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Editorial

Dear reader,

The Journal of Accounting Education and Research (REPeC) is a scientific journal issued by the Brazilian Academy of Accountancy (Abracicon), electronically published every three months.

As from Volume 12, Number 1, REPeC starts to publish at least 7 (seven) articles in its quarterly issues, aiming to comply with the requirements of the main scientific indices.

This first issue of 2018 is also marked by the conclusion of Dr. Paulo Roberto Cunha's work (FURB) as Associate Editor of REPeC. This is the final issue in which we count on Prof. Cunha as an Associate Editor, but not as an important collaborator of REPeC. Throughout his mandate as an editor, his acquired expertise was highly relevant for REPeC. His dedication has certainly contributed to much of the journal's growth. That is how we build a strong REPeC, with each team member leaving some history and effort behind. Therefore, on behalf of the entire Editorial Team, we are very grateful! We hope to be able to count on your cooperation and publications in the future!

At the same time, also on behalf of this Editorial Team, I welcome Prof. Vinícius Gomes Martins, who holds a Ph.D. in Accounting from the Multi-Institutional and Inter-Regional Graduate Program in Accountancy at UnB/UFPB/UFRN. Professor Martins is a tenured professor in the Graduate Program at the Federal University of Pernambuco (UFPE) and has published relevant research in different Accounting journals. Therefore, Vinícius, welcome!

Below is a brief description of the 7 (seven) studies we are publishing:

The first is a Teaching Case entitled **Pricing in the Farming Cooperative CALU: the Dilemma of Milk Production**, by *Mônica Aparecida Ferreira, Camilla Soueneta Nascimento Nganga, Taís Duarte Silva, Amanda Rosa Santana, Gilberto José Miranda* and *Edvalda Araujo Leal*, which is intended to stimulate the understanding of aspects related to cost management and to the approaches used to determine the sales price. The paper was elaborated for discussion in undergraduate programs, in Management Accounting and specifically Cost Accounting subjects. The case discusses a problem in a milk cooperative, in which the members are responsible for providing the main production input: the milk. Thus, they consider that they should receive payment as expected, as that was why the created the cooperative, which has not happened in practice though.

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Hugo Dias Amaro and *Ilse Maria Beuren* are the authors of the second article, entitled **Influence of Contingency Factors on the Academic Performance of Accountancy Students**, whose objective was to verify the influence of contingency factors on Accountancy students' academic performance at a Federal Higher Education Institution (Fhei). This descriptive study with a quantitative design was developed through a survey among the students at an Fhei in the South of Brazil, with a sample of 295 respondents. The authors conclude that, among the external factors, the variables father's instruction level, weekly hours of extra-class study and professional experience influenced the academic performance, while the institutional environment, the constructs internal environment, technical system and strategy of the Pedagogical Course Project influenced the students' academic performance at the investigated FHEI.

The third paper, entitled **To the Teacher with Love: the Good Teacher From the Perspective of Generation Y Accounting Students**, was elaborated by *Ricardo Adriano Antonelli, Bárbara Francielli Caleffi Guelfi, Renato Cezar Tumelero* and *Simone Bernardes Voese*. The authors highlighted the characteristics of a good teacher according to Generation Y Accountancy students. In this quantitative research, the data were collected through a questionnaire, applied in class at two private and one public Higher Education Institution, with 265 valid answers. The main findings indicate that the students consider the following characteristics of their teachers in order of importance: knowledge and content mastery; clear explanations, didactics and content preparation; relationship between students and teachers and technology amidst higher education; and teachers' personal attributes. With regard to the teaching institutions, differences were observed between the investigated public and private students' perceptions.

In the fourth study, entitled Students' Intention to pursue a career in Accounting from the Perspective of the theory of Planned Behavior, by *Edicreia Andrade dos Santos, Ivanildo Viana Moura* and *Lauro Brito de Almeida*, undergraduate Accountancy students' intentions regarding the profession and their career were verified. In view of the professionals' different options in the market, this study investigates the factors that influence the intended behavior of students in all phases at a federal university in the South of Brazil to pursue a career in accounting, resting on the theory of Planned Behavior. The data were collected by means of a questionnaire applied to 302 students. For the data analysis, descriptive statistics, factorial analysis and Structural Equations were used. The research results contribute to clarify factors that can significantly influence the students' intention to pursue a career in the area they are studying and can also offer support in terms of aspects that need improvement to stimulate the students' interest.

Audit Assertions and Change of Auditors' Opinion in the Brazilian Market, by *Thayanne Costa da Silva* and *José Alves Dantas*, was the fifth paper, investigating the use of audit assertions to justify changed opinions in Brazilian audit reports. The analysis considered 2,243 reports of 338 non-financial publicly traded companies listed on BM&FBOVESPA between 2009 and 2015, among which 192 audit reports with changed opinions were identified. The authors investigated whether any assertion was prevalent in the changed opinions and whether any of them can be associated with certain equity and income account groups. It was verified that the audit assertions Valuation and Integrity are the most used to justify opinion changes. As for the association between the audit assertions and the account groups, it was verified that the categories Existence/Occurrence tend to be associated with asset and revenue accounts, while Integrity accounts are related with liabilities and expenses.

The sixth article, by *Ricardo Vinícius Dias Jordão, Cleonice Rodrigues Barbosa* and *Paulo Tarso Resende*, is entitled **Internal Inflation, Cost Management and Control: a Successful Experience at a Brazilian Multinational** and investigated the contributions of dimensioning internal inflation to cost management and control and pricing strategies in a multinational Corporation (MNC). The authors developed a specific approach to calculate the own price index (OPI), based on a quantitative and qualitative case study with a descriptive approach in a world-class MNC. Based on their results, the authors could conclude that (i) the MNC benefitted from using a specific method instead of traditional inflation rates in the market; and (ii) the OPI was a management control and accounting tool that managed to equip the company, offering a differential in price negotiations in its respective production chain. On the whole, the authors noticed (iii) the importance of the company's effective use of the OPI for the sake of in-depth knowledge, accounting treatment, control and proper management of its costs, establishing a pricing policy in line with its strategic objectives.

The seventh article is **Accuracy in earnings forecast and organizational life cycle stages: evidences in the Brazilian capital market** by *Alan Santos de Oliveira* and *Luiz Felipe de Araújo Pontes Girão*. This study was aimed at investigating the effect of the organizational life cycle on the accuracy of analysts' forecasts in the Brazilian capital market, departing from the premise that the challenges for the financial analysts' forecasts can vary in the course of the companies' evolution. The sample consisted of 713 companies-year between 2008 and 2014. The results revealed that, in companies in the birth and decline stages, the analysts' earnings forecasts are affected more problematically, despite controlling for several common factors in the literature on analysts' forecasting errors. An additional control for financial difficulties was included, but the results remained qualitatively similar. As for the optimism and pessimism in the predictions, the results appointed that, depending on the life cycle stage, the optimistic or pessimistic bias may particularly increase or decrease; the decline stage led to projections with a reduced bias in comparison with the other non-mature stages, despite the abovementioned controls.

Finally, the entire editorial team of REPeC hopes you will enjoy your reading!

Prof. Orleans Silva Martins, Ph.D.
Editor-in-Chief

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Pricing in the Farming Cooperative CALU: the Dilemma of Milk Production

Abstract

Context and objective: This teaching case is intended to stimulate the understanding of cost management aspects and the approaches used for sales pricing. Elaborated for discussion in Management Accounting subjects, specifically in Cost Management, as part of undergraduate programs, the case addresses a problem faced in a milk cooperative, in which the members are responsible for providing the main raw material in the production: the milk. Thus, these members consider that they should be paid according to their expectations, as that was why they created the cooperative, but this has not happened.

Method: The data to elaborate the case were collected by means of the semistructured interview technique, applied to the managers. In addition, a visit to the cooperative's factory took place to get to know the production process. Also, documentary research was applied with the company's authorization.

Expected results: The case is expected to encourage the participants to reflect on cost management and proposed approaches to the establishment of sales prices involving consumers and the competition. In addition, the case proposes the analysis of the products' contribution margin in the studied organization's decision process.

Key words: Price management. Cooperative. Costs.

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1. Introduction

Founded in the 1960s by a group of 40 milk producers, Cooperativa Agropecuária Ltda. of Uberlândia (Calu) emerged to solve problems related to the commercialization of milk in the region. The city of Uberlândia is located in the region of Triângulo Mineiro, State of Minas Gerais, which, at that time, was already prominent in milk production. At the start of its activities, this cooperative received support from class entities, authorities and politicians and, in return, contributed to the economic development of the city of Uberlândia, considering that it was one of the first companies to generate jobs in the city.

Currently, Calu has a wide range of dairy products sold, including milks, dairy drinks, yoghurts, butters, cheeses, curd cheese, as well as a light line for milks and cheeses. The cooperative has approximately 350 employees and 3,000 cooperative producers. In addition to the headquarters in Uberlândia, Calu also has four branches in the Triângulo Mineiro region, specifically in the cities of Monte Alegre de Minas, Tupaciguara, Gurinhatã and Ituiutaba.

2. Context

Since that morning, Marcos, the director of Calu, kept thinking about what he had heard on a Monday in November when he was working, as usual, always very committed to what he was doing. On that day, something happened that intrigued him: Mr. Joaquim, one of the member producers who founded the cooperative, appeared there, with his usual tranquility, but not very satisfied, as he had received his payment for the milk and did not like the amount, so he went to Marcos to try and understand what was going on. Marcos was uneasy about the situation and thought about what he could do, as the Cooperative had high costs and was paying the producers what it could, but it seems that was not pleasing. So this was a difficult situation.

At the moment Mr. Joaquim arrived, Marcos could not imagine what the producer wanted, but gently summoned him to sit down in his office so they could talk better.

– Good morning, Mr. Joaquim, good to see you here, for I have not seen you for a long time!

– "Good morning, Marcos, it's been a while. This city life is not for me, I prefer my tranquility of the countryside, I only come when I really need to.

– "I understand, I know how peaceful the countryside is, but what has brought you here today?"

– "So, Marcos, I received my payment this month and I was saddened by what I saw, because the price of milk has dropped a lot and even more this month. We come to the city to buy feed and medicine for the cattle and everything continues expensive; only the price of our milk is dropping.

– Mr. Joaquim, I think I understand what you mean, but the Cooperative also has very high costs and, during this rainy season, the supply is larger. You know that more than I do.

– "But something is not right, because some time ago it was not like that. A few years ago, we received a good price for the milk and we still had a good share in the results of the Cooperative. For some time now, however, the price of the milk has been dropping and the cooperative has not distributed profits anymore either. You should know that. What is going on?

Marcos was a bit confused by Mr. Joaquim's questions, finding it better to ask for help.

– Mr. Joaquim, I'm going to call someone who can explain better, just a minute.

Marcos left the room. Despite being a calm person, he was very worried because he always tried to solve all the problems that were happening in the Cooperative, even those beyond his competence. But at that moment, he thought it would be better to ask for help, so he went to the room of Paulo, the comptroller of the Cooperative, who was responsible for managing the costs and the price of the products. He knocked on the office door and there was Paulo.

– Paulo, how are you? I need your help.

– "Well, Marcos, what can I do for you?"

– "I've got one of the cooperative members in my office, Mr. Joaquim. He has provided us with milk for a long time and we have always had a good professional and also personal relationship. He came here today though because he did not like the payment this month at all, so I thought it would be good for you to talk to him, after all, we need the members on our side.

– "Well ... Actually, Marcos, this month, really, the pay was a little lower, because this time of the year is always harder, you know, right? But let's see, I'll talk to him; I think he will understand our situation.

The three of them sat down to talk about the price of the milk. Paulo tried to explain things to Mr. Joaquim. He was not very convinced yet, however, and in his simplicity he decided to ask a question:

– Paulo, I heard what you have said about all these problems. I think I do not understand much of this, but I got curious: what do you do to put the price on the milk and other products manufactured by the Cooperative? How do you know if product X or Y is generating profit? How do you pay us? We send the milk, which is the main product of Calu, and we earn little, but who buys the products in the supermarket pays very, very much. I do not think that's right.

Paul immediately responded:

– Mr. Joaquim, the price is formed according to the market practices. It's simple.

– But how so? What if the market prices are not feasible, what then?

Paul started to reflect, saying to himself. And is not Mr. Joaquim right?! We price the milk bought from the producer and the products according to the market, but we do not know how much each product costs for the Cooperative ... Even less how much profit or loss each product generates for the company.

In that short time they were talking there, there were other members waiting to talk to Mark, who did not seem too pleased either. The secretary, a little apprehensive, interrupted the conversation of the three and reported that there were more members waiting. Marcos was a little startled by the movement, he thought and made a decision.

– Mr. Joaquim, let's do this: I need to talk to Paulo and set up a meeting here at the Cooperative with all the producers. Let's find a way to solve this problem.

And so it happened. Marcos spoke with the cooperative members and everyone agreed. Everything was fine, but only for now. And now, what were they going to do?

Paulo was worried about the situation. "Perhaps Mr. Joaquim is right about our price. If it really is not fair, maybe we're doing something wrong. I think we have a lot to think about. " Marcos foresaw changes in the Cooperative.

3. Production Process at the Cooperative

The confusion that had happened at the Cooperative that morning worried Marcos and Paulo. They looked at each other without knowing what to do, but they had promised the cooperative members a solution, knowing that the situation could not remain as it was. After the shock, they thought more calmly and decided that they needed help, a consultancy perhaps.

The next morning, Marcos, Paulo and Eduardo, the consultant they had hired to help and solve the problem, were in the meeting room. They talked for a long time, analyzing the situation of the Cooperative. As the milk price was floating, it was clear that the supply would be greater in the rainy season and that, therefore, the price would fall, but was there any way to ease the situation so that the cooperative members would not feel dissatisfied? Eduardo, a consultant with many years of experience, suggested:

– I think that, at first, we will have to do a more thorough cost analysis of the products you are making. Subsequently, we will evaluate the pricing mechanisms the company uses.

"But there are many products and how will we go about?" asked Paul.

– At first, we will use a product, preferably one with a more detailed manufacturing process. After the mapping of this product, it will be easy to work on the others.

"Um ... I think I already know which. We can use ricotta cheese!

That day, they decided what they would do. Paulo felt better and, believing that it would be easy to solve the problem, chose the product he thought would be the ideal to analyze. In addition, he imagined that the solution was near.

Not everything was as easy as it seemed though. Marcos, Paulo and Eduardo started to analyze the ricotta cheese and realized that many factors could influence the price. According to the consultant, all costs and expenses of this product in each stage of the production process should be surveyed and classified as fixed or variable. Eduardo commented:

– It will be a time consuming process, but, so, we will check if the product is being properly priced.

Eduardo spoke with great propriety and demonstrated a profound understanding of the subject, but he did not imagine the countless challenges lying ahead. Therefore, he decided to get to know the Cooperative's productive process. He visited the dairy and made a first map of the general product manufacturing process, with a detailed description of each stage of the ricotta cheese production process (Figure 1).

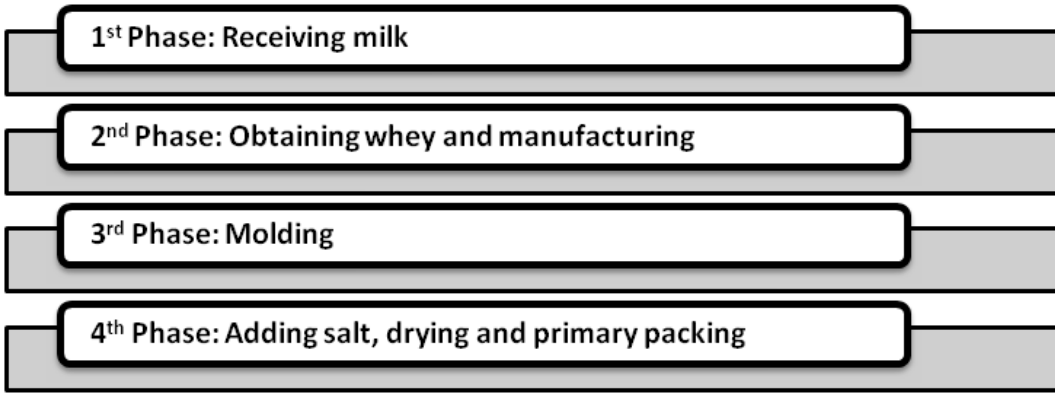

Figure 1. Production process at CALU

Source: elaborated by the authors

1st Phase) Receiving milk: the milk collected from the cooperative members reaches the company Calu, where it is initially stored in tanks. Then, the milk is tested to check the quality and acidity of the product. Next, the milk is distributed to reservoirs through the pipes to manufacture each product: fresh cheese, mozzarella cheese, butter, ricotta etc. Each product receives the proper treatment in its own tank to start the manufacturing.

2nd Phase) Obtaining whey and manufacturing: in the specific case of ricotta, the two main ingredients are whey and milk, with lactic acid as the secondary ingredient (preservative). The whey is obtained in the manufacturing process of mozzarella cheese. In that production process, the whey, which would be discarded, turns into an input for the ricotta production. Next, milk and lactic acid are added and the tank is warmed to 90ºC. As informed, the milk is transferred to the ricotta tank through pipes. The lactic acid is added for the destabilization and flocculation of the protein, as well as to form the mass of the ricotta.

3rd Phase) Molding: in the same tank where the ingredients are mixed, the mass is drained, collected with the help of a stainless sieve and transferred to the molding table, where it is placed in tubes for the ricotta to gain its cylindrical shape. Each tank results in 160 to 200 units, and the remaining whey is disposed of for animal feed.

4th Phase) Adding salt, drying and primary packing: next, the ricotta is refrigerated to gain consistency and be cut into smaller units. After being cut in smaller and regular sizes, the ricotta is immersed in brine for approximately one hour. After the brine bath, the product is stored on shelves in a drying room for 24 hours. Finally, after the drying period, each unit is vacuum packed in EVA plastic, and then wrapped and stored in a cold room. The product is ready!

4. Main management dilemmas faced

After knowing the production process and the formula for making the ricotta, Eduardo thought: "What am I going to do with this information? Hmm ... I can now discover the manufacturing cost of ricotta cheese. Then, just think about how much profit the cooperative expects to make and that's it! So what would be the ideal selling price for this product? Are we making a profit or a loss in the sale of ricotta?"

As mentioned earlier, the dairy industries are faced with the problem of the "unstable" availability of the raw material milk, which means that, in certain circumstances, there is a surplus and, in others, insufficient milk. This fact may influence the price determination for the cooperative members and, consequently, for the manufactured product.

Observing the production process of ricotta, Eduardo discovered that this cheese is made from the whey of the mozzarella cheese, also identifying that ricotta is low in fat. This whey derived from the production of mozzarella intrigued him because, how would the value of the whey be calculated if, in other manufacturing lines, it could be "discarded" and, for the production of ricotta, it is essential? Also, how can the fat be treated that is extracted from the milk and used in ricotta? Is this fat a raw material for other products, such as butter and curd cheese? There were many doubts!

Eduardo kept thinking, "But does ricotta produce a profit or loss? Um ... He would have to analyze its individual cost, starting with variable costs, and then analyze the contribution margin of that isolated product. But what about the costs that are fixed and general for the entire company? How can they be assigned to each product? We have lots of work and research ahead !!!"

With the information on costs and expenses of the product, Eduardo managed to do some analyses. Table 1 shows the quantities and costs of the raw material used in the production of ricotta.

Table 1
Cost projection – Ricotta

Raw material	Unit	Quantity	Unit cost
Cooled milk	Liter	2.42	0.78
Whey	Liter	30.25	0.06
Raw material A (lactic acid)	Unit	0.00073	325.57
Raw material B (refined salt/Kg)	Unit	0.02	0.95
Carton box	Package	0.11	0.68
Packing tape	Roll	0.00010	3.49
Packing pouch	Unit	2.09	0.20
Outsourced services	**Unit**	**Quantity**	**Unit cost**
Cheese factory	Kilogram	1.00	0.17
Cheese packing sector	Kilogram	1.00	0.06
Reception and cooling	Liter	2.42	0.005
Refrigeration	Liter	35.09	0.01
Boiler	Liter	2.42	0.01
Milk standardization and pasteurization	Liter	2.42	0.0024
By-products	**Unit**	**Quantity**	**Unit cost**
Fat cream	Liter	0.01	6.2774

Source: elaborated by the authors based on the data from the Cooperative

Regarding the costs of the ricotta, as already pointed out, Eduardo identified two very interesting situations. The first concerns the whey, which is one of the items that make up the raw material of the ricotta, being obtained in the production process of mozzarella, that is, it is a by-product of mozzarella. If sold on the market, the whey would have a unit cost of 0.06 cents, a figure that could be considered as a transfer price to the ricotta manufacturing process. In other words, the value of the whey considered as raw material for ricotta would be deducted from the cost of the raw material of mozzarella. This procedure was adopted for the Cooperative to know the results of each area and, later, the overall result of the Cooperative.

The other peculiar situation Eduardo found in the analysis of the costs of ricotta refers to the level of fat of the milk used in the production. Generally, the milk purchased from the cooperates reaches the industry with approximately 3.6% fat (cream). The production process of ricotta requires only 3.2% of fat though. Thus, the milk goes through a standardization process (skimming) to extract the excess fat (0.4%). The fat represents the noble part of the milk, being the basic raw material of other dairy products, such as curd cheese and butter. Hence, the treatment is the opposite of that given to the whey. The extracted cream would be considered as raw material for other products (such as butter and curd cheese) and would represent a reduction in the price of the raw material milk used in the manufacturing of ricotta. This would be the proper treatment for a by-product such as whey according to Eduardo.

Eduardo was able to verify that the monthly quantity of ricotta sold in the analyzed period was 8,300 kilos, with an average sales price of R$ 5.70. The consultant was able to identify the following percentages of the expenses related to ricotta, after many calculations: tax expenses (7%); commission expenses (2%); freight expenses (0.3%); and financial expenses (2.4%). Eduardo also identified that, in the case of ricotta, there are no expenses with the freight to discard the whey, as the producers themselves withdraw this at the cooperative.

After many surveys, Eduardo needed to calculate the contribution margin of ricotta to compare it with that of other cooperative products, in order to better analyze the price and contribution margin of ricotta in relation to the other products.

Table 2

Contribution Margin – Comparative Table

Product	Low-fat milk	Full-fat milk	Large mozzarella	Small mozzarella
Volume	112.500	514.000	255.200	2.300
Sales Price	R$1.75	R$1.65	R$9.00	R$8.90
Invoicing	R$196,875.00	R$848,100.00	R$2,296,800.00	R$20,470.00
Total Variable Costs	R$165,729.45	R$716,865.19	R$2,244,977.80	R$20,687.72
Total Variable Expenses	R$23,034.38	R$99,227.70	R$270,103.68	R$2,407.27
Tax Expenses	R$13,781.25	R$59,367.00	R$160,776.00	R$1,432.90
Commission Expenses	R$3,937.50	R$16,962.00	R$45,936.00	R$409.40
Freight expenses	R$590.63	R$2,544.30	R$6,890.40	R$61.41
Financial expenses	R$4,725.00	R$20,354.40	R$55,123.20	R$491.28
Disposal freight expenses	R$0.00	R$0.00	R$1,378.08	R$12.28
Revenues from by-products	R$26,694.81	R$124.09	R$127,229.91	R$1,146.66
Contribution Margin	**R$34,805.98**	**R$32,131.20**	**(R$91,051.57)**	**(R$1,478.33)**
Unit Contribution Margin	**R$0.31**	**R$0.06**	**(R$0.36)**	**(R$0.93)**

Source: elaborated by the authors based on the data from the Cooperative

Table 2 shows the results achieved with regard to the contribution margin of the products "low-fat milk", "full-fat milk", "large mozzarella" and "small mozzarella". In addition, it will be important to identify the contribution margin of ricotta for the sake of comparison with the other products, in order to verify which product is more profitable.

It is important to highlight that the company has a high fixed cost. Therefore, the contribution margins generated should be enough to dilute this cost and present a positive result. The consultant verified, in his projections, that two products analyzed have a negative contribution margin. Thus, he will need to develop various analyses to identify solutions to the problem.

5. Teaching Notes

5.1 Educational objectives of the case

This case is indicated to study the subject Costs, discussing the classification of costs, variable costing method, contribution margin and sales price formation. The objective is to encourage students to understand cost management and the approaches used to determine the sales price, such as costs, consumers and competition.

The case also shows a practical situation that demands decisions of the organizational managers. Thus, it allows the students to experience a scenario in which they will have to act as managers, to find ways that lead to the solution of the problem. Therefore, the application of the case can contribute to the development of skills needed in the performance of a manager or comptroller, such as the ability to make decisions (leadership), teamwork, information management and conflict solution.

5.2 Recommended use

The application of this case is recommended for undergraduate and postgraduate courses in disciplines in the area of Costs, Cost Analysis, Management Accounting and Comptrollership, focused on cost management. In this sense, the students are confronted with a real situation and should contribute and propose possible solutions for the Cooperative under analysis.

5.3 Suggestion for teaching plan

This teaching case could be applied in two classes (50 minutes each) and, if necessary, the teacher can extend the term depending on the classroom discussions. It is important that the theoretical part about the terminology and cost classification (fixed and variable, direct and indirect), and about the approaches to the determination of the sales price, has already been addressed in the classroom, so that the teaching case is a time to apply the content in practice.

To solve the case, the teacher needs to offer the material and request individual background reading. When it comes to solving the case in the classroom, working in groups of four to six people is suggested.

In the first part (50 minutes), students should read, discuss in groups and propose solutions for the case. In the second part (50 minutes), all students should be arranged in a circle to discuss possible solutions they have found. Also, it is important for the teacher to conclude on the main ideas the students addressed and present the possible solution to the case.

Another suggestion is that the case be conducted outside the classroom environment, encouraging students to research and make decisions more autonomously. Thus, it is suggested that groups of four to six people be formed and that each group finds the solution to the case and takes it to the next class. The moment in the classroom would be for all groups to discuss the ways they found to solve the dilemma.

5.4 Data sources

The data for the elaboration of this teaching case were obtained by the use of semi-structured interview technique with the comptroller, the production manager and the quality manager. The data collection was based on a visit to the Cooperative factory, in order to get to know the production process of ricotta through direct observation. Documentary research was also applied, authorized by the comptroller's office and production management, and the documents analyzed presented the description of the production process of ricotta, cost sheets and other information related to the productive process in the Cooperative. Information was also searched on the Internet, specifically on the Calu website.

5.5 Questions for discussion in the classroom

- What approaches are used to determine the sales price in a farming cooperative?
- What is the contribution margin of ricotta? Does it contribute to the company income?
- In view of the contribution margin of ricotta and the other products presented, which analysis could be developed on the use of the contribution margin for the cooperative's decision process?
- How can the cost management help to determine the sales price?

5.6 Analysis of questions

Question 1 – *Which approaches are used to determine the sales price? Can these approaches be applied to a farming cooperative?*

For Horngren, Datar and Foster (2006: 385), "the price of a product or service depends on supply and demand. The three influences on supply and demand are: customers, competitors and costs". Bruni and Famá (2004) emphasize that three different methods can be used in the process of determining the sales price: cost, consumer or competition.

Cost-based pricing involves measuring the costs of the products and, based on the costs established, a profit margin is added, that is, the sales price is the sum of the product cost and the profit margin the company expects (Bruni & Famá, 2008).

It is important to emphasize that the cost method, for several market segments, continues to be the driver in determining the sale price. Nevertheless, applying this method exclusively to the definition of the sales price is not advisable, as this may generate conflict and lead to a loss of competitiveness if (customer) demand and competition levels are not taken into account (Bruni & Famá, 2008).

In addition, consumers influence the price because they create the demand for a product or service. High-priced products and services can make customers replace them with more affordable ones. Thus, the company needs to know the price the customer is willing to pay for the product, but needs to stipulate the highest price in order to maximize the results (Bruni & Famá, 2008; Horngren, Datar & Foster, 2006).

The competition analysis method in the pricing process involves investigating the competitors who offer similar or substitute products. Normally, managers will set prices that are the same or similar to those of competitors and, in some situations, offer lower prices than the available alternatives (Canever, Lunkes, Schnorrenberger & Gasparetto, 2012).

The teacher should explain that it is possible to apply the approaches presented regarding the determination of the price in farming cooperatives. These companies should analyze the methods that best meet their objectives in terms of price and competitiveness. In some situations, price itself may be one of the competitive strategies and a market differential for cooperatives. Thus, the teacher can also emphasize the importance of the manager's role in the decision process, considering the objectives intended by the company.

Cost management in the price determination process can influence the decision-making process, especially in the case of farming cooperatives. These organizations compete for cost leadership, and the information they provide can help to improve operational efficiency and reduce costs and price.

Question 2 – *What is the contribution margin of ricotta? Does it contribute to the company income?*

To analyze the contribution margin of ricotta, the teacher can use the structure proposed in Attachment 1 of this case. Thus, after the presentation of the students' answers, the teacher can discuss with the students and present the proposed results to solve possible doubts.

Question 3 – *Considering the contribution margin of ricotta and the other products presented, what analysis can be done on the use of the contribution margin for the cooperative's decision process?*

Horngren, Datar and Foster (2006) define contribution margin as the revenue minus all costs, which vary in relation to the level of activities, that is, how much is left for the company to pay fixed expenses and make a profit.

Organizations offer products and services at different prices, costs and expenses, which makes it relevant to determine the contribution margin of each product or service. Therefore, it is of fundamental importance to measure the direct or variable cost of each product or service in order to calculate the contribution margin.

The sum of the unit contribution margins allows the managers to know how much they will have to cover the fixed costs and generate profit in the company (Maher, 2001). It is expected that no product or service presents a negative contribution margin, which occurs when the value of the sales price is less than the sum of the variable expenses and variable costs, thus not contributing to pay fixed expenses and generate profit.

In Calu, two products were identified with a negative contribution margin. This may be acceptable when the negative margin is related to some sales promotion strategy. Nevertheless, it should be assessed whether the sales of other products, whether or not added to the promotion, present positive contribution margins (selling price higher than variable costs and variable expenses) that can contribute to a positive company income.

Based on the analysis of the contribution margin, the company can enhance its decision-making process in order to reach the break-even point as appropriately as possible. Therefore, managers should not rest their decisions solely on the contribution margin, as long-term analysis may be unsuitable, considering that the company should seek revenues that cover variable and fixed costs and also a profit that satisfies the investors, according to Bruni & Famá (2008).

These authors cite as a disadvantage of the use of the contribution margin, through variable costing, "the existence of mixed costs (costs with a fixed and a variable portion), as it is not always possible to objectively separate the fixed from the variable portion" (Bruni & Famá, 2008, p.223).

The application of the concept of contribution margin to Calu may benefit the profitability analysis of sales prices of items produced and traded, such as: contribution margin indices help managers in deciding which products should deserve greater incentives or efforts by the sales team; and contribution margins are essential to aid decision making, that is, whether a productive segment should be abandoned or not; contribution margins can be used to evaluate alternatives to price reductions, special discounts, special advertising campaigns and the use of rewards to increase the sales volume.

The contribution margin approach helps to determine costs and helps managers to understand the relationship among costs, volume and profit, which influences pricing decisions. The adoption of the income statement that shows the contribution margin per product can be used to guide actions in relation to product sales and the promotional efforts to be made.

Thus, the use of the contribution margin for the cooperative's decision-making process may contribute to: indicate which products are the most profitable (both in monetary units and in profitability percentage); identify products that contribute insignificantly (small value or percentage) or with a negative contribution margin (which are generally tolerated in function of the benefits they provide with the sale of other products concurrently); to project the effects on the income resulting from the elimination or reduction of traded goods; provide supports to make choices, in the case of sales strategies (e.g. "tied-in sale"); to facilitate the definition of the goods that will be offered or that will have their prices changed; and verify the acceptance or rejection of sales proposals in a quantity higher than normal, but with a lower price than that adopted by the Cooperative.

Question 4 – *How can cost management assist in determining the sales price?*

Regardless of the cost strategy (method) the company adopts, according to Martins (2008), the market has a great influence in the determination of the prices, and not only the product costs. Therefore, the efficient management of costs will contribute to the maximization of profits. Measuring and properly analyzing costs in organizations provides informed decision-making in relation to the pricing of products or services.

The first step in determining prices is to identify the strategies adopted by the company and then determine which pricing methods will be used to achieve the proposed objectives, thereby involving cost management. Several authors discuss the importance of price decisions for the profitability and survival of each company in the long term (Bruni & Famá, 2008; Martins, 2008).

Pricing with improper settlements can considerably impair the sales performance of certain products and even reduce the company's market share. In this sense, pricing directly affects the competitiveness, sales volume, margins and profitability of companies.

In addition, managers who know the production cost can set attractive prices for customers, which may influence the maximization of the operating profit. The perceived price has a significant impact on consumer satisfaction, which will influence the conquest of the market.

6. Case analysis based on brief literature review

6.1 Approach used to determine the sales price

In order to set prices, in addition to costs, it is necessary to analyze the degree of elasticity of demand, the prices of competitors and substitute products, the conditions of the market the company is inserted in, the organization's marketing strategy, etc. (Martins, 2008).

Pricing is one of the main and most difficult functions performed within the company. To determine the sales price of a product, it is necessary to know factors internal and external to the company, such as direct and indirect costs, demand, competition, consumer market, among others (Horngren, Datar & Foster, 2006).

Bruni and Famá (2008) indicate three approaches that can be used to determine prices: costs, consumers and competition. First, in the cost-based process, "the lower the cost of producing a product in relation to the price paid by the customer, the greater the supply capacity of the company" (Horngren, Datar & Foster, 2006). This means that the lower the cost of production, the more companies are able to set prices that attract customers so that managers can make more profit for their organizations.

As for the consumer market, organizations use the value of the product perceived by customers, and not the production costs (Bruni & Famá, 2008). According to Horngren, Datar and Foster (2006), the customers influence prices, promoting the demand for a product or service.

For competitive analysis, firms should be alert, as alternative or substitute products may affect demand and influence the firm's decision to lower prices (Horngren, Datar & Foster, 2006).

In this sense, as observed, for the process of determining product prices, the first method is based on costs, being considered the most traditional in organizations. Subsequently, the competition and the characteristics of the market are analyzed, the price being established based on the value perceived by the consumer market.

6.2 Cost management in organizations

According to Martins (2008), the main function performed by Cost Accounting is to help decision making. The author discusses that:

> (...) in relation to the decision, its role is extremely important, as it consists in the feeding of information on relevant values related to the short and long term consequences on measures to introduce or cut of products, administer sales prices, choose to purchase or produce, etc. (Martins, 2008, p. 22)

In this sense, the company manager, in order to make its decisions, needs detailed information about the costs of the products, using, for that purpose, the costing methods . According to Bruni and Famá (2008, p.181), one of the main objectives of costing systems is to "generate information about opportunities to improve the company performance in terms of economic results. As for the costing methods available in the literature, we can cite: Absorption Costing, Variable Costing and ABC.

It is important to highlight the Variable Costing method and the analysis of the contribution margin for the decision-making process. In this method, only variable costs will be part of the product cost; the fixed costs, together with the expenses, will be part of the income (Martins, 2008). According to Megliorini (2007), fixed costs originate in the maintenance of the productive structure of a given organization, so they exist even at times when the company does not manufacture or provide any service. Examples of fixed costs are: factory rent, fixed expenses on preventive maintenance, among others.

Martins (2008) explains that variable costs are all costs that vary in proportion to the volume produced. Thus, the larger the company's production volume in a given period, the greater the total variable costs. The consumption of raw material is an example of variable cost, as its oscillation depends on the volume produced.

The contribution margin, according to Martins (2008), is the difference between the sales price and the variable unit cost of the product, that is, through this margin, the variable cost method only settles the costs directly associated with the products. The sum of the unit contribution margins allows managers to know how much they will have to cover fixed costs and generate profits for the company (Maher, 2001).

In the contribution margin analysis, factors that limit production may occur. Insufficient raw material, for example, can put a constraint on the production process. In this case, the use of the contribution margin by limiting factor is suggested, "[...] if there is no limitation in productive capacity, the product that produces the highest contribution margin per unit is of interest, but if it exists, it is the product that produces a greater contribution margin by the limiting capacity factor that matters" (Martins, 2008, p.191). The contribution margin per limiting factor is obtained by dividing the unit contribution margin by the consumption of the limiting factor per produced unit. Thus, the constraint factor (such as the raw material for example) becomes the denominator in the equation, subordinating the remaining production phases to the available quantity of this factor. Another noteworthy aspect in the verification of dairy industries' costs is the joint production phenomenon. According to Martins (2008, p. 162):

> Joint production is the emergence of several products usually from the same raw material. A number of joint products normally classified as co-products and by-products are produced from the same material. (Martins, 2008, p.162)

Products are not identified as separate individual products until a certain stage of production called a "separation point" is reached. The main products are called co-products and,

> By-products are those items that, emerging normally and during the production process, have a relatively stable sales market, both as regards the existence of buyers and the price. These are items that are traded as normal as the company's products, but represent a tiny fraction of total sales (Martins, 2008, p. 122).

Joint production is complex in terms of the determination of unit costs per product, both for the purposes of inventory evaluation and for the determination of the sales price and analysis of gross margins per product. Martins (2008, p. 123) points out that the accounting treatment takes place as follows: the net realizable value is calculated, based on the market price of the by-product, is debited from the inventory account of the by-product and credited to the cost of the main co-product sold.

For Horngren, Foster and Datar (2000, p. 386), a second approach is possible, which allocates costs, employing physical data such as weight and volume. The authors emphasize, however, that the market price is generally, a better indicator of the advantages obtained than the physical measures.

Attachments 1 and 2 present the cost calculations, pricing and contribution margin related to the case under study.

6.3 By-product and transfer price

Some concepts are important to understand the process of costing and pricing in the dairy industry, such as the concepts of by-product and transfer price. For Martins (2008):

> By-products are those items that, emerging normally and during the production process, have a relatively stable sales market, both as regards the existence of buyers and the price. These are items that are traded as normal as the company's products, but represent a tiny fraction of total sales (Martins, 2008, p. 122).

According to Carli, Marcello, Gomes and Hein (2012, p.6), by-products are "the items normally produced by the production process that have a stable market, but represent a very small portion of the company's revenues". In the case of the company Calu, the by-product is generated from the manufacturing process of mozzarella, which in turn generates the whey (by-product), which is used in the production of ricotta.

This whey transferred to the ricotta needs to be measured at a certain value, which is the transfer price, so that the results of the sectors and of the company in general can be determined.

According to Catelli (2007, p.392), "transfer pricing is defined as the value by which goods and services are transferred between the activities and internal areas of an organization". The author states that it is important to measure the contribution of each isolated area of the company to the overall result (Catelli, 2007).

The concept of transfer pricing is also related to the concept of opportunity cost, which, according to Catelli (2007:389), "corresponds to the value of a given resource in its best alternative use; represents the cost of choosing one alternative over another capable of providing a greater benefit, that is, it is the cost of the best opportunity that is waived when choosing an alternative".

Based on the concepts presented, it is argued that the transfer price contributes to the determination and achievement of the results of the company as a whole and, at the same time, it supports the managers to determine the final price of the product and to know the result (profit or loss) of each department or area of the company. According to Catelli (2007), transfer pricing models adopted by companies can be based on: costs (total realized cost, variable realized cost, marginal cost, standard variable cost and cost plus margin); based on negotiation between managers; and models based on market prices (current market price and adjusted market price).

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Attachment 1

Cost calculation of ricotta cheese, suggested price and contribution margin

Raw material	Unit	Quantity	Unit cost	Total cost
Cooled milk	Liter	2.42	0,78	1,90
Whey	Liter	30.25	0,06	1,74
Raw material A	Unit	0.00073	325,57	0,24
Raw material B	Unit	0.02	0,95	0,02
Carton box	Package	0.11	0,68	0,08
Packing tape	Roll	0.00010	3,49	0,0003
Packing pouch	Unit	2.09	0,20	0,42
Total cost raw material				**4,39**

Outsourced services	Unit	Quantity	Unit cost	Total cost
Cheese factory	Kilogram	1.00	0,17	0,17
Cheese packing sector	Kilogram	1.00	0,06	0,06
Reception and cooling	Liter	2.42	0,005	0,01
Refrigeration	Liter	35.09	0,01	0,39
Boiler	Liter	2.42	0,01	0,03
Milk standardization and pasteurization	Liter	2.42	0,0024	0,01
Total cost outsourced services				**0,67**

By-products	Unit	Quantity	Unit cost	Total cost
Fat cream	Liter	0.01	6,2774	0,06
Total cost By-products				**0,06**

Total Direct Cost	Amount
Total direct cost (Raw material + Outsourced services)	5.06

Variable expenses	Amounts
Taxes	0.40
Commissions	0.11
Freight	0.02
Financial expenses	0.14
Variable expenses - Total	**0.67**
Sales price suggested by Cooperative	**5,70**
Contribution margin = price – (variable costs + Variable expenses) + revenues from by-products	**0,02**
Quantity sold	**8300**
Total contribution margin	**166,00**

Source: elaborated by the authors based on data provided by the Cooperative

Attachment 2

Comparative table of products studied

Product	Ricotta cheese	Low-fat milk	Full-fat milk	Large mozzarella cheese	Small mozzarella cheese
Volume	8,300	112,500	514,000	255,200	2,300
Sales price	R$ 5.70	R$ 1.75	R$ 1.65	R$ 9.00	R$ 8.90
Invoicing	**R$ 47,310.00**	**R$ 196,875.00**	**R$ 848,100.00**	**R$ 2,296,800.00**	**R$ 20,470.00**
Total variable costs	**R$ 41,960.60**	**R$ 165,729.45**	**R$ 716,865.19**	**R$ 2,244,977.80**	**R$ 20,687.72**
Total variable expenses	**R$ 5,535.27**	**R$ 23,034.38**	**R$ 99,227.70**	**R$ 270,103.68**	**R$ 3,062.66**
Taxes	R$ 3,311.70	R$ 13,781.25	R$ 59,367.00	R$ 160,776.00	R$ 1,432.90
Commissions	R$ 946.20	R$ 3,937.50	R$ 16,962.00	R$ 45,936.00	R$ 409.40
Freight	R$ 141.93	R$ 590.63	R$ 2,544.30	R$ 6,890.40	R$ 61.41
Financial expenses	R$ 1,135.44	R$ 4,725.00	R$ 20,354.40	R$ 55,123.20	R$ 0.00
Freight disposal	R$ 0.00	R$ 0.00	R$ 0.00	R$ 1,378.08	R$ 12.28
Revenues from by-products	**R$ 521.03**	**R$ 26,694.81**	**R$ 124.09**	**R$ 127,229.91**	**R$ 1,146.66**
Contribution margin	**R$ 167.00**	**R$ 34,805.98**	**R$ 32,131.20**	**(R$ 91,051.57)**	**(R$ 2,133.72)**
Unit contribution margin	**R$ 0.04**	**R$ 0.31**	**R$ 0.06**	**(R$ 0.36)**	**(R$ 0.93)**

Source: elaborated by the authors based on data provided by the Cooperative

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Influence of Contingency Factors on the Academic Performance of Accountancy Students

Abstract

Objective: This study aimed to verify the influence of contingency factors on the academic performance of Accountancy students at a Federal Higher Education Institution (FHEI).

Method: This descriptive research with a quantitative approach of the problem was developed through a survey among the students from an FHEI in the South of Brazil, using a sample of 295 respondents.

Results: The results of the Kruskal-Wallis test appoint that, among the investigated external contingency factors, the father's instruction level, weekly hours of extraclass study and professional experience influenced the academic performance. As regards the institutional environment at the investigated FHEI, the latent variables internal environmental, technical system and strategy of the course's pedagogical project positively influenced the academic performance. The latent variables teaching staff structure and strategy did not show a statistically significant relation. These results provoked concerns and encourage construct validity tests in other institutional environments.

Conclusions: Among the external factors, the variables father's instruction level, weekly hours of extraclass study and professional experience influenced the academic performance. In the institutional environment, the constructs internal environment, technical system and strategy of the course's pedagogical project demonstrated influence on the students' academic performance at the investigated FHEI.

Keywords: Academic performance; External contingency factors: Internal contingency factors: Federal Higher Education Institutions.

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1 Introduction

Higher Education Institutions (HEIs) are constantly challenged to promote high-quality higher education. Therefore, they cannot restrict themselves to simply passing on content, but need to provide support for students to develop their own skills, competences and values in order to generate personal and professional training. The development of these skills and competences already figures on the agenda outlined in the Department of Education's Curriculum Guidelines for undergraduate courses (Silva, 2008).

To achieve this purpose, several factors that can influence the HEIs need to be considered. First, it is necessary to identify their current contingent situation, that is, how the HEI is structured to meet the possible diversities of its environment (Fagundes, Soler, Feliu, & Lavarda, 2008). Among the organizational theories that study the organizational management process, the Contingency Theory refers to this aspect. Nevertheless, no single organizational structure can be effective in all organizations, as their optimization depends on contingency factors (Donaldson, 2001).

The external factors include the variables related to the students' socioeconomic profile. The HEIs' institutional environment, then, includes the internal environment variables, among which the structure, the technical system (the technology used to conduct the course) and the course strategies are highlighted, the strategies being focused on the formulation of the Pedagogical Course Project (PCP) and faculty-related strategies. All of these factors can influence the quality of the course and the students' academic performance.

One of the results of the changes that impact these factors is that the HEIs have operated in a more competitive environment than before. HEIs need to deal with market forces, increased spending and increasingly diverse student associations (Eckel, Couturier, & Luu, 2005). Contingency theory contemplates the relationship between organizations and their environments. Organizational choice and actions are limited by internal pressures and external demands, and HEIs need to be sensitive to these factors in order to survive (Boezerooij, 2006).

According to Contingency theory, there is no single way to deal with environmental pressures (Boezerooij, 2006). For Morgan (1996), everything will depend on the type of activity or the environment the organization in dealing with and the management should be concerned with making the necessary adjustments. Donaldson (2001) emphasizes the importance of adjustments to achieve organizational effectiveness. Thus, in adopting new characteristics, organizations are shaped by contingencies (Boezerooij, 2006).

Pfeffer (2003) warns that problems arise not only because organizations depend on their environment, but also because this environment is unreliable and changes over time. Boezerooij (2006) argues that everything depends on the size of the organization, technology, the stability of its context and external hostility. The author emphasizes the importance of external and internal factors in understanding organizational behavior. Hammond (2003) points out the following influencing factors of HEIs: the political, cultural and social context, national politics, technology development, society's beliefs and expectations about objectives and methods of financing and educational support.

In view of the above, there is a field of research to be explored. Thus, the following guiding question was elaborated for this research: **What is the influence of contingency factors on the academic performance of Accountancy students?** This study aims to investigate the influence of contingency factors on the academic performance of Accountancy students at a Federal Higher Education Institution (FHEI). The academic performance, in this study, corresponds to the general average of the disciplines taken and the self-assessment of students' performance.

Verifying the influence of the contingency factors on the students' academic performance in Accounting teaching is relevant from a practical and theoretical perspective. From a practical perspective, through its investigation, administrative measures can be outlined to improve the quality of higher education in the area. The fact that Brazil is going through a convergence process with the International Accounting Standards, issued by the International Accounting Standards Board (IASB), stresses the need to rethink Accounting teaching in the Country. This research is expected to contribute to strengthen the Accountancy course at Federal Higher Education Institutions and to be useful for the investigated FHEI, its teachers and students and the community interested in the accounting area.

We also intend to offer theoretical contributions through the development of this research, particularly regarding the influence of contingency factors in Accounting teaching at HEIs. We intend to offer a theoretical construct based on Contingency Theory to advance in future research in the area. Therefore, the study's theoretical contribution refers to the development of constructs that can verify the influence of contingency factors on undergraduate Accountancy students' academic performance at Higher Education Institutions.

2 Theoretical and Empirical Framework

2.1 Contingency Factors

The end of the 1950s was marked as the beginning of the application of the idea of contingency to organizational structures. Pioneering authors, such as Burns and Stalker (1961), Woodward (1965), Lawrence and Lorsch (1967), presented their theories, with comparatives in different organizations. They found that the organizations that adapted their structures to the environment obtained better performance. Thus, studies that previously were concerned with predicting how companies and their members should organize themselves, changed to describe what happens in this process in the organizational environment (Guerra, 2007).

Under the lens of Contingency theory, the environment outlines the organizational structure so that it can match its requirements (Morgan, 1996). The environment variable directly influences the degree of change desired by the organization (internal environment), which, in turn impacts the organizational structure (Donaldson, 1999). The organizational structure, according to Chenhall (2007), refers to the formal specification of the organizational members or task forces' different roles to ensure that the organization's activities are accomplished.

Donaldson (1999, p. 106, authors' translation) explains that "each of the different aspects of the organizational structure is contingent upon one or more contingency factors". Thus, organizations need to be sensitive to so-called contingency factors (Donaldson, 2001). Chenhall (2003) points out strategy, uncertainty and technologies as contingency factors. These, in turn, reflect the influence of the environment the organization is embedded in.

According to Chenhall (2007), strategy is a mechanism by which managers are influenced by the external environment, structural mechanisms, culture and control for decision making. The perceived environmental uncertainty leads managers to outline the strategy to be used as the guiding principle of their business. The adequacy of the technology leads to a performance superior to that of organizations in which the structure is at odds (Woodward, 1965). Technology "refers to how the organization's work processes operate (the way tasks transform inputs into outputs) and includes hardware (such as machines and tools), materials, people, software and knowledge" (Chenhall, 2003, p. 139).

Donaldson (1999) argues that there is some influence of these contingencies, but also a considerable degree of choice by the managers. These choices consist of the company's option to change its strategic position against external contingencies. The author points out that, in the mid-1970s, there was an established paradigm of Structural Contingency theory. Subsequent studies could guide their efforts within this tradition and contribute to the evolution of the literature. Parallel to the criticism against the Structural Contingency theory, other approaches have emerged since the 1970s.

It is pointed out that Contingency theory always seeks to understand and explain how organizations function under different conditions. This operation takes place under the influence of the contingency factors in a wide range of organizations, including Higher Education Institutions. In this case, the study is focused on an FHEI. The contingency factors considered in this research include external factors (related to the students) and internal factors of the institutional environment (internal environment, structure, technical system and course strategies).

2.2 Influence of contingency factors in higher education

In recent decades, HEIs have undergone profound changes in their environment, affecting primary teaching and research processes, as well as their secondary processes: organization, administration and support services (Boezerooij, Van Der Wende, & Huisman, 2007). There is a whole functional logistic chain - from the attractions to the entry of new students until their departure. Therefore, it is necessary to identify the current contingent situation, that is, how the institution is structured, with a view to attending to the diversities of its surroundings (Fagundes, Soler, Feliu, & Lavarda, 2008).

Andriola (2009) emphasizes that every educational institution is inserted in a social context that strongly influences it in established relationships and this context creates both limitations and opportunities. For the author, the educational system is continuously and dynamically interacting with the social context it is immersed in. This is a basic premise of the Contingency theory, so that educational institutions need to respond to environmental contingencies to ensure their continuity.

In order to evaluate the quality of education, it is essential that factors not directly related to the school be investigated, which include, among other aspects, the socioeconomic status of the family, parents' educational level, educational resources in the home and educational activities beyond the school (Vianna, 2000). This socioeconomic profile of the students consists of external environmental factors that lie beyond the school's control.

In the case of college students, as they already have an established personality and individual differences that influence the learning process, the intellectual level, their specific skills, their previously developed knowledge, among other aspects, explain part of their performance in the institution (Gil, 2011). In order to influence external factors in higher education, we have identified some empirical studies published in Brazil and internationally, among which we highlight the studies in Figure 1.

Authors	Theme discussed and results
Caiado and Madeira (2002)	Analyzed the relation between academic performance (entry grade on admission exam) and the influence of Accountancy students' gender and professional experience at two schools in the interior of Portugal. The results revealed that the entry grades to teaching are indicators of future successful academic performance, while gender and professional experience statistically null influence on the academic performance.
Frezatti and Leite Filho (2003)	Studied the students' profile in terms of attitudes and their performance in an Accountancy discipline offered in evening education at a public university. The authors observed a positive relation between the students' behavior in and beyond the classroom and their final performance.
Freitas (2004)	Related demographic variables (color, gender, income, parents' education, secondary school) and their effect on the students' admission exam performance and course output. The research was developed at a private higher education institution, in the Human Resource Administration, Business Management, Journalism and Physical Education programs. The income variable showed a Strong influence on the academic performance. The students gaining up to five national minimum wages obtained lower mean grade than students gaining a Family income of ten or more minimum wages. The study indicated a positive correlation between income and academic performance, with higher income meaning higher scores.
Andrade and Corrar (2008)	Examined the effects of academic, demographic and economic variables (marital status, racial condition, income, work journey, father's education, mother's education, secondary school, access to informatics, number of students per class, library use, hours of extraclass study, teachers' teaching method and academic activities developed at the institution) on the performance of Accounting students in Brazil. The results in a sample of 22,662 undergraduate students indicated that all variables, except for racial condition, are related with the academic performance. The tests of means indicated that all variables, except for library use frequency, contributed to the students' performance.

Figure 1. Research on the influence of external contingency factors on higher education

Source: elaborated by the authors based on the references.

In Figure 1, the influence of different external variables on the students' academic performance is observed. Hence, the HEIs are responsible for adapting their internal processes to the external environment. In response to these external variables, the HEIs can be more thorough in the selection process of the students they intend to receive and in the selection of their teaching staff (Stoll & Fink, 1999). The external factors set limits for the educational institutions' activities. Sometimes, these factors are that narrow that the institutions can do little or nothing to increase their educational efficacy and teaching quality (Murillo, 2003).

The social relationships established inside the teaching institutions represent another influential factor, as they reflect the socioeconomic conditioning factors, diverse histories of the educational community's members, their beliefs and values, among other factors determining the institutional internal environment (Andriola, 2009). Some Brazilian and international empirical studies in this sense have been identified, as demonstrated in Figure 2.

Factors	Approach of internal contingency factors
Internal environment	Rizzatti (2002) observed in his research that one of the factors that require particular attention in universities is the work environment and satisfaction of their members, mainly in administrative functions. An internal environment with motivated serves can enhance the students' satisfaction with the course offered.
	Paiva and Lourenço (2011) investigated the influence of the classroom environment on the academic performance, involving 217 students in the third year of basic education at a public school in Northern Portugal. The authors found that the internal environment exerts positive and significant influence on the students' academic performance. This can expand to the contact with the managers.
Structure	Andriola (2009) investigated the influence of structural factors (classrooms, laboratories, libraries, equipment) in the National Student Performance Exam (ENADE) among the 1,337 students enrolled in 40 programs at an FHEI. The author found that the courses with better structures scored higher. The library and the quality of its collection was highlighted, due to the influence on students' learning and educational quality.
Technical system	Singh, O'Donoghue and Worton (2005) highlight that the Internet is a technological factor that can transform and restructure the traditional higher education models, as it has changed the learning process and allowed universities to establish global educational providers. According to Boezerooij (2006), the challenge teaching institutions face is to integrate the students into the university through workstations and computers that can integrate them into these technological initiatives. Nevertheless, Bates (2003) highlights that the impact of technology on the way the students learn, how the teachers teach and how the administrators manage the institution is complex.
	Weathersbee (2008) investigated the use of technology at 6,654 public schools in the State of Texas, USA, considering children enrolled in the fourth, eighth and eleventh year. Using data from the local Education Agency, the author related the influence of four technological integration areas with the performance on standardized Reading, Mathematics and Science tests. The results indicated that, in teaching and learning, technology use only exerted influence in the 11th year and in all tests. Concerning the preparation and development, the results did not appoint statistical significance in any test modality. In institutional support, the results appointed that technology influence fourth-year students' performance in Reading and Mathematics and eighth-year students' performance in Mathematics and Science tests. In the technological infrastructure, the study showed significant influence only in eighth-year students' Reading tests.
PCP strategy	In the Pedagogical Course Project (PCP), institutional aspects are expressed, such as: academic undergraduate teaching policies, student and teacher allocation across different classes, relevance and appropriateness of content to be taught, pedagogical procedures and learning assessment systems (Andriola, 2009). The PCP should also respect the laws and rules established in the educational system the institution is affiliated with.
Strategy of teaching staff	Andriola (2009, p. 27) alerts "the effect the educational institution adds to the students' education is largely determined by the teacher's actions, by the proper use of knowledge, by the way the activities are conducted in the classroom". This activity, according to Morosini (2000), is characterized by the teacher who masters the subject, integrates it into the curricular and socio-historical context, uses different forms of teaching, masters the body language/gestures and aims for student participation.
	Miranda (2011) investigated the influence of the academic staff's academic qualification on the students' academic performance, represented by the Ph.D. degree. According to the research results, the academic qualification presented a significant regression coefficient and a significant positive correlation with the Enade results.

Figure 2. Research on the influence of internal contingency factors in higher education

Source: elaborated by the authors based on the references.

The theoretical base reveals that, besides the external environmental variables linked to the student group, the HEI is responsible for taking into account and paying special attention to the variables in the institutional environment, specifically the internal environment, structure, technical system, course strategies, subdivided in PCP education strategies and strategies related to the teaching staff. It is important to observe that the HEIs have their own contingency factors. Hence, the management board is responsible for promoting the adaptation of the management process in response to the HEIs' external and internal contingency factors.

2.3 Research hypotheses

The literature cited in the theoretical framework of this study indicates relations between the academic performance and external and internal factors of the institutional environment at the investigated HEIs. In this sense, the following hypotheses were tested:

- H1: There are statistically significant differences between the averages of students' general academic performance and the external factors (gender, marital status, family members, housing, weekly work hours, participation in family income, monthly family income, mother's level of education, father's level of education, secondary school, hours of weekly extraclass study, professional experience) of the FHEI (Caiado & Madeira, 2002; Andrade & Corrar, 2008).
- H2: There is a statistically positive and significant influence of the internal environment factor on students' academic performance (Paiva & Lourenço, 2011).
- H3: There is a statistically positive and significant influence of the structure factor on students' academic performance (Andriola, 2009).
- H4: There is a statistically positive and significant influence of the technical system factor on the students' academic performance (Singh, O'Donoghue, & Worton, 2005; Weathersbee, 2008).
- H5: There is a statistically positive and significant influence of the pedagogical course project factor on the students' academic performance (Andriola, 2009).
- H6: There is a statistically positive and significant influence of the faculty strategy factor on students' academic performance (Andriola, 2009; Miranda, 2011).

The hypotheses formulated seek to test which contingency factors influence the academic performance of the Accountancy students at the FHEI where the study was undertaken.

3. Methodological Procedures

This descriptive study with a quantitative approach was carried out based on a survey among the Accountancy students of a Federal Higher Education Institution, established in the South of Brazil. The choice of this university was due to the access the course coordinator granted to the research data. For the sample, the undergraduate Accountancy program was intentionally chosen.

The research population included the students enrolled in all academic periods of the course. Of the 498 students enrolled, 316 answered the questionnaire, but 17 were excluded from the analysis because they were incomplete, leaving 299 valid questionnaires, representing 60.04% of the total number of students. The questionnaire was applied in direct contact with the student, in December 2013, to obtain a more successful response rate.

3.1 Research variables

The questionnaire developed for the LHEI's student group consisted of seven blocks (external factors, internal environment, structure, technical system, PCP strategy, faculty strategy and self-evaluation of performance). The variables for the construct external factors were extracted and adapted from the socioeconomic questionnaire of the National Student Performance Exam (Enade), while the other independent variables were elaborated according to the research proposal.

In order to guarantee the dimensionality and reliability assumptions of the questionnaire variables, Exploratory Factor Analysis (AFE) was applied, using the main components analysis method, the Kaiser-Meyer-Olkin (KMO) test coefficient and the internal reliability obtained by Cronbach's alpha.

According to Hair, Anderson, Tatham, and Black (2005), exploratory factor analysis demonstrates the structure of interrelations (correlations) between variables, defining a set of shared latent dimensions, called factors. The EFA was performed per latent research variable, the basic assumption of the EFA being that some latent structure does indeed exist in the set of selected variables. In terms of Cronbach's alpha coefficient, this indicator guarantees the internal reliability of the items (variables) in each construct.

In Figure 3, the coding of the variables in the research instrument is displayed.

Constructs		Coding of variables in research instrument
Contingency Factors	**External Factors (EF)**	Gender (EF1)
		Age (EF2)
		Marital status (EF3)
		Family members (EF4)
		Housing (EF5)
		Work journey (EF6)
		Economic and Family participation (EF7)
		Family income (EF8)
		Mother's education level (EF9)
		Father's education level (EF10)
		Secondary school (EF11)
		Hours of extraclass study (EF12)
		Experience in the area (EF13)
	Internal Environment (IE)	Score between 0 and 10 the dedication and care you have received at your institution from:
		Department head or equivalent (IE1)
		Course coordinator (IE2)
		Teaching staff (IE3)
		Employees (IE4)
	Structure (S)	Score between 0 and 10 the quality of the infrastructure at your institution concerning:
		Appropriateness of classrooms (S1)
		Appropriateness of physical facilities at library/ies (S2)
		Quality of bibliographic survey (S3)
		Modernity of informatics laboratories (S4)
	Technical System (TS)	Score between 0 and 10 the quality of the technological resources employed at your institution concerning:
		Didactical resources (multimedia, others) (TS1)
		Teaching software (laboratory) (TS2)
		Internet access (TS3)
		Academic system (TS4)
	PCP Strategy (STR)	Score between 0 and 10 the pedagogical project and curriculum matrix of the course concerning:
		Course organization (disciplines) (STR1)
		Disciplines offered (STR2)
		Integration of curriculum elements (contents/summaries) (STR3)
		Course load of disciplines (STR4)
	Teaching Staff Strategy (STR)	Score between 0 and 10 the teaching staff in the program concerning:
		Qualification (degree) (STR5)
		Mastery of content taught (STR6)
		Teaching practices (STR7)
		Interaction with student (STR8)

Constructs	Coding of variables in research instrument
Performance Self-Assessment (PSA)	Score between 0 and 10 your course performance, considering the following in your self-assessment:
	Punctuality in classes (PSA1)
	Attendance in classes (PSA2)
	Participation in classes (PSA3)
	Interest in classes (PSA4)
	Accompaniment of class contents (PSA5)
	Performance in the solution of exercises (PSA6)
	Time dedicated to extraclass studies (PSA7)
	Performance on exams and tests (PSA8)

Obs.: EFA of **IE:** Explained variance=61.021, KMO=0.683 (p<0.05), alpha=0.7905; **S:** Explained variance=65.511, KMO=0.741 (p<0.05), alpha=0.787; **TS:** Explained variance =62.447 KMO=0.775 (p<0.05), alpha=0.8048; **STR:** Explained variance=37.821, KMO=0.683 (p<0.05), alpha=0.833; **STR:** Explained variance=34.261, KMO=0.833 (p<0.05), alpha=0.8126; **PSA:** Explained variance=50.008, KMO=0.842 (p<0.05), alpha=0.8132.

Figure 3. Coding of variables in research instrument

Source: elaborated by the authors based on the research proposal.

In Figure 3, the research constructs and their variables are displayed. For the operationalization of the dependent variable academic performance, two measures were used: a) general performance, which is the general average of the disciplines taken by an enrolled student, whose information was made available by the course coordinator; and b) self-evaluation of performance, consisting of eight sub-variables of the "self-evaluate" construct, proposed by Freitas and Arica (2008).

Cunha, Cornachione Jr., De Luca and Ott (2010) investigated the relationship between the judgment of self-efficacy and Accountancy students' performance at HEIs from four Brazilian states. The results showed that students' modesty about their performance is higher than the accumulated academic average of those who consider themselves to be inferior. Therefore, the use of two metrics in this research is justified to evaluate the FHEI students' performance.

To measure the constructs in the institutional environment, an 11-point interval scale was used (from 0 to 10). This interval was chosen to standardize it with the dependent variable general performance. In addition, the larger the scale, the better the approximation of the normal response curve and the greater the variability that will be extracted among the respondents (Cooper & Schindler, 2011).

3.4 Data analysis procedures

The data obtained in the survey were organized and typed in an Excel worksheet, and later served as input for SPSS version 19 and Smart PLS 2.0. In the verification of the missing data, outliers and normality of the data, it was verified that there were no lost data situations. Regarding the outliers, the "Graphs Boxplot" routine in SPSS version 19 was used, in which the four most representative outliers were eliminated. The numerical values for normality should correspond to the reliability limits of +/- Z 1.96 for asymmetry and kurtosis (Hair *et al.*, 2005). Thus, the Kolmogorov-Smirnov test was performed by construct and respective variables, and all probability values were below the significance level of 0.05, rejecting the hypothesis that the data are normal. In view of the non-normality of the data, non-parametric tests were used.

In the quantitative analysis of the data, initially, descriptive statistics with frequencies and percentages were used to characterize the respondents. We then analyzed the influence of external factors on academic performance using the Kruskal-Wallis one-way Analysis of Variance test. This test analyzes whether K groups originate from populations of different medians (Siegel & Castellan Jr, 2006). This test was performed in comparison with the variable general performance of the students (general average in the disciplines taken).

In order to determine if the constructs of the institutional environment influence the academic performance or not, the Structural Equation Modeling (SEM) technique was used. The use of this technique is justified, according to Hair *et al.* (2005), because SEM is not limited to the analysis of simultaneous dependence of the data; the technique provides a transition from exploratory analysis to a confirmatory perspective. With this technique of multivariate analysis, one can test empirically a set of dependency relationships by the model that puts the theory in practice.

For Hair *et al.* (2005), the use of SEM is justified when one wants to incorporate latent variables in the analysis, and when one establishes relations of dependence and independence. According to the authors, a latent variable cannot be measured directly, but can be represented or measured by one or more variables. In the study, the latent variables are the constructs of the institutional environment (internal environment, structure, technical system, strategy of the pedagogical course project and strategy of the teaching staff). The causal relation of the variables occurs with the endogenous construct or dependent variable (Hair *et al.*, 2005). The endogenous construct is composed by the eight variables of the students' self-assessed performance and the variable academic performance (general average of the disciplines taken).

Thus, the Structural Equation Modeling (SEM) technique was used, estimated based on the Partial Least Squares (PLS). According to Chin (1995), this technique gained acceptance despite the lack of global fit indices in relation to the proposed models and observed data. The PLS allows education models to be treated with smaller samples and variables that do not adhere to a normal multivariate distribution (Chin & Newsted, 1999). Chin (1995) explains that the PLS only considers aspects such as the average variation extracted and R-square index (R^2) to evaluate the impact of the exogenous and endogenous constructs, and the adequacy of the manifest variables (indicators) as a construct validity measure. The program used in this research for the statistical treatment based on this method was Smart PLS version 2.0.

To validate the statistical techniques, we used: convergent validity, discriminant validity, compound construct reliability, Goodness of Fit index (GOF) and assessment of the significance of each path. The convergent validity verifies the Average Variance Extracted (AVE), which represents the amount of variance shared between the indicators of each of the constructs or latent variables (Hair *et al.*, 2005). The amount of AVE from a construct to assess its convergent validity needs to be higher than 0.5 (Ferreira, Cabral, & Saraiva, 2010).

The discriminant validity also observes the AVE and seeks to ensure that the inclusion of second-order constructs is valid. According to Fornell and Larcker (1981), this procedure is performed to verify if the square root of the AVE of each of its first-level constructs is greater than any of the correlations between the first-level construct and the others. The compound reliability test is an internal consistency measure of the construct indicators (Hair *et al.*, 2005). According to Chin (1995) and Hair *et al.* (2005), this test should surpass 0.7 to assure the adequacy in the PLS estimation.

The Goodness of Fit (GoF) index, proposed by Tenenhaus, Chatelin and Lauro (2005), measures the overall performance of the model based on the calculation of the geometric mean between the mean R^2 and the mean AVE of the constructs. Wetzels and Odekerken-Schröder (2009) recommend that, in the Social and Behavioral Sciences this index should be superior to 0.36. To evaluate the significance of each path of the coefficients or influence of one construct on another, we used the procedure available in SmartPLS called bootstrapping. Hair *et al.* (2005) explain that bootstrapping resamples the original data and calculates parameter estimates and standard errors based on survey data rather than statistical assumptions.

The tests presented in the analysis method are necessary to enhance the credibility of the results. In addition, the construction of all the paths explained here reveals how the data of this research were analyzed.

4. Description and Analysis of Results

4.1 Respondents' profile

In the sample characteristics, it was observed that, in the 295 (299 from the sample - 4 outliers), 128 (43.4%) were male and 167 (56.6%) female. The average age of the survey respondents is 22.86 years; the minimum age is 18 years and the maximum 45 years, the predominant age range varying between 21 and 25 years, with 120 (40.7%) respondents. Regarding marital status, 243 (82.4%) students indicated being single, 41 (13.9%) married, 8 (2.7%) divorced and 3 (1%) widowed. Among the family members living with the sampled students, 123 (41.7%) respondents lived with up to two members, followed by up to four members with 121 (41%) respondents, and 33 (11.2%) respondents who do not live with family members.

As far as the students' workday is concerned, only 28 (9.5%) do not work. The predominant situation is full-time work of 44 hours, with 130 (44.1%) of the cases, followed by those working between 20 and 44 hours with 128 (40%) respondents. Regarding the residence status, the predominant situation is "I live in my own home" with 151 (51.2%) respondents, followed by "I live in my own home with a loan" with 66 (22.4%) and "I live in a rented home" with 55 (18.6%).

Concerning participation in family income, the predominant situation is "I work and earn a living" with 114 (38.6%) respondents, followed by "I work and contribute to family support" with 83 (38.6%) respondents. Regarding family income, the situation analysis indicates that the sample is concentrated in 11 national minimum wages or more with 76 (25.8%) respondents, followed by six to ten national minimum wages with 75 (25.4%), and four to five national minimum wages with 71 (24.1%).

As for the mother's education level, there was one case of a mother without any schooling; at the other end, there were 96 respondents (32.5%) whose mother had a university degree, followed by a high school diploma with 76 (25.8%). Regarding the father's level of education, the extremities in the sample are highlighted, as there were six situations in the sample in which the father does not have schooling, and 100 (33.9%) respondents whose father holds a higher education degree, followed by 84 (28.5%) with a high-school degree.

In relation to the high school the students attended, the predominant situation is completely in public schools, with 160 (54.2%) respondents, followed by completely in private schools with 88 (29.8%). For the variable "weekly extraclass study hours", the predominant situation is one to two hours with 102 (34.6%) respondents, followed by three to five hours with 97 (32.9%). It should be noted that 46 (15.6%) respondents do not engage in extra-class studies and only attend classes.

Regarding the experience in the area, the prevailing situation is "I have never worked in the area" with 94 (31.95%), followed by one year of experience in the area with 80 (27.1%) respondents.

4.2 Influence of external factors on students' academic performance

In the analysis of the relationship between students' general performance (average of disciplines studied) and external factors, the non-parametric Kruskal-Wallis one-way analysis of variance test was used. This is useful to decide whether K independent samples come from different populations. Sampling values almost always differ, and the question is whether the differences mean genuine differences between populations or whether they represent the kind of variation that would be expected between random samples from the same population (Siegel & Castellan Jr, 2006).

The hypothesis to be rejected is that there are no statistically significant differences between averages of general performance and external factors. If the probability value is less than $p < 0.05$, there is at least one pair of different population medians. The variable EF2 (age) is not included in the construction of the hypotheses, as this was a continuous variable in this research. Thus, we chose to relate it separately. The Kruskal-Wallis test pointed out that there are no statistically significant differences between academic performance and age ($p = 0.362$).

Table 1 presents the Kruskal-Wallis test for the relationship between academic performance and variables EF1 (gender) and EF3 (marital status).

Table 1

Kruskal-Wallis test of the relation between academic performance and the gender and marital status variables

Variable	External Factor	N	Mean Rank	Chi-Square	Df	Asymp. Sig.
EF1	Gender			0.218	1	0.641
	Male	128	145.35			
	Female	167	150.03			
	Total	295				
EF3	Marital status			1.963	3	0.580
	Single	243	145.79			
	Married	41	153.16			
	Divorced	8	186.56			
	Widowed	3	154.00			
	Total	295				

As verified in Table 1, according to the Kruskal-Wallis test for EF1 (gender), there is no statistically significant difference ($x^2 = 0.218$, $p = 0.641$) between the medians of general performance and gender. Differently from this result, Freitas (2004) found in her study that women's performance was superior to that of men, considering both admission exams and course performance. The author justified the better performance of women by better secondary education and greater dedication in undergraduate course disciplines.

For the variable EF3 (marital status), there are no statistically significant differences ($x^2 = 1.963$, $p = 0.580$) between the medians of general performance and marital status. These results do not agree with those of Andrade and Corrar (2008), in which the performances differed significantly ($p = 000$), with single students presenting better academic performances.

Table 2 presents the Kruskal Wallis test for the relationship between academic performance and external socioeconomic variables: EF4 (family members), EF5 (residence status), EF6 (work day), EF7 (participation in family income) and EF8 (monthly family income).

Table 2

Kruskal-Wallis test of relation between academic performance and socioeconomic variables

Variable	External Factor	N	Mean Rank	Chi-Square	Df	Asymp. Sig.
EF4	**Lives with family members**			5.473	4	0.242
	None	33	168.65			
	Up to two	123	147.60			
	Up to four	121	143.64			
	Up to six	16	154.81			
	More than six	2	41.50			
	Total	295				
EF5	**Place of residence**			4.158	4	0.385
	I live in a rented home	55	135.58			
	I live in a student dorm and share expenses with other people	12	188.25			
	I live in my own home with a loan	66	145.63			
	I live in my own home fully paid	151	149.47			
	Other	11	160.18			
	Total	295				
EF6	Work journey			2.038	4	0.729
	I work full-time 44 hours	130	147.11			
	I work between 20 and 44 hours	118	143.46			
	I work up to 20 hours	14	152.04			
	I work occasionally	5	181.20			
	I do not work	28	163.30			
	Total		295			
EF7	**Participation in family income**			5.660	4	0.226
	I work and am the main family provider	25	145.62			
	I work and contribute to family support	83	131.06			
	I work and make a living	114	152.24			
	I work and receive financial help	44	157.24			
	I do not work and my family funds my expenses	29	167.84			
	Total	295				
EF8	**Monthly family income**			7.729	4	0.102
	Up to one national minimum wage	5	108.10			
	Between two and three national minimum wages	68	147.88			
	Between four and five national minimum wages	71	145.20			
	Between six and ten national minimum wages	75	133.01			
	Eleven or more national minimum wages	76	168.15			
	Total	295				

As verified in Table 2, according to the Kruskal-Wallis test, there are no statistically significant differences ($x^2 = 5.473$, $p = 0.385$) among the medians of general performance and family members for variable EF4 (family members). The same occurred for variable EF5 (housing status), in which the tests showed $x^2 = 4.158$ and $p = 0.385$ for the relation with academic performance.

For EF6 (work day), there are no statistically significant differences ($x^2 = 2.038$, $p = 0.729$) between the medians of general performance and the weekly workday. The results of this research differ from those found by Andrade and Corrar (2008), in which, for students who during most of the course had a paid job, the test suggested significant differences ($x^2 = 342.26$; $p = 0.000$). The authors justified the results by the greater motivation of working students, which gives them better grades.

For EF7 (participation in family income), there are no statistically significant differences ($x^2 = 5.660$, $p = 0.226$) among the medians of general performance and participation in family income.

For EF8 (monthly family income), there are no statistically significant differences ($x^2 = 7.729$, $p = 0.102$). These results differ from Freitas (2004), who observed in his study that, in all the courses studied, the higher-income students perform better, indicating a positive correlation between income and performance. The results also differ from Andrade and Corrar (2008), where the family income test suggested significant differences ($x^2 = 592.31$, $p = 0.000$) among the salary ranges, indicating that students with lower family incomes obtained lower performances.

Table 3 presents the Kruskal-Wallis test for the relation between academic performance and the variables of education level: EF9 (mother's level of education), EF10 (father's level of education), EF11 (secondary school), EF12 (weekly hours of extra-class study) and EF13 (professional experience).

Table 3

Kruskal-Wallis test of the relation between academic performance and education level variables

Variable	External Factor	N	Mean Rank	Chi-Square	Df	Asymp. Sig.
EF9	**Mother's education level**			8.651	6	0.194
	None	1	194.00			
	Unfinished primary education	42	115.56			
	Finished primary education	33	153.56			
	Unfinished secondary education	24	163.48			
	Finished secondary education	76	144.68			
	Unfinished higher education	23	152.8			
	Finished higher education	96	157.41			
	Total	295				
EF10	**Father's education level**			15.660	6	0.016*
	None	6	183.75			
	Unfinished primary education	37	105.73			
	Finished primary education	30	150.02			
	Unfinished secondary education	11	149.73			
	Finished secondary education	84	141.95			
	Unfinished higher education	27	143.28			
	Finished higher education	100	167.06			
	Total	295				
EF11	**Secondary school**			1.990	4	0.738
	Fully public school	160	144.36			
	Mostly public school	25	136.46			
	Fully private school	88	153.76			
	Mostly private school	20	163.82			
	Other	2	171.50			
	Total	295				
EF12	**Weekly hours of extraclass study**			26.725	5	0.000**
	None, I simply attend class	46	107.80			
	One to two	102	142.54			
	Three to five	97	148.83			
	Six to eight	32	185.19			
	Nine to ten	4	226.00			
	More than ten	14	206.82			
	Total	295				
EF13	**Professional experience**			11.540	5	0.042*
	I have never worked in the area	94	156.86			
	One year	80	160.84			
	Two years	54	151.20			
	Three years	37	115.76			
	Four years	12	126.38			
	More than four years	18	115.72			
	Total	295				

Where: *Significant p<0.05 / **Significant p<0.01.

As verified in Table 3, according to the Kruskal-Wallis test, there are no statistically significant differences ($x^2 = 8.651$, $p = 0.194$) between the medians of general performance and the mother's education level for the variable EF9 (mother's level of education). These results differ from the study by Freitas (2004), in which a total effect of this variable was verified for the student's admission test performance, demonstrating the importance of the mother in the orientation of the children's studies along the school trajectory. This was not evidence in the undergraduate course output though, revealing that the students' learning success in this phase depends much more on their effort than on their mother's interference. In the study by Andrade and Corrar (2008), the test indicated significant differences ($x^2 = 12.48$, $p = 0.01$) for the mother's education, with the students with the highest grades figuring in the range of mothers holding a higher education degree.

For the variable EF10 (father's level of education), there are statistically significant differences ($x^2 = 15.660$; $p = 0.016$) between the medians of general performance and the father's education. The mean rank analysis for this variable revealed the highest coefficient for the range without education, with an average of 183.75, which is surprising. In the study by Freitas (2004), the results were different. The statistical test for the father's education on the course performance showed that there is no interference of this variable in academic performance, but an interesting point highlighted by the author is that, often, the average income of students whose father has a low education level is higher than for students whose father holds a higher education degree. This statement supports the results found in this research. On the other hand, the results by Andrade and Corrar (2008) are similar in relation to the father's education. The test showed significant differences ($x^2 = 47.85$, $p = 0.000$). In this study, the variable "father with a higher education degree" was responsible for performance differences among the students.

For the variable EF11 (secondary school), there are no statistically significant differences ($x^2 = 1{,}990$, $p = 0{,}738$) among the medians of general performance and secondary school. These results differ from Andrade and Corrar (2008) in relation to students' performance and secondary school background. Significant differences were observed in the means ($x2 = 172.19$; $p = 0.000$), and the authors deduce that students from private schools perform better than students in public schools.

For the variable EF12 (weekly hours of extraclass study), there are statistically significant differences ($x^2 = 26.725$; $p = 0.000$) between the medians of general performance and the weekly hours of extraclass study. In the mean rank analysis, there was a gradual increase, as the number of hours of study increased. The range "none, I only attend classes", with a mean rank of 107.80, and the range "over ten hours of study", mean rank of 206.82, reveal the importance of this variable in academic performance. Therefore, students who are more dedicated perform better. These results are in line with Andrade and Corrar (2008), where the test indicated that the number of hours dedicated to the studies is directly related to the academic performance ($x^2 = 178.79$; $p = 0.000$).

For the variable EF13 (professional experience), statistically significant differences ($x^2 = 11.540$; $p = 0.042$) exist between the medians for general performance and professional experience. These results differ from the study by Caiado and Madeira (2002) because, in that study, the linear correlation coefficients between the final course average and professional experience were not statistically significant and close to zero.

Based on the results of the statistical significance tests, resulting from the Kruskal Wallis analysis, the following can be deduced about the test of the first research hypothesis: H1 - There are statistically significant differences between the averages of the students' general academic performance and the FHEI's external factors. The hypothesis can partially be accepted because there is a statistically significant relation between academic performance and the following external factors: father's level of education, weekly hours of extraclass study and professional experience. The other external factors (gender, marital status, family members, residence status, work hours, participation in family income, monthly family income, mother's education level, secondary school) did not indicate a statistically significant influence on academic performance.

4.3 Structural Equations Modeling

The model proposed with R^2 coefficients is displayed in Figure 4, defined by the covariance estimation technique SEM-PLS.

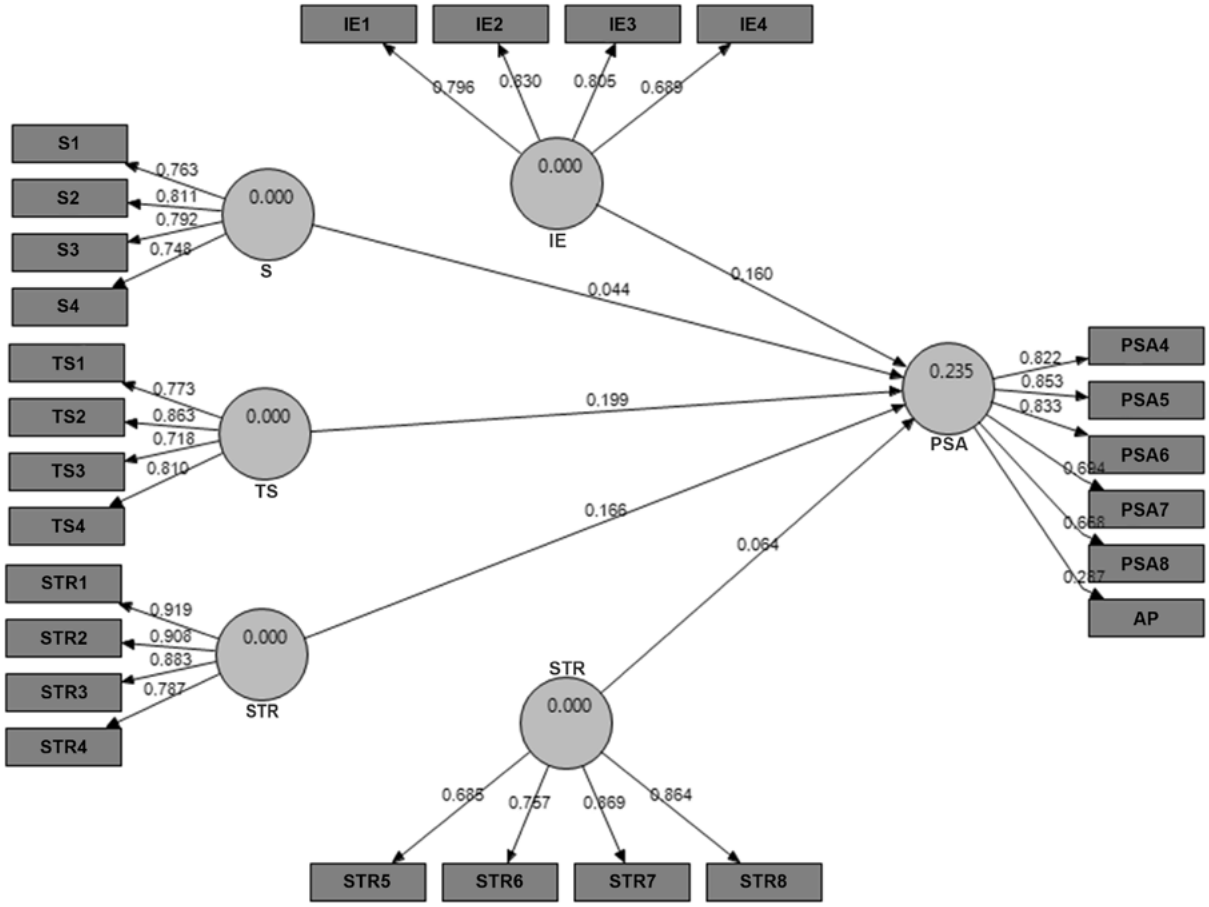

Figure 4. Proposed model with R^2 coefficients – SEM/PLS

The variables PSA1 (punctuality in classes), PSA2 (class attendance) and PSA3 (participation in classes) were removed from the model due to insufficient convergent validity. After these adjustments, the measuring tests of the model were undertaken

4.4 Validity and fit tests of the SEM-PLS model

In Table 4, the reliability indicators of the SEM-PSL model - average variance extract (AVE) and compound reliability are displayed. According to Hair *et al.* (2005), these estimates serve to assess whether the specified indicators are sufficient to represent the latent variables. The recommended coefficient is 0.50 for AVE and 0.70 for compound reliability.

Table 4
Fit indices of the SEM-PLS model

Construct	AVE	Compound Reliability	*R Square*	*Cronbach's Alpha*	Communality	Redundancy
Int. Environment	0.6114	0.8623	0.000	0.7905	0.6114	0.000
Structure	0.6067	0.8604	0.000	0.7870	0.6067	0.000
Technical System	0.6067	0.8708	0.000	0.8048	0.6286	0.000
PCP strategy	0.7673	0.9293	0.000	0.8983	0.7673	0.000
TS strategy	0.6363	0.8739	0.000	0.8126	0.6363	0.000
Acad. Perform.	0.5179	0.8566	0.2355	0.8132	0.5179	0.0413

In Table 4, in relation to the fit indices of the model for convergent validity, there are no indicators inferior to 0.50 for the average variance extracted (AVE), permitting the acceptance of the model. Regarding the compound reliability coefficients, all indicators are superior to 0.70, which represents 50% of the variance, considering the sample size of 295 cases. These coefficients are significant at 0.05, as prescribed by Hair *et al.* (2005). To test the discriminant validity, we verified the correlation between the latent variables, as shown in Table 5. According to Hair *et al.* (2005), the correlations between the variables should be lower than 0.95.

Table 5
Correlation coefficients of first-order constructs

Description	Internal Environment	Structure	Technical System	PCP strategy	TS strategy	Academic Performance
Int. Environment	1.000	0.000	0.000	0.000	0.000	0.000
Structure	0.3302	1.000	0.000	0.000	0.000	0.3211
Technical System	0.3056	0.6281	1.000	0.4811	0.4229	0.3807
PCP strategy	0.4983	0.4697	0.000	1.000	0.5408	0.3763
TS strategy	0.5734	0.3656	0.000	0.000	1.000	
Acad. Perform.	0.348	0.000	0.000	0.000	0.000	1.000
AVE	0.6114	0.6067	0.6067	0.7673	0.6363	0.5179

As verified in Table 5, there is no correlation superior to 0.95 between the first-order constructs that exceed the square root of the AVE in magnitude, indicating the discriminant validity of the model. To finish the fitness of the model, the Goodness-of-Fit Index proposed by Tenenhaus *et al.* (2005) was calculated. In this study, the SEM-PLS model reached an index of 0.3821, superior to the minimum of 0.36, as recommended by Wetzels and Odekerken-Schröder (2009) for the Social and Behavioral Sciences. After these validation steps, the structural model and the hypothesis test are discussed.

4.5 Path analysis

The test of the Structural Model is evaluated according to the adjustment indices and coefficients obtained. These tests show significance based on the coefficients corresponding to the "t" test for the path used in the model, with coefficients superior to 1.96 being considered acceptable according to Hair *et al.* (2005). The bootstrapping analysis was applied, generating N = 2000 different sub-samples, each with n = 295 observations, as recommended by Hair *et al.* (2005). The path analysis is demonstrated in Table 6.

Table 6

Calculated coefficients of structural model

Structural Relation	Coefficient	t-value	Hypothesis	p-value
Internal Environment → Academic Performance	0.160	2.190	H2	0.029*
Structure → Academic Performance	0.044	0.635	H3	0.525
Technical System → Academic Performance	0.199	3.009	H4	0.003**
PCP Strategy → Academic Performance	0.166	2.002	H5	0.045*
TS Strategy → Academic Performance	0.064	0.848	H6	0.396

Where: *Significant p<0.05 / **Significant p<0.01.

According to Table 6, the coefficients superior to 1.96 for the path analysis are: internal environment with t-value = 2.190, technical system with t-value = 3.009 and strategy of the pedagogical course project with t-value = 2.002. The constructs structure (t-value = 0.635) and faculty strategy (t-value = 0.848) were not significant. Based on the results found, one can analyze the hypotheses elaborated for this research.

The internal environment factor exerts statistically significant and positive influence on students' academic performance, with p-value = 0.029, thus accepting H2. Although the latent variable presents low statistical significance, with a direct effect of 0.16, the results corroborate the results by Paiva and Lourenço (2011), which obtained a direct effect of 0.22 with p-value = 0.004. In this study, however, we intended to investigate the entire internal institutional environment, while the authors quoted set out to analyze the classroom environment only.

No statistically significant and positive influence was found for the structure factor in the students› academic performance, with p-value = 0.525; thus, H3 is rejected. This result is not in line with the study by Andriola (2009) that better institutional structures provided higher grades in the National Student Performance Examination (Enade).

There is a statistically significant and positive influence of the technical system factor on students' academic performance, with p-value = 0.003; thus, H4 is accepted. The research reinforces part of the results by Weathersbee (2008), which related the technological structure to the students' performance in Reading, Mathematics and Science tests. In the three situations, there was a significant influence (p = 0.000) in the Reading tests of eighth-grade students.

There is a statistically significant and positive influence of the pedagogical course structure factor on students' academic performance, with p-value = 0.045; thus, H5 is accepted. Despite the low coefficients (0.166), the results reinforce the research by Araújo, Camargos and Camargos (2013), as the variables related to the formulation of the disciplines are positive and significantly correlated with the academic performance.

There is no statistically significant and positive influence of the factor teaching staff strategy on the students› academic performance, with p-value = 0.396; thus, H6 is rejected. Miranda (2011) found a significant regression coefficient and a positive and significant correlation between academic qualification and performance in Enade, which cannot be confirmed in this study.

5. Final Considerations

This study aimed to verify the influence of contingency factors on the academic performance of Accountancy students at a Federal Higher Education Institution. Among the variables related to external factors, the ones that influenced the academic performance of the students under analysis were: father's education level ($x^2 = 15.660$; $p = 0.016$); weekly hours of extraclass study ($x^2 = 26.725$; $p = 0.000$); and professional experience ($x^2 = 11.540$, $p = 0.0402$). The other external variables were not influential. Thus, H1 was partially accepted.

These results are in line with Andrade and Corrar (2008), who found a statistically significant influence on the variables "father's education" and "weekly hours of extraclass study". On the other hand, they do not converge with the results by Freitas (2004) for the variable "father's level of education" because, in that study, the author did not find a statistically significant influence on academic performance. They do not agree either with the study by Caiado and Madeira (2002) that, for the variable professional experience, in this study, the linear correlation coefficients between the final average for the course and professional experience were not statistically significant and close to zero.

Among the institutional environment factors of the investigated FHEI, the hypotheses H2 (internal environment), with a direct effect of 0.16 and p = 0.029; H4 (technical system), with a direct effect of 0.166 and p = 0.003; and H5 (strategy of pedagogical course project), with a direct effect of 0.199 and p = 0.045 were confirmed, indicating the influence on students' academic performance. Therefore, the influence of H3 (structure) and H6 (faculty strategy) on the academic performance of Accountancy students at the investigated FHEI was not confirmed. It is noteworthy that the variable teaching staff did not indicate influence on the students' academic performance, especially if considering that more than 50% of the faculty at this HFEI holds a Ph.D.

Thus, it is concluded that, among the contingency factors surveyed, in relation to the external factors, the variables that influence the students' academic performance are the father's education, weekly hours of extraclass study and professional experience. Regarding the institutional environment of the investigated HFEI, the factors of the internal environment, technical system and pedagogical course project strategy demonstrated their influence on the Accountancy students' academic performance. These conclusions should take into account the cut made in the data collection and cannot be extended beyond the respondents of the research, not even to other courses at the investigated HFEI.

Future research is recommended to verify the constructs' validity in other institutional settings. Other variables can be included, such as types of disciplines, performance on discursive and objective questions, students' motivational aspects and professional activities. It is also recommended to expand the study to higher education institutions in other regions of the country, public or private, in order to verify the influence of these variables on these HEIs and for the sake of comparative analysis. Additionally, the data collected in this research can be analyzed using different perspectives and statistical techniques, in order to verify if this leads to different conclusions.

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To the Teacher with Love: the Good Teacher From the Perspective of Generation Y Accounting Students

Abstract

Objective: to highlight the characteristics of a good teacher according to Generation Y Accounting students.

Method: in this quantitative research, the data were collected through a questionnaire, applied in person at two private and one public Higher Education Institutions, with 265 valid answers.

Results: the main findings indicate that the students consider the following characteristics of their teachers, in order of importance: knowledge and mastery of content; clarity in explanations, didactics and content preparation; relationship between students and teachers and technology in higher education; and teachers' personal attributes. Concerning the educational institutions, differences were observed between the investigated public and private-school students' perceptions.

Contributions: the results in this study are important for the educators and teaching institutions' self-assessment, to hire and assess the teachers, with a view to promoting and/or strengthening continuing education, contributing for the teaching staff to attend to the students' expectations.

Key words: Generation Y; Accounting Program; Characteristics of the Good Teacher; Technology in Higher Education.

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1. Introduction

The expansion of Brazilian higher education in recent years is perceived more intensely, mainly due to some factors, such as the opening of new Higher Education Institutions (HEIs) and the accreditation of new courses, which is reflected in a increasing demand for teachers. It is important to emphasize that this entire expansion in education essentially reflects governmental actions intended to promote the population's access to education, such as the creation of the ReUni Program to Support Restructuring and Expansion Plans of Federal Universities; National Plan for Student Assistance (PNAES); University for All Program (ProUni); and the Student Financing (Fies).

In this context, according to Cunha and Pinto (2009), the expansion of higher education has some consequences, among which the arrival of increasingly heterogeneous students stands out, considering age, cognitive styles, background education, motivations and expectations. As a result of this fact, teachers need to be increasingly prepared, making their task more complex and unpredictable. In this context, specifically in the accounting area, Miranda, Casa Nova and Cornacchione (2012) indicate that the teaching profile of accounting required in the current context is complex and needs research, analysis and discussion.

Considering the increasing complexity of teaching tasks, some studies aim to better understand the characteristics of a good teacher from the student perspective, such as Lowman (2007), Pan, Tan, Ragupathi, Booluck, Roope Ip (2009) and Nogueira, Casa Nova and Carvalho (2012). Also noteworthy are the results of the research by Reichelad and Arnon (2009), which concluded on the plural nature of good teachers' profile, varying according to the student audience, which gives rise to a series of future research.

In recent years, studies have focused on Generation Y students, who according to Lipkin (2010) are known as the Generation of the Internet or iGeneration, born between 1980 and 2000, in the era of technology, which changes continuously. In this sense, the members of Generation Y represent the children of technology, those who were born totally immersed in the digital environment.

Nogueira *et al*. (2012) emphasize that students born in the era of information technology (IT), the well-known Generation Y, when they enter higher education, are faced with teachers from previous generations (Baby Boomers and Generation X), who did not have the same technological background because they developed in a less technological period. Generation Y entails some characteristics, such as greater protection from the parents; being team oriented, confident, targeting successful accomplishments, multitasking; and easy handling of technology (MCalister, 2009).

In this sense, Treml, Pereira and Rank (2013) report that, in the teaching situation, there is an increasing need to work together, in interdependent and collaborative systems, which demands that teachers be attentive to the profiles of their students, as well as being able to interact in their work with people who have different characteristics and experiences, often influenced by different backgrounds, values and even different generations. Thus, the authors affirm that the search to better understand the people of Generation Y has been a challenge, aiming to gain support and means to attract and retain them in these environments.

In the accounting area, according to Antonelli, Colauto and Cunha (2012), in recent years, professionals see a greater need for improvement of their knowledge, which gained momentum as a result of the recent changes in the Brazilian corporate law of 2007 and the convergence between national and international standards. These changes have prompted and required accounting professionals and corporations in general to manipulate more information to assure managers of quick, accurate and reliable responses. Consequently, these organizational needs were reflected directly in education. Medeiros and Oliveira (2009) report that the new attributions expected from the profile of the worker have increased the requirements in the training process, intended to develop educability skills, relationships and basic competences in the different fields of knowledge.

In view of the above, one of the ways for teachers to better understand Generation Y is through the study of this generation's opinion on the characteristics of a good teacher, thus achieving the improvement of teaching practice, as reported by Nogueira *et al.* (2012). The results of the research carried out in HEI of São Paulo and Paraná by the previously mentioned authors offer important contributions to the academy, such as, for example, the characteristics of greater importance in a good teacher are the mastery of content and clarity in the explanations. Knowing the impossibility to generalize the results, however, this research is motivated by the objective of understanding the Accounting students' view, specifically in the city of Pato Branco (PR), in addition to comparing it with that of students from other regions.

In addition, the various careers coming from Accounting programs have been considered the most profitable in 2017, according to Kometani (2017), such as purchasing analyst, accounting analyst, financial planning analyst, tax planning analyst, among others. For the author, with the economic crisis, companies continue working on restricted budgets, seeking to balance the accounts by cutting expenses and limiting staff expenses, which exalts even more the importance of the accounting professional within contemporary organizations. Thus, it highlights the need to improve the characteristics that can serve as facilitators of the teaching and learning process, stimulating the qualification of future professionals and, consequently, the improvement of the area.

In this context, two important points are highlighted which are discussed in this study are: Generation Y's heterogeneity and yearning in relation to the use of technologies and in the process of teaching and learning; and the need for greater preparation of teachers in the face of changes in teaching, especially of their audience. These two points permeate the study's research question: **What are the characteristics of the good teacher from the perspective of Generation Y accounting students?** Thus, the main objective of the study is to evaluate the characteristics of the good teacher according to Generation Y accounting students.

This research is justified by contributing to the discussion about the difference of generations between Accounting teachers and students. In addition, it presents advances in relation to the research by Nogueira *et al.* (2012), firstly due to the more comprehensive consideration of technology used in the classroom environment, and secondly, due to the search to understand possible different and similar perceptions based on the respondents' characteristics, seeking to promote a greater consolidation of the good teacher's characteristics according to Accounting students. These advances can help teachers to understand the preferences of their students, contributing to the teaching and learning process.

The article is structured in four sections besides the introduction. First, we present the theoretical framework, followed by the methodological trajectory. Then, the analysis of the results, conclusions and recommendations for future research are presented.

2. Generation Y and The Characteristics of The Good Teacher

In recent years, research has sought to understand the characteristics of Generation Y, such as, for example, Worley (2011), who in his work observed in Generation Y a greater proximity to the parents, which generates increased confidence. For the author, this greater proximity encouraged parents to guide their children to success in adulthood, through hard work and better academic achievement. For Treml *et al.* (2013), Generation Y has become the focus of countless research, being the latest generation to enter the job market and also in vocational courses and because its characteristics are extremely different from Baby Boomers and Generation X.

In view of the above, in addition to understanding the characteristics of Generation Y, it is important to identify the concept of good teacher in its members' conception. In that sense, HEIs have sought to evaluate their teachers through questionnaires applied to their students. For Strassburg (2002), these evaluations are not only focused on improving teaching but also on teaching characteristics, such as whether the teacher knows how to represent well (artist); if the teacher is a charismatic person and knows how to involve the student; whether the teacher is flexible or does what the management or coordination determines; and check that the teacher is well liked by the students. According to the author, however, some HEIs try to verify if the level of learning required from the students is being reached, that is, greater emphasis is placed on content and learning.

According to Marques, Oliveira, Nascimento and Cunha (2012), the concept of a good teacher implicitly entails common criticism against the scientific perspective, which is the subjective aspect of the adjective "good". Regardless of this criticism, it is a concept with important pedagogical implications. For the authors, the student makes his own construction of what is a "good teacher", but this construction fits in a historical-social context and, therefore, is not fixed, changing as the needs of human beings located in time and space change.

Seeking to unveil the characteristics of a good teacher, Lowman (2007) presents the two-dimensional model of teaching effectiveness. The model emerged from his observations of a group of 25 exemplary teachers in a series of subjects at various colleges in North Carolina and New England in the early 1980s. In the author's model, the quality of teaching is a result of the university professor's ability to create both the "intellectual stimulus" (Dimension I) and "interpersonal empathy" (Dimension II) with students. For the author, excellence in one of these skills can ensure effective teaching with some students. When there is a mastery of both dimensions, however, there is a great chance that the teacher will be exceptional and will impact a large number of students.

In Lowman's model (2007), Dimension I contains two components: (i) clarity in the teacher's presentation, related to what is presented; and (ii) stimulating emotional impact on learners, related to how the material is presented. Therefore, it is assumed that the teachers know the content they are teaching. Therefore, teachers who are able to master the content and convey it clearly will have great possibilities of achieving the goal of transmitting knowledge.

Next, the author reports that Dimension II deals with the teachers' awareness of interpersonal phenomena and their ability to communicate with students in order to enhance their motivation, pleasure and autonomous learning.

It is important to highlight that, according to Lowman (2007), the mere memorization of facts and isolated data does not mean knowledge and mastery of content. In fact, teachers possess knowledge and master content when they are able to "wander" through content, performing analyses from different angles, comparing and confronting concepts. The author reports that, in addition to the clarity of the explanation, it is important that exemplary teachers be able to involve the student through their voice, gestures and movements that attract and maintain the student's attention, arousing emotion through learning.

Some studies exist in the literature, such as Nogueira *et al.* (2012), aiming to identify the characteristics of the good teacher from the perspective of Generation Y Accounting students. Their results indicate that Generation Y values a good relationship between the teacher and student, besides showing interest in the teachers' use of technology.

According to Oro, Santana and Rausch (2013), in Accounting and other university courses, there are teachers who come from a wide range of professional activities, mostly entering the teaching career without prior knowledge about the processes of teaching and of learning. Subsequently, these teachers end up developing their teaching skills in the form of "trial and error". In this context, Oro *et al.* (2013) investigated the characteristics of the so-called "good teachers" for Accounting students. The results show that the teacher most mentioned as a "good teacher" dominates content, develops dynamic classes, explains well, is motivating and dedicated, and maintains good relations with students.

In a large survey between 1993 and 2005, Puentes (2005) related the six most discussed subjects in the theme of teachers' professional status, which are related to: (i) the concept of teachers' professionalization; (ii) the aspects of the professionalization process; (iii) the stages in professionalization; (iv) the fundamental or necessary conditions for professionalization; (v) the knowledge, competences and performances considered necessary for the profession; (vi) problems that affect professionalization, in addition to others. For the author, item (v) stands out in the list, which refers to the importance of the subject.

Subsequently, Puentes, Aquino and Quillici Neto (2009), aiming to analyze and understand the different classifications and typologies about the knowledge and skills required to teach classified eleven studies that represent a modest part of the research carried out in the past two decades. For the authors, the eleven typologies surveyed did not present significant differences as, for all of them, the professionalization of teaching is composed of three fundamental but not sufficient ingredients: knowledge, know-how and know-how presented in the form of knowledge or skills.

Based on the results of Puentes *et al.* (2009), later, Miranda *et al.* (2012) aimed to evaluate the predominant knowledge of teachers perceived as "reference teachers" by graduate Accounting students at a Brazilian public university. The authors concluded that the main reasons for choosing the reference teachers were didactics or teaching method, attitudes and personal qualities of the teacher.

In this sense, Nogueira *et al.* (2005) constructed an instrument based on the results of Marsh (1991), Lowman (2007) and Pan, Tan Ragupathi, Booluck, Roop and Ip (2009). In addition, the authors included questions about the use of technology, based on the research by Whale (2006) and Kemshal-Bell (2001). The importance of including statements about technology was already predicted by Perrenoud (2000), who indicates the teachers' use of new technologies as one of the skills needed to teach in the 21st century.

In the same sense, Mainart and Santos (2010) mention the importance of teachers being prepared to interact with new technologies in the work environment, stimulating and facilitating the dissemination of educational informatics, supporting the elaboration of pedagogical projects, according to the students' discipline and school level. The authors also report on the need of the teacher to provide conditions to enhance the use of information technology in all students' teaching and learning process, including those with special needs, always weighing the possibilities of using software in projects and pedagogical activities. In view of the above, the instrument of the study by Nogueira *et al.* (2012) is used as the base of this present research, with small adjustments regarding the use of technology in the classroom.

3. Method

This study is a replication of the study by Nogueira *et al.* (2012), which was applied to the Accounting students of four universities (three from Paraná and one from São Paulo). The choice of the instrument was motivated by the tests and validations already performed in the instrument, which is able to capture the characteristics of a good teacher from a student perspective, thus contributing to the understanding of college teachers' work. It should be noted that questions were added to the instrument about the use of technology in the classroom, so that one can analyze their influence on the respondents' perception of what a good teacher is.

For the data collection, the questionnaire was applied in person to the students of the Accounting program at three higher education institutions (HEI) in the city of Pato Branco (PR), one public and the other two private, on the following dates: (i) HEI 1- 7/17 and 7/18/2014; (ii) HEI 2 - 7/24/2014 and (iii) HEI 3 - 8/05/2014. The questionnaire used is an adaptation of the instrument used in the research by Nogueira *et al*. (2012). The instrument is divided into two parts, the first one on personal information (gender, age, professional performance, among others), and the second on the description of what characteristics are attributed to a good teacher. The instrument was improved with some questions on the respondent's characteristics and the inclusion of assertions about the use of technology, so that one can analyze their influence on the respondents' description of the good teacher. These improvements in the instrument are intended to better understand the students' perceptions, through characteristics that can influence the divergence of opinions, thus helping the teacher to know their students, and contributing to the quality of teaching.

Regarding the instrument, specifically its second part, the answers are given on an adapted 10-point Likert scale, ranging from 1 (least relevant) to 10 (most relevant). The 35 assertions in the second part of the instrument are segregated into four groups and two dimensions, as proposed by Lowman (2007). The final instrument applied is detailed in the appendix to this article.

Table 1
Descriptions of groups in the questionnaire.

Dimension I "Clarity in teacher's presentation" and "stimulating emotional impact on the students"	**Group 1**	Knowledge and content mastery
	Group 2	Clarity in explanations, didactics and content preparation
Dimension II "Teacher's awareness of interpersonal phenomena and of their ability to communicate with the students"	**Group 3**	Relationship between students and teachers and technology in higher education contexts
	Group 4	Teachers' personal attributes

Source: adapted from Lowman (2007)

The population consists of 458 Accounting students from higher education institutions in the city of Pato Branco (PR). The questionnaire was applied in the classroom, in person, resulting in 329 responses, 265 of which were valid and 64 invalid. Of the 64 invalid responses, 11 questionnaires are from respondents not belonging to Generation Y and 53 are due to incompletely answered questionnaires. For the classification of which respondents belong to Generation Y, the definition by Tapscott (1999) and Lipkin (2010) was used, considering only those born between 1980 and 2000.

Before beginning the statistical analysis in the instrument, Field (2009) cites the importance of checking the reliability of the scale. In this sense, Cronbach's Alpha coefficient was chosen, with a minimum ideal coefficient of 0.7, while 0.6 could be accepted for exploratory research (Hair, Black, Babin, Anderson & Tatham, 1998).

The scale reliability was verified by means of Cronbach's Alpha coefficient in the groups and later in the instrument, resulting in: Group 1 (0.855); Group 2 (0.788); Group 3 (0.931); Group 4 (0.825) and the Instrument (0.922). As shown, all the coefficients obtained are acceptable, thus confirming the reliability of the scale used in the model. It is important to note that the assumption of Cronbach's alpha coefficient was met in all situations (correlations between items should be positive).

Statistical analysis took place in three steps: (i) evaluation of normality and homogeneity of variances; (ii) evaluation of the means of the groups considered; and (iii) comparison of the groups, segregating the sample by collected characteristics. In the third item of the analysis, we used nonparametric comparison of means tests, such as the Kruskal-Wallis test and the Mann-Whitney hypothesis test.

4. Analysis of Results

4.1 Sample Characteristics

The first part of the instrument applied consists of questions to characterize the respondents. In that sense, some characteristics were collected and summarized from the 265 elements in the sample, as follows:

- as for gender, a predominance of women (59.62%) is observed when compared to men (40.38%);
- concerning the age range, young people of up to 25 years are predominant (77.74%), separated between "up to 19 years of age" with 20.00% and "between 20 and 25 years" with 57.74%;
- respondents were also asked if they had completed another undergraduate program. According to the answers, 90.19% have not and 6.04% reported having taken Business Administration;
- as for the year / period the students were taking at the time of the data collection, the majority is in the last two years of the course (60.38%), being: "1st year or 1st / 2nd period" with 14.72%; "2nd year or 3rd / 4th period" with 24.91%; "3rd year or 5th / 6th period" with 32.83% and "4th year or 7th / 8th period" with 27.55%;
- regarding the hours worked per week, the vast majority (80.75%) works more than 30 hours a week, indicating the high employabilit y and workload of the academic staff. It is important to note that only 7.55% reported not working;
- finally, of the 265 respondents, 85 come from the public HEI (32.07%), while the rest studies at private HEIs (67.92% - 180).

According to the sample characteristics, some similarities with the research by Nogueira *et al*. (2012) are observed, being: (i) in relation to the academic year / period, most respondents are in the last two years; and (ii) more than 75% of students work more than 30 hours a week. The age group is also similar to the study, because both consider only the students of Generation Y.

4.2 Analysis of the characteristics of a good teacher

To analyze the characteristics of a good teacher according to the Generation Y students, first, the means, standard deviations and medians were calculated for each assertion, as well as for the four instrument groups, separated in Tables 2 and 3. In the first table, the groups related to Dimension I are displayed and, in the second, the groups related to Dimension II of Lowman's model (2007).

Table 2

Univariate analysis of assertions and Groups in Dimension I

Dimension	Group	Coding	Question	Analysis Assertions			Analysis Groups		
				Mean	Standard Deviation	Median	Mean	Standard Deviation	Median
Dimension I	Group 1	Q1.1	Being knowledgeable on the theory of the theme taught	9.4	1.2	10.0	9.3	1.1	10.0
		Q1.2	Being knowledgeable on the practice of the theme taught	9.2	1.1	10.0			
		Q1.3	Knowing how to link up theory and practice	9.3	1.1	10.0			
		Q1.4	Mastering the content taught	9.4	1.0	10.0			
	Group 2	Q2.1	Ability to explain (didactics)	9.3	1.1	10.0	9.0	1.3	10.0
		Q2.2	Offering clear explanations	9.3	1.2	10.0			
		Q2.3	Coming to class prepared (Preset content)	8.8	1.4	9.0			
		Q2.4	Ability to arouse the students' interest in the content	8.8	1.3	9.0			

Source: obtained from the study

According to Table 2, the great importance in the characteristics of Group 1 is observed, in line with the research by Nogueira *et al.* (2012, p. 45), who cite that "content appears as the first most relevant feature, followed by the ability to explain. Thus, by analyzing the characteristics in isolation, good teachers are those who, in addition to knowing the content, transmit it clearly to the students." In the analysis of the groups, the small variation in the answers is also observed, that is, the students have very similar opinions.

The results found here are in line with other studies, such as Miranda, Casa Nova and Cornacchione (2012), as they proved that the reference teachers are those who present better evaluations in three types of knowledge: didactic knowledge, content mastery and experimental knowledge. In the same sense, the results by Marques, Oliveira and Nascimento (2012) showed that the level of knowledge, didactics and safety were the most valued attributes in Accounting students' definition of competence of a good teacher.

Next, Dimension II is analyzed, which is segregated in Group 3, intended to evaluate the relationship between academic and teaching staff and technology in higher education, in addition to Group 4, which evaluates the personal attributes of teachers, according to Table 3.

Table 3

Univariate analysis of assertions and Groups in Dimension II

Dimension	Group	Coding	Question	Analysis Assertions			Analysis Groups		
				Mean	Standard Deviation	Median	Mean	Standard Deviation	Median
Dimension Ii	Group 3	Q3.1	Being enthusiastic to transmit the content	8.7	1.4	9.0	8.4	1.6	9.0
		Q3.2	Being dynamic in class	8.7	1.4	9.0			
		Q3.3	Being well-tempered in class	8.0	1.8	8.0			
		Q3.4	Being thoughtful towards students	8.7	1.4	9.0			
		Q3.5	Being accessible to students	8.8	1.4	9.0			
		Q3.6	Being friendly to students	8.0	1.8	8.0			
		Q3.7	Being respectful to students	9.2	1.2	10.0			
		Q3.8	Being understanding towards students	8.6	1.6	9.0			
		Q3.9	Being sympathetic towards students	7.9	1.8	8.0			
		Q3.10	Being dedicated to the profession	9.1	1.2	9.0			
		Q3.11	Being demanding	8.5	1.4	9.0			
		Q3.12	Being patient	8.4	1.4	8.0			
		Q3.13	Being helpful	8.6	1.4	9.0			
		Q3.14	Being challenging	8.1	1.5	8.0			
		Q3.15	Preparing the material used in class well	9.0	1.3	9.0			
		Q3.16	Being learned	8.1	1.7	8.0			
		Q3.17	Being organized	8.8	1.3	9.0			
		Q3.18	Giving rapid feedback on grades	8.3	1.6	9.0			
		Q3.19	Using resources like videos and songs in the classroom	7.6	2.0	8.0			
		Q3.20	Using content from the internet (indicating websites, blogs, etc.)	7.9	1.8	8.0			
		Q3.21	Using e-mail to communicate with the students	8.6	1.6	9.0			
		Q3.22	Allowing students to use notebooks in the classroom	7.8	2.1	8.0			
		Q3.23	Using software for dynamics (worksheets, accounting software)	7.9	2.0	8.0			
	Group 4	Q4.1	Being physically pretty	3.7	3.1	2.0	5.9	3.1	7.0
		Q4.2	Being tidy (well-dressed, hair combed, always dressed up)	5.5	2.9	6.0			
		Q4.3	Having a pleasant tone of voice	6.6	2.7	7.0			
		Q4.4	Having readable handwriting when writing on the board and in making corrections	7.7	2.2	8.0			

Obs. Source: obtained from the study

Table 3 shows a lower mean score for the assertions in Group 4. At first sight, this indicates that the teachers' personal attributes do not have as much relevance as the other characteristics surveyed. We also highlight the high variability of the responses obtained, since the standard deviations were relatively high when compared to those obtained in Table 2. These results indicate that the student's perception regarding the attributes of Dimension II is not uniform, with upward and downward deviations in terms of importance.

The joint analysis of Tables 2 and 3 revealed a higher average in the assertions belonging to Group 1 (Knowledge and content mastery) and secondly those in Group 2 (Clarity in explanations, didactics and preparation of content). On the other hand, the assertions of Group 4 (Teachers' personal attributes) obtained the lowest mean and greatest disparity among the answers. These results are in line with Nogueira *et al.* (2012, page 46), mentioning:

> These findings contribute to initiating the process of disappearance of the myth that the popular teacher is the best teacher. Although students value this personal relationship with the teacher, they demonstrate that only this variable is not enough to characterize a good teacher: talking to students and being nice is of no use if, in the classroom, the teacher does not say what they are truly interested in knowing (content).

Considering the above indications on the relevance of the groups from the students' viewpoint, statistical comparison of means tests are needed in order to verify if these absolute differences can also be considered statistically valid.

In order to compare the means among the groups, aiming to rank them by the intensity of the responses, the means of each group were first determined and, afterwards, the normality and homogeneity of the data were verified by means of the Kolmogorov-Smirnov and Levene tests, respectively. In the normality test, with a significance level of 5% for all competencies, the null hypothesis (H0), reporting on the non-normality of the data, was rejected for the four groups. In relation to the Levene test, no homogeneity of variances is observed for the data either. Due to the non-normality of the data, a non-parametric technique was necessary to evaluate any differences between the means.

In order to verify the existence of statistically significant differences among the groups, the non-parametric Kruskal-Wallis test was used; when found, the Mann-Whitney hypothesis test was applied to verify in which group (s) the difference detected by the previous test existed. For all tests, a significance level of 5% was used and the Bonferroni correction was applied when the subsample was considered large (Field, 2009).

In the comparison between the groups, Kruskal-Wallis' non-parametric test indicated a statistically significant difference. Thus, post hoc analysis was required by means of the Mann-Whitney hypothesis test with Bonferroni correction in all effects with a significance level of 0.0083 [0.05/6], indicating the statistical difference between all the groups when compared [G1-G2; G1-G3; G1-G4; G2-G3; G2-G4 and G3-G4]. These results indicate that the sample considers it more important that their teachers have "Knowledge and content mastery" (Group 1), followed by "Clarity in explanations, didactics and preparation of content" (Group 2), "Relationship between academics and teachers and technology in higher education "(Group 3) and, finally, the" Personal attributes of teachers "(Group 4).

The second group stands out in order of importance, represented by the "Clarity in explanations, didactics and preparation of content" (G2), concerning which research indicates teachers' lack of preparation with pedagogical training, such as Behrens (2011) and Lima, Oliveira, Araújo and Miranda (2015), affirming that many teachers 'go to bed as accountants and wake up as teachers', entering college education without any pedagogical training, venturing into a teaching of trial and error for many years. This view is also corroborated by other researchers, such as Imbernón (2011) and Lapini (2012). Thus, on the one hand, the great importance of teachers' characteristics for the students is observed, for which the teachers themselves did not have background training and education.

4.3 Intergroup comparison with segregation of the sample

Using Kruskal-Wallis and Mann-Whitney's non-parametric tests, the relation between answers per group and the sample characteristics can be assessed. First, the relations among the groups are analyzed by gender, according to Table 4.

Table 4
Groups by gender

Group	Mean per gender		Result Mann-Whitney test
	Male	Female	
Group 1 (Knowledge and content mastery)	9.19	9.37	=
Group 2 (Clarity in explanations, didactics and content preparation)	8.74	9.24	≠
Group 3 (Relationship between students and teachers and technology in higher education contexts)	8.09	8.60	≠
Group 4 (Teachers' personal attributes)	5.78	5.93	=

Source: elaborated by the author

As can be observed in Table 4, there is no statistical difference regarding the importance of the characteristics of a good teacher related to both "Knowledge and content mastery" and "Personal attributes of teachers", when comparing the male and female respondents' view. In Group 2 ("Clarity in explanations, didactics and content preparation") and in Group 3 ("Relationship between students and teachers and technology in higher education contexts"), the female respondents considered these characteristics more important than the male respondents. For Nogueira *et al.* (2012), the female members tend to be more observant, which would explain their higher average in the group of teachers' personal attributes, similar to what was found in this research. In the statistical test, however, it is observed that there are no perception differences between the genders, especially considering the teachers' personal attributes.

Next, another analysis concerns the students' view on the groups of characteristics of a good teacher, segregated between the respondents who have completed another undergraduate program and those who are in their first undergraduate program, according to Table 5. The analysis of this assertion is due to the fact that students with greater academic experience may have different perceptions of their teachers when compared to students with less academic experience, that is, those who have not completed an undergraduate program yet.

Table 5
Groups by other undergraduate program

Group	Mean by other undergraduate program		Result Mann-Whitney test
	No	Yes	
Group 1 (Knowledge and content mastery)	9.28	9.43	=
Group 2 (Clarity in explanations, didactics and content preparation)	9.02	9.14	=
Group 3 (Relationship between students and teachers and technology in higher education contexts)	8.40	8.36	=
Group 4 (Teachers' personal attributes)	5.79	6.58	=

Source: elaborated by the author

As can be observed in Table 5, for all groups, there is no statistical difference regarding the importance of the teaching characteristics when comparing the answers of the students who are attending their second undergraduate program with those who are taking their first. The analysis of the periods / years the students are taking was also analyzed, in order to verify if, as the school years pass, the students' opinions differ, it being expected that, with the passing of the school years, the students gains academic maturity, which indicates a change in perception on the teaching attributes. In this sense, the Kruskal-Wallis non-parametric test indicated a difference only in groups 2 and 4, according to Table 6.

Table 6
Groups per year/period

Group	Mean per period/year				Result Kruskal-Wallis test
	1st and/or 2nd Semester / 1st Year	3rd and/or 4th Semester / 2nd Year	5th and/or 6th Semester / 3rd Year	7th and/or 8th Semester / 4th Year	
Group 1 (Knowledge and content mastery)	9.08	9.36	9.28	9.36	=
Group 2 (Clarity in explanations, didactics and content preparation)	8.69	8.98	9.12	9.17	≠
Group 3 (Relationship between students and teachers and technology in higher education contexts)	8.32	8.45	8.44	8.33	=
Group 4 (Teachers' personal attributes)	6.60	6.09	5.40	5.84	≠

Source: elaborated by the author

As a result of the detected differences, a post hoc analysis was needed, using the Mann-Whitney hypothesis test with Bonferroni correction in all effects, with a significance level of 0.0083 [0.05/6], indicating the statistical differences demonstrated in Table 7.

Table 7
Groups per segregated period/year

Group	Mean per Period/Year					
	1-2	1-3	1-4	2-3	2-4	3-4
Group 1 (Knowledge and content mastery)	=	=	=	=	=	=
Group 2 (Clarity in explanations, didactics and content preparation)	=	≠	≠	=	=	=
Group 3 (Relationship between students and teachers and technology in higher education contexts)	=	=	=	=	=	=
Group 4 (Teachers' personal attributes)	=	≠	=	=	=	=
Numbering of periods/years: (1) = 1st and/or 2nd semester / 1st year; (2) = 3rd and/or 4th semester / 2nd year; (3) = 5th and/or 6th semester / 3rd year and (4) = 7th and/or 8th semester / 4th year						

Source: elaborated by the author

As can be seen in Table 7, the differences detected in Groups 2 and 4 occur between first-year students (1st semester / 2nd semester) and students from the last two years, that is, 3rd and 4th year (5th to 8th semester). Based on the joint analysis of Tables 6 and 7, it can be affirmed that the students in the final years of the undergraduate program consider clarity in the explanations, didactics and preparation of content (Group 2) more important than the undergraduate students in the first year (either 1st or 2nd semester). A possible explanation for the findings refers to the high employability of the Accounting program, as mentioned by Dalongaro, Ramos and Azzolin (2016), which may indicate that students in the last periods, due to their greater chances of being active in the market, value the time in the classroom more, due to the time dedicated to the market, thus seeking fuller use.

Then, the relationship between the perceptions of the public and private HEI students with the groups of the teachers' characteristics was also analyzed. In Table 8, the results of the non-parametric Kruskal-Wallis test can be observed, which indicated the statistical difference in three groups, so that, only in Group 1 ("Knowledge and content mastery"), the students from the three HEI consider these characteristics equally relevant in statistical terms.

Table 8
Groups per HEI

Groups	Mean per HEI			Result Kruskal-Wallis test
	Private HEI 1	Public HEI	Private HEI 2	
Group 1 (Knowledge and content mastery)	9.48	9.38	8.98	=
Group 2 (Clarity in explanations, didactics and content preparation)	9.27	8.94	8.83	≠
Group 3 (Relationship between students and teachers and technology in higher education contexts)	8.55	8.12	8.49	≠
Group 4 (Teachers' personal attributes)	5.84	5.39	6.44	≠

Source: elaborated by the author

As a result of the detected differences, a *post hoc* analysis was needed, using the Mann-Whitney hypothesis test with Bonferroni correction in all effects, with a significance level of 0.017 [0.05/3], indicating the statistical differences demonstrated in Table 9.

Table 9
Groups per segregated HEI

Groups	Mean per HEI		
	1-2	1-3	2-3
Group 1 (Knowledge and content mastery)	=	=	=
Group 2 (Clarity in explanations, didactics and content preparation)	≠	=	=
Group 3 (Relationship between students and teachers and technology in higher education contexts)	≠	=	≠
Group 4 (Teachers' personal attributes)	=	=	≠
Numbering of Periods/years: (1) = Private HEI; (2) = Public HEI and (3) = Private HEI 2			

Source: elaborated by the author

As can be seen in Table 9, in the comparison of private HEIs (1-3), no differences were detected among all groups, that is, on average, the answers of students at private HEI 1 were statistically equal to those of students from Private HEI 2. When comparing the answers of the students from the Public HEI, divergences are detected though. Considering the data in Tables 8 and 9, the students of the public HEI do not consider the characteristics of Groups 2, 3 and 4 that relevant when compared to the students' perceptions at the private HEIs. This result may indicate the private HEI students' greater need in relation to the clarity of explanations, didactics, preparation of content, relationship with their teachers, use of technology and personal attributes of teachers. Several factors can provoke these results, and research may indicate that students at public and private institutions have different profiles, as observed by Freitas (2005), when reporting that students of private HEIs face academic shortages, socioeconomic deficiencies and limitations for their full dedication to their studies, being young people who combine study and work and who are able to attend a higher education course. Additionally, Soares, Poubel and Mello (2009) found that the students of public institutions present better academic adaptation than those of private institutions.

Finally, the means of the teaching characteristics in this study were compared with the study by Nogueira *et al.* (2012), according to Table 10.

Table 10
Comparison of teaching characteristics with background study

Characteristic Assessed	Nogueira et al. (2012)	Current research
Knowledge of theory	9.64	9.38
Ability to explain	9.53	9.31
Link between theory and practice	9.47	9.26
Coming to classes prepared	9.31	8.79
Being respectful	9.24	7.91
Ability to arouse interest	9.15	8.78
Being thoughtful	8.91	7.91
Being understanding	8.34	7.91
Giving rapid feedback	8.28	8.31
Being demanding	8.23	8.46
Using e-mail	8.19	8.57
Being patient	8.17	8.40
Being challenging	8.09	8.14
Being friendly	8.05	7.91
Being well-tempered	7.99	7.91
Being sympathetic	7.59	7.91
Using the Internet	7.54	7.86
Allowing students to use the computer	6.84	7.85
Using videos in classes	6.44	7.57
Having a pleasant tone of voice	5.80	6.63
Being tidy	5.36	5.52
Being physically pretty	2.02	3.69

Source: elaborated by the author

As can be observed in Table 10, the averages of most teacher characteristics are close between the studies. Nevertheless, it was observed that the greatest divergences occurred in the characteristics related to Group 4 of the research ("personal attributes of teachers"), which in the analysis of this study was less important when compared to the other groups.

Finally, it is important to note that the results obtained here are in line with similar research carried out in undergraduate programs in other areas, such as the research by Pereira and Nörnberg (2012), who evaluated the requirements to be a good teacher and the pedagogical knowledge required for teaching according to the students in Biological Sciences and Pedagogy. The results indicated content mastery, continuous training, valuation of background knowledge and knowledge of appropriate teaching methods as the main teaching requirements.

5. Conclusion

The transformations happened in recent years in the context of HEIs have brought changes more quickly when compared to other segments, as the technological and scientific advances in the educational process are inseparable, and the teaching and learning process is considered one of the pillars of HEI, the major protagonists of this process being the student and the teacher. In this sense, knowledge from the viewpoint of these two actors is fundamental, such as, for example, students' perceptions regarding their teachers' characteristics (Vasconcelos, 2009; Vasconcelos, 2010; Miranda *et al*., 2012).

According to the above, this study was aimed at evaluating the characteristics of a good teacher according to Generation Y Accounting students at two private and one public HEI in Pato Branco (PR). Therefore, the instrument by Nogueira *et al*. (2012) was replicated, with minor adaptations.

To reach the study objective, a quantitative approach to the collected data was used, aiming to evaluate the results found. It is important to note the statistically significant difference among the four groups of teacher characteristics surveyed h. That is, for students of Generation Y, the characteristics in order of importance are: (i) knowledge and content mastery - G1; (ii) clarity in the explanations, didactics and content preparation - G2; (iii) relationship between students and teachers and technology in higher education; and (iv) personal attributes of teachers - G4.

These results coincide with the results of Miranda *et al.* (2012), who concluded that didactic knowledge, content mastery and experience-based knowledge were more important in their research. These results indicate the teacher's great need for content mastery and didactic training. It should be emphasized that didactic training for teachers, especially in Accounting, should be continuous, and preferably obtained in *stricto sensu* programs, as undergraduate courses in the area do not prepare them for teaching. It is important to mention that the results obtained are also in line with Nogueira *et al.* (2012), in which the attributes of having physical beauty, being tidy and having pleasant tone of voice were less valued by the students.

When the sample was segregated by the respondents' characteristics and the statistical tests were carried out to evaluate the possible differences of means, some interesting points were discovered. Firstly, it was observed that both genders give equal importance to knowledge and content mastery (G1), and less importance, equally, to the personal attributes of teachers (G4). For clarity in explanations, didactics and preparation of content (G2) and for the relationship between academics and teachers and technology in higher education (G3), however, the female respondents consider these more important than the male respondents. This indicates that, for this sample, the female gender values such characteristics more. For teachers, this information can be important, essentially when having a predominantly female class, so that they can adapt to the profile of the students.

The students' perceptions were also compared among the years / semesters. The students in the final years of graduation consider the clarity in the explanations, didactics and preparation of content (G2) more important than the first-year students (or 1st or 2nd semester). With the due limitations that the present research is not a longitudinal study, a possible explanation for these results is that, at the end of the school years, the students expect more clarity and didactics by their teachers, possibly motivated by the higher level of difficulty of the subjects in the final years / semesters, a situation that again gains importance for the continued pedagogical training of Accounting faculty, which is deficient according to Lima *et al.* (2015). In addition, as mentioned, due to the high employability in the area, students in the last periods tend to be more employed. As a result, for these students, the time in class would be more "valuable".

The comparison between HEIs was also performed. The characteristics inherent in the knowledge and content mastery (G1) are equally important for private and public students. On the other hand, the students from private HEI consider the other groups of characteristics more important. These results indicate the difference of students from those institutions and, in addition, teacher evaluation tools cannot be generalized, in view of different student anxieties among HEIs.

The results obtained in this study are important for the self-assessment of educators, first in relation to the intensity of the evaluation of the teacher characteristics and, secondly, due to the peculiar characteristics of Generation Y students. It is also important to verify the distinction among students from different institutions and different years / periods. These divergences reinforce the need for the teacher to be constantly changing, seeking to meet the expectations of his students. In addition, it should be noted that the results indicate not only the importance of the teacher's theoretical mastery, but also of updated knowledge on the market, that is, of market practices, as also observed by Miranda, Casa Nova and Cornacchione (2012) .

According to Silva, Kreuzberg and Rodrigues Júnior (2015), it should be emphasized that the main role of postgraduate studies is the construction of scientific knowledge, as well as teacher training for higher education. In addition to the few postgraduate programs in Accounting in Brazil, only the University of São Paulo (USP) has a research line focused on accounting education. In addition, Nganga, Botinha, Miranda and Leal (2016) indicate that a low number of subjects on teacher training offered in Master's and doctoral programs in Accounting, and also that, when offered, they tend to be optional. This finding is worrying, in view of the large number of Accounting courses in Brazil, but only one of the postgraduate programs focused on the pedagogical training of these teachers.

In this context, the results discussed here can be important for the HEIs themselves, firstly for hiring teachers, prioritizing the characteristics the respondents listed as more important. In addition, the HEIs, through the instrument used in this research, evaluate their teachers and promote and / or strengthen the continuing education of their teachers, aiming their teaching staff to surpass the students' expectations.

Finally, as a limitation of the research, it is important to cite the impossibility of generalizing the results due to the sampling method used, which was non-probabilistic, and the temporal limit, as the research was carried out in 2014. Indications for future research are: replication of this study in a broader sample, application of the instrument in different undergraduate and postgraduate courses, and verification of the causes or reasons for the differences found among HEIs.

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Appendix – Research Instrument Applied

Analyze each of the items (characteristics) and score their relevance between 1 and 10 to indicate the characteristics of the "Good Teacher". In the scoring, keep in mind that, the closer to 10, the more relevant you consider this characteristic and, the closer to 1, the less relevant.

Questionnaire	Completely Irrelevant									Completely Relevant
	1	2	3	4	5	6	7	8	9	10
1.1. Being knowledgeable on the theory of the theme taught										
1.2. Being knowledgeable on the practice of the theme taught										
1.3. Knowing how to link up theory and practice										
1.4. Mastering the content taught										
2.1. Ability to explain (didactics)										
2.2. Offering clear explanations										
2.3. Coming to class prepared (Preset content)										
2.4. Ability to arouse the students' interest in the content										
3.1. Being enthusiastic to transmit the content										
3.2. Being dynamic in class										
3.3. Being well-tempered in class										
3.4. Being thoughtful towards students										
3.5. Being accessible to students										
3.6. Being friendly to students										
3.7.Being respectful to students										
3.8. Being understanding towards students										
3.9. Being sympathetic towards students										
3.10. Being dedicated to the profession										
3.11. Being demanding										
3.12. Being patient										
3.13. Being helpful										
3.14. Being challenging										
3.15. Preparing the material used in class well										
3.16. Being learned										
3.17. Being organized										
3.18. Giving rapid feedback on grades										
3.19. Using resources like videos and songs in the classroom										
3.20. Using content from the internet (indicating websites, blogs, etc.)										
3.21. Using e-mail to communicate with the students										
3.22. Allowing students to use notebooks in the classroom										
4.1. Using software for dynamics (worksheets, accounting software)										
4.2. Being physically pretty										
4.3. Being tidy (well-dressed, hair combed, always dressed up)										
4.4. Having a pleasant tone of voice										

Respondent Characteristics

Age:

( ) Up to 19 years; ( ) 26 till 30 years; ( ) 36 till 40 years; ( ) 46 till 50 years;
( ) 20 till 25 years; ( ) 31 till 35 years; ( ) 41 till 45 years; ( ) more than 50 years.

Gender:

( ) Female ( ) Male

Have you concluded another undergraduate program?

( ) Yes ( ) No If yes, which? _____.

Semester or year you are taking:

( ) 1st and/or 2nd Semester / 1st Year ( ) 5th and/or 6th Semester / 3rd Year
( ) 3rd and/or 4th Semester / 2nd Year ( ) 7th and/or 8th Semester / 4th Year

How many hours per week do you work?

( ) I do not work;
( ) I work up to 20 hours per week;
( ) I work between 20 and 30 hours per week;
( ) I work more than 30 hours per week.

Comments, criticism and suggestions. (Any comments you want to give and/or characteristics not mentioned in the questionnaire, etc.)

_____
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Students' Intention to pursue a career in Accounting from the Perspective of the theory of Planned Behavior

Abstract

Objective: What are the students' intentions related to the profession and, consequently, their career when taking the undergraduate course in Accounting? In view of the diverse options the professionals of the area have in the market, this study investigates the factors that influence the behavioral intention of the students in all phases at a federal university of the South of Brazil to follow a career in the accounting area, in the framework of the Theory of Planned Behavior.

Method: Data collection was performed through a questionnaire applied to 302 students. For the analysis of the data, we used descriptive statistics, factorial analysis and Structural Equations.

Results: The results obtained emphasize that the opinions of professionals in the area, friends and partners are relevant for this decision. It is also inferred that the students do not see the careers of the accounting profession accompanied by acknowledged status and prestige; that remunerations are not good; and that there are no good opportunities available in the market.

Contribution: The research results contribute to clarify factors that can significantly influence the students' intention to pursue a career in the area they study in, and may also provide inputs on aspects that need to be improved to stimulate students' interest.

Key words: Profession, Career, Theory of Planned Behavior, Accounting.

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1. Introduction

In the decision-making process on which profession or career to pursue, many young people encounter difficulties, as there are new and stressful situations to be overcome (Safta, 2015). Choosing a profession involves a decision that may affect the future of the individual forever, making it necessary to think about it, considering all the information necessary for a conclusion about which profession and career to follow. Marion (2006) argues that a poorly made important decision can be detrimental for life, and therefore requires greater care and in-depth analysis of the items to be considered.

Nunes (2014) emphasizes that the individual is in conflict with his interests and aptitudes when he has to decide on something important, such as the professional decision. Gonzaga (2011) states that this process is multifactorial and very complex and, as these factors dominate the concerns of adolescents before making the decision, they can turn into worrying symptoms of stress. Thus, it is indicated that young people choose their profession early, even if they do not yet have an identity formed, taking into account that the choice will be definitive and will accompany them for life (Almeida & Pinho, 2008).

Thus, it is conjectured that many young people receive several influences in daily life that allow them to reach the moment of choosing the profession and consequently the career, with some maturity on the subject. In this regard, Byrne, Willis and Burke (2012) argue that many young students begin to make career choices at a relatively early stage of their lives, having fulfilled many of their educational and occupational aspirations by the time they complete their school education.

The undergraduate course the student chooses does not always determine what career he will follow in the job market though, as some people choose occupations different from the options made possible by the university curriculum, or they do not follow the course until the end, leading to drop-out. Thus, these and other aspects give rise to empirical research that seeks to understand and explain the factors that influence people in their career choice. In this regard, Bomtempo (2005) mentions that the reasons that determine students' course or career choice have been evaluated in career guidance and career development studies, together with a specific area of activity or for a set of areas, and with students in different stages.

In the Accounting area, career choice has been attributed to many factors. In the current context, the new challenges bring concerns, as economic development is based on decisions that are taken fundamentally based on information generated and provided by accounting professionals (Mbawuni & Nimako, 2015). For Byrne, Willis and Burke (2012), the accounting profession needs to be highly competitive in relation to the others in attracting qualified students, and the best way to achieve this is by understanding the factors that determine students' career choices.

Marion (2006) presents some career options in the area of Accounting, such as: general accountant, cost accountant, controller, subcontractor, internal auditor, tax accountant, among others. Thus, as the profession has several options to be followed, there is a need to identify the reasons that lead the accounting student to follow, or not, a career in that area.

Therefore, based on the attitudinal, subjective norm and perceived behavioral control factors, the research question proposed for this study is: **What is the intention of the students of the Accounting course at a federal university in the South of Brazil to pursue a career in Accounting?** Therefore, the purpose of this study is to identify the intention of the students of the Accounting course at a federal university in the south of Brazil to pursue a career in accounting, with the theoretical support of Theory of Planned Behavior (TPB).

The justification for the elaboration of this work rests on three main pillars, according to Castro (1977): importance, originality and feasibility. This research is important because, after identifying the factors that lead students to choose or refuse to pursue one of the careers in Accounting, the results can provide insights on the aspects that need to be improved in order to stimulate interest in the various careers, beyond that of accountant. Its originality is due to the fact that research on the careers in the accounting area in Brazil is still incipient, mainly using theories in the field of Psychology and Statistical Techniques. The feasibility of the work is due to the fact that, first, the researchers get involved in the theme and the data were collected without additional cost. Another justification is the interest in investigating the intention of students in all academic phases of the Accounting course. This interest is in line with the fact that, at Higher Education Institutions (HEI), little attention is paid to intentions, behaviors and attitudes necessary for students to take up their professional role (Shinyashiki, Mendes, Trevizan & Day, 2006). In addition, this study complements the research by Santos and Almeida (2018), which investigating the intention of 691 graduating students from the State of Paraná, separated in samples corresponding to the ten mesoregions of the state (criterion of Paraná Institute for Economic and Social Development - Ipardes) to pursue a career as an accountant. Among the findings, the authors confirmed differences among the samples of the mesoregions, possibly justified by geographical, economic and population factors, among others.

2. Theorical Framework and Research Hypotheses

2.1 Theory of Planned Behavior

The behavior of the human being is defined in several ways, and most of the existing theories emphasize the individual as a locus, which can suffer impacts from external factors that generate competing influences, but whose final decision is given by the subject (Morris, Marzano , Dandy, & O'Brien, 2012). The theories used to predict behavioral intentions include the Theory of Planned Behavior (Ajzen, 1991), which is an extension of the Theory of Rational Action (TRA) (Fishbein & Ajzen, 1975).

TRA originated in the 1960s with Fishbein's (1963, 1967) studies and admits that humans are rational and use the available information, assessing the implications of their behaviors in order to decide on their achievement (Ajzen & Fishbein, 1980). In this sense, TRA assumes that external variables, such as behavioral traits, general attitudes and demographic variables, are related to behavior, and this relationship is mediated by the rational use of information (Ajzen & Fishbein, 1980). Behavior is understood when the determinants of behavioral intentions are identified: attitudes, which relate to the personal aspect; and subjective norms, which refer to social influence (Moutinho & Roazzi, 2010).

TRA predicts that the subject's intention in performing the behavior will be greater insofar as his or her assessment of the behavior is more positive (attitudes), and insofar as he or she realizes the approval of the people who are important to him about the accomplishment of this behavior (subjective norm) (Fishbein & Ajzen, 1975; Ajzen & Fishbein, 1980). Nevertheless, ART has been questioned for not considering factors that are likely to influence the intentions and behavior of individuals. Thus, Ajzen (1991) developed TPB as a continuation of the development of TRA, adding the variable "perceived behavioral control" in an attempt to understand the individual's limitations to perform certain behaviors (Solikhah, 2014).

TPB, like other theoretical models created to predict human behavior, is focused on behavioral intention because it is the direct variable that precedes the actual behavior. Therefore, the TPB model has three variables, being (i) attitude and (ii) subjective norms derived from TRA, and (iii) behavioral control, perceived as the variable that favored the extension of TRA.

Ajzen (1991) developed TPB based on the premise that three types of beliefs that underlie the model variables (attitude, subjective norms and perceived behavioral control) define human behavior. The beliefs are as follows: (i) behavioral beliefs, which relate to the likely consequences of a behavior; (ii) normative beliefs, related to the expectations of third parties; and (iii) control beliefs about factors that prevent or facilitate the performance of a behavior. Thus, the three variables together, being or not, under volitional control, predict the intention with respect to the actual behavior.

In the context of this study, the three variables (attitude, subjective norms and perceived behavioral control) are directly related to the intention of the students in the undergraduate course in Accounting to pursue a career in accounting. According to the TPB model, attitude is defined as an individual's positive or negative feelings towards the action to be performed and is determined by the assessment of beliefs about the consequences of the behavior and the opportunities of these consequences (Fishbein & Ajzen, 1975; Solikhah, 2014). It is observed that, the greater the students' intention to pursue a career in accounting, the more positive will be their evaluation of this action. Thus, the first research hypothesis can be formulated as follows:

H1: The attitude positively influences the intended behavior of the students at a federal university in the South of Brazil to pursue a career in Accounting.

The second variable of TPB is related to the individual's perception of the opinion of the people that are important to him in relation to the behavior that should or should not be performed (Fishbein & Ajzen, 1975; Solikhah, 2014). Thus, if the individual realizes that the people who are important to him feel they should pursue a career in accounting, their intention to do so will automatically be greater. Based on the second variable of the model, the second research hypothesis is:

H2: The subjective norm positively influences the intention of the students at a federal university in the South of Brazil to pursue a career in Accounting.

The third variable of TPB (perceived behavioral control) refers to factors that may facilitate or impede behavioral performance (Ajzen, 1991). Therefore, if the students realize that there will be resources and opportunities that facilitate the activities related to their functions in the accounting career, their intention to pursue this career will be stronger. Thus, the third research hypothesis is: H3: The perceived behavioral control positively influences the intention of the students at a federal university in the South of Brazil to pursue a career in Accounting.

2.2 Profession and career choice

The professional trajectory of a person is marked by a very important decision, which is the choice of the profession/career, a process that begins very early in the individual's life (Palos & Drobot, 2010). Safta (2015) argues that choosing a profession is a rite of passage from adolescence to adulthood, in which young people need to project themselves to build their future life. According to Gonzaga (2011), professional interests are important aspects in the professional trajectory of adolescents, and there is a need for studies to investigate and map the processes of insertion, performance, continuation in courses and prevention of drop-out.

Concerning the definition of the terms profession and career, Tolfo (2002) points out that, within organizations, the term career is generally associated with both occupation and profession. In this sense, the terms are commonly mixed up by treating them as synonyms, despite being words with different meanings. Given this aspect, Nunes (2014) argues that, because they are related to work, profession and career, they generate the idea of a single concept and end up being confused. In view of the above, it is important to note the difference between the two so that one can analyze the impact of one and the other on the individual's life.

The define profession, Nunes (2014) emphasizes that, in order to be understood as such, it needs specific knowledge and more intense preparation, having a working relationship, some of which allow its independent execution, without the need for employment, which are classified as liberal professions. On the other hand, the definition of career, according to Chanlat (1995), is something recent, having arisen in the course of the 19th century with the liberal industrialist capitalist society. According to the author, career advancement takes place within the professional discipline, as knowledge and experience accumulate and, therefore, the person who learns and gains qualification can grow in the profession. For Tolfo (2002), in the capitalist society, the career is associated with success and social ascent, whose trajectory takes place as a path to be pursued professionally, allowing for progress in positions over time.

Therefore, although the terms "profession" and "career" do not have the same meaning, a career can be influenced by the choice of profession. Teixeira and Gomes (2005) emphasize that, in the decision to follow a certain career, individuals need to be able to identify their interests within the profession, establishing their professional goals and drawing an action strategy to reach them. From the perspective of Alnıaçık, Alnıaçık, Akçin, and Erat (2012), the individual identifies with the career insofar as there is the involvement of organizational and professional work, also relating the degree of immersion in the activities linked to his function within the organization, demonstrating the need for advancement and promotion.

Nevertheless, not always the profession defined in the choice of undergraduate course is the same in which the individual pursues his professional career. The reasons that influence the choice of profession and career have been studied mainly in the field of psychology, leading to approaches related to the theme. In this regard, Bomtempo (2005) mentions that the psychological factors involved in the process of choice and professional adjustment are explained by the theories framed in this approach, which establish these phenomena as individual linked to the subject's characteristics.

Regarding the difficulty to make the decision, Safta (2015) mentions that the students feel insufficiently prepared for the orientation process and consider the career choices an extremely difficult process; this is because, in the choice of profession, in addition to individual interests and aptitudes, the way he sees the world and sees himself is also at stake, what he knows about the professions and external influences (Almeida & Pinho, 2008). In addition, the choice of the profession can also be influenced by factors such as home incentives, school incentives, peer and community expectations, etc.

The factors influencing the choice of the profession have been the focus of many studies in a wide range of areas, in the framework of social and behavioral psychological theories. Carpenter and Foster (1977) point out intrinsic, extrinsic and interpersonal factors as influential in the choice of profession and career. Bomtempo (2005) lists the social class, the educational and cultural, professional and work qualification opportunities, family, religion, and other value transmitting agents as vocational determinants in the choice of profession and career.

In the context of Accounting, according to Demagalhães, Wilde and Fitzgerald (2011), the intrinsic factors are related to satisfaction due to the opportunity to work in a dynamic and challenging environment that stimulates the accounting professional's creativity, while the extrinsic factors are associated with employment safety, career perspective, wages and benefits. The authors further highlight the existence of other factors that may include professional experience, employer location, proximity to the family, etc.

For Mbawuni and Nimako (2015), the degree of recognition and respect for careers in accounting defines the reputation of the profession. Byrne, Willis, and Burke (2012) argue that the accounting profession needs to be highly competitive in attracting qualified students, and the best way to do this is by understanding the factors that determine students' career choices. Andon, Chong and Roebuck (2010) argue that the role of the accounting professional is to solve the problems of companies and this is one of the main motivators for the student to pursue or not a career in accounting, so that new characterizations of professionals in the area are increasingly oriented to the search for skills desirable for members of the profession.

In this sense, Marion (2006) describes that professionals who pursue a career as an accountant cannot maintain the mere position of bookkeeper, whose functions are summarized in bureaucratic activities. According to the author, the professional needs to be constantly evolving and possess indispensable attributes in the various specializations of the accounting profession.

Among some sectors in which the accounting activity can be applied and some career options for the graduates in Accounting, Marion (2006) lists the following:

Table 1

Career options for Accounting graduates

In companies	Self-employed	In teaching and research	In public entities
General accountant	Independent auditor	Teacher	Public accountant
Cost accountant	Consultant	Researcher	Tax inspector
Controller, subaccountant	Accounting service provider	Writer	External agent and/or technician in audit offices
Internal auditor		Speaker	
Tax accountant	Accounting Expert		
International accountant			

Source: adapted from Marion (2006).

It is observed, therefore, that for the professional graduated in Accounting, the area offers many career options, but the individual needs to identify with some of them in order to make the right choice. Regarding this aspect, Safta (2015) argues that the individual should reflect on himself, his interests, aspirations and desires, as well as his fears, anxieties and doubts, in order to find the emotional control that will permit effective career management. In the same sense, Bardagi and Paradiso (2003) contextualized that the individual's personal identity is complemented by the professional identity, and the choice is evaluated as good or bad according to the way it was taken and the cognitive and affective consequences it produces.

According to the above, the model with the constructs and the hypotheses proposed is summarized in Figure 1.

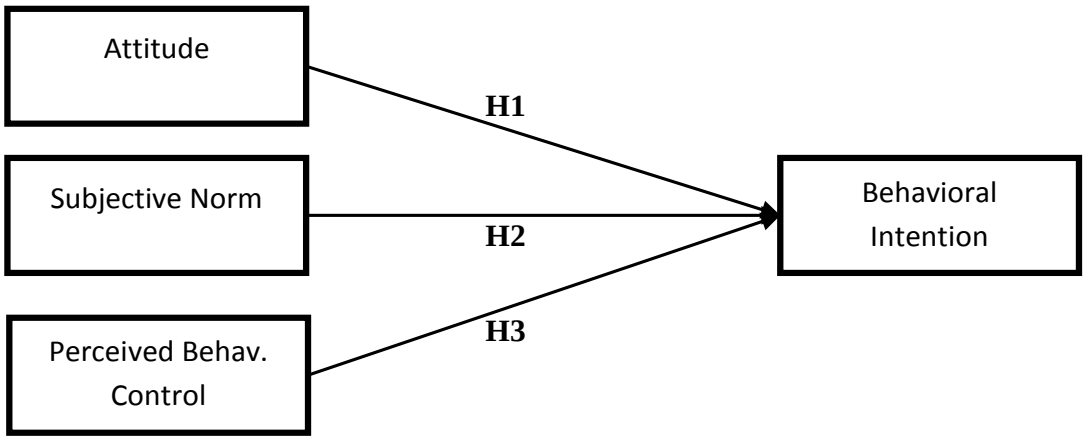

Figure 1. Proposed Theoretical Model and Research Hypotheses
Source: the authors.

In this context, the behavioral intention of the Accounting students to pursue a career in Accounting was investigated, using the TPB model and trying to confirm the results, or not, of each hypothesis listed, thus surveying the individuals' perception of the investigated behavior.

3. Method

This research is characterized as descriptive, performed through a survey. The total population consists of 435 students in all phases of the Accounting course, duly enrolled in 2015 at a federal university in the South of Brazil. The final sample resulted in 302 valid respondents, that is, 69.43% of the population.

The questionnaire was composed of 40 assertions, 25 of them consisting of a 7-point Likert scale, partially anchored, ranging from 1 = totally disagree to 7 = totally agree. We adopted the random presentation of the assertions among the constructs and 3 of them were described in a reverse way to test the respondents' attention when answering the instrument.

The applied research instrument was based on several studies according to: Attitude (Gul, Andrew, Leong & Ismail; Cohen & Hanno 1993; Felton *et al.* 1995; Ahmed, Alam & Alam; Albrecht & Sack 2000; Byrne & Willis 2005; Jackling & Calero 2006; Tan & Laswad 2006; Hutaibat 2012; Mbawuni & Nimako 2015); Subjective norm (Paolillo & Estes 1982; Tan & Laswad 2006; Byrne; Willis & Burke 2012; Peltier, Cummins, Pormirleanu, Cross & Simom; Mbawuni & Nimako 2015); Perceived Behavioral Control (Auyeung & Sands 1997; Sugahara & Boland 2006; Karakaya, Quigley & Bingham 2011; Peltier *et al.* 2014; Mbawuni & Nimako 2015) and intention (Ajzen 1991; Azevedo & Sugahara 2012; Mbawuni & Nimako 2015). It should be emphasized that this instrument was validated in Brazil in the research by Santos (2016) and Santos and Almeida (2018). For the data collection, the research instrument was delivered in person to the students, in the classroom, on October 28, 2015.

For the treatment of the data, initially, descriptive statistics were used to characterize the social and economic profile of the sample studied, followed by factorial analysis and Structural Equation Modeling (SEM). Klem (1995) considers SEM as an extension of multiple regression as, in the regression, a single dependent variable is predicted whereas, in structural equation modeling, there is more than one dependent variable. According to Hair Jr., Black, Babin, Anderson and Tathan (2009), this multivariate statistical technique can be used to elaborate models and also act in a complementary way to traditional statistical methods.

The SEM is classified in two types: i) structural equations modeling based on covariance or LISREL model; and (ii) Partial Least Squares (PLS) (Bido, Silva & Souza, 2010). The LISREL approach seeks to test theoretical models, while PLS focuses on the construction of theoretical models in an exploratory perspective (Bido *et al.*, 2010). In this research, the PLS technique was used through SmartPLS version 2.0 for processing.

4. Description and Analysis of Results

In order to answer the research question, the empirical results reached in the study are presented and discussed. Initially, the students' profile is described through descriptive statistics, followed by data evaluation procedures, Factorial Analysis and Structural Equations Modeling.

4.1 Respondents Profile

Table 2 shows the demographic data of the respondents, categorized by (i) Gender, (ii) Age group, (iii) Marital status, (iv) Year of course, (v) Work and (vi) Income.

Table 2
Respondents' Data

Gender	N	(%)	Age	N	(%)
Female	169	55.96	16 till 25	218	72.19
Male	133	44.04	26 till 35	75	24.83
			36 till 45	9	2.98
Total	**302**	**100.00**	**Total**	**302**	**100.00**
Marital status	**N**	**(%)**	**Course yearrso**	**N**	**(%)**
Married	36	11.92	1st year	61	20.20
Divorced	7	2.32	2nd year	81	26.82
Single	259	85.76	3rd year	89	29.47
			4th year	71	23.51
Total	**302**	**100.00**	**Total**	**302**	**100.00**
Work	**N**	**(%)**	**Income**	**N**	**(%)**
Not working	46	15.23	Up to 2 MW	120	39.74
Work in acc. area	156	51.66	Up to 3	52	17.22
Work not in acc. area	100	33.11	Up to 4 MW	35	11.59
			Up to 5 salários	26	8.61
			More than 5	23	7.62
			None rendimento	46	15.23
Total	**302**	**100.00**	**Total**	**302**	**100.00**

Source: research data

Considering the respondents' data, the following profiles were found: 55.96% female (n = 169) and 44.04% male (n = 133). The majority was born between 1990 and 1999, that is, they are between 16 and 25 years old (72.19%) at the date of data collection. Regarding the marital status, 85.76% of the sample responded being single, that is, 259 students. As for the year of the Accounting course, respondents from the 3rd year were the most representative with 29.47%; followed by the second year with 26.82%; the 4th year with 23.51%, and at the end of the 1st year with 20.20%.

Regarding the students' work, they were asked whether or not they were working. 84.77% of the sample were currently professionally engaged. Of these, 51.66% work in Accounting and 33.11% do not. The remainder, 15.23%, claimed not to be working at the time. In addition to the previous question, personal income was questioned, evidencing that 39.74% of the total sample gained up to 2 minimum wages, that is, 120 students receive up to R$ 1576.00. Next are those with gains up to 3 and 4 minimum wages (52 and 35 individuals, respectively).

When asked about previous courses, that is, if the respondents had already taken another degree, among the 302 students, 226 were attending Accounting as their first degree. Another 64 students were attending their second graduation, as follows: Administration (n = 18); Law (n = 11); Biology and Interior design (n = 2 each); and one person each for: Systems Analysis; Economics; Physical Education; Nursing; Production engineering; Civil Engineering; Pharmaceutical Sciences; Information management; Financial management; Journalism; Languages; Nutrition; Dentistry; Psychology, Chemistry; Radiology; International Relations Secretariat. The remaining 12 students did not complete their other undergraduate courses.

As influential factors for the investigated students to choose to take Accounting, 146 of them were motivated by the job market, which shows a wide range of options for graduates in the area, followed by 133 students who consider the course as a preparation for public exams (expectation to take part in public contests). In addition, they also argued that the careers of the accounting profession have good salary expectations and that it is a course in which passing the entrance exam is relatively easy (little competition). In this respect, it should be noted that, at this institution, the candidate/place ratio for the general total of candidates enrolled for the 2015/2016 college entrance examination was 8 competitors per place.

For the 302 respondents, questions were also raised about their satisfaction with the Accounting course, observing that 59% argued they were satisfied; 28% neither dissatisfied nor satisfied. Six and two percent of the responses were totally satisfied and dissatisfied, respectively. Finally, 5% of the respondents said they were totally dissatisfied.

As a complement, we inquired about the interest of these 302 students to pursue postgraduate education in Accounting or not. Of the total sample, 25% of them are not interested; 33% want to study a lato sensu postgraduate course in Accounting and 13% in another area; 23% think about taking a stricto sensu course in Accounting and 5% in another area. On the basis of these results, the students' considerable interest in attending a master's and doctoral degree in accounting area or not stands out, possibly justified by the institution offering several stricto sensu postgraduate courses, including in Accounting.

4.2 Preparation of the data

For the treatment of the data, we verified the multivariate outliers, the normality and variance of the data for further application of factorial analysis and structural equations.

The Kolmogorov-Smirnov (K-S) test is used to indicate whether the distribution of the study variable derives from a population with normal distribution. Considering a significance level of 5%, it can be inferred that the results do not present a normal distribution. Next, the presence of outliers was verified using the Mahalanolis distance criterion (D^2), which presents a chi-square distribution with k degrees of freedom (number of variables analyzed). By means of this criterion, we observed the presence of 6 outliers that were kept in the sample, as statistical procedures were performed both with and without and no significant differences were evidenced.

Then, we performed Exploratory Factor Analysis (EFA) at two moments: (i) first, it was elaborated without fixing a number of factors, identifying up to three factors with eigenvalues greater than 1 (Kaiser's criterion); (ii) then, another procedure was performed, setting the number of 1, in which the indicators with low commonalities were verified, which were individually removed. At the end of the factorial analysis, the following indicators were obtained:

Table 3
Factorial Analysis

Dimensions	KMO	Explained Variance	Scale Items	Cronbach's Alpha
Attitude	0.778	64.65%	4	0.816
Subjective Norm	0.648	60.67%	3	0.675
Perc. Behav. Control	0.741	61.61%	4	0.79
Intention	0.837	79.99%	4	0.916

Source: research data

In line with the data in Table 3, it was verified that, for all the constructs, the EFA presented total explained variance superior to 50% and with KMO superior to 0.5, validating the application of the Structural Equation Modelling technique. In addition, some indicators had to be excluded, so that the Attitude construct finished with four indicators; the Subjective Norm (SN) with three questions; and Perceived Behavioral Control (PBC) and Intention with four each.

Regarding the indicators that were excluded in the factorial procedure for the "attitude" construct, three dealt with factors extrinsic to the students, such as perceived status-prestige; significant results (remuneration, benefits); and career opportunities; and one intrinsic factor related to the perception that the work of Accounting careers requires aptitude (vocation). For the SN construct, it was observed that parents, teachers, relatives (siblings, uncles, cousins) are not significant referents that influence students to pursue a career in Accounting because they refer to the excluded indicators. In relation to the PBC, the indicators related to the ability to perform the work in a career in Accounting have not been validated, in the belief that the knowledge obtained in Accounting is insufficient to pursue one of the careers. These two indicators were possibly compromised though because they were formulated in reverse form to the respondents in order to test their attention.

4.3 Evaluation of the measurement model and the structural model

In order to evaluate the internal consistency of the model, the Composite Reliability and Cronbach's Alpha were used according to the results presented in Table 5. Together with these results, the quality assumptions highlighted by the Average Variance Extracted (AVE) are evidenced, which represents the model's intensity of determination. This index (VME) also represents convergent validity and refers to the "extent to which a measure correlates positively with alternative measures for the same construct" (Hair Jr. Hult, Ringle & Sarstedt, 2013, p. 102). In this understanding, when this coefficient is greater than 0.5, it means that, on average, the latent variable explains more than half of the variance of its indicators (Hair Jr. *et al.*, 2013).

Table 4
Construct validity and consistency

Dimensions	KMO	Explained Variance	Scale Items	
Attitude	0.778	64.65%	4	0.816
Subjective Norm	0.648	60.67%	3	0.675
Perc. Behav. Control	0.741	61.61%	4	0.79
Intention	0.837	79.99%	4	0.916

Source: research data

According to Table 4, the values recommended by the literature for AVE (AVE> 0.5) and for Composite Reliability (CR> 0.7) were complied with. For Cronbach's alpha, according to Nunnaly (1978) and Hair Jr., Hult, Ringle & Sarstedt (2014), the values must be equal to or greater than 0.70, except in exploratory research, when lower coefficients are admitted. Only one result below the suggested value of 0.6747 was found for the Subjective Norm construct. Nevertheless, the coefficient is very close to the acceptable value.

To proceed with the analysis of the measurement model, the discriminant validity is highlighted, which refers to the "extent to which a construct is distinct from other constructs by empirical standards" (Hair Jr. *et al.*, 2013, p.104). For this validity, two forms of observation are found in the literature: (i) cross loadings, and (ii) Fornell and Larcker criterion (1981). In the first, it is evident that the weights of the indicators associated with the construct should be greater than the cross loadings and, when there are loadings that exceed the external loadings of the indicators, discriminant validity problems emerge. In turn, the Fornell and Larcker criterion (1981) is applied by comparing the square root of the AVE coefficients with the correlations of the latent variables. The square root of the AVE (each construct) should be be larger than its highest correlation with another construct. If the criterion is not met, the indicator of a specific construct can be extracted in an attempt to meet the suggested criteria, but with caution, because, while it can improve the reliability or discriminant validity, on the other hand, it can decrease the content validity.

In this study, both ways of measuring discriminant validity were met but, in Table 5, the results are reported according to Fornell and Larcker's criterion (1981).

Table 5
Discriminant validity - Fornell and Larcker criterion (1981).

Construct	Attitude	PBC	Intention	Subjective Norm
Attitude	0.8023	-	-	-
PBC	0.4573	0.9276	-	-
Intention	0.6320	0.5480	0.8940	-
Subjective Norm	0.3616	0.3347	0.4179	0.7701

Source: research data

Table 5 shows that the latent variables satisfy the conditions recommended in the literature for the Fornell and Larcker criterion (1981), that is, there is discriminant validity in the data analyzed. Next, according to Hair Jr. *et al.* (2009), the R2 coefficients were also verified, which demonstrates the percentage of variance of a latent variable that is explained by other latent variables. The R2 values provide a relative adjustment measure for each structural equation, and are also provided for endogenous latent variables only. Table 4 indicates that the R2 between the constructs was 0.5058, which suggests a strong explanatory power for the construct intention through the constructs attitude, subjective norm and perceived behavioral control. Thus, in Figure 2, in addition to the structural relationships of the variables, the obtained R^2 is shown.

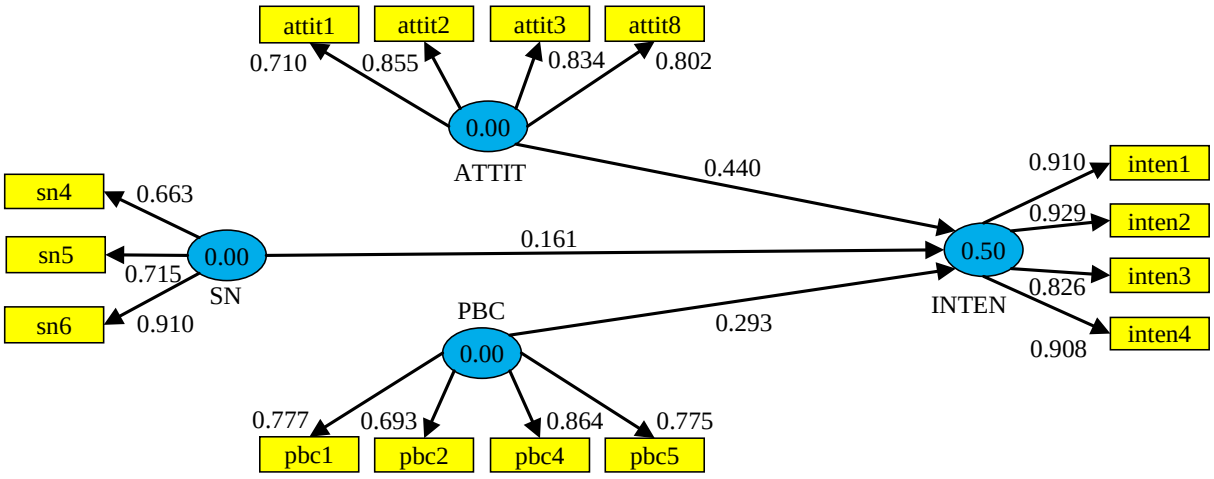

Figure 2. Adjusted Final Model

Source: research data.

Figure 2 shows that the influences of the predictive variables of intention are positive, indicating that the three variables of the model, together, explain the students' intention to pursue a career in approximately 51%.The next step was to estimate the model using the bootstrap function. With this function, the final parameter estimates are calculated for all generated samples and the confidence interval is not estimated by sampling error, but directly observed. Thus, the bootstrapping procedure was used to obtain the t-statistic in order to assess the significance of the parameters (Hair Jr. *et al.*, 2014). This procedure combines the estimates with the original sample and is appropriate to evaluate the significance of the proposed model estimators. Their results are shown in Table 6.

Table 6
Path Coefficient Result

Structural Relation	Original coefficient	t-value	Hypothesis	p-value
Attitude → Intention	0.4398	22.787	H1	0.0000
Subjective Norm → Intention	0.1608	9.0468	H2	0.0000
PBC → Intention	0.4398	12.763	H3	0.0000

Source: research data

Table 6 shows the t-test for the path used in the model, coefficients superior to 1.96 being considered acceptable according to Hair Jr. *et al.* (2009), obtained by bootstrapping analysis.

Based on Fishbein and Ajzen (1975), the first hypothesis (H1) sought to verify if attitude positively influences the behavioral intention of the students to pursue a career in Accounting. The results were significant ($\beta = 0.4398$, $t = 22.787$, $p < 0.01$), that is, the students' intrinsic factors significantly influence their intention to pursue one of the Accounting careers, thus supporting the first hypothesis. It is curious concerning the findings of H1 that the respondents do not perceive extrinsic factors, such as perceived status-prestige; significant results (remuneration, benefits); and career opportunities as significant influencers of the attitude of pursuing an accountant career. This is so because these indicators were not valid in the factor analysis process and, therefore, are not validated in the structural equations procedure.

The second hypothesis sought to investigate whether the subjective norm positively influences the intention of the graduating students to pursue a career in Accounting (Fishbein & Ajzen, 1975; Solikhah, 2014). The findings ($\beta = 0.1608$, $t = 9.0468$, $p < 0.01$) support this statement, that is, the evaluation of the referents' perceptions, who are influential individuals, affect their intentions. It is worth pointing out, however, that the most influential referents are friends, partners and professionals in the area of Accounting.

Supported by Ajzen (1991), H3 was intended to show if the perceived behavioral control positively influences the graduating students' intention to pursue a career in Accounting, which was supported by the results ($\beta = 0.4398$, $t = 12.763$, $p < 0.01$). Thus, it is inferred that students believe in their ability to practice an accounting career after graduating. This finding is in line with the study by Santos and Almeida (2018), which investigated the intention of graduating students from all over the State of Paraná, who believed in their competencies to pursue their careers and, consequently, the accounting profession.

Finally, based on the results evidenced, it is worth noting that, although the graduates evaluate the opportunities of insertion and career progression in a more realistic and objective manner in comparison with the new, second or third-year students (Bardagi & Boff, 2010; Santos & Almeida, 2018); these are also aware in view of their intended professional activities. Nevertheless, as they are still in training, their intentions can change by the time they complete their undergraduate course.

5. Conclusions

The focus of this study was to investigate the behavioral intention of all students enrolled in the Accounting course of a federal university in the South of Brazil to pursue a career in accounting, in the theoretical framework of the Theory of Planned Behavior (Ajzen, 1991).

One of the justifications for investigating the intention of accounting students to pursue a career in the field or not is due to the considerable growth in the enrollment of young people in Accounting courses in recent years. This expansion started in the last decade of the twentieth century, with approximately 262 undergraduate Accounting courses offering 97,223 places, data that showed significant growth in subsequent years, according to data from 2013, when 1,168 in-class courses were offered with 328,031 places (INEP, 2013). Despite the great demand for the course and although professional practice in Accounting is a market protected by corporate laws and regulations, it is illusory to think that all entrants and/or graduates want to build a professional career in this area. Therefore, the findings of this study can support discussions about the desired profile of the students and/or changes in the curriculum, so that graduates compete with trainees from other areas in professional activities that require knowledge of Accounting, instead of focusing only on the accountant career.

Regarding the research results, the data revealed that, regarding the attitude, the students do not see the careers of the accounting profession with recognition of status and prestige; without good remuneration; and no good opportunities available in the market. Thus, the results lead to what Byrne, Willis and Burke (2012), Demagalhães, Wilde and Fitzgerald (2011), Mbawuni and Nimako (2015) argued, as the students' perceived benefits of the accounting career can lead them to pursue a career in this area or not, as the intrinsic factors are related to satisfaction due to the opportunity to work in a dynamic and challenging environment that stimulates the creativity of the accounting professional, which the students under analysis did not perceive.

Regarding perceived behavioral control, respondents perceive themselves capable of practicing an accounting career, thus having strong beliefs in their abilities and also in the conditions to pursue an accounting career or not. The results confirm Bardagi and Paradiso (2003) and Safta's (2015) observations on the individuals' reflections on their interests and aspirations, which can make their management effective, as the choice is also influenced by the cognitive and affective consequences it produces.

As to the subjective norm, it has little influence on the students' intention to pursue a career in the accounting area. These results are in line with Santos and Almeida (2018) in a study carried out at the state level, investigating the intention of the graduating students at public HEIs throughout the state of Paraná to pursue a career in Accounting. Among the findings, the relevance of the opinions of professionals in the area (peers), friends and partners in this decision was verified. Thus, they concluded that individuals who are already included in the profession/career exert great influence on the decision of future professionals.

Thus, the research results contribute to clarify factors that can significantly influence the students' intention to pursue a career in the accounting area, and may also provide subsidies for aspects that need to be improved to stimulate interest. The findings of this study also contribute to the understanding of Accounting students' profiles at a federal public HEI in Paraná and how the competent entities can use and deepen research on the variables that influence the intention to more consistently develop courses that are more appropriate to the market. For the HEI, another possible approach would be to develop actions aimed at supporting professional practice, in order to enhance students' interest and knowledge.

This study contributes to the advancement of the theme career choice of higher education students in Brazil, mainly to evaluate the most significant aspects of this process; to the use of social psychology theories in accounting and to increase the use of structural equation modeling using Partial Least Square (PLS) with SmartPLS software. As a limitation, it can be mentioned that this research has investigated only students from a single institution, which can be expanded in other studies. Moreover, one can extend the study by seeking to understand which variables can affect the attitudes and perceived behavioral control in the Brazilian context, as well as the intention of individuals in the area to recommend the profession.

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Audit Assertions and Change of Auditors' Opinion in the Brazilian Market

Abstract

Objective: Investigate the use of audit assertions to justify opinion changes in Brazilian audit reports.
Method: A descriptive study was undertaken through content analysis, in which 2,243 reports from 338 non-financial publicly traded companies listed on BM&FBOVESPA between 2009 and 2015 were investigated, identifying 192 audit reports with a changed opinion. We investigated whether some assertion prevails in the opinion changes and whether each of them can be associated with certain accounting equity and income groups.
Results: The audit assertions Evaluation and Integrity are the most used to justify opinion changes. As for the association between the audit assertions and the accounting groups, it was verified that the categories of Existence/Occurrence tend to be associated with asset and income accounts, while the Integrity categories are related to liabilities and expenses. The relevant number of justifications based on business continuity aspects stood out.
Contributions: This study contributes to the development of the Brazilian literature on auditing and to reflections on the quality of audit work, mainly by presenting evidence on how and in what dimension the Brazilian auditors use audit assertions to justify opinion changes on the financial statements.
Key words: Audit; Audit Assertions; Assertion Categories; Changed Opinion; Audit Report.

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1. Introduction

Considering its purpose of contributing to an economic environment characterized by the credibility and reliability of financial information, reducing the informational asymmetries between the management and financial statement users (Dantas, Chaves, Silva & Carvalho, 2011), the audit consists of a systematic process to obtain and evaluate evidence on management assertions about economic actions and events to assess the degree of correspondence among them and the criteria set forth in the applicable financial reporting framework in order to express an opinion on whether or not the financial statements present misstatements. This definition, presented by the American Accounting Association (AAA, 1972), has reflected a certain scholarly and professional consensus on the scope and purposes of the audit, being reproduced with variations in textbooks - Boynton, Johnson and Kell (2002), Ricchiute (2002), Hayes, Dassen, Schilder and Wallage (2005) and Gramling, Rittenberg and Johnstone (2012), for example - and supporting professional standards - in particular the International Auditing Standards (ISA), which in Brazil are embodied in the Brazilian Accounting Standards of Independent Audit (NBC-TA).

As noticed, the formation of the auditor's opinion presupposes knowledge on the audited company, the environment it operates in and the nature of its operations. This knowledge provides the basis for the auditor to create expectations about the audit assertions in the financial statements, about which the auditor should obtain and evaluate evidence that confirms them or not (Felix & Kinney, 1982).

A model initially developed by Mautz and Sharaf (1961, apud Leslie, Aldersley, Cockbum, & Reiter, 1986), the audit assertions, despite representing the point of reference that guides the development of audit work, has not been studied frequently in academic research. Internationally, Leslie *et al.* (1986), Smieliauskas and Smith (1990) and Waller (1993) can be cited. In the Brazilian accounting literature, no articles specifically discussing the topic were found.

In the mid-1980's, Leslie *et al.* (1986) evaluated this lack of studies from the perspective that researchers would be afraid to address a topic that would be at the forefront of practice because audit firms were still unable to integrate audit assertions into their audit approaches. Three decades later, even with the consolidation of the model, including in the professional standards, there remains a certain academic silence about the subject. In this case, exactly the opposite argument can be predicted, that is, with the wide use of the model in practical terms, the researchers may feel little stimulated to study the audit assertions. As Hartmann (2017) points out, however, it is important that accounting research also includes discussions on practical issues, with a view to enhancing its development by overcoming the barriers between theory and practice.

In this sense, understanding how auditors use audit assertions for targeting, applying procedures and obtaining appropriate and sufficient evidence, in order to anchor the formation of opinion on the financial statements, may be important for qualitative research in the area, especially as regards the quality of audit work, as Smieliauskas and Smith (1990) point out, by stating that audit quality can be improved and achieved through appropriate explanations linking audit evidence to audit assertions.

The problem is that the documentation of the audit process is, by legal and regulatory definition, confidential, making it difficult to carry out studies with such a degree of comprehensiveness - the only part of the audit work that is known to external users is the called the auditor's report, published with the financial statements. Thus, the researcher can only examine the application of the audit assertions in cases where these are explained in the auditor's reports.

In that context, the purpose of this study was to investigate the use of audit assertions by Brazilian auditors in order to justify the changes of opinion in the audit reports. In such cases, the auditor should justify the reasons why the statements present material misstatements, assuming they are related to the audit assertions. In more specific terms, we try to understand: if some audit assertion is prevalent to justify the change of opinion in the Brazilian market; and whether each audit assertion can be associated with asset or liability and income statement accounts - revenues or expenses.

In order to achieve the proposed objective, the basic paragraphs for the opinion in 192 audit reports with changed opinions were investigated, previously selected in a set of 2,243 reports on the annual financial statements of 338 non-financial publicly-traded companies listed on BM&FBOVESPA between 2009 and 2015. Besides this introduction, which contextualizes the theme and sets its objectives, this study addresses: the theoretical framework to support the understanding of fundamental issues, with a review of the audit assertions and a discussion about prior studies on the theme (Section 2); the methodological procedures adopted for the empirical tests (Section 3); the presentation and analysis of the results (Section 4); and, finally, the final considerations on the study (Section 5).

2. Theoretical Framework

2.1 *Audit assertions* as a framework for audit work

ISA 300 (in Brazil, the ISAs were fully received, through the NBC-TA, with equivalent numbering, which is why, whenever reference is made to a particular ISA in this study, an NBC-TA exists with the same number and equivalent content) states that the objective of the auditor is to plan the audit to be performed effectively, with the planning corresponding to the definition of an overall strategy for the work and for the development of an audit plan. The Public Company Accounting Oversight Board (PCAOB, 2010) states that obtaining an understanding of the entity and its environment, as well as its internal control, is an essential part of planning an audit to respond to the assessment of the risks of material misstatements.

In this planning process, it is of particular importance to consider that the auditor, in declaring that the financial statements are in conformity with the applicable financial reporting framework, took into account that management makes implicit or explicit assertions regarding the recognition, measurement, presentation and disclosure of the various elements of these statements (ISA 315). The standard establishes that the auditor should use these statements to consider the different types of potential misstatements that may occur in the entity. This specification helps in the planning of audit tests and the auditor should test these assertions by obtaining appropriate and sufficient audit evidence (Gramling, Rittenberg, & Johnstone, 2012).

Although ISA 315 provides for audit assertions about classes of transactions and events, balance of accounts and presentation and disclosure, the standard itself admits that the auditor may treat these statements differently by combining, for example, statements about transactions and events with those related to the balance of accounts. In this sense, based on Hayes, Dassen, Schilder and Wallage (2005) and Gramling, Rittenberg and Johnstone (2012), it can be concluded that the most common has been the use of five audit assertions, as summarized in Table 1.

Table 1
Audit Assertions

Existence / Occurrence	Refers to the existence of everything that is registered in the assets, liabilities, equity and income accounts.
Integrity / Completeness	Its meaning is opposite to existence/occurrence, that is, the equity and income items should have been recorded completely – in short, everything that exists or occurred should have been recorded.
Rights and Obligations	Intends to verify if the organization controls or is entitled to its assets and if its obligations (liabilities) are truly rights of third parties.
Valuation / Allocation	Is associated with how the entity assessed its equity and income items. They should have been valued and adjusted in accordance with the accounting practices concerning adjustment at realizable value, depreciation calculations, price-level restatement calculation, among others.
Presentation / Disclosure	Refers to the disclosure of relevant information in the financial statements, particularly in the notes to the financial statements, complying with the accounting standards and guaranteeing that the transactions are clarified to the users.

Source: adapted from Hayes *et al.* (2005) and Gramling *et al.* (2012)

2.2 De Mautz and Sharaf (1961) to ISAs: evolution and consolidation of audit assertions

According to Leslie *et al.* (1986), the first reference to the concept of audit assertions in audit literature was found in Mautz and Sharaf's The Philosophy of Auditing, written in 1961, and remained hibernating until 1973, when it reappeared in A Statement of Basic Auditing Concept (Asobac), a publication on basic audit concepts. Still in the 1970s, R.J. Anderson also recognized the merits of the concept and was responsible for the recognition of audit assertions in the manual of the Canadian Institute of Chartered Accountants (CICA), today called the Auditing and Assurance Standards Board (AASB). It was only in 1980 that the American Institute of CPAs (AICPA) addressed the concept for the first time through SAS 31.

Nevertheless, not many references to the audit assertions are found in the accounting literature. In the 1980s, Leslie *et al.* (1986) attributed this lack of studies in the field to the fact that audit firms were unable to integrate the concept of assertions into their audit approach. Thus, academics might be reluctant to produce studies that would be one step ahead of practice and would rather study what they believe to be the most commonly used method.

In the early 1990s, Smieliauskas and Smith (1990) stated that the relationship between detailed audit procedures and elementary assertions is not yet standardized in practice, which can be caused by differences in expertise, cost structure and cost/benefit of audit firms.

More recently, the concept of audit assertions is already consolidated and addressed in the International Standards on Auditing (ISA). Thus, the auditors need to prepare their audit work based on the assertions, in order to test them in the course of the work, as explained in Section 2.1.

2.3 Theoretical discussions on the utility of audit assertions

Even though the issue has been discussed since 1961 and consolidated as regulatory professional practice, the academic studies on audit assertions are still not frequent, even in the international scenario, with the work of Leslie *et al.* (1986), Smieliauskas and Smith (1990) and Waller (1993).

Leslie *et al.* (1986) set out an audit approach based on audit assertions, focusing on the strategic level and seeking to refine the internal control review and evaluation approach conditioned to the inherent risk assessment, to guide the auditor to a more comprehensive view of the financial statements, join the different audit concepts and use the audit assertions as the organizing principle of these concepts, proposing an audit method that would truly meet the precepts of practicality and effectiveness.

In their study, Smieliauskas and Smith (1990) refined the theory of Audit Evidence based on research in philosophy of science. Based on this precept, they improved the definition of evidence confirmation and related it to the auditor's opinions and found that explanations are a critical component linking the evidence to audit assertions. Finally, they concluded that the definition of professional audit standards should increasingly emphasize the underlying explanations of audit evaluations.

Smieliauskas and Smith (1990) also reinforce that purely quantitative audit models may not be sufficient to develop a theory about audit evidence. The explanatory component of the evidence helps to ensure that the professional standards and the auditor's social duty to bring confidence to external users are met and also provide an important factor associated with the quality of the audit. The authors demonstrated that appropriate explanations improve the quality of audit work.

Therefore, it is expected that problems in the statements will lead to a modification in the auditor's opinion. Audit assertions provide coverage for the main sources of errors in the financial statements (Smieliauskas & Smith, 1990). Thus, obtaining evidence as to the presence or not of material misstatements related to these categories of assertion influences the opinion that the auditor should issue. In addition, an opinion based on these assertions helps to construct a sound and high-quality explanation for the audit report.

In addition to Leslie *et al.* (1986) and Smieliauskas and Smith (1990), another author on the subject was Waller (1993). Although not directly addressing the issue, he studied the association between inherent and control risks and statements. It was expected that inherent risk and control assessments would vary according to the assertions of each account, which was not confirmed.

Although few, international studies were able to address the audit assertions more specifically. The Brazilian literature does not present studies that deal directly with the subject, only studies on other aspects of the auditor's opinion, as presented in Section 2.4.

2.4 Research in Brazil on opinion change

Although no studies were found in the Brazilian literature that specifically address audit assertions, studies on changes in the auditor's opinion are relatively common, focusing either on their causes or their consequences, among which we can mention Batista, Pereira, Silva and Imoniana (2010), Damascena, Firmino and Paulo (2011), Camargo (2012), and Dantas, Barreto and Carvalho (2017).

According to ISA 705, the modified opinion should be issued when audit evidence shows that the financial statements present material misstatements or when the auditor is unable to obtain appropriate and sufficient audit evidence to express an opinion on the existence, or not, of relevant misstatements, taking three forms: qualified opinion, used when there are relevant misstatements or when it was not possible to obtain appropriate and sufficient audit evidence; adverse opinion and no opinion, used when there are widespread effects, the former being used if relevant misstatements exist and the second when there is no possibility of obtaining appropriate and sufficient evidence.

The study by Batista *et al.* (2010) sought to analyze the reaction of the stock returns to the disclosure of audit opinions. Through a bibliographic and documentary research and secondary data collection, the authors identified whether the opinions were issued with or without qualification and obtained the average stock returns, which permitted the analysis of the data using the Wilcoxon test, thus seeking to compare the average stock return before and after the disclosure of the audit opinion. They concluded that the publication of the opinions did not influence the average stock returns in the month after their disclosure.

Damascena *et al.* (2011) aimed to identify the factors that motivate the issuing of a qualified opinion and/or paragraphs of emphasis in the audit reports on the Brazilian public companies' statements. In total, 1,466 financial statements were analyzed from 2006 to 2008, 647 of which presented an opinion with qualifications and/or paragraphs of emphasis. After analyzing the content, the authors concluded that the limitation in the scope and impossibility of opinion formation are the reasons that most lead to the issuing of qualified opinions and that continuous losses, short-term liabilities and working capital shortages lead to the existence of paragraphs of emphasis.

Camargo (2012) investigated the determinants of opinion in the audit reports of 279 companies listed on BM & FBOVESPA in 2010, concluding that companies with greater delays in receiving opinions and those audited by the big four are more prone to changed opinions, while companies that paid the highest fees and exchanged firm in the analyzed period are more likely to receive unchanged opinions.

Dantas et. al. (2017), in turn, assessed the impacts of the changed opinion on the continuity of the audit service contract and whether the fact that the audit firm is a big four or that the audited company belongs to the corporate governance segments reduce this risk of contractual discontinuity. We analyzed 333 companies listed on BM & FBOVESPA, considering the period from 2009 to 2014 and the authors concluded that there is a positive and statistically relevant relationship between the issuing of a modified opinion in one period and the change of auditors in the subsequent period. They also found that the audit firm being one of the big four or the company's listing in a corporate governance segment of the stock exchange does not reduce the risk of discontinuity of the contracts.

In summary, although the studies carried out in Brazil related to the auditor's opinion, particularly the context in which reports with changed opinions were issued, none of them addresses the issue from the perspective of audit assertions, defined as guides for audit work, which makes this study a pioneer in the Brazilian literature.

3. Methodological Procedures

Considering its objectives, this is a descriptive study with a qualitative approach. Prodanov and Freitas (2013) define descriptive research as studies that expose the characteristics of a certain population or phenomenon and define the qualitative approach as using the natural environment as a source to collect data, interpret phenomena and attribute meanings.

3.1 Study population

In view of the objectives and exploratory nature of the study, first, we examined the audit reports on the annual financial statements of 338 non-financial publicly traded companies listed on BM&FBOVESPA between 2009 and 2015, totaling 2,243 reports, directly collected on the website of the Brazilian Securities Commission (CVM).

As the study is focused on the audit reports with opinion changes, we concentrate on identifying the type of opinion the auditors issued in the previously identified reports, whose statistics are summarized in Table 2.

Table 2
Distribution of audit reports of 338 non-financial companies listed on BM&FBOVESPA between 2009 and 2015

Type of Report	Quantity	Percentage
No Modification	2,051	91%
Qualified Opinion	154	7%
Adverse Opinion	0	0%
No Opinion	38	2%
Total	**2,243**	**100%**

Source: research date

The results of this preliminary assessment reveal that, in the set of reports examined, 192 (9% of the total) contained changed opinions – with qualification or no opinion – which were the object of this study.

3.2 Analysis criteria

Based on the 192 modified opinion reports specified in Section 3.1, the basic paragraphs for the opinion were analyzed by means of content analysis, aiming to identify the audit assertions used as justification for the change of opinion, using the content of Table 1 for reference.

For a better understanding of how audit assertions are used to justify auditors' opinion changes, the data in this content analysis is organized in statistical terms using the following criteria:

- Relation between the audit assertions and the type of report issued, in order to evaluate if any assertion category is prevalent to justify the opinion change; and
- Relationship between the audit assertions and the equity and profit and loss account groups - assets, liabilities, shareholders' equity, income and expenses - in order to identify whether it is possible to associate each category of statement with a particular accounting group.

It should be noted that the process of classifying the justifications for opinion changes, based on the content analysis of the report, is an intrinsically subjective task, subject to the bias of the researcher's judgment, which obviously characterizes a limitation of this study.

4. Analysis of Results

As established in Section 3, the baseline paragraphs for the opinion expressed in the 192 reports with changed opinions that constituted the study population were investigated, aiming to identify the justifications used for this change, as well as the association between these reasons and the audit assertions. The purpose is to assess whether any audit assertion prevails to support the opinion change, and whether each of them can be associated with specific groups of equity and income accounts.

4.1 Relation between audit assertions and the type of report issued

The first step in the analysis of the results was to relate the audit assertions with the types of changed opinion, with a view to concluding whether any assertion category stands out among the justifications for opinion changes and whether the types of reports vary. The results have been consolidated in Table 3.

Table 3
Audit assertions present in the bases for opinion change, according to the type of opinion

Audit assertion	Qualified		Abstention		Adverse		Total	
	No.	Perc.	No.	Perc.	No.	Perc.	No.	Perc.
Existence / Occurrence	25	11%	15	13%	–	–	40	11%
Integrity	56	23%	26	22%	–	–	82	23%
Rights / Obligations	10	4%	7	6%	–	–	17	5%
Valuation	70	29%	13	11%	–	–	83	23%
Presentation / Disclosure	10	4%	12	10%	–	–	22	6%
Business continuity	25	10%	36	31%	–	–	61	17%
Others	47	19%	8	7%	–	–	55	15%
Total	243	100%	117	100%	–	–	360	100%

Source: research data

Some reports presented more than one justification for opinion changes, which required the allocation in more than one category, resulting in 360 justifications extracted from the 192 reports with changed opinions studied here. Although referring to the categories presented in Table 1, a special topic was needed to frame the issues addressed in the basic paragraphs for the changed opinion, related to Business Continuity - which includes justifications that refer to the risk that the disclosing entity will not continue to carry out its operations, that is, which discusses evidence that questions the assumption that the organization will continue to operate normally. Justifications for opinion changes that could not be classified in the other categories were classified as "other" due to the difficult association with some of the audit assertions or risk of operational continuity.

In relation to the audit assertions, the results initially show that the categories Evaluation and Integrity are the most frequent arguments for opinion changes in all the reports studied, both with a frequency of 23%. This reveals that the evidence associated with non-recognition of equity or income items or the misstatement of these items are the matters the auditors address most to justify their giving a changed opinion on the statements. These results arouse a question as to whether the concentration in these two categories is due to the auditors' greater concern with such matters or the fact that the companies commit more improprieties in these areas. Considering that the only visible part of the auditor's work is his report, that question cannot be answered objectively.

For the total group of examined reports, the categories Evaluation and Integrity have the same frequency. When considering the type of opinion, a clear distinction is noted regarding the prevalence of audit assertions. For the reports with qualifications, the category Evaluation (29%) is the most used for justification, while Integrity (26%) prevails among the arguments for the auditor to issue a report without opinion. It should be noted, however, that operational continuity problems account for 31% of the justifications used in reports with no opinion, suggesting that, when the client shows signs of discontinuity, the auditor is more afraid to express an opinion. This set of evidence suggests that problems of misstatements in the value of equity items and/or results justify exemptions, while problems of non-recognition of these items and operational continuity result in a lack of opinion.

This is consistent with Serra and Rodríguez' (2012) statement that the auditor, when issuing reports with opinion changes, risks losing clients. On the other hand, when expressing a clear opinion when the situation requires modification, they face reputational losses and can even be held civilly liable to shareholders and investors who have been harmed or misled based on the content of the report. Thus, in delicate situations, such as cases where evidence, even if not conclusive, of a risk of discontinuity is identified, failure to issue a changed opinion would be too risky for the auditor, which may explain the apparently surprising number of cases in which operational continuity is addressed as an argument to question the adequacy of the financial statements.

At the other extreme, audit assertions related to Rights and Obligations (5%) and Presentation / Dissemination (6%) are the least used by the auditors to justify the change of opinion, which may suggest that they find problems of misstatements linked to these categories less important compared to the others. Nevertheless, the possibility of less space for manipulation regarding these matters or even less incentives for the management to stop complying with the regulatory determinations cannot be discarded.

4.2 Relation between audit assertions and the account groups covered by the change

After completing the analysis of the association between audit assertions and types of opinion change, the next step was to relate the assertion categories to the account groups that were subject to change, that is, that presented material misstatements. The purpose is to identify whether each audit assertion can be associated to a particular account group.

The first category is Existence/Occurrence and is related to the assertion that the equity items recorded in the statements actually exist and that the events translated into the income and expense accounts actually occurred. There were 40 references to this audit assertion in the 192 reports examined with changed opinion. The distribution of these cases by account groups has been consolidated in Table 4.

Table 4
Distribution of opinion changes based on audit assertion Existence/Occurrence, according to the accounting groups

	Asset	Liability	Equity	Revenues	Expenses	Not Ident.	Total
Quant.	35	2	–	3	–	–	**40**
Perc.	88%	5%	–	7%	–	–	**100%**

Source: research data

As evidenced, 95% of the cases of opinion change based on the Existence/Occurrence category are linked to Asset or Revenue accounts, that is, they represent questions about the existence of assets disclosed in the Balance Sheet or the occurrence of revenues that are part of the income statement. The most recurring cases are related to financial assets and property, plant and equipment. These findings are consistent with the premise that management has more incentives to overestimate than to underestimate assets and revenues.

It is also consistent with Martinez' (2001) statement that a number of reasons can cause the manipulation of accounting income, including the motivations related to capital markets and contracts, with incentives to practice information management, aiming to reducing the investors' perception of company risks and increasing the managers' remuneration - based on profit. Therefore, the better the entity presents itself, in terms of equity position or performance, the better it will be for the manager. Hence the incentive to overestimate assets and revenues, which should be considered in the audit mechanisms to assess risks of material misstatements. The results shown in Table 4 are consistent with this premise.

In the case of the audit assertion Integrity, which refers to the questions about non-registration of existing obligations and expenses that occurred, 82 references were found in the 192 reports with changed opinions studied here. Of these, 90% are linked to liability or expense accounts, as evidenced in Table 5.

Table 5
Distribution of opinion changes based on audit assertion Integrity, according to the accounting groups

	Asset	Liability	Equity	Revenues	Expenses	Not Ident.	Total
Quant.	6	72	2	–	2	–	**82**
Perc.	8%	88%	2%	–	2%	–	**100%**

Source: research data

This concentration in liability and expense accounts is also consistent with the management's incentives and, consequently, the audit risks. The cases of integrity problems identified in these accounts mainly concerned tax provisions and obligations. Following Martinez (2001), it is natural that management has more incentives to underestimate than to overestimate liabilities and expenses accounts in order to improve the economic-financial situation and performance reported through its statements. Furthermore, in this case, the findings highlighted in Table 5 confirm these theoretical perspectives.

The Rights / Obligations category is related to the premise of the management's assertion that the organization controls or holds rights over its assets and that its obligations are truly the rights of third parties. Only 17 references to this audit assertion were registered in the 192 reports with changed opinion and, in 82% of these citations, they could not be linked to a specific account group.

Table 6

Distribution of opinion changes based on audit assertion Rights/Obligations, according to the accounting groups

	Asset	Liability	Equity	Revenues	Expenses	Not Ident.	Total
Quant.	3	–	–	–	–	14	**17**
Perc.	18%	–	–	–	–	82%	**100%**

Source: research data

The reason for not linking the large majority of problems to a particular account group is explained by the lack of more detailed explanations in the reports. The justifications related to Rights/Obligations were generally presented to indicate noncompliance with contractual clauses or problems, without further specification, which made it impossible to associate the problem with a specific account group. This limitation is associated with the fact that the auditor's report is the only part of the audit work that is accessible for review. Moreover, this lack of explanations also draws attention to the quality of the audit report made available to users, as this document is important in order to enhance the credibility of financial statements and assist in decision making. It is possible that, with the adoption of the new audit report, as from the base year 2016, some effect may exist in the way auditors communicate their findings.

For the audit assertion Valuation/Allocation, being associated with the valuation criteria of equity and income items the management adopts, notably with respect to accounting practices involving some degree of subjectivity and professional judgment, the prevalence of some account group does not appear to be a theoretical imperative. The consolidation, according to Table 7, of the 83 citations of problems related to the Valuation category to justify a change of opinion in the 192 reports examined, reveals a relatively significant concentration in the account group Assets though.

Table 7

Distribution of opinion changes based on audit assertion Valuation, according to the accounting groups

	Asset	Liability	Equity	Revenues	Expenses	Not Ident.	Total
Quant.	48	21	3	1	7	3	**83**
Perc.	58%	25%	4%	1%	8%	4%	**100%**

Source: research data

Almost 60% of the cases related to the value of equity and income items that gave rise to changes in auditors' opinion are related to Assets accounts, mainly property, plant and equipment, presenting problems in the depreciation calculations. This seems to suggest, as opposed to what was initially anticipated, that there is more room for errors (or manipulations) in the measuring of asset items, although it was the audit assertion in which there were records of justifications for changes in the auditors' opinion related to all account groups.

In the case of the fifth audit assertion highlighted in Table 1, this is linked to the disclosure of the relevant information in the financial statements, particularly in the explanatory notes, in order to ensure the users' proper understanding of the economic and financial situation of the disclosing entity. As would be natural, given the greater concern with the production of explanatory notes, the analysis of the 22 cases of justifications for opinion changes based on this assertion category reveals that, in practically all of them (95%), there is no link to an account group, as evidenced in Table 8.

Table 8
Distribution of opinion changes based on audit assertion Prsentation/Disclosure, according to the accounting groups

	Asset	Liability	Equity	Revenues	Expenses	Not Ident.	Total
Quant.	–	–	1	–	–	21	**22**
Perc.	–	–	5%	–	–	95%	**100%**

Source: research data

The topics in this category the auditors used to change their opinion on the financial statements as a whole include: non-disclosure of all required items in the consolidated financial statements; problems that jeopardize the company's operational continuity; and failure to present the financial statements in accordance with applicable laws and regulations. These are general matters, not associated with a specific account group. As for the only subject in the category related to Shareholders' Equity, it deals with problems in the restatement of adjustments of previous years. The Company recorded an adjustment of the equity method of accounting for the previous year in shareholders' equity, without restating the balances adjusted in accordance with the current standard, which caused an increase in equity.

Finally, it is worth noting that, although it is not specifically an audit assertion, which is the focus of this study, the distribution of cases of opinion change justified by risks of operational discontinuity was evaluated, given the relevance of the topic highlighted in Section 4.1. The 61 cases of this kind do not refer specifically to an account group, as evidenced in Table 9.

Table 9
Distribution of opinion changes based on the risk of operational discontinuity according to the accounting groups

	Asset	Liability	Equity	Revenues	Expenses	Not Ident.	Total
Quant.	–	–	–	–	–	61	**61**
Perc.	–	–	–	–	–	100%	**100%**

Source: research data

Given the natural range the risk of operational discontinuity necessarily implies, the lack of reference to a specific account group is completely natural.

5. Final Considerations

A model initially developed in the 1960s, the audit assertions have turned into a relevant instrument for the planning, execution and formation of audit opinions, consolidating themselves as an integral element of professional standards. The assumption is that they help to identify possible material misstatements and should be used to justify a possible change in the auditor's opinion.

Notwithstanding their importance for audit work, the audit assertions have been little studied in the academic world, perhaps because they are already considered as something consolidated, in view of the regulatory determinations for their use. Considering, however, the argument that the study of practical issues may be important to enhance their development, this study aimed to investigate Brazilian auditors' use of these audit assertions to justify the changes of opinion in their reports, more specifically if some audit assertion prevails and if each of the assertions can be associated to equity and income accounts.

From a set of 2,243 reports on the financial statements of 338 non-financial publicly-traded companies listed on BM & FBOVESPA from 2009 to 2015, 192 audit reports with opinion changes were identified, which were studied in this research.

The results showed that, from a set of 360 justifications extracted from the analyzed reports, the assertions related to Evaluation and Integrity, both with a frequency of 23%, are the most recurrent to justify the opinion changes. The concentration in these assertions may be due to both a greater concern of the auditors with issues related to these categories and the fact that the companies commit more improprieties in these areas. Only the analysis of the audit report, which is the only visible part of the auditor's work, does not provide an objective answer to this question, which is a limitation of this study - due to the restricted access to the auditors' working papers.

At the other extreme, audit assertions related to Rights/Obligations and Presentation/Disclosure are the least used as a basis for opinion change, which may indicate a trend for auditors to assign less importance to problems related to these categories when compared to the others. In any case, one cannot overlook the fact that there may be less room for manipulation in relation to these assertions or even less incentive for management to disregard the regulatory instructions.

Regarding the types of opinion changes, there were differences regarding the prevalence of audit assertions. When it comes to qualified opinions, the most frequent assertion category is Evaluation (29%), while Integrity (26%) is the most used to justify cases of abstention. It is important to note that problems related to Operational Continuity, which does not represent an audit assertion per se, constitute 31% of the reasons for abstention, which may be related to the risk for the auditor's reputation in expressing an opinion in cases in which the companies present problems that can interrupt their activities.

In the second stage of the tests, the relationship between the audit assertions and the equity and income account groups was analyzed. The results showed that 95% of the cases of justification of opinion changes based on the Existence/Occurrence category are associated with asset and income accounts, while 90% of Integrity problems refer to liability and expense accounts. These results support the premise that management has more incentives to overestimate assets and revenues and to underestimate liabilities and expenses, which may justify the auditors' concern.

Also noteworthy is the fact that 58% of the problems reported as justifications for opinion changes related to the audit assertion Evaluation are related to assets, mainly to property, plant and equipment. This suggests the greater probability of material misstatements associated with the measuring of asset items, especially fixed assets, which can be explained by the subjectivity implicit in the disclosure of depreciation and impairment of these elements. Misstatements related to Rights/Obligations and Presentation/Disclosure could not be associated with a specific account group.

This study contributes to the development of the Brazilian audit literature, mainly for presenting evidence on how and to what extent Brazilian auditors use audit assertions to justify a change of opinion on the financial statements examined. The audit assertions are expected to direct the audit work. The reflections and the study on the theme indicate that a high-quality audit seeks evidence based on the assertions present in the statements. Thus, it is interesting to note that the planning of the audit work may tend to value certain audit assertions, as presented in the results, which can raise doubts about the auditors' direction in their work and, consequently, doubts about the quality of the audit work.

As a contribution to the literature, it is also important to highlight the fact that this study permits an objective link between the theoretical foundations and their practical application in the process of planning, realization and communication of audit results.

Nevertheless, this study is limited not only by the restricted access to other audit information than the report that is part of the statements, but also by the subjectivity implicit in the content analysis method used in the analysis of the reports, being subject to the bias of the researcher's judgment.

As a suggestion for future research that complements the reflections and evidences highlighted in this study, we can highlight: the justifications related to Operational Continuity, frequent mainly in the bases for abstention; the application in other types of companies and economic sectors; the verification of the potential effects of the structure of the new audit report, established as of the base date 2016, in the manner in which the audit assertions are reflected in the justification for opinion changes. In addition, continuous reflection on the audit process and planning is encouraged in order to obtain further information that can be gathered to obtain increasingly complete and high-quality audit work.

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Domestic Inflation, Cost Management and Control: A Successful Experience at a Brazilian Multinational

Abstract

Objective: Analyze the contributions of internal inflation dimensioning to the cost management and control and pricing strategies in a Multinational Corporation (MNC).

Method: A specific approach was developed to calculate the own price index (OPI), based on a quantitative and qualitative case study with a descriptive approach in a worldclass MNC.

Results: Based on the management strategy and control theories, it could be concluded that (i) the MNC benefitted from using a specific method instead of traditional market inflation rates; and that (ii) the OPI was a management control and accounting tool capable of equipping the company, differentiating the organization in price negotiations in its respective production chain. On the whole, (iii) the importance of effectively using the OPI was noticed for the sake of in-depth knowledge, accounting treatment, control and proper management of the company's costs, establishing a pricing policy in line with its strategic objectives.

Contributions: Besides the originality of the research, deriving from the lack of studies on internal inflation in the context of MNCs, the study broadens the theoretical knowledge on the theme, also evidencing the role of OPI as a cost management and control and pricing tool in MNCs – a matter of interest to most companies, experts and society, in function of the relevance of this type of company for the economy and the market.

Key words: Management control and accounting system, Cost management and pricing, Internal inflation, Multinational corporations (MNCs), Emerging markets.

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1. Introduction

Since the last two decades of the 20th century, management accounting and control systems (MACS) have increasingly been recognized in the international literature as mechanisms that facilitate the implementation of strategies and the achievement of corporate objectives (e.g. Langfield-Smith, 2008; Layton & Jusoh, 2012; Cooper & Ezzamel, 2013; Yadav & Sagar, 2013; Maiga, Nilsson & Jacobs, 2014; Jordão, Souza & Avelar, 2014; Otley, 2016; Turner, Way, Hodari & Wittemanc, 2017). The international literature also stresses that advances in information and communication technologies, increased competitive pressure from globalization and the turbulences in the business environment were some of the factors that significantly affected MACS, requiring a greater sophistication in those systems in order to generate useful information about business performance, enhance managerial decision-making and, above all, establish sustainable competitive advantages.

The classic strategy literature states that competitive advantage can derive from the company's ability to produce at lower costs or to differentiate itself, thereby being able to operate with higher prices (Porter, 1985; Montgomery & Porter, 1991). At this point, cost control and management systems are of particular interest because they are directly related to competitiveness, not only because they are the basis for differentiation strategies, but also because they affect the companies' price formation, profitability and survival, especially in multinational corporations (MNCs) - which tend to suffer competitive pressures from the domestic and international environment.

Authors such as Yadav and Sagar (2013) postulate that, although studies on cost accounting and management began in the 1930s, the international literature has highlighted that scholars and professionals dealing with MACS still face challenges in measuring costs on bases that improve business performance and emphasize both value creation and the development of sustainable competitive advantages.

These challenges are magnified in productive chains in which the competitive dynamics between MNCs and local rivals force competition and organizational coevolution, especially in emerging markets (Huq, Chowdhurya & Klassenb, 2016). Particularly in the automobile chain, commercial relations involve the evaluation of complex and interrelated cost and market variables, which can best be understood based on MACS instruments, such as the own price index (OPI). This type of index, according to Bugelli (1995), can reflect the company's internal inflation and support price negotiations on a fairer basis, a gap that is still to be understood in depth in the international accounting and management literature - even more in relation to the MNCs, due to the lack of studies on the subject in the Brazilian and international contexts.

In that sense, in this study, the focus was Sigma (a fictitious name for reasons of confidentiality), which is a globalized MNC in the worldclass automobile sector with shares traded in stock exchanges, having thirty-two plants located in sixteen countries, whose headquarters are located in São Paulo (SP), Brazil. This company has been facing a series of competitive challenges to increase its margins, considering that pricing is done by the client (assembler). The company needs to appropriately dimension its costs and/or create strategies that justify the transfer to the manufacturer - Fiat Cars S/A. In this context, cost control and management strategies and internal inflation sizing gain special importance as management tools, being profoundly relating with the profitability, profitability and value creation of Sigma.

Recognizing and exploiting this research gap, the research described in this article aimed to analyze the contributions of internal inflation sizing to cost management and control (CMCS) and pricing strategies in an MNC, based on the experience of a worldclass car parts industry.

The relevance of a research stems from its contributions to a substantial segment of society, as mentioned by Jordão and Novas (2013) and Jordão *et al.* (2014). In this sense, in addition to having recommendations from scholars such as Hitt, Li and Xu (2016), the study is justified by its originality, (i) helping to fill the aforementioned research gap, (ii) collaborating to understand the CMCS and pricing strategy through an OPI in MNCs (an issue that is of interest to most companies, scholars and society, as the international literature broadly recognizes the need for specific studies on the subject), (iii) improving the understanding about the role of MACS for the competitive dynamics of MNCs in emerging markets and (iv) contributing to enhance the theoretical body of knowledge on the theme.

Based on extensive research, covering major databases and portals such as Ebsco, Proquest, Emerald, B-One, Scholar Google, Science Direct, plus databases and portals with a Latin American focus such as SciElo, Redalyc, Latindex, Capes, among others, there are some studies that recognize the relevance of the topic and/or address the problem, citing it as a future research opportunity, but without discussing it - confirming the originality of the research and justifying its development. Although some studies focus on one, two or three of the five variables, namely OPI, cost control, industrial firms, globalized MNCs and emerging markets, studies have yet to be found that cover all these variables simultaneously. As management implications, it is noted that the use of OPI as a MACS instrument in internationalized industries can equip their managers in decision making on cost and price policies, serving as a strategic benchmarking for companies and/or similar situations, especially considering the relevance, size and sector of the company.

In addition to this introductory part, the article is structured in five more sections. The second presents the theoretical support platform of the research, about cost management and control strategies, pricing and internal inflation in MNCs. Next, the method used is detailed, which is a case study. The fourth shows the analysis and discussion of the results achieved against the background of the theory, indicating the role of OPI as a cost control and management and pricing tool. The fifth presents the final considerations, in line with the research objectives, followed by the references used.

2. Strategies for Cost Management and Control, Pricing and Internal inflation in MNCs

In recent years, many organizations have experienced different changes in their business processes as a result of a more complex and dynamic business environment (Herath, 2007; Yadav & Sagar, 2013; Hitt *et al.*, 2016), requiring actions and strategies that make it easier to achieve the objectives focused on maintaining and improving sustainable competitive positions in the market (Mintzberg, 1978; Porter, 1979; Prahalad and Hamel, 1990). In particular, Hitt *et al.* (2016) emphasize that MNCs have had to develop specific strategies seeking to exploit and harness critical capacities to build competitive advantages in an attempt to survive and thrive in international markets, especially in emerging economies, given the additional challenges brought about by this type of economy.

The international literature is high in examples that clarify the role of MACS as a means of implementing organizational strategies (e.g. Jordão & Novas, 2013; Jordão *et al.*, 2014). The literature has not yet clearly shown how OPI can be used as a MACS tool though, aiming to promote the implementation of cost management and pricing strategies. Nevertheless, many scholars have been studying alternatives that expand the use of MACS, cost management and pricing and OPI as managerial tools.

Cooper and Ezzamel (2013), for example, examined how management and accounting systems function as intervening means to turn the speeches of senior managers into something practical in companies. They argue that MACS instruments, such as the Balanced Scorecard (BSC), offer the promise of converting the top management's discourse into a series of actionable initiatives, that is, ways to turn strategy into action. These authors have realized that the way managers speak and give meaning to concepts and ideas is key to making such discourses a practice though. Ideas of competition, benchmarking, cost management, profits, motivation or innovation can be leveraged, for example, by expanding production, changing the product mix, increasing the volume, diversity and sales quality and encouraging employee engagement.

Lay and Jusoh (2012), Jordão and Novas (2013) and Jordão *et al.* (2014) call attention to the need to integrate the MACS with the organizational strategy, emphasizing that the quality of such systems is fundamental for the achievement of business objectives, for the success of the enterprises and for the generation of organizational value. Maiga *et al.* (2014) highlight the benefits of integrating MACS, in particular cost controls, with information technologies, and observed improvements in financial and productive performance resulting from this integration.

In the international literature, there are several papers that explored the CMCS theme (Yadav & Sagar, 2013), but there seems to be no universally accepted framework on the subject yet (Guilding, Cravens & Tayles, 2000; Langfield-Smith, 2008). Studies developed on CMCS, sales pricing and domesticinflation calculations mostly explore one or two of these variables in either productive chains or MNCs. Nevertheless, the need to expand the scope of the MACS to respond to the new information needs have been appointed in classical studies, such as Johnson and Kaplan (1987), Berliner and Brimson (1988), Bromwich and Bhimani (1989), Shank (1989), or more contemporarily Lay and Jusoh (2012) and Jordão *et al.* (2014). Besides the significant corporate interest in the issue, as presented in Yadav and Sagar (2013), in a competitive market, the price arbitration can flatten out the profit margins and erode the company equity. Also, the excessive cost transfer can affect the organizational sales and competitiveness.

Costs have become determinant for the competitiveness of many sectors (Govindarajan, 1993) and efforts to reduce them sometimes border on obsession, especially in MNCs operating in hypercompetitive markets such as the automobile industry. In this sector, automakers put pressure on part suppliers, and these, in turn, need costing systems that are able to incorporate, in their context of analysis, within the production chain, aspects such as: the influence of the supplier in the composition of client costs, the company's ability to rationalize its productive processes and labor productivity, making good management of these factors a key task for good CMCS. These aspects may affect the companies' competitive strategy, according to Shank (1989), Shank and Govindarajan (1992), Chenhall and Langfield-Smith (1998) and Lay and Jusoh (2012). On this occasion, Huq *et al.* (2016) argue that many MNCs sometimes opt for new productive organizational arrangements, acting in productive chains, value chains and supply chains, and may include the expectation of cooperation and/or coevolution among firms as a means of leveraging their decisions.

In accordance with these arrangements, companies seek management approaches that align the needs of production processes with the premises of CMCS, both for cost control and supplier relationships (Kato 1993; Carr & Ng, 1995; Ashvine & Shafabi 2011). One of the major business challenges currently in the automotive chains, related to CMCS, lies in the implementation of measures that 'ensure' cost reduction objectives, in line with Johnson and Kaplan (1987). In the attempt to achieve these objectives, however, some MNCs in the car parts industry impose their prices on suppliers, requiring discounts, productive, financial and operational performance improvements, instead of seeking to establish win-win situations and share the benefits obtained from these improvements among all stakeholders, being international or local companies.

In such a business context, the link between costs and prices needs to be established with due care because, through it, in the long term, the company expects to achieve the highest possible profit, increase its market share, improve its productive capacity and maximize the capital employed (Nagle & Holden 2002). The practical challenges for this to occur are truly quite significant, particularly because of the inflationary pressures on the MNC's industrial costs. Ross (1984) already recognized that inflation affects the sales prices, altering costs and affecting corporate profitability. In addition, the price set by the market as a result of the supply and demand forces does not relieve the companies from evaluating the best mix of products to be manufactured and sold, optimizing the productive capacity. In that sense, the importance of the CMCS, a MACS instrument, as a mechanism to analyze the pricing process is enhanced (Atkinson, Banker, Kaplan & Young, 2004). Authors such as Nagle and Holden (2002) already indicated that profits can be maximized through three pricing strategies: captive price (offering basic products at lower prices), bait price (attracting customers to buy even more expensive products) and the differentiated pricing for a set of products (with lower prices of the items sold together than of individually sold items).

According to Mendes (2003), most of the studies found in the literature on internal inflation use Brazil as a macroeconomic context - which in the recent past experienced a long inflationary experience, alternating periods of growth and recession. This author clarifies that, between the 1960s and 1990s, the average annual inflation rates varied between 18% and 200% - which indicates hyperinflation. Although the hyperinflationary period was overcome in Brazil with the adoption of the Real Plan in 1994 and the Brazilian economy has become stable to a certain extent, we cannot ignore the reflexes that price changes have caused in companies and people's assets over time. These reflections permeate the financial statements, mainly in those accounts measurable in monetary terms, impacting the perception of corporate value. This set of factors permitted generating unique knowledge of inflation sizing methods that allow for cost management, pricing and the measuring of assets in a particular perception, depending on the type of company, structure and, above all, "consumption basket" - which indicates the inflation of each company.

The issue of internal inflation, in particular, is a subject that has not yet been explored,although studies such as Francischetti, Padoveze and Farah (2006) can be found, which can be traced back to small and medium-sized enterprises, but not to production chains nor focused on cost management and pricing in MNCs. Specifically concerning the practical application of the OPI calculation, studies such as Silva and Souza (2003), Gazzana (2004) and Morato (20070 were located, in which the model by Bugelli (1995) called Inflatec was used. This model consists of verifying the relative weights of the cost and expense items, according to the time periods in which the indices are calculated and considering the historical weights and the inflationary effects on them. The method proposed by Bugelli (1995) can help in the CMCS and in pricing, favoring, according to Kato (1993), opportunities to reduce spending due to actions taken along the production chain based on knowledge on the origin of the material, human, financial and technological resources and on the end consumer. It is highlighted that, in companies belonging to a production chain, like in the case investigated, sales pricing depends on external and internal variables, such as: competitive conditions, the company's productive capacity, the automation levels and the management and production technologies applied.

In summary, it could be observed that the method proposed by Bugelli (1995) could theoretically be used as a MACS tool, permitting the sizing of internal inflation in MNCs, allowing managers to know the degree of organizational exposure to price variations of its main inputs along the production chain. The detailed analysis of the accounting accounts, the inflationary pressures and the behavior of the costs, besides constant and in-depth reviews in the company's production process, the application of management strategies appropriate to the corporate positioning towards the activity market, as well as the perception of how this set of actions could affect the company's profitability would be a 'way' for the CMCS, for pricing and for the identification of opportunities of gains within and beyond the company limits.

3. Methodological Procedures

The research described above consists of a qualitative and quantitative case study, with a descriptive and applied approach (Cooper & Schindler, 2006; George & Bennett 2005), seeking to approximate theory and reality, according to Eisenhardt (1989). This approach, according to Morato (2007), is sensitive enough to capture the complexity inherent to the calculation of internal inflation. Regarding the qualitative and quantitative approach, George and Bennett (2005) clarify that a single approach may not be sufficient to meet the requirements proposed in this type of research, justifying the methodological choice. In addition, the combined use of a qualitative and quantitative approach, according to Jick (1979), permits complementary knowledge and greater depth in the analysis.

Jordão *et al.* (2014) and Otley (2016) suggest that MACS need to be investigated using approaches that take into account the context of the organizations investigated, emphasizing the importance of case studies as a means to understand this type of phenomena. More emphatically, however, authors such as Mellahi, Frynas and Collings (2016) and Huq *et al.* (2016) defend the case study as the most appropriate strategy to understand the complexity of the phenomenon in the context of MNCs in emerging countries - as is the case of Brazil.

The selected unit of analysis was the company Sigma, which is a globalized multinational in the car parts business with operations on the five continents. The choice of the case was made based on three different criteria, namely the relevance of the case, the characteristics of the MNC and the profile of the respondents and the access to information - which is considered one of the greatest difficulties in this type of research, according to Jordão *et al.* (2014). The subsidiary where the research was developed is part of the Fiat Chrysler Automobiles (FCA) production chain. This subsidiary has Fiat Automóveis S / A as its main customer, which exerts strong competitive pressures, in addition to the requirement of price negotiation with open cost worksheets. This context offered the possibility to analyze how Sigma's CMCS could impact the competitive and cooperative relationships of these companies in an emerging economy - Brazil. In this sense, Sigma's choice made it possible to investigate the possibility of using OPI as a strategic MACS tool, as the price is not established within the company, but comes from the market - established by Fiat Automóveis S / A. It is particularly emphasized that pricing in Sigma is totally dependent on the costs of the period, given that a mark-up is added whose percentage was previously agreed between the contracting and hired companies.

The units of observation were the interviewees (qualitative part) and the information from the MACS (quantitative part), which were enriched by the vision of analysts and managers of the operational, tactical and strategic level of the company (including superintendents, directors and the president). It is worth mentioning that the respondents were selected by typicity, that is, by the informational capacity they had on the issue under scrutiny. Among the various sources of evidence in a case study, in-depth personal interviews, supported by an interview script, were a primary source of evidence, in line with Eisenhardt (1989). This script consisted of 24 questions based on variables extracted from the literature, concerning the organizational structure and costs; corporate and business strategies; cost control and management strategies; cost and business process; the costing system; the cost and pricing policies; the mechanism and analysis system of costs and prices; to the MACS and its use as an information system to support the strategic and operational decision-making process, the role of the MACS to monitor and monitor the achievement of the established objectives and targets; indicators of productivity, quality and efficiency and critical success factors; errors and opportunities for improvement in the processes; the relations between costs and corporate profitability; the relations among cost management, competitiveness and pricing; the relations among costs, prices and OPI; and finally, the relations among costs, prices and negotiation with assemblers.

The analysis of the results began with the answers to the interviews, which were carried out with 30 professionals at the operational (technicians and analysts), tactical (intermediary coordinators and managers) and strategic levels (superintendents and directors, including the president). These responses were recorded, transcribed and tabulated, with an average duration of 30 minutes each. The interviews were carried out in the last quarter of 2015, responses being complemented in December 2017 and January 2018. The qualitative part of the research was supported by the content analysis method which, according to Bardin (2004), consists of a set of techniques used to investigate the content of the messages of the linguistic communications, helping to make connections between the situation to be analyzed and the manifestations at the discursive surface, put in practice by means of semantic, syntactic and logical dismemberment and classification operations.

In the quantitative part of the research, we aimed to develop a proposal derived from the model originally devised by Bugelli (1995) for small and medium commercial enterprises, expanding it and adapting it for application in an industrial environment in an MNC. Thus, in the quantitative part of the research, the implications and results of the implementation of this proposal were analyzed in a large, globalized multinational organization - the activity universe of Sigma Company. The data for the years 2013 and 2014 were taken at the end of 2015 and beginning of 2016, from which a basic consumption basket and a criterion of weights could be defined for each group, subgroup and item - based on the use of the Pareto curve or ABC curve.

The starting point for the analysis of these data was the information extracted from the analytical income statement, used for the following: a) initial analysis; b) clustering of analytical accounts in the company's account chart with similar characteristics, forming a representative group of expenses for the salary and tax accounts (salaries, weekly paid rest, overtime, night additional, guarantee fund, National Institute of Social Security, provision for vacations and 13th salary, among others); benefits (e.g. health care, transportation); third party services (cleaning, security, lawyers, among others); travel (national and international); and financial expenses (interests, bank expenses, loan repayments, etc.); c) reorganization of the accounts, according to the logic established in item 1, i.e., obeying the criterion of a single account, representing a group by similarity of expenditure; d) consolidation of the expenses of the company's various cost centers in the account groups by nature: personnel (salaries with charges and benefits of all the cost centers of the company); production (all expenses, except personnel, of production cost centers); administrative expenses - all expenses, except personnel, from administrative cost centers; commercial expenses (all expenses, except for personnel, from the sales cost center); and financial expenses. The latter were separated for the sake of a complete income statement, but not considered as an item that could be included in the consumer basket, as its content, for Sigma, is mostly due to the loan repayment account, and is therefore not subject to reduction actions.

The data showing the disbursements that occurred in each of the expenditure items for the 24 months that made up the time series, already classified in groups, were arranged in Excel spreadsheets, side by side, monthly, and then added up. Each row was divided by the total of the respective month, resulting in a percentage value. The percentages of the whole period were added up and this sum was divided by the number of months, that is, 24, resulting in an average percentage - denominated "average weight".

Subsequently, the items were classified in descending order of values, based on the average weight percentages, in line with the method according to which up to 60% of total items should cover 85% of total expenses. Items with relative weights inferior to 3.5% of the total were not part of the expenses group and their percentages were redistributed proportionally among the other items. After determining the weights of each item, costs and expenses were segregated based on the income statement for the year. At this stage, for the purposes of calculating the OPI, indirect production costs and indirect labor costs were classified in the consumption basket of expenses, i.e., only the expenditures on raw materials were named cost. This separation of costs and expenses respected the original method of Bugelli (1995), being considered a central issue for the implementation of the model, in view of the company's reality and the complexity of the industrial environment. After determining the weight of the expense items, the weight of the direct costs also had to be discovered (in this specific case only spending on raw material). Therefore, the data from the time series had to be retrieved. To obtain the weights of the elements in a company's costs, the characteristics of Sigma's activity need to be analyzed - an MNC industry that manufactures car parts and belongs to the automobile value chain. This company is characterized by manufacturing many items and in large numbers. Therefore, for the purpose of simplifying the calculations, the following steps were taken to select the cost items: a) extraction from reports of the items indicated month by month from January 2013 to December 2014; b) the "explosion" of the items in the memorandum report according to the technical list of each; c) the valuation of each item at replacement cost at the end of the period, i.e. December 2014; d) the total valuation of each item by multiplying the replacement costs by the amounts indicated; e) the classification of the items in descending order of value and creation of the relative values of each item based on the division of its value by the general total; and f) the accumulation of the number of items. At the end of these six steps, we reached the list of 190 items, whose cumulative percentages met the method's assumption of covering at least 85% of total costs. Composing a cost basket with 190 items would be unfeasible for methodological purposes due to the number of items produced. Therefore, we aimed to rank the items, clustering them by similarity in the manufacturing: a) classification according to the main characteristic (complying with registration criteria in the company's integrated management system); b) sum of the shares of all items in each group and formation of a total for each group; c) valuation of each item, month by month, by the average cost of the inputs, except for the items in the group called the benefitted component (whose average cost includes raw material and services) that were valued at the contract value.

The values of replacement costs were used only to classify the items and select those with considerable shares in the cost consumption basket. In addition, the same criterion adopted in the composition of the basic expense consumption basket, related to the items with inexpressive shares, was adopted in the composition of the cost consumption basket, that is, the percentages of items that exceeded 85% were eliminated and their weights redistributed, thus forming the basic cost consumption basket. This decision is in line with the calculation method proposed by Bugelli (1995), in which companies with a wide range of products could depart from the representative items of a group or family of items. Without this, the study could not be successful, considering that it was not only the replication of a tool in another context, but there was a translation of a tool originally intended for a commercial environment to an industrial environment with its own characteristics and singularities. On this opportunity, with the technical data of the products and reports of the items sold at hand, the cost variation of raw materials was analyzed over time, verifying their behavior in relation to the previous month.

After this stage, the Inflatec III method was adopted, with mobile weights of the weighted averages. Thus, the weights assigned to each item in the consumption basket were based on the arithmetic mean between the previous weights and the current weights, with monthly updates. These weights fed the first column of the average weights to calculate the second month, and the monthly variation between the weights that increased and the previous average weights represented the OPI of each month.

The calculated index was compared with the official inflation indices IPCA and IGPM. Based on the systematization and processing of the data, the results were evaluated and an indicator sufficiently representative of the price variation the company was subject to was generated. These results were presented and discussed with the respondents - who also provided information on the company's cost structure and its MACS. The concept of improving costs and expense management was emphasized, highlighting those items of greater relevance or above-average growth, with the indication of limit prices in negotiations with suppliers, as well as the monitoring of cost and expense inflation in relation to price growth. The research assumptions analyzed were:

i. OPI originally developed for application in small and medium-sized commercial enterprises can be adapted as a MACS tool in multinational industries; and
ii. the calculation of internal inflation strengthens the CMCS and pricing in the company analyzed (our highlights).

The most important limitation of this study, according to George and Bennett (2005), was that it was based on data from a single company. This fact, however, despite limiting the indiscriminate generalization of the results, does not impede the research. On the contrary, it emphasizes its contribution, considering the need for the availability of detailed and unrestricted data the method requires - which would be hampered in case of multiple companies or large-scale studies. This issue gains special emphasis at this moment in the research, in which there are still few studies on the subject and none, as we know, in MNCs.

According to Cooper and Schindler (2006), the final quality of a paper depends fundamentally on the diversity of procedures used to obtain the data, which is reinforced by Yin (1984), in that the opportunity to use multiple sources of evidence, from a triangulation process is enhanced in a case study. According to Jordão *et al.* (2014), this process is fundamental as a way to increase the reliability of the results and grant internal validity to the study - which in this case was done by comparing the information resulting from the application of the method (quantitative part) with those deriving from the content analysis of the testimonies, direct observation (participant) and documentary analysis (qualitative part). Still, according to those authors, we tried to dismember the research findings affecting each of the specific objectives in topics and compare them with the previous empirical theory and results, in order to obtain greater external validity. Finally, as additional procedures, the recommendations of Kvale (1995) were followed, presenting the results of the research to a group of senior executives of the company. At that time, people examined and validated not only the results, but also the calculation system and how it was adapted and applied in the study conducted in an MNC.

4. Results and Analysis

Founded in 1918, the multinational Sigma acts globally with a strong worldwide presence in the production of components for motor vehicles, currently generating around 18,450 jobs, distributed in 32 plants located in 16 countries. Due to the high competitiveness of the sector, accentuated by all managers (coordinators, managers, superintendents and managers), this company adopted the expansion and global consolidation of its activities as a market strategy, for which it has developed and maintains a worldwide production and distribution of products: Europe accounts for 32.9% of business, South America 32.3%, North America 28.7% and Asia and Oceania 6.1%.

> The Board of Directors defines strategic guidelines at the macro level and the corporate board works with each division in the preparation and annual review of the strategic plan in the respective business units (Chairman of the Board of Shareholders).

The statements of managers at the strategic level have shown that the current global competitive landscape has required that Sigma enhances its ability to identify opportunities nowadays, aiming to achieve sustainable competitive advantages and require changes in organizational structures and processes, in a process of competition and coevolution in countries like Brazil. In the specific case of the branch analyzed, despite all efforts to increase its efficiency, Sigma has been suffering from the loss of margin due to the difficult relations between companies in the automobile production chain, needing to deal with key issues daily, such as the need to have instruments available to support the CMCS and pricing, in an attempt to compensate for the increases resulting from inflation, at prices acceptable to the market. In this sense, the results confirm and broaden the findings of Cooper and Ezzamel (2013), which emphasized the role of MACS in providing key performance indicators in the context of MNCs.

In Brazil, where its parent company is located, Sigma, despite the crisis in the sector, has achieved revenues of nearly two billion reais in recent years. Its strategy includes the search for greater participation in the international markets and for greater production and cost reduction efficiency. In this sense, control over cost management has gained particular interest, relating directly to the competitiveness, profitability and sustainability of this MNC.

> The strategic goals are monitored on a quarterly basis with a long-term focus and monthly in relation to the annual plan, according to specific performance indicators - monitored at operational review meetings with the divisions (CEO).

The set of strategic, tactical and operational testimonies revealed that, in the analyzed unit, the chances of passing costs to the sales prices are more distant from the reality every day because suppliers increasingly inhibit readjustment initiatives beyond the contractual criteria (which are quite restrictive), making it essential to adopt objective tools that reveal the actual effect of inflation on costs and prices, furthering decision making about these factors. The documentary analysis revealed that inflation is one of the few factors that permit price adjustments according to contractual criteria. In this context, it was observed, through several statements, that the information coming from the MACS, by enhancing the calculation of the OPI, gained prominence in Sigma in the analysis and confrontation of the competition, confirming the studies by Morato (2007) and Lay and Jusoh (2012). Several respondents, such as the Controller, considered that "the MACS contributes to the analysis of internal inflation, CMCS and pricing, and can be used easily and effectively as a support tool in company management."

The empirical research results have revealed the need to equate costs with management tools such as IPP which, based on the company's MACS, could facilitate the pricing process or model, amplifying and corroborating the findings of Francischetti *et al.* (2006) related to the extended use of OPI. In this sense, in the course of the research, we aimed to include into the list of available cost management technologies for MNC Sigma an instrument capable of measuring its internal inflation so that, based on the calculation of the price variations of its main inputs, the company could have proper control over its costs. Afterwards, we sought to analyze the costing system of Sigma and what possible contributions it could provide to the CMCS and sales pricing, considering the particularities of the company size, the automobile sector and value chain in which the company carries out its business - this is because ignorance of internal inflation could lead to a distorted perception of its costs' trajectory, making it difficult to establish an appropriate pricing policy.

Thus, considering the information obtained from the MACS, in a time series, and following the Inflatec calculation model developed by Bugelli (1995), the aim was to classify expenditure in costs (58.97%) and expenses (41.03%), excluding taxes or financial disbursements. Similar accounts were clustered, sorting the items in descending order and eliminating the inexpressive items. Expenses corresponding to 41.03% of expenditures are presented in Table 1, whose analysis reveals that personnel expenses are the most relevant, corresponding to 79.22% - which amounts to 32.5% of total expenditure. The other items are less than 2%, reaching less than 9% of expenditure.

Table 1
Composition of expense items and recalculation of relative weights

Items	Weight (%)	Share of expenses in OPI (%)	Redistributed weight (%)
Personnel	79.22	41.03	32.50
Outsourced services	4.67	41.03	1.90
Maintenance (production)	4.61	41.03	1.90
Electric energy	4.23	41.03	1.70
Consumption materials (production)	4.17	41.03	1.70
Freight on sales	3.11	41.03	1.30
Total	**100.00**		**41.03**

Source: elaborated by the authors based on research data

In order to collect cost data, the calculations had to be simplified, which are classified by application similarity, that is, each item was analyzed according to its main characteristic, according to the registration criteria set out in the integrated management system of the company, being classified as: raw material steel, raw material component or benefitted component, maintaining the calculations of shares obtained in the previous stages. Next, the shares of the items in each group were added up and a total per group was formed that valued each item, month by month, by the average cost of the inputs. The exception was the items in the group called "benefitted component", whose average cost value included raw material and services, evaluated at the contract price because it only referred to the outsourced industrialization service.

The values of replacement costs were used only to classify the items, according to their importance, thus forming the cost basket which, similarly to the expense basket, was transformed according to the proportion in the total spending. Details are shown in Table 2.

Table 2

Expense and cost consumption basket with percentage shares

Benefitted component	Initial weight (%)	Share in OPI (%)	Redistributed weight (%)
Raw material (steel)	60.10	58.97	35.40
Personnel	79.20	41.03	32.50
Raw material (components)	22.70	58.97	13.40
Benefitted components	17.20	58.97	10.20
Outsourced services	4.70	41.03	1.90
Maintenance (production)	4.60	41.03	1.90
Electric energy	4.20	41.03	1.70
Consumption materials (production)	4.20	41.03	1.70
Freight on sales	3.10	41.03	1.30
Total	**200.00**		**100.00**

Source: elaborated by the authors based on research data

The analysis of Table 2 reveals that, more impacting than the expense on personnel is the spending on raw materials, followed by benefitted components and others. After completing the composition stage of the expense and cost consumption baskets, the next step was the establishment of the forms and procedures for the collection of prices and the calculation of Sigma's OPI. According to Bugelli (1995: 26), "the first step is to identify, for each expense, the factors that influence its price increases". Table 3 shows the component items of the company's price basket in descending order of participation and the form used for its readjustments.

As can be seen in Table 3, the three items that make up the raw material account for 59% of total expenditures and were grouped for the purpose of simplifying the calculations in: a) raw material steel (most important cost in the company, which produces structural components for light-alloyed steel vehicles), b) components of raw materials and c) benefitted components.

The option was made to analyze the price variations of the items based on the average cost of the inputs with all variations analyzed and corrected distortions; the average prices of the inputs were extracted from the company's integrated system and listed in an Excel spreadsheet. All the variations that occurred were analyzed and the distortions found (such as occasional entry errors, occasional supply with an alternative value, among others) were corrected in order to neutralize non-real price changes. The groups were totaled and the total compared to the previous month.

Table 3

Factors influencing the price increase of company Sigma

Description	Weights (%)	Indexers
Raw material (steel)	35.40	Variation in mean entry price
Personnel	32.50	Wage correction factors (collective agreement)
Raw material (components)	13.40	Variation in mean entry price
Benefitted component	10.20	Variation in mean entry price
Outsourced services	1.90	IPCA and IGPM
Maintenance (production)	1.90	Variation in mean entry price
Electric energy	1.70	Variation in provider and free market tariffs
Consumption materials (production)	1.70	Variation in mean entry price
Freight on sales	1.30	Negotiation on truck value per stretch – single provider
Total	**100.00**	

Source: elaborated by the authors based on research data

This step was translated into one of the main adaptive changes of the method for application in the industry, as Bugelli (1995) initially suggested that prices be submitted in each item, analyzing variations through replacement prices. This would be impracticable due to the large volume of raw material items Sigma uses. A similar fact occurred with consumption and maintenance materials. It is worth mentioning that internal and external audits use average price variation analyses at the end of quarters to validate inventory account balances and cost and profitability calculations. The maintenance of equipment is done by employees of Sigma itself, whose salaries make up the item personnel expenses in the consumption basket. Only maintenance materials which, for internal reasons, are stocked separately from consumer materials, were valued under this heading. Wages, as a rule, are corrected at the time of the category's collective bargaining agreement (CCT). In the case of metal workers and for the sake of simplification, all salary-related funds received the same correction factor established in CCT - which was another adaptation of the original method to the industry's reality. Expenses arising from outsourced services, measured on the basis of contractual criteria, varied according to the IBGE's IPCA and FGV's IGPM indices (accessed through Internet search engines). The company Administre, which provides electric power management services to Sigma, calculated the variation in electric energy expenses.

The company Sigma concentrates more than 90% of its sales to the automaker Fiat Automóveis S/A without incurring freight expenses, as the automaker collects the merchandise in the JIT system. The other freights (including tolls) are paid per distance covered and type of vehicle. In the period analyzed, there was no change in trading conditions. Nevertheless, the price variation of the items in the company's consumption basket was obtained based on the criteria mentioned, over which Sigma has no control. Being variables established by the market, it is up to the company to measure and evaluate the impacts of these variations on their cost and price structure. On the whole, however, the aforementioned groupings provided for the application of the method and the analysis of the effects of internal inflation on prices in the course of 24 months, as shown in Table 4. On several occasions, the deponents emphasized the importance of this analysis and its internal coherence with its strategic objectives, in line with Lay and Jusoh (2012).

> Monitoring internal inflation is fundamental for the company's sustainability over time and serves as a fundamental pillar of support to the cost and sales areas (Director-Superintendent of the Plant).

Table 4

Price variations in items in the consumption basket of company Sigma - 2013 and 2014

Items /Variation percent. 2013	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Personnel	–	–	–	–	–	–	–	–	–	6.58	–	–	6.58
Outsourced services	–	0.14	0.48	0.33	0.37	–	0.50	1.22	–	–	0.35	1.68	5.08
Maintenance (production)	-0.07	0.23	-0.02	0.26	0.01	0.05	-0.10	0.05	0.17	0.29	0.10	0.16	1.12
Electric energy	-2.21	-7.57	-0.34	21.83	2.68	-0.25	0.24	-0.15	1.55	-0.14	1.52	-0.23	16.93
Consumption materials (production)	-0.07	0.23	-0.02	0.26	0.01	0.05	-0.10	0.05	0.17	0.29	0.10	0.16	1.12
Freight on sales	–	–	–	–	–	–	–	–	–	–	–	–	–
Raw material (steel)	-0.65	-0.30	0.51	0.79	1.86	0.78	3.71	-0.47	0.81	0.75	0.10	0.74	8.63
Raw material (components)	-0.04	-0.81	0.50	0.12	0.36	0.35	1.14	0.37	-1.47	1.81	2.13	2.06	6.52
Benefitted component	-0.10	-0.02	0.16	-0.16	0.59	-0.29	-0.28	0.23	0.43	0.16	-0.24	-0.18	0.32
Itens /variação percent. 2014	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Total**
Personnel	–	–	–	–	–	–	–	–	–	7.00	–	–	7.00
Outsourced services	–	0.12	0.44	0.34	0.39	–	0.51	1.30	–	–	0.39	1.82	5.33
Maintenance (production)	0.09	0.09	0.75	0.51	0.34	0.75	0.44	0.24	-0.04	0.10	0.06	0.45	3.77
Electric energy	1.24	0.04	0.17	0.60	0.38	-0.06	-0.36	0.36	1.37	0.78	1.15	0.34	6.01
Consumption materials (production)	0.09	0.09	0.75	0.51	0.34	0.75	0.44	0.24	-0.04	0.10	0.06	0.45	3.77
Freight on sales	–	–	–	–	–	–	–	–	–	–	–	–	–
Raw material (steel)	1.31	3.99	1.91	0.91	0.26	-0.29	-0.25	-1.19	0.07	1.53	-0.19	-0.07	7.99
Raw material (components)	0.93	0.71	0.87	0.97	0.69	0.40	-0.91	3.41	0.84	-0.19	-0.07	0.02	7.67
Benefitted component	-0.19	-0.15	0.14	0.24	-0.12	0.16	-0.29	-0.03	-0.08	0.07	0.42	0.02	0.18

Source: elaborated by the authors based on research data

Table 4 shows that the analyzed items behave quite peculiarly over time. Although there is no single standard among them, in both years, the largest readjustments happened in electricity, raw materials and personnel. It could be observed, in agreement with the findings of Bugelli (1995) and Ross (1984), that the internal inflation calculation system in the company permitted observing the evolution of the expenses, thus influencing both the cost control and management process and the sales pricing - because the analysis of Sigma's internal inflation derived from the creation of price indices for its main inputs.

These findings were in line with the premises of Francischetti *et al.* (2006), indicating that simply obtaining an index is not enough for a company to make decisions on CMCS. In order to do so, these authors propose that the use of the information deriving from the internal inflation calculation system should consider its impact on profitability, taking into account the market the company operates in, which demonstrates similarity with the research findings.

Table 5 exemplifies the calculation of the OPI for one month at Sigma, a procedure repeated for the entire 24-month period. The calculation of this index was in line with the expanded perspective of control, according to the findings of Jordão *et al.* (2014), related to the development of a strategic awareness oriented to continuous improvement, as the competitiveness of the market Sigma is inserted in was already fierce in the XX century, but, in the last four years of the 21st century, the company 'suffered a lot' in terms of competition due to the entry of new players, considering that the market did not grow in that period and, as a result, the company's turnover was reduced. The changes in spending observed in Sigma as shown in Table 4 represent a real increase of the costs distributed in the items of the consumer basket, as exemplified in Table 5. The triangulation among the statements of the different levels revealed that this company has difficulties to pass them on to the customers, especially due to (Fiat) - which requires an open cost sheet in the negotiation of prices and exerts strong pressure on the company's pricing. These pressures, coupled with the reality of the car parts industry in 2016, which showed an average decline of 12.4% in sales in 2015 compared to 2014, impacted the company analyzed, leading to a sharp drop in or-

ders by this automaker. The triangulation among the testimonies, direct observation and documentary analysis also revealed that manufacturing overheads - which make up the hourly rate, which divided by a smaller volume of items produced - increase the unit cost - need to be recomposed so as not to "erode" the banks. In this sense, if there is no counterpart of revenue, the company may end up losing in the product margin. This scenario of decline was repeated in 2016, presenting a 24.3% loss in production in the period from January to May when compared to 2015.

Table 5
Demonstration of internal inflation calculation in January 2013

Items	Mean weights 24 months (%)	Variation (%)	Weights with increase (%)	New weights (%)	New mean weights month 01/2013 (%)
Personnel	32.50	0.00	32.50	32.60	32.55
Outsourced services	1.92	0.00	1.92	1.92	1.92
Maintenance (production)	1.89	-0.07	1.89	1.90	1.89
Electric Energy	1.74	-2.21	1.70	1.70	1.72
Consumption materials (prod.)	1.71	-0.07	1.71	1.71	1.71
Freight on sales	1.27	0.00	1.27	1.28	1.28
Raw material (steel)	35.44	-0.65	35.21	35.31	35.38
Raw material (components)	13.36	-0.04	13.36	13.40	13.38
Benefitted component	10.16	-0.10	10.16	10.18	10.17
	100.00		**99.71**	**100.00**	**100.00**
	OPI		**-0.29**		

Obs.: The same procedure was adopted for each of the months in the period analyzed.

Source: elaborated by the authors based on research data

In Sigma's competitive context, it was observed that the OPI was perceived as a tool that objectively reveals the true effect of inflation on the company costs, providing it with a means to justify the transfers in the prices to the clients. In Figure 1, the OPI is compared with the IPCA and IGPM indices during the 24 months used to support the analysis made.

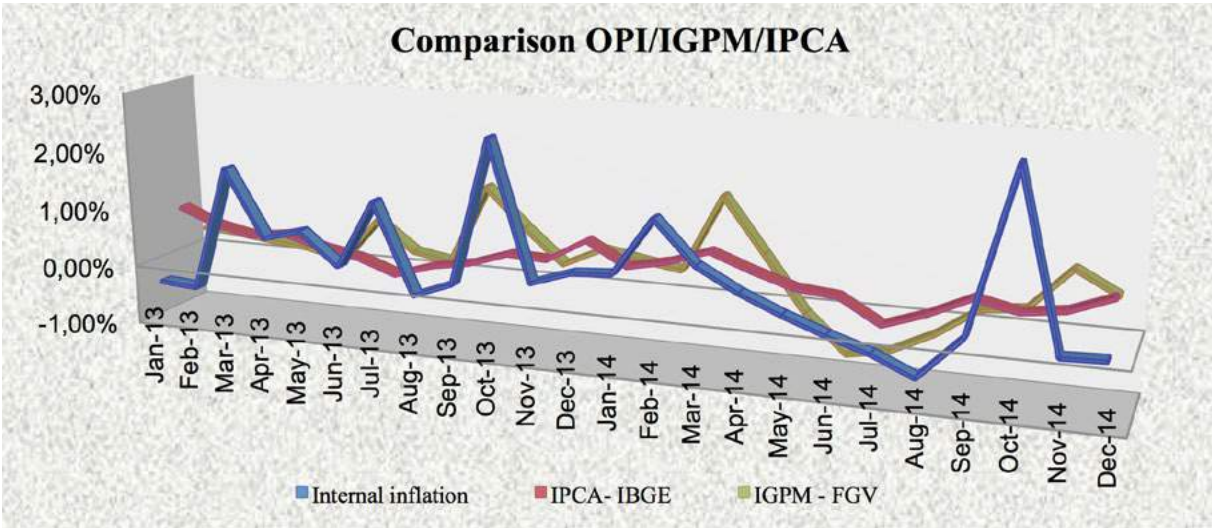

Figure 1. Comparative graph of inflation between OPI using official indices (IPCA-IBGE and IGPM-FGV)

Source: elaborated by the authors based on research data

The analysis of Figure 1 indicates a greater linearity of these indices than of the OPI, that is, the analysis revealed that Sigma is more subject to price changes in its main inputs than revealed by the main official inflation indexes disclosed. As observed in this figure, the accumulated internal inflation index for the years 2013 and 2014 at Sigma was 13.99%, which is two percentage points higher than the IPCA, which reached 11.99% and 4.95% higher than the IGPM, which recorded 9.04%. This demonstrates that, if the company had opted for one of these two indices (which were previously used as the basis for negotiating margin recomposition), instead of OPI, it would have significant losses, especially when considering that the company's turnover is about two billion reais per year. In fact, tactical and operational statements confirmed this possibility, indicating that the index itself was not yet being used, but emphasized that this possibility could be fully utilized in the company and could bring financial benefits without a great increase of work, making future price negotiations fairer.

The documentary analysis revealed that the variation in the months October 2013 and 2014 was due to adjustments in the payment sheet resulting from the collective agreement of the (metal worker) category. The adjustments observed in the months March, April and May of 2013 and of February, March and April 2014 consist in readjustments in the steel price. As changes in the items that make up the company's consumption basket are subject to variations that are beyond its control, it needs its own instruments, such as the OPI, to measure variations in expenses and it needs to act in order to minimize the reflections of those variations in the expenses. Based on the adapted method, it was possible to arrive at the final calculations, also witnessing opportunities for improvement and potential efficiency gains, deriving from optimizations in processes and production systems. It is important to highlight the contribution of the application of this method, as it does not derive from statistical or econometric methods, but it allowed the company to know the behavior of the variables that influence the behavior of the prices of its main items in the analyzed period in a relatively simple way. The use of multiple methods for data collection, analysis, and interpretation has made it clear that this perspective links methods to assumptions. The fact that it was able to combine methods and sources of qualitative and quantitative data collection (testimonials, documentary analysis, ERP reports, direct observation and field notes on the calculations of internal inflation) allowed a broader view of the effects of inflation on costs in the industry analyzed. The triangulation between the different statements at the strategic level (superintendents and directors, including the CEO) allowed us to understand that the application of the OPI calculation method has great strategic value and was well accepted in the company management, particularly as, in the market Sigma operates in, prices are imposed by the automaker Fiat, which, in hiring suppliers, often requires extra efforts from these, such as the concession of discounts on current products (the so-called performance discount). The synthesis of the management's perception is illustrated by the account of a senior executive, who said:

> The calculation of internal inflation is an important instrument, as it supports the company in the systematic monitoring of its costs, thus creating parameters based on the complexity of the company itself. Maintaining profit margins, in an increasingly competitive market, requires applying, in the company, methods to monitor inflationary effects and know how to pass them on to the market or, where this is not possible, to compensate them with internal actions. Therefore, companies that seek to maintain controls to measure their internal inflation and effectively know their effects, have greater probabilities of success (Controllership Director).

5. Discussion of Results and Analysis of Premises

Through the triangulation between documentary analysis, formal and informal statements, direct observation (participant) and cost data extracted from the MACS, it was verified that, during the period in question, the company was subject to price variation in its main inputs, measured by the OPI, which was higher than the IPCA and IGPM, revealing both the managerial utility of the method in industrial companies and the effects of the analysis of internal inflation for the CMCS and sales pricing, fully confirming the first and second research assumption, as shown in Figure 2. In this sense, there was a significant alignment between the quantitative and qualitative analysis of the research.

In analyzing the method used for internal inflation calculations in Sigma, it was noticed that, due to the industrial characteristics and quantity of items in the company's manufacturing, the method proposed by Bugelli (1995), for small and medium enterprises, lacked adaptations such as the clustering of items by similarity in the application and the variation analyses by groups and the adoption of the average stock price instead of market prices, which would permit measuring the price changes of the company's main inputs and how to explain the main flows that relate to the CMCS. Sigma, part of the automotive production chain, participates in the market through requests for price quotes for which there is a target that needs to be reached. To compete, efficient cost control is required. Although it was considered relevant for the company to know its OPI and use it as a management tool in strategic cost planning and pricing, the findings revealed that there were practical difficulties in sizing the effects of internal inflation on cost management and pricing, as the company was not, until then, knowledgeable about its OPI.

In Sigma, through a detailed analysis of its costs, it was verified throughout the research described that the 'paths traveled' by the resources in the industrial transformation process, in a simplified view, originated from purchases, where other costs are aggregated, and are finalized upon delivery to the customer. These evidences were supported by the direct observation and documentary analysis, being confirmed by the operational statements.

During the process of cost sizing and inflation analysis, the adaptations that were necessary for the effective calculation of the OPI were discussed and defined, such as: the substitution of the pricing in three suppliers by the use of the average stock value, the clustering of items by similarity and the treatment of variations by groups. Together, these adaptations would enable the application of the method in the case analyzed, allowing its application in a large multinational industry. In this sense, interviewees of all levels perceived the calculation system of internal inflation as an important innovation that can now be considered in the company's cost control and management process, confirming the first research premise.

Premises	Result	Theoretical-empirical implications
(i) The OPI originally developed for application in small and medium-sized commercial companies can be adapted as an MACS tool in multinational industries.	Fully confirmed	The analysis of the original system was unable to permit decision making in industries. Through the adaptations, the method was capable of permitting cost appropriation in the multinational industry analyzed, according to the accounting parameters in force in the company. The OPI calculation method led to the adoption of the mean inventory value as the base for verifying price variations – which broadened the applicability of the method.
(ii) The calculation of the domestic inflation makes possible CMCS and pricing in the company analyzed.	Fully confirmed	The dimensioning of the internal inflation provided increased knowledge on the reality of the analyzed companies' costs, furthering the CMCS in relation to the MACS model that used to exist in the company. The experience supported the creation of a standard to support future price negotiations.

Figure 2. Synthesis of research premises, results and theoretical-empirical implications

Source: elaborated by the authors based on research data

When analyzing the second research premise, it was realized that, for the sake of sales pricing, the company uses the manufacturing route, which is designed by process engineering, whose valuation is based on hourly rates that reflect manufacturing overheads. The raw materials are valued at the replacement price. In addition, general, commercial and administrative expenses are considered. On these expenses, a mark up is established. Automakers impose a target price limit, however, which has to be achieved for the auto parts manufacturer to be appointed as the supplier of a particular item. The negotiations between automakers and the auto parts industry were increasingly difficult, as the system of calculating the company's internal inflation, as well as its role for CMCS, is also important in the pricing process as this method provides the negotiator with relevant details about costs in order to reveal the effect of internal inflation on them. This helps to identify the price limits, aiming for greater flexibility and maintenance of the company's profitability. The controllership and sales departments systematically monitor the product margins and periodically open negotiation rounds with the assembler to pass through changes in costs, such as collective bargaining and/or steel price increases. The testimony of the plant director illustrates this dynamic:

> Negotiations are necessary based on internal and external changes of economic indicators and/or cost evolutions. This occurs directly (sales x purchases), with the open demonstration of the economic evolutions and their influences on the cost and prices. When we deal with individual items, minimum price parameters are defined through controllership, in an attempt to guarantee the defined margin (Director-Superintendent of the plant).

The findings of the study are in line with the observations of Mutlu, Zhan, Peng and Lin (2015), which advocated that the result of increased competitiveness and rivalry between MNCs and local firms made it difficult to predict the competitive results between the former and the latter, as some domestic companies with lesser resources can leverage their unique domestic skills to establish a global presence, facing the competitive challenge posed by MNCs from developed economies. In the case of Sigma, this challenge generated a hypercompetitive environment, and the analysis of the inflationary effects on costs and prices helped it to meet the shareholders' expectations of return. The results of the study show that the CMCS can be leveraged through the use of OPI, as the analysis and detailed monitoring of the inflationary effects on purchases, especially for the main consumption items, may open up new possibilities for the company to obtain gains over processes and the supply chain, especially with suppliers, aiming to increase profitability and competitiveness - which until then were not considered, in view of a worldwide trend (very strong in Brazil) that automakers demand open cost sheets in the negotiations. These issues are emphasized in the statements of tactical and strategic managers - who on several occasions explicitly mention the importance of using OPI, suggesting that it can be used in the formulation and implementation of new cost and pricing strategies. This corroborates and amplifies the observations of Nagle and Holden (2002), for whom the design of a company's pricing strategies should make it possible to obtain a unit contribution margin in the quantities to be sold, according to the desired return.

Although authorized in the planning of the year 2016 that the calculations of the OPI were made via ERP, the data analysis revealed that this still did not take place in 2017. The declarations of the leaders clarified that this fact is due to the reflections of the economic crisis on the performance of the Brazilian automobile industry and the necessary expenses for the changes in the company's ERP, in order to allow this to be done systematically. The managers' expectation is that this integration between cost controls and ERP can provide for a faster calculation and refinement of the method, confirming and expanding the results of Maiga *et al.* (2014). Even so, a surprising result, aligned with the research object, was that the organizational learning deriving from the research, resulting from the involvement of the people in the construction of the OPI to be used as a managerial tool, already supported the price recomposition negotiations with the customers in 2015. At the end of the research, a work group was created to deepen the cost controls in 2015, 2016 and 2017, such as: (i) review of apportionment criteria of indirect manu-

facturing expenses, (ii) revival of the cost module of the ERP (optimizing its functions), (iii) joint work with the process engineering, logistics and manufacturing area (review of manufacturing scripts and their relation with the work centers), (iv) knowledge of recording levels, including automation studies, as well as (v) increase of the level of details in the analyses of the realized versus planned hour rates (with identification of main variations).

On the whole, the results showed the managers' concern with the effects of the OPI on the costs and the performance. Triangulation among the different data sources confirmed that the sizing of domestic inflation, in fact, can contribute to cost management and to improved business profitability. These results align with and amplify the findings of Mellahi *et al.* (2016), who perceived, through a qualitative case study in three Brazilian MNCs, that these companies had a strong tendency to centralize and standardize their performance measurement policies and practices. In a similar way to the present study, these authors verified that the MACS practices of the MNCs analyzed were strongly influenced by the global and non-local best practices, revealing an alignment between the policies and management processes of the subsidiaries in developed countries with the subsidiaries in developing countries. In the case of Sigma, however, the results go beyond those authors, as changes in the company's functional structure in the last quarter of 2016, especially in the controllership directory, added to the statements of the directors, indicate the inclination of the board to implement the calculation method of the internal inflation in all the plants of the company in Brazil as from 2017. These issues are highlighted in the testimony of the plant director, for whom:

> The work presented demonstrated the importance of inflation sizing for CMCS and pricing, being a valid question for our company. Similarly, I think it will be for others as well. This theme should be further explored in order to be implemented as a daily activity in our current management (Director-superintendent of the plant).

The results of this study extend the understanding of MACS in a broader perspective that takes into account the context of organizations, as advocated by Otley (2016). In this sense, in line with Eisenhardt's (1989) premises, the results of this case can help construct theories and models on the subject, especially in MNCs. In an integrative perspective, the sizing of internal inflation in the firm can be thought of as a 'driving force' for the costing and pricing strategy, corroborating and amplifying the observations of Turner *et al.* (2017) on the role of the MACS in the strategic implementation - because the information extracted from the MACS was considered fundamental for the correct dimensioning of the product costs and for the analysis of the impact of the inflation on them.

Likewise, it was realized that the MACS contributes to this sizing, facilitating the implementation of measures that 'ensure' the objectives of cost reduction, in line with Sakurai (1997). What is more, a surprising finding of this study contradicts and expands the observations of Mellahi *et al.* (2016), who considered it plausible that, as emerging market MNCs increase their experience in managing global operations, they will learn how to build rapport with local actors and adopt global best practices in order to increase the legitimacy of approaches from the parent to the subsidiaries. In the case of Sigma, the statements of the managers revealed that the experience reported in the research and that is already being implemented in the subsidiary is that it can and will be incorporated in the other MNC units.

On the whole, these statements exemplify some practical possibilities the implementation of OPI for CMCS offers, generating significant contributions to managerial practice by providing similar companies with a benchmarking process and allowing the analyzed MNC to improve its structure every day in order to face the challenges of remaining competitive in its market.

6. Final considerations

The theme involving the CMCS and sales pricing in MNCs has gained relevance in the accounting and management literature, also being a concern of professionals and academics. Nonetheless, the understanding of the effects of domestic inflation on the CMCS and pricing in MNCs is yet to be understood in depth. Recognizing and exploiting this research gap, the research described in this article aimed to analyze the contributions of the internal inflation sizing to cost management and control strategies and pricing in a world-class MNC.

The empirical results indicate that a method originally developed for small and medium-sized commercial enterprises could be adopted, allowing the company to access detailed information about its costs, analyze how the main cost variations occur, verify the relations between internal inflation, costs and pricing, in addition to permitting strategic cost management. As a result, the research described in this article allowed us to establish relationships that can serve as a standard for the company to adopt and that can enhance current and support future price negotiations at Sigma. In this company, the calculations indicated, for the two years analyzed, that the OPI captured a change in input prices superior to the value measured by the official inflation indices.

The qualitative analysis revealed that this company lacked a tool that would direct the 'managerial look' to the in-depth analysis of costs and how they incur, helping Sigma to balance the capacity to absorb increases and its need to transfer them, aiming at the maintenance and/or improvement in expected profitability. In the company, the OPI emerged and permitted the expansion of the control perspective, related to the development of a strategic awareness oriented to continuous improvement in the MNC by continuously seeking production efficiency and cost reduction (basis of its competitiveness), keeping in mind that it develops its activities in the context of the automotive value chain, that is, in a complex, unstable, competitive and often hostile environment.

Considering the inherent limitations of a single case study, we aimed to increase the internal and external validation of the research findings through triangulation among the different sources of evidence and between the findings and the literature, respectively, in order to grant greater wealth of details to the interrelationships among the research variables. For this purpose, methodological triangulation (internal and external) was used, which resulted in the possibility to analyze the data obtained from different sources, corroborating, complementing or contradicting the previous empirical findings. Specifically, in this case study, the scope did not encompass analysis along the value chain, due to time and access constraints, being also an aspect beyond the scope of this research. As a result, it could not be quantified whether benefits can be obtained to be shared among the companies in the chain, and the subject deserves further research. In this sense, it is recommended that new case studies can be done, specifically involving the other companies in the value chain (MNCs and local), replicating the method applied or applying it in more than one MNC along the supply chain. The expectation is to share knowledge among the companies, to observe opportunities for joint task development that can somehow contribute to the CMCS of the chain, and not only of a certain company. As the study of internal inflation is still an incipient field in accounting and management literature, it deserves discussion and deepening of how to use such information in cost management and profitability in different MNCs. The CMCS itself requires more in-depth research, especially in the observation of other cases in other value chains and/or the comparison among different sectors.

As managerial implications, other MNCs can use the research experience described in this study, either to materialize concepts of a technical-commercial proposal via an open cost spreadsheet, or to support decision-making on price negotiation in situations similar to those of an assembler or its suppliers, or to size international cost variations in MNCs. Thus, it is expected that the observed results can make the customer-supplier relationship compatible with the declared expectations in the formulation of its strategy.

Summarizing the results of the research, it could be concluded that (i) the OPI calculation method developed for small and medium commercial enterprises was successfully adapted to an industrial world-class MNC. As observed, this case study established possible routes for its future application in other large industrial companies and/or MNCs. In addition, (ii) it was noticed that the OPI, by helping the company to know its costs in further depth, indicated opportunities for appropriate and "aggressive" cost management, helping the company to establish a pricing policy in line with its profitability objectives. Thus, the OPI calculation is a differential capable of equipping the MNC with better CMCS for sales price negotiations, as it reveals the company's specific exposure to price variations of its main inputs. This tool can turn into an indicator of profitability maintenance, gain or loss when compared to indicators like IPCA or IGPM, normally used for the recomposition of losses in the Brazilian context. What is more, based on the research findings, we can conclude that, (iii) in an integrated perspective, the effects of the price variation the MNC suffered in its main inputs are directly related with the CMCS and should also reflect in the sales pricing.

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Accuracy in Earnings Forecast and Organizational Life Cycle Stages: Evidences in the Brazilian Capital Market

Abstract

Objective: This study aimed to investigate the effect of the organizational lifecycle on the accuracy of analysts' forecasts in the Brazilian capital market, presupposing that the challenges for the financial analysts' projections can vary in the course of the companies' evolution.

Method: The sample consisted of 713 companies per year in the period from 2008 till 2014. This information was used to measure the accuracy of the earnings forecasts, and Dickinson's model (2011) was used to measure the companies' life cycle stages. As for the analysis methods, linear and quantile regression and sensitivity test models were used.

Results: The results revealed that the analysts' earnings projections are affected more problematically for companies in the birth and decline stages, despite controlling for several common factors in the literature on analysts' forecast errors. An additional control was included for financial difficulties, but the results remained qualitatively similar. As for the optimism and pessimism in the forecasts, the results appointed that, depending on the life cycle stage, the optimistic or pessimistic bias can particularly increase or decrease; the decline stage lead to projections with a lesser bias in comparison with the other non-mature stages, despite the previously mentioned controls.

Contributions: The study can contribute to the literature by evidencing that environmental factors tend to play a determinant role in the accuracy of the earnings forecast.

Key words: Analysts, Accuracy, Organizational Life Cycle Stages.

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1. Introduction

The determinants of the accuracy of analysts' forecasts are mainly due to characteristics related to analysts' experience and coverage, brokerage size, firm size and corporate governance (Martinez, 2004; Hirst, Koonce & Venkataraman, 2008; Dalmácio 2009). Nevertheless, in a current scenario of ongoing crises and constant changes in firms, there is a need to identify the influence of internal and external environmental factors, such as life cycle stages (LCSs) in the accuracy of analysts' earnings predictions.

The Business Life Cycle theory, which guides this study, can evidence aspects of businesses' evolution, demonstrating an alternative economic scenario, motivated by internal environmental factors, such as the adopted strategy, financial slack, management capacity, among others, and external environmental factors such as corporate competition and macroeconomics (Costa, 2015). Thus, growth tactics and the ability to raise capital can vary in different stages of a company's life cycle, which can be divided into five phases: birth, growth, maturity, turbulence and decline (Mueller, 1972; Dickinson, 2011). Thus, for each stage of the life cycle, the analysts are expected to behave differently.

In the birth stage, the firm's value depends entirely on its future growth potential. Thus, estimates are prone to error due to the context of uncertainties (Miller & Friesen, 1984; Costa, 2015). According to Dickinson (2011) and Hribar and Yehuda (2015), mispricing occurs throughout the life cycle, but is especially perceived during the early stages when the signs of different performance measures are more distinct. In addition, there is little publicly available information about these new companies. Thus, there is more private information, which tends to increase uncertainty, hindering the analysts' accuracy (Girão, 2016).

In the growth stage, the valuation is still limited and unreliable, which may compromise the accuracy of analysts' forecasts (Costa, 2015; Koh, Dai & Chang, 2015). In this phase, the forecasting difficulty is increased and, consequently, the costs and efforts for analysts to follow the companies in the growth phase are increased (Hamers, 2017). In addition, the reduced visibility of firms in the growth phase may limit the benefits of analysts that could derive from these firms' coverage (Bushee & Miller, 2012).

At maturity, in turns, analysts tend to make more accurate forecasts, as firms are less prone to the predictability risk (Costa, 2015). Mature companies have a stable operating environment, reflected in persistent profits, thereby facilitating analysts' ability to predict future performance more easily (Easley & O'Hara, 2004, Donelson & Resutek, 2015). Mature companies do not have many investments to make, nor are they likely to default (life cycle classification based on cash flow signs evidences this), making profit more predictable when compared to the early stages.

In the turbulent stage, accounting information loses relevance and may undermine the analysts' performance (Dickinson, 2011; Costa, 2015). Companies in turbulence can migrate to earlier stages, deploy new ideas or improve their efficiency, or they can move into the decline stage. Little is known about these companies though, leading to uncertainty about the implications for the financial analysts' difficulties (Girão, 2016).

Finally, in the decline stage, analysts' earnings forecast tend to be easier because they are based on existing assets and past practices (Damodaran, 2012). Thus, due to the visibility of these companies and the analysts' greater knowledge, this stage tends to present more accuracy. Investors need to know how long these companies will be able to continue the activity or whether they will be able to pay dividends (Girão, 2016). Therefore, the analysts' monitoring should be more prioritized, also facilitating the accuracy of the earnings.

There also exists a hypothesis that, in different conditions of the economy and, consequently, of firms, the analyst's degrees of uncertainty and confidence affect their beliefs about the future of firms. Evidence (Jiang, Habib & Gong, 2015) indicates that economic recession is positively associated with error accuracy, but negatively associated with forecast accuracy. Nonetheless, not only these economic aspects influence the firms, and the recession will not necessarily affect all firms.

Hamers (2017), in turn, investigated how the enterprise life cycle affects the analyst and the properties of the analyst's forecast, presenting the first international evidence. Using a sample of listed companies in the United States between 1994 and 2012, it was verified, as far as the accuracy of analysts' forecasts is concerned, that analysts' individual forecasts are less accurate for companies in the introduction, turbulence and decline phases in relation to forecasts issued for mature companies. The predictions of individual analysts are more accurate for companies in the growth phase though, countering theoretical assumptions.

Thus, although evidence on the subject is scarce and limited in developed markets, there are indications that life cycle stages can determine analysts' earnings forecasts. Thus, the main objective of this article is to investigate the effect of the organizational life cycle on the accuracy of analysts' forecasts in the Brazilian capital market.

The justification of the study is due to the importance of the factors that determine the accuracy of earnings forecasts as, internationally, evidence is found that considers the effects of companies' internal and external environmental factors. A wider debate is necessary in the literature though and the findings of other works need to be expanded, considering the influence of life cycles on the quality of earnings forecasts (e.g. Jiang *et al.*, 2015 and Hamers, 2017), with a different form of capturing the effect of each stage of the enterprise life cycle by analyzing the optimistic or pessimistic bias of the forecasts, as well as by investigating an emerging capital market, such as Brazil, due to its various informational peculiarities (obscurities), (Girão, 2016).

In addition to the factors that determine the accuracy of earnings forecasts, it is important to emphasize the relevance of analysts' projections, which deserves attention and debate, as they reduce informational asymmetry and influence the decision-making process of investors and other users (Sun, Carrete & Tavares, 2017).

In order to meet the proposed objective, we used Dickinson's (2011) classification model of LCSs, which classifies companies into 5 stages: (1) birth; (2) growth; (3) maturity; (4) turbulence and (5) decline, based on the signs of the cash flow statement. Then, dummy variables were created for each stage, except for maturity, to serve as a reference in the analysis of the results and to avoid the trap of the dummy variable.

To analyze the accuracy of the analysts' forecasts, a model based on the studies of Jiao, Koning, Mertens and Roosenboom (2011), Gatsios (2013) and Martinez and Dummer (2014) was used, using a measure called Absolute Forecast Error (AFE), being used as a proxy for accuracy. In order to analyze the pessimistic and optimistic biases, the forecast error was used without the application of the module to obtain the absolute error, so that the negative errors (observed earnings - expected earnings) represent the analysts' optimism and positive errors represent pessimism.

The main results of the survey pointed out that the analysts' earnings projections for companies in the birth and decline stage are the most problematic, despite controlling for several common factors in the literature on analysts' forecast errors and financial difficulties. With regard to optimism and pessimism in the analysts' projections, in short, the declining stage has led to less biased projections comparing with the other non-mature stages, even when controlling for the various factors that may affect analysts' forecasts.

2. Development of Hypothesis

Life cycle literature suggests three key aspects: (1) life cycle stages may explain the differences in the underlying economy of value attributes, such as the production function and companies' investment opportunity; (2) companies in different stages of the life cycle need customized management of their business in order to be successful and; (3) the knowledge of the company's specific life cycle stage may favor the understanding of where the firm is and where it intends to go (Park & Chen 2006).

This research focuses on the first aspect, because analysts tend to check the evolutionary stages of firms in the valuation process, as business fundamentals (which create value) tend to vary throughout the stages of the life cycle and the asymmetric information level also differs between the stages, which may affect the valuation process and the analysts' accuracy.

According to Dalmácio, Lopes, Rezende and Sarlo Neto (2013), analysts, when projecting future earnings, evaluate firms' observable and individual characteristics, in which they can determine whether to acquire the investment, considering the accuracy of their projections. Investigations aimed at understanding the activities of analysts are important, as not every earning forecast produced is useful, often due to bias, as well as lack of accuracy and precision (Myring & Wrege, 2009). Nevertheless, there is little evidence that considers the individual economic characteristics of firms, such as the life-cycle stages in the analysts' earnings predictions (Jian *et al.*, 2015).

Almeida and Dalmácio (2015) investigated how the interaction of competitive environments and corporate governance has improved the accuracy of analysts' forecasts and deviations from forecasts. Their results revealed that, despite the fact that competition increases the flow of information, it negatively influences the accuracy of analysts' forecasts and increases the deviation of the forecasts. Corporate governance mitigates informational problems though. Thus, it is expected that the influence of competition on the evolution of the company's life phases may compromise analysts' accuracy in forecasting future earnings.

Lima, Carvalho, Paulo and Girão (2015) carried out a study to analyze the effect of the life cycle stages of the companies listed on BM & FBOVESPA (currently Brazil Stock Exchange - B3) regarding the quality of their accounting information, in the period from 1995 to 2011. The model by Anthony and Ramesh (1992) was used to measure the stage of the life cycle. The evidence from the survey suggests that there are significant differences in the quality of accounting information, except for the management of accounting results between the life cycle stages of Brazilian publicly traded companies. Thus, it has been suggested that this behavior may influence the valuation process.

Costa (2015) investigated the effects of life cycle stages on the quality of accounting information, from 2008 to 2013, considering as attributes: relevance, timeliness and conservatism, as well as Dickson's model (2011) to measure the stages of the life cycle. Their results indicated that in the growth and maturity phases, accounting information is more relevant and timely, whereas conservatism was not statistically significant in the life cycle stages.

Some authors have investigated the factors affecting analysts' accuracy in predicting Initial Public Offering (IPO) gains, using the company's life cycle, company size, forecast period, leverage, industry classification, volatility of the stock price and audit quality (Lonkani & Frith, 2005, Bahramian, 2006, Sareban & Ashtab, 2008) as proxies.

The results of the research by Lonkani and Frith (2005) revealed that there exists an exclusive positive relationship between errors in earning predictions and size and forecast horizon. The evidence presented by Bahramian (2006) indicated that the earnings forecast error is positively associated with the forecast period and stock price volatility. There was no significant relationship between the error of earning forecasting and size, life cycle, leverage and audit quality though.

In turn, Sareban and Ashtab (2008) examined the determinants of earning forecasting errors in 107 companies recently listed in the TSE during the period 1999-2006. The results indicated that the prediction, leverage and life cycle period has a significant negative effect on the accuracy of the predicted results. The significant relationship was also observed among the auditors' opinions.

Uncertain economic environments, with expansions or recessions, can substantially affect the life cycle stages of a business, and affect analysts' accuracy, precision and bias. In Brazil, Martinez (2004) studied the relationship between the oscillations of the Gross Domestic Product (GDP) in a given year and the performance of analysts' forecasts. The results showed that, in periods of economic growth, analysts are more optimistic; on the other hand, their forecasts are more accurate. For this purpose, this study presented trends, although it did not accurately capture the effects of crisis periods.

Jian *et al.* (2015) evaluated whether economic recession influences the characteristics of analysts' earnings forecasts, such as frequency, pessimism, and forecast accuracy. The results indicated that the frequency of forecasting is higher during the recession, but pessimism and precision are lower during the recession, while analysts' error has shown an opposite sign to the forecast.

In turn, Hamers' research (2017) investigated the role of the life cycle in the capital market. Specifically, it verified how the company life cycle affects the analyst and the predictor properties of the analyst. Using a sample of listed companies in the United States over the period 1994 to 2012, it was verified, as far as the accuracy of analysts' forecasts is concerned, that analysts' individual forecasts are less accurate for start-ups, turbulence and decline in relation to forecasts issued to mature companies.

It should be noted that the evidence presented, while demonstrating that life cycle stages may affect the accuracy of earning forecasts, does not precisely detail the effect of each specific phase (birth, growth, maturity, turbulence and decline) on analysts' decisions, whether optimistic or pessimistic, and in emerging markets, which can have particular effects on business life cycles. Thus, according to Figure 1, a theoretical survey was carried out to justify analysts' performance in predicting earnings for each life cycle stage.

Birth Stage	
Characteristics	**Accuracy Problems**
The companies in this stage are typically small, dominated by their owners (entrepreneurs), with a simple and informal structure and with functional systems without a focus on the interaction among sectors. The company does not make profit, its operational flow will probably be equal to zero, despite expected future receivables (Costa, 2015).	The products offered have not been tested yet and have no established Market, so that the company value depends totally on its future growth potential. Therefore, the estimates are prone to errors due to the context of uncertainties (Damodaran, 2012). According to Dickinson (2011) and Hribar and Yehuda (2015), mispricing happens throughout the lifecycle, but is particularly noticed during the initial phases, when the signs of different performance measures are more distinct. In addition, there is little publicly available information on these new companies, so that there is more private information, factors that tend to increase the cost of capital, due to the uncertainty, making the analysts' precision more difficult (Girão, 2016).
Growth Stage	
Characteristics	**Accuracy Problems**
The basic aspect of this phase is the change from the birth to the growth stage, mainly related to market expansion, thus increasing the companies' needs when compared to the previous phase (Costa, 2015). Companies in the growth stage are generally medium-sized with multiple shareholders, and achieve rapid growth, because they attract more clients and establish their presence in the market (Koh *et al.*, 2015).	Normally, their revenues increase rapidly, although this can still turn into losses. Hence, the valuation is still limited and hardly reliable, factors that can compromise the accuracy of analysts' forecasts (Damodaran, 2012). In this phase, forecasts become more difficult and, consequently, the analysts' costs and efforts to follow the companies in the growth stage increase (Hamers, 2017). In addition, the companies' limited visibility in the growth stage can limit the analysts' benefits that could derive from covering these companies (Bhushan 1989; Bushee & Miller, 2012). Nevertheless, the evidence by Costa (2015) appoints that, in the growth stage, the accounting information is more relevant when compared to other phases. Hence, the analysts' accuracy, although the companies are still in an uncertain stage, can be less biased.
Maturity Stage	
Characteristics	**Accuracy Problems**
In the maturity stage, the companies are less prone to assuming innovative or risky strategies than in their birth and growth stages. Their revenues will grow at a stable rate and the cash flows increase continuously. In this phase, the operational performance stabilizes and the focus changes to the organizational efficiency (Miller & Friesen, 1984).	Mature companies have a stable operational environment, reflected in persistent earnings, thus facilitating the analysts' capacity to predict the future performance (Easley & O'Hara, 2004, Donelson & Resutek, 2015). The study by Costa (2015) appoints that, in this stage, together with the growth stage, the accounting information is relevant and hence possesses explanatory and predictive power. Hence, the analysts tend to provide accurate and precise earnings forecasts, as the companies are less risk-prone. Mature companies do not have many investments to make, nor is a default probably (the classification of the life cycle based on the signs of the cash flows evidences this), so that the earnings are more predictable when compared to the initial stages.

Turbulence Stage	
Characteristics	**Accuracy Problems**
Dickinson (2011) appoints that the literature lacks information on the cash flow for these companies. Thus, when the companies do not rank in the other cycles, they fit into the turbulence stage. For the same author, in this stage, the number of producers starts to decline. Nevertheless, this stage is marked by the company's oscillations.	According to Costa (2015), in case of turbulence, the companies are in a phase of change and may migrate to another stage. Hence, the accounting information loses information contents and can negatively affect the analysts' performance in the earnings forecast process. In the same sense, according to Girão (2016), companies in the turbulence stage can migrate to previous stages, implementing new ideas or improving their efficiency, or can move to the decline stage. Nevertheless, little is known on these companies, leading to uncertainty about the implications in the financial analysts' activities.
Decline Stage	
Characteristics	**Accuracy Problems**
In the Companies' decline stage, the revenues and earnings start to decrease; existing investments will probably continue to produce cash flows, although with a downward rhythm; and the firm has little need for new investments (Damodaran, 2012). In this phase, the companies are stuck in a vicious circle of bad performance due to their stagnated business models and face difficulties to attract and retain clients (Miller & Friesen, 1984).	The company value completely depends on existing assets due to past practices. Hence, the analysts' earnings forecast tends to be easier, that is, more accurate and less biased. Nevertheless, in this phase, the investors gradually leave the companies, as they have no incentives to invest in the companies, leading to a lesser quality of the accounting information and, consequently, the analysts may face some difficulty to predict future earnings (Costa, 2015).

Figure 1. Analysts' accuracy in company life cycle stages

Source: elaborated by the authors, 2016

Thus, according to all the arguments presented above, we postulate that the life cycle stages have different economic characteristics, in which they serve as support for financial analysts to make predictions. Given this, we have the following main hypothesis, and its consequences:

- **H1:** the accuracy of earnings forecasts is influenced by the life cycle stages of firms in the Brazilian capital market.
- **H1a:** Firms in the birth stage have their earnings predicted less accurately when compared to companies in the maturity stage
- **H1b:** Growth-stage companies have their earnings predicted less accurately when compared to companies in the maturity stage
- **H1c:** Companies in the turbulence stage have their earnings predicted less accurately when compared to companies in the maturity stage
- **H1d:** Firms in the decline stage have their earnings predicted more accurately when compared to companies in the maturity stage.

3. Method

3.1 Sample Selection and Composition

The universe of this study will consist of all the non-financial companies listed on BM&FBOVESPA. For the composition of the (non-probabilistic) sample, those companies were selected whose information was available in the database of Economatica® and Thomson Reuters Eikon®. Financial companies were excluded from the population because they have specific accounting regulations and equity structures.

The period used for the assessment and, consequently, for the constitution of the sample was from 2008 to 2014, in order to capture some effects in the market in relation to the convergence process with the international accounting standards and the economic crisis from 2008 to 2010. After complying with the criteria listed above, the sample was composed of 713 companies a year.

3.2 Description of Models

3.2.1 Classification of Life Cycle Stages (LCS)

Dickinson's (2011) ranking of the LCSs was used, as shown in Table 3, which classifies the companies into five stages: (1) birth, (2) growth, (3) maturity, (4) turbulence and (5) decline. This model is based on the combination of signs of each of the three cash flow components, i.e. operational, investment and financing.

In order to illustrate this ranking, the companies in the birth stage are taken as an example. These companies need operating cash and negative investment cash as well as positive financing cash, as the company is not yet able to generate cash through its operating activities (negative sign) and needs to have cash outflow to invest (negative sign) in its projects, therefore resorting to financing (positive sign). Otherwise, it should be classified in the other life cycle stages, whose respective criteria are displayed in Figure 2.

Cash Flow	Birth	Growth	Maturity	Turbulence	Decline
Operational	-	+	+	+ - +	- -
Investment	-	-	-	+ - +	+ +
Financing	+	+	-	+ - -	+ -

Figure 2. Classification of Life Cycle Stages

Source: Dickinson (2011, p. 9)

Dickinson (2011) appoints that the measuring method of the LCSs using cash flow patterns can absorb the effects of measures such as sales growth and dividend distribution, used in methods like Anthony and Ramesh (1992). In addition, it does not need the researcher's own arbitrary classifications. Hence, Dickinson (2011) measures the life cycle stages using the signs of the components in the cash flow statement.

3.3.1 Accuracy measuring model of analysts' earnings forecasts

To analyze the accuracy of the analysts' forecasts, a model based on the studies by Jiao *et al.* (2011), Gatsios (2013) and Martinez and Dummer (2014) was used, by means of a measure called Absolute Forecast Error (AFE). The AFE results from the absolute difference, using the module, between the annual earnings per share (EPS) of company" j" in the period of the income presentation ($A_{j,r}$) and the analysts' mean forecast for EPS on April 1st ($F_{j,t}$), dividing this difference by the companies' stock price ($P_{j,t}$), as described next:

$$EPA_{j,t} = \left| \frac{A_{j,r} - F_{j,t}}{P_{j,t}} \right|$$

According to Martinez and Dummer (2014), in this model, all errors can be considered, as it does not depend on whether the errors are negative or positive, while other methods, such as those that measure the analysts' bias, considered that the positive errors cancel the negative errors of the same magnitude.

3.2.2 Proposed Regression Model

To investigate the effects of the life cycle stages as environmental determinants in the accuracy of earnings forecasts in the Brazilian capital market, a model was used based on the studies by Gatsios (2013) and Jiang *et al.* (2015), described next. Nevertheless, as dummy variables are used to capture the life cycle stages, the maturity stage had to be removed for the sake of comparison in the results analysis. Therefore, two linear equations were created: the first containing only the variables of interest; and in the second, the control variables were inserted as described next:

$$AFE_{it} = \alpha + \beta_1 * DBIRT_{it} + \beta_2 * DGROW_{it} + \beta_3 * DTURBU_{it} + \beta_4 * DDECLI_{it} + \varepsilon_{it} \quad (1)$$

$$\begin{aligned} AFE_{it} = {} & \alpha + \beta_1 * DBIRT_{it} + \beta_2 * DGROW_{it} + \beta_3 * DTURBU_{it} + \beta_4 * DDECLI_{it} + \beta_5 \\ & * DLOSS_{it} + \beta_6 * QANALYST_{it} + \beta_7 * DOPTIM_{it} + \beta_8 * PTB_{it} + \beta_{10} \\ & * LnSIZ_{it} + \beta_{11-29} * \sum DSECT + \beta_{29-35} * \sum DYEAR\ \varepsilon it \end{aligned} \quad (2)$$

Where:
AFE = Absolute Forecast Error (Accuracy measure)
DNASC = Dummy variable that indicates the Birth Stage of the Life Cycle, with score 1 for companies in the Birth Stage and 0 for the others.
DCRES = Dummy variable that indicates the Growth Stage of the Life Cycle, with score 1 for companies in the Growth Stage and 0 for the others.
DTURBU = Dummy variable that indicates the Turbulence Stage of the Life Cycle, with score 1 for companies in the Turbulence Stage and 0 for the others.
DDECLI = Dummy variable that indicates the Decline Stage of the Life Cycle, with score 1 for companies in the Decline Stage and 0 for the others.
DLOSS = Dummy variable that indicates 1 for loss in the year and 0 for the others.
QANALYST= Control variable that indicates the analysts' total coverage.
DOPTIM = Dummy control variable that indicates 1 for optimistic forecast and 0 for pessimistic forecast.
PTB = The Price-to-book is a control variable that measures the relation between the market value and equity value of company i in time t.
LnSIZ = Control variable that indicates the company size through the Natural Logarithm of Total Assets.
∑DSECT = Control variable that indicates the sector the company acts in. Eighteen (19-1) dummies were included for the sectors.
∑DYEAR = Control variable that indicates each year analyzed. Six (7-1) dummies were included for the years.
ε = Error term of the regression of company *i* in period *t*.

The control variable DLOSS was used, which indicates negative results of the period, as the studies by Dalmácio *et al.* (2013), Gatsios (2013) and Jian *et al.* (2015) revealed that analysts tend to decrease their accuracy with companies' negative results.

The control variable QANALYST was used in the studies by Martinez (2004) and Dalmácio *et al.* (2013) and indicates that, the more analysts monitor the company, the more information will be disseminate and the lesser the earnings forecasting errors will be. This information for QANALYST was collected by means of the total recommendations each company in the sample received.

The variable DOPTIM was also used, which according to Martinez (2004) and Almeida and Dalmácio (2015) represents the analysts' bias, whether pessimistic or optimistic.

The PTB variable, in turn, used in the studies by Martinez (2004) and Almeida and Dalmácio (2015), reveals that, the higher the PTB, the greater the analysts' accuracy will be. This same behavior is also expected for LnSIZ, as greater accuracy is expected for larger companies, being better known. Finally, the sector is used as a control variable as, according to Pessotti (2012), Gatsios (2013) and Jian *et al.* (2015), the analysts' forecasts can be associated with the companies' activity branches.

4. Results and Discussion

4.1 Descriptive statistics

The data presented in Table 1 provide information on the descriptive statistics for the non-dummy (control) variables in the measuring model of the life cycle stages' effects on the accuracy of the analysts' earnings forecasts.

Table 1
Descriptive statistics of continuous variables – total and per LCS

Variables	Mean	Median	Maximum	Minimum	Standard Dev.
AFE	0.387	0.040	120.484	1.84e-6	4.735
QANALYST	11.533	11	26	1	5.670
PTB	5.015	1.690	309.580	-12.812	21.446
SIZ	21,100,000	5,370,000	793,000,000	333,000	67,300,000
LnSIZ	15.616	15.497	20.491	12.717	1.416
Birth Stage (n = 25)					
AFE	1.224	0.357	13.626	0.004	2.764
QANALYST	9.800	9	21	1	6.021
PTB	1.997	1.862	11.503	-10.437	3.617
SIZ	9,890,000	3,280,000	58,200,000	493,000	14,900,000
LnSIZ	15.158	15.002	17.880	13.109	1.451
Growth Stage (n = 306)					
AFE	0.518	0.040	120.484	0.000	6.889
QANALYST	11.556	11	25	1	5.709
PTB	5.540	1.579	309.580	-4.855	26.163
SIZ	21,800,000	5,090,000	678,000,000	466,000	64,400,000
LnSIZ	15.623	15.443	20.334	13.051	1.445
Maturity Stage (n = 330)					
AFE	0.097	0.030	1.920	0.000	0.198
QANALYST	11.906	12	26	1	5.683
PTB	5.195	1.927	287.160	-12.812	18.850
SIZ	20,200,000	5,230,000	793,000,000	333,000	65,000,000
LnSIZ	15.610	15.469	20.492	12.717	1.391
Turbulence Stage (n = 48)					
AFE	0.945	0.098	34.572	0.003	4.975
QANALYST	9.729	9.5	21	2	5.193
PTB	2.111	1.385	23.690	-0.080	3.565
SIZ	28,900,000	6,930,000	753,000,000	477,000	109,000,000
LnSIZ	15.768	15.751	20.440	13.076	1.379
Decline Stage (n = 4)					
AFE	2.346	0.537	8.309	0.002	3.992
QANALYST	11.500	12.5	19	2	7.047
PTB	3.663	0.475	13.894	-0.190	6.829
SIZ	24,400,000	21,300,000	47,400,000	7,370,000	20,100,000
LnSIZ	16.676	16.608	17.674	15.813	0.987

Obs.: AFE = Absolute Forecast Error, QANALYST = Control variable indicating how many analysts monitor the company, PTB = The Price-to-book is a control variable that measures the relation between the company's market value and equity value, SIZ = Company's total assets and LnSIZ = Is the natural logarithm of SIZ.

Source: research data

Based on the results presented in Table 1 for the AFE variable, which indicates the analysts' absolute forecasting errors, the mean values corresponded to 0.387 in the period analyzed (2008 till 2014), with a median value of 0.040. The minimum was approximately 0.000 and the maximum 120.484.

The results corroborate the common and known heterogeneity in accounting and financial data (Ohlson & Kim, 2015; Duarte, Girão & Paulo, 2016), and the variance is also different for AFEs among the different stages of the life cycle, based on the Levene test (p-value = 0.000, not tabulated), which will justify the analyses presented in sections 4.2.2 and 4.4, where this heterogeneity will be better explored.

In addition, the AFEs vary according to the life cycle stages, based on a Kruskal-Wallis test (p-value = 0.000, not tabulated). This indicates that this study will seek to confirm, through the analyses in the following sections, that the "unripe" (birth, growth, turbulence, and decline) stages of the company life cycle increase analysts' propensity towards mistaken earnings predictions.

It should be noted, based on the theoretical-empirical framework adopted, that in the growth phase for example, companies are adopting a posture of putting new products on the markets, hiring more qualified employees to meet their needs, and often with high profits, but still with many investments to be made, a post-birth stage, which is less complex and less profitable (Dickinson, 2011), which may disrupt the accuracy of analysts' predictions.

In the maturity phase, in turn, firms tend to have more stable/persistent results because the growth costs are lower and the operating environment is more stable than for turbulent and declining firms (Easley & O'Hara, 2005; Donelson & Resutek, 2015) which consequently facilitates analysts' forecasting work when we compare the non-mature stages with maturity.

Thus, we can already notice a U-shaped pattern for the average AFE, based on the life cycle stages, respectively: birth = 1.224, growth = 0.518, maturity = 0.097, turbulence = 0.945 and decline = 2.346. The following sections may corroborate these previously found results in a descriptive way. This pattern is similar to that found for the average cost of capital in the life cycle stages in Brazil (Girão, 2016), but with an inverted "U", as expected.

The average value of QANALYST was 11,533, with a median of 11. The maximum number of analysts who monitored a company was 26 and the minimum 1 (to be included in the sample, being monitored by analysts was a requirement), a factor that influenced the high standard deviation for this variable, indicating that firms may have disparities in accuracy as some receive more attention from analysts, leading to greater dissemination of information and less informational asymmetry (Girão, 2016).

The second control variable was PTB, which presented an average value of 5.015 and a median of 1.690. The maximum value was 309.580 and the minimum -12.812. The standard deviation was 21.446, corroborating the previous results that indicated the heterogeneity of the sample, consequently entailing possible prediction errors for the groups of companies with lower PTB coefficients. Negative PTB indicates that there are companies with short-term liabilities due to financial difficulties, which should also affect the analysts' accuracy (Moses, 1990; Behn, Choi & Kang 2008), but are not directly captured by PTB.

Finally, the last control variable was company size, represented by total assets (SIZ). The average value was R$ 21 billion, with a median of R$ 53 billion. Theoretically, the larger the company size, the better the analysts' performance, especially when linked to the life cycle, which helps to reduce informational asymmetry. No evidence was found that enterprise size varies according to the life cycle stages though (p-value> 10%), even when the natural logarithm of the total asset is used, indicating that the company life cycle is really indifferent to size because cash flow patterns are used to classify firms (Dickinson, 2011).

In addition to the AFE variable, which presented different means among the life cycle stages as indicated by the abovementioned Kruskal-Wallis test, at a significance level of 1%, PTB also presented different means among the stages, at the level of 1%, whereas QANALYST presented different means among the stages at 10% (p-value = 0.064). Only SIZ did not present evidences of difference among the means of the life cycle stages (p-value = 0.223).

4.2 Linear models

4.2.1 General model

Table 2 indicates the empirical results of the two equations proposed to capture the effects of the life cycle stages in the accuracy of the analysts' forecasts. The first of them relates to the analysis in which only the variables of interest are considered, while the control variables were included in the second.Due to the identified autocorrelation and heteroscedasticity problems, Newey-West's robust standard erros were estimated.

Table 2

Equations measuring the effects of the life cycle stages on the accuracy of the analysts' earnings predictions between 2008 and 2014

Variables	(1)	(2)
DBIRT	1.354**	0.933
	(0.614)	(0.794)
DGROW	0.551	0.450
	(0.450)	(0.486)
DTURBU	1.354*	1.270
	(0.842)	(0.802)
DDECLI	2.620*	2.358*
	(1.553)	(1.421)
DLOSS	-	0.382
	-	(0.353)
QANALYST	-	-0.033*
	-	(0.019)
DOPTIM	-	0.538
	-	(0.452)
PTB	-	-0.005
	-	(0.005)
LnSIZ	-	0.092
	-	(0.095)
Const	-0.463	-2.221
	(0.356)	(2.157)
F statistics	0.700	0.890
R^2 adjusted	0.028	0.026
White statistics	358.450***	481.960***
Wooldridge statistics	31,781.318***	37,175.755***
Obs.	713	713
Sector dummy	YES	YES
Year dummy	YES	YES

Obs.: *, ** indicate 10% and 5% significance. Newey-West standard error between brackets.
VIF: the dummy variable for the year 2012 presented the highest VIF, equal to 1.66, for model (1), indicating no multicollinearity problem.

$AFE_{it} = \alpha + \beta_1 * DBIRT_{it} + \beta_2 * DGROW_{it} + \beta_3 * DTURBU_{it} + \beta_4 * DDECLI_{it} + \beta_5 * DLOSS_{it} + \beta_6 * QANALYST_{it} + \beta_7 * DOPTIM_{it} + \beta_8 * PTB_{it} + \beta_{10} * LnSIZ_{it} + \beta_{11\text{-}29} * \sum DSECT + \beta_{29\text{-}35} * \sum DYEAR + \varepsilon_{it}$

AFE = Absolute Forecast Error, DBIRT = Dummy indicting the Life Cycle Stage of Birth, DGROW = Dummy indicting the Life Cycle Stage of Growth, DTURBU = Dummy indicting the Life Cycle Stage of Turbulence, DDECLI = Dummy indicting the Life Cycle Stage of Decline, DLOSS = Dummy indicating 1 for loss in the year and 0 for the others, QANALYST = Control variable indicating how many analysts monitor the company, DOPTIM = Control dummy for optimistic forecasts, PTB = The Price-to-book is a control variable that measures the relation between the company's market value and equity value, SIZ = Company's total assets and LnSIZ = Natural logarithm of SIZ.

Source: research data

With regard to equation (1), it was observed that the stages of birth, turbulence and decline seem to affect the accuracy of analysts' predictions at the level of 5%, 10% and 10%, respectively. As indicated in the analysis of descriptive statistics, these were the life cycle stages with the highest AFE, justifying their significance, which tend to make analysts err more, corroborating the positive signs of these variables in the regression.

A possible theoretical justification for this effect would be the challenge that the stages of birth, turbulence and decline generate for analysts, making it difficult to forecast revenues and costs as, often, this type of company does not generate revenue and often incurs debts to finance its activities (Lima, Carvalho, Paulo & Girão, 2015), while mature firms remain institutionalized and formalized, favoring an increase in analysts' accuracy (Hamers, 2017).

Non-tabulated data confirm that, although not statistically significant (p-value = 0.136), mature companies show a negative sign (-0.714), which would reduce the analysts' forecast error. This means that it cannot be argued that business maturity has any impact on accuracy, as mature firms are less problematic, less risky, and therefore easier to analyze (e.g. Easley & O'Hara, 2005; Dickinson, 2011; Donelson & Resutek, 2015; Girão, 2016).

When analyzing equation (2), with the inclusion of control variables, only the decline stage remained significant at 10% and with a positive coefficient, indicating that, even though controlling for several factors, the companies' decline offers some important information, which is not captured by the controls, for the analysts to calibrate their forecast models.

With respect to the controls inserted in equation (2), only the analysts' coverage was statistically significant at 10% and with a negative sign, as expected, as analysts' coverage is able to reduce informational asymmetry (Girão, 2016).

The results remain similar when the dummies of birth, growth, turbulence and decline are exchanged for their maturity counterpart, but the signal of the maturity, as expected, is negative, but without statistical significance.

It should be emphasized that, overall, the models presented above were not statistically significant. Some sensitivity tests for outliers were used though (Winsorization in section 4.2.2 and a different estimator in section 4.4), demonstrating that the results were statistically more acceptable, but with qualitatively similar results of the variables' signs.

4.2.2 Control for outliers by winsorization

The analysts' forecast error has a very high dispersion for the sample used in this research, ranging from 1.84e-6 to 120.484 (mean 0.377 and standard deviation 4.735), which may pollute the analysis of the results.

In this way, we tried to control the dispersion of this variable with the Winsorization procedure at 5% in each tail of the variable distribution.

Table 3

Equations that measure the effects of the life cycle stages on the accuracy of the analysts' earnings forecasts in the period from 2008 till 2014, with 5% winsorization in each tail

Variables	(3)	(4)
DBIRT	0.236***	0.050
	(0.048)	(0.050)
DGROW	0.130	0.006
	(0.010)	(0.008)
DTURBU	0.056**	0.027
	(0.028)	(0.024)
DDECLI	0.191*	0.113
	(0.113)	(0.078)
DLOSS	-	0.209***
	-	(0.018)
QANALYST	-	-0.003***
	-	(0.001)
DOPTIM	-	0.004
	-	(0.013)
PTB	-	-0.000
	-	(0.003)
LnSIZ	-	0.001
	-	(0.003)
Const	0.072***	0.050
	(0.017)	(0.049)
F statistics	7.320***	12.930***
R^2 adjusted	0.232	0.489
White statistics	215.77*	448.970***
Wooldridge statistics	5.595**	1.627
Obs.	713	713
Sector dummy	YES	YES
Year dummy	YES	YES

Obs.: *, **, *** indicate 10%, 5% and 1% significance. Standard errors between brackets - Newey-West for equation (3) and White for equation (4).

VIF: the dummy variable for the year 2011 presented the highest VIF, equal to 1.67, for model (7), indicating no multicollinearity problem.

$AFE_{it} = \alpha + \beta_1 * DBIRT_{it} + \beta_2 * DGROW_{it} + \beta_3 * DTURBU_{it} + \beta_4 * DDECLI_{it} + \beta_5 * DLOSS_{it} + \beta_6 * QANALYST_{it} + \beta_7 * DOPTIM_{it} + \beta_8 * PTB_{it} + \beta_{10} * LnSIZ_{it} + \beta_{11\text{-}29} * \sum DSECT + \beta_{29\text{-}35} * \sum DYEAR + \varepsilon_{it}$

AFE = Absolute Forecast Error, DBIRT = Dummy indicting the Life Cycle Stage of Birth, DGROW = Dummy indicting the Life Cycle Stage of Growth, DTURBU = Dummy indicting the Life Cycle Stage of Turbulence, DDECLI = Dummy indicting the Life Cycle Stage of Decline, DLOSS = Dummy indicating 1 for loss in the year and 0 for the others, QANALYST = Control variable indicating how many analysts monitor the company, DOPTIM = Control dummy for optimistic forecasts, PTB = The Price-to-book is a control variable that measures the relation between the company's market value and equity value, SIZ = Company's total assets and LnSIZ = Natural logarithm of SIZ.

Source: research data

As can be observed, when comparing tables 2 and 3, in Table 3, the models presented statistical significance and a better fit (through the adjusted R^2), due to the control for outliers by the winsorization process.

The results remained qualitatively similar for the uncontrolled model [equation (3)], with the same variables remaining statistically significant. In the winsorized model, however, the significance increased for the turbulence stage.

When adding the controls, the results are somewhat different as, when comparing equation (2) with equation (4), we can verify that no stage in the life cycle of the companies seemed to affect the analysts' forecast error, not even at a 10% significance level.

The variable DLOSS (dummy for loss in the current year), however, was statistically significant at 1% level and with a positive sign, indicating that, when there is a loss, analysts tend to err more in their earnings projections. These results support the studies by Dalmácio *et al.* (2013), Gatsios (2013) and Jian *et al.* (2015), who realized that losses tend to worsen the analysts' performance.

In turn, the QANALYST variable, which represents analysts' coverage, was significant at 1% with a negative coefficient. As previously mentioned, the increase in analysts' coverage is expected to favor the analysts' performance (Martinez & Duma, 2014).

4.3 Analysis of the Bias of Optimism and Pessimism

In order to analyze the effects of the life cycle stages in detail, serving as economic determinants or not, of the accuracy of earnings forecasts in the Brazilian capital market, quantile regression was used because, due to the heterogeneity of the sample, this is a more robust method than OLS, previously used (Ohlson & Kim, 2015, Duarte, Girão & Paulo, 2016).

In addition, there may be particularities in the distribution of the analysts' accuracy, that is, extreme forecast errors that may be optimistic or pessimistic ex-post (Martinez, 2004). Testing this characteristic is not possible with the use of the OLS models, without incurring a greater sample selection bias. When using the quantile regression, this test is possible, because we can test the tails of the distribution of the analysts' forecast error without major problems.

Thus, the two tails of the distribution were tested by means of the first quartile (p25%) and the last quartile (p75%), according to Table 4. It is noteworthy that, for this test, the analyst's absolute forecast error was not used (in module), because the focus now is not the size of the error per se, but its sign.

Table 4

Equations that measure the effects of the life cycle stages on the accuracy in the tails of the analysts' earnings predictions between 2008 and 2014

Variables	(5) p.25	(6) p.75
DBIRT	-0.476***	0.013
	(0.019)	(0.010)
DGROW	-0.008	-0.004
	(0.007)	(0.004)
DTURBU	-0.060***	-0.004
	(0.014)	(0.007)
DDECLI	-0.436***	-0.157***
	(0.041)	(0.023)
DLOSS	-0.371***	-0.109***
	(0.010)	(0.005)
QANALYST	0.003***	0.000
	(0.001)	(0.000)
DOPTIM	-0.051***	-0.092***
	(0.009)	(0.005)
PTB	0.000	-0.000**
	(0.000)	(0.000)
LnSIZ	0.000	0.001
	(0.002)	(0.001)
Const	-0.013	0.067***
	(0.041)	(0.020)
Wald test	145.480***	58.740***
Pseudo R^2	0.107	0.060
Obs.	713	713
Sector dummy	YES	YES
Year dummy	YES	YES

Obs.: *, **, *** indicate 10%, 5% and 1% significance. Standard error between brackets.
VIF: the dummy variable for the year 2011 presented the highest VIF, equal to 1.67, for model (7), indicating no multicollinearity problem.

$AFE_{it} = \alpha + \beta_1 * DBIRT_{it} + \beta_2 * DGROW_{it} + \beta_3 * DTURBU_{it} + \beta_4 * DDECLI_{it} + \beta_5 * DLOSS_{it} + \beta_6 * QANALYST_{it} + \beta_7 * DOPTIM_{it} + \beta_8 * PTB_{it} + \beta_{10} * LnSIZ_{it} + \beta_{11-29} * \sum DSECT + \beta_{29-35} * \sum DYEAR + \varepsilon_{it}$

AFE = Absolute Forecast Error, DBIRT = Dummy indicting the Life Cycle Stage of Birth, DGROW = Dummy indicting the Life Cycle Stage of Growth, DTURBU = Dummy indicting the Life Cycle Stage of Turbulence, DDECLI = Dummy indicting the Life Cycle Stage of Decline, DLOSS = Dummy indicating 1 for loss in the year and 0 for the others, QANALYST = Control variable indicating how many analysts monitor the company, DOPTIM = Control dummy for optimistic forecasts, PTB = The Price-to-book is a control variable that measures the relation between the company's market value and equity value, SIZ = Company's total assets and LnSIZ = Natural logarithm of SIZ.

Source: research data

Equation (5), which aims to measure the effect of the life cycle stages on the accuracy of profit forecasts for p.25%, a group of companies with more optimistic forecasts by analysts (forecasted earnings higher than observed earnings) showed that the stages of birth, turbulence and decline were significant, as well as the control variables analysts' coverage, DLOSS and DOPTIM, all at a significance level of 1% and with negative signs, except for analysts' coverage.

The results reveal that the stages of birth, turbulence, and decline lead to less optimistic projections of earnings by analysts, possibly because birth-stage estimates are prone to error due to the context of uncertainty about the company's development (Damodaran, 2012). In turbulence, the results are inconstant (Dickinson, 2011) and, in decline, companies decrease the quality of accounting information, which tends to lead to a decrease in analysts' accuracy if they do not control these factors (Costa, 2015; Lima *et al*., 2015).

Analyzing the right end (tail) of the distribution, which deals with the most positive (pessimistic) forecast errors in equation (6), when the projected profit is lower than the observed profit, only the decline stage remained significant at 1 % and with a negative sign, indicating that, in companies in the decline stage, the tendency is for the forecast errors to be close to zero, in view of a lesser bias in both the pessimistic and the optimistic environment, possibly because enough is known about the company and that it is going through a process that will tend towards discontinuity.

Regarding the control variables, a similar behavior was observed with p.25%, as only the variables DLOSS and DOPTIM were significant at 1% and with a negative sign.

4.4 Estimation Sensitivity Testing

4.4.1 Quantile Regression

Additionally, in order to capture the effect of possible outliers of the sample with an estimator different from the OLS, a sensitivity test was performed by means of quantile regression in the median (p50%), according to Table 5.

Table 5

Equation that measures the effect of the life cycle stages on the accuracy in the median of the analysts' earnings forecasts between 2008 and 2014

Variables	(7) p.50
DBIRT	0.113***
	(0.010)
DGROW	0.003
	(0.004)
DTURBU	0.008
	(0.007)
DDECLI	0.594***
	(0.012)
DLOSS	0.223***
	(0.005)
QANALYST	-0.001***
	(0.000)
DOPTIM	-0.006
	(0.005)
PTB	-0.000*
	(0.000)
LnSIZ	-0.000
	(0.001)
Const	0.036*
	(0.020)
Wald test	167.500***
Pseudo R^2	0.062
Obs.	713
Sector dummy	YES
Year dummy	YES

Obs.: *, **, *** indicate 10%, 5% and 1% significance. Standard error between brackets.
H0 of the Wald Test: all estimated betas are equal to zero.
$AFE_{it} = \alpha + \beta_1 * DBIRT_{it} + \beta_2 * DGROW_{it} + \beta_3 * DTURBU_{it} + \beta_4 * DDECLI_{it} + \beta_5 * DLOSS_{it} + \beta_6 * QANALYST_{it} + \beta_7 * DOPTIM_{it} + \beta_8 * PTB_{it} + \beta_{10} * LnSIZ_{it} + \beta_{11\text{-}29} * \sum DSECT + \beta_{29\text{-}35} * \sum DYEAR + \varepsilon_{it}$
AFE = Absolute Forecast Error, DBIRT = Dummy indicting the Life Cycle Stage of Birth, DGROW = Dummy indicting the Life Cycle Stage of Growth, DTURBU = Dummy indicting the Life Cycle Stage of Turbulence, DDECLI = Dummy indicting the Life Cycle Stage of Decline, DLOSS = Dummy indicating 1 for loss in the year and 0 for the others, QANALYST = Control variable indicating how many analysts monitor the company, DOPTIM = Control dummy for optimistic forecasts, PTB = The Price-to-book is a control variable that measures the relation between the company's market value and equity value, SIZ = Company's total assets and LnSIZ = Natural logarithm of SIZ.

Source: research data

The results of equation (7) showed that the stages of birth and decline were significant at 1% and with a positive sign, as expected. In comparison with the previous estimates of equations (2) and (4) in Tables 2 and 3, we can see that, although all the signs of the variables of interest were the same, only the decline showed statistical significance at 10% in equation (2).

As the quantile regression, when compared to the OLS, may be more suitable for the analysis of accounting and financial models, being less sensitive to the outliers, there is no need to lose information with the use of winsorization, and it is robust to the heterogeneity so common in this type of data (Ohlson & Kim, 2015; Duarte, Girão & Paulo, 2016). The estimates presented in Table 5 are considered safer, although they are qualitatively in line with the estimates in Tables 2 and 3.

This supports the previous results that companies in the birth and decline stages lead to an increase in analysts' absolute forecast error in general.

Figures 3 and 4 below show these variables' behavior along the quantiles, although the differences between the 1st and 3rd quartiles were statistically significant for the stages of birth (p-value = 0.066) and decline (p-value = 0.067) only at 10%. One can see that the effect of the birth stage increases with the AFE. The same happens, but more sharply, with the stage of decline.

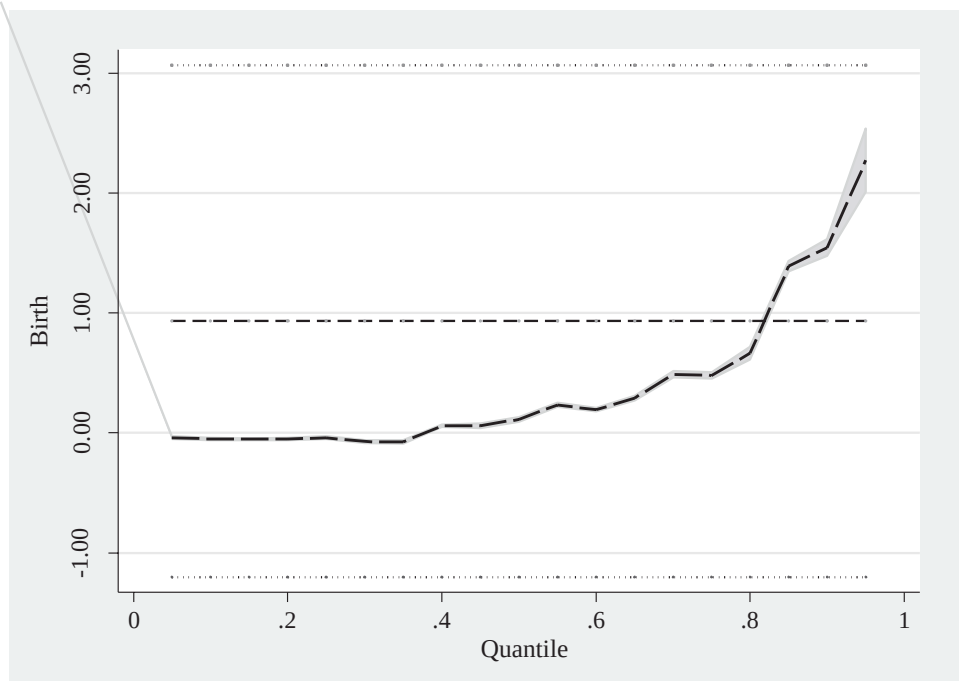

Figure 3. Effect of dummy variable representing the companies in the decline stage throughout the quantiles of the AFE variable between 2008 and 2014

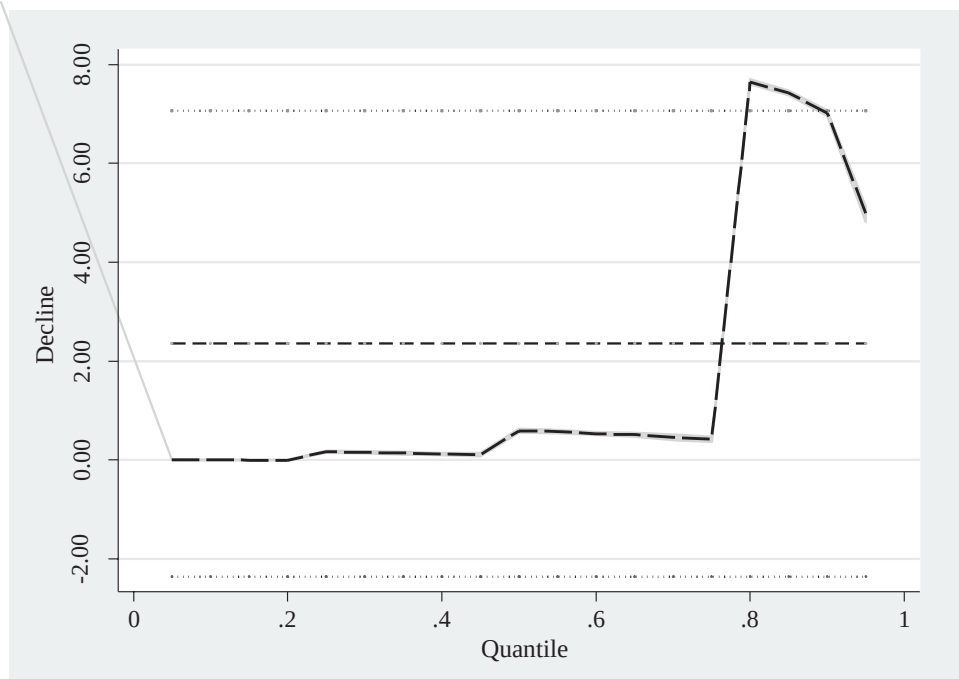

Figure 4. Effect of dummy variable representing the companies in the decline stage throughout the quantiles of the AFE variable between 2008 and 2014

4.4.2 Analysis of unsecured liability effect (financial difficulty)

As mentioned earlier, negative PTB indicates that there are companies with unsecured liabilities due to financial difficulties, which should also affect the analysts' accuracy (Moses, 1990; Behn, Choi & Kang, 2008; Jiang, Habib & Gong, 2015), but which are not directly captured by PTB.

In the sample, only the company Gol Linhas Aéreas Inteligentes SA (Gol) had uncovered liabilities and, consequently, PTB <0, in the year 2014 (final year of the sample). Thus, a dummy variable (PLDESC) was inserted into the quantile regression model in the median, presented in equation (7), now represented by equation (8), to control this specific effect of a company classified as mature, by the cash flow patterns (Dickinson, 2011), but at a high level of financial difficulty that lasts until today (2017).

To gain a more empirical idea of the effect this specific case may have on the results, Gol's AFE was 0.272 (the error was negative, indicating analysts' optimism), while the mean (median) AFE of mature companies corresponded to 0.097 (0.030) and there were 10 analysts following its activities - below the average and median of the mature companies and the average and median of the general sample.

The results remained qualitatively similar with respect to the signs, in that all signs of the variables of interest (including the dummy for Gol in 2014) and of DLOSS were positive and the other control variables presented negative signs, as expected.

Concerning statistical significance, the results of equation (8) corroborate those presented in equation (7), where only birth and decline were statistically significant at 1% and the PLDESC variable was also significant at 1%, but with the highest magnitude among all other variables of interest, with its coefficient equal to 2.766, indicating that Gol's financial difficulty has a significant impact on the AFE, corroborating the previous results that companies in financial difficulties get less accurate forecasts from analysts, or a higher AFE (Behn, Choi & Khang, 2008).

Table 6

Equation that measures the effect of the life cycle stages on the accuracy in the median of the analysts' earnings forecasts between 2008 and 2014

Variables	(8) p.50
PBIRT	2.766***
	(0.017)
DNASCI	0.136***
	(0.09)
DGROW	0.004
	(0.003)
DTURBU	0.008
	(0.007)
DDECLI	0.088***
	(0.018)
DLOSS	0.200***
	(0.005)
QANALYST	-0.001***
	(0.000)
DOPTIM	-0.006
	(0.005)
PTB	-0.001**
	(0.000)
LnTAM	-0.000
	(0.001)
Const	0.037**
	(0.018)
Wald test	1,158.920***
Pseudo R^2	0.073
Obs.	713
Sector dummy	YES
Year dummy	YES

Obs.: *, **, *** indicate 10%, 5% and 1% significance. Standard error between brackets.
H0 of the Wald Test: all estimated betas are equal to zero.

$AFE_{it} = \alpha + \beta_1 * DBIRT_{it} + \beta_2 * DGROW_{it} + \beta_3 * DTURBU_{it} + \beta_4 * DDECLI_{it} + \beta_5 * DLOSS_{it} + \beta_6 * QANALYST_{it} + \beta_7 * DOPTIM_{it} + \beta_8 * PTB_{it} + \beta_{10} * LnSIZ_{it} + \beta_{11\text{-}29} * \sum DSECT + \beta_{29\text{-}35} * \sum DYEAR + \varepsilon_{it}$

AFE = Absolute Forecast Error, DBIRT = Dummy indicting the Life Cycle Stage of Birth, DGROW = Dummy indicting the Life Cycle Stage of Growth, DTURBU = Dummy indicting the Life Cycle Stage of Turbulence, DDECLI = Dummy indicting the Life Cycle Stage of Decline, DLOSS = Dummy indicating 1 for loss in the year and 0 for the others, QANALYST = Control variable indicating how many analysts monitor the company, DOPTIM = Control dummy for optimistic forecasts, PTB = The Price-to-book is a control variable that measures the relation between the company's market value and equity value, SIZ = Company's total assets and LnSIZ = Natural logarithm of SIZ.

Source: research data

5. Final Considerations

Analysts play a relevant role in the capital market, as they provide additional information to the decision-making process (Sun, Carrete & Tavares, 2017). The internal and external environmental factors that determine the analysts' predictions, however, such as the life cycle stages (birth, growth, maturity, turbulence and decline), are still a gap in the literature though.

The main results of the research pointed out that the analysts' earnings forecasts for companies in the birth and decline stage are the most problematic (statistical significance at 1%), despite controlling for several common factors in the literature on analyst forecast error, and the addition of a dummy variable to control the shortfall as a proxy for financial difficulties.

The control for short-term liabilities, specifically, was significant at the 1% level and had the greatest magnitude among the variables of interest used in this study, indicating their relevance and opening the scope for further research in Brazil on analysts' forecast error for companies in financial difficulties, mainly because the sample of this work did not cover the years referring to the recent Brazilian crisis, which may have affected the financial health of companies and, as one of the consequences, the analysts' forecasts.

Analyzing the signs of prediction errors (optimism and pessimism), the stages of birth, turbulence and decline lead to less optimistic earnings forecasts whereas, for pessimistic predictions, only the decline stage was significant, reducing the pessimistic bias. In short, the decline stage led to less biased projections compared to the other, non-mature stages.

These results remain qualitatively similar despite the inclusion of control for the financial difficulty, with the difference that, for forecasting errors with optimistic bias, firms at birth are significant at 1% and reduce this bias. For forecasting errors with a negative bias, on the other hand, firms at birth increase bias at the 10% level (non-tabulated data).

Therefore, one cannot reject the hypothesis that the companies' life cycle stages affect the analysts' accuracy but, against expectations, the decline stage seems to reduce rather than increase the accuracy, as presented in the research assumptions. When the forecasting bias is analyzed, however, only the decline stage reduced the more pessimistic and optimistic bias in situations of more extreme forecasting errors (p.25 and p.75).

In this scenario, this study may contribute to the still scarce literature at the international level, especially at the Brazilian level, that environmental factors, whether internal or external to companies, such as life cycle stages, in which they already improve the quality of accounting information (Sun, Carrete & Tavares, 2006), are likely to play a determinant role in the accuracy of error forecasts - an important topic in financial market research, as analysts' forecasts and reports are able to influence investors (Sun, Carrete & Tavares, 2017).

It should be emphasized that these results cannot be generalized to the entire reality of Brazilian companies, as analysts did not evaluate all companies listed on the stock market.

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Objective: this study was aimed at investigating the relevance of accounting education and research for the growth of the Brazilian economy during the first decade of the 21st century.

Method: to collect the data, a structured questionnaire was used, elaborated based on the relevant literature. The questionnaire was tested and applied to a sample of Brazilian accountants and businessmen during 2017. In the analysis of these data, content analysis was applied and statistical tests were used to establish relations between the answers obtained.

Results: the main findings of this study indicate that the expansion of accounting education and research in Brazil was essential for the growth of the economy, according to the respondents' perception, despite the impression that accountants and businessmen need to make better use of the accounting information.

Contributions: from the academic viewpoint, the evidences from this research contribute to fill of an important existing gap in the Brazilian literature. What the market is concerned, they contribute by providing evidence that, despite its perceived relevance, its users need to make better use of the accounting information.

Key words: Education: Research; Accounting.

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Spacing before and after paragraphs	3 pt.
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Title	The table title must be brief, clear and explanatory. It should be placed above the table, in the top left corner, and on the next line, just below the word Table (with a capital initial), followed by the number that designates it. The tables are presented with Arabic numerals in sequence and within the text as a whole. Eg: Table 1, Table 2, Table 3, and so on.
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