became mandatory for Brazilian publicly-held corporations as from 2010.

Before this technical interpretation, the energy sector infrastructure would be accounted for as a fixed asset. After the regulation, the information preparers began to disclose the public infrastructure of the concession agreement as a financial asset and/or an intangible asset.

In December 2010, in order to clarify doubts about ICPC 01, guidance OCPC 05 – Concession Contracts was issued. For the electric sector, OCPC 05 established that the accounting processing that best reflects the transmission companies' operations is the recognition of the infrastructure as a financial asset, since the activity has the unconditional right of receiving cash or any other financial asset from the granting authority. On the other hand, distribution and

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generation companies tend to be more suited to the bifurcated model, that is, partly accounted for as a financial asset and partly as an intangible asset (OCPC 05 – items 63 to 130, 2010).

Brazilian government Electricity Regulatory Agency (ANEEL, in the Portuguese abbreviation) has not approved all the changes caused by the adoption of the above standards. The agency then instituted a regulatory accounting through Normative Resolution ANEEL No. 396/2010, which reformulated the Accounting Manual of the Electric Sector (MCSE, in the Portuguese abbreviation), in order to meet the regulatory agency's needs.

ANEEL, through Normative Resolution No. 605 dated March 11, 2014 has approved the updating of the Accounting Manual of the Electric Sector with the intention of including a new chart of accounts for the sector. Beginning in 2015, concessionaires were required to present the most complete regulatory statements, including explanatory notes and an independent audit report. Previously, ANEEL would only require the disclosure of accounts that would be impacted due to differences in accounting practices.

In November 2014, OCPC 08 guidance was issued, aiming to address the requirements for initial registration and subsequently measurement of assets and/or liabilities dealing with regulatory tariffs in the companies' financial statements. Its application is exclusive to electric energy distribution companies (OCPC no. 08, 2014). Notably, the implementation of OCPC 08 made it possible to approximate corporate and regulatory rules in relation to the distribution sector.

Thus, electricity distribution concessionaires have amended their contracts identifying the granting authority as the counterparty responsible for the liquidation of regulatory assets and liabilities, which, even in the event of extinction, shall be included in the indemnification base. As a result, the bodies responsible for accounting standards have understood that there are no more uncertainties making it impossible to recognize and measure regulatory assets and liabilities of electric power distributors (OCPC no. 08, 2014).

In the electric sector's regulatory body's opinion, the introduction of ICPC 01 in Brazilian electric companies has not caused improvement in the quality of information (ANEEL, 2010).

According to Ribeiro (2016), ANEEL's interviewed analyst stated that IFRIC 12 is perfectly suited to highway concessionaires and therefore its examples are all related to this industry. For the electricity sector regulator, developing estimates for tariff remuneration and recognizing the infrastructure in the bifurcated model does not reflect the reliable value of the economic activity since only the financial asset is updated, which makes it difficult for inspection to be carried out by the agency. Ribeiro (2016) also states that there is an agreement on the difficulties that companies face in the adequacy of the systems, concern with the quality of the information and the approximation of the corporate and regulatory statements with the adoption of OCPC 08. On the other hand, it was possible to identify that there is no consensus yet on the possibility of unification of accounting processing for the electricity sector.

In turn, Hoppe (2012) has concluded that disclosing regulatory information to the public is positive in order to complement the volume of data that has already been disclosed by corporate statements.

In view of the above, the present study has the objective of analyzing investment and credit analysts' perceptions regarding the usefulness of the electricity sector's accounting and regulatory accounting information.

One of the reasons for carrying out this research lies in the fact that few national studies were identified that sought to understand the relevance of the electric sector's accounting information to financial analysts.

As a practical contribution, this study intends to investigate and report users' perception of the electric sector's information regarding accounting information disclosed in two different models and thus help regulatory bodies (of the sector and of the capital market) in developing accounting regulations of measurement, recognition and disclosure, taking into account users' needs. This study also expects to contribute to the literature of relevance of accounting information regarding the understanding of users' heterogeneity and their different needs.

## 2 PREVIOUS STUDIES

The relevance of accounting information has been discussed for about five decades and still remains a current subject, since its definition and application are considered subjective and complex. Morton (1974) was concerned with understanding the relationship between the concepts of relevance and comprehensibility of financial statements by preparers, auditors and market analysts.

More recently, researchers have analyzed various sources of information and financial statements have been considered as the main source of information for a variety of users. In most studies, investors and creditors, investigated in different developed markets.

Although financial statements are the main source of information for external users, Zimmerman (2013) states that he has never heard anything like “we shall improve the quality of external financial reporting to increase investor wealth” and also says that Chief Financial Officers (CFOs) view financial statements as a compliance activity and not as a way to increase the company’s value.

Even so, it is the information that is part of users’ decision making, even if its quality increase is not necessarily the main effect to increase the company’s value. It is important that information be reliable and relevant to capital providers.

Figure 1 presents studies that address information usefulness/relevance by users, particularly investors and creditors. These studies were carried out using research instruments such as questionnaires, interviews or experiments.

Despite the importance attributed to statements as the main sources of information, a study by Bartlett and Chandler (1997) has shown that even over time the perception of usefulness of accounting reports by English investors has not changed so much. However, surveys were conducted in times of low timeliness and difficult access to information. In addition, results are contradictory, since they consider financial statements as the main source for decision making and little used.

Also, according to Figure 1, it can be observed that for both emerging and developed markets, accounting information is the main source, according to the users included in the literature, and that recent research on perceptions of usefulness of information have been carried out in emerging markets.

Based on the studies mentioned, there is little attribution of value by investors and creditors to nonfinancial reports, such as socio-environmental reports and the company CEO’s statement (management message), while the auditor’s report has a larger importance when compared with the aforementioned ones. Despite this, Hodge (2003) states that investors consider audited financial information as the most relevant information but believe that there is some loss in its reliability due to the perception of independence decline among audit firms and companies.

As shown in Figure 1, the studies selected have a qualitative approach and the use of questionnaires as a collection tool. It is possible to notice that throughout the years the response rate has been diminishing in relation to the oldest searches.

By means of the studies examined, users (investors and creditors) consider the balance sheet, income statements and cash flows as the most important items in financial statements, as previously mentioned in the literature. In less developed countries, cash flows have not proved to be so important, suggesting that there is a low level of maturity among users and that companies have insufficient disclosure quality.

It is noted that both emerging and developed market users have distinct needs for the use of information. There are differences within subgroups of users and also divergent understandings. While some have more sophisticated tools and only capture the accounting data to feed their bases and conduct their assessments, others are limited to what companies disclose and supplement that information with nonfinancial data released by the media.

| Author (year)                           | Objective   | Search method/data collection   | Sample/Country  | Result of the Study  |
|---|---|---|---|--|
| Morton (1974)                           | To demonstrate the relationship, if any, among concepts of relevance and understanding perceived by four groups of participants in the financial reporting process in relation to financial data disclosure.  | Questionnaires. Auditors, controllers, credit and insurance analysts.   | From a universe of 213, the response rate was 63%.<br>The United States.  | There is a positive trend in the relation among objectives of understandability versus relevance. The study suggests that more understandable information is considered more relevant. It implies that unfavorable information may be inherently more difficult to understand. The company may intentionally present unfavorable disclosures in a more incomprehensive manner.   |
| Bouwman, Frishkoff and Frishkoff (1995) | The purpose of this study is to observe financial analysts while they make investment decisions.  | Questionnaires and interviews. Financial analysts.  | From the 20 interviewees, the final sample represented 40% of the population identified. United States (San Francisco and New York) | Results suggest that GAAP (Generally Accepted Accounting Principles)-based information primarily serves a screening function, quickly eliminating "unattractive" users. However, it plays a much less important role in developing a positive case to invest in the company. This decision depends largely on qualitative information and information on individual segments. When deciding which company to invest in, analysts look for disaggregated and future information that allows them to evaluate the earnings potential of individual segments. |
| Bartlett and Chandler (1997)            | The goal is to examine whether shareholders use and understand information from company reports.<br>(A replica of studies by Lee and Tweedie in the 1970s)  | Questionnaires adapted from Lee and Tweedie. Period of application: December 1994. A group of shareholders of a company was identified for questionnaires to be sent. | From a universe of 300, the response rate was 25.3%.<br>United Kingdom  | Results show that annual accounting reports are not widely read yet. The level of voluntary information has increased. However, it may be a management strategy to try to manipulate shareholders. Few read the new sections, either because they need to become familiar with the new standards or because they do not consider them important. Finally, annual general purpose statements are unlikely to meet information needs of a large investor scope.  |
| Ho and Wong (2001)                      | The goal is to explore the practice, perceptions of effectiveness (and ways to improve) of corporate disclosure by companies listed in Hong Kong. Compares perceptions about the variety of information flow, disclosure and efficient market issues. | Questionnaires. Applied from November 1997 to January 1998. Information preparers and investment analysts.  | There were 610 preparers and 535 users interviewed. With a response rate of 16.8% and 17.2%, respectively.<br>China.                | Analysts have identified more than preparers that there is a need for increased monitoring of financial reporting. Both groups do not believe that improving disclosure is the only sufficient requirement to do away with financial reporting problems. Instead, they suggested the need for improved communication and, by more appropriate means, a more proactive disclosure strategy and more voluntary information required by users.  |

Continue



Figure 1 (continued)

| Author (year)                | Objective  | Search method/data collection   | Sample/Country   | Result of the Study  |
|------------------------------|--|---|--|--|
| Hodge (2003)                 | The article investigates whether nonprofessional investors perceive SEC's concerns about independent auditors' work and the reliability of audited financial information and fundamental analysis. | Questionnaires. Divided into two groups, a prize pre-announcement for respondents and other post ads. Investors of NAIC.                | 13,250 questionnaires were sent, with 3% response rate. The United States. | Results show that investors perceive that the financial information audited from the year 2001 is more relevant but less reliable due to the perception of less independence among audit companies and audited companies.  |
| Campbell and Slack (2008)    | To explore the usefulness and relevance of disclosures in explanatory notes to financial statements.   | Semi-structured interview for one hour with sell-side analysts. Conducted between the end of 2004 and the half of 2006. Banking Sector. | There were 19 interviewees. United Kingdom.                                | Participants demonstrated that there was a general belief that the explanatory notes were not immediately applicable nor useful in the primary sell-side tasks (which is the construction of forecasting models and buy-sider reports). Despite this, researchers were unable to identify specific uses of a particular category of financial reports disclosure. The management report and the socio-environmental report are irrelevant. As for risk disclosure, it was considered extremely important and corporate governance reports are generally not read, as UK banking governance has a high level of confidence on the part of analysts. |
| Zoysa and Rudkin (2010)      | To report how users of annual financial statements in emerging markets view these reports.   | Questionnaire.  | 264 respondents. Sri Lanka.  | Results show that most use the annual reports to obtain information on stock transactions. Despite the delay in publishing and the lack of availability of public access in general, most identify them as an important source of information. Compared to developed markets, Sri Lankan users rely more on information on financial statements than on information provided by brokers, newspapers and other media commentators.  |
| Cascino <i>et al.</i> (2016) | To investigate the use of financial information by capital providers.  | Questionnaire. Experiment. Institutional investors.   | 81 participants from 16 countries.   | Results of research indicated that the purpose of the use of information matters. They attach greater importance to the outcome information. Participants reported that, despite all the sources of information available today, financial statements remain the first to be used in their decisions. Especially for those who want to analyze managerial performance.   |

Figure 1. Previous studies on users' perception of the relevance of accounting information

Source: Prepared by the authors.

Other aspects noted by these studies were some concerns that users have about financial information, such as lack of availability, non-timely disclosure and communication deficiency, which are commonly reported in surveys. It is perceived that they are concerns related to other qualitative characteristics of the information such as those established by the conceptual structure, namely timeliness and understandability.

Information preparers and investment analysts do not believe that improving disclosure is a sufficient requirement to tackle financial reporting problems (Ho & Wong, 2001).

Compared with international literature, studies carried out in Brazil on the relevance of the information, with a qualitative approach, are incipient and with little academic repercussion.

Results found in a study by Boff, Procianoy and Hoppen (2006) corroborate international studies in emerging countries regarding the lack of external information from companies. Antunes and Leite (2008) have also identified that there is little disclosure of intangible assets, even though investment analysts consider as an important account for decision making, even if indirectly.

Convergence to international standards has brought a greater burden of mandatory disclosure. The above mentioned studies were either outside the convergence period or early on. They suggest that this reality may have changed with the maturity of international standards, interpretations and guidelines developed by regulatory agencies.

With respect to studies on the relevance of the electric sector accounting information, it was possible to identify that there is a greater amount of research on value relevance for the sector than the use of a qualitative approach on the information relevance. Nevertheless, studies such as those by Ribeiro, Macedo and Marques (2012) and by Gomes (2013) have sought to identify the importance of indicators or accounting data for different groups of information users. The first study was carried out with creditors and the second one with managers (internal users) who, although not being the focus of this study, are also part of the accounting information recipients. Results corroborate previous studies that the accounting information is relevant, whether for a basis of indicators or for internal use.

### 3 METHODOLOGY

The research is characterized as descriptive. The data collection tool for this study was the questionnaire made available online through the Google Forms tool. In order to capture credit and investment analysts' perceptions in relation to the Brazilian electricity sector's corporate and regulatory accounting, it was necessary to conduct a qualitative-quantitative approach.

The survey questionnaire was designed to understand how analysts perceive the usefulness of a company's accounting information in an industry that is qualified as a reference for investment, maintenance or disinvestment decisions. It includes a set of issues accompanied by a model of financial statements that shall serve as a basis for analysis.

In order to place participants in a situation closer to the reality of a financial analyst specialized in the electric energy sector, two cases were developed with situations that simulate the divergences of accounting classifications of an electric sector company's infrastructure. In addition, financial statements were formatted comparing the corporate model with the regulatory model.

Financial statements used as reference in the survey were prepared based on data from a private company in the electricity sector that develops energy distribution activity in a state of Brazil. Data were summarized to enable application with questionnaire respondents in a time frame not exceeding one hour.

Questions used in the questionnaire were developed from the questionnaire developed by Cascino *et al.* (2016). Some modifications were made to suit the objective of the present research. The research instrument questions include questions on the following topics: Respondents' profile – intending to know the target audience (block 1); accounting information relevance – the purpose of this block was to capture perceptions regarding financial information in general for those respondents by means of closed questions (block 2); concession contract – in this part, two cases of accounting records of a public infrastructure for a concessionaire were presented, according to ICPC 01. Examples were developed in order to simulate the situation of an electric transmission company and an electric energy distributor, respectively (block 3); and, finally, relevance of

regulatory accounting information – in order to identify what this group of users believes to be important for its analysis regarding electricity distribution companies (block 4). In the last block, perceptions were collected by means of a simplified analysis of an electric distribution company's corporate and regulatory statements and also through some closed questions and only one open.

To measure respondents' perception, a seven-item Likert scale with the following designation was adopted: (a) strongly disagree; (b) mostly disagree; (c) slightly disagree; (d) neutral; (e) slightly agree; (f) mostly agree and (g) strongly agree. Each of these responses was assigned a number on an ordinal scale of one to seven. Based on this ordinal scale, it was possible to apply nonparametric statistical tests, as normally applied in scientific studies using questionnaires.

Regarding the identification of market professionals, 14 companies in the electricity sector were analyzed, which disclosed the contacts (e-mail address and telephone number) of the financial analysts appointed by the company on their Investor Relations (IR) website. In total, 224 names of financial analysts were found. Excluding names that had no contact data and duplicates, the workforce was reduced to 56 "expert" financial analysts in the power sector. The final sample comprised 26 financial analysts (46.4% of the total) who answered the questionnaires sent.

These professionals were selected due to accessibility and convenience and because the literature suggests that this type of analyst usually uses accounting information in their decision-making processes. In addition, although there is already a large volume of research in the field of information usefulness, there were no significant studies in the local literature seeking to identify financial analysts' perception in a sector with accounting and regulatory peculiarities such as electricity.

The research used the frequency descriptive statistics tools, the Chi-squared test and the nonparametric Mann–Whitney U test for two independent samples.

#### 4 RESULTS ANALYSIS

In the first part of the questionnaire, respondents provided information on age, gender, main academic background, current occupation, length of service, number of companies analyzed per year, type of analyst, type of company in which they work and financial information used for composing their analyses. To better present the data, two tables were developed, summarizing each part of the questionnaire. The first one (Table 1) deals with the respondents' profile.

The final sample consisted of 26 financial analysts listed by the electric sector companies in their Investor Relations sites, representing 46.4% of the population identified. 65% of the sample consisted of men and 35% of women. Based on the Chi-squared test, it can be stated that there is no statistically significant difference between the ratio of men and women in the sample in relation to the population analyzed [ $\chi^2 = 0.813$  ( $p\text{-value} > 0.10$ )]. The result of this statistical test allows to conclude that the sample gender composition does not present distortions in relation to the analyzed population's profile.

**Table 1**  
**Respondent Profile**

| Panel A - Gender              |  | Sample (N=26) |            | Population (N=56)      |            | X <sup>2</sup> Test<br>( <i>p-value</i> ) |
|-------------------------------|--|---------------|------------|------------------------|------------|---|
|                               |  | Quantity      | %          | Quantity               | %          |   |
| Female                        |  | 9             | 35%        | 14                     | 25%        | 0.813<br>(0.367)                          |
| Male                          |  | <u>17</u>     | <u>65%</u> | <u>42</u>              | <u>75%</u> |   |
| Total                         |  | 26            | 100%       | 56                     | 100%       |   |
| Panel B - Academic Background |  | Quantity      |            | Panel C - Analyst Type |            |   |
|                               |  | Quantity      | %          | Quantity               | %          |   |
| Economy                       |  | 12            | 46%        | 'Buy side' investment  | 12         | 46%                                       |
| Engineer                      |  | 9             | 35%        | 'Sell side' investment | 2          | 8%  |

Continue

**Table 1 (continued)**

|                         |    |      |                    |    |      |
|-------------------------|----|------|--------------------|----|------|
| Accounting              | 3  | 12%  | Credit and similar | 11 | 42%  |
| Business Administration | 2  | 8%   | Rating Analyst     | 1  | 4%   |
|                         | 26 | 100% |                    | 26 | 100% |

**Note.** n = 26 respondents.

Source: Prepared by the authors based on the questionnaires received.

According to Panel C, Table 1, the predominant professional activities in the responses are intended to be “buy side” and “credit and the like” investments. They make up 46% and 42%, respectively. It is noteworthy that two different groups were formed for the analyses. Respondents were classified as investment analyst or credit analyst and the like (rating analyst), accounting for 54% and 46% of the total, respectively.

Table 2 below presents the average values (average ranking according to the seven-item Likert scale) calculated based on the two groups of analysts’ response frequency according to their education and the total respondents’ average value and, in addition, the nonparametric test results for two independent samples (type of analyst) of the indicators evidenced in Panel A.

Panel A in Table 2 presents the average indices found for the economic-financial indicators. In general terms, indicators of Net Debt/EBITDA and Net Debt/Shareholders’ Equity presented higher degrees of agreement, while indicators based on equity accounts were those that presented a lower level of similarity in the answers ranging from 4.1 to 4.5. Indexes in scale 4 are considered “neutral”, that is, for research interpretation they are “indifferent” to the respondents’ analyses.

Panel B in Table 2 reveals that most respondents admit that Income Statement, Balance Sheet, Cash Flow Statement and Explanatory Notes are fully relevant to their analyses. For these statements, average ranking ranged between 6.9 and 7.0.

Results presented are consistent with those found by Ohara (2014), who analyzed the difference between financial indicators calculated based on information from the two accounting systems of the main companies in the electricity sector and found that indicators such as “Net Debt/EBITDA”, “Net Income/Shareholders’ Equity” and “Net Income/Income” present significant differences due to the divergence of corporate and regulatory processes.

Considering the nonparametric test results, it is possible to observe that there is no statistically significant difference in the perception about the relevance of most financial economic indicators among investment analysts and credit analysts and the like [ $p$ -value > 0.10]. Only for the index of current assets/liabilities [ $X^2 = 37.50$  and  $p$ -value < 0.10] it was observed that credit analysts attribute more importance than investment analysts, 5.4 and 4.9, respectively.

Table 2

### Relevance of accounting information – Financial indicators, financial statements and bookkeeping account – by type of analyst

| Indicators                         | Analyst Type       |                        | Main Academic Background |         |          |       | Test            |
|------------------------------------|--------------------|------------------------|--------------------------|---------|----------|-------|-----------------|
|                                    | Investment Analyst | Creditors and the like | Business and Accounting  | Economy | Engineer | Total | Mann-Whitney    |
|                                    |                    |                        |                          |         |          |       | ( $p$ -value)   |
| Current Assets/Current Liabilities | 4.9                | 5.4                    | 6.2                      | 4.8     | 6.0      | 5.5   | 37.5<br>(0.014) |
| Total Assets/Total Liabilities     | 3.7                | 4.5                    | 4.2                      | 4.2     | 3.6      | 4.1   | 64.0<br>(0.298) |
| Gross Debt/Equity                  | 5.1                | 5.0                    | 4.8                      | 5.2     | 5.1      | 5.1   | 78.5<br>(0.773) |
| Net Debt/Ebitda                    | 6.8                | 6.1                    | 4.8                      | 6.8     | 6.8      | 6.5   | 62.5<br>(0.174) |
| Net Debt/Equity                    | 5.7                | 6.3                    | 6.0                      | 5.8     | 6.2      | 6.0   | 64.5<br>(0.290) |
| Fixed assets/Equity                | 4.2                | 4.9                    | 4.6                      | 3.8     | 5.2      | 4.5   | 66.5<br>(0.358) |
| Net profit/Total assets            | 4.5                | 4.3                    | 4.2                      | 4.4     | 4.2      | 4.4   | 82.0<br>(0.916) |
| Net Profit/Equity                  | 5.4                | 4.8                    | 4.4                      | 5.1     | 4.9      | 5.1   | 68.0<br>(0.392) |

Continue

**Table 2 (continued)**

| Financial Statements   | Analyst Type       |                        | Main Academic Background |         |          |       |
|--|--------------------|------------------------|--------------------------|---------|----------|-------|
|  | Investment Analyst | Creditors and the like | Business and Accounting  | Economy | Engineer | Total |
| Balance Sheet  | 6.8                | 7.0                    | 7.0                      | 6.8     | 6.9      | 6.9   |
| Income Statement (DRE)   | 7.0                | 7.0                    | 7.0                      | 7.0     | 7.0      | 7.0   |
| Cash Flow Statement (DFC)  | 7.0                | 6.9                    | 7.0                      | 7.0     | 6.9      | 7.0   |
| Shareholders' Net Worth Changes Statement (DMPL, in the Portuguese abbreviation) | 4.9                | 5.3                    | 5.8                      | 4.6     | 4.3      | 5.0   |
| Value Added Statement (DVA, in the Portuguese abbreviation)                      | 4.6                | 3.8                    | 2.6                      | 4.2     | 4.9      | 4.2   |
| Explanatory Notes  | 6.9                | 6.9                    | 7.0                      | 7.0     | 6.8      | 6.9   |
| Auditor's Opinion  | 5.5                | 6.2                    | 6.8                      | 5.6     | 5.6      | 5.8   |
| Management Report  | 6.1                | 5.2                    | 5.0                      | 5.8     | 5.9      | 5.7   |
| Social Accounting  | 4.8                | 4.1                    | 4.0                      | 4.3     | 4.8      | 4.5   |

| Bookkeeping account                     | Analyst Type       |                        | Main Academic Background |         |          |       |
|---|--------------------|------------------------|--------------------------|---------|----------|-------|
|   | Investment Analyst | Creditors and the like | Business and Accounting  | Economy | Engineer | Total |
| Net Revenues (DRE)                      | 6.5                | 6.4                    | 5.8                      | 6.5     | 6.8      | 6.5   |
| Net Profit (DRE)                        | 6.9                | 6.1                    | 5.6                      | 6.8     | 6.6      | 6.5   |
| Cash flow generated by operations (DFC) | 6.8                | 6.8                    | 7.0                      | 6.9     | 6.6      | 6.8   |
| EBITDA (DRE)                            | 6.8                | 6.3                    | 5.2                      | 6.8     | 6.8      | 6.5   |
| Fixed Assets (BP)                       | 6.1                | 5.9                    | 5.0                      | 6.2     | 6.1      | 6.0   |
| Intangible Assets (BP)                  | 5.4                | 5.0                    | 5.4                      | 5.2     | 5.1      | 5.2   |
| Financial Asset (BP)                    | 5.3                | 5.8                    | 5.8                      | 5.4     | 5.6      | 5.5   |

**Note.** N = 26 respondents.

(a) The mean values indicated were calculated according to the seven-item Likert scale. (b) (1) strongly disagree; (2) mostly disagree; (3) slightly disagree; (4) neutral; (5) slightly agree; (6) mostly agree and (7) strongly agree.

Source: Prepared by the authors.

In order to capture the respondents' opinion on the concession assets infrastructure accounting record, two examples (similar to that of ICPC 01) were developed regarding accounting of a transmission network infrastructure and the other one of an electricity distribution network. ICPC 01 interpretation, together with OCPC 05, establishes that the concession infrastructure that is within the scope of the standard should be recorded as a financial asset and/or intangible asset, as described in the references of this study.

Table 3 presents a summary of the preference for presentation of corporate and regulatory information format by investment analysts and credit analysts. It shows that only 38% of the respondents opted for a separate disclosure of the corporate and regulatory statements, which is the current way of doing so. The corporate statement is filed at CVM and the regulatory statement at ANEEL. Most of the respondents chose to have a statement showing the comparative of the corporate and regulatory or an explanatory note in the corporate statement with the reconciliation of Shareholders' Equity and Net Income, representing 38% and 19%, respectively. Only one respondent with a background in accounting sciences believes that the disclosure should be only for the financial statement.

**Table 3****Respondents' preference for disclosure of information**

| Disclosure     | Investment Analyst |                        |       | Creditors and the like |                        |       |
|----------------|--------------------|------------------------|-------|------------------------|------------------------|-------|
|                | Investment Analyst | Creditors and the like | Total | Investment Analyst     | Creditors and the like | Total |
| Corporate      | 0                  | 1                      | 1     | 0%                     | 4%                     | 4%    |
| Reconciliation | 3                  | 2                      | 5     | 12%                    | 8%                     | 19%   |
| Separate       | 5                  | 5                      | 10    | 19%                    | 19%                    | 38%   |
| Comparative    | 6                  | 4                      | 10    | 23%                    | 15%                    | 38%   |
| Total          | 14                 | 12                     | 26    | 54%                    | 46%                    | 100%  |

**Continue**

**Table 3 (continued)**

| Disclosure     | Business and |         |          |       | Business and |         |          |       |
|----------------|--------------|---------|----------|-------|--------------|---------|----------|-------|
|                | Accounting   | Economy | Engineer | Total | Accounting   | Economy | Engineer | Total |
| Corporate      | 1            | 0       | 0        | 1     | 4%           | 0%      | 0%       | 4%    |
| Reconciliation | 0            | 2       | 3        | 5     | 0%           | 8%      | 12%      | 19%   |
| Separate       | 2            | 6       | 2        | 10    | 8%           | 23%     | 8%       | 38%   |
| Comparative    | 2            | 4       | 4        | 10    | 8%           | 15%     | 15%      | 38%   |
|                | 5            | 12      | 9        | 26    | 20%          | 46%     | 35%      | 100%  |

**Note.** (a) Both the corporate and regulatory statements must be separately disclosed; (b) A comparative of the two (corporate and regulatory) statements should be disclosed in an integrated report; (c) An explanatory note reconciling Shareholders' Equity and Net Income from corporate and regulatory accounting; (d) Regulatory information should not be published, only made available to the competent regulatory body. (n = 26 respondents).

Source: Prepared by the authors.

In Panel A of Table 3 it is seen that all "Investment Analysts" prefer disclosure of both pieces of information. Results suggest that there is a tendency among analysts to prefer this information in a more detailed way, considering that the separate and comparative disclosure tends to be more informative than the disclosure of reconciliation of accounts impacted by the divergence of accounting models or only of the companies' financial statements.

In order to analyze preferences on the income statement format, whether regulatory or corporate, respondents were asked which of the two formats they considered most appropriate for their analyses. A summary of responses is given in Table 4.

**Table 4****Preference for the Income Statement format**

|            | Investment | Creditors    | Total | Investment | Creditors    | Total | Test X <sup>2</sup> ( <i>p</i> -value) |
|------------|------------|--------------|-------|------------|--------------|-------|--|
|            | Analyst    | and the like |       | Analyst    | and the like |       |  |
| Regulatory | 11         | 4            | 15    | 42%        | 15%          | 58%   | 5.418                                  |
| Corporate  | 3          | 8            | 11    | 12%        | 31%          | 42%   | 0.02                                   |
| Total      | 14         | 12           | 26    | 54%        | 46%          | 100%  |  |

Note. n = 26 respondents.

Source: Prepared by the authors.

Table 4 shows that although the majority of respondents prefer the Regulatory DRE to compose their analyses, totaling 58% of the sample, the corporate DRE model also presented a high degree of preference (42%) by respondents. Statistical evidence suggests that investment analysts have greater preference for regulatory DRE, while credit analysts have opted for the corporate income statement [ $X^2 = 5.418$  ( $p$ -value < 0.10)].

To better understand participants' preferences, they justified their choices in a dissertative manner. The summary of results found is reported in Figure 2. Examining justifications by respondents who chose the regulatory DRE, it is possible to notice that there is a trend of answers regarding their importance: a) generation of cash flow and b) discrimination of the Installment A costs. As for those who opted for the corporate model, they tended to respond that in the regulatory income statement there is excessive information.

Corroborating the statistical test result, where it is possible to see that there is greater interest by investment analysts in the regulatory DRE, in 9 of the 11 justifications cash flow is cited as the reason for the preference. As for credit analysts or the like, who prefer the corporate DRE for the most part, they commented that there is too much information in the regulatory DRE.

|   |   |
|---|---|
| <p>Panel A – Investment Analysts</p> <p style="text-align: center;"><u>Regulatory</u></p> <ul style="list-style-type: none"> <li>– “Interest in effective cash generation” (Economy);</li> <li>– “More clarity of concession data beyond short-term volatility” (Engineering);</li> <li>– “Better information for correct calculation of companies’ cash flows” (Engineering);</li> <li>– “The cash effect is better reflected in the regulatory statements, besides discriminating between Installment A cost and Installment B cost” (Economy);</li> <li>– “Regulatory LL has no non-cash effects such as the revaluation of Financial Assets (a non-cash and non-operating item of the distributor) and also highlights the differences between accounting and regulatory depreciation (an item that impacts almost all accounts)” (Economy);</li> <li>– “Both are important but in terms of Cash Flow analysis, the regulatory one provides further details of information” (Economy);</li> <li>– “Because there are fewer accounting entries and they better portray companies’ actual cash generation” (Economy);</li> <li>– “More adequately reflects the cash generation of the period” (Economy);</li> <li>– “Better reflects the business’ economics” (Engineering);</li> <li>– “The regulatory model facilitates understanding recurring profitability due to Installment A variations in the corporate format” (Economy);</li> <li>– “Closer relationship with FCF” (Economy).</li> </ul> | <p style="text-align: center;"><u>Corporate</u></p> <ul style="list-style-type: none"> <li>– “Closer to actual cash flow” (Engineering);</li> <li>– “For purposes of equity analysis, corporate results are more important” (Economy);</li> <li>– “Reflects companies’ true financial health” (Engineering);</li> <li>– “The corporate model represents the competence and it is possible to see the receipt (or not) and the financing (or not) of rights and duties in the Balance Sheet” (Adm. and Accounting).</li> </ul>   |
| <p>Panel B – Credit Analysts and the like</p> <p style="text-align: center;"><u>Regulatory</u></p> <ul style="list-style-type: none"> <li>– “In the regulatory DRE I see the composition of the tariff” (Adm. and Accounting);</li> <li>– “It correctly covers the breakdown of taxes, charges and costs” (Engineering);</li> <li>– “You better understand what Installment A is, which the costs that the company can not manage are and Installment B, which are the ones that it can get. If the company is generating low results after Installment A, it can be understood that the business model is not sustainable. By differentiating Installments A and B, one can have a better understanding of the company’s cash generation” (Adm. and Accounting);</li> <li>– “Better tax breakdown” (Engineering).</li> </ul>   | <p style="text-align: center;"><u>Corporate</u></p> <ul style="list-style-type: none"> <li>– “Basic statement for dividends” (Adm. and Accounting);</li> <li>– “Because the regulatory model depends on decisions by the granting authority” (Economy);</li> <li>– “Information from the Regulatory DRE is complementary in the analysis, bringing data from the operational performance. In this way the corporate model reflects the company’s economic-financial status, being more appropriate for credit risk analyses” (Adm. and Accounting);</li> <li>– “The regulatory model is noisy and may vary with regulatory changes” (Economy);</li> <li>– “Tends to better demonstrate the company’s results as well as being clearer” (Engineering).</li> <li>– “I’m not interested in a separation among accounts. Excess of information” (Economy);</li> <li>– “The cost/expense format is the most understandable way to evaluate the company at first” (Engineering).</li> </ul> |

**Figure 2.** Qualitative Data Analysis (n = 26 respondents)

Source: Prepared by the authors.

Also in the disclosure question, participants were asked if the disclosure date of the regulatory statement after the date of the corporate disclosure harms their analyses, in order to identify whether investment or credit analysts perceive that the presentations at different dates affect their analyses. Table 5 summarizes the results for such questioning.

Table 5 shows that, on average, participants agree that there is some loss to their analyses in view of the disclosure of regulatory information that is subsequent to the corporate information, representing a total of 74% of agreement with such loss. Segregating by type of analyst it turns out that 27% are investment analysts, who agree that they miss information with disclosure at a later date.

**Table 5**  
**Perceived impairment in analyses due to difference in disclosure date**

|                    | Analyst Type       |                        | Main Academic Background |         |                    | Total |
|--------------------|--------------------|------------------------|--------------------------|---------|--------------------|-------|
|                    | Investment Analyst | Creditors and the like | Adm. or Accounting       | Economy | Engineer           |       |
| Totally Disagree   | 4%                 | -                      | -                        | 4%      | -                  | 4%    |
| Mostly Disagree    | 4%                 | -                      | -                        | 4%      | -                  | 4%    |
| Partially Disagree | -                  | 4%                     | -                        | -       | 4%                 | 4%    |
| Neutral            | 4%                 | 12%                    | 8%                       | 8%      | -                  | 15%   |
| Partially Agree    | -                  | 12%                    | 4%                       | 4%      | 4%                 | 12%   |
| Mostly Agree       | 15%                | 15%                    | 4%                       | 12%     | 15%                | 31%   |
| Totally Agree      | 27%                | 4%                     | 4%                       | 15%     | 12%                | 31%   |
| Average Ranking    | 5.7                | 5.1                    | 5.2                      | 5.2     | 5.9                | 5.4   |
| Mann Whitney test  |                    | X <sup>2</sup><br>49.0 |                          |         | p-value<br>(0.063) |       |

**Note.** n = 26 respondents.

Source: Prepared by the authors.

Based on the results found in the statistical test, it can be seen that investment analysts and credit analysts and the like perceive differently the impairment in their analyses due to the disclosure of regulatory statements at a later date [ $p$ -value < 0.10]. Considering the average values found and the statistical test result, it is possible to note that investment analysts are more in agreement than credit analysts with respect to the existence of informational loss for their analyses due to the difference in the corporate and regulatory statements date of disclosure.

Table 6 shows respondents' degree of perception on the electricity sector bookkeeping account, which, for the most part, makes up the income statement, in addition to two accounts of the balance sheet. There are accounts that are seen in both models as there are also accounts presented in only one of the accounting processes. All of them are related either to ICPC 01 or to the Accounting Manual of the Electric Sector (MCSE, in the Portuguese abbreviation).

Examining Table 6, it is possible to observe that there is an agreement in which accounts related to the tariffs composition are relevant for analysis of the companies of the sector in question. Accounts such as "regulatory asset", "regulatory liability", "Installment A tariff recomposition" and "Installment A costs" obtained an average level of concordance between 6.0 and 6.4. The "construction costs" account, which is purely corporate in nature, received the lowest average score (3.7) among investment analysts.

Results found in the nonparametric test suggest that it is possible to see that investment analysts consider the regulatory asset (BP), regulatory liability (BP), network (N) availability accounts more relevant than credit analysts do [ $p$ -value < 0.10], with the exception of the "construction cost" account. Investment analysts tend to disagree that this account is relevant to compose their analyses and credit analysts and the like seem to agree that they are important.

**Table 6**  
**Importance of bookkeeping account in the regulatory DRE**

| Bookkeeping account                | Analyst Type       |                        | Main Academic Background |         |          | Total | Test<br>Mann-Whitney<br>(p-value) |
|------------------------------------|--------------------|------------------------|--------------------------|---------|----------|-------|-----------------------------------|
|                                    | Investment Analyst | Creditors and the like | Adm. and Accounting      | Economy | Engineer |       |                                   |
| Regulatory Asset                   | 6.9                | 5.8                    | 5.4                      | 6.5     | 6.8      | 6.4   | 43.0<br>(0.013)                   |
| Regulatory Liabilities             | 6.7                | 5.8                    | 5.4                      | 6.4     | 6.7      | 6.3   | 49.5<br>(0.042)                   |
| Installment A tariff recomposition | 6.5                | 6.0                    | 6.0                      | 6.3     | 6.4      | 6.3   | 68.5<br>(0.859)                   |
| Energy supply                      | 6.1                | 5.7                    | 5.0                      | 5.9     | 6.4      | 5.9   | 51.5<br>(0.390)                   |
| Network availability               | 6.0                | 5.2                    | 4.6                      | 5.8     | 6.0      | 5.6   | 84.0<br>(0.082)                   |
| Installment A costs                | 6.2                | 5.8                    | 5.8                      | 6.0     | 6.2      | 6.0   | 52.0<br>(1.000)                   |
| Construction Costs                 | 3.7                | 5.4                    | 4.6                      | 2.8     | 6.0      | 4.5   | 52.0<br>(0.093)                   |

**Continue**



**Table 6 (continued)**

| Bookkeeping account              | Analyst Type       |                        | Main Academic Background |         |          | Total | Test<br>Mann-Whitney<br>(p-value) |
|----------------------------------|--------------------|------------------------|--------------------------|---------|----------|-------|-----------------------------------|
|                                  | Investment Analyst | Creditors and the like | Adm. and Accounting      | Economy | Engineer |       |                                   |
| Advance Expenses – CVA           | 5.9                | 5.6                    | 4.4                      | 5.6     | 6.4      | 5.8   | 74.5<br>(0.610)                   |
| Deferred Taxes                   | 5.2                | 5.0                    | 3.6                      | 5.1     | 5.4      | 5.1   | 75.0<br>(0.635)                   |
| Remuneration of Financial Assets | 4.8                | 6.0                    | 6.0                      | 4.8     | 6.2      | 5.3   | 61.0<br>(0.205)                   |

**Note.** n = 26 respondents.

Source: Prepared by the authors.

The results have shown that investment analysts, credit analysts and the like use the accounting information and, in general, consider financial statements important to compose their analyses. Income statement (DRE, in the Portuguese abbreviation), balance sheet (BP, in the Portuguese abbreviation) and cash flow statement (DFC, in the Portuguese abbreviation) have been perceived as the most important for these analysts, confirming results found in previous studies (see, for example, Cascino *et al.*, 2016).

Profit and loss accounts are valued as most relevant to equity accounts. Additionally, cash flow generated by the operations, evidenced in the DFC, was considered very important by respondents. Regarding the indicators, the “Net Debt/EBITDA” index is highlighted, which, together with “Net Debt/Shareholders’ Equity”, were considered relevant for the participants’ analyses.

Considering that participants attributed greater importance to DRE, DFC and EBITDA, it is possible to assume that investment analysts and credit analysts use the information in order to estimate future cash flow generation, since they are assigning greater importance to financial performance (profitability) and accounts (and indexes) that are used to analyze companies’ cash generation capacity in order to pay their debts. They corroborate the findings in a research by Cascino *et al.* (2016), which demonstrated that demand and use of financial information are carried out to meet the need to predict or estimate cash flows and that asset items are not as relevant because information role is more confirmatory than predictive.

Both the analysts investigated in this research and those in the study by Cascino *et al.* (2016) evaluated EBITDA as of high relevance for their analyses, since it is a fast access measure of companies’ cash generation.

Participants were asked about the relevance of specific accounts of the electricity sector for their analyses. Results showed that accounts such as regulatory assets, regulatory liabilities, tariff recomposition – Installment A and Installment A costs – were considered important for participants.

Prior to OCPC 08, companies in the electricity sector could not recognize regulatory accounts as regulatory (equity) assets and liabilities and, consequently, income statements related to them (energy supply, network availability and Installment A costs and charges) in corporate statements. The IASB asserted that such assets and liabilities did not have the characteristics established in the conceptual framework to be recognized as assets or liabilities. With the adoption of OCPC 08 and the amendment of contracts, companies became guarantors of the granting authority and were able to recognize such amounts in corporate statements, considered important for energy tariff revision. Regulatory asset and liability accounts, now recorded in corporate statements, were considered important for analyses by these respondents.

Analyzing the two groups, it is possible to see that the regulatory statement disclosure at a later date than that of the corporate statement is detrimental to analyses by both types of analysts. This loss is perceived as greater by investment analysts. This evidence corroborates results from the preference for income statements, where investment analysts consider the regulatory DRE to be more adequate to meet their analyses needs.

Results suggest that credit analysts may have already standardized analyses models. Probably because of this reason, they do not assign so much importance to regulatory accounts and DRE and do not perceive informational loss in disclosure on different dates, since there is evidence that the corporate information already meets their standardized models. Despite this,

credit analysts consider regulatory information to be relevant and the evidence suggests that it is used as complementary information in the analyses carried out by companies in the electricity sector.

Results also show that only 38%, less than half, of respondents believe that the best form of disclosure is the current formatting, separate corporate and regulatory statements. These results suggest possible need to rethink disclosure of energy companies' corporate and regulatory information. Additionally, it is possible to suggest that the two statements be used, since only one respondent opted for disclosure of only the corporate statement. Most participants chose the regulatory income statement as the most appropriate to compose their analyses.

Although more than half of respondents agree that the disclosure of information on different dates may cause some impairment in their analyses, there is not a considerable number of respondents who have opted for disclosure of information in a comparative format or a reconciliation note of both (regulatory and corporate) approaches in the financial statements, prepared in accordance with accounting standards in force in the country. These would be the two types of diffusion in formatting that is different from the current one and that include corporate and regulatory information on a single date of disclosure, which reveals that there is not a consensus among participants of how statements should be disclosed in a way that would soften the loss caused by disclosure on different dates.

## 5 CONCLUSIONS

The purpose of this study was to analyze financial and credit analysts' perceptions regarding the usefulness of corporate and regulatory accounting information from companies in the electricity sector.

To reach the objective, a questionnaire was used as a data collection instrument. The population was identified by means of information available on electric power companies' websites, which indicate professionals who perform analyses on them. Of the 56 professionals identified, 26 responded to this study. Following the profile of these participants, two groups were created: investment analysts and credit analysts and their equivalent.

Results showed that: i) items in the income statement are more relevant than balance sheet items; ii) investment analysts consider the regulatory DRE to be more adequate for their analyses than credit analysts and the like; iii) perception of impairment for the analysis, due to delay in disclosure of the regulatory statements, was greater for investment analysts than for credit analysts; and iv) the current disclosure format (a corporate and regulatory accounting statement) of electric power companies' financial information is not considered ideal by financial analysts.

In line with the literature, the findings of this study confirm that financial statements are used by financial analysts and that information on income statement is more important than equity information, especially for analysts who have the objective of evaluating the companies' cash flows. For this reason, investment analysts believe that the regulatory income statement provides them with more adequate information on companies' operating results in the electricity sector than the corporate income statement. Additionally, investment analysts realize that disclosure on different dates causes them some informational loss.

Regardless of the type of professionals, most respondents do not seem to be satisfied with the current disclosure format for corporate and regulatory financial statements, since they believe there should be other formats for such information. Although the current formatting is separate, one with filing with CVM and another with ANEEL, there are companies, such as Transmissora Aliança de Energia Elétrica S.A. (TAESA), which (voluntarily) present their results to investors in the comparative format of these statements. This suggests that there may be a demand for this type of disclosure from external users of the information.

Results found in this research may be important for regulators to evaluate a better way of disclosure of corporate and regulatory statements by companies in the electricity sector, without causing informational damages to external users. Another contribution of the study was to highlight what is considered relevant by analysts appointed by companies in the electricity sector

in order to help in the format of standards (such as CVM Resolution No. 727/2014), which propose a reduction of information details disclosed in financial reports.

In addition to practical contributions, this study contributes to the development of the literature on the relevance of accounting information, since it presents findings about a group of specific users that have perceptions similar to those already found in previous studies.

It should be noted that financial statements perceptions of users who participated in this study are personal and do not represent the totality of the interviewees' perceptions. Of course, qualitative surveys based on questionnaires are of a subjective nature and depend on respondents' understanding of the research instrument.

As a suggestion for future research, it is recommended to deepen the knowledge of accounting information relevance by means of studies that evaluate the use of this information by other groups of users or in other economic segments that present regulatory accounting statements.

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## GROWTH ACCELERATION PROGRAM (PAC): A DESCRIPTIVE STUDY OF ACTIVE AND PASSIVE WASTE

### DANIELE SILVA RODRIGUES

*Master in Business Administration with a concentration in Public Area in the Graduate Program in Business Administration at Universidade Federal de Viçosa (PPGADM/UFV). Address: Avenida Peter Henry Rolfs, s/n | Campus Universitário | 36570-900 | Viçosa/MG | Brazil.*

**E-mail:** [silvar.daniele@gmail.com](mailto:silvar.daniele@gmail.com)

### NÁLBIA DE ARAÚJO SANTOS

*Doctor in Controllershship and Accounting by Universidade de São Paulo (USP). Professor of the Department of Business Administration and Accounting and of the Professional Master's Program In Public Administration at Universidade Federal de Viçosa (UFV). Address: Avenida Peter Henry Rolfs, s/n | Campus Universitário | 36570-900 | Viçosa/MG | Brazil.*

**E-mail:** [nalbiaas@yahoo.com.br](mailto:nalbiaas@yahoo.com.br)

### WALMER FARONI

*Doctor in Economic and Business Sciences from University of Valencia. Professor of the Department of Business Administration and Accounting and of the Post-Graduation Program In Business Administration at Universidade Federal de Viçosa (PPGADM/UFV). Address: Avenida Peter Henry Rolfs, s/n | Campus Universitário | 36570-900 | Viçosa/MG | Brazil.*

**E-mail:** [walmerfaroni@gmail.com](mailto:walmerfaroni@gmail.com)

## ABSTRACT

In 2007, the Brazilian government implemented the Growth Acceleration of Program (PAC), with the objective of encouraging Brazil's economic growth, with investments in the areas of sanitation, housing, transportation, energy and water resources. This program, in its first phase (2007-2010), contributed in a decisive way to the increase in the supply of jobs and in the generation of income in Brazil. However, according to "Instituto Trata Brasil" 86% of the sanitary sewage works from the PAC were paralyzed, or delayed or not started until December 2012. Also, in 2008 and 2009, through the special edition of the Inspection Program by Public Sweepstakes, the Federal Comptroller General's Office found several irregularities in 110 Brazilian municipalities covered with PAC funds. In this context, the objective of the study was to analyze the irregularities verified by the CGU, in the application of the federal resources destined to the sanitation and housing areas of the Brazilian municipalities through the first stage of the PAC. The main source of data for the survey were CGU's reports from the PAC and Census 2000 data, made available by IBGE. The techniques of Content analysis were used to classify the irregularities, verified by the CGU, in active waste (corruption) and passive (mismanagement). The Descriptive statistics were used to analyze the profile of irregularities and the municipalities audited. It was observed that the most frequent wastes in the municipalities audited are those classified as Overbilling and Fraudulent Bidding (classified as active waste); and "Bad Administration" and "Irregular Bidding", in the form of passive waste.

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**Keywords:** Public audit. Active and passive waste. Growth of Acceleration Program. General Comptroller of the Union.

## 1 INTRODUCTION

The process of evaluating the execution of Government Programs is relevant to verify the achievement of objectives and the adequacy of federal resources management. This type of evaluation is the responsibility of the Brazilian government Federal Department of Internal Control (SFC, in the Portuguese abbreviation), responsible for overseeing and evaluating “the execution of government programs, conducting audits and evaluating results from federal public administrators management, investigating complaints and representations, exercising control of credit operations and also carrying out activities in support of external control” [Comptroller General of the Union’s Office (Portuguese: Controladoria-Geral da União, abbreviated CGU)], 2017a).

SFC has the administrative structure of CGU regional units to carry out internal control activities throughout the country. The focus of the SFC auditors’ work is to improve the management and execution of public policies aiming at improving the provision of public services as well as the defense of government property and the increase of management transparency. During audit work, the main procedures are the analysis of accounts and documents, personal and physical inspection of works and services in progress and, in situations that the auditors consider relevant, contact with the population occurs directly or through community councils and other organized entities. These procedures make it possible to collect evidence on the legality and to evaluate results from the execution of Government Programs (CGU, 2017a).

In order to give transparency and publicity to results from its audit work, CGU discloses this evidence through auditing and supervision reports. Inspection reports from the Public Sweepstakes Inspection Program (PFSP, in the Portuguese abbreviation) present an evaluation of the effective application of federal public resources destined to fulfillment of the purpose in the governmental action (CGU, 2017a). This type of report contains useful evidence to establish a diagnosis of the irregularities found by the CGU in the processing of resources intended to comply with governmental policies through Government Programs.

These evidences of legal nonconformity are used in this study to identify indicators of corruption and inadequate management of federal resources applied in municipalities via Brazilian government Growth Acceleration Program (PAC, in the Portuguese abbreviation), a program for which, upon recommendation by the Brazilian Presidency of the Republic, a special edition of the PFSP was carried out in order to follow up the regularity in the use of its resources and thus avoid diversions that could compromise the effectiveness of its actions (CGU, 2009). Thus, the objective of this study is to analyze irregularities verified by the Comptroller General of the Union’s Office in the application of federal resources destined to sanitation and housing areas in Brazilian municipalities through the first stage of the Growth Acceleration Program..

Surveying the irregularities profile can contribute to identification and improvement of indicators relevant to PAC performance evaluation and observation of trends of indicators of active or passive waste in the use of resources destined to the program. In addition, the study can contribute to analyzing results from indicators of active or passive waste according to geographic and populational characteristics of municipalities audited by CGU. This analysis of the indicators, considering the municipalities’ geographic and populational characteristics, may suggest probable assumptions to be explored in future research.

This type of analysis is relevant due to PAC’s social importance and the volume of resources invested in such program. In PAC’s first phase, investments represented approximately BRL 619 billion until December 31, 2010, according to PAC’s 11th Complete Debriefing (2007-2010) (Brazilian government Ministry of Planning, Budget and Management [MPOG], 2010). In addition, according to a study from Brazilian institute Instituto Trata Brasil (ITB), by 2012, only 14% of the total of 138 works in the area of sanitation related to the PAC, that is, 114 PAC1 works and 26 PAC2 works, were completed. Thus, until December 2012, 86% of the sewage works were paralyzed, delayed or not yet started.

The ITB study concluded that the works delays are due to deficiencies in the quality of the projects originally sent to the federal government, problems in biddings, bureaucracy in transfer of resources, slowness in environmental licensing process, lack of coordination among the actions of federal, state and municipal levels in scheduling and focus on the execution of larger projects, among other aspects (ITB, 2013). Furthermore, based on the latest ITB survey in 2015, this situation has persisted in recent years, considering that by 2015 only 32% of PAC's sewage works were completed (ITB,2016).

The scenario mentioned indicates possible problems of mismanagement and legal nonconformity in the application of PAC's federal resources in the second case, especially when it suggests the presence of problems in bidding. Therefore, understanding the mechanisms of fraud and, consequently, the types of waste that may have occurred in PAC's management, can help in understanding the mode of operation of corrupt people at the municipal level. Thus, it is expected, with the study results, that there is a contribution to the improvement of possible indicators to be used in Government Programs execution evaluation.

This paper has five more sections, besides this introduction. The following sections present a brief history of PAC and a review of the literature on the topic proposed. The fourth one covers the methodological procedures performed in the study to meet the objectives proposed. The fifth one describes the results found. Finally, the sixth section presents the conclusions obtained based on this research results.

## **2 THE GROWTH ACCELERATION PROGRAM – PAC**

The Growth Acceleration Program (PAC, in the Portuguese abbreviation), an initiative from the Brazilian federal government, has been launched in 2007 with the purpose of encouraging Brazil's economic growth, with investments in the areas of sanitation, housing, transport, energy and water resources. Through PAC, the government's main objective was to increase investments in infrastructure to eliminate the main bottlenecks that limit economic growth and to increase corporate productivity in addition to stimulating private investment growth and reducing regional inequalities. PAC's federal resources have generally been transferred to federal, state and municipal agencies or legally qualified entities to be applied in specific projects in the municipality and to meet certain public policies (MPOG, 2017).

According to MPOG (2017), developed as a strategic plan to resume planning and investments in the country's structural sectors, PAC, in its first phase, has decisively contributed to increasing the supply of jobs and income generation and increased public and private investment in fundamental works. According to MPOG's data, in its early years (2007-2010), PAC<sup>1</sup> has contributed to increase Brazilian public investments, the GDP (which was 1.62% in 2006 went to 3.27% in 2010) and for the generation of new jobs (8.2 million jobs were created during its implementation period). For the Brazilian Ministry of Planning, PAC was important for the country during the severe global financial crisis between 2008 and 2009, since it guaranteed employment and income to Brazilians. Therefore, it has contributed to the continued consumption of goods and services. It kept the economy active and reduced the effects of that crisis on domestic companies.

Also, according to the PAC's first stage 11th Complete Debriefing (2007-2010), released in December 2010, the program has initially foreseen investments in the amount of BRL 657.4 billion for the 2007 to 2010 period . By October 2010, BRL 559.6 billion were invested, 85.1% of the total estimated. In the areas of housing and basic sanitation, around BRL 215.6 and BRL 40 billion were destined to be invested in such areas, respectively (MPOG, 2010).

## **3 PREVIOUS STUDIES**

There are studies that have used indicators of corruption and mismanagement to analyze public resources inadequate management both in the international context and in the Brazilian context. For example, international literature presents studies by Hart, Shleifer and Vishny (1997), Di Tella and Schargrotsky (2003) and Bandiera, Prat and Valletti (2009). At the national level, studies carried out by Mendes (2004), Ferraz, Finan and Moreira (2008), Vieira

(2011), Dias, Matias-Pereira, Farias and Pamplona (2013), Marin, Gama and Campelo (2014) and Caldas, Costa and Pagliarussi (2016).

Within the international literature, Hart *et al.* (1997) have investigated when it would be beneficial for the government itself to provide prison service or choose to outsource through private institutions in the context of the United States. The authors have developed a mathematical model to analyze the relationship between cost versus benefit of providing directly or outsourcing prison services. This model has considered the existence of corrupt managers in this type of decision. In relation to public managers' corrupt behaviors, the authors argued that in situations where the problems of favoring private companies in public contracts are greater than the problems of sponsoring interest groups (providing jobs to workers who have supported the politician in elections) the provision of service by the government itself is more indicated. Public service privatization, on the other hand, is more appropriate when problems of sponsoring interest groups are greater than the problems of favoring private companies in public procurement.

Di Tella and Schargrotsky (2003) have developed a study having as its object of research the sectors of purchases in public hospitals in the city of Buenos Aires, Argentina, during 1996 and 1997. The objective of the research was to investigate the relationship between prices paid for basic hospital supplies, the salaries paid to employees responsible for purchasing such inputs and the implementation of a policy by the local government to combat corruption in said sector. The survey results pointed to a reduction of approximately 10% in the prices paid for inputs due to the repression of corruption, which occurred through hospital audits. In addition, regarding the relationship between prices paid for inputs and the hospital purchasing officials' salaries, the authors concluded that it is necessary to jointly implement a policy aimed at improving these employees' salaries and intensifying audits in order to improve procurement efficiency in this sector.

Also, in the international context, Bandiera *et al.* (2009) have developed a theoretical framework to study the characteristics of unnecessary expenses that occur in public resources administration in Italy. The authors have classified these expenditures into two categories: active waste and passive waste. The first one, active waste, also called corruption, occurs when public agents obtain direct or indirect benefits for themselves, causing damages to the public entity. As for the second category, called passive waste or inefficiency, public agents do not obtain direct or indirect advantages for themselves. Such waste comes from a number of factors, such as: over-regulation in the public sector and lack of competent public officials who should be encouraged to minimize procurement costs incurred by public administration.

After the construction of the theoretical framework on active and passive waste, Bandiera *et al.* (2009) have empirically verified whether these wastes are determinants of the cost of products bought by Italian public bodies. To do so, the authors analyzed 21 items purchased by 447 employees responsible for the purchasing sector in several Italian public agencies in the 2000-2005 period. Using statistical techniques, Bandiera *et al.* (2009) have developed a mathematical model to analyze the impact of the two forms of waste on the price of the products acquired. It was found that, from of the total of active and passive waste that occurred in the purchase of goods carried out by Italian public bodies, on average, 83% of the expendable expenditures occurred due to passive waste (public management inefficiency). In this regard, the authors clarify that this result does not indicate that corruption is not an important issue in the administration of public resources. The aim, according to them, is to highlight a type of waste that receives little attention from public agencies and that often occurs in the management of these resources, causing damage to the public sector.

In Brazil, a study by Mendes (2004) had the objective of analyzing the profile of irregularities present in the municipal management of the Fund for Maintenance and Development of Elementary Education and Valorization of Education Professionals (FUNDEB, in the Portuguese abbreviation, formerly FUNDEF). In order to do so, the author used the findings present in reports from the 1st to the 9th sweepstakes of CGU's Public Sweepstakes Inspection Program (PFSP, in the Portuguese abbreviation) related to 67 municipalities that were granted funds from FUNDEB. The research results showed that 18 types of irregularities occurred in FUNDEB's municipal management. The most common are the following irregularities: Ineffectiveness at FUNDEB's social monitoring and control council (73%),



diversions of resources from FUNDEB's 40% share (63%), diversion from purpose for expenditure not characterized as regular education (60%), low quality of managerial control (52%) and evidence of fraud in bidding processes (43%).

Ferraz *et al.* (2008) have analyzed effects of corruption and mismanagement on education spending on the performance of elementary school students. The main sources of data that the authors used were results from Brazilian government so-called Brazil Test from 2005 and audit reports from PFSP regarding sweepstakes 2 to 16<sup>2</sup>. The first source of data was used as a proxy for the students' cognitive abilities, while the second one was used to construct indicators of corruption and mismanagement by classifying findings present in the audit reports in one of the 20 categories preestablished by the authors. In order to achieve the objective proposed, the authors developed a model of educational production function incorporating effects of corruption and mismanagement. It was found that, controlled by other characteristics, corruption significantly reduces students' performance in the Brazil Test and negatively affects other school indicators, such as the students' passing rate and the dropout rate.

Vieira (2011) has analyzed in a study the characteristics of improbity (corruption) in municipal public administration and has investigated the possible causes and effects of this improbity. To identify misconduct in municipal public management, the authors classified the findings present in the audit reports from the 20th to 30th PFSP sweepstakes in: information and comments, formal failures, average failures and serious failures. Having done that and based on the main hypotheses described in the literature and using some statistical tests, the author has empirically analyzed corruption causes and effects in the public sector. The main results showed that the degree of irregularity significantly differs among political and administrative areas of the country and that corruption is negatively associated with the municipalities' socioeconomic development and with institutional capacities to control opportunism.

Dias *et al.* (2013), based on the theoretical framework on active and passive waste presented in a study by Bandiera *et al.* (2009) and in the variables used in a research by Ferraz *et al.* (2008), have developed a study to identify factors of active waste (corruption) and passive waste (inefficiency) related to irregularities that occurred in health expenditures from transfers from the federal government to Brazilian municipalities. Therefore, findings present in the PFSP audit reports, derived from the 31st and 32nd sweepstakes, were classified as active or passive waste. The authors have used the same variables used in the study by Ferraz *et al.* (2008) to identify active and passive waste in CGU's audit reports. By means of the factorial analysis multivariate statistical technique, three passive waste factors were identified, statically associated with irregularities that occurred in health spending in the municipalities audited. These are: Administrative inadequacy, poor supervision and low compliance. As for active waste, it was not possible to present a factor representing it, since the research data did not present adequate levels of significance. Moreover, the study pointed to the need for greater concern on the part of the responsible bodies, the academy and the population for passive waste that, as well as active waste, significantly affects the quality of the services rendered. In addition, the authors have highlighted the urgent need to "implement governance mechanisms in the public sector, which could reduce active and passive waste" (Dias *et al.*, 2013, p. 206).

Marin *et al.* (2014) have investigated the types of active and passive waste that occurred in the application of federal resources destined to the municipalities of the Brazilian State of Pará for the development of programs and actions coordinated by the Ministry of Cities. The authors used 21 categories, the same ones used in the study by Dias *et al.* (2013), with the inclusion of the variable "Lack of Advertising" to classify the findings present in the audit reports from the PSFP into active and passive waste. The universe of analysis of the research was 23 audit reports carried out in the municipalities of Pará from 2003 to 2013, which involved the 4th to 38th sweepstakes. By means of the content analysis technique and the percentage quantification of the irregularities present in the audit reports, the authors have verified that the two types of waste are present in the sample analyzed. The most frequent ones are: resource diversion (19%), classified as active waste, and irregular bidding (38%) and lack of advertising (31%), classified as passive waste.

Finally, the study by Caldas *et al.* (2016) has aimed to investigate the relationship between corruption and the composition of government spending in Brazilian municipalities. The

main sources of data used by the authors were the audit reports of the CGU's Public Sweepstakes Inspection Program 20th to 30th sweepstakes, transfers from the federal government resources available in the federal government Transparency Portal and the municipalities' expenditures accounting data obtained on the website of the Brazilian Department of National Treasury (FINBRA, Portuguese abbreviation for Brazil Finances). The first data source was used to develop corruption measures. For this, the authors used only the findings classified by CGU's auditors into average failures and severe failures. As for the second and third data sources, they have been employed to describe the composition of the federal government transfers to municipalities and municipal expenditures. It has been verified, by means of multiple regression econometric models, that there is an association between the occurrence of corruption and expenditures with social assistance, education, health and other functions. In the case of education and health expenditures, the authors point out that this relationship was significantly positive. They indicate that higher levels of corruption in municipalities cause higher spending on education and health.

## **4 METHODOLOGICAL PROCEDURES**

### **4.1 Description of the data source**

The main source of the research data was in the reports of the CGU's auditors from the special edition of the Public Sweepstakes Inspection Program (PFSP). In this edition, which was released in 2008 and 2009, the selected municipalities were inspected exclusively for the application of resources from the Growth Acceleration Program (PAC), involving the sanitation and housing areas. Two sweepstakes were carried out selecting municipalities with up to 500 thousand inhabitants, except the capitals, 50 municipalities in 2008 and 60 municipalities in 2009, equivalent to 110 municipalities. The analysis universe of this research consisted of 108 of these municipalities drawn and audited, because two reports were not available in the CGU system (CGU, 2017b).

Another source of data used was the 2000 Census developed by the Brazilian Institute of Geography and Statistics (IBGE, in the Portuguese abbreviation). Census 2000 data were used to identify the socioeconomic and geographical profiles of the municipalities analyzed and thus complement the information contained in the audit reports. These data allowed a detailed descriptive analysis of the results obtained in the audit reports content analysis with the socioeconomic and geographical profiles of sampled municipalities. The descriptive analysis made it possible to relate the indicators of active and passive waste obtained in the content analysis with the municipalities' context at the time they were audited by the CGU.

It is noteworthy that the inspection reports were chosen because they allowed to collect information regarding the application of PAC's federal public resources in the Brazilian municipalities, since the audits were carried out based on an on-site visit. These visits have as their goals the examination of accounts and documents to carry out personal and physical inspection of the works and services in progress, besides collecting information from the population by means of interviews and questionnaires. Consequently, the inspection reports include information concerning the number of inspections carried out and the amount of funds invested, as well as indicating the irregularities contained in the works. Thus, based on this information, it was possible to survey the active and passive waste that occurred in PAC's works in the areas of sanitation and housing.

### **4.2 Content analysis**

Interpretation of the GCU audit reports content was based on the content analysis technique. The main method of analysis was the categorial one. It clarifies that, according to Bardin (1977, p. 27), the content analysis "is a set of techniques of communications analysis" and the categorial analysis method consists of a classification process.

In order to apply the categorization method, variables mentioned in studies by Ferraz *et al.* (2008), Dias *et al.* (2013) and Marin *et al.* (2014) were considered. This study was based on 21 types of irregularities grouped in the active and passive waste categories to develop the

content analysis using the categorization method. Table 1 describes the variables used to classify the (active or passive) types of waste:

Table 1  
Category of active and passive waste

| Constructs                                    | Active waste  |  |
|---|---|--|
|   | Description   |  |
| Overbilling                                   | It occurs when prices paid are above market prices or when the quantity purchased far exceeds the municipality's needs.   |  |
| Bidding with resource diversion               | It occurs when there is evidence that the service tendered and paid was not provided.   |  |
| Resource diversion                            | It occurs in cases where there are expenses without proof of the physical part or service rendered.   |  |
| Fraudulent bidding                            | It occurs when the executing agent, in the bidding, uses relatives or third parties for their own benefit or to benefit others.   |  |
| Nonpayment of a tribute                       | It occurs when the municipality fails to pay any tribute.   |  |
| Inexecution of a resource                     | It occurs when the federal government transfers the money but the municipality does not use it.   |  |
| Work unfinished or with irregular execution   | It occurs when the agency in charge leaves work unfinished and pays the corresponding installment (paralyzed work).   |  |
| Lack of or weak board action                  | It occurs when the board does not demonstrate to be acting in the inspection of expenses of the area.   |  |
| Clientelism                                   | It occurs when city mayors spend public resources for the explicit purpose of obtaining votes.  |  |
| Irregular execution of social programs        | It occurs when the control or registration of social programs is irregular.   |  |
| A white elephant                              | It occurs when there is a construction or purchase of assets that are disproportionate to the municipality's needs.   |  |
| Irregular bidding                             | It occurs when there is an irregularity in the bidding documents.   |  |
| Bidding fractionation                         | It occurs when the executing agent splits the expenses to be carried out in different biddings aiming to change the type of bid required, according to regulation established by law.                   |  |
| Bidding lacking competition                   | It occurs when the bidding does not present a minimum of 3 competitors.   |  |
| Diversion of purpose for the same sector      | It occurs when the resource is used for the PAC's works but for an objective that is different from that initially agreed with the federal government.  |  |
| Diversion of purpose to another sector        | It occurs when the resource is used in another sector for an objective that is different from that initially agreed with the federal government.  |  |
| No counterpart has taken place                | It occurs when the municipality does not provide the counterpart of its responsibility.   |  |
| Lack of advertising                           | It occurs when city mayors do not notify political parties, labor unions and business entities about money transfer from the federal government to carry out works in the municipality.                 |  |
| Work finished with irregularity               | It occurs when work is done in its entirety but there are some minor irregularities.  |  |
| Irregularity unrelated to the executing agent | It occurs when there are irregularities that are not under the executing agent's responsibility.  |  |
| Mismanagement                                 | Any other irregularity pointed out by the CGU that does not meet the other criteria above and results in deterioration in the provision of public service and failure to achieve the program objective. |  |

**Note.** Source: Adapted from Ferraz, C., Finan; F., & Moreira, D. B. (2008). *Corrupção, má gestão, e desempenho educacional: evidências a partir da fiscalização dos municípios. Anais do Encontro Nacional de Economia*, Salvador, BA, Brasil, 36. Dias, L. N. S., Matias-Pereira, J., Farias, M. R. S., & Pamplona, V. M. S. (2013). *Fatores Associados ao Desperdício de Recursos da Saúde Repassados pela União aos Municípios Auditados pela Controladoria Geral da União. R. Cont. Fin-USP*, 24(63), 206-218. Marin, T. I. S., Gama, D. S. S., & Campelo, S. (2014). *Corrupção e Ineficiência nos Repasses Federais: uma análise dos gastos do Ministério das Cidades nos Municípios Paraenses (2003-2013). Anais do Congresso USP de Iniciação Científica em Contabilidade*, São Paulo, SP, Brasil, 11.

It should be emphasized that the word waste is defined in this study as any irregularity that results in the loss of public resources, either through mismanagement or corruption. In order to distinguish active and passive waste categories, definitions used by *Dias et al.* (2013)

were used. Thus, active waste occurs when “some private entity obtains financial advantage over financial loss caused to the public entity” (Dias *et al.*, 2013, p. 207) and is also termed corruption. As for passive waste, it occurs “when the public treasury is damaged but there is no financial benefit for the private entity in return” (Dias *et al.*, 2013, p. 207) and is considered as inefficiency or mismanagement. In the case of subcategories, the study by Ferraz *et al.* (2008) was the main basis for identifying 20 types of irregularities, which were grouped in the categories corruption (active waste) and mismanagement (passive waste). A new variable was added in the passive waste category, called “Lack of Advertising”, defined by Marin *et al.* (2014), which also based on the study by Dias *et al.* (2013) were used.

## 5 RESULTS PRESENTATION

### 5.1 Descriptions of municipalities

The main characteristics of the municipalities analyzed are described in Table 2. The municipal sample represents the audited values of approximately BRL 307.58 and BRL 261.58 million, generating 117 and 133 Service Orders (SO) for CGU auditors in 2008 and 2009, respectively. These amounts audited are distributed by ministerial portfolio, BRL 235,912,624.77 and BRL 219,180,822.73 to the Ministry of Cities, with 58 and 80 SO, BRL 61,802,315.27 and BRL 35,524,889.78 for the Ministry of Health, with 52 and 47 SO and BRL 307,580,208.07 and BRL 9,865,268.03 for the Ministry of National Integration, with 7 and 6 SO, respectively, for the years 2008 and 2009.

Table 2

#### Audited value, Service Order (SO) number and location of municipalities

| Year                                  | 2008           | 2009           |
|---------------------------------------|----------------|----------------|
| <b>Total number of Service Orders</b> | 117            | 133            |
| <b>Total amount audited (BRL)</b>     | 307,580,208.07 | 261,580,653.41 |
| <b>Total of cities</b>                |                |                |
| <b>Location</b>                       |                |                |
| <b>Midwest</b>                        | 4              | 4              |
| <b>Northeast</b>                      | 23             | 25             |
| <b>North</b>                          | 6              | 7              |
| <b>Southeast</b>                      | 8              | 14             |
| <b>South</b>                          | 8              | 9              |

**Note.** Source: Research data.

The socioeconomic characteristics mean values of the audited municipalities' population and of the total of Brazil are shown in Table 3. These averages show how, in most indicators, the audited municipalities differ from the average of Brazilian municipalities. In general, the data show that the municipalities audited have lower average socioeconomic indices compared to the national average. This shows that the audited municipalities present socioeconomic conditions that are lower than the country average.

Table 3

#### Average socioeconomic characteristics of the audited municipalities' population and the general averages of Brazilian municipalities

| Indicators                              | Audited 2008 |                    | Audited 2009 |                    | Brazil  |                    |
|---|--------------|--------------------|--------------|--------------------|---------|--------------------|
|   | Average      | Standard Diversion | Average      | Standard Diversion | Average | Standard Diversion |
| Expected years of schooling             | 8.07         | 1.68               | 7.95         | 1.79               | 8.34    | 1.80               |
| Illiteracy rate - 11 to 14 years old    | 9.74         | 8.36               | 10.17        | 9.18               | 7.52    | 8.23               |
| Illiteracy rate - 18 years old or older | 26.27        | 14.13              | 25.95        | 14.49              | 23.56   | 13.52              |

**Continue**

**Table 3 (continued)**

| Indicators   | Audited 2008 |                    | Audited 2009 |                    | Brazil    |                    |
|--|--------------|--------------------|--------------|--------------------|-----------|--------------------|
|  | Average      | Standard Diversion | Average      | Standard Diversion | Average   | Standard Diversion |
| GINI   | 0.55         | 0.06               | 0.55         | 0.06               | 0.55      | 0.07               |
| % of extremely poor  | 24.12        | 17.46              | 24.79        | 17.56              | 20.69     | 17.21              |
| % of poor  | 45.26        | 23.11              | 45.86        | 23.71              | 41.06     | 22.78              |
| % vulnerable to poverty  | 67.23        | 20.88              | 67.00        | 21.97              | 63.90     | 20.71              |
| <i>Per capita</i> income (BRL)                                     | 306.47       | 185.85             | 315.15       | 197.70             | 338.54    | 192.44             |
| THEIL  | 0.52         | 0.11               | 0.52         | 0.11               | 0.51      | 0.14               |
| % of the population in households with bathrooms and running water | 55.36        | 29.85              | 54.74        | 32.28              | 62.66     | 30.93              |
| % of population in households with density > 2                     | 42.58        | 15.19              | 43.61        | 14.99              | 38.14     | 14.92              |
| % of the population in households with garbage collection          | 76.46        | 29.57              | 76.05        | 27.21              | 79.20     | 25.59              |
| % of the population in households with electricity                 | 84.19        | 16.88              | 84.14        | 17.45              | 86.61     | 17.03              |
| % of people in households with inadequate water supply and sewage  | 15.43        | 15.40              | 18.19        | 20.02              | 13.47     | 15.60              |
| Municipal Human Development Index (HDI)                            | 0.50         | 0.10               | 0.51         | 0.11               | 0.52      | 0.10               |
| Rural Population   | 10,534.73    | 13,591.49          | 7,114.31     | 5,525.55           | 5,722.38  | 10,370.68          |
| Total population   | 40,415.29    | 63,663.78          | 37,942.29    | 72,744.20          | 30,511.96 | 185,672.80         |
| Urban population   | 29,880.55    | 57,784.69          | 30,827.98    | 71,827.02          | 24,789.57 | 178,967.49         |

**Note.** Source: Research data.

The profile reported in Table 3 is complemented with the analyses presented in the following tables. It can be observed in Table 4 that more than 50% of the municipalities analyzed have low or very low Human Development Index (HDI). Also, it is verified that the sampled municipalities are needier than the national average.

**Table 4**

**Percentage distribution of municipalities by Human Development Index range of municipalities audited and means of total municipalities in Brazil**

| Classification | MHDl                      |                             |             |
|----------------|---------------------------|-----------------------------|-------------|
|                | % of audited ones in 2008 | % of municipalities in 2009 | % of Brazil |
| Very low       | 46.94                     | 57.63                       | 41.80       |
| Low            | 30.61                     | 16.95                       | 29.7        |
| Average        | 20.41                     | 22.03                       | 26.1        |
| High           | 2.04                      | 3.39                        | 2.4         |
| Very high      | 0                         | 0                           | 0           |

**Note.** Source: Research data.

IDHM ranges: Very low: 0 to 0.499; Low: 0.500 to 0.599; Average: 0.600 to 0.699; High: 0.700 to 0.799; Very high: 0.800 to 1.

The Gini coefficient and Theil index, presented in Table 3, have indicated that the sampled municipalities present a high level of inequality and income concentration, respectively. This finding is complemented with information contained in Table 5. It shows that most of the municipalities analyzed had a per capita income below the minimum wage in 2008 and 2009, which was approximately BRL 465.00.

Table 5  
**Municipalities' percentage distribution by income groups of the average per capita household income**

| 2008             |                          |                     |
|------------------|--------------------------|---------------------|
| Range (BRL)      | Number of municipalities | % of municipalities |
| 103.91 to 158.92 | 12                       | 24.5                |
| 158.93 to 239.45 | 13                       | 26.5                |
| 239.46 to 449.92 | 12                       | 24.5                |
| 449.93 to 899.91 | 12                       | 24.5                |
| 2009             |                          |                     |
| Range (BRL)      | Number of municipalities | % of municipalities |
| 86.79 to 150.36  | 15                       | 25.4                |
| 150.37 to 233.83 | 15                       | 25.4                |
| 233.84 to 442.80 | 15                       | 25.4                |
| 442.81 to 830.87 | 14                       | 23.7                |

**Note.** Source: research data.

Also, in Table 6 it is possible to notice that the expectation of years of study for the population up to 18 years of age in the municipalities audited was equanimous in the ranges presented. However, most of the ranges were below 11 years. It indicates that the majority of the population with up to 18 years of age in the sample does not finish high school courses. This context is aggravated when compared to the average illiteracy rate for the sampled population aged 18 years or older, reported in Table 3, which shows that 26.27% and 25.95% of the municipalities' population analyzed, respectively, in the years 2008 and 2009, cannot read or write a simple note.

Table 6  
**Municipalities' percentage distribution by ranges of expectation of study years up to 18 years of age**

| 2008         |                          |                     |
|--------------|--------------------------|---------------------|
| Range        | Number of municipalities | % of municipalities |
| 4.75 a 6,70  | 12                       | 24.5                |
| 6.71 a 8,13  | 13                       | 26.5                |
| 8.14 a 9,50  | 12                       | 24.5                |
| 9.51 a 11,25 | 12                       | 24.5                |
| 2009         |                          |                     |
| Range        | Number of municipalities | % of municipalities |
| 3.99 a 6,39  | 15                       | 25.4                |
| 6.40 a 7,90  | 15                       | 25.4                |
| 7.90 a 9,35  | 15                       | 25.4                |
| 9.36 a 11,60 | 14                       | 23.7                |

**Note.** Source: Research data.

Information presented in Tables 2 to 6 above shows that, in general, the municipalities audited in 2008 and 2009 are concentrated in the Brazilian northeastern region and are needier than the national average. In addition, its population has a low educational level, since a significant part, at the age of 18 years, has not yet completed high school and presented an average illiteracy rate of 26.27 and 25.95, respectively, in the periods of 2008 and 2009.

## 5.2 Analyses of irregularities

Irregularities mentioned in the CGU's reports were segregated according to the origin of the resource. Therefore, they shall be described for each Brazilian Presidential Ministry. The resources audited are transfers from the Ministries of Cities, Health and National Integration. It should be noted that there are municipalities that have received resources from the three ministries. On Table 7 it is possible to visualize the amount of municipalities that obtained

resources in each Ministry. It is noteworthy that the Ministry of Cities had the largest number of municipalities that received the PAC I resources.

Table 7

**Number of municipalities audited by CGU according to distribution of resources per Ministries**

| Ministry | of Cities | of Health | of National Integration |
|----------|-----------|-----------|-------------------------|
| 2008     | 32        | 29        | 3                       |
| 2009     | 43        | 28        | 4                       |

**Note.** Source: Research data.

Table 8 shows the percentages of irregularities found for each municipality audited in 2008 per Ministry (Cities, Health and National Integration). In general, the resources used in the projects linked to the Ministry of Cities were destined to construction and improvements in the area of housing of the municipalities and come from the PAC's first stage. In the case of the Ministry of Cities, in the active waste category the variables with the highest percentages were "Overbilling", with 12.50%, and "Fraudulent Bidding", with 9.4%. Regarding irregularities of the passive waste modality, the facts that presented the highest percentages were "Mismanagement", with 62.50%, "Irregular Bidding", with 31.30%, "Lack of Advertising" with 25.00% and "Irregularity unrelated to the executing agent", with 21.90%.

In relation to the Ministry of Health, most PAC resources were used to improve municipal sanitation. Table 8 shows that for active waste all types of irregularities obtained the same percentage, 3.4%. As for the passive waste modality, the findings with the highest percentages were "Mismanagement" (69%), "Irregular Execution of Social Programs" (27.60%), "Irregularity unrelated to the executing agent" (24.10%) and "Irregular Bidding" (20.70%).

For the Ministry of National Integration, PAC resources were used in the projects to implant, expand or improve sanitary sewage in municipalities that cover the basins of Brazilian São Francisco and Paraíba Rivers. It can be seen in Table 8 that in the active waste category, the variable "Overbilling" (33.30%) presented a higher percentage. As for the passive waste category, the variables that presented the highest percentages were "Mismanagement" (100%) and "Irregular Bidding" (66.7%).

Table 8

**Details of waste types in percentage of municipalities analyzed per Ministry – 2008**

| Waste Category                                | of Cities                  | of Health                  | of National Integration    |
|---|----------------------------|----------------------------|----------------------------|
| <b>Active waste</b>                           | <b>% of municipalities</b> | <b>% of municipalities</b> | <b>% of municipalities</b> |
| Overbilling                                   | 12.50                      | 3.40                       | 33.30                      |
| Fraudulent bidding                            | 9.40                       | 3.40                       | 0.00                       |
| Bidding with resource diversion               | 0.00                       | 3.40                       | 0.00                       |
| Resource diversion                            | 0.00                       | 3.40                       | 0.00                       |
| <b>Passive waste</b>                          |                            |                            |                            |
| Mismanagement                                 | 62.50                      | 69.00                      | 100.00                     |
| Irregular execution of social programs        | 12.50                      | 27.60                      | 0.00                       |
| Irregularity unrelated to the executing agent | 21.90                      | 24.10                      | 33.30                      |
| Irregular bidding                             | 31.30                      | 20.70                      | 66.70                      |
| No counterpart has taken place                | 0.00                       | 10.30                      | 0.00                       |
| Work unfinished or with irregular execution   | 9.40                       | 6.90                       | 33.30                      |
| A white elephant                              | 3.10                       | 6.90                       | 0.00                       |
| Work finished with irregularity               | 0.00                       | 6.90                       | 0.00                       |
| Lack of or weak board action                  | 0.00                       | 3.40                       | 0.00                       |
| Diversion of purpose to another sector        | 0.00                       | 3.40                       | 0.00                       |

Continue

**Table 8 (continued)**

| <b>Waste Category</b>                    | <b>of Cities</b>           | <b>of Health</b>           | <b>of National Integration</b> |
|--|----------------------------|----------------------------|--------------------------------|
| <b>Passive waste</b>                     | <b>% of municipalities</b> | <b>% of municipalities</b> | <b>% of municipalities</b>     |
| Diversion of purpose for the same sector | 0.00                       | 3.40                       | 0.00                           |
| Lack of advertising                      | 25.00                      | 0.00                       | 33.30                          |
| Bidding lacking competition              | 3.10                       | 0.00                       | 0.00                           |
| Nonpayment of a tribute                  | 0.00                       | 0.00                       | 0.00                           |
| Inexecution of a resource                | 3.10                       | 0.00                       | 0.00                           |
| Clientelism                              | 0.00                       | 0.00                       | 0.00                           |
| Bidding fractionation                    | 0.00                       | 0.00                       | 0.00                           |

**Note.** Source: Research data.

The percentage of irregularities found for each municipality audited for the year 2009 is presented in Table 9, according to the three government ministries analyzed. In general, the resources allocated by the Ministries of Cities, Health and National Integration to municipalities were used in the same activities of 2008.

For the Ministry of Cities, in the active waste modality, it is reported in Table 9 that the irregularities with the highest percentages were "Overbilling" (14%), "Resource Diversion" (7%) and "Fraudulent Bidding" (4.7%). For passive waste, the findings with the highest percentages were "Mismanagement" (62.8%), "Lack of Advertising" (44.2%) and "Irregular Bidding" (39.5%).

Table 9 shows that, in the active waste category, irregularities with the highest percentages were "Overbilling", with 17.9%, "Fraudulent Bidding" and "Resource Deviation", both with 3.6%, for the Ministry of Health. Regarding irregularities in the passive waste modality, the facts that presented the highest percentages in the analyzed municipalities were "Mismanagement" (82.10%), "Irregular Execution of Social Programs" (21.4%) and "Irregular Bidding" (17.9%).

As for the Ministry of National Integration, it is reported in Table 9 that, in the active waste category, variables "Overbilling" and "Resource Diversion" also represent 25% of the municipalities analyzed. As for the passive waste modality, categories that presented the highest percentage of verification were "Mismanagement", with 75%, "Irregular Bidding" and "Work unfinished or with irregular execution", both with 25%.

**Table 9****Details of waste types in percentage of municipalities analyzed per Ministry – 2009**

| <b>Waste Category</b>                         | <b>of Cities</b>           | <b>of Health</b>           | <b>of National Integration</b> |
|---|----------------------------|----------------------------|--------------------------------|
| <b>Active waste</b>                           | <b>% of municipalities</b> | <b>% of municipalities</b> | <b>% of municipalities</b>     |
| Overbilling                                   | 14                         | 17.9                       | 25                             |
| Fraudulent bidding                            | 4.7                        | 3.6                        | 0                              |
| Bidding with resource diversion               | 0                          | 0                          | 0                              |
| Resource diversion                            | 7                          | 3.6                        | 25                             |
| <b>Passive waste</b>                          |                            |                            |                                |
| Mismanagement                                 | 62.8                       | 82.1                       | 75                             |
| Irregular execution of social programs        | 4.7                        | 21.4                       | 0                              |
| Irregularity unrelated to the executing agent | 25.6                       | 7.1                        | 0                              |
| Irregular bidding                             | 39.5                       | 17.9                       | 25                             |
| No counterpart has taken place                | 2.3                        | 0                          | 0                              |
| Work unfinished or with irregular execution   | 4.7                        | 7.1                        | 25                             |
| A white elephant                              | 0                          | 0                          | 0                              |
| Work finished with irregularity               | 4.7                        | 0                          | 0                              |
| Lack of or weak board action                  | 4.7                        | 0                          | 0                              |

**Continue**



Table 9 (continued)

| <b>Waste Category</b>                    | <b>of Cities</b>           | <b>of Health</b>           | <b>of National Integration</b> |
|--|----------------------------|----------------------------|--------------------------------|
| <b>Passive waste</b>                     | <b>% of municipalities</b> | <b>% of municipalities</b> | <b>% of municipalities</b>     |
| Diversion of purpose to another sector   | 0                          | 0                          | 0                              |
| Diversion of purpose for the same sector | 0                          | 0                          | 0                              |
| Lack of advertising                      | 44.2                       | 10.7                       | 0                              |
| Bidding lacking competition              | 0                          | 0                          | 0                              |
| Nonpayment of a tribute                  | 2.3                        | 3.6                        | 0                              |
| Inexecution of a resource                | 11.6                       | 0                          | 0                              |
| Clientelism                              | 0                          | 0                          | 0                              |
| Bidding fractionation                    | 2.3                        | 3.6                        | 0                              |

**Note.** Source: Research data.

Results in Tables 8 and 9 show possible inefficiencies resulting from management carried out by those in charge of managing resources passed through the PAC. As shown previously, in the active waste category, the highest frequencies were observed in the irregularities “Overbilling” and “Fraudulent Bidding”. An example of overbilling is when auditors find purchases of items at prices above those practiced by the market. In the fraudulent bidding category, irregularities were found when there was evidence that the bidding process was directed to an organization that had a kinship relationship with a political agent.

The following examples of mismanagement were recurrently recorded in the CGU reports for the years 2008 and 2009 in the passive waste category: irregularities in the documentation of projects sent by the city hall to obtain funds from the PAC and delays in the municipality in regularizing pending issues indicated in the transfer agreements signed between the city and the competent bodies to manage the program resources. Another frequent type of irregularity was “Irregular Bidding,” which was due mainly to completion of the bidding process before approval of the basic project by the agency in charge and the lack of evidence of an analysis of the work costs having been carried out in order to support the verification of the tenders submitted in the bidding dossiers. It is emphasized that there is a possibility that the absence of personnel with adequate knowledge of the Bidding Law be the reason for the relevant percentage of “Irregular Bidding”.

Regarding the “Irregularity unrelated to the executing agent”, which is a set of irregularities committed by the bodies in charge of selecting the municipalities that shall benefit from the PAC programs, it was observed in the CGU’s reports that such irregularities, in general, have occurred due to delay in analysis of documentation sent by the executing agent (in most cases the executing agents are the city halls themselves) interested in obtaining resources from the PAC. This situation indicates problems in management by these bodies, which jeopardizes an effective execution of works and has as consequence noncompliance with the program objective.

“Lack of Advertising” was a recurrent type of irregularity found by the CGU in the PAC1 audit reports. This irregularity occurred when the municipality stopped notifying political parties, labor unions and business entities about money transfer from the federal government to carry out works in the municipality. Lack of advertising the execution of resources indicates a possible absence of transparency from the city hall’s actions. In addition, it should be investigated if the “Lack of Advertising” was intentional or because of deficiencies in administrative management due to noncompliance with the minimum rites required by public legislation.

Regarding the “Irregular Execution of Social Programs”, duplicity of beneficiaries, beneficiaries who did not meet the program requirements and outdated beneficiaries program registration were frequent in the CGU reports.

In addition, as previously mentioned, the CGU audit reports consistently perceived the irregularity “Work unfinished or with irregular execution”. Examples of this irregularity are the execution of work items outside the specifications of the basic project approved to be executed and delayed works.

## 6 CONCLUSIONS

The objective of the study was to analyze irregularities verified by the CGU in the application of federal resources destined to sanitation and housing areas in Brazilian municipalities by means of the PAC's first stage. In this study, irregularities found by the CGU's auditors were classified as active and passive waste. CGU's inspection reports and the 2000 Census data, made available by IBGE, were used. It was decided to carry out content analysis and descriptive procedures in order to reach the objective proposed.

It is observed that the municipalities that are the object of analysis of this research present a profile of social deprivation when compared to the national average and have a population with low educational level. It is possible that these municipalities' profile may contribute to the high percentage of active and passive waste, evidenced in the analyses presented. Previous studies have shown that the municipalities' socioeconomic vulnerability can be conducive to greater corruption and mismanagement. In this sense, Mendes (2004), based on Mendes' (2001), argues that there are indications that irregularities and mismanagement are concentrated in vulnerable municipalities with low schooling and living conditions. Also, Vieira (2011) stresses that corruption can have negative effects on social well-being. In his study, the author mentioned has perceived that there is a statistically significant negative association between the HDI and the failures verified by the CGU in the municipalities audited.

Regarding the waste profile, it is observed that the irregularities that presented a greater percentage of findings are classified as passive waste, with emphasis on the irregularity classified as "Mismanagement", which presented the highest percentage in the three government ministries analyzed. This result corroborates findings from Dias *et. al* (2013) and Marin *et. al* (2014). In their study, Dias *et. al* (2014) emphasize the need for greater concern with passive waste because, according to the authors, this type of waste is not given due attention by the responsible bodies, the academy and the population. However, the authors argue that such waste significantly affects the quality of the services offered to the population and causes damage to the public coffers.

In addition, it is worth mentioning that the scenario verified in 2008 and 2009 by the CGU auditors in the works of PAC1, via special edition of the PFPS, still persists. In a new survey carried out in 2015 by ITB, in 183 sanitary sewage works (110 for PAC1 and 71 for PAC2), it was observed that only 32% of the works were completed and that the factors that generated delays and stoppages are the same ones found in previous surveys carried out by ITB. They are: deficiencies in the quality of the projects originally sent to the federal government, problems in the bidding processes, bureaucracy in the transfer of resources, slowness in the process of granting environmental licenses, among other aspects (ITB, 2016). In view of this, it can be seen that the bodies responsible for the PAC have not taken steps to correct the irregularities found in 2008 and 2009 by the CGU auditors in PAC1 works, which could jeopardize the performance of the actions carried out under the program.

Finally, it is suggested that future research verify the existence of an association between the profile of the municipalities audited and the irregularities verified by the CGU, besides the reapplication of this study in other areas audited by the CGU and an evaluation of the degree of performance of social control versus the level of occurrence of irregularities.

## NOTES

<sup>1</sup> Considering the PAC first stage. Also called PAC1.

<sup>2</sup> For the construction of indicators of corruption and mismanagement, Ferraz *et al.* (2008) have not used audit reports from sweepstakes 8, 11, 12, 13 and 15, since they were not available when the survey was conducted.

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## PROPOSAL OF FINANCIAL INDICATORS ON HEALTH JUDICIALIZATION IN THE MUNICIPALITY OF CHAPECÓ (SC)

### GILVANE SCHEREN

*Master Candidate in Accounting and Business Administration from Universidade Comunitária Regional de Chapecó (UNOCHAPECÓ). Professor at Universidade do Oeste de Santa Catarina (UNOESC). Address: Avenida Senador Atilio Fontana, 591-E, Efapi | 89.809-000 | Chapecó/SC | Brazil.*

*E-mail: gilvanescheren@outlook.com*

### RODNEY WERNKE

*Doctor in Production Engineering from Universidade Federal de Santa Catarina (UFSC). Professor of Universidade do Sul de Santa Catarina (UNISUL) and in the Postgraduate Program in Accounting and Business Administration at Universidade Comunitária Regional de Chapecó (UNOCHAPECÓ). Address: Avenida Senador Atilio Fontana, 591-E, Efapi | 89.809-000 | Chapecó/SC | Brazil.*

*E-mail: rodneywernke1@hotmail.com*

### ANTONIO ZANIN

*Doctor in Production Engineering from Universidade Federal do Rio Grande do Sul (UFRGS). Master's Professor in Accounting and Business Administration from Universidade Comunitária Regional de Chapecó (UNOCHAPECÓ). Address: Avenida Senador Atilio Fontana, 591-E, Efapi | 89.809-000 | Chapecó/SC | Brazil.*

*E-mail: zanin@unochapeco.edu.br*

### ABSTRACT

This research aimed to propose financial indicators that allow the analysis and comparability of expenses with medicines from the judicialization of health in the municipality of Chapecó. Methodology was used as quantitative description, where the data collection covered 4,145 drug dispensations per judicial determination in the period between 2008 and 2015. The monetary amounts spent on this supply of drugs in the period and obtained the amounts of factors related to three perspectives: municipal revenues, municipal expenses and "Health Function" expenses. These figures were corrected by the IPCA and used to calculate fifteen suggested indicators to evaluate the evolution of health judicialization. The indices found allowed us to conclude that between 2008 and 2011 there were gradual increases in each period, while in 2012 there was a high growth (more than doubling in practically all indices in relation to the previous year). In the last three years, there were significant increases, since three of the indicators in the income group rose by more than 2,000% in 2015 compared to 2008. In the case of the parameters of the "Health Function", the three main variables changed by around 1,800 % Over the initial year of the series, while in the context of the expense metrics the evolution over the initial year was also significant (from 1,474.8% to 2,165.5% according to the indicator). The analysis of these indexes showed, then, a worrying reality from the point of view of the finances of the municipality by the tendency of worsening of the situation seen in the last years of the covered series.

**Keywords:** Judicialization of health. Indicators. Town hall.

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## 1 INTRODUCTION

Right to public health care has been guaranteed in Brazil by the 1988 Federal Constitution. However, since the creation of public health care services offered to Brazilian society, there has been difficulties related to their quantity and quality, which means that citizens use legal means to make them effective. In this sense, Freitas (2015) observes that the number of lawsuits aimed at obtaining medication and medical treatments and procedures has been increasing in recent years. It is also mentioned that this evolution allows us to design a worrying scenario for expenses related to public entities' obligation to meet society's demands regarding hospital care and pharmacological supply for the population.

Ventura, Simas, Pepe and Schramm (2010) assert that individual medical prescription along with absence of financial resources and the claimants' urgency for access to medication are the main arguments justifying the judicial decisions that determine the supply of medication as required by the authors. They argue that impacts on public finances are becoming more evident and deserve managers' attention to the proposal of a new model of service that can reduce operational and financial impacts for the next years.

In this sense, Tabosa (2010) discusses the need to think about the Brazilian judiciary branch's role in responding to demands from health care services and asserts that a solution to this type of shortage should also involve the legislative and executive branches. This opinion is corroborated by Mocelin (2013) when he says that ensuring the right to health care does not depend only on restricted or individual actions, as in the case of lawsuits, but on a set of articulated governmental policies guaranteeing the effectiveness of this right. Thus, it is up to public entities to study pertinent initiatives to be in line with new social needs, especially regarding health care judiciality.

However, while these policies are not developed to change this reality, it is necessary to follow the evolution of this problem. This monitoring and respective control tend to be facilitated by creation and adoption of operational and/or economic-financial indicators that allow managers to have the minimum conditions for understanding the reality (*Fundação Getúlio Vargas* [FGV], 2004).

In this context, the issue of research prioritized in this article emerges: What financial indicators can be used to manage the supply of medication in cases of health care judiciality to the population? Therefore, in order to resolve this issue, the objective is to propose financial indicators that allow analysis and comparability of expenses with medication originating from health care judiciality in the Brazilian municipality of Chapecó, SC.

Studies with this approach can be justified by three aspects. The first is that there is a need, according to Pepe, Figueiredo, Simas, Castro and Ventura (2010), of research aimed at deepening the understanding of certain variables, especially when comparing the common and divergent characteristics of these lawsuits in Brazilian municipalities and states. The aforementioned authors state that, in general, procedures and factors that lead to courts in the whole country lawsuits seeking supply of medication that is not obtained at public services are generally unknown.

The second point is related to the fact that the percentages spent on health care by municipalities widely vary from one city to another, according to the General Accounting Office in the Brazilian state of Santa Catarina (2017). This survey shows that the main municipalities in the Brazilian state of Santa Catarina spend 18.30% (São José) and 38.70% (Rio do Sul) from their "Current Expenses" with "Own Municipal Health Care Expenses," but do not allow the factors most closely linked to the judiciality to be evidenced.

The third factor to justify this focus is that there is a gap in studies published in Brazilian accounting journals related to public accounting on the judiciality of medication supply, according to a survey conducted in January 2017 on online research platforms "EBSCO (Business Source Complete)," "SPELL (Scientific Periodicals Electronic Library)" and Brazilian "Portal de Periódicos CAPES" [CAPES Journals Web Portal; Brazilian Coordination of Improvement of Higher Education Personnel] (CAPES, in the Portuguese abbreviation)]. That is, in the national scientific literature there are few studies on the subject and the existing ones have prioritized legal analyses (Freitas & Dalla Vecchia, 2010; Silva, Silva, Vaccaro & Barbosa, 2012; Campos et al., 2012; Medeiros, Diniz & Schwartz, 2013; De Carli, 2014; Macêdo, Rocha,

Costa, Souza & Santa Rita, 2015) or precepts inherent in public health care (Pepe et al., 2010; Diniz, Machado & Penalva, 2014; Trevisan et al., 2015; Caron, Lefèvre & Lefèvre, 2015; Monsores, Lopes, Bezerra & Silva, 2016). Thus, there is a gap in terms of studies aimed at proposing indicators in the scope of public accounting allowing municipal managers to deepen knowledge about this type of expense.

## 2 THEORETICAL FRAMEWORK

The right to health care judiciary has its foundations in the Brazilian Federal Constitution of 1988 since it makes up the chapter of fundamental rights, also known as social law. According to Dresch (2015), from the constitutional text of the right to health care arises the conclusion that it is a fundamental human right and proposes to the State positive provisions for society, which must be included in public policies. In this way, social law has characteristics of public and subjective natures, since at the same time it is an individual right it can also be classified as a social right.

In this sense, Rosa, Saes and Abuleac (2012) mention that the Federal Constitution of 1988 represents an advance in health care practices and, from its promulgation, social protection activities began with the purpose of improving the public health care scenario in Brazil. In addition, the consolidation of the Brazilian government Unified health care System (SUS, in the Portuguese abbreviation) is one of the main objectives of public policies in force, as well as the expansion and formulation of health care actions, according to needs imposed by the Federal Constitution.

In the role of managing funds and defining public policies to be carried out within the scope of public health care, it is the responsibility of the Brazilian government Unified health care System (SUS, in the Portuguese abbreviation) to achieve social objectives with its effectiveness linked to the joint responsibility of the federation's entities with regard to the matter of health care and the proposal of public policies (Lucchese, 2009).

For Primor and Souza Filho (2014), obviously the judiciary branch should not exercise executive and legislative functions. However, in order to meet the collective goals set forth in the Constitution, every political activity must reconcile the performance/omission under the point of view of serving the State's goals, which provides legitimacy to the judiciary branch's activities and, ultimately, its constitutionality.

Lack of standardization and adequate parameters entail, according to Travassos *et al.* (2013), different decisions taken by the country's courts, since they still lack understanding of certain regional aspects, such as access to public services, efficiency in the provision of government services, the attitude by health care professionals and local managers with knowledge about the rights guaranteed by law to the population, as well as the values and conceptions used by judges at courts, which may influence the dimension of the judiciary, the distribution of values and society's moral behavior.

Supply of medication, according to Ventura *et al.* (2010), requires that, in order for the right to health care to take place, it demand broad governmental actions and policies, not only formal ones restricted to fulfilling judicial orders. These authors also mention the concern that judicial instruments should not be considered pharmaceutical management instruments but rather as important elements for decision making and for improving access to medication from SUS.

In this direction, health care judiciary represents, by means of judicial demands, society's main claims regarding pharmaceutical assistance and those that are latent in public health care. Thus, public managers are challenged to proposed strategies in public policies that improve and allow the effectiveness of the right to health care in Brazil (Veloso, 2015).

### 2.1 Accounting in public administration

Lima Júnior (2007) states that accounting information enables users to view entities' status from different angles and also allows administrators to analyze the organizations' management. It provides projections of results and information on investments of funds and assist in the planning of activities.

In public management in Brazil, according to Rosa (2011), the normative framework is represented by Federal Law No. 4,320 (1964), which has established the financial law general rules for preparation and control of budgets and balance sheets of the federal, state and municipal governments and the federal district and is in force and in full application until nowadays.

Thus, in the scope of public management, the main instrument of planning and control is the public budget, defined by the Federal Constitution of 1988 (articles 165 to 169) as a preventive and authorizing act of expenses that the State must carry out in a year of the modern public administration (Silva, 2011).

In this direction, governments should use planned and transparent actions in the management of public funds by means of adopting planning criteria and detailed classification of public revenues and expenses in their management control instruments in order to characterize revenue and the items of expense used to identify accounting facts. The provision of public service entails expense (public expense) and is linked to the capacity of tax collection by the State. In this context, government revenue is equivalent to any inflow of funds made in public coffers, whether effected in cash or other assets representing securities. On the other hand, public expense is the set of outputs performed by public entities for the provision and maintenance of services provided to society (*Secretaria do Tesouro Nacional [STN]*, 2017).

In addition, the budget classification structure of expense comprises the following categories: (i) *the institutional classification, divided into "body" and "budgetary unit"; (ii) the functional classification, divided into "function" and "sub-function"; (iii) the programmatic classification, divided into "program" and "action" (equivalent to projects, activities and special operations) and (iv) the classification by economic nature, divided into economic category, expense nature group, application modality and expense element, as recommended by the Brazilian Department of National Treasury (2017).*

Accounting based on these criteria allows the elaboration of indicators regarding this, as discussed in the next section.

## 2.2 Financial and operational health care indicators

Indicators are necessary management tools in entities' monitoring and evaluation activities and it is by means of these that it is possible to evaluate projects, programs, actions and public policies in order to measure the achievement of goals, identify advances and propose improvements and correction of problems. In turn, financial indicators are often used to enable the demonstration of data obtained by means of a formula, which makes the information visualization clearer. With this, they point out, indicate, approximate and translate into operational terms the social dimensions of interest, defined based on theoretical or political choices made (Jannuzzi, 2009).

It should be noted, then, that the indicators can be of different natures: financial, accounting, economic, social etc. In the context of public management, there are also accountability indicators that show data on compliance with constitutional limits and limits established in Brazilian Complementary Law No. 101 (2000), which establishes public finance standards for accountability in fiscal management, called Fiscal Responsibility Act (FRA), accompanied in all spheres according to their results and notes by the General Accounting Offices. In the case of public expense, there are several ways to present them. One of the reports used is called "Expense by Function" and represents expense groups from the various areas that are in the public sector, such as health care, assistance, security, judicial, legislative, among others (*Tribunal de Contas de Santa Catarina [TCE/SC]*, 2016).

*On the other hand, the Department of Management of the Brazilian Ministry of Planning (2009) argues that the construction of indicators must follow specific definitions of performance, from which the performance measurement models can be defined on a case by case basis. However, it is necessary to follow some "rules" and methodological considerations, such as: avoid reductionist and one-dimensional definitions, include significant aspects and dimensions in the model and leave behind factors of little significance. It is also mentioned that a performance system must go beyond the measurement of indicators and allow the generation of measures in different dimensions of efforts and results, as well as the generation of a score for*



each indicator that present a relative measure (such as in comparing the current goal with an “ideal” goal).

To this end, Brazilian Ministry of Health’s Public Health Care Budget Information System (SIOPS, in the Portuguese abbreviation) presents several indicators in its database. Of these, it is pertinent to point out some parameters that seek to demonstrate where (or how) public funds are applied in health care, such as the metrics “total per capita health care expense,” “per capita own funds expense,” “SUS transfers per capita,” “percentage (%) of personnel expense on total expense,” “percentage (%) of investment expense on total expense,” “percentage (%) of own funds applied in health care” and “percentage (%) of expense on third party (legal entities) services on total expense.” However, no indicators related to health care judiciality were found in the database mentioned.

### 2.3 Similar research

*In order to know the current scenario about preparation or use of indicators for monitoring and control of health care judiciality, online search was carried out on research platforms “EBSCO (Business Source Complete),” “SPELL (Scientific Periodicals Electronic Library)” and “Portal de Periódicos CAPES”. In these searches, carried out in January 2017. keywords “health care judiciality” or “judiciality in medication” and “indicators” plus the symbol “\*” (asterisk) were used to allow derivations in the sentences used. It should also be clarified that search for these keywords was done in search options “Summary” and “Title.” No results were found that approached the focus prioritized in this article.*

However, by broadening the search to other sources, studies that most resembled the topic highlighted were those by Wang, Vasconcelos, Oliveira and Terrazas (2014) and Vaz, Bonacim and Gomes (2016).

In the case of Wang *et al.* (2014), the research estimated that expenses of the Brazilian municipality of São Paulo (SP) with health care judiciality in 2011 was equivalent to 6% of what the municipality spent on its pharmaceutical assistance policy and 10% of the total spent on medication and hospital supplies and outpatient and dental care. They also comment that about 55% of these expenses are destined to the supply of medication that is the responsibility of the state or federal governments, whereas about 45% are related to treatments not included in the Brazilian government Unified Health Care System (SUS, in the Portuguese abbreviation).

In the study by Vaz *et al.* (2016) evidence has emerged that the municipalities with the best health care indexes (IDSUS, Portuguese abbreviation for the Performance Index for the Brazilian government Unified Health Care System) are the ones that suffer most from the number of lawsuits, which increases the importance of public managers in understanding the problem and working on the causes, thus avoiding unpredictability for the government budget and improving public policies in the area of health care.

This small number of studies on the financial aspects of health care judiciality in Brazil reveals the existence of a research gap, especially regarding the proposal of indicators for measurement and comparability of the amounts provided to the beneficiaries. Therefore, this article proposes to contribute to reducing, even minimally, such a deficiency.

### 3 METHODOLOGICAL PROCEDURES

As for the methodological design, this can be characterized as a quantitative research of description. Rauen (2015. p.157) mentions that this type of study is better known as “data collection, investigation or survey and consists of requesting information to a statistically significant group of people for subsequent quantitative analysis, using field research techniques.” In this sense, Andrade (2002) argues that descriptive studies are concerned with observing facts and recording, analyzing, classifying and interpreting them without a direct interference from the researcher in the context. The survey aspect was characterized by the fact that all data considered in the survey were directly collected from each judicial process (specifically in the control of providing medication maintained by the Brazilian city of Chapecó for each demand) and manually entered in a Microsoft Excel® spreadsheet used to tabulate them.

Regarding the quantitative approach modality, Richardson (1999) adds that it involves research that uses quantification, both in the modalities of collecting information and in the processing of these modalities by means of statistical techniques, from the simplest ones (such as percentage, means, standard deviation etc.) to more complex ones (such as correlation coefficients, regression analyses etc.). In addition, the research carried out is of an *ex post facto* type, since it comprises analyses based on facts that had already occurred. There is no interference from the researcher (Bezerra & Corrar, 2006).

### 3.1 Population and sample

All legal proceedings against the Brazilian municipality of Chapecó, SC, the object of which was related to the supply of medication, were analyzed. This focus was chosen because of the apparent increase in the volume of lawsuits in which the municipality has been involved over the last few years, as well as the possibility of access to data provided by municipal health care managers.

As for the time span covered, the period between 2008 and 2015 was prioritized, given the availability of data. However, it is pertinent to point out that data referring to 2005, 2006 and 2007 were also investigated, the inconsistency of records of which impaired standardization/comparison of data collected in subsequent years and implied their exclusion from the list of information used.

Regarding the execution of the data collection procedures, it was manually performed in the third bimester of 2016, process by process, in the offices of the Department of Health Care of the city of Chapecó. The data were compiled in a Microsoft Excel® spreadsheet, due to the unavailability of this information with the detail required in the municipality's computer system. In this sense, the variables collected in the judicial processes are listed in Table 1.

Table 1  
Summary of judicial processes variables

| Variable                  | Abbreviation | Role/Methodology  |
|---------------------------|--------------|---|
| Age group                 | FE           | Classification of the beneficiary by age group          |
| Sex                       | GE           | Male or female  |
| Defendants of the Lawsuit | RP           | Defendants in the Lawsuit, city and State, or Union     |
| Group of Medication       | GM           | Classification by risk users group                      |
| Date of discharge         | DT           | Chronological order of delivery of drugs                |
| Medication                | MA           | List of medication dispensed                            |
| Quantity dispensed        | QD           | Quantification of the medication dispensed by year      |
| Value dispensed           | VD           | Value (BRL) spent per medication                        |
| Total amount dispensed    | VTD          | Total value (BRL) spent on medication under judiciality |

**Note.** Source: Prepared by the authors.

It is important to point out that the data collected were circumscribed to those mentioned in Table 1 and are focused on the design and analysis of the current scenario regarding the phenomenon of judiciality of medication supply in the municipality. In this sense, Martins (2010) argues that one of the outstanding features of the quantitative approach is the clear definition of research variables by researchers based on the theoretical framework adopted and the use of statistical instruments for analytical treatment.

It should also be mentioned that ethical precautions have been taken regarding the names of the persons benefiting from these processes, in order to safeguard their right to privacy. Then, from the determination of the data prioritized, 104 lawsuits were filed against the Brazilian municipality of Chapecó (or having this municipality also as claimee). Each beneficiary was classified according to gender and age group. There was an attempt to distinguish the processes linked only to the municipal sphere and those in which the municipality responded together with the state and/or federal governments.

Finally, with the support of pharmacists responsible for distribution of the medication, this one was classified according to its pharmacological group. This has led to surveying provisions of medication involving data such as dates, medication supplied, quantities and respective monetary values. It was found, therefore, that 3,843 items were provided in the period covered and that these were all computed in this study.

### 3.2 Procedures for data collection and analysis

In this stage, information was collected on all provisions of medication in the period in question, the data of which were recorded in a Microsoft Excel® spreadsheet arranged according to variables listed in Table 1 (previously mentioned).

Also, with the purpose of knowing the scenario of the judiciary for the purposes of this research, the frequency (or presence) of aspects that portray the main characteristics prioritized in the sample investigated were presented. In addition, in order to obtain the amount (in BRL) spent on the judiciary of the supply of medication by the municipality of Chapecó, the amounts spent on providing medication to users were estimated. For this purpose, the average value (in BRL) of the cost of purchasing the medication in bidding processes in each year covered was measured.

Finally, in order to use them for a comparative analysis of the results of values spent with the judiciary, values related to revenues and expenses had by the municipality in the years under study were collected. *In this case, the path used was the search in publications made available on the municipality's official website and in the SIOPS about the factors outlined in Table 2.*

Table 2  
Description of the accounting data collected

| Description                                     | Acronyms (according to the original in Portuguese) | Concepts and their sources  |
|---|--|---|
| Net Current Revenue                             | RCL  | These funds are available during the fiscal year and constitute a new element for public assets, as recommended in art. 2 of the Fiscal Responsibility Act (FRA) (Lima, 2007; Zuccolotto, Ribeiro & Abrantes, 2008; STN, 2017).           |
| Total revenues related to health care           | RTVS   | It represents own revenues related to health care, including those of health care services and total funds transferred to the municipality or the Brazilian Federal District (SIOPS, 2017).   |
| Revenue from federal government transfers (SUS) | RTU  | It is equivalent to the share of health care-related revenue from federal government transfers to the municipality or the Brazilian Federal District (SIOPS, 2017).   |
| Revenue from state government transfers (SUS)   | RTE  | It expresses the share of health care-related revenue from state government transfers to the municipality or the Brazilian Federal District (SIOPS, 2017).  |
| Function  | FUNS   | It basically seeks to answer the question about "in what area" of government action shall the expense be performed (SIOPS, 2017; STN, 2017).  |
| Sub-function                                    | SFAT<br>SFPT<br>SFVS<br>SFSO                       | It represents a level of aggregation immediately below the function and must show each area of governmental action and also identify the basic nature of the actions that are agglutinated around the functions (SIOPS, 2017; STN, 2017). |
| Current Expenses                                | DCOR   | This category includes all expense which does not directly contribute to formation or acquisition of capital goods (SIOPS, 2017; STN, 2017).  |
| Total health care expenses                      | DTSA   | It includes the total expenses applied in the health care area in all its fields of action by the federal, state and municipal governments (SIOPS, 2017).   |

**To be continued**

**Table 2 (continued)**

| Description  | Acronyms (according to the original in Portuguese) | Concepts and their sources   |
|--|--|--|
| Own municipal health care expenses   | DPMS   | It covers the total expenses applied in the health care area in all its fields restricted to the municipalities' funds (SIOPS, 2017).  |
| Expenses on pharmaceutical assistance with transfers from the federal government (SUS) | DFTU   | It regards the recording of entries, outflow and provisions of medication from the basic, strategic and specialized components of pharmaceutical assistance contained in the Brazilian government National List of Essential Medication and of the states (SIOPS, 2017). |
| Expenses with medication expenses element  | DEDM   | It indicates the objects of expenses that the public administration uses to achieve its purposes (SIOPS, 2017; TCE/SC, 2016).  |

**Note.** Source: Prepared by the authors.

However, since the monetary values used refer to the period between 2008 and 2015, they were inflated by the Brazilian National Index of Broad Consumer Prices (IPCA, in the Portuguese abbreviation) for the last year of this historical series in order to allow comparability of the values in currency of similar purchasing power. The choice of this index was due to IPCA being the official parameter of Brazilian inflation.

Thus, historical data were inflated to the reference date of December 31, 2015, based on the annual IPCA indexes calculated by the Brazilian Institute of Geography and Statistics (IBGE, in the Portuguese abbreviation) (2017), according to the formula recommended by Merchede (2001). For example: BRL 100 in 2008 was inflated by index "1.5531438" (obtained by equation:  $[1 \times (1+0.0431) \times (1+0.0591) \times (1+0.0650) \times (1+0.0584) \times (1+0.0591) \times (1+0.0641) \times (1+0.1067)]$ ) to determine the value updated for 2015 (R\$ 155.31). This amount corresponds to the IPCA accumulated in 2009 (4.31%), 2010 (5.91%), 2011 (6.50%), 2012 (5.84%), 2013 (5.91%), 2014 (6.41%) and 2015 (10.67%).

Then, from the methodological procedures mentioned, the results presented in the following sections have been observed.

## 4 PRESENTATION AND ANALYSIS OF RESULTS

In this section, the main aspects related to the data collected are presented and the indicators that were developed to evaluate the evolution of the economic-financial impacts generated by the allocation of public funds in health care judiciary in the municipality in question are presented. These indicators can be split into three categories that take into account municipal revenue and expenses, as well as health care-related functions and sub-functions. In addition, they can be evaluated by the angles of participation in the total and the evolution over the years, as described below.

### 4.1 Indicators on municipal revenue

In order to portray the share of health care judiciary in the amount of municipal revenues, some metrics were prepared that involve the concepts of Net Current Revenue (RCL), Total Revenues Related to Health Care (RTVS), Revenue from Federal Government Transfers-SUS (RTU), Revenue from State Government Transfers related to SUS (RTE) and Total Amount of Health Care Judiciary (VTJS), the main characteristics of which are set out in Table 3.

Table 3  
Suggested indicators on municipal revenue

| Indicator   | Formula               | Resulting information  |
|---|-----------------------|--|
| Quotient of Net Current Revenue                               | $QRCL = VTJS / RCL$   | Percentage (%) of health care judiciality in medication in relation to the net current revenue.                                    |
| Quotient of Total Revenues Related to Health Care             | $QRTVS = VTJS / RTVS$ | Percentage (%) of health care judiciality in medication in relation to total revenues related to health care.                      |
| Quotient of Revenue from the Federal Government Transfers/SUS | $QRTU = VTJS / RTU$   | Percentage (%) of health care judiciality in medication in relation to transfers from the federal government to health care (SUS). |
| Quotient of Revenue from State Government Transfers/SUS       | $QRTE = VTJS / RTE$   | Percentage (%) of health care judiciality in medication in relation to transfers from state government to health care (SUS).       |

**Note.** Source: Prepared by the authors.

In order to use the indicators mentioned in Table 3, monetary values related to variables of the respective formulas have been surveyed. Thus, Table 4 shows the amounts of revenue modalities prioritized in the study and the amounts spent with judiciality in the period studied (duly inflated).

Table 4  
Municipal revenues and expenses with health care judiciality (amounts in Brazilian Reais (BRL) restated by IPCA up to December 31, 2015)

| Year | NET current revenue (RCL) | Total revenues linked to health (RTVS) | Revenue from Union /SUS transfers (RTU) | Revenue from State/SUS transfers (RTE) | Total expenses with judicialization of health (VTJS) |
|------|---------------------------|--|---|--|--|
| 2008 | 366,501.62                | 208,624.31                             | 74,051.63                               | 4,647.38                               | 22.71  |
| 2009 | 394,610.95                | 219,621.43                             | 72,880.34                               | 4,524.59                               | 30.28  |
| 2010 | 435,715.56                | 229,603.98                             | 76,423.27                               | 6,895.01                               | 57.62  |
| 2011 | 497,093.14                | 261,140.38                             | 91,353.44                               | 6,351.58                               | 63.28  |
| 2012 | 508,200.28                | 264,421.78                             | 87,521.78                               | 15,400.34                              | 125.09   |
| 2013 | 500,282.99                | 285,312.27                             | 89,932.33                               | 14,251.49                              | 393.35   |
| 2014 | 532,529.76                | 296,154.16                             | 100,107.67                              | 17,191.95                              | 620.39   |
| 2015 | 550,557.59                | 283,967.41                             | 103,747.13                              | 14,303.02                              | 690.39   |

**Note.** Source: Prepared by the authors.

As for the scenario shown in Table 4, it was concluded that there was a positive evolution of revenues throughout the period covered by the analysis. This shows that the contribution of funds to health care has increased in those years and shows entities' concern with improvement and maintenance of these public services. However, values on health care judiciality (last column) have significantly grown, as best seen based on the analysis metrics proposed in the sequence.

Thus, as the data needed to consider in the indicator formulas suggested were available, the results were ascertained as shown in Table 5.

Table 5  
Results of indicators on municipal revenue

| Year | Quotient of Net Current Revenue (QRCL) |           | Quotient of Total Health Care-Related Revenue (QRTVS) |           | Quotient of Revenue from Federal Government Transfers SUS (QRTU) |           | Quotient of Revenue from State Government Transfers SUS (QRTE) |           |
|------|--|-----------|---|-----------|--|-----------|--|-----------|
|      | Index                                  | Variation | Index   | Variation | Index  | Variation | Index  | Variation |
| 2008 | 0.0062%                                | 100.0%    | 0.0109%   | 100.0%    | 0.0307%  | 100.0%    | 0.4887%  | 100.0%    |
| 2009 | 0.0077%                                | 123.8%    | 0.0138%   | 126.7%    | 0.0416%  | 135.5%    | 0.6693%  | 137.0%    |

To be continued

Table 5 (continued)

| Year | Quotient of Net Current Revenue (QRCL) |           | Quotient of Total Health Care-Related Revenue (QRTVS) |           | Quotient of Revenue from Federal Government Transfers SUS (QRTU) |           | Quotient of Revenue from State Government Transfers SUS (QRTE) |           |
|------|--|-----------|---|-----------|--|-----------|--|-----------|
|      | Index                                  | Variation | Index   | Variation | Index  | Variation | Index  | Variation |
| 2010 | 0.0132%                                | 213.4%    | 0.0251%   | 230.5%    | 0.0754%  | 245.8%    | 0.8357%  | 171.0%    |
| 2011 | 0.0127%                                | 205.5%    | 0.0242%   | 222.6%    | 0.0693%  | 225.9%    | 0.9964%  | 203.9%    |
| 2012 | 0.0246%                                | 397.2%    | 0.0473%   | 434.6%    | 0.1429%  | 466.0%    | 0.8122%  | 166.2%    |
| 2013 | 0.0786%                                | 1,268.9%  | 0.1379%   | 1,266.5%  | 0.4374%  | 1,426.2%  | 2.7601%  | 564.8%    |
| 2014 | 0.1165%                                | 1,880.1%  | 0.2095%   | 1,924.4%  | 0.6197%  | 2,020.7%  | 3.6086%  | 738.5%    |
| 2015 | 0.1254%                                | 2,023.7%  | 0.2431%   | 2,233.4%  | 0.6655%  | 2,169.8%  | 4.8269%  | 987.8%    |

**Note.** Source: Prepared by the authors.

Since the monetary values used in the calculations have the same purchasing power, comparison of indexes can be done in two ways: by the value of the quotient calculated (column "Index") and by percentage evolution in relation to 2008 (column "Variation").

In the case of the QRCL, in the initial year of the series the index was 0.0062% and increased to 0.1244% in 2015. That is, in that last year, for each BRL 100 of Net Current Revenues about BRL 0.1244 were spent with the processes inherent to health care judiciousity. The percentage variation between these two years reached 2,023.7%, showing that increase in expenses with health care judiciousity started to have a much higher percentage share in the total Net Current Revenue in relation to 2008. This evolution can be split into three "phases": between 2008 and 2011 it doubled in proportion, in 2012 it almost doubled its percentage compared to the previous year and between 2013 and 2015 growth was much more significant (1,268.9% in 2013, 1,880.1% in 2014 and 2,023.7% in 2015, compared to the reference year).

These growth stages were also seen in the other quotients calculated in relation to municipal revenues. Regarding the QRTVS, variation of these indexes between the initial (0.0109%) and final (0.2431%) years was the most significant, since it reached 2,233.4% in 2015 over the 2008 value. Regarding the QRTU indicator, it went from 0.0307% in 2008 to 0.6655% in 2015 (with a variation of 2.169.8% between the two periods), while in the QRTE the parameter measured was of 0.4887% in 2008 to 4.8269% in 2015, with 987.8% oscillation between these two years. The scenario revealed by the four indicators linked to municipal revenues, displayed in Table 5, shows that expenses with health care judiciousity have substantially increased during the period evaluated, especially in the last three years.

#### 4.2 Indicators on health care function and sub-functions

The second perspective of proposed indicators is related to expenses related to the "Health Care Function." In this case, a division of expenses by function and sub-functions was observed, according to Administrative Rule no. 42/1999, which has updated item I of paragraph 1 of article 2 and paragraph 2 of article 8 of Brazilian Federal Law No. 4,320 (1964). It is interesting to note that the word "function" has the purpose of basically answering the question "in what area" of governmental action shall the expenses take place. In turn, the related sub-functions regard the level of aggregation immediately below the function and must show each area of governmental action and also identify the basic nature of the actions that are agglutinated around the functions (STN, 2017).

Based on this rationale, the "Health Care Function" (FUNS) has been split into sub-functions "Basic Care" (SFAT), "Hospital and Outpatient Health Care" (SFHA), "Prophylactic and Therapeutic Support" (SFPT), "Sanitary Surveillance" (SFVS), "Epidemiology and Food Surveillance" (SFVEA) and "Nutrition" (SFN). However, in this study the values obtained in the last two sub-functions mentioned (SFVEA and SFN) have been consolidated as "Others" (SFO).

Based on these peculiarities, indicators that consider the total value of health care expenses in terms of their proportion to the amounts spent with the “Health Care Function” and respective sub-functions, as summarized in Table 6, were prepared.

**Table 6**  
**Suggested indicators on health care function and sub-functions**

| Indicator   | Formula                     | Resulting information  |
|---|-----------------------------|--|
| Quotient of the Health Care Function  | $QFUNS = \frac{VTJS}{FUNS}$ | Percentage (%) of health care judiciality in medication in relation to the Health Care Function.   |
| Quotient of Basic Health Care Sub-function                                    | $QSFAT = \frac{VTJS}{SFAT}$ | Percentage (%) of health care judiciality in medication in relation to the Basic Care Sub-function.  |
| Quotient of Sub-function Health Care, Hospital and Outpatient Care            | $QSFHA = \frac{VTJS}{SFHA}$ | Percentage (%) of health care judiciality in medication in relation to the sub-function health care, hospital and outpatient care.           |
| Quotient of Sub-function Health Care and Prophylactic and Therapeutic Support | $QSFPT = \frac{VTJS}{SFPT}$ | Percentage (%) of health care judiciality in medication in relation to the sub-function health care and prophylactic and therapeutic support |
| Quotient of Sub-function Health Care and Sanitary Surveillance                | $QSFVS = \frac{VTJS}{SFVS}$ | Percentage (%) of health care judiciality in medication in relation to the sub-function health care and sanitary surveillance.               |
| Quotient of Sub-function Others   | $QSFOS = \frac{VTJS}{SFOS}$ | Percentage (%) of health care judiciality in medication in relation to the sub-function health care and others.                              |

**Note.** Source: Prepared by the authors.

Therefore, in order to measure the indicators mentioned in Table 6, the data to be used in the equations proposed have been surveyed, whose monetary values of expenses with the “Health Care Function” and respective subdivisions are shown in Table 7 (corrected by IPCA and listed in thousands of Brazilian reais).

**Table 7**  
**Expenses by function and health care sub-functions (amounts in Brazilian Reais (BRL) restated by IPCA up to December 31, 2015)**

| Year | Function Health (FUNS) | Sub-function Basic Care (SFAT) | Sub-function Health Care and Hospital and Outpatient Health Care (SFHA) | Sub-function Health Care and Prophylactic and Therapeutic Support (SFPT) | Sub-function Health Care and Sanitary Surveillance (SFVS) | Sub-function Other (SFOS) |
|------|------------------------|--------------------------------|---|--|---|---------------------------|
| 2008 | 117,769.22             | 55,835.79                      | 58,292.18   | 1,330.80   | 1,235.61  | 1,074.84                  |
| 2009 | 126,311.59             | 61,585.87                      | 61,168.78   | 1,084.02   | 1,214.45  | 1,258.47                  |
| 2010 | 131,844.92             | 56,396.35                      | 70,230.79   | 2,956.44   | 1,476.64  | 784.71                    |
| 2011 | 149,047.28             | 70,304.86                      | 73,358.08   | 3,083.21   | 1,434.20  | 866.93                    |
| 2012 | 161,893.73             | 81,143.46                      | 75,891.38   | 3,136.96   | 1,292.98  | 428.94                    |
| 2013 | 171,397.72             | 88,221.04                      | 77,233.08   | 2,628.71   | 2,687.90  | 626.98                    |
| 2014 | 194,790.13             | 96,572.63                      | 93,206.88   | 2,439.26   | 2,571.36  | *                         |
| 2015 | 196,525.39             | 94,631.57                      | 97,567.91   | 2,563.19   | 1,762.72  | *                         |

**Note.** \*There were no values recorded for this sub-function in the period.

Source: Prepared by the authors.

The growth in values (already monetarily restated) applied in the “Health Care Function” reveals an increase in these figures in the period from 2008 to 2015 but with lower increase in the last two years of the series. In addition, the values in Table 8 highlight the relevance of the amounts spent with sub-functions “Basic Care” and “Hospital and Outpatient Health Care” when

compared to the other three functions (which still had their values reduced in recent years in relation to the initial ones).

As judiciary expenses had already been mentioned in the Table of the previous section, expenses values to be considered in the formulas of this group of indicators were used to determine the quotients presented in Table 8.

Table 8

**Result of indicators on health care function and sub-functions**

| Year | Quotient of the Health Care Function (QFUNS) |          | Quotient of the Basic Health Care Sub-function (QSFAT) |          | Quotient of Sub-function Health Care, Hospital and Outpatient Care (SFHA) |          | Quotient of Sub-function Health Care and Prophylactic and Therapeutic Support (SFPT) |          | Quotient of Sub-function Health Care and Sanitary Surveillance (SFVS) |          | Quotient of Sub-function Others (QSFSO) |          |
|------|--|----------|--|----------|---|----------|--|----------|---|----------|---|----------|
|      | Index  | Var.     | Index  | Var.     | Index   | Var.     | Index  | Var.     | Index   | Var.     | Index                                   | Var.     |
| 2008 | 0.02%  | 100.00%  | 0.04%  | 100.00%  | 0.04%   | 100.00%  | 1,71%  | 100,00%  | 1,84%   | 100,00%  | 2,11%                                   | 100,00%  |
| 2009 | 0.02%  | 124.30%  | 0.05%  | 120.90%  | 0.05%   | 127.10%  | 2,79%  | 163,70%  | 2,49%   | 135,70%  | 2,41%                                   | 113,90%  |
| 2010 | 0.04%  | 226.60%  | 0.10%  | 251.20%  | 0.08%   | 210.60%  | 1,95%  | 114,20%  | 3,90%   | 212,30%  | 7,34%                                   | 347,50%  |
| 2011 | 0.04%  | 220.20%  | 0.09%  | 221.30%  | 0.09%   | 221.40%  | 2,05%  | 120,30%  | 4,41%   | 240,10%  | 7,30%                                   | 345,50%  |
| 2012 | 0.08%  | 400.70%  | 0.15%  | 379.00%  | 0.17%   | 423.10%  | 3,99%  | 233,70%  | 9,67%   | 526,40%  | 29,16%                                  | 1380,20% |
| 2013 | 0.23%  | 1190.10% | 0.45%  | 1096.20% | 0.51%   | 1307.30% | 14,96%   | 876,90%  | 14,63%  | 796,20%  | 62,74%                                  | 2969,30% |
| 2014 | 0.32%  | 1651.60% | 0.64%  | 1579.40% | 0.67%   | 1708.50% | 25,43%   | 1490,40% | 24,13%  | 1312,70% | *                                       | 0%       |
| 2015 | 0.35%  | 1821.70% | 0.73%  | 1793.70% | 0.71%   | 1816.20% | 26,93%   | 1578,30% | 39,17%  | 2130,90% | *                                       | 0%       |

\*There are no received values recorded for this sub-function in the period.

Source: Prepared by the authors.

The first index related to health care expenses relates to the "Health Care Function" (QFUNS). The value calculated for 2008 was 0.019% and increased to 0.351% in 2015. Therefore, in the year 2015, for each BRL 100 spent on this function, approximately BRL 0.351 were allocated to meet the lawsuits. As a result, from the base year of 2008, growth was 1,821.7% until the final year of the historical series in this study. However, the increase in this type of spending was higher in the final triennium, since it went from the 0.077% level in 2012 to 0.229% in 2013 and went to 0.318% in 2014 and finished with 0.351%.

Similar evolutionary behavior was also observed in the other indicators:

- Quotient of the Basic Health Care Sub-function (QSFAT): it went from 0.041% in 2008 to 0.730% in 2015 (ranging around 1,793.7% between these two periods);
- Quotient of Sub-function Hospital and Outpatient Health Care (QSFHA): increased from 0.039% in 2008 to 0.708% in 2015 (variation of 1,816.2%);
- Quotient of Sub-function Health Care and Prophylactic and Therapeutic Support (QSFPT): in 2008 this indicator was 1.71% and increased to 26.93% in 2015, with an evolution equivalent to 1,578.3% over the base year;
- Quotient of Sub-function Sanitary Surveillance (QSFVS): in this index, the result went from 1.84% in 2008 to 39.17% in 2015 (evolution of 2,130.9%);
- Quotient of Sub-function Others (QSFO): as there was no record of values for 2014 and 2015, performance of this metric was measured only between 2008 (it reached 2.11%) and 2013 (when it stood at the level of 62.74%), when it grew by 2,969.3% over this period of years.

### 4.3 Indicators on municipal expenses

The third perspective of indicators covered in this research highlights the weight of health care judiciary in relation to certain municipal expenses. In this case, it was considered more relevant for the purpose of the study to measure this representativeness in relation to the values "Current Expenses" (DCOR), "Total Health Care Expenses" (DTSA), "Own Municipal



Health Care Expenses” (DPMS), “Expenses on Pharmaceutical Assistance with Transfers from the Federal Government/SUS” (DFTU) and “Expenses with Medication Expenses Element” (DEDM).

Then, based in these five categories of expenses, the equations described in Table 9 were formulated.

Table 9  
**Suggested indicators on municipal expenses**

| Indicator  | Formula               | Resulting information  |
|--|-----------------------|--|
| Quotient of the Current Expenses   | $QDCOR = VTJS / DCOR$ | Percentage (%) of health care judiciality in medication in relation to current expenses.   |
| Quotient of Expenses Total Spent on Health Care  | $QDTSA = VTJS / DTSA$ | Percentage (%) of health care judiciality in medication in relation to the total health care expenses.   |
| Quotient of Own Municipal Health Care Expenses   | $QDPMS = VTJS / DPMS$ | Percentage (%) of health care judiciality in medication in relation to own municipal health care expenses.   |
| Quotient of Expenses on Pharmaceutical Assistance with Transfers from the Federal Government/SUS | $QDFTU = VTJS / DFTU$ | Percentage (%) of health care judiciality in medication in relation to expenses with pharmaceutical assistance with transfers from the federal government/SUS. |
| Quotient of Expenses with Medication Expenses Element  | $QDEDM = VTJS / DEDM$ | Percentage (%) of health care judiciality in medication in relation to expenses with medication expenses element.  |

**Note.** Source: Prepared by the authors.

As the concepts of these expenses modalities have already been commented on (Table 2), it is pertinent to point out only that the expenses that has the greatest possible detailing on the expenses with medication supply judiciality is “DEDM,” since it refers to registration of provisions of medication of the basic, strategic and specialized components of pharmaceutical assistance, contained in the Brazilian government National List of Essential Medication and of the states, federal district and municipalities (SIOPS, 2017). Next, data on amounts spent on the expenses mentioned were obtained, as outlined in Table 10.

Table 10  
**Expenses by type of municipal expenses (amounts in Brazilian Reais (BRL) restated by IPCA up to December 31, 2015)**

| Year | Current Expenses (DCOR) | Total health care expenses (DTSA) | Own municipal health care expenses (DPMS) | Expenses on pharmaceutical assistance with transfers from the union (DFTU) | Expenses with medication expenses element (DEDM) |
|------|-------------------------|-----------------------------------|---|--|--|
| 2008 | 316,131.35              | 111,195.19                        | 39,677.96                                 | *  | 3,049.29   |
| 2009 | 344,755.77              | 119,924.84                        | 45,127.61                                 | 1,006.09   | 3,586.02   |
| 2010 | 371,466.27              | 130,878.37                        | 46,790.66                                 | 1,119.93   | 4,473.63   |
| 2011 | 416,842.76              | 146,503.07                        | 53,073.04                                 | 1,415.63   | 4,398.19   |
| 2012 | 436,341.74              | 162,011.80                        | 60,561.40                                 | 1,245.18   | 5,025.49   |
| 2013 | 467,237.57              | 171,410.75                        | 55,692.28                                 | 1,254.36   | 4,957.41   |
| 2014 | 457,630.01              | 194,790.13                        | 74,244.29                                 | 1,184.53   | 4,663.44   |
| 2015 | 521,602.22              | 196,525.39                        | 75,486.06                                 | 1,059.16   | 6,285.39   |

**Note.** \*There are no values recorded for this sub-function in the period.

Source: Prepared by the authors.

There is a similar growth between the total amounts of the item “Current Expenses” in the municipality of Chapecó and the growth of the “Total Health Care Expenses” and “Own Municipal Health Care Expenses.” However, there has been a stagnation of funds stemming from transfers linked to the “Expenses on Pharmaceutical Assistance with Transfers from the Federal Government,” which corresponds to one of the main sources of funds for the supply of medication in the public health care system. It has also been verified that the growth of amounts spent on medication was higher than increases in total health care expenses in the period evaluated.

In this sense, analysis of results from suggested indicators on municipal expenses can be better carried out from the provisions in Table 11.

Table 11  
Result of indicators on municipal expenses

| Year | Quotient of the Current Expenses (QDCOR) |           | Quotient of the Total Health Care Expenses (QDTSA) |           | Quotient of the Own Municipal Health Care Expenses (QDPMS) |           | Quotient of the Pharmaceutical Assistance with Transfers from the Federal Government (QDFTU) |           | Quotient of the Expenses with Medication Expenses Element (QEDM) |           |
|------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|
|      | Index                                    | Variation | Index  | Variation | Index  | Variation | Index  | Variation | Index  | Variation |
| 2008 | 0.007%                                   | 100.0%    | 0.020%   | 100.0%    | 0.057%   | 100.0%    | *  | *         | 0.745%   | 100.0%    |
| 2009 | 0.009%                                   | 122.3%    | 0.025%   | 123.6%    | 0.067%   | 117.2%    | 3.010%   | 100.0%    | 0.844%   | 113.4%    |
| 2010 | 0.016%                                   | 215.9%    | 0.044%   | 215.6%    | 0.123%   | 215.2%    | 5.145%   | 170.9%    | 1.288%   | 172.9%    |
| 2011 | 0.015%                                   | 211.3%    | 0.043%   | 211.5%    | 0.119%   | 208.3%    | 4.470%   | 148.5%    | 1.439%   | 193.2%    |
| 2012 | 0.029%                                   | 399.1%    | 0.077%   | 378.0%    | 0.207%   | 360.9%    | 10.046%  | 333.7%    | 2.489%   | 334.2%    |
| 2013 | 0.084%                                   | 1,171.9%  | 0.229%   | 1,123.6%  | 0.706%   | 1,234.0%  | 31.359%  | 1,041.8%  | 7.935%   | 1,065.4%  |
| 2014 | 0.136%                                   | 1,887.1%  | 0.318%   | 1,559.4%  | 0.836%   | 1,459.9%  | 52.374%  | 1,740.0%  | 13.303%  | 1,786.2%  |
| 2015 | 0.132%                                   | 1,842.5%  | 0.351%   | 1,720.0%  | 0.915%   | 1,597.9%  | 65.182%  | 2,165.5%  | 10.984%  | 1,474.8%  |

**Note.** \*There are no received values recorded for this sub-function in the period.

Source: Prepared by the authors.

From the indexes found in Table 11, it was also observed that the amounts spent on health care judicijality have taken larger proportions over the eight years covered by the study. However, unlike the other two groups of indicators, there was a reduction from the penultimate to the last year of the historical series under consideration in two of the parameters measured.

In this sense, when evaluating the evolution of QDCOR, it was found that health care judicijality expenses have equaled only 0.007% of Current Expenses in 2008 but this ratio has strongly increased in the following periods, reaching 0.136% in 2014 and falling a little in 2015, when it was equivalent to 0.132%. Therefore, considering only the initial and final years evaluated, the variation was of 1,842.5%.

Regarding the QDTSA, the performance measured had an identical year-on-year increase, with acceleration in the last three years. In 2008, the values inherent to health care judicijality equaled only 0.020% of Total Health Care Expenses, increasing to 0.025% in 2009.

They fell to 0.044% in 2010, remained practically stable in 2011 (0.043%) and rose to 0.077% in 2012. However, in the final years, growth was much higher, since the index rose to 0.229% in 2013 (with a variation of 1,123.6% over 2008), increased to 0.318% in the following year (1,559.4% over the base year) and ended the series with 0.351% in 2015 (1,720.0% variation over 2008).

Regarding the Quotient of Own Municipal Health Care Expenses (QDPMS), in this parameter there were increases in all years surveyed: it started with 0.057% in 2008 and reached 0.915% in 2015, which corresponds to the variation of 1,597.9% between these two years.

On the other hand, in the Quotient of Expenses on Pharmaceutical Assistance with Transfers from the Federal Government (QDFTU), the scenario evaluated does not involve 2008, since there was no value record regarding this type of expense in the accounts of the Municipal Government of Chapecó. According to the municipal accountant, this happened because of the fact that up to 2008 this expense would be classified in the other groups of health care accounts. Thus, from this indicator it was only possible to make an evaluation from 2009 onwards. In that first year, the index was 3.010% and gradually increased to reach 65.182% in 2015 (2,165.5% variation compared to the reference year).

The last parameter of this group is the Quotient of Expense with Medication Expense Element (QDEDM), where a result of 0.745% was seen in 2008 and 10.984% in 2015, representing an evolution of 1,474.8% over this time period. However, in 2014 this index was higher, when it reached 13.303% (growth of 1,786.2% over 2008).

## 5 CONCLUSIONS

This study has aimed to answer a research question linked to the use of financial indicators to manage the supply of medication related to health care judiciality. The objective was to propose financial indicators on judiciality expenses in the supply of medication in the Brazilian municipality of Chapecó, SC.

In order to meet this objective, data collection was carried out on judicial processes involving the municipality under this study, which culminated in 3,843 provisions of medication to beneficiaries/claimants. Monetary values related to three perspectives were as follows: municipal revenues, municipal expenses and "Health Care Function" expenses (and their main sub-functions). From these values, performance indicators presented in Tables 3, 6 and 9 were developed, the results of which were evidenced in Tables 5, 8 and 11. As a result, the authors understand that the goal has been achieved because it was possible to know the annual evolution of these expenses from the three angles mentioned by means of the fifteen quotients proposed as evaluation metrics.

As for the most relevant "findings" of the research, it is interesting to highlight at least two aspects. The first one refers to the percentages measured in all indicators, which showed similar evolutionary behavior. Between 2008 and 2011 there were gradual increases in each period, while in 2012 there was a high growth (more than doubling in practically all indexes in relation to the previous year). However, in the last three years there were significantly more significant increases, culminating in increases of over 2,000% in relation to 2008 in three of the four indicators in the revenue-linked quotient group. This behavior was similarly repeated with respect to the parameters associated with the "Health Care Function" expenses and their sub-functions, where the three main metrics (QFUNS, QSFAT and QSFHA) varied by about 1,800% over the initial year from the series. Within the scope of the quotients of expense categories, the evolution over the initial year was also large in the final years of the series: QDCOR (1,842.5%), QDTSA (1,720.0%), QDPMS (1,597.9%), QDFTU (2,165.5%) and QDEDM (1,474.8%).

The second aspect concerns the increase observed in monetary values, the representativeness of which can be better expressed from the indicators proposed. For example, in the year 2008, for each BRL 100 of Net Current Revenue, around BRL 0.0062 were spent on health care judiciality, while in 2015 this amount increased to BRL 0.1254. The same for the case of comparison with expenses with the Health Care Function (from BRL 0.019 in 2008 to BRL 0.351 in 2015) and Current Expenses (which ranged from BRL 0.007 to BRL 0.132).

Regarding the contributions of the study, the authors consider that they reside mainly in the proposal of indicators that allow to measure the proportion of expenses related to judicial demands for provision of medication in the municipality under study. In addition, the same indexes can be used in other municipalities, since monetary values can be obtained from municipal public accounts (revenues and expenses) and internal controls of municipalities (regarding judicial expenses).

However, perhaps the main limitation of the study is the fact that it was not possible to compare the results with others, since no similar approaches were found, especially with regard to monetary values of medication provided by judicial orders in municipalities. Even if the absence of comparison with other studies can be qualified as a restriction, the authors consider that this reality only praises the importance of more research in this area that is still little explored in Brazilian accounting literature. Thus, the small contribution of the study now presented may serve to draw the attention of other researchers in order to better assess this field of research. In addition, it is pertinent to point out that because it is a case study in the Brazilian municipality of Chapecó, SC, the conclusions are limited to this context. Therefore, it is considered that the reality found is probably unique to the city under study and, a priori, does not allow extrapolating the results obtained to other municipalities of the state of Santa Catarina or Brazil.

Finally, as recommendations for future work, it is suggested to use the indicators proposed in other municipalities, geographic regions or Brazilian states, in order to allow comparisons among these realities. Also, it is possible to verify possible limitations of the indexes suggested here in order to improve these management instruments applicable to the sphere of Brazilian public administration.

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